Full title of project

The potential of alternatives to face to face consultation in general practice, and the impact on different patient groups

Summary of Research

AIM: This study uses a theory based evaluation approach to understand how, under what conditions, for which patients, and in what ways, alternatives to face to face (F2F) consultations such as use of the telephone, email or internet video may offer benefits to patients and practitioners in general practice. We will develop a website resource with recommendations for practices about how to implement the most promising alternatives and model the best methodological approach for evaluation. This covers the first stages of the MRC complex intervention framework.

IDENTIFYING EVIDENCE BASE: We will conduct a synthesis of qualitative and quantitative research on patients' and practitioners' experiences of alternatives to F2F consultations, with a particular focus on the views of different groups of patients and on factors that promote or hinder the wider implementation/uptake of these alternatives forms of consultation.

DEVELOPING THEORY: The study uses a mixed methods case study design employing a 'focused ethnography' approach. Using a scoping exercise we will identify the range of ways in which general practices in England and Scotland are currently providing alternatives to F2F consultations and identify approx. 8 practices with varied experience of implementing these alternatives to act as case studies.

In each case study practice we will interview clinicians and other practice staff, including receptionists, to understand the alternatives to F2F consultations that have been tried, why and how these were introduced, key contextual factors, barriers and facilitators to implementation, and intended benefits for patients, clinicians and/or practices. We will explore assumptions about how the alternative forms of contact might lead to benefits.

We will interview patients to explore advantages/disadvantages of alternatives to F2F consultation, and how different forms of communication impact on the consultation and the clinician-patient dynamic. We will purposively select patients with different characteristics (e.g. age, deprivation, long term conditions). A key focus will be the impact of alternative forms of access on different patient groups and whether they increase or reduce access inequalities.

We will observe how practices record details of consultations not delivered F2F and, if possible, use routine data to quantify this, analysing the number of patients using these alternatives, how this has changed over time, and in particular take-up by different patient groups.

MODELLING PROCESS and OUTCOMES: Based on our findings we will develop a website resource and recommendations for general practices about the most promising applications of alternatives to F2F consultations for different patient groups, for different purposes and in different practice contexts. These recommendations will be developed by the research team and optimised and validated at a workshop involving patients, GPs and other stakeholders.

Treating provision of alternatives to F2F consultations based on our recommendations as an intervention, we will use our findings within a theory based evaluation approach to model the key contextual factors, processes and outcome measures that need to be assessed in a subsequent evaluation. Data from the case studies will be used to address questions about the feasibility and best methodological approach which might be taken in undertaking a formal evaluation, including the extent to which the intervention can be standardised, feasibility across a range of practice settings, which alternatives to F2F consultations to offer, the number of patients who are likely to use them, for which purposes, and consultation rates.

Background and Rationale

What is the problem being addressed?

Communications technologies are routinely used by the public in everyday life, and there is an expectation that this should extend to healthcare.[1] This expectation is supported by policymakers, who believe that alternatives to F2F consultation could have a transformative impact on general practice, with advantages in terms of access and resource use.[2] It may save travel time for patients and staff (reducing carbon emissions), reduce the need for time off work to visit doctors, improve access for geographically isolated, housebound or mobility impaired patients and potentially result in more focused time-saving consultations. Since the population is getting older, frailer and increasingly housebound, alternatives to F2F consultations offer an opportunity to improve care for this group in a cost-effective manner, but it is important to determine for which types of conditions and people such innovations are likely to be safe and useful.

Therefore there is pressure on general practice to offer alternative methods of consulting with patients, such as by telephone and using newer approaches e.g. email; internet video. However, apart from increased use of telephone consultations, most practices have been slow to adopt alternatives.[3] This reflects concerns expressed by general practitioners about the impact of introducing additional consultation methods, particularly concerns about increased workload and achieving safe use.[3-5]

In addition, professional bodies (RCGP, BMA)[6,7] have been unsupportive. This reflects uncertainty arising from a lack of evidence in the general practice setting and wider concerns about general practice workload. Given that some general practices have already adopted alternative methods of consulting,[8] and that these are only likely to increase in popularity, there is a need to provide GPs with recommendations for use, based on best evidence and existing experiences, encouraging those taking them up to do so as safely and effectively as possible and bringing the maximum benefit for patients and the NHS.[9]

In doing so it is important to understand how these alternatives work for patients, determining the benefits, advantages and disadvantages for different groups of patients and for the practice as a whole. Some groups are likely to benefit more than others.[10] Whilst attempts have been made to determine the impact of some alternatives on clinical outcomes,[11,12] there has been a lack of focus on appropriate application and implementation, and this is key if we are to inform safe use and to be able to successfully evaluate their use in practice.

Evidence explaining why this research is needed now

Evidence to date has assessed the potential impact of some alternatives on clinical outcomes. [11,12] Whilst trial evidence is poor, observational data has pointed towards some clinical benefit.[13,14] There has also been a focus on obtaining speculative opinions from both patients and healthcare professionals on whether and how they would use these alternatives. [15,16]

What the existing literature does not tell us is under what conditions, with which patients and in which ways alternative methods of consultation actually work. Our proposal addresses this need and builds on previous research by focusing on the experiences of patients and practitioners who have used these alternative methods with different groups of patients for different purposes.[5]

Where GPs have started to use alternatives we can learn from their experiences, from their rationale for introducing them, through to reasons for them persisting or discontinuing use. Feasibility of these alternative methods is likely to rely on factors only identifiable when they are used in practice; e.g. patient characteristics or purpose of consultation. Barriers and facilitators become apparent as patients and practitioners navigate their way through use. Existing literature on experience can be utilised to develop a picture of how these alternatives might be expected to work.[17-19]

Existing research has demonstrated limited understanding of the fact that consultation methods are complex interventions.[11] The lack of good quantitative evidence on technologies like email and video consultation reflects the difficulties of testing them in trials, as their use has not been clearly defined.[20] Often, distinct elements of the consultation have not been taken into consideration. By developing a theoretical framework, we hope to deconstruct what makes alternatives different from F2F consultations, allowing us to assess whether and how they should be tested, in relation to the appropriate populations, outcome measures, and methodological approach.

This research builds on previous literature in related fields on how new technologies are adopted and implemented in health care, although there has been little research specifically in relation to alternatives to F2F consultations. There has been some research in relation to telehealth interventions to support patients in their own homes. For example normalisation process theory has been applied to the implantation of telehealth and this has suggested that it is the work involved that influences whether they normalise in practice – they must fit in with the healthcare professionals and their role.[21,22] Other work using the Technology Adoption Model has highlighted the importance of both usefulness and perceived ease of use influencing behavioural intentions to use new technology.

This research builds on previous literature in related fields on how new technologies are adopted and implemented in health care, although there has been little research specifically in relation to alternatives to F2F consultations. There has been some research in relation to telehealth interventions to support patients in their own homes. For example normalisation process theory has been applied to the implantation of telehealth and this has suggested that it is the work involved that influences whether they normalise in practice – they must fit in with the healthcare professionals and their role.[21,22] Other work using the Technology Adoption Model has highlighted the importance of both usefulness and perceived ease of use influencing behavioural intentions to use new technology.[23] Work by Greenhalgh et al on the failed introduction of the HealthSpace communication platform also highlighted the importance of ensuring that the technology meets peoples' perceived needs and fits with their other healthcare arrangements.[24] We will take account of these related theoretical perspectives, including insights from normalisation process theory, the technology adoption model and diffusion of innovations theory, and will refer to them in interpreting our findings, but we do not propose to base our analysis on any of these specific models.

