# ARTICLE

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# Workplace-based knowledge exchange programmes between academics, policymakers and providers in the health and social care sector: a scoping review and mapping exercise

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Knowledge mobilisation can be achieved through various routes. This can include immersive, in-person time spent in a different workplace with people from other disciplines or sub-sectors. By doing so participants mobilise and exchange knowledge through observing the dynamics of a different workplace; by learning directly from others with different expertise and/or through sharing their own expertise. We have called this form of knowledge exchange 'Workplace-based Knowledge Exchange Programmes' (WKEPs) and have focused on their role in the health and care sector because of the importance of knowledge mobilisation in this field yet their relatively low profile in the literature. This study explores the main characteristics of WKEPs among academics, providers, and policymakers in the health and care sector in the United Kingdom (UK) through a scoping review and mapping exercise. We systematically identified 147 academic articles (between 2010 and 2022) and 74 websites which offered WKEPs as part of, or all of, their knowledge mobilisation activities (between 2020 and 2022). Characteristics were grouped into structures, processes, and outcomes. WKEPs lasted between one day and five years and were mostly uni-directional. Exchange ambitions varied, aiming to benefit both the participants and their working environments. They commonly aimed to build networks or collaborations, improve understanding of another field and bring back knowledge to their employer, as well as improve leadership and management skills. Almost all programmes were for healthcare providers and academics, rather than social care providers or policymakers. In-person WKEP activities could be categorised into four domains: 'job shadowing', 'work placements', 'project-based collaborations', and 'secondments'. The aims of many of the WKEPs were not clearly described and formal evaluations were rare. We used the findings of this study to develop a framework to describe WKEP activities. We suggest the use of common language for these activities to aid participation and research, as well as recommending principles for the comprehensive advertising of WKEPs and reporting of experiences after participation in WKEPs. We recommend the establishment of an online repository to improve access to WKEPs. These resources are necessary to strengthen understanding and the effectiveness of WKEPs as a mechanism for knowledge mobilisation.

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## Introduction

Many higher education providers and research funders in the UK have objectives around knowledge exchange and mobilisation. In the context of the health and care field, knowledge mobilisation is defined as 'the sharing of knowledge between communities to catalyse change, which can include research producers pushing out their findings, research users seeking out health research, but also the co-production or co-creation of knowledge' (NIHRtv, 2022). For many in the field, 'knowledge' is multi-faceted, including research evidence, but also technical knowledge (including practical skills, experiences and expertise) and practical wisdom (including professional judgments, values and beliefs) (Ward, 2017). These definitions have been derived over decades in a rich literature base, much of which has been focused on understanding what happens once knowledge (or evidence) has been brought into practice from an implementation science discipline perspective (c.f., (Harvey and Kitson, 2016; Lynch et al. 2018; Nilsen, 2015)). The literature also includes numerous evaluations of knowledge exchange interventions, demonstrating the diversity of approaches to knowledge exchange, such as:

- 'embedded researchers'/'researchers in residence' who inform local care practices by drawing on research knowledge (Marshall et al. 2014; Ward et al. 2021),
- 'knowledge brokers'/'boundary spanners' who bring new knowledge into an organisation by building relationships with outside organisations or providing skills training (Nasir et al. 2013),
- researchers being seconded into policy organisations to encourage evidence use in policymaking (O'Donoughue Jenkins and Anstey, 2017; Uneke et al. 2017),
- simultaneous secondments and the creation of an embedded team of researchers and local policymakers (Wye et al. 2020), and
- funded and facilitated long-term partnerships between academia and practice to bridge the gap between evidence and policy (Rycroft-Malone et al. 2015).

Frameworks have also been developed from systematic mapping exercises to help categorise interventions in the health and care field. For example, Ward (2017) provided a conceptual framework offering probes and categorical responses to knowledge mobilisers when analysing models, including 'Why mobilise knowledge?', 'Whose knowledge is being mobilised?', 'What type of knowledge?', 'How is knowledge mobilised?'. The mutually exclusive categories describing why knowledge could be mobilised included: to develop local solutions to practice-based problems; to develop new policies, programmes and/or recommendations; to adopt/implement clearly defined practices and policies; to change practices and behaviours; and to produce useful research/scientific knowledge. These frameworks have progressed the way that knowledge mobilisation activities are framed and discussed by researchers, as well as helped confirm conceptualisations of what 'counts' as evidence or knowledge for practice and policy, building on previous suggestions for the inclusion of experiential and practical knowledge (Oliver et al. 2019, 2014).

Despite the breadth and depth of the literature on knowledge mobilisation and exchange in health and care, we argue that gaps remain. While the evaluations of interventions have provided helpful information about individual knowledge exchange activities, they provide little insight into how to compare knowledge exchange interventions. Furthermore, while the existing frameworks compare activities, they appear to be targeted at people who self-identify as knowledge mobilisers and do not encourage the categorisation of some of the more practical details involved in running or participating in a knowledge exchange intervention.

For example, we were aware of a long-standing knowledge exchange programme that involves a cohort of hospital-based doctors and managers working through a range of activities, including shadowing, group-based learning, and quality improvement projects. Collectively, these activities aimed to improve relationships between participants, helping them to better understand each other's daily challenges in order to find local solutions and ultimately improve the patient care provided in the hospital (Klaber et al. 2011). Using Ward's (2017) framework, we were unable to articulate a main aim, as the programme aimed to develop local solutions to practice-based problems and new policies, change practices and behaviours, and produce useful research—as well as build relationships enabling better care, which according to this framework, is not an end goal. Another example of an ongoing knowledge exchange programme we believed needed an expanded description rooted in practical information was the Harkness Fellowship, which involves a cohort of mid-career researchers, policymakers, and care providers moving to the United States for 12 months to build methodological research skills, develop contacts, and opportunities for collaboration on research that will improve health systems.[1] While the main goal is to produce useful research, the programme was also meant to develop the Fellow in a professional capacity through research skills and contacts.

Thus, with the ambition to increase awareness of and access to immersive workplace-based knowledge exchange concepts and opportunities, we carried out a scoping study to map their characteristics and relationships in an applied conceptual framework. We decided to call the immersive, workplace-based opportunities we were interested in 'workplace-based knowledge exchange programmes' (WKEPs) and were guided by the research question: *What are the characteristics of workplace-based knowledge exchange programmes in the health and care field in the UK as described: (i) in the international academic literature; and (ii) on their websites and webpages?*

## Methods

This scoping study involved a review of the international academic literature, a mapping exercise of the WKEP opportunities in the UK advertised online, and interviews with WKEP beneficiaries. This article examines the first two data sources, and the interview data are reported separately (Kumpunen et al. 2023). We chose to undertake a scoping review because of the exploratory nature of our research questions, which aimed to describe the key characteristics of WKEPs and knowledge gaps (Peters et al. 2022). Mapping exercises are known to be helpful in revealing the organisation and structure of a field's scholarship and providing direction for its growth and sustainability (Farley-Ripple et al. 2020). We followed guidance and commentary on developing and reporting scoping reviews (Colquhoun et al. 2014; Peters et al. 2015; Tricco et al. 2018). The scoping review and mapping exercise involved five stages carried out in parallel for the two data sets: (1) defining research questions, (2) identifying relevant studies/exchange programmes, (3) selecting texts/programmes, (4) charting the data, and (5) collating, summarising and reporting the results (Arksey and O'Malley, 2005; Levac et al. 2010).

**Identifying relevant papers/exchange programmes**. For the scoping review, we searched five electronic databases, MEDLINE, Embase, ERIC, OpenGrey, HMIC and Google Scholar, using a search strategy adapted for each database (available in Supplementary File 1). The search strategy was piloted to identify volumes of results and check that key papers had been identified.

The electronic search strategy was reviewed by a clinical librarian to ensure that all search terms and sources were captured and that the search strategy was optimal for the review questions.

For the mapping exercise, we used five approaches to identify programmes summarised in Supplementary File 1, which included: (i) running site-specific searches using Google advanced search functionality (e.g., Academy of Medical Sciences, Medical Research Council); (ii) searching Google using the scoping review terms; (iii) using simplified derivatives of the scoping review search terms in Google; (iv) using single search terms (intended to mimic how applicants might search) in Google; and (v) collecting programme names using word of mouth recommendations from interviewees in our wider scoping project.

**Selecting articles and online advertisements**. Exchanges were included if they were for employed adults working in the health and care field as a health or care provider (including clinicians and non-clinicians), in academia (in any role), or as a policy-maker (in any role), and involved at least one uni- or bi-directional in-person visit to a peer's workplace. Exchanges were included regardless of whether they involved reflection, a key component of experiential learning (Lewis and Williams, 1994) and a concept from the education literature we were interested in exploring for its role in knowledge exchanges in health and care. Exchanges were excluded if they were intended for secondary school or undergraduate degree students (e.g., student placements, internships, or 'first job' placements), as these are commonplace in the health and care sector, and we were seeking to understand the role of exchanges following training. Similarly, exchanges were excluded if their primary purpose was to obtain a qualification or degree (e.g., postgraduate medical training, clinical doctoral fellowships) or a job (e.g., retraining programmes with work placements). We also excluded international clinical placements where the NHS offers temporary training opportunities to overseas clinicians (e.g., Academy of Medical Royal Colleges Medical Training Initiative[2]). Models that involved exchanges for example through action learning sets, but that did not involve a period of time embedded/physically immersed in another workplace (e.g., Digital Pioneer Fellowships[3]) or inter-disciplinary / inter-policy networks (e.g., Catapult Network[4] or Sciana – The Health Leaders Network[5]) were excluded. However, it is worth noting that while these programmes were out of scope for this study, they may share characteristics with the included types of exchanges. For the scoping review, we sought to include all English language papers found in the academic literature including opinion based articles, case reports, observational and experimental research, as well as literature reviews. The scoping review was international in searches, but we analysed papers where at least one participant or component of the exchange was carried out in the UK. The mapping exercise was limited to UK-based opportunities or those which targeted UK residents.

The scoping review was searched from 1 January 2000 to 3 March 2020. We then paused the project during the Covid-19 pandemic and re-ran the search on 1 July 2022. Two reviewers (BB and GI) independently assessed and screened all the titles and abstracts of the identified records to evaluate eligibility. The full text of all papers was retrieved and identified as potentially relevant by one or both review authors. Two reviewers then independently assessed these papers (BB and GI). Any disagreements on inclusion were resolved by discussion. No study was excluded on the grounds of methodological limitations.

The mapping exercise provided a snapshot view of the programmes available in May 2020, which was then updated in June 2022 as the UK came out of the Covid-19 pandemic. For the mapping exercise, one reviewer (SK) assessed the eligibility of each programme website or webpage, and a second reviewer (LP) checked the coded characteristics of 10% of the included programmes. Additional programmes were added through the peer review process.

**Charting the data**. A data extraction framework was developed for both the literature review and online mapping, which adapted the TIDieR intervention design framework (Hoffmann et al. 2014) (see Supplementary file 1). Descriptive information was extracted from each academic paper or exchange programme website (where relevant and available), including author; year; location; exchange objective; setting; participant job role; exchange organisation; exchange characteristics; and exchange duration. Information about how the academic paper was designed and conducted, along with findings, were also extracted for the scoping review.

