ReGROUP: Detailed Project Description

1. Full title of project

The changing general practitioner workforce: the development of policies and strategies aimed at retaining experienced GPs and those taking a career break in direct patient care (ReGROUP).

2. Summary of Research

2.1. Research questions

We have two research questions. First, what are the key policies and strategies that might (i) facilitate the retention of experienced general practitioners (GPs) in direct patient care and (ii) support the return of GPs to direct patient care following a career break? Second, how feasible is the implementation of those policies and strategies? To address these questions, there are four aims:

Aim 1: To develop a conceptual framework and detailed assessment of factors associated with UK GPs' decisions to: a) quit direct patient care, b) take career breaks from general practice, and c) return to practice after a career break.

Aim 2: To identify the potential content and assess the evidence supporting key potential components of policies and strategies aimed at retaining experienced GPs and/or supporting the return of GPs to direct patient care following a career break.

Aim 3: To identify practices that may face supply-demand workforce imbalances at the macro (regional) and micro (general practice/GP) level within the next 5 years with a view to strategically targeting relevant policies and strategies.

Aim 4: To assess the acceptability and feasibility of implementing the policies and strategies.

2.2. Overview of research design

A comprehensive programme of work involving the engagement of GPs and associated stakeholders is proposed to identify implementable policies and strategies to support the retention of experienced GPs in direct patient care and to support the return of GPs on a career break. A mixed-method programme is proposed, incorporating six workstreams.

Workstream 1: Systematic literature review of empirical research conducted in the UK and other high income countries describing factors influencing GPs' decisions to quit patient care.

Workstream 2: A census survey of all GPs in the South West region of England to provide a sampling frame to support qualitative sampling (see project 3 below) and to identify potentially modifiable factors relevant to different groups of GPs (see workstream 5 below).

Workstream 3: Qualitative work: To identify the content of policies and strategies to support the retention of GPs in direct patient care.

Workstream 4: Assessment of the likely feasibility and effectiveness of the proposed policies and strategies by an expert panel.

Workstream 5: Strategic targeting of policies, using supply-demand modelling over the next 5 years, to identify at the micro-level practices in South West England at risk of supply-demand imbalance.

Workstream 6: Stakeholder consultations to determine the acceptability of the proposed policies and strategies (identified through workstreams 3 and 4) along with the likelihood of their immediate uptake through identification of obstacles and potential facilitators.

2.3. Study outcomes

The primary outcome is to develop clear policies and strategies aimed at supporting the retention of experienced GPs and GPs on a career break at risk of quitting patient care. Policy content will be guided by expert opinion and will reflect current need. A secondary outcome is to comment on the acceptability of the proposed policies and strategies by those likely to implement their introduction, and to gain an understanding of the likelihood that such stakeholders would resource and mandate their timely implementation. As we do not have foresight of the policies and strategies for GP retention, conducting an evaluation is not feasible in the present proposal. A final outcome will be an outline of a future funding bid for the evaluation of the proposed policies and strategies.

2.4. Anticipated benefits of the proposed research

Our research is multi-centre, draws on relevant expertise and track record, will fill an evidence gap, and will apply across the UK. The research will be of importance to NHS managers, health professionals, health educators and patients. It will target localised areas of need but will inform Academic Health Science Networks (AHSNs), Deaneries, commissioners/Clinical Commissioning Groups (CCGs), and GP representative organisations (British Medical Association [BMA], Royal College of General Practitioners [RCGP]) on potentially suitable mechanisms for supporting the retention of the GP workforce. We anticipate rapid benefit to NHS users (within 3-5 years) if feasible and affordable policies and strategies are identified and implemented.

3. Background and rationale

Our proposed research directly and specifically addresses this call, focussing on the “effectiveness of policies and strategies to recruit and retain staff”. In particular, our research focuses on the retention of the experienced GP workforce, and on supporting the return to work of GPs following a career break.

3.1. Understanding the GP workforce crisis

Ninety percent of NHS patient contact takes place within the context of primary care – 1.3m consultations every working day, 340m consultations per year with a projected primary care workload of 430m consultations per year by 2018[1] [2]. Some patient groups contribute disproportionately to this demand for NHS services – for example, patients aged over 75 currently have an average of 15 contacts per year in primary care[2]. Such groups may therefore be particularly vulnerable to changes in the availability and accessibility of primary care services occasioned by workforce problems. In particular, around 66% of primary care contacts take place with a GP. GPs are trained in handling complex disease presentations and have unique abilities in respect of the diagnosis and management of complex multi-morbidity. General practice has been described as “the jewel in the crown” of the NHS[3]. International evidence has identified that without strong primary care-based healthcare, adverse consequences are likely to be reflected in increased costs of care, reduced satisfaction with care, increased health inequalities, and adverse health outcomes for the population[4]. Authoritative reports[5] have identified the need for both local and national approaches to workforce planning, and for an acknowledgement of the inherent uncertainties of the process.

General practice in the UK is facing a workforce crisis with imminent GP shortages, and a clear resulting risk to patient health and wellbeing. Over 50% of GPs aged over 50 anticipate quitting direct patient care within 5 years. Research from the BMA has highlighted the continuing problem. In the study of 431 doctors from the

2006 cohort of medical graduates, those in general practice reported the lowest morale of all cohort doctors, with higher than expected workload being identified as a key problem[6]. In addition the shifting demographic profile of GPs is likely to contribute to full time equivalent (FTE) shortages. Of male doctors, 90% plan to work full time compared with just 40% of female doctors. Of all doctors graduating 7 years previously, 35.1% were working in general practice; the figure for male doctors was just 25.6% whilst for females it was 42.5%. A near quadrupling of unfilled GP posts was observed between 2010 and 2013 (from 2.1% to 7.9%)[7].