Why is the research important in terms of improving the health of the public and/or to patients and the NHS?

The proposed research will contribute appropriately to a series of NHS needs:

HEALTH NEED: If alternative types of consultation are to become routine, as desired by policymakers, then we need to ensure that they are not detrimental to patient care, and that they are able to deliver benefits. Care delivered should be safe, equitable and of high quality and the intended research will focus on these factors. Data on patient safety associated with alternative consultation methods is lacking, and there is a need to better understand the potential for harm, including in relation to the quality of care and interpersonal aspects of care. [11,25]

EXPRESSED NEED: Health needs differ between patient groups. Evidence around how different groups are affected by the introduction of new consultation methods is sparse. Studies have included patient populations in general practice, without focus on different groups of patients.[5,18] Existing data from a range of countries and settings indicate that young people, those with tertiary education, the employed and students are more likely to use alternative methods of consultation, along with those in poor health.[26,27] It is important to understand more about the use of alternatives by different patient groups in general practice and whether this is providing better access to care in relation to need therefore increasing or decreasing health inequalities.

SUSTAINED INTEREST AND INTENT: There is likely to be sustained interest in alternative consultation methods. Policymakers favour the introduction of these technologies in the health service,[2] and patients and the public expect health services to deliver efficient care, based on new technologies. There is a need to develop new ways of working in order to cope with the increasing proportion of the population who have multiple long term conditions. We need to be able to anticipate which developments are likely to enhance healthcare practice and which may jeopardise patient safety and access to care. The programme theory developed through this work will be transferable to future innovations; this is crucial since technologies and communication methods change rapidly.

CAPACITY TO GENERATE NEW KNOWLEDGE: The proposed research is focused to fill the gaps in the existing evidence base in a way that leads to practical and applicable findings, and provides a framework for future evaluation. We hope the research findings will broaden the scope for research in this area.

ORGANISATIONAL FOCUS CONSISTENT WITH THE HS&DR MISSION: Without evidence on how to safely and effectively implement these types of consultation it will not be possible to use them for delivery of healthcare. While the programme theory may be transferable beyond primary care we will focus on general practice, and produce pragmatic outputs in line with the aims of HS&DR in producing rigorous and relevant evidence that translates to implementation.

GENERALISABLE FINDINGS AND PROSPECT FOR CHANGE: We will add clarity to the debate about the impact on patients and staff of alternatives to F2F consultations. The findings and the website resource and recommendations will be of value to NHS managers, practice staff and members of the public, allowing them to bring about change and improvement. They will provide information that is specific to the general practice setting, allowing practice managers to determine how alternative methods of consultation may work for their practice population and for the GPs in the practice. It will allow policymakers to determine how best to direct policy to ensure that patients receive the most effective care at a time when NHS resources are stretched.

Aims and objectives

AIM: Using a theory based evaluation approach, to understand how, under what conditions, for which patients, and in what ways, alternatives to face to face (F2F) consultations may offer benefits to patients and practitioners in general practice and to use this understanding to develop recommendations for general practices and a framework for subsequent definitive evaluation.

OBJECTIVES:

(1) To synthesise the literature (qualitative and quantitative) on patients' and practitioners' experiences of alternatives to F2F consultations, with a particular focus on the views of different groups of patients and on factors that promote or hinder the wider implementation and uptake of these alternative forms of consultation.

(2) Using a scoping exercise, to identify the range of ways in which general practices in England and Scotland are currently providing alternatives to F2F consultations in order to create a typology of these alternatives.

(3) To identify and recruit approx. 8 practices with varied experience of implementing alternatives to F2F consultations to act as focused ethnographic case studies. We will include practices which make extensive use of different types of alternatives and others which have tried and rejected or substantially modified their plans to use alternatives.

(4) In the case study practices, to explore how practice context, patient characteristics, type of technology and the purpose of the consultation appear to interact to determine the feasibility and impact of alternatives to F2F consultations, from the perspectives of both patients and staff. This

includes impact on the clinician-patient dynamic. The impact for isolated, disabled, disadvantaged and other vulnerable or hard to reach groups will be a particular focus.

(5) To identify the factors which act as the main barriers and facilitators to wider use of these alternatives.

(6) To use the findings to develop recommendations and a website resource for general practice detailing the most promising applications of alternatives to F2F consultations for different patient groups, for different purposes, and in different practice and population contexts. The website resource will include the best evidence and share experiences from general practices.

(7) Treating provision of alternatives to F2F consultations based on our recommendations as an intervention, to develop a framework for a subsequent evaluation. The current study will clarify the target population, appropriate outcome measures, and best methodological approach for this evaluation.

Research Plan

Remit

Setting:

This research will be conducted in the setting of NHS general practices in and around Bristol, Oxford or Edinburgh. This includes practices serving a wide range of urban, suburban and rural populations, including areas with varying levels of deprivation, as well as including practices working in the different health economies in England and Scotland.

Types of technology:

The study is designed to explore the use of alternatives to F2F consultations, including telephone consultations, email, internet video (e.g. Skype) and other web-cam technologies. We recognise that in many practices different combinations of these alternatives may be offered to varying extents, for example practices that offer internet video consultations may also offer telephone and email consultations. One aim of this study is to understand how and why different practices and patients use these different alternatives. This includes, for example, why the same patient may choose to make a F2F consultation on one occasion but may prefer to use an email consultation on another occasion. Furthermore, several methods of communication may be used over the course of one illness. For example a patient with asthma may have a regular review by completing a structured review form online which is checked later by the practice nurse, may send an email with a query about their medication, might make a telephone consultation to assess whether they need to be seen urgently during an acute attack, or may make a F2F consultation if their attack does not resolve. This study will provide greater insight into how these different forms of consultation can be and are being used in general practice.

Practices may also offer the same technology for different purposes, for example most practices allow patients to contact the GP by telephone (most commonly by leaving a message and the doctor phoning them back), but some practices encourage patients to use telephone consultations as the usual first form of contact. This study explores the use of alternatives to face consultations for any clinical purpose, including consultations with doctors or nurses for initial assessment of symptoms or triage, follow-up, chronic disease management, and/or discussion of test results. In line with the commissioning brief, this excludes remote monitoring of health conditions not involving a consultation and also excludes administrative purposes which do not usually involve direct contact with a clinician e.g. making an appointment, requesting a repeat prescription.

Several different forms of telephone, email, or internet video consultation have been described that would fulfil our inclusion criteria and which exemplify the types of consultation that we wish to study.

