Project title: Partnership for Workforce Sustainability in Underserved Areas: Exploring challenges to workforce sustainability in general practice

Project protocol

Context

This proposal sets out the programme of work being carried out by the NIHR-funded Partnership for Workforce Sustainability (NIHR160772), known as Workforce Voices. This is a five-year programme of work focusing on improving staff experience in primary care and maternity services, in order to address problems in workforce recruitment and retention in these sectors.

This proposal sets out initial research within general practice, enabling us to collect primary data elaborating problems, and developing interventions, across different settings. This evidence can then support the development of intervention-specific protocols to examine wider roll-out and evaluation. It will allow us to collect initial empirical evidence, develop theoretical understanding and evaluate pilot interventions.

Background and rationale

The crisis in the recruitment and retention of staff across the NHS presents fundamental challenges for the effective delivery of services.[1] Despite aspirations and policy initiatives to encourage recruitment, including those in the 2023 long term workforce plan,[2] the crisis is worsening.[3,4]

The problem is one of recruitment and retention. Attracting new staff, to administrative, support, qualified and non-qualified clinical roles, presents one challenge, but ensuring they stay in those roles is another.[5,6] Even where efforts are taken to increase recruitment, the root causes of workforce challenges need to be addressed to ensure sustainability. Problems of recruitment and retention should therefore be considered together.

The problem is complex, and there is often a risk that policy frames ‘workforce’ as an impersonal resource to be commissioned and deployed, overlooking the experience of individual workforce members, including their agency to stay or leave. That staff wellbeing is a factor in workforce attrition has been recognised,[7] but often interventions focus on mitigating threats to wellbeing, or addressing symptoms, rather than addressing systemic causes.[8,9]

The work of the Partnership will consider systems-level issues impacting wellbeing, and not just personal resilience. We suggest that sustainable solutions require the problem to be reframed from one which requires workers to adapt to an adverse system, to one which requires changes to the system such that people want to work within it.

However, it is likely that system changes cannot be universally applied. It is well-established that health needs vary with socioeconomic deprivation,[10,11] and there is evidence that similar variation is apparent in the workforce.[12] While strain in the workforce is apparent in all areas, that strain may therefore be more acute, with greater risk of systems failing, in areas with greater socioeconomic deprivation. Members of minority ethnic groups are more likely to live in areas of high deprivation.[13] Considerations of diversity and equity are therefore also essential; systems that recruit, train and support people from all backgrounds will be more likely to have the right people, in the right roles, in the right context, leading to higher retention and increased workforce sustainability.

1.1 Patient impact

Workforce issues have a direct impact on patients and the public. For example, lower nurse staffing levels have been found to contribute to adverse patient outcomes.[14,15] Continuity of care, enabled by stable staffing, can strengthen relationships between healthcare staff and patients,[16] and lead to better patient outcomes, and even lower mortality.[17] The loss of continuity of care may be particularly harmful for patients with multiple long-term conditions, which are more prevalent in disadvantaged communities.[11] Health literacy can be less in deprived areas,[18] adding a communication challenge in healthcare.

Workforce gaps also expose remaining staff to greater workload, which may lead to burnout.[19,20] This may further reduce quality of patient care,[21] and so make work less appealing in a vicious circle. The loss of expertise as clinicians retire early[22,23] can affect efficiency, while payments for locums/agency staff to fill gaps add a financial burden on providers.[24] A link has also been suggested between understaffing and safety.[19] Evidence has shown a correlation between high staff turnover within general practice and poor population health outcomes.[12]

Improving workforce recruitment, retention and stability therefore has a potentially direct benefit for care, and safety, in those areas. However, despite evidence of the impact of workforce problems on patient outcomes, accounts of interventions or strategies to support the sustainability of the workforce are limited.[25,26]

1.2 Scope and focus

In this work, we will prioritise ‘under-served’ areas, taking the view that they are more vulnerable to catastrophic failure in a workforce crisis. This will be defined pragmatically,[27] considering frameworks such as PROGRESS+[28] and Core20Plus5,[29] which encompass geographical, social and health markers to define areas of need, alongside direct consideration of workforce data. In general practice, the Deep End movement provides a group of practices which are de facto identified as serving deprived communities.[30] Members of the Deep End network across the North East and North Cumbria are co-applicants and partners in the partnership.

The Partnership will take a national view, but draws on regional expertise: North East England has the highest rates of poverty and unemployment in the country, and the highest rates of poor health and early death,[31] as well as a mix of urban, rural and coastal areas. London and Birmingham present issues unique to large conurbations, and a greater ethnic mix.

The focus on deprived areas is supported by evidence that workforce problems, such as higher rates of sick leave among healthcare staff, may be greater in deprived areas.[32,33] This may be linked to workload, or to the concurrent effects of poverty in work – many staff working in more deprived areas are also likely to experience that deprivation. A review of literature in emergency medicine[34] connected the specialty’s staffing crisis to excessive workloads, poor working conditions, low income, high stress, and antisocial working patterns.

An ‘inverse training law’ – that areas most in need are less likely to train and retain staff – has been suggested as negatively influencing patient outcomes.[35] As well as initial recruitment, the training experience, and quality of the environments in which they learn, are important factors in shaping people’s decisions to stay in a job. Data on career choices in medicine shows that people prioritise location and working conditions, over pay and familiarity with a specialty.[36] While other occupational groups may have less choice over their location, they may value these factors when choosing to stay or leave the sector.