Our proposed research is aimed at developing policies and strategies to support GPs returning to work after a career break or retaining the experienced GP workforce aged 50-60 years. We anticipate that the policies and strategies may have components relating to the clinical support of GPs and thus may build on Drennan's research on the potential for physician assistants in supporting GPs [8, 9], Sibbald[10] in relation to the potential of diversifying the primary care workforce through the increased use of nurses in primary care, and Avery[11] regarding the potential for increased use of pharmacists in roles extending beyond medication management to include structured care for individuals with long-term conditions and in the provision of healthcare advice for a range of individuals[12]. The pharmacy role is currently of particular interest and scrutiny in the context of GP workforce issues[13]. We have also undertaken preliminary research supporting the development and submission of this bid. We anticipate the emergent policies and strategies might involve issues relating to the professional and personal support of GPs (e.g. in relation to negotiating a "light touch" approach to revalidation for this group of individuals, addressing issues relating to costs of indemnity, or in providing dedicated clinical (e.g. nurses, pharmacists, physician assistants) or administrative support for GPs, who have identified the administrative burden of their work as substantial, increasing, and intolerable). Personal support for doctors might involve taking account of the personal health and wellbeing of the GP workforce, the risks of burnout and job-related stress, and taking account of issues relating to the financial and pension arrangements which may be pertinent to decisions being made regarding quitting patient care. In addition, feedback from Exeter Primary Care Federation (Dr Sally Ewings, Medical Director, April 2015) has identified issues relating to workload, funding and attitudinal issues to be of relevance to workforce planning and concerns.

3.2. What policies and strategies might avert the crisis in GP workforce?

The proposed research will take place in partnership with South Devon CCG (recognised for the integration of health and social care and one of the integration pioneer sites for new ways of delivering coordinated care[14]), the Southwest AHSN, and Health Education Southwest (HESW). The future of NHS care[15] is likely to involve new models of care, with innovations in respect of both horizontal and vertical integration involving professional skill mix, health/social care, and new approaches to managing the service[15, 16] and in federations of previously independent practices[15]. Whilst these models develop and emerge, it is vital that the GP workforce is sustained now – without strong general practice input, the ability to develop and implement these new models of care will be threatened. Our research therefore targets the critically important area of developing policy and strategy interventions targeting the retention of experienced GPs in direct patient care, especially those GPs considering or at risk of retirement and those GPs who have taken a career break (most often on account of family issues).

In planning this submission we have undertaken a preliminary scoping review of the relevant literature in conjunction with AHSN colleagues. We have identified 25 relevant studies (2000-14), 19 being survey based (10 UK), one being quasi-experimental. A brief preliminary analysis has identified key emergent themes

underpinning decisions to quit patient care including: pressure of work (medical & admin), exhaustion, burnout, poor job satisfaction, disillusionment with medical system or Medicare, family reasons, improved lifestyle, career changes, reducing hours, financial reasons, health related concerns, fear of deteriorating skills and competence, medico legal issues, or simply 'had enough'. A recent BMA survey[17] (3000 doctors) identified issues of workload and working conditions, NHS changes, income, and negative media portrayal as major factors contributing to career decisions being taken by doctors (but did not explore options to address these concerns). Such survey based research has also identified issues which might be addressed in considering early decisions to quit patient care, including flexible working hours/workload reduction/ sabbatical/salaried posts, improved working conditions other than hours, financial issues, fewer NHS changes/less bureaucracy/more emphasis on patient care, health/competence/job satisfaction, issues relating to career change. Other non-survey based studies, including research from Australia and from Belgium, have identified an important range of initiatives which might also be considered in addressing early retirement of GPs from patient care including the value of professional support networks, phased retirement plans, active support for 'at risk' GPs, enhanced locum availability, development of portfolio career opportunities (eg teaching, research, alternative clinical pursuits), shared infrastructure, and revised organisational policy decisions. These findings need to be confirmed in a more detailed literature review undertaken alongside a suitable assessment of the quality of reported studies.

Further preliminary research has been undertaken with a view to establishing the magnitude of the early retirement problem in the South West. This comprised a survey of GPs, and beta-testing a novel mathematical model for assessing the 5-year risk at individual practice level of demand-supply imbalance. This exciting new initiative has already proved highly successful in early development work, with identification of a group of practices rated 'red', but has also identified missingness in datasets, and limitations on data availability as issues to address in the planned major extension of our work presented here.

Our preliminary research has also involved qualitative work with a small sample of experienced GPs in which we have explored decision making around quitting direct patient care. In our own research, we have identified some key factors potentially influencing retirement/quitting decisions including 'push' factors (e.g. health concerns, impact of personal ageing, workload concerns, changing work environment) as well as 'pull' factors (e.g. career opportunities, pension issues); these factors need to be developed and explored in more detail in the planned work described here. Whilst we succeeded in identifying potential retirees, we encountered difficulty identifying and accessing doctors on career breaks and identified relevant strategies to take into the next phase of this research.

4. Evidence explaining why this research is needed now

Immediate challenges face the NHS in respect of GP workforce capacity. Recent years have seen falling recruitment to a general practice career. In addition, 54.1% of GPs over the age of 50 anticipate quitting direct patient care within 5 years[18]. Thirty percent of the GP workforce is over 50[18]. England has an ageing GP workforce, especially in inner city settings where the problems of recruitment and retention are compounded by issues relating to the socio-demographic mix of the population and the increased demands for care. Retaining the GP workforce is thus urgent. If unaddressed, "meltdown" in NHS care may follow

within the foreseeable future[1]. The situation has been described as a “crisis”[19] and there has been a call for policies and strategies to help retain GPs[7, 20].

In England, major initiatives have recently been announced to support primary care and GPs. NHS England announced (Jan 2015) a £10m joint initiative administered via Health Education England, the RCGP, and the BMA[21, 22], targeting enhanced training in difficult-to-recruit areas, offering part-time working arrangements for GPs considering retirement, actively promoting GP careers, examining potential for non-medics to support GPs, and providing enhanced induction and support for GPs considering returning to patient care after a career break. Whilst the RCGP’s key policy statement on ‘The 2022 GP’[23] anticipates important changes in the organisation and delivery of care and the training and support of GPs, and anticipates that by 2022 ‘the general practice workforce will have grown to reflect need, with more doctors and nurses working in practices and community-based settings, more GPs entering and remaining in the profession, and better support for GPs wishing to return to practice’, the challenges of attaining that vision are increasingly being recognised with difficulties encountered in recruitment and increasing loss of GPs from direct patient care. The Care Quality Commission (CQC)[24] has also developed relevant policy and practice taking account of workforce considerations. Against this changing policy and practice background, there is a need for detailed information at practice level to facilitate and support the planning of services; to date, GP workforce information has been reported at regional and national levels – greater granularity is urgently required to identify practices at imminent and foreseeable risk – our research will specifically address this area of need for the NHS.