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For example, some practices offer a system of care in which almost all patients are offered a telephone consultation initially (e.g. Doctor First[28]), some commercial providers are offering website services which can act as a secure host for email consultations (e.g. MySurgeryWebsite[29]), others are seeking to share care with patients by providing online consultations alongside shared online access to records (e.g. Patient Knows Best[30]), and some GPs are describing their use of Skype to provide internet video consultations.[31] Some GPs offer email consultations using conventional email programs, while others argue in favour of asynchronous consultations via a structured online form.[32]

It is important to note that although we are examining alternatives they are not replacements for face to face consultations - rather additional methods of consultation. We do not know of any examples of practices where alternatives are the only service available.

Telephone consultations have been in use for a long time, so the issue here is not plausibility but optimal application addressing and gaining greater understanding about how practices have addressed potential problems such as concerns about increased workload, safety etc.

Email can be divided into two 'models' – those that are designed and implemented (and thus reported on in the literature), and ad hoc use by individual GPs in a practice setting – we know about this type of use via surveys and qualitative work.[5,8,33] The use of a considered approach involving the whole practice, and specific processes, has obvious advantages since it makes it possible to take account of factors like storing email, confidentiality etc in a way that the ad hoc use by individual GPs would not. The issue with this kind of organised use of email may not serve the needs of the individual GP who likes being able to use email as a selective tool rather than being forced to use a prescribed practice wide and patient wide system.

The most commonly used method of applying practice wide access is via a secure website, whereby patients log into the practice website and are given the option to send an online message, the response coming to their email in box or to an inbox they can access via the website. These sites also tend to offer appointment booking and repeat prescriptions at the same time, in the manner of a patient portal. There is speculation that they could also offer access to medical records.

Other models offer 'structured online consultation' (https://hurleyclinic.webgp.com/) via the portal where patients are asked a series of questions that provide the GP with a history to enhance the consultation.[34] Several UK practices use these portals, which are available via website providers like Silicon Practice Ltd and Cure4you professional. Policymakers draw on examples of these sites from the US, for example from Kaiser Permanente and the Mayo Clinic, where 'patient portals' are in use.[13,34] Thus UK policymakers appear to believe that a patient portal system is the most plausible model for introduction of email type consultation, despite this not being backed by robust evidence, nor being tested in a UK setting.

On the practice side, examples of models of delivery include those that are very simple (for example emails being routed to the patient's chosen individual GPs for a response) and those that are structurally more complex, for example the use of a duty doctor who conducts all telephone and email consultations on any given day. Some practices take an interim approach – with structured processes but not using a secure portal (http://www.northendmedicalcentre.nhs.uk/online-services.aspx?t=2). All examples given here are anecdotal – encountered during the conduct of qualitative research and via personal networks/word of mouth. Some examples are obtained via sites like eHealth insider. There are very few published reports of UK use and those that are have been referenced previously.[15,16,18]

The use of Skype is much less well known in UK primary care. There are reports of practices taking it up (including a project funded by the challenge fund, NHS England)[35] but no evidence. One focus of interest in this research is to gain understanding of whether and how practices are using internet video technologies such as Skype.

In England, the Prime Minister's challenge Fund has recently announced funding of £50M over one year to twenty pilot projects to test new approaches to improve access to general practices.[35] Several of these pilots include the use of alternatives to F2F consultation, including email consultations, Skype and/or greater use of telephone consultations. Some of these pilots (for example the One Care Consortium in the Bristol area) are within our study areas or could be visited reasonably easily. We will consider including one or more of these practices within our case study sites, depending on whether they offer different use of alternatives to F2F consultation that are not already represented amongst practices within our main study areas..Therefore there are many examples of experimentation and innovation in providing alternatives to F2F consultation, but it is notable that the rhetoric about them has not been matched by evaluation of whether the claimed benefits are actually achieved. Our research is designed to provide a theoretical framework to guide understanding of how, why and what ways these innovations may lead to benefits, and to provide a framework to inform the design of a subsequent evaluation of these new approaches.

Conceptual framework

This study uses a 'theory based evaluation' approach which 'examines the conditions of program implementation and mechanisms which mediate between processes and outcomes as a means to understand when and how programs work' (Weiss).[36] There are a number of other related approaches to intervention development and evaluation including Logic Models,[37] Realist Evaluation,[38] Intervention Mapping[39] and Causal Modelling[40]. Although these have different emphases, they share many ideas including the importance of context in determining outcome, the need to clarify the underlying theory about how an intervention leads to change, and to clearly specify the intended outcomes. In addition, May and colleagues have developed Normalisation Process Theory to understand the processes of implementation and integration that lead to innovations becoming embedded in everyday work.[41]

Weiss distinguishes between 'program theory' which specifies the mechanism of change (the theoretical causal chain for how an intervention leads to intended outcomes) and 'implementation theory', which describes how the intervention is carried out. [36] This theory based evaluation approach is helpful in identifying factors which are deemed to be key mediating processes through which an intervention achieves its aims and moderating factors which influence the extent to which process and outcomes are achieved.

In order to develop the 'program theory' we will use a realist approach[42] to describe provision of alternatives to F2F consultations in terms of:

- context (for example characteristics of the general practice, the target patient population, the policy framework, and the IT infrastructure)
- the theory and assumptions underlying the intervention (how and why alternatives to F2F consultations might lead to benefits)
- the flow of activities that comprise the intervention (the key processes that occur when patients make use of these alternatives)
- intended benefits/outcomes (those deemed important to patients and practitioners)

The 'implementation theory' will explore moderating factors which influence the extent to which the process and outcomes are achieved, such as factors acting as barriers and facilitators to practices offering alternatives to F2F consultations or to different groups of patients using them.

RESEARCH METHODS

Our research is designed to provide understanding about which alternatives to F2F consultation are likely to be beneficial, to whom, and in what contexts. To disseminate the results of the study we will develop a website resource and recommendations for practices about how to implement the most promising alternatives to F2F consultation and model the best methodological approach to evaluation.

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This study covers the first stages of the MRC complex intervention framework i.e. identifying the evidence base, identifying/developing theory and modelling process and outcomes.[43] These stages will inform future evaluation of use of the recommendations that we develop.

Phase 1: Identifying evidence base

We will synthesise the literature on patient and staff experiences of alternatives to F2F consultations. We will also explore factors that promote or hinder implementation and uptake of these alternatives.

We will use an approach informed by realist review, a method for synthesising research evidence regarding complex interventions.[42,44] Policy and practice initiatives need to build on collective wisdom about the successes and failures of previous initiatives; our aim in this review will be to identify explanations of *why* and *how* various alternatives to F2F consultations might work (or not) with different populations, in different settings. Realist review offers a useful framework for identifying and managing syntheses of existing research and has been applied in such fields as lean thinking in health care,[45] Internet-based medical education,[46] social diffusion in health care,[47] social networks and social capital in the self-management of chronic illness[48] and the potential health effects of accessing online patients experiences.[49]

The literature on this topic is likely to be diverse, encompassing both opinion pieces and empirical studies using trials, surveys, process evaluations, interviews and focus groups. Although our focus is research about general practice, we will take account of research from related settings (e.g. email communication between patients and specialists) if it provides lessons directly relevant to general practice. Our approach will be iterative and collaborative; SZ and HA (who are experienced in the field and the methods) will conduct the review. Being both located in Oxford they will meet regularly, both dedicating 30% of their time to the review over the first 6 months of the project. In Box 1 we summarise the 5 overlapping stages involved in the review, drawing on Ziebland and Wyke 2012.[49]

Box 1: Summary of the Steps Taken to Develop a "Conceptual Map" of the potential for alternatives to F2F consultations in British Primary Care

Step 1: Clarification of Scope

a. Finalise the review question, currently: "What is known about the experiences of using alternatives to F2F consultations in primary care, including barriers to implementation in different settings and populations?"
b. Develop an initial matrix to record the cumulative results from the literature.

