BRACE Rapid Evaluation Centre

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BRACE Rapid Service Evaluation Centre

Overarching study of service innovations for people with multiple long-term conditions: what works for whom, how and why?

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Summary

This protocol sets out the BRACE Centre's approach to its overarching longer-term study. The study is focused on what our rapid evaluation projects reveal about how service innovations, particularly in primary care and community settings, work (or not) for people of all ages with multiple long-term conditions.

We set out here the thematic framework that will underpin the synthesis of evaluation findings and methodological learning, and give examples of a range of academic and service-focused outputs from the project series.

Our thematic approach draws on two major studies of multimorbidity in health services: the house of care model; and the SELFIE (**S**ustainable int**E**grated chronic care mode**L**s for multi-morbidity: delivery, **FI**nancing, and performanc**E**) framework.

We have developed a typology of evaluation projects within our portfolio to inform how we will use them for analyses of multimorbidity. The typology includes: projects where multimorbidity is the main focus; others where a lens of multimorbidity is applied in secondary analysis of evaluation data; and thematic portfolio analyses across multiple projects.

Finally, we set out how the overarching study is informed and challenged by our public, patient and professional engagement processes, ensuring that the lenses of multimorbidity used reflect the current and enduring concerns and priorities of patients, carers, families and health and care staff.

UNIVERSITY OF BIRMINGHAM RAND EUROPE UNIVERSITY OF CAMBRIDGE National Voices

Introduction

This protocol sets out how the National Institute for Health Research (NIHR) Birmingham RAND and Cambridge (BRACE) rapid service evaluation team will undertake its overarching, longer-term study as a thematically-linked series of rapid evaluation projects.

The theme underpinning and guiding this longer-term study is service innovations for people of all ages with multiple long-term conditions, particularly focusing on services provided in primary care and community settings. We will use this thematic framework to undertake an in-depth synthesis of evaluation findings, based on research questions that interrogate critical issues faced by people of all ages who live with multimorbidity. These questions will be developed in partnership with our Service User and Public Engagement Group, and the BRACE Health and Care Panel[1]. The longer-term study will also distil and disseminate methodological and practitioner learning about undertaking and using rapid evaluation research. This overarching study will result in a range of academic and service-focused outputs.

Background and rationale

Background

When the National Institute for Health Research (NIHR) Health Services and Delivery Research programme issued the call to establish rapid service evaluation teams, it was suggested that each team would undertake a number of shorter evaluation projects over the five-year period of funding, and also a single overarching long-term project of approximately four years' duration. However, the Health Services and Delivery Research programme agreed to the idea of using the longer term-project as a way of nesting shorter studies within a wider and more sustained body of work. This is intended to help the research teams and those using their work to make sense of, and quickly build upon, emerging findings, from both a topic (i.e. area of health and care) and a methodological (i.e. learning about undertaking and using rapid evaluations) perspective.

In our BRACE proposal to the NIHR Health Services and Delivery Research programme in 2017, we suggested that the longer-term aspect of the BRACE rapid evaluation work would enable:

- Rapid synthesis of emerging evidence
- Nested case study work
- Wider analysis of data across themes and case studies
- Prompt follow-up of issues detected through BRACE rapid evaluation work;

and hence would provide prompt information to decision-makers and to those charged with implementing innovations. The longer-term work would contribute to:

- Regular interaction with the BRACE Health and Care Panel, the BRACE Steering Group, and the secretariat of the Health Services and Delivery Research programme, about other studies in the thematic area.

[1] We work closely with people who plan, deliver and use health and care services. The main way we engage these groups is through our Health and Care Panel, which we consult at all stages of our work: from deciding what to evaluate, through to designing dissemination strategies that maximise the reach and impact of project findings. The Panel's diverse membership includes service users and the public, system leaders, managers, clinicians and other practitioners, voluntary sector organisations and health service researchers. This approach helps to ensure that our evaluations focus on the things that matter most to people working in and receiving services from the NHS and social care.

- Delivering a range of outputs, including evidence briefings for policy and practice, and methodological publications for evaluation researchers and practitioners.

Whilst these elements were proposed originally as part of a single four-year research project within the BRACE portfolio, we now consider that they are highly relevant features of a revised approach, which we set out in this protocol. We are proposing a longer-term series of related projects, using an overarching thematic framework for in-depth and focused synthesis and learning from our BRACE work.

Following discussion with the Health Services and Delivery Research programme secretariat and our BRACE Steering Group, we have agreed that instead of allocating BRACE resource to a single, four-year (long-term) evaluation project, we will undertake scoping to link many of our rapid evaluation studies within a theoretical framework focused on innovation in the health and social care of people living with multimorbidity. This will provide the basis for us to undertake in-depth analysis and synthesis of findings within specific evaluation studies as well as across a portfolio of work, seeking always to understand what our rapid evaluation of service innovation means for the specific issues and questions identified by people of all ages living with multimorbidity, and needing care and support from health and social care services.