For the mapping exercise, information about each programme was found from publicly available websites, webpages and linked documents. Some programmes had only a single webpage describing the exchange process and how to apply, whereas others had multiple web pages and linked documents that we used to map key characteristics.

**Collating, summarising and reporting the results**. Consistent with previous research on scoping reviews (Levac et al. 2010), we followed three steps in MS Excel separately for the scoping review and mapping exercise: analysing the data (descriptive summary and thematic analysis), reporting results, and applying meaning to results. We iteratively reviewed the study and programme characteristics and coded extracted descriptions to calculate basic frequencies in tables and charts (Arksey and O'Malley, 2005; Levac et al. 2010). This enabled a deeper analysis of the sample of texts and programme websites as separate data sets and consequently identification of where the significant gaps existed (Peters et al. 2015; Tricco et al. 2017). We then conducted deductive and inductive thematic analysis approaches using an analytic framework based on the data extraction guide.

As set out in the introduction, we aimed to describe the characteristics of WKEPs and their relationships to one another. During analysis, all authors brought together the identified characteristics from both data sources into a conceptual framework that is categorised based on WKEP opportunities. Each WKEP opportunity we identified was mapped into one or more of these categories. The categorisation was straightforward for many opportunities because they used a particular term, e.g., shadowing, placement, collaboration, or secondment. However, there were times we made interpretations based on descriptions as well as gaps in descriptions. For example, where no particular outputs were specified but it was clear that an immersive, in-person element was involved, possibly through reference to a 'visit', we assumed that some form of shadowing would be involved in the visit. See, for example, the Academy of Medical Sciences Daniel Turnberg Travel Fellowships as an example of this.

After an initial analysis, we re-examined data drawing on existing frameworks (Davies et al. 2015; Ward, 2017) and bringing in additional forms of knowledge exchange programmes we had previously overlooked (e.g., embedded researcher programmes). Our ambitions were to help the people running and participating in WKEPs navigate their way through the fragmented literature and programme opportunities, as well as highlight the key characteristics required when describing or advertising a new opportunity, or reporting the experience of having been on a WKEP. It should, however, be noted that the resulting framework is not an overarching 'typology' of
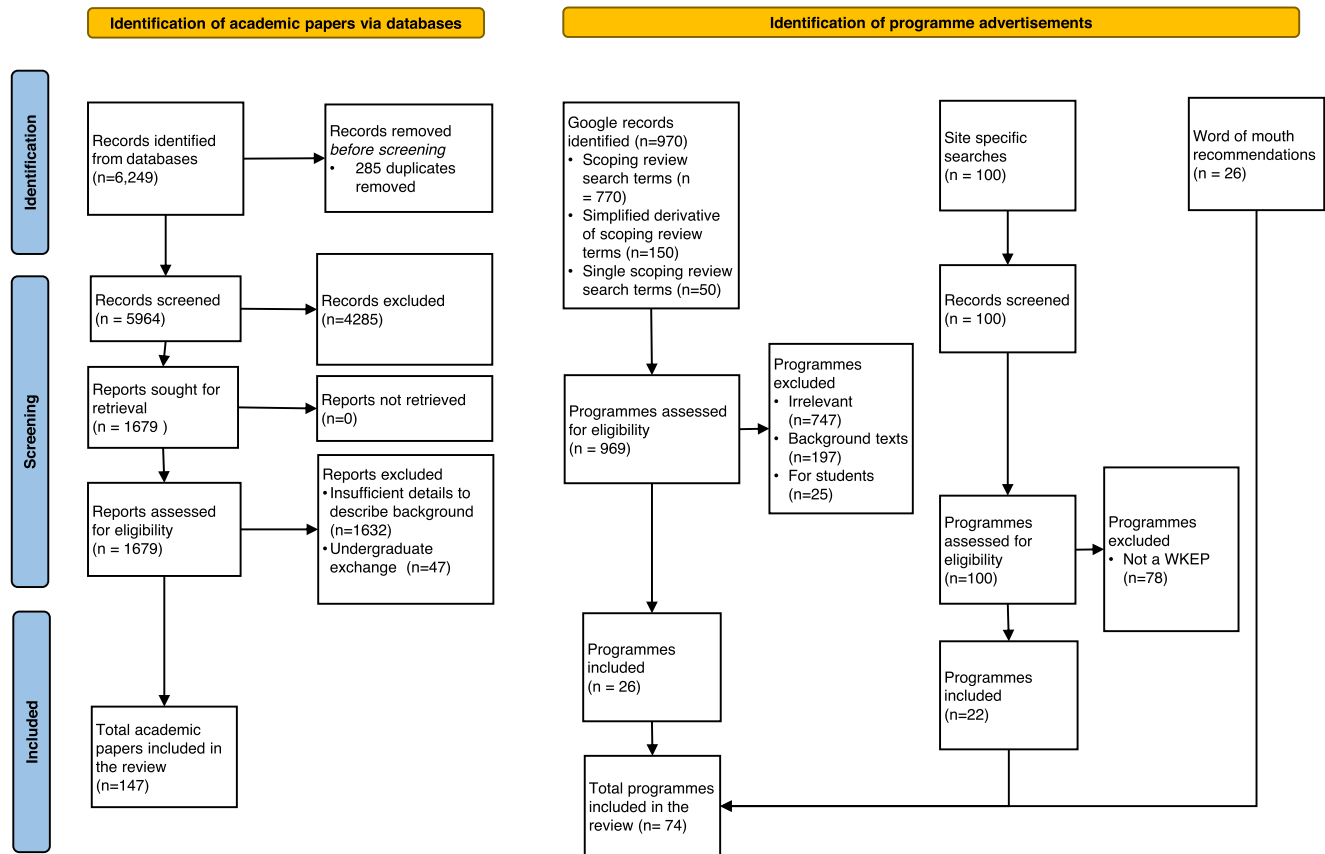
**Fig. 1 PRISMA flow diagram.** This PRISMA flow diagram combines the sources used to inform both the scoping review and the mapping exercise.

exchanges. Throughout the scoping review and mapping exercise, we considered whether a typology might be possible. However, our ability to do so was limited, as we found it was not possible to assign a single label to some of the exchanges identified because they included more than one type of WKEP activity (e.g., job shadowing and project-based collaboration) and often other forms of knowledge exchange and/or learning. This was particularly true among exchanges that self-described as 'fellow-ships' or 'sabbaticals'. Fellowships often included a range of activities or components that mapped onto shadowing, project-based collaboration and/or work placements, as well as other activities such as educational events, mentorship, action-learning sets and networking. Sabbaticals often overlap with secondments but could also take the form of other types of exchanges, as well as other 'non-exchange' activities. Thus, where included, fellowships and sabbaticals were mapped into their main activity type in the scoping review and by all the activities in the programme mapping.

**Ethical approvals**. The research was reviewed by the Observational and Interventions Research Ethics Committee at the London School of Hygiene and Tropical Medicine. A favourable ethical opinion was confirmed on 11 March 2020 (Reference number 21668). All data included in this paper were obtained from within the public domain.

## Results
**Identification of texts and programmes**. The process of identifying the included academic articles and programme webpages is detailed in a PRISMA flow diagram (see Fig. 1). The initial scoping review search strategy identified a total of 6249

references. After the screening of the title and abstract, 1679 full-text articles were reviewed. From this, 147 full-text papers were included. The mapping exercise examined 970 search hits in Google (using various strategies described in Supplementary File 1), which identified 26 WKEPs. A further 22 WKEPs were identified through site-specific searches of research funding organisations (e.g., Academy of Medical Sciences) and a further 26 through word-of-mouth recommendations from interviewees from the wider scoping study and peer reviewers of initial manuscript drafts. A total of 74 WKEPs were analysed in the mapping exercise.

The characteristics of the texts included in the scoping review are available in Supplementary File 2, as well as on Rayyan.ai under the name 'Workplace-based exchanges'. The detailed characteristics of the programmes included in the mapping exercise are in Table 1. Each of the programmes is described first by name, whether it was a regional, national or international programme, followed by the types of participants involved, such as Academic → Policy with the arrow indicating if it is uni- (→) or bi-directional (←→), and the duration. We categorise the WKEP activities undertaken during the programme into our proposed nomenclature of activities including job shadowing, project-based collaborations, work placement and secondments. We also capture other activities where they existed (e.g., networking, training) and financial support provided where available.

The scoping review included mostly self-reported case reports (142), followed by three primary research studies, two review articles, and no randomised trials. Thirty-three reports were described as evaluations. The results of the scoping review are presented grouped by the four main exchange activities we identified, including job shadowing,

**Table 1 Workplace-based knowledge exchange programmes in the UK operational between 2019 and 2022 ($n$ = 74).**

| Name of programme (Geography) | Description of people involved Sector visitor-->Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| Academy of Medical Sciences Daniel Turnberg Travel Fellowships (International) | Academic<-->Academic, visiting research institutions, 1-3 mos, early to mid | To build research links and developing ongoing scientific collaborations between the UK and the Middle East. Participants visit a research institution of their choice. | X | X | | | Networking | https://acmedsci.ac.uk/grants-and-schemes/grant-schemes/daniel-turnberg-travel-fellowship |
| Academy of Medical Sciences The Hamied Foundation UK-India Antimicrobial Resistance (AMR) Visiting Professorship Scheme (International) | Academic<-->Academic, 1-2 weeks, late career | To facilitate a long-term collaboration between the researchers in the field of antimicrobial resistance (AMR) in the UK and India through a 1-2 week lecture tour of India with potential inclusion of laboratory visits. | X | X | | | Lecture tour | https://acmedsci.ac.uk/grants-and-schemes/grant-schemes/amr-professorships |
| Academy of Medical Sciences, Royal Society and British Academy Newton Advanced Fellowships (International) | Academic--> Academic, 3 mos, early to mid-career | To support the development of a well-trained research community who can contribute to advancing economic development and social welfare of the partner country, by transferring new skills and creating new knowledge, as well as, establish long term collaborative links between the next generation of research leaders and their groups | | | | X | | https://acmedsci.ac.uk/grants-and-schemes/grant-schemes/newton-advanced-fellowships |
| Academy of Medical Sciences, Royal Society and British Academy Newton International Fellowships (International) | Academic--> Academic, 2 y, early career | To support the development and training of postdoctoral researchers from any country outside the UK and foster long-term relations | | X | X | | | https://acmedsci.ac.uk/grants-and-schemes/grant-schemes/newton-international-fellowships |
| Academy of Medical Sciences/MRC internship programme (National) | Academic--> Policy, 3 mos, any stage (but must be doing Phd) | To give postgraduate students first-hand experience of the medical science policy environment, to gain insights into how research can impact on policy, and to build valuable networks. | | | X | | Networking | https://acmedsci.ac.uk/about/administration/internship-schemes |
| Applications open for Pan London Cancer Research Fellowships (National) | Clinician--> Academic, 1 y, any (but must be doing Phd) | To gain preliminary data and work on competitive applications to external funding bodies to fund continuation of the project into a higher degree | | X | X | | Salary + running costs | https://rmpartners.nhs.uk/applications-open-for-pan-london-cancer-research-fellowships-2021-22/ |
| BBSRC collaborative training partnerships (National) | Academic--> Industry, 4 y, any | To build capacity, address strategic skills challenges in the UK bioeconomy, and provide candidates with research, innovation and transferable skills | | | X | | Stipend | https://www.ukri.org/opportunity/bbsrc-collaborative-training-partnerships/ |
| BBSRC international travel award scheme (International) | Academic (BBSRC funded researcher)--> Industry, 1 mos, any (not student) | to initiate or prepare proposals with international partners, visiting overseas facilities for up to one month or attending European consortia-building events. | | X | | | One-off grant | https://www.ukri.org/opportunity/bbsrc-international-travel-award-scheme/ |
| BBSRC Brazil pump-priming award (International) | Academic (BBSRC funded researcher)<--> Academic/Industry, 1mos, any (not student) | To pump-prime collaborations between UK and Brazilian scientists in São Paulo state | | X | | | Costs cover networking, travel and some research costs | https://www.ukri.org/opportunity/bbsrc-brazil-pump-priming-award/ |
| Bedford Council (Regional) | Any Bedford role--> Any Bedford role, 1d, any stage | To work effectively together and ensure better outcomes for families and to see how other members of the workforce do their job (among other aims) | X | | X | | | https://www.bedford.gov.uk/schools-education-and-childcare/teachers-and-education-staff/workforce-shadowing/ |
| British Academy Global Professorships (for project collaboration) (International) | Academic--> Academic, 48, mid to late career | To support high-risk, curiosity-driven research that enables the award-holders and their UK host institutions to achieve a step change in their respective research programmes | | X | | | | https://www.thebritishacademy.ac.uk/programmes/global-professorships-2020 |
| British Academy APEX awards (National) | Academic<--> Academic, 24 mos, any stage but must have postdoctoral standing (i.e, mid) | To promote collaboration across academic disciplines through the support of world-leading interdisciplinary research projects | | X | | | | https://www.thebritishacademy.ac.uk/funding/apex-awards |
| British Academy Newton Mobility Grant (International) | Academic--> Academic, 12 mos, any stage | To support for international researchers based in a country covered by the Newton Fund to establish and develop new collaborations with UK researchers around a specific jointly-defined research project | | X | | | | https://www.thebritishacademy.ac.uk/funding/newton-mobility-grants/ |