Step 2: Search for Evidence

a. We already have considerable existing knowledge of the literature based on our own and colleagues' bibliographic databases.
b. We will conduct a wide-ranging search (with assistance from a librarian at the Oxford Knowledge Centre) to identify any studies that have explored, or tested, the effects of alternatives to F2F consultations in relation to experiences, or described theories or ideas about the potential effects
c. SZ and HA will examine all resulting titles and abstracts and select potentially promising papers that could inform our thinking.
d. More papers and books will be identified by "snowballing" from reference lists as promising ideas emerge.
e. A final search for additional studies will be made when we have nearly completed our review or when we come across them in the course of our professional lives, for example, through discussions and seminars.

Step 3: Appraise Studies and Extract Data

a. At least one of us will read each of the full papers. Although we will use no formal quality appraisal tools, we will consider papers in relation to their:
    - Relevance: Does the research address the topic and enable us to add to, adapt, or amend the initial matrix developed in step 1b?
    - Rigour: Does the research support the conclusions drawn from it by the researchers or the reviewers?
b. Both SZ and HA will identify papers containing important ideas and discuss their relevance during regular meetings throughout the review.
c. This matrix will be our main data extraction framework; we will incorporate new categories if relevant during our initial reading.

Step 4: Synthesize Evidence

a. Our initial "map" or overview will identify potential positive and negative effects of alternatives to F2F consultations, with particular focus on impact on inequalities and access, effect on patients and all staff working in primary care, and the potential mechanisms through which each effect might work.
b. We will use constant comparison between reading and the working table to identify the point at which no new ideas are emerging and we are confident that we have achieved "saturation."
c. We will draw up a glossary of terms defining, recording, and explaining key concepts; our understanding of them; and their application in this overview.

Step 5: Disseminate and Evaluate

a. We will present and discuss the table and glossary at a full project team meeting.
b. We will arrange a post-presentation discussion with interested parties at the Society for Academic Primary Care conference in 2015.
c. At the end of the case study period we will present the conceptual review, along with the findings of the case studies, to the case study practices as part of our respondent validation exercise.
d. We will submit the review to a peer reviewed journal

Phase 2: Developing theory

This will be based on a mixed methods case study design[50] employing a 'focused ethnography' approach.[51]

Identifying case study sites

In an initial scoping exercise we will conduct a survey of general practices. We plan an online survey, but in the first 50 practices we will pilot whether an online survey, a postal survey or a telephone survey produces a better response rate.

The sampling frame will be general practices in three areas of England and Scotland. This will include all practices within the Clinical Commissioning Groups in (a) Bristol, South Gloucestershire and North Somerset (n=107)(b) Oxford (n=82) in England and Lothian and Highland and Islands (n=245) in Scotland. This represents 434 practices. The practice manager (or a practice research lead, if known) will be sent an email with a link to a brief online questionnaire, hosted by Bristol Online Surveys. They will be asked to forward the link to all GPs in the practice. Where no reply is received from a practice, we will send one reminder to the practice manager by email and contact him or her once by telephone if necessary. The questionnaire will include questions about whether or not the practice provides consultations by telephone, email or internet video and for which purposes (categorised as initial assessment of symptoms/triage, follow-up, regular review, and/or discussion of test results). For each type of use, participants will indicate whether the practice provides the service frequently (for most patients requiring this type of service), regularly (on a daily basis), occasionally (less than once a day) or rarely (less than once a week). Participants will also be asked whether they have offered these options in the past and no longer do so. For each of the three alternative types of consultation

(telephone, email, internet video), participants will be asked questions to determine whether they feel they are have made innovative or extensive use of these alternatives. These practices will be given a free-text box in which to provide any further comments they wish to make about how and why they or do not offer these alternatives to F2F consultation.

Of the 434 practices in the areas specified, we anticipate that about 40% (n=174) will reply. This assumption is based on our previous experience and a recent (unpublished) survey of access arrangements in general practices conducted by the Scottish government which achieved a response rate of 52%. Responses from 174 practices will allow us to estimate proportions within 95% confidence limits of ±7.5%. Descriptive statistics will be used to analyse the findings. However, the main purpose of the survey is not to make precise quantitative estimates of the use of alternatives to F2F consultation (as we anticipate that response rates will not be high enough to provide reliable and generalisable information) but to scope the range of services provided by different practices, and to identify potential candidate practices for the case studies.

Alongside the survey we will use several other methods to identify practices which currently (or have in the last three years) offered each of the alternatives to F2F consultation: (a) Many practices have their own websites describing the services they provide, so we will search the websites of practices in the three areas covered by this study and extract data in a structured form about any advertised used of alternatives to F2F consultation. (b) The applicants are already aware of practices in their local areas which have experience of using each of the three alternative forms of consultation. (c) we will contact the organisations promoting the types of service listed on page 5 and ask them which practices use their services in our study areas. (d) In England, local CCGs will also be asked to identify any practices that they are aware of which use (or have tried to use) any of the alternatives to F2F consultation. In Scotland we will also make use of the Scottish Centre for Telehealth and Telecare that has good inside knowledge of practices that have been experimenting with novel approaches to consulting. (e) we may become aware of general practices which are making particularly interesting use of alternatives to F2F but which are outside the three areas specified (e.g. practices in London). We will retain the option to include one or two practices of this type if it is feasible in terms of travel time for the researcher and it benefits the research.

From these various sources of information we will construct a matrix describing practices which have varied experience of implementing each of the different types of alternatives to F2F consultation. We will use this matrix to identify and recruit approximately 8 practices with varied experience of implementing alternatives to act as case studies. This will include practices which make extensive use of different types of alternatives to F2F consultation and others which have tried and rejected or substantially modified their plans to use alternatives.

We will recruit about eight case study practices in different areas (three near Bristol, three near Oxford and two in Scotland). We will purposively select practices to include different types of area (urban/rural), population (affluent/deprived; ethnicity) and practice size. We recognise that there is potential for bias because, at first sight, the research areas are all relatively affluent medium sized cities with a predominantly white and well educated population. However, within the research area there are many practices in deprived (e.g. Hartcliffe in Bristol, Blackbird Leys in Oxford, Criagmillar in Edinburgh) or rural areas (e.g. South Gloucestershire, Western Isles), as well as providing care to populations with a high proportion of ethnic minority groups (e.g. St Paul's, Bristol). We will ensure that the practices included in the study are diverse in terms of practice setting and population.

Case studies

The take up of alternatives to F2F consultation has been lower in medicine than in most other professions, and some of the reasons for this have been described in earlier qualitative research.[3-5] By focusing on practices which have tried to offer alternatives, including some that deem their use successful, we aim to learn lessons about how practices have overcome problems such as barriers to

implementation and the key factors that made this possible. We will also gain understanding of the motivations of practitioners who have or have not offered alternatives to F2F consultations, the experience of different groups of patients who have had the opportunity to use these alternatives, the benefits and disadvantages from the perspectives of patients and practitioners, and the problems that remain.