Why this research is needed now

The theme for our long-term BRACE overarching study is **service innovations for people of all ages with multiple long-term conditions**; and within that we are particularly focusing on primary care and community settings. This was the highest-rated topic in our highly inclusive and bottom-up initial BRACE prioritisation process undertaken in summer 2018 and facilitated by Katherine Cowan of the James Lind Alliance. The prioritisation process involved 30 members of our Health and Care Panel, including patient and public involvement colleagues, health and care frontline professionals, senior evaluation practitioners and policy makers. Further details of the priority setting process and its outcomes are available in a paper shared with the Health Services and Delivery Research programme secretariat.

The National Institute for Health and Care Excellence (NICE) defines multimorbidity as 'the presence of two or more long-term health conditions, which can include:

- Defined physical and mental health conditions such as diabetes or schizophrenia
- Ongoing conditions such as learning disability
- Symptom complexes such as frailty or chronic pain
- Sensory impairment such as sight or hearing loss
- Alcohol and substance misuse.' (NICE 2016)

This is the definition of multimorbidity upon which the scope of the present protocol is based. The prevalence of multimorbidity is uncertain but large, with estimates ranging from 15-30% of the total population (Aiden 2018). Although prevalence increases with age, there are large numbers of people in all age groups with two or more long-term conditions. Patients with multiple morbidities are not only higher users of NHS services and likely to have poorer life expectancy and lower quality of life than other members of the population, they also face particular difficulties (Whitty et al. 2020) and may struggle to cope (Aiden 2018).

A systematic review of the lived experience of mental and physical multimorbidity found that "the phenomenology of multimorbidity is experienced as a complex state that goes beyond counts of conditions and symptom burden and incorporates psycho-social problems played out against a backdrop of uncertainty and constant flux" (Coventry et al. 2015). The World Health Organisation

(WHO) describes people with multimorbidity, compared to other members of the population, as facing "more frequent and complex interactions with health care services leading to greater susceptibility to failures of care delivery and coordination; the need for clear communication and patient-centred care due to complex patient needs; demanding self-management regimens and competing priorities; more vulnerability to safety issues…" (WHO 2016).

Multimorbidity is now a high-profile issue for consideration in NHS policy and practice. It is a major theme in the NHS Long-Term Plan (NHS England 2019a) and the Academic Health Science Network, NIHR and NHS England report on priorities for innovation and research (AHSN Network et al. 2019). In July 2019, the Academy of Medical Sciences, NIHR, Department of Health and Social Care, Medical Research Council and Wellcome Trust jointly declared: 'Multimorbidity is recognised as an important priority across all our organisations and we all take a special interest in it' (Academy of Medical Sciences et al. 2019).

In January 2020, the Chief Medical Officers of the four countries of the UK, along with senior representatives of medical royal colleges and others, declared the need for the medical profession to respond to the large and growing number of patients who have two or more long-term conditions. They noted: "Clustering of diseases, and how we might better tackle management of coexisting physical and mental health problems, should be embedded into medical training and continuous professional development" (Whitty et al. 2020). Multimorbidity is therefore highly appropriate as a way of framing, interrogating and synthesising a series of BRACE studies.

Hitherto, much of the published work on multimorbidity has focused on those at the highest risk of adverse events (hospitalisations in particular) or/and older patients (Stokes et al. 2017). Widening the scope to evaluate services for people of all ages with multimorbidity and looking at the services' impact on diverse sub-populations, are important and explicit aspects of our BRACE overarching thematic framework. The need for a broad and inclusive approach emerged strongly from our priority setting work with Health and Care Panel partners and has been emphasised in recent studies and commentaries, leading to calls for a more equal and stronger focus on the needs and effectiveness of services and care models for younger populations (Academy of Medical Sciences 2018; Aiden 2018).

The primary care and community settings focus to the thematic framework for the longer-term overarching study resulted from a review of the BRACE portfolio. This includes evaluations of primary care networks; acute trusts running general practice services; digital and telephone access to primary care services; children and young people's mental health care in schools; artificial intelligence plus sensors to support adult social care; and remote home monitoring models in health and social care during the COVID-19 pandemic. However, this is not intended to be restrictive or definitive, and all the services we are already evaluating cross health and care boundaries and sectors, and increasingly so, as evidenced by our study of general practice run by hospitals and horizon scanning of innovations in social care and social work.