**Table 1 (continued)**

| Name of programme (Geography) | Description of people involved Sector visitor-->Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| British Academy Visiting Fellowship (International) | Academic--> Academia, 6 mos, any stage | To enhance and build new links between scholars anywhere in the world and in the UK, foster opportunities and develop future partnerships for collaborative research | | | X | | | https://www.thebritishacademy.ac.uk/programmes/visiting-fellowships-2018 |
| Centre for Future Health Fellowship (National) | Academic<--> Any, n.d., early career | To support innovative research across all disciplines that promotes a better understanding of health and wellbeing, nurture the next generation of research leaders, support mutually beneficial partnerships inside and outside academia and with the general public, advance impact outside academia and knowledge exchange | | X | | | Mentoring | https://www.york.ac.uk/future-health/fellowships/ |
| Clinician Scientist Fellowship (Health Foundation and AoMS) (National) | Clinician--> Academic, 5 y, any | To enable talented clinicians to pursue academic research alongside their clinical practice | | X | X | | Full salary covered, leadership training, mentoring, networking | https://www.health.org.uk/funding-and-partnerships/fellowships/clinician-scientist-fellowships |
| Capabilities in Academic and Policy Engagement (CAPE) (National) | Academic (or university-based professional services staff) /Policy--> Policy/Academia, 3 mo–1 yr, any stage | To build and strengthen partnerships between researchers and policy professionals (e.g., regional and local levels of government) | | X | X | | Training, seed funding for policy-relevant research, knowledge engagement events | https://www.cape.ac.uk/what-we-do/cape-policy-fellowships/ |
| Centre for Science and Policy (CSaP) Fellowship, Junior Fellow, Policy leaders (National) | Policymaker [or charity or industry]--> Academic, 2 y, early career (Junior Fellow), mid to late career (Fellow), late career (Policy leaders Fellowship) | To improve the transfer of research into policy by creating an opportunity for problem-solving, professional development, network building and access to expertise | | X | | | Bespoke workshops and events, Networking | http://www.csap.cam.ac.uk/policy-fellowships/policy-fellows/ http://www.csap.cam.ac.uk/policy-fellowships/faqs/policy-fellow-faqs/ http://www.csap.cam.ac.uk/about-csap/people/our-network/questions-asked-researchers/ |
| Daphne Jackson Fellowship (National) | Academic--> Academia, 3 y, any (but must have had a two-year career break for family, health or caring reasons) | To retrain anyone who has taken a break of two years or more from research for family, caring or health reasons. | | X | | | Salary costs | https://daphnejackson.org/about-fellowships/current-opportunities/ |
| ESRC/AHRC Policy Fellowships (National) | Academic--> Policy, 18 mos, early and mid career | To help fulfil the potential of social, economic, arts and humanities research and expertise to inform and shape effective public policy and its implementation. | | | | X | | https://www.ukri.org/news/22-policy-fellows-start-in-central-and-devolved-government/ |
| European Federation of Critical Care Nursing Associations exchange programme (international) | Clinician--> Clinician, 1 week, mid or late (but at least 5 y of experience) | To widen the professional horizon of critical care nurses in Europe, to promote international collaboration and to share expertise, to stimulate the personal professional development of critical care nurses in Europe | X | | | | Mentoring, supervision | https://www.efccna.org/education/exchange-programme |
| Faculty of Medical Leadership and Management (FMLM) national medical director's clinical fellow scheme (National) | Doctors in training from all specialties--> Policy, 12 mos, early career | To develop trainee doctors' skills in leadership, management, strategy, project management and health policy | X | | X | X | Training, Networking | https://www.fmlm.ac.uk/programme-services/individual-support/national-medical-directors-clinical-fellow-scheme |
| Faculty of Medical Leadership and Management (FMLM) Chief Dental Officer's Clinical Fellow Scheme (National) | Dentists --> Policy, 12 mos, early career | To develop trainee dentists' skills in leadership, management, strategy, project management and health policy | | | X | X | Training, Networking | https://www.fmlm.ac.uk/programmes-services/individual-support/clinical-fellow-schemes/chief-dental-officers-clinical-fellow-scheme |
| Faculty of Medical Leadership and Management (FMLM) Chief Nursing Officer for England's Senior Nurses Clinical Fellow Scheme (National) | Nurses --> Policy, 12 mos, mid-career to senior (Band 8 or 9) | The aim of the scheme is to bridge an existing gap between senior nurse leadership at an organisation level and senior nurse leadership at a strategic, national level and increase senior clinical leadership capacity and capability within the profession. | | | | X | Mentorship, Networking | https://www.fmlm.ac.uk/clinical-fellow-schemes/chief-nursing-officer-for-england%E2%80%99s-senior-nurse-clinical-fellow-scheme |
| Faculty of Medical Leadership and Management (FMLM) Chief Pharmaceutical Officer's Clinical Fellow Scheme (National) | Pharmacists --> Policy, 12 mos, early career | To develop pharmacists' skills in leadership, management, strategy, project management and health policy | | | X | X | Training, Networking | https://www.fmlm.ac.uk/CFS-pharmacy |
| Faculty of Medical Leadership and Management (FMLM) Chief Sustainability Officer's Clinical Fellow Scheme (National) | Clinician (any, healthcare scientists, allied health professionals) --> Policy, 12 mos, early career | To develop clinicians' skills in leadership, management, strategy, project management and health policy | | | X | X | Training, Networking | https://www.fmlm.ac.uk/clinical-fellow-schemes/chief-sustainability-officer%E2%80%99s-clinical-fellow-scheme |

**Table 1 (continued)**

| Name of programme (Geography) | Description of people involved Sector visitor-->Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| Faculty of Medical Leadership and Management (FMLM) and NHS England NHS Regional Clinical Leadership Fellow Scheme (National) | Clinician (any, healthcare scientists, allied health professionals) --> Policy, 12 mos, early career | To develop multi-professional clinicians to work in regional systems, leading improvement projects across clinical pathways, retaining a clinical role and increasing their leadership capabilities | | X | | | Training, Networking | https://www.fmlm.ac.uk/clinical-fellow-schemes/nhs-regional-clinical-leadership-fellow-scheme |
| Forward Institute Exchange programme (Cross sector) (National) | Any<-->Any, 6 mos, late career | Responsible leadership programme across sectors. Imagine a leader from the British Army observing a leader at easyJet, or someone from the BBC spending time at Barclays. | X | | | | Facilitated workshops | https://www.forward.institute/exchange-programme  https://www.charityjob.co.uk/jobs/forward-institute/exchange-programmes-manager/676671 |
| Frimley 20/20 programme (Local) | Any (clinical, social care, military, local government, voluntary sector)<--> Any, 6-7 mos, mid-career stage or higher | To build upon cross organisational cooperation, representing leadership across the Frimley Health and Care System. | X | | | | Residentials, action learning sets, coaching, presentations from external speakesr | https://www.frimleyhealthandcare.org.uk/working-here/frimley-academy/ |
| Frimley Wavelength programme (Local) | Any<-->Any, 5 mos, any career stage | To develop the skills, mindset, knowledge and relationships that support effective, joined up digital transformation across the Frimley Health and Care Integrated Care System (ICS). | X | | | | Residentials, action learning sets | https://www.frimleyhealthandcare.org.uk/professional-resources/frimley-academy/wavelength/ |
| General Practice Fellowship for newly-qualified GPs and Nurses New to Practice Programme (National) | Clinician<-->Clinician, 2 y, early | To encourage learning and development post-registration, supporting nurses and GPs to take up substantive roles, understand the context they are working in, become embedded in the PCN, and increase and maintain high levels of participation in the primary care workforce | X | | | | Salary + running costs, CPD hours | https://www.england.nhs.uk/wp-content/uploads/2020/08/general-practice-fellowship-2021-22-operational-guidance.pdf |
| Harkness Fellowship (International) | Any-->Policy, 12 mos, mid career | To provide an in-depth understanding of the U.S. health care system and policy challenges, enhance methodological skills, and develop valuable contacts and opportunities for ongoing cross-national exchange and collaboration | X | | X | | Stipend, travel costs covered | https://www.commonwealthfund.org/fellowships/harkness-fellowships-health-care-policy-and-practice |
| Health Education England (NW) Medical Education Fellowship (National) | Clinician--> Academia, 2 y, early career | To stimulate interest in medical education during training and encourage take up valuable educational / supervision roles within clinical workplaces, and also foster a culture of teaching excellence and learning in the clinical workplace | X | | X | | | https://www.nwpgmd.nhs.uk/educator-development/mef |
| Health Education England (NW) Medical Leadership Fellowship (National) | Clinician--> Clinician, 1-2 y, any | To facilitate the development of trainees who have specific interest in medical leadership and aspire to be a future leader | X | | X | | Funding for PG Cert in Medical Leadership, Development days, | https://www.nwpgmd.nhs.uk/medical-leadership/medical-leadership-programme |
| HEE Deaneries - Global Health Fellowship Programme (NHS sender) (International) | General practice, paediatric and acute care speciality trainee doctor--> Care provider, 1 y, early career | To send qualified trainee doctors abroad for global learning and exchanges and, as a consequence, for their own development, also with the aim of building health education capacity in low and middle income countries. | | | X | X | | https://gprecruitment.hee.nhs.uk/Recruitment/GHF  https://www.hee.nhs.uk/sites/default/files/documents/HEE%20Guidance%20for%20Trainees%20planning%20to%20volunteer%20or%20overseas%20v2%20%28Low%20resolution%29.pdf |
| HEE Healthcare Science Innovation Fellowships (National) | Non-clinician (employed in NHS)-->Industry, 1 y, any (but must have been employed for one year) | To build system capacity to increase medical device regulatory and standards expertise and innovation capabilities | | X | | | £15k training bursary, mentorship | https://nshcs.hee.nhs.uk/programmes/healthcare-science-innovation-fellowships/ |
| HEE Improving Global Health Fellowship (NHS sender) (International) | Clinician (NHS employees)--> Care provider, 6 mos, early to mid | To enable volunteers to develop leadership skills through project in lower income country settings work using system-strengthening methods. The projects aim to contribute to improving healthcare in the local area in a sustainable way | | | | X | | https://www.hee.nhs.uk/our-work/global-health-engagement/improving-global-health-through-leadership-development-programme-0 |
| Hospitals of EurOPE Exchange Programme (International) | Health service manager<--> Health service manager, 1 mos, any stage | To share best practice and lead to better understanding of the functioning of healthcare and hospital systems within the EU | X | | | | All participant closing meeting | https://www.leadershipacademy.nhs.uk/programmes/hope-programme/ |