A key focus of interest will be which groups of patients make use of and have most to gain from these alternative forms of access and whether these new approaches are increasing or reducing inequalities of access. This will include consideration of which groups are currently disadvantaged by the limited provision of alternatives to F2F care. We will explore the impact of provision of these alternatives on patient satisfaction with access to general practice. We will also explore clinicians' perceptions of the impact of new forms of consultation on their workload and the appropriateness of patient contacts, as well as factors that would facilitate wider implementation of these new models of care.

We will take a focused ethnography approach to the case studies. Focused ethnographies[51] share many of the characteristics of classic ethnographies i.e. they are explorative rather than hypothesis testing, they elicit unstructured data in the form of field notes and transcripts from semi-structured interviews, involve a small sample, collect rich data and result in a narrative (rather than quantified) description which acknowledges the importance of interpretation of the significance of observed or reported behaviours:[52] Ethnography aims to provide insights into people's views and actions by observing the contexts and locations they inhabit.[53] Ethnographic methods have been used in primary care for several notable studies[54-56] but require skilled researchers and usually an intensive period of immersion (often by a sole researcher) in the study setting.

In a focused ethnography (FE) rather than embedding a single researcher in a social setting for a lengthy period, more targeted data collection is used to explore the study topics. '*Knowledge of what is known in the literature or in clinical practice will help determine an appropriate question to generate new findings that are relevant and useful for the service environment' (Higginbottom).[51]* We propose to use FE methods, drawing on our existing knowledge of the literature, policy and practice. Each of a small team of researchers will work intensively in two or three practices in their local region.

The methods include collecting detailed observations and interviews. One member of the research team will base themselves at each practice, observing, attending team meetings and interviewing practice administrative staff, general practitioners (GPs) and patients. We will gather data through non-participant observation and semi-structured formal and informal interviews, and also review any practice documents or protocols on non F2F consultations. Observations and informal interviews will be described in field-notes while more formal interviews will be audio recorded for transcription. We will also gather anonymised data about consultations which will contribute to a quantitative analysis.

1. **Administrative staff.** We will interview practice managerial and reception staff in each case study practice and work with them to create structured summary profiles of the types of alternative consultations that are (or were) provided, how these are/were provided (e.g. timing, volume, staffing) and any parameters for the types of patients who are/were allowed or encouraged to use these alternatives (for example, many practices do not allow telephone consultations with regard to babies). These practice staff (approx 2 per practice, 16 in total) will also be invited to take part in interviews about barriers to implementation of alternatives to F2F consultation, how these were or were not overcome, and the intended benefits of these alternatives.

2. **General Practitioners:** We will ask each participating practice to nominate the most appropriate GP(s) to be interviewed about the practice's use of alternatives to F2F consultation. Across the case studies we will seek to ensure diversity in the GPs in terms of their gender and years since qualification. The interviews will explore why they offered specific alternatives to F2F consultation for different purposes, what benefit to patients or the practice

they hoped this would provide (and how), what experience they had of introducing or conducting these alternative consultations, difficulties they had encountered and how these were or were not overcome, and any concerns about wider use of these alternatives.

3. **Patients:** We will interview a sample of patients with a range of characteristics about their attitudes to and experience of alternatives to F2F consultations. In order to explore the views of different patient groups we will purposively select 40 to 50 patients (about 6 per practice) with different characteristics in relation to age, sex, ethnicity, deprivation, disability, frequency of attendance and whether or not they have long term health conditions. We will initially identify and seek to recruit patients opportunistically from those who have contacted the practice to make use of one form of alternative to F2F consultations. In subsequent interviews we will purposively seek to recruit patients with particular characteristics in each practice in order to ensure that participants with the range of characteristics listed above are included. This will include some patients who have chosen to make a F2F consultation when they could have asked for another form of consultation.
Practice staff will identify patients with the appropriate characteristics and send them information about the study by post, asking if they would be willing to be interviewed by a researcher. In some cases, patients may be given this information when they attend the surgery. Those who express an interest will then be telephoned by the researcher who will arrange a time for them to be interviewed at their GP surgery or in their home. In the interviews the researcher will ask patients about their perceptions of the advantages and disadvantages of alternatives to F2F consultation, their experience of these alternatives and how access to these alternatives could be improved. They will be asked to describe their last 'non-F2F' consultation, their satisfaction with aspects of it, how it compared with their experience of F2F consultations, and whether they feel the use of alternatives affects the nature of their relationship with their GP. Patients will be asked about their use of related technologies such as email and internet video in other areas of their lives.
We are keen to include a number of interviews with people who are regarded as 'hard to reach' in research. Drawing on the experience of the Oxford group in this area we will (through targeted sampling at the case study practices) make particular efforts to include parents and carers of people with complex needs, young men, homeless people and minority ethnic groups. We will be looking at the range of problems and issues for these hard to reach groups, rather than aiming to make statements about specific population sub-groups e.g. the homeless, as we agree that numbers will be too small for a specific sub-group. To make it easier for people from these groups to participate we will offer telephone interviews,individual or paired interviews, and will also explore whether the opportunity to provide online comment might expand participation from people for whom a face to face interview is not appropriate.

4. Wider team impacts. In addition to the preceding three groups, we will also undertake interviews (face-to-face or telephone) with other team members associated with the case study practices. Our sampling will include practice-based and community based nurses, pharmacists, and allied health professionals (such as phlebotomists, community-based physiotherapists). Interviews will incorporate a small number of questions addressing issues relating to workload volume and redistribution (drawing on our experience from the ESTEEM trial in which we observed that introducing telephone consultations resulted in redistribution of workload from face-to-face to telephone, and from doctor to nurse), patient safety (including prescribing safety), system-related issues (computer systems, appointment systems, telephone systems). We will also consider prompting interviewees on issues relating to critical incidents or significant events associated with the introduction and/or maintenance of new technologies and platforms for consulting

5. **Analysis of routine consultation data:** We will explore how practices record their use of alternatives to F2F consultations. If possible, we will collect and analyse quantitative data

about the use of alternatives to F2F consultations by the case study practices using anonymised routinely collected data. Data about types of consultation (e.g. F2F, telephone, email) are in theory available in most general practice computer systems, but they may not be used reliably. For example, if a GP logs in and starts his or her day conducting F2F consultations, he or she may not change the field for consultation type when they conduct a telephone consultation. The extent to which this happens may vary by doctor and by practice. We know from our experience gained in several previous projects (e.g. Esteem[56], Advanced Access[57]) that data about consultation type is recorded in at least some practices. We will seek to validate the reliability of the data collected in the case study practices through direct observation and data validity checks (e.g. by comparison between the appointment system and the consultation record)

If the data appear to be reasonably reliable in at least some of the case study practices we will conduct searches using these practices' computer systems and download anonymised details of consultations for further analysis. We will extract pseudo-anonymous data on all consultations in the practice over a 12 month period, including details of patient age, sex, ethnicity (the majority of patients in general practice now have a record of ethnicity), index of multiple deprivation (by matching to postcode before data leaves the practice to ensure anonymity), clinician type (doctor or nurse), date and time of consultation, and type of consultation. We will include a pseudo-anonymous identifier for each patient, for which the key is only held by the practice and not available to the research team. In a separate data extraction exercise we will extract data about the number of chronic conditions diagnosed in each patient to generate a multimorbidity score, as a measure of health care need, using methods developed within another project funded by the HS&DR programme. This dataset will also use the same pseudo-anonymous identifier to allow it to be matched to the dataset of consultations. The combined dataset will be used for analysis. The focus of this analysis will be to quantify the extent to which alternatives to F2F consultation are used, including the number of patients using different alternatives, how this has changed over time, and in particular take-up by patients from different patient groups in terms of characteristics such as age, sex, deprivation and multimorbidity.