Workforce alone cannot solve the problems of social inequality, but designing solutions, which recognise inequality around, and within, the workforce may help mitigate those problems. We aim not to be limited by following paths of least resistance, but to identify what should, rather than just what can, be done.[37]

1.3 Primary care context

Initial work will focus on primary care, and specifically on general practice where problems are particularly recognised.[12,38,39,40] Waiting times have increased for patients, there is reduced access to primary care services, and staff experience high levels of stress and burnout.[41] Non-clinical staff are also under strain – GP receptionists are facing increasing levels of aggression from patients.[42,43] These challenges may be exacerbated by broader health inequalities and the challenges of delivering care in both densely populated urban environments, and remote, rural, and coastal settings. In under-served areas there are fewer GPs per 10,000 patients than in well-resourced areas.[44]

Policy changes also emphasise the importance of primary care. The NHS 10 Year Plan[45] set out three shifts: from hospital to community settings, from treatment to prevention, and from analogue to digital. All will shape the future work of staff in primary care, and present opportunities, and risks, in the implementation of change. The introduction of a new General Medical Services contract for GPs[46] similarly provides opportunity and risk, and the work of the partnership has potential to ensure that change is effective, and appropriate for different staff groups.

An initial focus on general practice also directly follows from, and builds upon, a realist review conducted by several members of the research team.[47] We have also developed relationships and understanding of concerns and opportunities in our initial scoping activity.

The current project

The research team have had extensive discussions with stakeholders during the development of the partnership bid, and since the commencement of the contract in March 2025. We have identified particular areas of challenge for some groups in primary care – general practice receptionists and practice nurses in particular – and aspects of the relationship between primary and secondary care (such as the use of advice and guidance) which may add strain to GPs' work.

We are therefore in a position to explore in more depth some of these issues for different staff populations, as we develop target implementation/evaluation projects in specific settings. This proposal sets out work which is exploratory, and responsive to expressed need and opportunity in different settings.

1.4 Aims and research questions

This project aims to identify what workforce challenges are witnessed and experienced by staff in general practice. Initial areas of study are the experience of practice receptionists and administration staff, the experience of practice nurses, and experiences arising from primary-secondary care communication, but other topics may emerge from scoping and initial data collection.

Research questions reflect different forms of understanding of challenges, and how they may be addressed:

1. What workforce challenges are experienced in different settings?
2. How do measures including staff wellbeing and experiences of work vary?
3. What factors influence staff choices to remain in or leave their roles?
4. What interventions can be developed to address those challenges?
5. What is the subjective and measurable impact of interventions on staff and the system?

Methods

The project will use multiple methods to address different research questions. These are delivered by different workstreams within the partnership, which will also be contributing to other longer-term projects within the Partnership's programme of work:

- knowledge mobilisation and implementation
- realist review
- analysis of secondary data

- staff survey
- health economics
- co-design of interventions
- qualitative data collection (encompassing problem elaboration, implementation and process evaluation).

Realist reviews will develop theoretical understanding based on targeted searches of relevant published and grey literature (see appendix A), while secondary data analysis will work with publicly available workforce data (see appendix B). This protocol focuses on primary data collection within the qualitative, staff survey, health economics, and co-design workstreams:

- RQ1 will be addressed by focus groups and interviews with staff. and observation of their work.
- RQ2 by a staff survey.
- RQ3 by a discrete choice experiment.
- RQ4 by co-design workshops.
- RQ5 by qualitative data collection, surveys, and analysis of secondary data, as appropriate.

The partnership involves a comprehensive Community Inclusion and Engagement (CIE) strategy, encompassing Patient and Public Involvement (PPI) and engagement of staff in health and care sectors. This CIE activity, through formal panels and ad hoc meetings, and the involvement of CIE co-applicants in partnership governance, will inform the development and refinement of all materials.

1.5 Research settings

Research settings for this phase of work will include general practice surgeries, and non-healthcare settings, for example community centres, or other venues where participants may be attending events (for example if data collection takes place in the context of wider meetings or conferences in hotels, business centres or similar settings).

In surgeries, data collection will only take place in private spaces where no clinical activity is taking place (for example meeting rooms), and in the case of observation, in public areas (for example waiting rooms). No data collection will take place during clinical activity.

For online data collection, participants may be in any location of their own choosing – however they will be encouraged to only take part in private locations.

1.6 Participants and recruitment

We have engaged leaders in the Integrated Care Boards in our partner regions (North East and North Cumbria, North East London, and Birmingham and Solihull) who are supportive of our work and have agreed to support data collection. Initial sites within these areas will be determined from insights from our research advisory group and wider network, and examination of secondary data. Our sampling strategy will be informed by what we know about the study contexts, learning across workstreams, theoretical frameworks, and wider literature in the area.

Some data collection may be across whole regions (for example, invitations may be distributed through integrated care systems), and some will be targeted on specific locations. At this stage of our work, the flexibility to adapt and respond to opportunities at short notice, in order to collect data where it is feasible, and where findings may be particularly informative, is important.