**Table 1 (continued)**

| Name of programme (Geography) | Description of people involved Sector visitor<-->Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| Institute for Policy Research (University of Bath) Policy Fellowship (National) | Policymakers (decision-makers from government and the third sector) --> Academia, n.d., late career | To renew and reinvigorate policymakers' professional thinking by connecting with world-class academics | X | X | | | Access to library resources, alumni network (which hold events and webinars). | https://www.bath.ac.uk/campaigns/the-ipr-policy-fellowship-programme/ |
| International Social Worker Exchange (International) | Social worker--> Social worker, 0.5 mos, any stage | To promote culturally-sensitive social work best practices and global partnerships | X | | | | Closing conference | http://www.iswep.com/ |
| Knowledge transfer partnership (National) | Academia<-->Industry, n.d., any (but project must employ 2 recent graduates) | To bring new skills and the latest academic thinking into a business partner to deliver a specific, strategic innovation project | | X | | | | https://apply-for-innovation-funding.service.gov.uk/competition/1071/overview |
| Leicestershire Partnership NHS Trust, Director of Nursing fellowship programme (National) | Clinician--> Academia, n.d., early | To develop leadership, quality improvement and clinical academic awareness and skills at an early stage of their careers | X | X | | | Taught element, quality Improvement project, mentoring | https://www.leicspart.nhs.uk/news/six-nurses-recruited-to-fellowship-programme/ |
| Leverhulme International Academic Fellowship (International) | Academic--> Academia, 3-24 mos, mid to late career | To provide established researchers to develop new knowledge, skills and ideas in one or more research centres outside the UK. | | | X | | | https://www.leverhulme.ac.uk/international-academic-fellowships |
| Manchester International Fellowship scheme (International) | Clinician--> Clinician, 1-2 y, any | To acquire useful and suitable skills and knowledge before returning to the country of origin | | X | X | | Enhanced induction, supervision, peer buddy and career advice | https://mft.nhs.uk/careers/roles/doctors-consultants-dentists/manchester-international-fellowship-scheme/ |
| Moorfields Medical Fellowships (National) | Clinician--> Clinician, 1-2 y, any | The aims are fellowship dependent | | X | X | X | Stipend + project costs | https://checkout.moorfields.nhs.uk/catalog?pagename=Medical-Fellowships |
| MRC Clinical Research Training Fellowship (National) | Clinician--> Academia, 2-4 y, early career | To support clinicians to undertake a PhD or other higher research degree. The scheme also provides a route for post-doctoral applicants who achieved their PhD some time ago but who have not been research active since due to clinical training commitments to reacquire research skills. | | X | X | | | https://mrc.ukri.org/skills-careers/fellowships/clinical-fellowships/clinical-research-training-fellowship-crtf/ |
| MRC Clinician Scientist Fellowship (National) | Clinician--> Academia, 4-5 y, mid career | To allow clinicians to lead their own research plans and establish their own research team to make the transition to independent investigator | | X | | X | Salary + project and team costs | https://www.ukri.org/opportunity/clinician-scientist-fellowship/ |
| MRC Senior Clinical Fellowship (National) | Clinician--> Academia, up to 5 y, mid-career | To provide funding for registered healthcare professionals to become internationally-recognised leaders in their field | | X | | X | Salary + project and team costs | https://www.ukri.org/opportunity/senior-clinical-fellowship/ |
| NHS Regional Clinical Fellow Scheme (National) | Clinician--> Care provider, 12 mos, any | To expand opportunities for aspiring clinical leaders to gain the necessary experience and skills for future system leadership roles | | X | | X | Alumni learning programme | https://www.fmlm.ac.uk/clinical-fellow-schemes/nhs-regional-clinical-fellow-scheme |
| NIHR 70@70 (nurse secondment scheme) (National) | Clinician--> Academia, 3 y, senior | To strengthen the research voice and influence of nurses and midwives in health and social care settings...and with the NIHR research agendas | | | | X | 0.4 FTE salary | https://www.nihr.ac.uk/documents/7070-nihr-senior-nurse-and-midwife-research-leader-programme/22750 |
| NIHR Short Placement Award for Research Collaboration (SPARC) (National) | Researcher (must receive >25% funding from the NIHR to apply) -->Any part of the NIHR infrastructure, 2/3 w-6 mos, early career | To offers NIHR Academy members (formal pre-doctoral training award holders/Masters students, PhD or early career post-doctoral researchers) supported by a part of NIHR Infrastructure an opportunity to spend time in other parts of the NIHR; to network, train in a specific skill or collaborate with other researchers/specialists. The scheme is designed to optimise and enhance the individuals' experience as well as their CVs and careers. | | X | X | | £5000 funding (to cover travel, accommodation, short course, publishing outputs) | https://www.nihr.ac.uk/documents/nihr-short-placement-award-for-research-collaboration-sparc-round-8-guidance-notes-september-2021/28736 |
| Outside Insight (Regional) | Academic service staff<--> Same, 0.5 d to 2 d, any stage | Gives the opportunity to engage with practical and professional development to bring back work practices from other institutions. | X | X | | | | https://www.heioutsideinsight.co.uk/index.html |
| Oxford Fellowship in Global Anaesthesia (International) | Clinician--> Care provider, 12 mos, mid-career onwards | To explore issues relevant to global health alongside clinical commitments | | X | | | Training component, 0.1FTE | https://www.ouh.nhs.uk/anaesthetic-fellowships/fellowships/global-health-anaesthesia.aspx |

# Table 1 (continued)

| Name of programme (Geography) | Description of people involved Sector visitor→Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| Paired Learning (Regional) | Participants depend on the local scheme, but can include hospital managers, clinicians, or policy organisations, n.d., any career stage | Peer-peer buddying tool that can break down barriers, increase knowledge and change attitudes, to learn to appreciate each other's roles, values, challenges and barriers. | X | | | | | https://www.bmj.com/rapid-response/2011/11/03/paired-learning-clinicians-and-managers-learning-and-working-together |
| Partner with researchers in Switzerland (International) | Academic (UKRI funded) --> Academic, 1-12 mos, any | To develop new and existing partnerships with researchers in Switzerland on physical sciences | X | X | | | Travel, event, and project costs | https://www.ukri.org/opportunity/partner-with-researchers-in-switzerland/ |
| Q visits (National) | Any (Q members) --> Any, n.d., any | To explore a range of relevant topics through immersive learning | | | | | | https://q.health.org.uk/get-involved/q-visits/ |
| Quality Improvement Fellowships (National) | Clinician--> Policy (IHI in US), 12 mos, senior | To build a cadre of clinically-qualified leaders with the enthusiasm, experience and skills to champion the spread of improvement in health care | | | | X | Costs of staff cover paid + relocation costs, alumni network | https://www.health.org.uk/funding-and-partnerships/fellowships/quality-improvement-fellowships |
| Royal Academy of Engineering (RAEng) Policy Fellowship programme (National) | Policymaker--> Academia, 4mos, any stage | To inspire policymakers to think differently and to use engineering and systems thinking to frame complex and wicked problems, and design resilient solutions | X | X | | | Kick-off workshop, coaching, reporting workshop | https://raeng.org.uk/policyfellowships |
| Royal Society Pairing Scheme (National) | Academic/ Policy (Parliamentarians and Civil Servants) <--> Policy/Academia, 0.5 days, any stage | To experience each other's worlds, build lasting relationships through reciprocal visits | X | | | | 1 week of joint learning before exchange | https://royalsociety.org/grants-schemes-awards/pairing-scheme/ |
| Royal Society Policy Associate Scheme (National) | Academia (Royal Society Fellows)--> Policy, 3 mos (or 6-9 mos p/t), any stage | To gain first-hand experience of working in science policy and using science and evidence to inform policy advice and decision making | | | | X | Travel and subsistence | https://royalsociety.org/grants-schemes-awards/policy-secondment-programme/ |
| Royal Wolverhampton Clinical Fellowship Programme for Doctors and for nurses (Regional) | Clinician--> Care provider, 1-3 y, any | structured training programme in a range of clinical specialties, through secondary and primary care | | | X | | Funded MSc, study leave budget, mentoring, coaching | https://www.royalwolverhampton.nhs.uk/work-with-us/clinical-fellowship-programme/ |
| Scottish Quality and Safety (SQS) Fellowship Programme (National) | Clinician--> Care provider, 1 y, any | To develop and strengthen clinical leadership and improvement capability in NHS Scotland. | | X | | | Study trip, mentoring, teaching component | https://learn.nes.nhs.scot/814/quality-improvement-zone/learning-programmes/scottish-quality-and-safety-sqs-fellowship-programme |
| ShadowMe (National) | Academia/Policy/Care provider (Communications team) <-->Policy, 1-2 d, any stage | To support shared learning, ideas and techniques, and dialogue between communicators, forging links that will last beyond the exchange | X | | | | | https://digital.nhs.uk/about-nhs-digital/careers/shadow-me-programme |
| The East Midlands Clinical Senate -Clinical Senates Leadership Fellows Programme (Regional) | Clinician--> Care provider, 0.10 FTE for 12 mos, senior | To provides opportunities to work with senior leaders to develop their skills in leadership, strategy, project management and health policy across a wide range of health systems | | X | X | | 0.1OFTE salary | https://midlandssenates.nhs.uk/leadership-fellows |
| Sustainability Fellowship and Scholarship Programme | Clinician--> Care provider, 1-3 y, any | To enable the fellow to work on sustainable healthcare and give them a strategic role in accelerating transformation by typically allocating 1-2 days per week to work on a sustainability project based in a host organisation - often an NHS trust | | X | X | X | Training courses, web-based networking tools, online case library, QI toolkit, supervisor | https://sustainablehealthcare.org.uk/what-we-do/sustainable-specialties/sustainability-fellowship-and-scholarship-programme |
| The Shuri Network - Shuri Shadowing Programme (National) | Any (digital)--> Any (digital), n.d., any | To increase the visibility of women from ethnic minorities and provide a national platform to share our contribution to digital innovation and patient care | X | | | | | https://shurinetwork.com/shuri-shadowing-programme/ |
| UCL Policy Engagement Fellowship Funding (National) | Academic--> Policy, n.d., early career | To work directly with policy professionals whilst embedded within a policy environment | | X | X | | Candidates must apply for own funding | https://www.ucl.ac.uk/public-policy/support/development-opportunities/fellowship-programme/fellowship-funding |
| UCL Visiting Policy Fellows programme (National) | Policymaker--> Academia, n.d., any | To build new networks in research and academia, and to investigate how UCL research can respond to policy demand and help to inform policy development | | X | | X | Access to course modules, seminars | https://www.ucl.ac.uk/public-policy/support/development-opportunities/visiting-fellows |
| UKRI/ESRC Policy Internships Scheme (National) | Academic (UKRI funded PhD student)--> Policy, 3 mos, any stage | To embed PhD students in an environment where they can engage with the process of converting research outputs into policy | | | X | | | https://www.ukri.org/skills/policy-internships-scheme/ |
| Vasco de Gama Movement Hippokrates exchange /Family medicine 360 (International) | Trainee or early career general practitioner<-->same, 0.5 mos, early career | To encourage international exchange and mobility among young doctors. | X | | | | | https://vdgm.woncaeurope.org/content/hippokrates-exchanges |