6. In each of the case study practices, we will review notes/minutes from practice meetings with a view to identifying technology and consulting-related issues raised over the six-month period following the introduction of new technologies within the practice. Should practices be reluctant to disclose the full minutes, we will ask the practice manager or one of the GPs to review the minutes, identifying and extracting the relevant information for our review.

Data collection and analysis

Qualitative data

To make sure that the ethnographic study team works cohesively on the data collection and analysis the researchers will all attend a two day qualitative data analysis course in Oxford. The ethnography research team (3 researchers, SZ and HA) will have conference calls every two weeks throughout this phase of the project, as well as occasional meetings.

Observations in formal meetings will be noted at the time but since this can feel intrusive during informal encounters, the researchers will write up field notes as soon as feasible after the event. Formal interviews will be digitally recorded with the consent of participants, using an encrypted recorder. The files will be fully transcribed by a professional transcription service.

The steps for analysing the interviews and field notes will be to: (a) agree a thematic coding structure with descriptive labels (b) use the qualitative software package NVivo to gather related sections of the transcripts and field notes under thematic codes (c) produce a series of NVivo 'reports containing all the relevant data across the case study sites (d) apply the OSOP method[58] to identify the line of

argument in each report (e) identify outliers or negative cases (f) present summaries of the main findings to the wider project team, staff at the case study practices and invited discussion groups following conference presentations on the results.

We will explore how and why the practices offered alternative forms of consultation, what problems they were trying to solve, the intended benefits of offering the alternatives and their implicit or explicit assumptions about how providing alternatives might lead to these benefits (the causal chain). The qualitative data from the interviews will also allow exploration of factors which affect the implementation or effectiveness of the alternatives, including patient or doctor characteristics or practice factors such as IT infrastructure, culture or organisation. We will explore patients' perceptions of the advantages and disadvantages of alternatives to F2F consultation, and what factors in terms of patient characteristics, purpose of the consultation or type of technology influence these perceptions. We will particularly seek to understand how different forms of communication impact on the nature of the consultation and on the clinician-patient relationship.

Quantitative data

It is important to note that the main focus of the analysis from this research is qualitative. We will explore the feasibility of collecting quantitative data about the number of consultations of different types, as this has important implications for later evaluation in a subsequent study. Analysis of any available data, whilst not crucial to our main objectives, will help enrich our understanding. Analysis and reporting of quantitative analyses will be conducted in accordance with STROBE guidelines.[59] In the main, quantitative analyses will be descriptive, calculating the percentages and rates of different types of consultations within the case study practices. 95% confidence intervals will also be obtained. In exploratory analyses (since the study has not been powered for such analyses) we will compare rates of different types of consultations for different groups of patients (relating to age, gender, deprivation, ethnicity and multimorbidity for example) using appropriate regression models (such as Poisson regression), controlling for clustering by practice. Interpretation of these exploratory analyses will focus on interpretation of 95% confidence intervals.

Phase 3: Modelling process and outcomes

Synthesis of findings

We recognise that different types of contact will probably be most useful for different types of patients, for different purposes and in different practice contexts. Using a theory based evaluation approach we will draw on the findings from the evidence synthesis and the case studies in order to gain understanding of relationships between the context (patient population, practice environment, necessary resources), the aims of providing alternatives to F2F consultations, factors influencing provision and uptake of the alternatives, and the desired and apparent benefits of these alternatives, from the perspectives of patients and health professionals. These comprise the 'program theory' as described earlier. We will also describe factors that appear to have an important effect on the implementation of alternatives to F2F consultations, representing the 'implementation theory'.

The analysis and synthesis of findings will initially be developed by the research team through discussion. We will then seek to optimise and validate our findings by discussing them at a workshop with our advisory group, to include representatives of key stake-holder groups such as patients, GPs and other practice staff, and commissioners and managers.

Modelling outcomes

One key aspect of the case studies will be to gain understanding about what practices are hoping to achieve by offering alternatives to F2F consultation, and the benefits that patients are seeking from greater access to these alternatives. It will be important to determine the outcomes which are most important from the different perspectives of patients and health professionals. These include not only benefits but also potential adverse consequences. How we structure the description of these

outcomes will be guided by the qualitative data, but provisionally we will use relevant sections of the taxonomy of outcomes of interest provided by the Cochrane Consumers & Communication Review Group[60] to inform our interview guides and our analysis of data. Relevant elements of this taxonomy are shown below:

Patient

- Communication enhancement – improved communication with provider, patient enablement.
- Evaluation of care - consumer-professional interactions experience, perceptions of care, satisfaction, relationship between patient/professional.
- Health status and wellbeing – physical health of patient, psychological health of patient, psychosocial outcomes.
- Treatment outcomes – adverse outcomes, clinical assessments, pain assessment/control, physiological measures.
- Patient safety

Healthcare professional

- Knowledge and understanding – attitudes, behaviour of health professionals, level of knowledge and skills, consultation processes.

Health service

- Adverse events – reporting, complaints and litigation.
- Health economic outcomes – cost of specific interventions, cost of care.
- Service utilisation – number of consultations, referral rates, admission to hospital, use of specific services
- Workload for GPs and other members of the practice team
- Of particular relevance to this study is the issue of efficiency – how general practices can manage increasing demand within resources which are declining in real terms

Alongside establishing the outcomes that are most important, we will consider how these can best be operationalised and measured. Where appropriate we will explore with practices the feasibility of collecting data in relation to these outcomes. For outcomes relating to service utilisation, this will be informed by our experience of seeking to obtain anonymised quantitative data from general practice computer systems.

Impact on reducing health inequalities

One particular issue of relevance to this study is whether providing alternatives to F2F consultation increases or decreases inequalities of access to primary health care. There is potential for decreased inequalities where, for example, these alternatives improve access for people who find it difficult to get to the GP surgery (e.g. the housebound, commuters). On the other hand, evidence from previous evaluations of new forms of access (e.g. NHS walk-in centres,[61] NHS Direct[55]) shows that use is associated with increased education and affluence and there is some evidence that the same is true of email consultation, [26,27] so greater provision of alternatives to F2F consultation could represent investment in providing care for those groups of the population with the fewest health needs. Using both qualitative and quantitative data from phase 2 we will seek to identify and model the ways in which greater provision of alternatives of F2F consultation may impact on health inequalities, and will make recommendations about key variables which will need to be measured in subsequent research to test these effects.