1.6.1 Staff participants

Staff participants will be those working in general practice settings in partner regions, and those working in other settings (such as secondary care specialists) who have contact with general practice staff. Participants will be recruited because of their professional role, and may be of any staff group (clinical or administrative). Recruitment will be by:

- email invitations cascaded through ICB and other Partnership networks (we expect these to be through items contained in newsletters, or other regular emails to practice addresses, but there may also be direct cascade to individual addresses),
- snowballed invitations where individuals in particular roles are desired,
- direct email invitation where potential participants have provided their contact details at in-person scoping events,
- in-person briefing and invitation (in the case of observation).

These contacts will invite participants to contact the researchers directly, by email, or through a short online form to express interest in participation. No personal information about potential participants, including contact details, will be shared by NHS organisations.

Initial work to build relationships with key individuals in the system, including practice managers, is underway to ensure that invitations to take part are distributed appropriately and without introducing any burden on staff. For qualitative methods, purposive sampling of specific occupational groups or demographics may be undertaken through brief screening questionnaires, to ensure representation of different staff groups or demographics.

Some recruitment, and identification of venues for in-person data collection, will be supported by Healthwatch (https://www.healthwatch.co.uk), which is a partner in the programme of work [NB, while the abolition of Healthwatch has been announced in the 10 Year Plan for England,[45] the network will perform this function until such a time as it is unable to. Alternative, direct routes to recruitment and support will be identified to ensure resilience following abolition].

1.6.2 Public participants

As the ultimate recipients of care, members of the public will be affected by any changes to systems or roles designed to benefit the workforce. It is therefore essential that while downstream benefits of retention and recruitment may be implicit, the immediate impact on and acceptability to the public, whether as patients, relatives or carers.

Recruitment of members of the public may therefore be through:

- invitations advertised in general practice settings (e.g. through posters and leaflets),
- wider public advertising (e.g. through social media),
- events such as pop-up sessions in community locations, organised with the support of Healthwatch.

Patient participation groups in general practice settings may also be approached. At no point will public participants be asked about details of their own conditions or care, but rather of their perceptions of the healthcare system and team, and how any changes may affect them.

1.7 Qualitative data collection

Qualitative data collection will have two main functions: problem elaboration and process evaluation. The former will consider contexts in which interventions **may** be implemented; the latter will consider contexts where interventions **have** been implemented. In both cases, similar methods will be used – individual interviews, focus groups and non-participant observation – and findings will inform the refinement, adaptation and scaling-up and scaling-out, of interventions.

These methods will consider the context and impact of workforce challenges in different locations, participant perceptions of the reasons for those challenges, and ideas for improvement. Where interventions are in place (either as a result of the Partnership's work, or separate initiatives), they will explore how changes are implemented and received, and their impact on work. In keeping with principles of rigorous qualitative research, sampling will be responsive to the study context. In some cases, fewer interviews, focus groups and non-participant observations may be conducted with some groups, and in others, additional data will be collected in response to our emerging analysis and/or study events.

Given the focus on staff experiences, most participants will be staff (in clinical and non-clinical roles). Participants will be purposefully sampled on the basis of their experiences of different contexts, to inform substantive and conceptual understanding. We estimate recruitment up to 10 clinical and non-clinical staff at up to five relevant sites will be appropriate and sufficient, but this will be responsive to context and emerging findings. Where relevant (for example where any possible interventions may change public experience of a service), we will also recruit up to 10 members of the public with relevant knowledge of a service.

1.7.1 Focus groups and interviews

Focus groups will be planned to last around 60 minutes, with no more than 8 participants, and individual interviews will last between 30-60 minutes. Both focus groups and interviews will ask about participants' experience of work, sources of strain or dissatisfaction, and consequences of any workforce challenges (such as high turnover) in their place of work. Participants will be offered compensation for their time, in the form of £25 gift vouchers, and reasonable travel expenses for attending focus groups.

We intend that focus groups will be undertaken face-to-face to maximise group interaction, and interviews undertaken remotely (online or telephone) as we know from experience that this is often preferred. However, this will be constrained by pragmatics and participant preference. We know that it can be challenging to assemble some staff groups, due to shift working and often the need to collect data out-of-hours. For example, while we may prefer to hold a focus group with practice nurses, it may be more feasible to conduct multiple interviews in order to accommodate volunteers. Also, if focus group participants are recruited from across a wide geographical area, we will offer an online group, and if an interviewee prefers to be interviewed in person, we will aim to accommodate that, in a neutral and safe space. We recognise that methods may have to adapt to individuals' access to technology, and personal preferences, to ensure representation and accessibility.

While different methods may elicit different perspectives, we feel that this will have minimal impact on findings with our research questions, and the topics to be addressed.

Interviews and focus groups will be audio-recorded, and initially transcribed using secure Microsoft systems which do not store or learn from online recordings (Teams built-in transcription, and Word 365/Copilot for recordings of in-person data collection). Some transcripts (for example if audio quality is poor and automated transcription fails) may be transcribed by university-approved third party companies with whom confidentiality agreements are in place. Transcripts will be checked by researchers as part of analysis.

1.7.2 Observation

Observation of work will allow us to identify qualities of interaction and space that participants may be too immersed in, or which are too fleeting, to be apparent in focus group or interview discussions.

We will conduct observations at selected sites, to explore problems and potential solutions, as well as the delivery and management of possible interventions. This could include a wide range of events, including site team meetings, related training events, or shadowing members of staff as they undertake their day-to-day work. Non-participant observations will generally last 30 minutes-4 hours. Data will be recorded via written field notes. No personally identifiable information will be recorded about sites, staff or service users in these field notes. We expect most observation will take place face-to-face, although some may be online (e.g. in the case of online team meetings).