**Table 1 (continued)**

| Name of programme (Geography) | Description of people involved Sector visitor-->Sector host, duration, career stage | Aims (type of knowledge exchanged) (how knowledge mobilisation occurred) | Shadowing | Project-based collaborations | Work placement | Secondments | Other features | URL(s) found |
|---|---|---|---|---|---|---|---|---|
| Welsh Clinical Leadership Training Fellowship (National) | Clinician--> Care provider, 1 y, any (but must have finished specialty training) | To recruit and develop the most aspiring clinical leaders of the future | | X | | X | Educational training, supervision | https://heiw.nhs.wales/support/qist/welsh-clinical-leadership-training-fellowship-wcltf/ |
| Wessex Model (Regional) | General practitioner<--> hospital doctor, 0.5d*2, any | To develop a better understanding of the barriers faced at the primary and secondary care interface; whether relational, reputational, historical, invisible or infrastructural | X | | | | Closing conference | https://www.england.nhs.uk/gp/gpfv/workload/interface/wessex-model-shadowing-scheme/ and https://www.england.nhs.uk/gp/case-studies/gp-consultant-liaison-southampton-2017-southampton-city-clinical-commissioning-group/ |
| West Midlands' Public Health Community Fellowship Scheme (Regional) | Clinician--> Care provider, 5 mos, any | To promote and improve the health, fitness and wellbeing of disadvantaged people in the West Midlands, whilst providing opportunities for trainee doctors and public health registrars to broaden their teaching, leadership, teamwork and communication skills across sectors | | X | | X | | https://www.westmidlandsdeanery.nhs.uk/postgraduate-schools/public-health/public-health-community-fellowship-scheme |
| Winston Churchill Memorial Trust Healthcare: innovations for the twenty-first century (International) | Any--> Any, 1-2 mos, any | To expand horizons through travel and research and make a difference to the community upon return | | X | | | | https://www.wcmt.org.uk/healthcare-innovations-twenty-first-century?gclid=EAIaIQobChMIkPXsz87O6QIVIbHtCh2mOwqHEAAYBCAAEgKOW_D_BwE |

work placements, project-based collaborations and secondments.

While no quality assessments of the reporting of the scoping review articles or the programme webpages were carried out, the quality of reporting was generally poor, with no record covering all domains from our data extraction framework. To describe the characteristics of exchanges, we have grouped them into the 'structures', 'processes' and 'outcomes' of WKEPs. Where possible, we have used language and characteristics derived from an existing framework developed to produce a common route to describing knowledge mobilisation projects (Ward, 2017) and the wider knowledge exchange literature. The sections include:

- Structures of WKEPs: aims, participants, geography, duration, and admission processes
- Processes involved in WKEPs: activities, learning outcomes, and scheduling and approvals
- Outcomes of WKEPs: benefits, outputs and outcomes, and theories of change

**Structures of WKEPs**

*Aims of WKEPs.* The aims of each text in the scoping review were grouped by the main exchange activity: job shadowing, work placements, project-based collaborations, and secondments. The aims of job shadowing exchanges were largely focused on facilitating personal and professional connections and brief insights into other settings. The aims of work placements were usually to supplement training, promote knowledge exchange and improve the quality of care. The aims of project-based collaborations were largely related to the completion of existing projects. The aims of secondment programmes were not always clear in the scoping review.

The most common aims we identified on the WKEP webpages were improving leadership and management skills ($n = 25$), developing networks or collaborations ($n = 19$), and improving understanding of another field or site (or country) to bring back knowledge to their employer ($n = 19$). See Supplementary File 3 for a full list. About half of the webpages suggested the WKEPs were multi-purposed. Most programmes aimed to serve the individual participant's professional development (often through networks and skills development)—a micro-level aim—but many also aimed to improve organisational learning of the visitor's and/or host's organisation (interpreted as a meso-level aim), as well potentially the wider health and care system (a macro-level aim).

*The direction of WKEP visits.* In the scoping review, job shadowing and secondments were exclusively uni-directional, with no reciprocal visit reported. Similarly, most work placements were uni-directional exchanges, with a minority being bi-directional. Project collaborations were both uni- and bi-directional. Most WKEP webpages described a single participant visiting another workplace (i.e., uni-directional) without a reciprocal visit (51/74 programmes, 69%).

*WKEP participants.* The WKEPs we sought were intended for researchers, providers (including clinicians and non-clinicians), and policymakers working in health care. In the scoping review, all texts described programmes for healthcare providers or researchers. Three also included providers in social care. None involved policymakers. The type of participant varied by the programme's main activity. For example, project-based collaborations typically target postgraduate early-career researchers. However, secondment participants were from any stage in their careers. Clinical work placements (that occurred outside usual postgraduate training programmes) were reported to be for

trainees and qualified physicians, surgeons, general practitioners, accident and emergency doctors, psychiatrists, nurses, midwives, pharmacists, and allied health professionals. Most of these placements occurred towards the end of postgraduate training or within the first five years after gaining a specialist qualification. Non-clinical participants included managers, academics, social workers, and librarians. Some placements required a participant to be an MD or PhD candidate or to have completed a specialist diploma (e.g., a Diploma in Tropical Medicine for an exchange overseas).

In the mapping exercise, almost half of the programmes drew applications from providers ($n = 27$). Slightly fewer were aimed at people working in academia, including one for academic support staff ($n = 23$). Eight programmes were open to any of our three participant groups; however, two of these programmes were restricted to people working in digital health (ShadowMe, Shuri Network). Only two programmes were available to people working in social care (Bedford Council, International Social Worker Exchange Programme), and six programmes specifically targeted policymakers (e.g., CAPE, CSaP, Institute for Policy Research (University of Bath) Policy Fellowship (National), Royal Academy of Engineering (RAEng) Policy Fellowship programme (National), Royal Society Pairing Scheme, and UCL Visiting Policy Fellows programme). The programmes often specified an essential or desirable professional background for applicants. Where relevant to the WKEP, sub-speciality requirements were made evident for clinicians. The programmes for researchers often specified which disciplines were eligible for application, such as researchers in the physical sciences, social sciences, or humanities—none were available across disciplines.

Just over half of the programmes in the mapping exercise were available to people at any stage in their career ($n = 33$) and often specified that people should have finished their training or have post-doctoral standing. Thirteen of the exchanges were for people in an early career stage, nine for those in their mid to late career, and five for people in the later (or senior) stages of their career. We made assumptions that opportunities for PhD students (noting that these were not activities necessary to obtain their degree, which was an exclusion criterion) usually meant that the programme targeted applicants at early career stages.

The settings in which exchanges took place were also examined, identifying industry as an additional stakeholder group involved in WKEPs. Ward's (2017) framework additionally identified members of the public acting as or on behalf of their communities and people in receipt of services, but we were unable to identify public involvement in any of the immersive WKEPs we identified in the literature or ongoing programmes.

*Geography*. In the scoping review, most reports focused on international travel ($n = 92$), and the minority were nationally focused ($n = 9$). The remaining reports were unclear as to whether the exchange involved international travel. In the mapping exercise, the converse was true. Around half of the programmes were described as nationally focused ($n = 32$), which meant that the activities and participants involved were carried out and recruited from the UK. Nine were regionally focused within the UK. Nineteen exchanges included international travel of UK-based participants.

*Duration*. In the scoping review, durations varied based on the type of programme. For example, job shadowing and clinical work placement-based programmes ranged from three days to two years, whereas secondments ranged from one through to three years. The duration of project-based collaborations was only reported in a minority of the texts ($n = 34$). In the remainder, it was either not clearly stated or lacking entirely. In the mapping

exercise, the median programme duration was 12 months, with a range of one day to five years (see Table 1). Many programmes were either designed to be taken up part-time (e.g., Fellowships which had a range of activities, including WKEPs, planned to be undertaken over a year while maintaining full-time employment) or full-time during a shorter period of time (e.g., job shadowing placements), others had both full-time or part-time options.

*Application and funding*. We examined the descriptions of the application process and the funding available to participants. In the scoping review, whilst the exchange organising body, if there was one, was often acknowledged, the application and funding processes, if there were any, were seldom reported or poorly described. Much of the literature found described self-organised exchanges, where there was often no or limited involvement from an overarching organisation. In comparison, the mapping exercise provided more information, revealing that all the programmes which could be identified via a website usually required applications and many required interviews. Most programmes were designed to be run once per year. Almost all programmes described funding associated with the programme, including either a full or part-time salary, a stipend, research costs, and/or other benefits in kind, such as training and mentoring. The total amount available (for the programme and other components) was evident when the exchange was being provided as part of a research grant, but it was not possible to calculate when it covered participants' salaries (and thus, the total cost depended on the applicants' unique situations).

### Processes of exchanges

*Activities*. As described earlier we identified four main types of activities involved in WKEPs.

Job shadowing: An arrangement whereby a visitor accompanies a host in their daily activities at work. Often a 1:1 arrangement that is driven by a desire for professional development or curiosity. It can also be used to provide an individual within a department the opportunity to work alongside more experienced colleagues so they can learn and develop within their current role. Shadowing can take the form of:

i. Observation: a typical representation of what the host does daily. This can sometimes include an active involvement component such as the host briefing the visitor before an activity/meeting, then debriefing about lessons learnt).
ii. Regular briefings: where the visitor shadows the host for specific activities during short periods of focused activity.
iii. Hands-on: this is an extension of the observation model detailed above where the shadow starts to undertake some of the tasks they have observed (under the supervision of the host) (SOAS, n.d.; University of Bristol, n.d.; University of Cambridge, n.d.)

Shadowing is used in a variety of fields, and when applied as an experiential learning tool, it serves as a way for shadowers to understand close collaborators' roles who are from different fields, providing first-hand insights about performance, roles, functions, practices, processes, logistics, etc. (Kusnoor and Stelljes, 2016; McDonald, 2005; Vega et al. 2021). Shadowing using observational practices has been used to increase student awareness of hospital pharmacy practice (Saine and Hicks, 1987), create opportunities for building relationships and trust (Aggarwal et al. 2022), broaden experience in different clinical settings and identify improvements to be incorporated into participants' own clinical practice (Bridgwood et al. 2018, 2017). The nature of shadowing means it also helps overcome some of the safety issues

and human resource governance issues related to a new person undertaking unsupervised 'hands-on' work in another setting, which is particularly relevant in healthcare settings.