Development of web resource and recommendations

Based on our findings we will develop a series of recommendations about the most appropriate and promising applications of alternatives to F2F consultations for different patient groups.

These recommendations will be made available via a website which provides an online resource for practices considering greater provision of alternatives to F2F consultations. The website will provide practical solutions to problems others have discovered in setting up and running alternative consultations. For example this might be a secure web-based self-triage questionnaire which would allow patients to decide what type of consultation was likely to be most successful for them and their particular problem or the potential benefits of providing greater use of structured online templates via asynchronous messaging for regular review of patients with long term conditions, along with guidance about suitable software to support such a development. We do not anticipate one set of prescriptive recommendations. Instead, we anticipate that there will be a set of recommendations and resources for different types of purpose e.g. initial assessment and triage, regular review, screening, supporting patient self-management. The online resource will include a 'self-appraisal tool' (to allow practices to assess how well they are providing options for access, particularly for hard to reach groups), and then guidance about providing greater use of email, telephone and/or internet video consultations. In each case this could include:

- a summary of existing evidence about the effects of providing these alternatives to F2F consultation for different purposes, including highlighting where there is a lack of evidence particularly in relation to the types of people who may be advantaged and disadvantaged by these technologies (for example telephone triage for those with hearing or communication difficulty).
- examples of good practice from other general practices which have introduced these services, with case studies and use of media such as YouTube videos to aid dissemination. This will include descriptions of key factors which facilitated implementation, along with barriers to implementation and how these might be overcome
- key infrastructure which needs to be in place for successful implementation (e.g. enhanced telephone systems or IT systems)
- specific examples of communication software, for example video-calling technology, that have been appraised by NHS IT experts and and found to be secure and appropriate for use.
- methods of incorporating e-communications securely and seamlessly within the electronic medical record (EMR). Exploring the desirability, potential and resource implications of attaching whole audio or video recorded consultations to the EMR
- highlighting other important issues that practices need to consider, such as in relation to data security (such as providing secure methods of providing logons to patients, assuring that the environment in which telephone or video-consulting takes places is secure), patient safety, staffing, and training
- likely impacts (both intended benefits for example improved continuity of care) and potential adverse consequences (for example to assuage fears of being swamped by e-consulting). Both of these issues (continuity and workload) could be audited by practices
- One possible web-based service would be the creation of a forum where people who have successfully started a service might give advice to those starting out.

Framework for subsequent evaluation

Use of the MRC complex intervention framework will provide a theoretical basis for the recommendations and website resource. However, in addition to providing practical advice for implementing new technologies our research will provide a framework for more rigorous evaluation heretofore lacking in some of these areas. It is important that we can be confident the introduction of new technologies improve care or improve efficiency and that they do this fairly for different groups in society. Treating provision of alternatives to F2F consultations based on our recommendations as an intervention, this research will provide a framework for subsequent pilot studies and formal evaluations of the implementation of technologies or combinations of technologies. The understanding gained through this study will help to determine the key contextual factors, processes and outcome

measures that need to be assessed in such evaluations. We recognise the challenges posed by the heterogenous way new technologies may be applied and indeed the current context which has encouraged the uptake of these technologies in advance of the evidence, such that conventional experimental intervention studies may not be possible, but the work described here will provide learning in its own right about the benefits of alternatives to F2F consultations, will help to clarify thinking and assumptions about how and they these new approaches might lead to benefits (and highlight potential adverse effects), and will provide a framework for evaluation.

With this in mind we expect qualitative and quantitative data from the case studies will be used to address questions about the feasibility of different interventions, the feasibility of evaluating these and the best methodological approach to evaluation, including:

- An estimate of the proportion of practices which are readily identifiable as providing alternatives to F2F consultation of different types (although this may not be an accurate representation of all practices offering alternatives, depending on the response rate to the survey, only those who are identifiable will be useful for future evaluation)
- the feasibility of providing different types of alternatives to F2F consultation in different types of practice
- which alternatives to F2F consultations to offer for different purposes
- the extent to which implementation of alternatives to F2F consultation can be standardised between different practices
- the number and types of patients who are likely to use different types of alternative to F2F consultation, for which purposes, and likely consultation rates
- key processes which appear to influence implementation and impact and which therefore need to be measured (e.g. the number of telephone lines available, the speed with which emails are answered)
- the outcomes which are deemed to be most important to patients and health care professionals, and which therefore need to be included as outcome measures for evaluation
- the feasibility of measuring these outcomes
- the potential wider impacts on the practice and patient population which need to be assessed
- potential impacts on health inequalities
- what types of quantitative research methods for particular technological interventions are feasible (if any). For example an individually randomised controlled trial of provision of access to webmail or video consulting might be possible or an interrupted time series following the introduction of telephone triage, Our research will help determine whether it would be possible to randomise practices to following the recommendations (or not) and if so which key practice factors should be included as stratification variables
- contextual factors which are likely to affect implementation and the impact of the recommendations, which should be collected at baseline in any evaluation.

Dissemination and projected outputs

Dissemination

We are very conscious of the fact that much academic research has very limited impact, and it is incumbent on researchers to think creatively about how they can devise knowledge translation strategies and provide practical resources to increase the chances of their findings being useful and actually used in the NHS. With this in mind, we will disseminate our findings to a range of audiences in the following ways:

General practices: The main practical endpoint of this research will be recommendations for practices about ways that they could change practice and a website resource to help them implement change, including a summary of evidence and guidance based on the experience of other practices. These will

be available from a project website. We will also write articles for widely read professional publications such as Pulse to make practices aware of these resources. GPs are influenced to some extent by academic publications in certain widely read journals such as the BMJ and the British Journal of General Practice. Academic publications also have indirect effects as they are picked up by professional magazines and influence guidelines and incentive schemes. We will help to facilitate this process through press releases. The Centre for Academic Primary Care in Bristol is in the process of appointing a communications officer whose role will be to improve the dissemination of its research in order to maximise 'real-world' impact.

Patients and the public: The project website will summarise the key findings of our research in lay terms, along with examples of how some practices are offering alternatives to F2F consultation and potential benefits for patients. Through press releases to lay media we expect that this story will be picked up by newspapers, magazines and websites. We think it is likely that the lay media will find this topic interesting, since the issue of difficulties in getting an appointment to see a GP is always newsworthy.

Managers, commissioners and policy makers: We will provide a brief report in a form useful to managers, probably working with NIHR to develop a short and engaging briefing paper, linked to the full report. In addition we will provide a one page abstract and five page executive summary of the final project report. We will seek opportunities to present key findings at relevant conferences attended by managers, provide briefing for the Health Services Journal to encourage them to write an article, and provide a short set of PowerPoint slides for managers which summarises the key findings.

Academics: We will write papers for academic journals to describe the literature synthesis, the case study research and the development of the theoretical model. We will present these findings at relevant academic conferences such as the Society of Academic Primary Care and the Society of Social Medicine.

NIHR (funding body): We will provide outputs throughout the project, including a report on the qualitative synthesis after 9 months, interim reports on project progress at 15 and 21 months and the final outputs at 27 months. We will write a full project report to be published in the NIHR library.