Elsewhere, the American Academy of Family Physicians (AAFP)[25] and the US Institute of Medicine[26] have recognised increasing pressures on, and opportunities for, the primary care workforce on account of changing demographics, and in fiscal and domestic health policy, and with the need for new models of integration in primary care; in their study, the AAFP have suggested that a predicted deficit of 44,000 US family doctors by 2025[25] may be an underestimate of the reality, with concerns expressed regarding recruitment and retention of family doctors. Similar pressures, with associated need for GP workforce planning, have been recognised in Canada[27], Australia[28], and New Zealand[29].

Targeting the recruitment and retention of the GP workforce is thus timely and urgent. Whilst provision of a primary care workforce benefits from skill mix (e.g. the use of nurses, pharmacists, and physician assistants), unless the GP workforce issue is addressed urgently, an imminent crisis looms in respect of leadership in primary care and in respect of inequalities in provision of care, especially for patients with complex multi-morbidity. Failure to commission this research runs the risk of failure in NHS care provision. Given the 10 year (minimum) trajectory for training a new medical student to becoming a qualified GP, and the falling recruitment to general practice, this research will remain relevant and important to the needs of the NHS for at least the next 20 years.

Limited evidence exists to inform the development of policies and strategies targeting the recruitment and retention of the GP workforce[30-37]. We secured some funding to undertake a brief collation of the relevant literature on GP retention to support the development of this submission, but an authoritative review of that literature is urgently required. We are familiar with the literature, and this research will allow us to collate this and to develop our ideas in a systematic way.

5. Aims and objectives

There are four main aims, each of which are described below along with their associated objectives.

Aim 1: To develop a conceptual framework and comprehensive assessment of factors associated with GPs' decisions to: a) quit direct patient care, b) take career breaks from general practice, and c) return to general practice after a career break. There are two objectives:

(1a) To conduct a systematic review of existing literature to describe factors affecting these decisions in the UK and other high income countries.

(1b) To conduct a census survey of GPs in South West England to provide a sampling frame to provide qualitative evidence from GPs intending to quit direct patient care and those who are currently taking, or who are considering taking a career break with a view to identifying factors affecting quitting intentions, and to identify potentially modifiable factors relevant to these groups of GPs.

Aim 2: To identify the potential content and assess the evidence supporting key potential components of policies and strategies aimed at retaining experienced GPs and/or supporting the return of GPs to direct patient care following a career break. There are two objectives:

(2a) To outline the content of policies and strategies that will support the retention of these groups of GPs in direct patient care.

(2b) To prioritise, using an expert panel and validated methodology, the proposed policies and strategies in respect of their feasibility and effectiveness.

Aim 3: To identify practices that may face supply-demand workforce imbalances at the macro (regional) and micro (general practice/GP) level within the next five years with a view to strategically targeting relevant policies and strategies. There are two objectives:

(3a) Drawing on a range of data, including the previously mentioned survey, to specify, develop, and test the approach necessary to identify supply-demand imbalance at the level of individual practices.

(3b) To use the approach developed in 3a to identify general practices in the South West of England (an area with broad representation of practice settings) at risk of workforce shortages owing to early retirement from direct patient care in experienced GPs and in GPs planning, or currently taking a career break.

Aim 4: To assess the acceptability and feasibility of implementing the policies and strategies. The objective is:

(4a) To gather feedback from key stakeholders on the acceptability and likelihood of implementing the policies and strategies at a local level.

6. Research plan and methods

A mixed method project, consisting of six inter-related workstreams (see uploaded flow diagram), is planned to address our study aims and objectives.

6.1. Establishing the evidence base for policies and strategies – a systematic review

6.1.1. Design: To address our study aims (objectives 1a, 2a) we will conduct a systematic review to identify the empirical evidence regarding factors associated with GPs' decisions to quit direct patient care, take a career break from general practice, and/or return to general practice after a career break. We will use a logic

model to organise the empirical evidence from different types of included study and enable their comparison and synthesis[38]. Whilst we have considered a range of theory based approaches to underpin this review, we plan to employ a pragmatic typology of documented 'pushes' and 'pulls' for retirement/career break decision-making, with acknowledgement of a wide range of both internal/personal mechanisms that motivate such decisions and external/contextual factors. The initial framework of push and pull factors will come from the preliminary literature review we have already conducted for the AHSN. Co-applicant Smart will join the systematic review team as an advisor, bringing important perspectives to the review material from the viewpoint of broader management theory.

The review will aim to gather evidence on actual quitting (behaviour) or intention to quit (attitudes) direct patient care amongst GPs, and GPs who have taken, or who are proposing taking, a career break. Within the review, we will focus on how these factors relate to the individual characteristics of GPs (especially age, and including family situation), practice, and system-level characteristics (e.g. pension options, service changes).

***6.1.2. Population*:** GPs or other community-based primary care physicians practising in high-income countries (World Bank definition [39]) with health systems that have comprehensive primary care based on general/primary care physicians.

***6.1.3. Inclusion criteria*:** Eligible empirical evidence includes: (i) qualitative research studies, such as those based on analysing data from interviews or focus group discussions with GPs, about their planned or actual retirement, career break or career change decisions and (ii) questionnaire surveys of GPs and quantitative analyses of routine data that wholly or partly assess the characteristics of GPs, practices and other factors in relation to taking career breaks, career changes away from being a GP, or early retirement. We anticipate that, based on our preliminary work, our search will identify a small number of evaluative studies which have addressed these issues (i.e. that is, which evaluate particular strategies or approaches to GP retention in particular countries), and we will summarise the types of approaches used as part of our review.