Work placement: A period of work where participants experience working in a specific role with an organisation or within a variety of settings. Supervised work placements are common among work-experience and undergraduate students as well as among young adults in the form of apprenticeships as an alternative to higher education where they develop occupational competencies (Guile and Griffiths, 2001). Work placements are also seen as complementary to taught and practical courses in higher education (Bullock et al. 2009). In post-qualification setting, they tended to feature as part of a broader professional development programme, often as part of a 'Fellowship'.

Project-based collaboration: These involve an ad-hoc arrangement by which a person is formally or informally brought into a project team for their external expertise. In either arrangement, participants' contributions are often part-time, while they combine this with other work. Project-based collaborations can involve pairs or small groups of people brought together in pre-arranged meetings in each other's workplaces to co-create solutions to pre-identified questions or problems or topics on which to collaborate beyond the meeting.

Secondment: A temporary transfer to another position or employment. In an internal secondment, the employee moves to a different part of the same organisation. In an external secondment, the employee temporarily works at a different organisation (O'Donoughue Jenkins and Anstey, 2017; Uneke et al. 2017). The embedded researcher model, where a researcher is based in a provider organisation, is often facilitated on a secondment basis. On expiry of the secondment term, the employee (the 'secondee') will typically 'return' to their original employer.

In the scoping review, we examined the main type of exchange activity reported, as the full range of activities was far less clear in the written reports in the academic literature than it was in the website-based mapping exercise, and we wanted to avoid making assumptions or omissions. Programmes that were typified by job shadowing (50/147, 34%) and secondments (50/147, 34%) formed the two largest categories in the scoping review. Some studies also referred to 'project-focused' programmes (25/147, 17%). There were also a relatively small number of 'work placements' (22/147, 15%).

For the mapping exercise, out of the 74 WKEP identified, 50 (68%) were composed of a single in-person WKEP activity, whereas 24 (32%) included two or more activities (see Table 1). There were a total 100 activities identified from the 74 WKEPs, of these 34 (34%) involved project-based collaborations, 24 (24%) involved work placements, 22 (22%) involved job shadowing and 20 (20%) involved secondments. A few programmes suggested that the activities carried out would depend on the interests and preferences of the visiting participant. Brief case studies of past participants were often provided to bring programmes to life and describe the types of activities that could be carried out. There were other common aspects of programmes, such as mentoring, networking or group-based learning, which are noted in Table 1, based on descriptions we assumed that these were not occurring within each other's workplaces.

*Learning expectations.* In this part of the analysis, we were particularly interested in how learning was captured during the WKEP. One route to learning through direct immersive experiences like shadowing, work placements, secondments, and project-based collaborations involves reflecting on the experience through writing or discussion afterwards to develop or consolidate new skills, new attitudes, or new ways of thinking. This is referred to as experiential learning in the education literature (Lewis and Williams 1994, p. 5).

The scoping review revealed a range of important insights about the learning process. For example, job shadowing exchanges often had a requirement to set learning objectives in advance, which were then reviewed after the exchange. There were pre- and post-virtual meetings reported, along with an end-of-exchange face-to-face meeting intermittently reported. Whereas a small number of work placements required learning objectives to be set in advance, less than one in four reported reviewing these after the exchange. Project-based collaborations requiring learning objectives were generally not described, although project deliverables were stated. It was unclear whether secondment participants set learning objectives in advance or indeed reflected on their experiences beyond what was captured in the published literature. Regarding work placements, additional training was commonly offered to support the placement, such as language training if it was an international exchange. The mapping exercise revealed very little about learning expectations and the learning process.

*Scheduling and permissions.* The scoping review revealed that most job shadowing exchanges were informally organised between individuals and did not follow a prescribed framework. Instead, those undertaking an exchange were able to dictate the exchange format and timetable. The permissions for job shadowing were required from the participant's post-graduate training programme and/or employer, as it was not a core part of training and/or needed permissions from the hosting organisation (e.g., GP surgery). There were no specific occupational health checks described. Visa requirements were in line with the law in the respective countries for international exchanges. Exchanges could take place at any suitable time. Time taken out of training was either taken as annual or study leave or added onto the length of a degree/training or integrated into the course length. Fourteen reports explicitly identified themselves as approved Out of Programme Experiences (OOPEs)—whereby postgraduate trainee doctors are granted a set period of time out of their speciality training rotation. There were usually two organisations linked in the exchange and, at times, three (e.g., Erasmus organising committee, host organisation, and the organisation of the exchange participant). However, their exact involvement was not always clear.

For work placements reported in the scoping review, the pairing was either self-organised, arranged through a network, or arranged by an overarching organisation. Permission to undertake a clinical placement was often needed from the employer, training deanery, or medical/nursing council. Occupational health checks for clinicians and security requirements were again largely not described. Typically, there was only one overarching organisation however, up to ten were reported. Project-based collaborations involved matching the participant and host based on the needs of the project. It was largely unclear how time was accounted for, and what permissions and human resources checks were required. There was often a lead university coordinating the exchange with administrators. Regarding secondments, there was often a single lead organisation which led the secondments. It was often unclear how the exchange was arranged, yet some were described as self-organised, and a smaller proportion were available through facilitated schemes. Information about prior permissions, HR checks and training was again generally not reported.

The mapping exercise revealed no information around the 'back end' of the exchange process beyond the steps of applying.

## Outcomes

*Benefits, outputs and outcomes.* Across both the mapping exercise and the scoping review, the benefits, outputs, and outcomes of exchanges were implicitly laden in the aims and descriptions of the programmes. The scoping review found that exchange benefits and outcomes were broadly themed into personal, professional, and organisational categories. Regarding job shadowing, personal outcomes included broadening horizons, increasing motivation to learn, developing cultural awareness and open-mindedness, enhancing self-confidence, gaining knowledge in new subject areas, including teaching methods and improving language skills. Work placements were described as leading to opportunities to gain experience in new clinical settings (e.g., emergency situations), practice evidence-based medicine, training in ethics, avoiding isolation and leadership training. There were no explicit benefits associated with project-based collaborations. The benefits of the secondments described in the scoping review included opportunities to be away from day-to-day workplace obligations, develop career-enhancement skills, undertake strategic secondments to make up shortfalls in specialist skills; to transition between roles; support recruitment and retention, and provide conflict resolution support.

In the mapping exercise, we found that fewer than half of the programmes described benefits for the main participants. The benefits were sometimes supported by testimonials from past participants describing a positive experience, but it was unclear exactly how benefits or outcomes would be achieved and when. The most common benefits identified included:

1. Building partnerships / collaborations (or 1:1 relationships)
2. Preparing participants for employment (through skill development)
3. Increasing the professional reputation of participants
4. Supporting international development in another country
5. Improving the well-being of local communities

*Theories of change and evaluations.* As might be expected based on the variation in reporting and advertising of the benefits and outcomes described above, there were very few examples of theories of change described. While the scoping review found no examples of this, the mapping review identified a few. Only one programme, CSaP, offered an explicit theory of change. The CSaP exchange programme was offered to early, mid and senior career-level policymakers. At all levels, the programme relied on the logic that: 'if' researchers and policymakers build professional relationships, 'then' more research will be transferred into policy. A small number of other programmes provided sufficient information that a probable theory of change could be developed. This was particularly true when programmes were narrow in scope or described a clear problem they were trying to solve. For example, the 70@70 programme made clear that the problem the programme sought to solve was a lack of nursing input into research at a national level. The aim of the 70@70 Programme could thus be summarised as: 'if' more nurses are funded to provide input to the NIHR programme across the country, 'then' nursing research priorities will be better represented at the system level.

*Evaluations.* Of the 147 academic papers included in the scoping review, 33 self-described as evaluations (and these are tagged in Supplementary File 3). The mapping exercise identified only five evaluations of programmes (CSaP, HEE Deaneries Global Health Fellowship, HEE Improving Global Health Fellowship, NIHR70@70, and Paired Learning). It is likely that other programmes have conducted evaluations or pilot studies, but have not made reports publicly available or were not picked up in the searches. This assumption is driven by key informant conversations we had with exchange programme leaders as part of the background work for this scoping study. Had more evaluations been available, the theories of change may have been more apparent.

## Discussion

**Principal findings.** This scoping study has mapped the systems, processes, and outcomes of a form of knowledge exchange in the field of health and care that we labelled 'Workplace-based Knowledge Exchange Programmes' (WKEPs). WKEPs provide opportunities for people from different disciplines or locations to spend a temporary amount of in-person time in another workplace, learning from observing a different work environment and learning from those with differing expertise or offering their expertise.

The WKEPs included in our scoping study were mostly uni-directional but otherwise varied. They ranged in duration from a single day to five years. The aims and benefits of these exchanges in the health and care field were found to exist at the individual/micro (e.g., developing networks), organisational/meso (e.g., improving understandings of another sector or site - including outside the UK - to bring back to participants' own workplace), and system/macro levels (e.g., producing research evidence). The entry process into WKEPs ranged from informal case-by-base arrangements for job shadowing to applications and interviews for other WKEP-related activities such as project-based collaborations, work placement, or secondments. This was particularly the case when WKEP formed part of a wider range of professional development and knowledge exchange activities, often under the generic term of 'Fellowship'. The consolidation of knowledge through reflection often depended on the formality of the exchange. Some WKEPs involved reviewing pre-set objectives at the end of the programme, logging continuing professional development points, or formal assessments by the hosting organisation.

We found that the programmes in the mapping exercise and scoping review could be described as involving one or more of the following activities: 'job shadowing', 'work placements', 'project-based collaborations', and/or 'secondments'. These terms were derived from the description of activities in the WKEPs' webpages and the case reports in the scoping review, as well as from the knowledge exchange and mobilisation and education literature. To clarify what is meant by each knowledge exchange activity and their relationships to each other, we have developed an applied conceptual framework which builds on existing frameworks (Davies et al. 2015; Ward, 2017). This distinguishes between WKEP activities and aims to help people or organisations facilitating, participating in, or researching knowledge exchanges describe their knowledge exchange opportunity (see Table 2).

**Reflections on challenges and implications for WKEP organisers and researchers.** We experienced three main difficulties in seeking to understand the characteristics of WKEPs in the health and care field in the UK. This incited reflection on the challenges potential WKEP participants may face when seeking out exchanges. These challenges included: (i) difficulty identifying WKEPs, (ii) WKEPs being poorly reported and advertised, and (iii) imbalances in WKEP opportunities. Based on these we recommend mechanisms through which to improve access and awareness of WKEPs drawing on the finding of this study.