Multimorbidity in theory and practice

The multimorbidity theme for the overarching study of our series of evaluations requires us to focus on whether and how providing effective and efficient care for a person with 'n' multiple long-term conditions might differ from providing care for 'n' different people, each of whom has just one of each of those conditions. That difference is where the significance of multimorbidity lies for the health care professionals, NHS providers and commissioners, and policy makers. Focusing on single diseases risks missing the combined impact they have on an individual living with multiple conditions. The particular needs of patients with multiple long-term conditions, and the impacts of

innovative services or service changes on their health outcomes and experiences of care, are at the core of the significance of multimorbidity for patients and their carers, families and friends.

Progression from single to multiple long-term conditions is much more likely, and happens at younger ages, for individuals from deprived backgrounds and living in less well served locations than for others (Guy's and St Thomas' Charity 2018). In the longer-term overarching study we therefore propose to include explicit consideration of the extent of any differential impact of evaluated innovations for lower income and other relatively disadvantaged groups of the population.

A variety of frameworks exist for conceptualising services for people requiring health care for more than one long-term condition. A Cochrane systematic review of interventions in primary care and community settings for improving outcomes in patients with multimorbidity found that there was some evidence of improved health outcomes if interventions can be targeted at risk factors such as depression, or specific functional difficulties in people with multimorbidity (Smith et al. 2016). We have reviewed the literature, both academic and grey, to identify frameworks to help to structure thinking about evaluating health and care services for people with multiple morbidities.[2]

We have identified two frameworks that we found to be particularly helpful: the SELFIE framework (Leitjen et al. 2018) provides a highly detailed overall view, and the 'House of Care Model' (Coulter et al. 2013) provides a condensed, and consequently more user-friendly, yet robust, framework. But there are also numerous other frameworks and models (see for example: Jack et al. 2018; Palmer et al. 2018; Salisbury et al. 2018; Stokes et al. 2017; Vermunt et al. 2018; and Yardley et al. 2015).

The SELFIE (**S**ustainable int**E**grated chronic care mode**L**s for multi-morbidity: delivery, **FI**nancing, and performanc**E**) framework was developed to support the development, description, implementation and evaluation of integrated care for multi-morbidity. The patient and their environment are at the core of the framework and concepts of integrated care for people with multimorbidity are described at the micro, meso and macro levels respectively and are divided based on six WHO components; service delivery, leadership and governance, workforce, financing, technologies and medical products, and information and research (Leijten et al. 2018). The SELFIE framework is comprehensive, and the 50 individual elements identified within it would also be needed to characterise integrated care for single morbidities.

A simpler framework than SELFIE for structuring thinking about services for people with multiple morbidities is the House of Care Model. It assumes an active role for patients in determining their own care and support needs and comprises four main elements within which personalised care planning can be achieved: health care professionals committed to partnership working; engaged informed patients (to which might be added 'carers', whether informal or formal, in some cases); organisational processes; and responsive commissioning of health services (Coulter et al. 2013). Like the SELFIE framework, the House of Care Model encompasses services for people with single conditions as well as those with multiple morbidities.

We shall refer to these two frameworks in structuring the evaluations that form part of the multimorbidity-themed, longer-term and overarching study.

[2] A search strategy was developed to find existing frameworks. The Health Management Information Consortium (HMIC) via Ovid was used to perform the searches with no time limit (1979 to July 2019). The first set of terms included "frameworks, models and theories" (and their derivatives) along with service delivery, needs and demand combined with terms of multi-morbidity and long-term conditions. The second set of terms included multi-morbidity and derivatives along with patient views and lived experience terms. In addition, grey literature was also searched, using Google Scholar and a combination of the above terms. The websites of the King's Fund, the Health Foundation, Nuffield Trust and NIHR were hand searched. Snowballing from the above sources was also performed to find additional resources.

Plans for service user and public involvement

The selection of the multimorbidity theme for the longer-term overarching study was the result of an extensive prioritisation process, described above, which involved several patients and members of the general public in a July 2018 workshop of the BRACE Health and Care Panel, facilitated and run using an adapted version of the James Lind Alliance approach for inclusive research priority setting. At a second Panel workshop, in September 2019, in which our patient and public involvement collaborators participated, issues for inclusion in the overarching study were identified (see Box 1). We have also had three formal discussions (plus other email and phone interactions) about the purpose and design of our overarching study with our Steering Group, whose membership includes Charlotte Augst (National Voices, our patient voice co-applicant) and a representative from our patient and public involvement collaborators. These discussions have informed the development of our approach and are reflected in the protocol, which has itself been reviewed by three of our patient and public involvement collaborators.