6.1.4. Search strategy: Published articles and 'grey' literature will be considered with articles restricted to those published in English. On the basis of scoping searches conducted for this proposal, we plan to conduct two searches. The first search aims to identify published, unpublished and grey literature studies in bibliographic databases. The search strategy, which will be developed by an information specialist working with the review team, will take the following form: (terms for setting: general practice or primary care) AND (terms for GPs: general practitioner or family doctor) AND (terms for career interruption/change, retention, retirement: career break, halting or stopping career etc.). These will be run in relevant databases including Medline, Embase, PsycINFO and HMIC (Health management information consortium).

The second search will draw on supplementary search methods to locate unpublished studies and grey literature. These searches will build on studies included at full-text in the first search - as well as those studies which were 'near includes' - and will look for bibliometric links between studies and study authors. We will run citation analysis, lateral searches using authors as points of contact, and related article searches; we will use any study names identified in our first search to draw out any sibling or nested studies through further database searches.

6.1.5. Identification and selection of studies: The titles and abstracts of search results will be screened against the eligibility criteria, with an initial sample being independently screened by two reviewers to

establish consistent application of the criteria. Titles and abstracts that cannot be excluded will be sought as full text articles, and the inclusion criteria applied to these. We anticipate three types of study which will need to be data-extracted and quality-assessed separately: (a) qualitative interview/focus group studies of GPs (b) questionnaire surveys of GPs, and (c) regression analyses of routine employment data.

***6.1.6 Data extraction and quality appraisal*:** A data extraction form will be developed and piloted, based on the research question, the study quality assessment tools, and other characteristics relevant to the generalisability of findings. Where included studies include evaluation of or data about a specific strategy or policy affecting early retirement or career break flexibility, information about the components and implementation of the strategy will be captured (including, if necessary, through contacting study authors). Study quality for each type of study will be assessed using the internationally approved checklists/appraisal tools suitable for each methodological design. We will use the CASP assessment tool for qualitative research[40], and the STROBE checklist for reporting observational studies (including cross-sectional study items where appropriate)[41].

6.1.7. Evidence synthesis and reporting: Synthesis will be narrative (that is, using tables, diagrams and text) to summarise the main factors (individual, practice-level, or other) associated with leaving general practice early or taking career breaks. Each of the three types of study will be synthesised separately first, and then an overarching synthesis will combine the findings and note where the different types of data corroborate or conflict with each other. Fuller and separate consideration will be given to studies from the UK, and for studies from countries where primary care and general practice is organised in a similar way to the UK's NHS (including remuneration). The systematic review protocol will be registered on the PROSPERO database, and it will be reported using PRISMA guidance[42] for reporting systematic reviews.

6.2. Establishing data on the GP workforce - a census survey

***6.2.1. Design*:** To address our study aims (objectives 1b, 3a, 3b) we will undertake a census survey of GPs in South West England registered on the 'Performers List' of doctors held by NHS England[43], and eligible to provide NHS services. South West England has a population of 5.3 million (2.3% non-white British), median age 42.9 years, 6.0% unemployment, and major conurbations in Bristol, Plymouth, Exeter with inner city characteristics[44]. Access to the Performers List has been secured through the active support of the Medical Directorate of NHS South of England (see attached letter). The aim of this survey, which builds on, and develops our earlier preliminary work, is three-fold: (i) to describe current and projected regional GP capacity in South West England; (ii) to provide a sampling frame for the qualitative research (see section 6.3); and (iii) to inform our demand-supply modelling at practice level (section 6.5).

6.2.2. Sampling: In our pilot work, we approached GPs using a practice-based paper survey, although we found this approach to be ineffective at identifying GPs who have been out of practice for extended periods and/or undertaking non-practice based roles (e.g. out-of-hours care, locum roles). By using the Performers List as a sampling frame, we will write to all 3,000 GPs in South West England at their home address (via, and with the support of NHSE), to invite participation; we hope to gain a representative sample of GPs. We will also make use of a press release and/or media events to promote awareness of the study.

6.2.3. Data collection and data handling: Each eligible GP will receive a survey pack consisting of a one-page questionnaire (based closely on that piloted in our preliminary work), a participant information sheet and a reply paid envelope. Non-respondents will receive up to two paper-based reminders 2 and 4 weeks

after the initial mailshot. The survey will include items addressing GP role, including their current/most recent clinical engagement (FTE status; named principal practice affiliation; out-of-hours provider status; locum status), current/planned intentions (5 year window) in respect of retiring, planned career breaks, or changes in working hours), and their willingness to contribute to our qualitative research. Whilst previous authoritative reports have estimated GP supply, we believe this survey, sent out via NHS England to GPs at their home addresses, will provide the most authoritative estimate yet of regional GP supply issues over the next 5 years. The methodology has the potential for national implementation if successful.

6.2.4. Response rate: Previous large-scale surveys (paper-based, two reminders) of GPs have achieved response rates of 40%[18]. We will offer paper- and web-based response options and survey packs will detail a modest prize draw entry incentive. In addition, we will seek ethical approval to follow up a random 10% sample of non-responders by telephone. In light of our preliminary data and with the added confirmed support of the NHS locally, with postage to the GP's home address, we believe that a response rate in excess of at least 60% is attainable. We will however pilot our survey methodology on a random sample of 200 doctors (including investigation of the effect on response of sending to the GP's home address compared with their practice address), utilising responses in our final survey results. We assume a 50% response rate (i.e. 1500 responding GPs out of 3000) and that of these respondents, 54% (810) will be aged 50-59 years. On these assumptions, if 50% of GPs aged 50-59 years report that they intend to retire within 5 years of completing the survey, the margin of error for this estimate, based on the width of the associated 95% confidence interval, is approximately +/- 3.5 percentage points.; if 30% of these GPs report that they intend to retire within 5 years, the margin of error will be approximately +/- 3.2 percentage points.