We will not be viewing, accessing or recording any service users' records held by the sites, nor any clinical interactions. However, observations may include information exchanges between staff in the presence of service users, or between staff and service users, for example, conversations at a front desk, or management meetings not expected to discuss direct patient care.

In all observation, we will follow the criteria set by the Confidentiality Advisory Group (CAG; (https://www.hra.nhs.uk/about-us/committees-and-services/confidentiality-advisory-group/cag-precedent-set-review-pathway/precedent-set-criteria/).

- In relation to observations in publicly accessible areas, such as reception or waiting areas, the CAG Precedent set category 10 will be followed. That precedent notes that NHS Staff are bound by the duty of confidentiality and should not be disclosing confidential patient information in a publicly accessible area. The researcher therefore should not be exposed to any information that any other external visitor (such as other patients or visitors to that setting) would not also be exposed to, and no breach in confidentiality occurs. The CAG also note that a researcher may overhear conversations about a specific patient's care in such settings, but that this is not over and above what other visitors may hear, given it is a public space. Relatedly the CAG notes that a researcher operating within a clinical setting cannot avoid overhearing patient information being overheard (such as names being called out in a waiting room). We will display information, such as posters, in the areas to be observed, to raise awareness to those attending this area. Alongside this, as outlined below (consent for observation) we will also seek verbal consent, where for example we are directly observing a receptionist's conversations with service users in a public space.
- In relation to meetings, the CAG Precedent set category 10, notes that attendees will as good practice be reminded that an external observer is present and to be mindful to not disclose identifiable patient information as part of the meeting.

We are aware that accidental disclosure, say, in a management meeting, is still possible. In such a case we will re-remind the meeting attendants that they should avoid disclosure. We will emphasise that no identifiable information will be recorded and kept onsite or removed from the site. If they need to continue to disclose identifiable patient information as part of the meeting, the researcher would then leave the meeting for the duration of that discussion.

1.7.3 Written feedback

Process evaluation may also be supplemented by brief written feedback – anonymous responses to a few questions reflecting on or tracking participants' perceptions of an intervention. The NoMAD (Normalisation MeAsure Development) questionnaire may also be used, also anonymously.[48]

1.7.4 Qualitative data analysis

Data analysis will be on-going and iterative throughout the study. Some interviews and focus groups will, with consent, be audio-recorded, transcribed verbatim and edited to ensure anonymity of respondents. Some interviews and focus groups may be recorded in field notes only and anonymised as they are produced to ensure anonymity of participants. Contemporaneous field notes from non-participant observation will be anonymised as they are produced to ensure anonymity of participants.

Analysis will encompass inductive, or bottom-up identification of themes, alongside theory-driven interpretation informed by the programme theory developed by our earlier realist review,[48] and as refined and extended in the Partnership's realist review workstream.

The analysis will be conducted according to the standard procedures of rigorous qualitative analysis. We will undertake independent coding and cross checking. Data will be analysed collectively in 'data workshops' where the researchers will share and exchange interpretations of key issues emerging from the data, as well as workshops with the broader research team and community inclusion and engagement (CIE) groups comprising patient/public and staff members.

1.8 Staff Survey

Surveys will take different forms for different samples, and be adapted to particular contexts. Some will be one-off, some longitudinal to explore changes over time. A diary approach will be used to track interactions between GPs and secondary care.

Cross-sectional and longitudinal surveys will consider how a number of variables vary with context and demographics. Measures will reflect several constructs, derived from existing tools in the literature for which there is evidence of validity. Potential measures are described in table 1, but final content will be adapted to different locations and populations, refined through review by members of the target populations and our CIE groups, and piloted to ensure acceptability of length and content. Demographics, including age group, sex, and occupational group, will also be recorded.

6. Potential content for staff surveys

Burnout	Burnout will be measured with the 16-item Maslach Burnout Inventory General Survey (MBI-GS[49]). This includes three primary domains of burnout: exhaustion, cynicism and professional efficacy. Each item is rated on a 7-point scale, based on the frequency participants experience feelings of burnout (1 being never, 7 being every day). The measure has been used in past research into stress and job pressures in healthcare populations,[50] but also it is designed to be used with the Areas of Worklife Scale[51] (AWS) which will be used in the current study.
Organisational Culture	The Areas of Worklife Scale (AWS)[54] will be used to measure organisational characteristics known to predict employee enthusiasm and burnout. It covers 6 domains: workload, control, reward, community, fairness, and values, which can be linked to psychological safety. The survey has been used in samples of health and social care workers[52] and found to be both valid and reliable.
Work engagement	The Utrecht Work Engagement Scale (UWES-9[53]) will be used to measure work engagement. It covers three factors: dedication, vigour and absorption,[54] and has been shown to be reliable in samples of healthcare workers.[55] The scale was chosen due to its consistent factor structure in longitudinal research.[56]
Psychological safety	Psychological safety refers to a work environment in which employees feel they can raise concerns, ask questions, and present criticisms in the workplace without fear of retribution. In this research psychological safety will be measured using the Edmondson measure of Psychological Safety.[57] This uses seven individual items designed to measure the feeling that an employee can take interpersonal risks in the workplace. It remains the most used psychological safety measure within the literature and demonstrates acceptable reliability and rigour. Psychological safety items from the six-item SCORE survey[58] may also be used for comparison. This measures the same construct as the Edmondson measure but with some differences in items (for example, "people are willing to take risks on this team").
Turnover Intentions	Turnover Intentions will be measured with a two-item scale assessing withdrawal intentions (e.g., "I intend to leave this job within the next year"). [59]
Work-family balance	This will use a four-item measure[60] developed to reflect how an employee's work impacts upon their non -work activities and the time they can dedicate to them (for example "I have difficulty balancing my work and non-work activities").
Inclusive leadership	Leadership inclusiveness will be measured using a nine-item scale.[61] An example item would be "The manager is available for professional questions I would like to consult with him/her".
Quality of care	Quality of care will be assessed by the Agency for Healthcare Research and Quality Surveys on Patient Safety Culture (SOPS) hospital version.[62] This 32-item questionnaire covers 10 domains of patient safety culture.
Primary-secondary care interactions	Diary format questionnaires will include questions about the frequency and nature of GPs' interactions with secondary care specialists, and their views of those interactions. This will specify that no information which could identify individual patients should be shared, but will ask in broad terms about the reason for the referral, desired outcome, and specialties involved.