Firstly, it was very difficult to identify WKEPs online. Using the scoping review's search terms (and simplified search terms) in Google revealed only five relevant programmes, whereas site-specific searches of research funding bodies such as the Medical Research Council or Academy of Medical Sciences revealed a

**Table 2 Framework of WKEPs by activity.**

| | Job shadowing | Work placement | Project-based collaboration | Secondment |
|---|---|---|---|---|
| Definition | An arrangement whereby a visitor accompanies a host in their daily activities at work. Often a 1:1 arrangement that is driven by a desire for professional development or curiosity. It can also be used to provide an individual within a department the opportunity to work alongside more experienced colleagues so they can learn and develop within their current role. Shadowing can take the form of: (i) Observation: a typical representation of what the host does daily. This can sometimes include an active involvement component such as the host briefing the visitor before an activity/meeting, then debriefing about lessons learnt). (ii) Regular briefings: where the visitor shadows the host for specific activities during short periods of focused activity. (iii) Hands-on: this is an extension of the observation model detailed above where the visitor starts to undertake some of the tasks they have observed (under the supervision of the host) (SOAS, nd; University of Bristol, n.d.; University of Cambridge, n.d.) | A period of supervised work, where participants experience working in a specific role with an organisation or within in a variety of settings. | This involve an ad-hoc arrangement by which a person is formally or informally brought into a project team for their external expertise. In either arrangement, participants' contributions are often part-time, while they combine this with other work. It may involve pairs or small groups of people brought together in pre-arranged meetings to identify solutions to pre-identified questions or problems. It might also involve visits to each other's sites to collaboratively identify research problems or topics on which to collaborate. | A temporary transfer to another position or employment. In an internal secondment, the employee moves to a different part of the same organisation. In an external secondment, the employee temporarily works at a different organisation. The embedded researcher model, where a researcher is based in a provider organisation, is often facilitated on a secondment basis. On expiry of the secondment term, the employee (the 'secondee') will typically 'return' to their original employer. |

**Table 2 (continued)**

|  | Job shadowing | Work placement | Project-based collaboration | Secondment |
|---|---|---|---|---|
| Purpose of participation | To exchange ideas and experiences and/or gain insight into a job or organisation and its culture. | To gain deliberate experience', as well as to exchange ideas and experiences and/or gain insight into a job, organisation and its culture. * | To contribute external expertise to a project and gain expertise and research skills. To build collaborations and networks. | To contribute expertise to another workplace, bringing new perspectives and sharing skills with the host organisation with a presumption that the individual will gain new skills transferable to their original position. * |
| Approximate duration | Half a day—four weeks | A few weeks—six months | A few days—one year | Secondments are normally for a period of two years or less. If the secondment is to be for a period of longer than 23 months, then in the UK the arrangement must be considered under the Fixed Term Work (Prevention of Less Favourable Treatment) Regulations 2002. |
| Who pays | Typically no cost, except trave, which is paid for by the visitor. | Clinical training in the UK may be funded through government schemes or directly by the employer. Non-clinical training varies. Although many people do get paid while they are working on prolonged placements, there is no legal obligation on host/training organisations to do so. | Typically, the host organisation offers the external person a fixed-term contract within their organisation. | In some external secondments, the original employer pays the salary, but it is more common for the host organisation to do so. |
| Entry process | Managed differently across varied organisations on a case-by-case basis among employees. | An application ± interview is common. | Teams can be developed through professional networks and personal contacts, but funding is often provided through an application. | An application and interview are common. |
| How learning is consolidated | Learning objectives can be set beforehand and reviewed after shadowing—these are typically optional, though they may be mandatory if part of a structured shadowing programme. | Training typically goes towards a qualification. For non-training posts, consolidation may be evidenced within continuing professional development, appraisal or publication. | A project summary meeting or report is common. | Work experience, continuing professional development, appraisals (host or home organisation). |

Note: * When the NHS sends clinicians abroad, some exchanges are intended to expand individual training and networks (and these are more aligned with work placements), and others are intended to have an impact on overseas development that benefits the health system (and these are more aligned with secondments or project-based collaborations). Internships, international clinical placements, fellowships, and sabbaticals can include elements of the above types of exchange activities.

**Table 3 Principles and guidance for reporting and advertising WKEPs in the health and care field.**

| Text section | List of principal items | Guidance on principles |
|---|---|---|
| 1. Programme details | a. What is the name of programme?<br>b. What type of activities best describe the type of workplace-based knowledge exchange programme?<br>c. Where can information about the WKEP be found?<br>d. Does the programme cover health or care (or both) and is it inclusive of other sectors? | a. Name of programme<br>b. In-person exchange activities involved (i.e., job shadowing, work placement, project-based collaboration and/or secondment) and any other activities (e.g. networking, training).<br>c. URL(s) found<br>d. Health or care only (vs. inclusive of other sectors) |
| 2. Problem driving programme, expected aims and benefits | a. What problem is the programme is trying to overcome?<br>b. What are the main aims and linked objectives?<br>c. What are the benefits for (a) the main participant, (b) other beneficiaries?<br>d. What are the expected short and long-term professional and personal outcomes for beneficiaries: (a) main participant, (b) others (e.g. employers, system level)?<br>e. What rationale, logic, or theory of change is essential to the programme (i.e. IF x, THEN y)?<br>f. Have the programme's outcomes been evaluated? If yes, please provide link to the evaluation | a. Describe the problem, challenge or issue that the programme is attempting to solve or overcome.<br>b. Describe the aim as a broad, general statement of intent that indicates the overall desired goal of the exchange. Use the categories developed by Ward, 2017: (i) to develop local solutions to practice-based problems; (ii) to develop new policies, programmes and/or recommendations; (iii) to adopt / implement clearly defined practices and policies; (iv) to change practices and behaviours; and (v) to produce useful research / scientific knowledge. The objectives can be more short-term and include those we identified in Supplementary file 3.<br>c. Benefits are the measure of the advantage gained by the individual, organisation, etc., through achieving the outcome.<br>d. Outcomes are the change that should result from the outputs. Outcomes are linked to the aims but should be phrased as measurable and specific (e.g., increased frequency of contact between participants maintained for six months after exchange).<br>e. Logic models are best co-constructed with participants and relevant stakeholders. Disagreement among stakeholders is common.<br>f. Wherever possible, it is important to provide links to process and outcomes evaluations. |
| 3. Participants | a. Who is the main participant / beneficiary / visitor?<br>b. Who is the host?<br>c. What, if any, stage of their career must participants be at?<br>d. What, if any, training, qualifications or personal characteristics are required to participate? | a. Describe these as either academic, policymaker, provider, service user or industry (and where possible, use Ward's (2017) terminology).<br>b. Describe these as either academic, policymaker, provider, service user or industry (and where possible, use Ward's (2017) terminology).<br>c. Describe this as either: any stage, early, mid or senior career.<br>d. This varies by sector. In clinical exchanges, this can be a certain number of years post-clinical qualification. A PhD degree is often used as a marker in academic exchanges. Civil servants use standard grading. |
| 4. What, how, when and how much | a. What activities are involved in the exchange?<br>b. Is a virtual exchange also an option?<br>c. How is pairing/matching done?<br>d. How long are exchanges?<br>e. Is the visit one-way or two-way (ie visiting each other's workplaces)?<br>f. What types of knowledge are expected to be exchanged?<br>g. Is it required that participants set learning objectives in advance?<br>h. Are learning objectives reviewed after the exchange (i.e., how does the experiential learning activity involve reflection and lead to change)?<br>i. What additional activities support the exchanges?<br>j. What types of knowledge are exchanged during different activities?<br>k. What, if any, training is involved to participate?<br>l. What permissions, occupational health checks, or security clearances are required to participate?<br>m. What is the application / hiring process?<br>n. When do exchanges happen?<br>o. How is time accounted for when on exchange? | a. Describe which activities were involved: job shadowing, work placement, project-based collaboration, or secondment – or a combination of these activities.<br>b. If there is any virtual exchange, describe which components are carried out, online versus in person.<br>c. This is usually the responsibility of the organiser but can vary. Describe the characteristics upon which matching will occur (e.g., area/topic of work, shared interests, specific questions that need to be answered)<br>d. Describe as either full-time or part-time, the number of hours or days required and over what time period.<br>e. Describe as uni-directional (one-way) or bi-directional (two-way).<br>f. Describe whether there are expectations on the types of knowledge that will be covered, such as (i) Scientific / factual knowledge – research findings, quality and performance data, population data and statistics, evaluation data; (ii) Technical knowledge – practical skills, experiences and expertise; (iii) Practical wisdom – professional judgments, values, beliefs.<br>g. Learning objectives will often be linked to the aims and outcomes. |

**Table 3 (continued)**

| Text section | List of principal items | Guidance on principles |
|---|---|---|
| | | h. Describe how learning objectives are reviewed (e.g., in person, online), by whom (e.g., individual, both/all participants in exchange, or employers) and when (e.g., on the day, one week later, months later). Also, describe how it can be assumed that the activities and the process of reflection will lead to change. |
| | | i. Describe whether exchanges are supported by a launch or closing event, mentoring, classroom-based learning, or networking etc. |
| | | j. Being specific about this can help in providing evidence for the logic model. |
| | | k. This is often linked to qualifications but can also include training required for human resources approvals or language training. |
| | | l. Describe all individual and organisational-level checks and approvals that will be required. Use existing templates from exchange toolkits where possible. See examples[a,b] |
| | | m. Describe the number of stages with a timeline and whether application, interviews, and references were/will be required. |
| | | n. Describe whether exchanges are ad hoc or run on a cycle (e.g., quarterly, annual, etc.) |
| | | o. Describe whether the participant was able to use the employer-funded time to take part in the exchange (and if so, what type) or whether annual leave was /will be required. |
| 5. Who provided | a. How many organisations are involved? b. Who funds the varied costs involved in the programme? c. Is a contact address available for administrators? | a. Describe the number of organisations and their roles in the exchange (e.g., sending organisation, host organisation, organisation facilitating the exchange) b. Where relevant, describe the costs involved and who provides the funding for these (e.g., participants' time, travel costs, event venue and refreshments costs, teaching costs, mentoring costs, etc.) c. When advertising, ensure a contact address is available for the programme administrators. |
| 6. Where | a. In which city (or region) is the programme based? If relevant, state online. b. Where is the exchange setting? c. Do exchanges involve engagement with patients/recipients of health or care? | a. Describe the city, region or country of exchange. Where virtual components are involved, state which tasks or activities will be carried out online. If reporting on an exchange programme, ask whether the programme consents to be named or would prefer to remain anonymous. b. Ensure descriptions are clear about the exchange setting, especially if they will include private spaces or locations where sensitive / confidential information will be / was discussed. c. Ensure a description of which tasks or activities will involve engaging with patients, where relevant. |
| 7. History of programme | a. How many participants have taken part over the programme's lifetime? b. What year did the programme start? | a. When advertising, state how many participants have taken part over the programme's lifetime and whether current participants will have opportunities to network or engage with past participants. b. Provide the starting year for the exchange to provide a sense of how mature or immature the programme is at the time. |

**Note:** This list of items could be used in advertisements and reports on exchange experiences. We would encourage exchange participants, organisers and researchers to use these and feed back suggestions for change to the authors of this study.
[a]https://www.imperial.nhs.uk/~/media/website/education/paired-learning/paired-learning-toolkit-part-1.pdf.
[b]https://www.england.nhs.uk/publication/the-wessex-model-how-to-set-up-and-run-a-workplace-exchange/.

further 22, and word-of-mouth approaches from well-networked interviewees (findings from interviewees are presented elsewhere - see Kumpunen et al (2023)) and peer reviewers revealed an additional 26. Enacting the well-thought-through searching strategy proved so challenging that we concluded that unless potential WKEP participants were well-connected or aware of websites from which to launch searches, the process of identifying programmes would likely prove challenging. This could be due to a lack of shared terminology to describe the particular immersive form of knowledge exchange we were interested in. The consequences of not having terminology, as highlighted by Farley-Ripple et al. (2020), include interested stakeholders overlooking existing research on this topic, leading to "wasted research, repetitive investigations leading to the same conclusion,

and, unfortunately, an over-claiming about what new research in this area can deliver" (p. 8). To address this, descriptions in online advertisements and publications could be linked to the conceptual framework's vocabulary, thus creating semantic ties and building a more easily searchable space. Furthermore, to bring together all WKEP-related documents, such as advertisements, programme testimonials, and evaluations, there may be value in developing (and widely publicising) an open-access database or repository on all WKEPs and possibly other knowledge exchange opportunities. This could be established and (co-)hosted by leading national organisations that champion a culture which values and incentivises the production and the use of knowledge and that have long-term funding to support the required necessary updates. For England, these could include UK Research & Innovation, Research England, NHS England, Health Education England (now also part of NHS England), the Faculty of Medical Leadership and Management and/or Higher Education Institutions, such as universities with expertise in the field of knowledge exchange in health and care.