6.2.5. Data handling and analysis: Each research participant will be assigned a research number and data will be double entered into Microsoft Excel, encrypted, and stored without name or address. Descriptive statistics summarising GP responses to the survey items will be presented at the regional and practice level. Because of the potentially sensitive nature of the questionnaire data relating to doctors' intentions to quit, although practice level data will be presented, it will be anonymised (e.g. practice A, B, etc) to protect the identities of individual practitioners or practices. We will compare the characteristics of responders and non-responders using the demographic data available on the Performers List database (e.g. age, gender, country of qualification).

6.3. Identifying policies and strategies - qualitative research

6.3.1. Design: To address our study aims (objective 2a) we will undertake a thematic analysis of CQC practice report data and conduct qualitative interviews with GPs.

6.3.2. Sampling and recruitment: To analyse CQC practice report data, we will sample up to 20 practices across a range of performance (2015-2016 inspection cycle) seeking to identify key practice issues related to staffing levels and related factors (e.g. succession plans, business management, indicators of staff stress, and how well led the practice is) in order to inform the conduct of the interviews and the identification and prioritising of policies and strategies aimed at addressing the retention and quit problem.

To identify and recruit GPs into an interview study, a maximum variance approach across South West practices will be undertaken. Our sample will account for practice list size (small, medium, large), setting (inner-city/urban/rural), demographic profile of GPs (ethnicity, gender), GP role (partner, salaried, locum or federation practice) and CQC ratings (inadequate, requires improvement, good or outstanding) , and should

also ensure variation in population deprivation, and ethnic mix. This sampling strategy builds on our preliminary research, and expands it to a wider group of GPs.

GPs will be identified by their response to the survey (see 6.2). In our preliminary qualitative work we had a 50% participation rate amongst consenting GPs after three contact attempts. Where possible, practice managers will be approached to assist with generating mailshots to invite potential GP participants. Building on our preliminary qualitative research undertaken with 22 GPs, we will interview a further 10 GPs aged 50-59 years who report their intention (the 'rhetoric') to retire from direct patient care within 5 years, and who are located in South West England. Our preliminary work has involved initial responses from 117 of the 306 practices in Somerset, Devon and Cornwall. We will interview 10 GPs who have already taken early retirement (before aged 60 – the 'reality') within the last 5 years and up to 15 GPs on a career break who have not yet confirmed their intentions regarding returning to work. Finally, we will interview up to 20 members of key stakeholder groups (practice managers, nurses, GPs from CCGs, LMCs or who advise CQC)to capture the impact of GP quitting decisions on practice management and organisation. These participants will be recruited using purposive sampling.

6.3.3. Data collection: We will use two data collection methods based on GP preference: telephone interviews (30 minutes) as this was feasible and acceptable to working GPs in our preliminary study, and face-to-face interviews (up to 60 minutes) in a setting of the GP's choice as this affords opportunity for (a) participation by those not currently working to be involved in the study and for those who do not wish to be interviewed whilst at work and (b) more in-depth interviews. Interview schedules will be informed by the findings of the literature review, the findings of our preliminary study, and the initial analysis of the CQC reports. An iterative approach will allow emerging themes to be explored in subsequent interviews, including the identification of any unmet clinical needs.

6.3.4. Analysis: Thematic content analysis, with constant comparison techniques[45] will be undertaken to allow inductive coding to identify emerging themes. These themes will be incorporated as evidence for the RAND/UCLA Appropriateness Method (RAM) (see 6.4); further in-depth interpretative analysis on a case by case basis will be employed to fully explore individual GP stories and where appropriate, a more deductive approach will be undertaken, taking account of existing theories (e.g. social network theory[46], identified as being of relevance in our preliminary research), to ensure all key informant perspectives are addressed (following the principles of framework analysis)[47].

6.4. Prioritising policies and strategies - RAND/UCLA Appropriateness Method

6.4.1. Design: To address our study aims (objectives 2a, 2b), the RAND/UCLA Appropriateness Method (RAM) with which we have expertise[48], will be used to prioritise the potential content and assess consensus regarding the key components of policies and strategies aimed at retaining GPs within direct patient care. The main components of the potential policies and strategies, identified as part of the evidence review (see 6.1) and qualitative work (6.3), will be developed into statements to present to an expert panel. The panel will review evidence and rate evidence in two rounds.

Statements will be grouped according to the characteristics of the GPs (retirees or career-break) and the practice contexts in which they are working. It is expected that around 80-90 statements, supported by brief evidence summaries and definitions, will be generated for the first round of consultation. Panel members will be asked to independently rate the series of statements using a 9 point scale (1 = definitely inappropriate to

9 = definitely appropriate) to assess the appropriateness of using the potential policies and strategies for different GP groups and practice scenarios. Prior to the second round, the panel's median rating will be fed back to panel members highlighting areas of inconsistency or disagreement. In round 2, the same panel will be presented with feedback on the group's median ratings with an interpretation of this in terms of appropriateness, the comments submitted and updated to the evidence summaries as well as a reminder of their own responses. Free-text comments collected from panel members from round one and any updates from national policy development since round one will also be accommodated in the design of round two. Panellists will be asked to review their ratings and either make changes or leave their previous rating.

6.4.2. Sampling and recruitment: Panel members will be recruited from the GP community in South West England, and inner city areas of Bristol and London (including staff from practices identified within the predictive modelling workstream [6.5]) and from key stakeholders from national organisations with expertise and involvement in GP recruitment and retention. Our sampling strategy will target GPs who are also business partners from urban/rural areas in the South West (from 8 practices- around 12-14 participants) and inner city areas of both Bristol and London (from 4-7 practices- around 8-12 participants with greater ethnic/social diversity), representatives from CCGs, AHSNs, HEE, NHS England South West, and the human resources and workforce planning experts from professional national organisations such as RCGP and BMA. The views of these stakeholders have been sought as they are most likely to influence the implementation of the policies and strategies at local and national level. It is expected that 30 individuals will be invited to take part in the panel, with around 20 completing the two rounds.