Surveys will be designed and developed for particular populations and locations, and may include any or none of these items, which are included as illustration.

Data collection will be designed to optimise response rate, and while sampling will necessarily be based on convenience, a recruitment strategy will be targeted to minimise self-selection biases and ensure a diverse sample. All surveys will provide appropriate signposting to support, should the subject matter provoke any distress.

Surveys may also include open questions to elicit free text responses on topics such as experiences of work and interactions with other staff. These may be used alongside scales, as separate surveys to reduce burden, or to capture contemporaneous perceptions in a 'diary' format.

1.8.1 Survey distribution

Surveys will be implemented online (we will pilot accessibility and acceptability on two platforms – Qualtrics and Jisc Online Surveys), but we will also develop paper versions to maximise accessibility where necessary. For diary formats, reminders with links to the survey will be sent to volunteer participants' email address or mobile phone, as preferred by participants. This information will not be recorded with responses.

1.8.2 Survey data analysis

Analysis will vary with the types of data included in specific surveys. Some will be limited to descriptive statistics and frequencies, others may involve more detailed consideration of associations, including multilevel regression. This will identify the effects of organisational and individual factors on the outcome measures. We will also consider any change in these measures over time, contributing to outcome evaluation by indicating any changes which may be associated with implemented interventions.

Estimates of required sample size for the survey will be based on power analysis for minimum sample sizes required in organisational research.[63]

1.9 Discrete Choice Experiment (DCE)

A Discrete Choice Experiment (DCE) is a questionnaire preference elicitation method for determining which attributes or characteristics related to a choice matter most to individuals. It presents individuals with multiple choice sets which differ in the level of a set of common attributes (in the context of workforce these could include pay, training, progression etc). A DCE provides information on the value that individuals place on any attribute.[50] By including a 'cost' attribute in the DCE it is possible to estimate the willingness to pay (WTP) for a unit change in any of the other attributes. This information can then be used to value any given intervention which may target those attributes so long as it is described in terms of levels of each attribute (this can also contribute to a cost-benefit analyses[64] as part of the economic evaluation).

The attributes and levels to be used in the DCE will be identified from literature, from evidence synthesis undertaken within the partnership, and from qualitative data. Examples from a DCE in the related area of medical education included geographical locality, potential earnings, and working conditions.[36] The final list of attributes and levels will be used in the experimental design of the DCE choice sets (using a software tool NGENE[65] and informed by guidelines[50]), which will be refined following a pilot. The final DCE questionnaire will then be administered online, with a paper format also available for accessibility.

The sample size for the discrete choice experiment is dependent on the specific design, but 100-300 respondents is common in healthcare.[66] A commonly used rule of thumb formula[67] suggests that with 6 attributes with a maximum of 4 levels, 10 choice sets and 2 alternatives to choose from, the minimum sample size would be 100.

1.9.1 DCE Data analysis

Conditional logit regression analysis[68] will be used to analyse the choice data and will measure the direction and strength of individual preferences on workforce intervention attributes. Dependent on the characteristics of the data and restrictions of conditional logit model, estimates from other model specifications will also be considered.[68] If feasible and appropriate, sub-group analyses will also be performed – for example, to compare the preferences of different demographic or professional groups.

Marginal rates of substitution (MRS) will be derived where appropriate. This is the ratio between coefficients of two attributes, which enables understanding of the trade-offs that individuals will be willing to make. Using the WTP values, costs individuals are willing to give up for a unit of any other attribute could be estimated. For example, if an individual is willing to give up more costs for training opportunities than they would for progression, then it would show the importance of training opportunities over progression for that individual.

By identifying which factors influence participants' decisions, and to what extent, the DCE will indicate which factors should be prioritised in developing and implementing interventions.

1.10 Co-design of Interventions

We will use co-designed methods to develop and tailor interventions in partnership with local key sector stakeholders such as service leaders, diverse front-line staff and service-using populations. Potential interventions and site selection will be informed by other workstreams and stakeholder input. We anticipate identification of some pre-existing interventions, but novel, bottom-up intervention possibilities will also be explored.