Other outputs

An intervention ready for subsequent evaluation:

This study addresses the first stages of the MRC complex intervention framework by developing an intervention (provision of alternatives to F2F consultations based on our recommendations) based on evidence and theory which will be ready to be evaluated in subsequent research.

The 'program theory' will identify how and why different types of alternatives are likely to be beneficial to different groups of patients for different purposes. The 'implementation theory' will elucidate the issues that need to be addressed to encourage practices to increase the availability of these alternatives, and to encourage or enable patients to use them. This will enable us to develop a website resource and recommendations about how use of alternatives to F2F consultation might be improved, but will not provide definitive evidence about the benefits and wider effects. This will require a subsequent pilot and feasibility study leading to a definitive evaluation. Our theory based evaluation approach will allow us to determine the best approach for definitive evaluation (e.g. cluster randomised controlled trial or quasi-experimental design) and will define the most important process and outcome measures.

Recommendations for manager, professional bodies and policy-makers:

Our evidence will highlight issues that need to be addressed by policy makers and incentives that need to be in place to encourage the wider provision of alternatives. For example this may demonstrate the need to deal with medico-legal concerns, or to address concerns about an increase in demand and workload.

Plan of investigation and timetable

The project timetable is shown on the attached project plan. Milestones are shown in bold. We have proposed a progress report approximately every 6 months as recommended.

The timeline also indicates when staff will be employed in each research site and shows that for most of the project there is only one researcher, employed in Bristol, with a maximum of 2.6 researchers across all 3 sites for an intensive 12 month period of data collection.

Please note that our timetable and budget are based on the assumption that we receive the initial decision from HS&DR by the end of April 2014, and the contract by the end of August 2014. If these timelines are delayed that would delay the project start date, which would increase costs because it would reduce the amount of time in which Dr Atherton's time is covered by her fellowship from the NIHR School for Primary Care Research.

Project management

CS will oversee the project as chief investigator and ensure that it is completed on time and budget. The project will be co-ordinated on a day to day basis by an experienced post-doctoral research associate employed in Bristol, supervised by CS. During the case studies phase, research associates will be employed in Oxford and Edinburgh (60% wte) supervised by HA and BM respectively.

The applicants and employed researchers form the project management group (PMG). This will meet either in person or by teleconference about every 6 weeks, with minutes and action points. Progress of the project against the timeline will be monitored at each meeting and will be reported to HS&DR at progress reports as indicated above.

During phase 2 (collection and analysis of data from the case studies) the researchers involved will have fortnightly conference calls in addition to occasional meetings to ensure that their work is closely co-ordinated.

The project will be overseen by an independent Study Steering Committee, which will be constituted in line with the requirements of the NIHR. This will be chaired by an independent academic with relevant expertise. Other independent members will include L Prosser, Primary Care Lead for Bristol Local Area Team, NHS England; R Anthwal, Senior Project Manager, South West Commissioning Support; and from South Gloucester CCG Dr H Minas Research Evidence lead and Dr T Sivayokan, Planned Care lead. Two members of the patient advisory group will also join this forum. This group will meet at least every year during the project.

Approval by ethics committees

The survey of general practices will not need NHS need ethical permission but will need NHS management approval, and we will apply for this as soon as funding for the project is agreed. We will not need ethics approval until we start the case studies in month 9, and we will start the process of applying for this in good time, as soon as the researcher in Bristol is in post. We do not envisage that there should be any difficulty in obtaining approvals for this project.

Patient and Public Involvement

We will form a Patient Advisory Group (PAG). Lethbridge, Harris-Golesworthy and Tatnell have agreed to participate. We will expand this group to approx. 10 people to reflect a broader range of experiences and to ensure inclusivity. We will a use a model of PPI that emphasizes the key dimensions of good quality PPI, i.e. engagement with user concerns, strength of the PPI voice, responding to that voice and appropriate and flexible modes of engagement in different elements of the research process.[62] The PAG will be invited to participate in all stages of the study to ensure that our work adequately addresses patient issues. This will include the development of our evidence

synthesis, the design of our scoping study, the purposive sampling, the design of interview instruments for use in our case studies, model and toolkit development, and dissemination plans. The PAG will meet 4 times throughout the study. They will also participate throughout the project, using a variety of methods to provide input. This includes participation in project team meetings as required. Appropriate training and support will be provided by AG. Appropriate expenses and reimbursements will be paid.

Expertise and justification of support required

Contribution of each team member

Salisbury is an academic GP with expertise in evaluation of innovations in general practice organisation, particularly improving access to care. He is Chief Investigator and will supervise the research associate employed in Bristol. McKinstry will act as PI in Scotland, providing access to practices in rural and remote areas (where video consultation is more common). He leads a programme of research on telehealth and will act as PI for case study sites in Scotland and will supervise the research associate employed in Edinburgh. Campbell leads the HTA funded Esteem trial of telephone triage (on which Salisbury is co-applicant) and will provide topic and methods advice. Atherton is a research fellow in Oxford who undertook her PhD on exploring the potential of email consultations in English General Practice. She has conducted a series of Cochrane reviews on the role of email for different purposes. She will act as PI for case study sites around Oxford and will supervise the research associate employed there. Ziebland is a medical sociologist with expertise in qualitative methods and e-health research. She will contribute to the qualitative work and, with HA, conduct the conceptual literature synthesis. Gibson is a Research Fellow and leads a Peninsula CLAHRC initiative facilitating patient and public involvement in the design, delivery, and dissemination of research.

How this research provides value for money

This proposal comes from a very experienced team including researchers who have strong track records in relation to the topic area and the relevant research methods.

Technology has transformed most types of commercial and social interaction, but most general practice consultations still occur F2F, which is time consuming and potentially inconvenient for patients and may also not be most efficient for the doctor. A major challenge for the NHS in general is how to meet the increasing need and demand for health care within resources which are static or declining in real terms. It is essential to explore ways in which the efficiency of care delivery could be improved. Furthermore, gaining prompt and convenient access to advice from a GP has been a long term problem in the NHS. The wider use of alternatives to F2F consultations such as use of telephone consultations, email, internet video and other technologies could transform the accessibility of primary care, particularly for those who currently find access difficult.

This could have numerous economic benefits, apart from increased convenience for patients. There would be less need to travel, with environmental benefits, and potentially less time off work which may reduce the cost of lost productivity. For GPs it could mean improved productivity in terms of the number of patients they can deal with in a day. For the NHS, there is some evidence that improved access to general practice is associated with less use of expensive alternatives such as attendance at A&E departments,[63] which offers potential for major cost savings. Finally, improved and faster access to health care advice in general practice might also improve patient's health, and be cost-effective in terms of cost per quality adjusted life year. On the other hand, increased use of alternatives to F2F could increase the total number of consultations, prescriptions and referrals therefore cost savings cannot be assumed and should be investigated.

Given that there are about 300 million GP consultations per annum in England alone,[64] the consequences and potential benefits of more efficient access to a consultation are very considerable. This research will provide recommendations and a website resource for practices about how to

improve appropriate access to alternatives to F2F consultations and will provide a framework for a subsequent evaluation of these recommendations.

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