6.4.3. Data collection: An online survey will be developed using an existing commercial cloud-based system (surveygizmo) with which we have expertise. This online method will be developed for use across desktop and tablet devices, with each set of statements and the accompanying evidence being presented in user-friendly digital formats. The evidence summaries and content of the online survey will also be presented in a PDF format for panel members prior to the start of the first round. A pilot phase for the system will take place with four members of the project team who are not involved in the development of the potential content or components of the policies and strategies. The survey database has robust backup systems saving the responses to questions in real time and these can be downloaded to the project system on a daily basis during the data collection. The panel members will be able to save and access the survey until final submission using a username and password system. The panel will be given two weeks to respond to each round with email reminders being generated twice in each process targeting only those who have not yet responded. In addition, the researcher will be available to provide support to any panel members who may require additional assistance in accessing and completing the survey online. Following the first round, there will be a gap of 3 weeks to analyse and prepare the second round which will be personalised to take into account the panel members' responses and the associated group responses.

6.4.4. Analysis: Data will be analysed in SPSS and the open-text feedback will be summarised as part of the second round and final analysis. The components with greatest agreement for appropriateness will be presented with the group's median rating for each series of statements in line with the GP characteristics and/or practice scenarios considered by the panel. It is expected that there will be agreement across the panel on the most appropriate components for prioritisation as part of potential policies and strategies and these will be put forward for the stakeholder consultation work (see 6.6).

6.5. Targeting policies and strategies – predictive risk modelling of South West practices

***6.5.1. Design*:**

Previous workforce modelling has focussed on broad approaches to analysis of demand and supply of GPs, i.e. at the regional or national (macro) level. This work addresses our study aims (objectives 3a, 3b), whereby we will refine modelling methods based on GPs reported intentions regarding quitting patient care to undertake predictive risk modelling at a practice (micro) level. We will account for the quitting 'rhetoric-reality gap' in our modelling processes (see below). We will identify individual practices at risk of GP workforce pressures within the next 5 years on account of projected demand compared to projected supply. Supply is influenced by retirement, retention and recruitment. Demand is influenced by patient numbers, patient demography and the level of deprivation of the local area. Using and refining existing workforce modelling methodologies developed in our preliminary work and previously by the Centre for Workforce Intelligence (CfWI), we will undertake demand/supply projections using a 5-year window, of GPs and their practices from the South West. This will provide a relative risk of GP supply challenges for each practice and highlight where targeted interventions can have the greatest impact to sustain and improve the access for patients to quality care.

6.5.2. Data collection:

The census-survey will be used to provide data on GPs intentions to quit practice in the 5-year time frame. An anonymised identification number will be used in the survey (see section 6.2) to link responders to the Performers List and GP practice. This way the non-responder cohort can be identified by age, gender and their practice by 'subtracting' the responders from the data held in the Health and Social Care Information Centre (HSCIC) medical census practice data. The HSCIC data will be obtained via the existing CfWI data sharing framework with HSCIC

6.5.3. Data analysis:

A relative ranking for each GP practice will indicate demand due to the following key influences:

- Practice list size.
- Practice list socio-demographic profile, and projections for socio-demographic profiles in future years calculated using published ONS algorithms [49, 50] applied to current list data [51].
- Weightings for demand on primary care services from age and gender groups (Department of Health primary medical services age and gender coefficients of need[52])
- Practice deprivation (English Indices of Deprivation, DCLG, based on practice postcode[53].

The weighting for each demand factor will continue as used in the preliminary work, further assessment of the relative weighting will be drawn based on evidence from literature.

A sub-set of the GP Patient Survey will be used to assess current access to services [54] and help account for current unmet need. A practice-level index will be established to assess the level of difficulty faced by current patients accessing services. This will operate as an efficiency factor reflecting each practice's ability to deliver services to patients within the assessment of demand.

The projected future supply of GPs by practice will be informed by:

- Using existing staffing data [55], adjusted to account for GPs who are likely to quit/reduce hours. For survey responders the intention of GPs to quit/reduce hours will come from survey results. For non-responders the future retirements will be estimated using system dynamics models (an area of expertise of CfWI[56] and co-app Smart[57] and the preferred approach to modelling in public health policy) and in statistical algorithms developed by CfWI (using existing methods[56] applied to HSCIC data[55]). The algorithms provide the probability of a GP retiring by GP age and gender. The probability of retirement can be segmented by the deprivation score [53] of the practice in order to give a realistic estimate of retirement based on historical GP behaviour in the SW and including local influences.
- Resilience of each practice to supply challenges. A function of practice size and ability to recruit.

The demand for practice services will be compared to the current and projected GP supply by practice. The practices with the greatest discrepancy between supply and demand will be those judged to be most at risk of GP undersupply and may be usefully targeted for policy implementation.

We will explore the potential for hybrid simulation of our data, utilising both system dynamic and discrete event simulation techniques[57]. Whilst some risk profiling has already been undertaken by a local CCG, this is solely based on GP age, and fails to account for GPs' intentions regarding quitting patient care. In contrast, we will use sophisticated approaches based on GPs' reports of their intentions. It is intended that representatives from practices identified in this work can be included within both the RAM (6.4) and stakeholder consultation (6.6) workstreams.

During the analysis we will verify the survey responses that indicate an intention to retire by comparing them to measured historical patterns of retirement for similar GP cohorts established using the CfWI statistical algorithms. Comparison of the two methods for forecasting retirements/leavers in the SW, the statistical algorithm and census-survey methods will help assess the potential to scale-up a statistics-driven model that could be applied to other areas of the country, avoiding the need for future census-surveys. The historical data from HSCIC will show the variance in age and rates of retirement of GPs segmented by area deprivation level or by region in England. This may uncover regional differences of relevance when planning interventions. The analysis will provide an assessment of relative risk to practices of GP shortages. We will look to extend the analysis to quantify an absolute measure of GP shortage, by practice and for the region.