We will use an adapted version of Experience-Based Co-Design (EBCD)[69,70] focusing on joint enquiry and development between staff, management and community members to discuss, select, curate and tailor a range of candidate interventions. For this exploratory project, a responsive, rapid process will be used, to develop tailoring and adaptation of existing ideas to a specific context, or service area and locations.

The research team will create theory-informed workshop materials,[71] [72] to feed into this process, drawing on outputs from other workstreams. Each rapid cycle will consist of workshops and conversations in which participants will consider how problems present in their locations, how existing ideas may be adapted, and any local barriers to implementation. Where appropriate, the research team will translate participants' insights into mock-ups and prototypes of resources. [73] [74]

To ensure optimal use of project resources, these will be assessed against readiness criteria including fit with project team capabilities, support from other workstreams and scoping work, feasible timeframe for governance requirements, and access to relevant qualitative data for workshop activity.

Experienced health and co-design researchers will facilitate workshops and meetings. Notes will be taken, and with audio and photographs used to record discussions, with participant consent.

1.11 Economic evaluation

Economic evaluation of interventions aimed towards workforce retention should ideally consider wider costs and benefits associated with the intervention. However, generic measures of health, such as Quality Adjusted Life Years, may not be appropriate to capture the multiple effects/benefits of a workforce intervention, whilst the resources associated with delivery of workforce interventions may come from several areas beyond the immediate context. Therefore, we will conduct a cost-consequence analysis (CCA)[75] of the implemented workforce interventions to estimate the economic impact of workforce interventions in the context in which they operate. If appropriate, a cost benefit analysis (CBA) will also be conducted using a method successfully used in previous NIHR funded studies[76, 77] to estimate the net monetary benefit from the selected workforce interventions.

Data collection will consider resource use associated with the delivery of the interventions, such as costs of consumables or staff from an NHS perspective. Unit costs for resource use will be derived from secondary sources (for example, NHS Reference Costs[78] and Unit costs of Health[79]). The outcomes data (for example, staff retention rates) will be taken from secondary sources (for example, those used in the Secondary Data workstream) and in consultation with partners.

1.11.1 Economic evaluation data analysis

For the CCA, the results will be presented as a balance sheet, with disaggregated costs presented alongside a range of outcomes. For the CBA, the WTP values from the DCE will be used to estimate the monetary value of the outcomes considered in the CCA. A net monetary benefit for these outcomes will be derived by subtracting the costs of the outcome (derived from CCA) from the WTP value of that outcome (estimated from DCE).

Ethical considerations and Informed consent

For staff participants, the subject matter of the research may raise issues of dissatisfaction with work, and impact on their wellbeing, and we take our duty of care to research participants seriously. Any data collection which may raise these issues will note this in information sheets, and as part of the process of gaining informed consent. Participants in all forms of data collection will be signposted to support services should they have concerns about their wellbeing, with details and links provided in information sheets. As well as general sources of support, and specific resources or contacts for particular staff groups in particular locations will be identified during the development processes, and included with participant information.

While every precaution will be taken to preserve staff and service user anonymity and confidentiality there will be limits to this. We are aware that researchers could hear something where they feel their duty of care requires confidentiality to be breached. For example, if they have serious concerns for the well-being of a participant, or others, action would be taken to disclose concerns to a named contact (e.g. safeguarding lead at GP practice). In all such circumstances local safeguarding protocols at the specific sites will be followed. Information sheets and consent forms will inform participants of this possibility, and no breach of confidentiality would be made without informing the participant.

All data collection will include explicit informed consent for participation. For survey participants, this will include explicit items requiring active response to indicate they consent for their anonymised data to be used in analysis and outputs. Information sheets will be provided with any invitations or links to surveys (as an attachment or link to an online version), and within the survey itself.

For in-person and online qualitative data collection, information sheets and consent forms (which may take the form of a link to an online version of the form) will be distributed in advance of data collection so that participants can consider whether they wish to take part. Consent will be confirmed verbally at the start of each session, both before and after any recording begins. If any participants attending a session have not provided written consent in advance, or join a session late or at short notice, they will be asked to provide verbal consent (recording may be paused to do this, and consent affirmed after this has been done).

1.12 Consent for observation

For observation, where consent is not for a single discrete event, we have designed a consent process balancing the need for informed consent with the need not to disrupt the normal healthcare process and ensure authentic observation.

The presence of researchers in any site will be clearly indicated by posters and information leaflets at any entrances, and specific locations of observation (e.g. a counter or desk where the observation is taking place).

Staff taking part in an observation will be formally recruited and asked to provide informed consent prior to any period of observation. Staff participants will be reminded that they can ask the researcher not to observe any interaction.

Where others are present at an event being observed, the researcher will take a staged approach to consent. In relation to staff this could include people such as a new member of staff, placement student, or member of staff returning from holiday, or a colleague with whom the staff member is having a phone call or remote meeting. In such cases, the staff member being observed will check if their colleague is happy to proceed with the researcher observing the interaction. The staff member, or the researcher, will if necessary further clarify verbally the purpose of the observation, and confirm that no identifiable information will be recorded, and that they have the right to decline to be observed. If the new staff member declines, no observation will take place.

Where direct interactions between staff and service users may be observed, the staff member will ask the service user if they have seen the posters and check they are happy to proceed with the researcher observing. The staff member, or the researcher, will if necessary further clarify verbally the purpose of the observation, and confirm that no identifiable information will be recorded, and that they have the right to decline to be observed. If the service user declines, no observation will take place. If there are any concerns about the service user’s understanding of the project, for reasons of language, literacy, or capacity, no observation will take place.