Secondly, the WKEPs we identified were poorly reported and advertised. We were unable to fully complete the data extraction form (available in Supplementary File 1) for any single paper or programme website. Regarding reporting gaps, the mapping exercise provided information about the aims, duration, application process and funding, but could not cover the areas the scoping review texts provided, such as the learning objectives and approvals and permissions. Knowledge gaps that were not consistently covered included which outcomes are achievable and when, the logic of the programme (echoing Oliver and colleagues' (2022) experience), as well as the costs of programmes. The specific methods for actually *exchanging knowledge* were also poorly articulated, as was first identified by Ward (2017). Further, evaluations of WKEPs were also notably absent from the literature and web pages we examined. This was unsurprising, as formal evaluations have proved highly challenging and relatively rare in the knowledge mobilisation space (Davies et al. 2015). The challenges of mapping and the inability to gain a comprehensive understanding of any single knowledge exchange programme has been identified as a problem in other similar reviews and mapping projects (c.f., (Bridgwood et al. 2018; Oliver et al. 2022; Ward, 2017)). Therefore without addressing poor reporting, it will be difficult for the field to continue building upon the existing frameworks (c.f. (Best and Holmes, 2010; Davies et al. 2015; Langer et al. 2016; Ward, 2017; Ward et al. 2012).

To support the improved reporting and advertisement of any existing or future WKEPs, we have produced good practice principles adapted from the TIDieR intervention design framework (Hoffmann et al. 2014), the applied conceptual framework we produced, and existing frameworks (Ward, 2017) (see Table 3). The reporting principles are valuable in two respects. They can help exchange organisers reflect on key aspects of their WKEPs, including their aims, theory of change, benefits, and costs. They also offer a mechanism for enabling programme organisers to communicate these details more clearly to applicants and their employers—making business cases easier to defend. The reporting principles also provide a structure to exchange participants around which to describe their experiences in case reports, should they publish them. The advertising and reporting of future WKEPs could be improved through more comprehensive descriptions of the induction, exchange and post-exchange activities, experiences and outcomes achieved. We would value organisations and individuals applying the principles and feeding back their comments to the authors of this study.

Finally, the conceptual framework was challenging to develop because of imbalances in opportunities. There were very few WKEP

opportunities within social care, a disappointing but perhaps unsurprising finding considering the sector has long suffered from underinvestment in its services and human capital. Further, we examined opportunities for three stakeholder groups of interest in this study—providers, policymakers, and academics—but the bulk of texts in the scoping review and around half of the programmes in the mapping exercise were aimed at providers (in the health sector). Only six programmes targeted policymakers as the primary (visiting) participants (e.g., CAPE, CSaP, Institute for Policy Research (University of Bath) Policy Fellowship (National), Royal Academy of Engineering (RAEng) Policy Fellowship programme (National), Royal Society Pairing Scheme, and UCL Visiting Policy Fellows programme). One possible explanation for the gaps in opportunities for policymakers is that other types of knowledge exchange and professional development opportunities are more common than WKEPs, such as mentoring or undertaking a short course or Masters-level degree. However, we were unable to identify literature to confirm this. That said, a study on professional development strategies for the education of policymakers suggested typical routes to professional development included staff exchanges and study visits, postgraduate programmes, and internships, as these were identified to enhance the knowledge and skills of policymakers, particularly for those who have been transferred to work in new areas (Nguyen, 2019). Thus, other possible explanations for the difference between opportunities for health care providers versus policymakers are that there are more NHS staff than policymakers or that it is not within the professional culture among policymakers (or possibly even appropriate) to publicly advertise or publish about professional development opportunities internal to the subsector. The nature of the day-to-day activities involved in each role, which may, for example, be more desk-based for policymakers compared to providers, may lend themselves less well to short in-person WKEPs. There is a need to further explore knowledge exchange opportunities for policymakers and social care practitioners.

To aid programme organisers aiming to address the imbalance in opportunities, there would be benefits in organisers building on existing research and tools. For example, the barriers to participation have been highlighted as upfront travel costs, administrative burdens associated with drafting exchange agreements, or loss of participant income (Kumpunen et al., 2023). To overcome these barriers, organisers could instead consider using virtual exchanges, which can minimise travel costs (relative to in-person WKEPs) and have been found to instil empowerment within participants, promote independent and collaborative learning skills, and inspire local health system development among health professionals (Bridgwood et al. 2023). Where preferences are for in-person immersive WKEPs (and administrative burden is preventing participation), organisers could borrow from the existing tools, such as the Paired Learning programme's publicly-available toolkit, which provide clear guidance and document templates (e.g., human resources approval letters) on how to replicate or adapt their model.[6] Successful adaptations of the original Paired Learning Programme involving multi-disciplinary team members engaging in a more condensed approach have been described in the literature (Houston and Morgan, 2018). A similar toolkit is available for general practitioner and hospital-based consultant exchanges.[7] Moreover, a set of guiding questions has also been produced to help organisations design an embedded researcher initiative.[8] Where a particular approach has been chosen, borrowing from existing knowledge about the barriers and facilitators may be of value. For example, when developing a secondment programme into policymaking environments, organisers could think about the extent they can build identified facilitators into their programme design, such as establishing a prior relationship between the two organisations and building a civil servant culture

that values the use of research in policymaking (O'Donoughue Jenkins and Anstey, 2017). Likewise, other studies looking at secondments have identified the importance of participants buddying up, strong team leadership, strong brokers' interpersonal skills, and two-year part-time contracts (Wye et al. 2020). Careful planning and adaptation of the existing evidence and tools could help address the imbalance of WKEP opportunities.

**Strengths and limitations**. Relatively little was known about the characteristics of WKEPs in health and care in the UK before this scoping study. Our searches were systematic, and the mapping of characteristics was comprehensive. Overall, we found 147 texts and 74 programme webpages and brought together data wherever available to strengthen our understanding of WKEPs and develop a framework of activities. Nevertheless, the methods of data collection in the scoping study were limited by time and budget, as well as methodological limitations. Additionally, our research team was dominated by five general practice providers (three of whom were in academic roles) and a health policy researcher (who was previously a policymaker)—thus, we lacked the perspectives of current policymakers and people in social care. As is common with scoping projects, we attempted to make our search strategies as sensitive as possible. But we know the exchanges we identified in the review and mapping exercise are likely to represent only a small proportion of the total number of exchanges that take place and that these will change over time. Indeed, it is likely that those reported and identified here are skewed towards the more structured programmes that tend to encourage report writing, publication, and advertising on public platforms. The mapping exercise, by its nature, excluded self-organised exchanges and those without an online description. Due to time and budget restrictions, we were unable to co-develop or test our 'next steps' recommendations with stakeholders, but this represents an opportunity for further research. Finally, we also recognise that the health and care sector also encompasses roles which may not clearly fit into the categories of providers, policymakers or researchers, for example, digital health developers in the private sector, management consultants or the pharmaceutical industry—as is suggested, the proposed conceptual framework and reporting principles should be amended as more information becomes available about WKEPs and their participants.

## Conclusion

In this study, we identified the characteristics of 'Workplace-based Knowledge Exchange Programmes' (WKEPs) by systematically examining 147 relevant texts and 74 programme websites. There was significant variation in the length, setting, and formality of WKEPs. The terms used to describe them were often applied interchangeably and covered a range of activities, particularly terms like 'fellowship', but we found that four activities were common to WKEPs: job shadowing, work placements, project-based collaborations, and secondments. The true extent of WKEPs is unknown, as their reporting in academic literature appears to be highly heterogeneous and opportunities relatively elusive in online searches. Two groups of participants appeared to be underrepresented in our sample, people working in social care and policymakers (working on health or social care). Moving forward, we recommend using common and consistent language by using the four terms above to describe knowledge exchange activities which involve a period of time spent immersed in person in another workplace (see Table 2). Secondly, we suggest an online register of opportunities be established. Thirdly, we encourage employers

of providers, academics, and policymakers to develop WKEPs as a form of professional development for their staff, drawing from the existing programme examples identified here, as well as using the principles for advertising and reporting experiences provided (see Table 3). Despite this scoping review providing new insights about WKEPs, there is an ongoing need to better capture their benefits, outcomes, and costs related with WKEPs in order to improve their application in the field of knowledge mobilisation.

## Data availability

In the scoping review, we analysed journal articles, many of which are accessible publicly, but some of which are only available behind journal paywalls. Our analysis of the included articles scoping is available in Supplementary file 2, as well as on Rayyan.ai under the label 'Workplace-based exchanges'. The mapping exercise examined publicly available websites, and our analysis of these are summarised in an MS Excel table which is available by request from the authors.

## Notes

1 https://www.commonwealthfund.org/fellowships/harkness-fellowships-health-care-policy-and-practice
2 https://www.aomrc.org.uk/medical-training-initiative/
3 https://digitalhealth.london/programmes/digital-pioneer-fellowship
4 https://catapult.org.uk/about-us/why-the-catapult-network/
5 https://www.sciananetwork.org/
6 https://www.imperial.nhs.uk/~/media/website/education/paired-learning/paired-learning-toolkit-part-1.pdf
7 https://www.england.nhs.uk/publication/the-wessex-model-how-to-set-up-and-run-a-workplace-exchange/
8 https://www.embeddedresearch.org.uk/wp-content/uploads/2020/08/questions-research-initiative.pdf

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## Author contributions

The authors confirm contribution to the paper as follows: study conception and design-All; data collection- SK, BB, GI and LP; analysis and interpretation of results- All; draft paper preparation- All. All authors reviewed the results and approved the final version of the paper.

## Competing interests

The authors declare no competing interests.

## Ethical approval

The research was reviewed by the Observational and Interventions Research Ethics Committee at the London School of Hygiene and Tropical Medicine. A favourable ethical opinion was confirmed on 11 March 2020 (Reference number 21668). The data presented here does not include data from human participants. All data included in this paper were obtained from within the public domain.

## Informed consent

No human subjects were involved, and all data was publicly available. Informed consent was not applicable.

## Additional information

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