6.6. Exploring implementation of policies and strategies: stakeholder consultation

6.6.1. Design: The previously outlined research will result in both the identification of policy likely to be relevant in addressing issues relating to retaining GPs in active patient care, and will provide a basis for targeting those policies at 'at risk' practices. This final study will provide preliminary evidence on the feasibility and acceptability of implementing emergent policies and strategies by seeking feedback from a wider range of stakeholders (study aim 4, objective 4a), in addition, exploring factors that will determine whether or not they are likely to be implemented; this latter step is critical if the NHS is to benefit from this research.

To reality-test the emergent policy and practice proposals we will conduct five facilitated stakeholder group consultations across England, including South West England, London, Manchester and Cumbria. Stakeholders will be recruited from CCGs, AHSNs, HEE, local medical committees of BMA, NHS England Local Area Teams from across England and we will aim to include staff from practices identified in the predictive modelling workstream (6.5). Groups will explore the feasibility and acceptability of the policies and strategies prioritised in the earlier work (see 6.3), and the likelihood of their implementation reviewed, taking account of stakeholder ideas, concerns, and expectations considered in the light of local, regional, and national policy.

6.6.2. Data collection and analysis: Consultation groups will be presented with our research findings and asked to reflect on factors relating to wider implementation of the emergent policies and strategies. Each group will be facilitated, and active discussion between participants encouraged. Stakeholders are likely to take a broad view of the likelihood of policy implementation, and of barriers and facilitators that might impede or enhance the utility of our research to the front-line NHS. Groups will be asked to work towards agreeing key findings arising from their discussion. The research team will write up the key messages and provide feedback to attendees for triangulation within 2 weeks of the meeting taking place. Based on agreed findings a summary document will be fed back to key regional stakeholder organisations with a view to directly influencing local and regional policy, and to national organisations with a view to informing national-level discussions.

7. Dissemination and projected outputs

The proposed research has been developed in direct collaboration with partners who will be central to the dissemination. Our consortium involves Medical School-based primary care and other academics, along with partners from the AHSN, CCGs and regional workforce specialists (HESW). In addition, our new partnership between academia, the NHS, and the National CfWI provides a further major platform for undertaking this work, for dissemination of our research findings, and for future related research.

Our aim in dissemination is to produce a series of high quality, relevant, and accessible Open Access reports and academic journal articles, which will both inform and support the NHS in planning the GP workforce. We will establish a website specifically for this project, the website developed within the banner University of Exeter Collaboration for Academic Primary Care (APEx http://medicine.exeter.ac.uk/apex/), with linkages to the partner sites of all collaborators. Our dissemination will include social media, using Twitter to identify and undertake preliminary dissemination amongst a wide range of contacts of key outputs from this work. Building on our stakeholder consultation, we will disseminate high quality policy papers for consideration by key regional workforce partners along with workforce specialists, stakeholder organisations, and patient groups. We are already developing coordinated media engagement between the communications teams in each of the principal organisations associated with this bid. We will produce a report to HSDR on this work, and anticipate the production of at least four scientific papers targeting relevant high impact academic journals, relating to the key components of the research. We will present the research at national and international primary care conferences, and at specialist workforce and NHS management fora.

By funding this research, NIHR HSDR will be supporting high quality research undertaken by experts working in collaboration with patients and stakeholder groups, with real potential to impact patient care through implementation. We cannot second guess the outcome of the research, but anticipate the

emergence of evidence-based policies and strategies addressing part/all of the professional clinical and administrative support of GPs, and support for elements of personal practice (health, wellbeing, stress, finances). We thus anticipate that our findings will inform the development and prioritisation of several practical policies and strategies targeting the retention of GPs in direct patient care. Failure to address this vital agenda will probably result in a critical exodus of experienced GPs from direct patient care. The research has the potential to affect the health and wealth of the nation through addressing retention of experienced GPs, offering potential support to the training of future primary care professionals either directly (retention of training doctors) or indirectly (retention of clinical and practical experience of primary care service delivery and organisation).

Our team has an enviable record of publishing in the highest quality international scientific literature, including The Lancet and BMJ group journals. We consistently deliver to time and budget. In addition to primary research papers, we will seek to maximise academic outputs and impacts through developing and delivering substantive secondary academic papers. We will maximise access to relevant Open Access publications and publication summaries where possible, using our websites and the NIHR platform. CfWI have an excellent track record in producing and disseminating outputs of the highest national and international relevance, work which is widely cited, including use in parliament and by healthcare planners and managers as well as patient groups. We will bring and coordinate several expert communications teams across our partner organisations maximising high profile impact.

We will adopt a strategic approach to conference attendance and presentation of our findings. Funding this research will not only fund direct activity, but will help establish a new, innovative and dynamic research collaboration across boundaries (health, workforce planning, methodological, new NHS/NIHR structures service and research structures) which has great potential for innovative applied clinical and organisational research.

8. Plan of investigation and timetable

The timetable for the six inter-related workstreams is outlined in uploaded flow diagram.

Systematic Review: Month 1: identify and select papers. Months 1-3: iterative searches. Months 3-5: data extraction and quality appraisal. Months 5-6: synthesise findings. Months 7-8: report findings. **Census survey:** Months 1-2: Pilot census survey and finalise methods and materials for full survey. Months 3-5: Full survey. Month 6: analysis and report findings. **Qualitative research**: Months 1-2: analysis of practice CQC reports. Months 3-7: identify, recruit and interview participants. Months 7-8: transcribe interviews. Months 9-14: analyse interviews. Month 15: report findings. **RAND/UCLA Appropriateness Method (RAM):** Months 9-11: Set-up and recruitment. Months 12-13: online survey Round 1. Month 14: summarise from Round 1 and preparation for Round 2. Months 15-16: online survey Round 2. Month 17-18: report findings. **Predictive risk modelling**: Months 1-10: data collection and modelling. Months 11-12: report findings. **Stakeholder consultation:** Months 17-19: identify, recruit and conduct focus group interviews. Month 20: report findings. Final report writing and dissemination will take place in the last 6 months alongside preparation of the findings reports from the RAM and stakeholder consultation.