Timeline

This project will constitute much of the first 18 months of the partnership’s activities to September 2026 (the partnership started on 1 March 2025). An indicative timeline is illustrated in figure 1, with initial data collection projected to start in autumn 2025. Dates may shift, being dependent on appropriate approvals, and engagement from target populations. Ethical approval for some elements of this work (involving staff only, away from clinical settings) has been provided by Newcastle University research ethics committee.

Exploratory qualitative data collection, supplementing scoping discussions, will inform the development of survey/DCE materials, and initial design workshops. However, piloting of these later methods will proceed alongside qualitative methods. Local implementation will be examined where possible, and evaluation carried out using qualitative methods described. More ambitious interventions may require implementation work beyond the scope of this protocol, and child projects will be submitted for review where appropriate.

Figure 1. Indicative timeline 2025-26

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Outreach and advertising of Partnership work	x	x																	
Development of survey			x	x	x	x	x												
Development of DCE									x	x									
Development of design methods		x	x	x															
Qualitative data collection					x	x	x	x	x	x	x	x	x	x	x	x			
Distribution of survey								x			x			x					
Distribution of DCE																x	x		
Qualitative analysis								x	x	x	x	x	x	x	x	x	x	x	
Quant analysis								x	x	x	x				x	x	x	x	
Co-design workshops					x	x	x				x	x	x				x	x	x
Development of report and outputs (HSDR review point Sept 2026)															x	x	x		

Outputs and Dissemination

Outcomes from this project will feed directly into other work within the partnership – including potential implementation and evaluation of interventions arising from co-design work. Subsequent projects with specific site-based interventions will have specific protocols, and may require additional governance.

Outcomes will also directly produce outputs – not only academic papers and presentations, but staff-, public- and policymaker-facing materials developed and disseminated as part of the partnership Knowledge Mobilisation workstream. These will be developed with CIE panels and stakeholder review.

The content and form of these outputs will be steered and curated with input from the partnership advisory group, and CIE panels, to maximise the salience and timeliness of messaging. Some outputs may be changes in practice, or new ways of working, for which the primary audiences will be staff and service-using populations. Others may operate at a higher level of policy, and primary audiences may be local organisational stakeholders through to national government. We will consider all potential avenues – from digital and interactive channels, through legacy media, to formal briefing documents and in-person presentations, as well as academic outputs (publishing pre-prints to ensure rapid access).

We will publish outputs on our website (currently under development) and where appropriate, we will provide public- and staff-facing outputs under an open-source Creative Commons license, allowing their wider dissemination and adaptation, while retaining attribution to the Partnership.

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Appendix A: Realist review workstream

This workstream will identify and synthesise evidence contributing to a theoretical model of causal mechanisms leading to workforce sustainability in different healthcare sectors.

We will conduct realist reviews[1] of evidence relating to the sustainability of the workforce in relation to specific population and contexts (for example, we may conduct separate reviews of evidence relating to receptionists and practice nurses). The heuristic within this approach is the context-mechanism-outcome configuration (CMO) which explains in what context, and by what mechanisms, an outcome is achieved. This approach allows potential as well as existing interventions to be considered and generates a programme theory (PT) to inform the transfer of findings between settings.

Our starting point in general practice will be a programme theory developed through a realist review funded by the NIHR School of Primary Care Research, which considered the sustainability of general practitioner workforce.[2] This produced CMOs highlighting the importance of minimising de-personalised work encounters and activities and maximising human interaction and connection within work, for example, between primary and secondary care, as well as clinician-patient encounters or related work activities. It also highlights the importance of intellectual enrichment and socially situated learning and knowledge as part of meaningful practice. This PT will be further developed throughout the Partnership to identify contextual factors and processes associated with staff retention/attrition across workforce sectors.

Several reviews will be conducted throughout the Partnership period, iteratively building on evidence from each completed review. We will use a diverse range of data including quantitative, qualitative and mixed methods empirical studies, in addition to grey literature (policy documents, editorials, commentaries). Throughout the review, we will integrate CIE and other stakeholder input to maximise the relevance of findings for future impact on policy, practice, and patient care.

Methods

Our search strategy from our previous review, combining concepts of workforce and sustainability, will be adapted in consultation with the Research Advisory Group and CIE panels. A third search element will include focus on each specific topic (receptionists, practice nurses, primary-secondary care communication). Specific inclusion criteria for each review will be determined collaboratively, but we will select data to maximise included documents' contributions to our evolving programme theories. We will follow a realist logic of analysis to inform data extraction from a final set of included documents, and to formulate CMO configurations and contribute to the developing PT. Implications of CMOs for equity and diversity will be explicitly considered.

Throughout the project, we will maximise dialogue and collaboration across the Partnership team to integrate emerging empirical findings, including from other workstreams, in our developing emerging programme theories. Thus, we can rapidly develop and build upon existing evidence in relation to dynamic changes in practice and policy. Iterative movement between initial empirical observations and the ongoing review(s) will be used to identify relevant contexts and possible mechanisms at work.

Outputs and links to other workstreams

The primary output will be a programme theory which will be the intellectual core of the project – allowing integration of existing evidence with knowledge generated by the Partnership and providing a framework on which to build and target interventions.

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Appendix B: Secondary data workstream

In this workstream we will analyse data held by organisational stakeholders, to consider in detail the organisational, geographical and sociodemographic features associated with threats to workforce sustainability.

Data sources

Data will be gained from different sources. Some datasets are publicly available, and allow us to calculate workforce size and skillmix for different practices, and consider how geographical and sociodemographic variables may be associated with differences between practices.

For more detailed consideration of individual staff groups, we have requested data from the Data Access Request Service (DARS), to provide individual-level staff data by practice. This request has been approved in principle. Data will be pseudonymised by DARS, and outputs will report only aggregated data, eliminating any risk of reidentification of individuals.

Additional geographical and sociodemographic data (such as urban-rural classification and index of multiple deprivation) will be obtained from the Office of National Statistics (ONS). Other sources, such as the Care Quality Commission register, may also provide context.

Data analysis

Data analysis will identify how geographical and sociodemographic variables, such as the urban/rural setting of site, staff demographics, and proportion of patients in deprived areas, may be associated with risk of workforce instability. By identifying factors associated with higher risk, analysis will identify where, and for whom, tailored interventions should be prioritised.

Firstly, datasets will be linked on available key – NHS organisation codes, postcodes, and Lower Layer Super Output (LSOA) or Middle Layer Super Output Area (MSOA) codes.

Secondly, indicators of workforce stability at practice level will be generated from DARS data. This will primarily be turnover of different staff groups, but other indicators may be derived when we have the data. Other appropriate indicators will be identified in consultation with the RAG and CIE panels.

Thirdly, locations of high or low risk with regard to sustainability will be identified by consideration of these organisational-level indicators. Cluster analysis (K-mean clustering[1][54]) will be used to identify any latent patterns in these indicators, and consequently sites which are at high or low risk.

Fourthly, predictors of cluster membership will be considered through logistic regression. Models will include membership of a high-risk cluster as an outcome variable, and predictor variables derived from organisational, geographical and individual data where possible. Model building will use a criterion-based threshold (such as the Akaike Information Criterion) to determine which predictors to retain. Additional approaches (key influencer techniques, decomposition trees) will also be considered as they provide visual tools to facilitate communication with different audiences.

Outputs and links to other workstreams

Analysis will identify if geographic and sociodemographic factors are associated with workforce challenges. Reported analysis will not contain any individual data, nor detail of individual practices which may allow any individuals (for example where staff numbers are small) to be identified. Derived data sets, aggregating different linked data at practice level, may be shared through a public data repository. This will contain no identifiable information, and where any staff groups have small numbers in cross-cutting attributes (n<5), those practices will not be included.

This WS also has no dependencies on others. Its outputs will support the identification of sites to target in other workstreams. Findings will also contribute to theoretical understanding, and illuminate CMOs identified in the Realist Review workstream.

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Appendix C: Protocol version change log

Version and date	Description and changes
v1 8/6/2025	Initial umbrella proposal, describing planned data collection in primary care. Submitted for Newcastle University ethical review to allow scoping work to pivot to formal data collection.
v1.5 18/9/2025	Revised protocol designed for submission for Health Research Authority (HRA) approval. Scope is similar to v1, but contains additional elements (data collection in maternity services, and with public/patients in primary care) which were anticipated may require NHS research governance (HRA, ethics, R&D). Key changes from v1: - Changes to opening para to more clearly frame scope of umbrella. - Addition of link to 10 Year Plan (published July 2025). - Addition of description of maternity services context. - Clarification of scope of current project. - Addition of RQ5 'What is the subjective and measurable impact of interventions on staff and the system?' to encompass evaluation. - Expansion of 'Participants and Recruitment' to encompass patient and public participants. - Redraft of qualitative section, including addition of observation methods. - Addition of health economics section. - Addition of separate 'informed consent' section. - Revision of timeline.
v2 20/10/25	Interim revision – not uploaded to REALMS. Revised following initial feedback from HRA that to expedite proportionate review (and so allow data collection to proceed), a focus on primary care only would be preferred. Key changes from v1.5: - Title change to refer only to General Practice. - Removal of maternity services section of background. - Some clarification of 'research settings' and 'participants and recruitment sections' - Addition of detail of compliance with Confidentiality Advisory Group (CAG) precedent criteria relating to observation - Staff survey details reformatted for clarity, and detail of diary format added. - Further detail added to consent section, relating to process for unexpected staff involvement in observation.
v3 27/10/25	Interim revision – not uploaded to REALMS. Revised following further conversation with HRA. Key changes from v2:

Version and date	**Description and changes**
	- Details of possible research areas added to aims and research questions section. - Clarification of staff participant groups, and recruitment approaches. - Clarification that public participants are not patients per HRA definition. - Paragraph on duty of care moved to 'Ethical considerations and informed consent'. - Simplification of paragraph relating to unplanned participants in observation. - Comment on potential subsequent project protocols added.
v4 27/11/25	Final version approved by HRA, and as amendment to Newcastle University ethical approval. Some other changes made to clarify information governance for DARS application. Key changes from v3: - Addition of further route of staff recruitment (direct email), and clarification that personal information will not be shared by NHS partners. - Addition of clarification that third-party transcription may be used. - Addition of clarification of survey recruitment, and signposting to support. - Clarification of verbal consent as an option where necessary. - Addition of Appendices describing realist review and secondary data workstreams. - Addition of appendix containing this table