9. Project management

We will adopt management principles modelled on GCP procedures and operationalised in our previous/current NIHR funded studies. A Project Management Group (PMG), chaired by JC, will provide

overall project delivery, financial oversight and leadership. All co-applicants will provide specialist input to the PMG, which will meet quarterly. EF as project manager will manage the day-to-day conduct of the project. Workstream leads (JC, CS, SD, RA, GF, SR) will supervise research staff and oversee deliverables associated with each work stream. Budget monitoring will be undertaken by EF, who will meet regularly with the Finance team at the University of Exeter. We will work in collaboration with our commercial partners and draw up service level agreements detailing key deliverables and milestones such that the PMG can manage performance across the project. Routine interactions with all workstream participants will be managed on a day-to-day basis by EF. We will employ tele- and video-conferencing to support team meetings and interactions. The first meeting of the PMG will set out a plan of academic outputs anticipated from each workstream, with individuals across the programme assigned to undertake or oversee these papers. We have set up an Advisory Board with an independent Chair (Dr Jo Roberts of South Devon and Torbay CCG), and comprising members with a range of perspectives from the RCGP, BMA, CQC, HEE, AHSN and Northern, Eastern and Western Devon CCG (including Chief Nursing Officer, Ms Lorna Collingwood-Burke) to advise the PMG on the conduct and emerging data. The Board will meet by teleconference every 6 months and face to face annually (4 meetings in total).

10. Approval by ethics committees

10.1. Ethical review and approval

As this project works with NHS staff or members of key stakeholder institutions (e.g. RCGP, BMA), but does not involve the recruitment of patient participants or withholding or allocation of treatment, we will seek ethical review from the University of Exeter Medical School Ethics Committee and R&D approvals from the Health Research Authority (via the Integrated Research Application System [IRAS]). EF will lead the process of gaining approval with the support and advice from the co-applicant group. We are highly experienced in such submissions. Our Patient and Public Involvement (PPI) group will ensure that any participant materials are written in plain English and accessible to potential participants. The ethics submission process for the project will be started as soon as notice of funding is provided and while contracts are being prepared.

10.2. Informed consent and data management

We will ensure that NHS staff and members of key stakeholder institutions who are approached to take part in this study will be provided with detailed information leaflets regarding study procedures and the possible benefits and risks of taking part, and are given the opportunity to ask questions prior to consent being sought. They will be reminded of their right to refuse participation, or to withdraw from the study at any time. Participant information and research procedures will be designed in consultation with PPI team members, to identify practical ways to minimise the burden of participating in the research for consenting participants.

All personal information obtained about potential participants for the purposes of recruitment or data collection (e.g. names, addresses, contact details, personal information) will remain confidential and held in accordance with the Data Protection Act. Each research participant will be assigned a research number and all data will be encrypted and stored without name or address. Electronic data will be held on a secure database on a password-protected computer at the University of Exeter Medical School, and paper-based information held in a locked filing cabinet in the research team office. Access to data will be restricted to the research team. Names and participant details will not be passed onto any third parties and no named individuals will be included in the write up of the results. All study data will be kept for 10 years under secure

conditions. Through our preliminary work, we have become alert to the ethical implications and sensitive nature of some of the information obtained regarding retirement intention and work availability, which is, of course, of a sensitive and personal nature. Our findings will therefore be fully anonymised, both at the level of the GP and the practice with which they are associated. The predictive risk modelling of South West practices runs the risk of disclosure of workforce intent, and this is a matter for further discussion with the GPs involved in our preliminary work in the first instance, especially given the known limitations and uncertainties associated with the data. Discussion of this matter regarding the sensitivity and commercial interest of our preliminary data will take place at a dissemination event scheduled for 21 May 2015.

10.3. Safety of participants and researchers

Our procedures have been designed to minimise any foreseeable risk; provision will be made for indemnity by the sponsor. To ensure the safety of researcher and participants, the Lone Worker Policy and 'buddy system' designed by the Primary Care Research Group will be adopted by the study's researchers. This provides a mechanism for ensuring that the exact whereabouts of researchers and participants at any time point during the research is known by a supervisor or buddy.

11. Patient and public involvement

JW (PPI lead in Wellcome funded Centre for Biomedical Modelling and Analysis, ongoing contact with southwest CLAHRC PPI group) undertook a workshop (18/11/2014) with seven patients with experience of long-term conditions (LTC) and of accessing primary care. The project outline was presented and comments and open discussion invited around patient involvement throughout the project. The group was extremely supportive of the project and shared concerns regarding the retention of experienced GPs. However, they were emphatic that patient and public involvement should be woven throughout the project for two reasons; first that any strategies that influence GPs' working patterns are likely to impact patients, particularly those with multi-morbidities or LTC. Second, participants felt that the public would be able to contribute to the development of policies or strategies through their awareness of issues in primary care which might lead to wasted GP time, and of which neither researchers nor health professionals may be aware. Participants thus felt they would be able to contribute a unique perspective to inform the project's outcomes. Their recommendations have significantly informed this application with PPI activities embedded throughout the project. The full bid has been reviewed by lay representatives, and patients have been involved in writing the lay summary.

A Patient Advisory Group (PAG), supported by JW, with relevant experience of long-term health conditions and accessing Primary Care, have supported the development of this bid and will continue contributing a lay perspective to the project. Additional members will be recruited to ensure a core PAG of 8 members. Planned activities include: representation on Project Steering and Project Management Groups; workshops to enable a lay contribution to the systematic review (selection of search terms, identifying grey literature); review of qualitative interview schedule and contribution to the analysis of the qualitative data; contribution to the "Expert panel" prioritising proposed policies and strategies - informed by a preparatory "patient only" meeting; participation in the stakeholder consultations to review the acceptability of any policies and strategies for implementation, and contributing to dissemination, e.g. preparing lay summaries of project outcomes. Some members of the PAG have previous lay research experience and have helped design and

analyse qualitative studies. Additional training and support for PAG representatives will be provided by the research team and JW as necessary.

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