Box 1. Health and Care Panel suggestions of issues to consider in multimorbidity evaluations

- Commissioning for patient outcomes, rather than commissioning care activities
- Coordination and integration of care provision / case management
- The role of self-management – supporting patients to manage their own care
- Supporting carers to manage patients' care, including supporting parents to manager their children's care
- The role of 'expert generalists' among health care professionals
- Allowing for longer, multi-condition, consultations
- Managing the polypharmacy that results from multiple morbidities
- Distinguishing between services for people whose multiple long-term conditions all concern physical health and those for people where one or more of their conditions concerns mental health
- Multiple morbidity where one of the conditions is a rare disease
- Transition from child and adolescent to adult services for patients with multiple morbidities

We intend that service users and members of the public continue to guide and contribute to the longer-term overarching study in the following ways as the constituent evaluations progress, and as the overall series of projects develops over time:

- Involvement in the design of projects within the overarching study, including consultation about research questions, outcome measures (where appropriate), samples and recruitment methods, and plans for patient and public involvement. Such consultation is vital for ensuring that projects focus on the things that matter most to people who use services. Where appropriate, we will foster the involvement of groups with specific knowledge or lived experienced of the topic/service which is the focus of the evaluation in question. As with all BRACE projects, the protocols for evaluations within the longer-term series will each be reviewed by at least one of our patient and public involvement collaborators.

- Discussing emerging findings and exploring key themes in workshops and other fora with stakeholder groups including service users and carers. This might include, for example, workshops to draw out and explore the implications of our findings for particular subgroups

of the population with multiple morbidities, or for services in rural areas. We will work closely with Charlotte Augst to involve members of the National Voices network, thereby ensuring that our work and findings build on the insights from previous research and publications. This approach will also help to build networks for the dissemination of outputs.

- Harnessing external expertise to help shape and develop project and cross-analysis outputs, especially public- and practitioner-facing outputs. This will include working with the overarching study leads (Judith Smith, Jon Sussex and Brandi Leach) to produce a short summary report of the findings and insights across the series for a public audience, along with associated infographics, pod-/vodcasts and social media materials. We will also ask our patient and public involvement contributors and wider networks for advice about how best to present and disseminate findings to public audiences, and seek opportunities to do this collaboratively where possible.

Project plan

Aims

1) To build a coherent and in-depth body of evidence and learning about service innovations in primary and community settings for people of all ages with multiple long-term conditions, focused on those questions that matter most to those living with multimorbidity and their families/carers.

2) To develop methodological insights about how rapid evaluation approaches can be used to inform the scoping, testing and implementation of service innovations in health and social care.

By connecting a series of evaluations within a single overarching theme – multimorbidity – we will be able to distil insights and understanding for policy and practice beyond what is possible with discrete rapid evaluation studies. Specifically, we will be able to:

- Build cumulatively in later evaluations on what we have learned from earlier projects. Avenues related to multimorbidity identified as requiring further research can be followed up promptly and efficiently by a research team whose members already embody key specific experience and expertise as a result of having conducted the prior research.

- Focus on what is consequential for health and social care services from the existence of multiple morbidities within one person, as distinct from caring for an array of patients each living with only one of those morbidities. Our initial scoping of theoretical frameworks concerning multimorbidity is that they contain many aspects that apply just as well to the treatment of patients with single conditions. A clearer focus on what is special about multimorbidity is both necessary and desirable to enable insights into the particular care delivery, coordination and organisation needs of people of all ages and from all sections of the population who are living with multimorbidity, and the corresponding needs of their families/carers.

- Make methodological developments in the practice of rapid evaluation. By comparing methods across individual studies in the BRACE portfolio, we can better determine the

suitability of different methods for rapid evaluation, including learning from formative feedback.

Research questions

Two levels of research questions are relevant:

- Those applying across the whole BRACE long-term project series.
- Those specific to an individual BRACE evaluation project (or subset of projects) within our portfolio.

The overarching study's overall research questions (ORQs) cover all of the House of Care Model's elements – professionals, patients, processes and commissioning – and are:

ORQ1: Do people living with multimorbidity and their carers have specific health and care requirements, including for service coordination that people with single morbidities, and their carers, either have to a lesser degree or not at all?

ORQ2: To what extent and how are these requirements met by commissioning and provision of health and care services? Who takes overall responsibility for the totality of care and support?

ORQ3: How effectively and cost-effectively are these requirements being met?

ORQ4: To what extent are people with multimorbidity being supported to design, coordinate and manage their own care?

ORQ5: How do services aimed at people with multiple long-term conditions affect inequalities in access to care and inequalities in health; and how are these services' impacts affected by inequalities (of all kinds)?

ORQ6: What can we learn from rapid evaluation studies about the health service delivery and organisational outcome measures that are important to people living with multimorbidity and their carers?

These overall research questions all include consideration of the extent to which the answers are affected by the changes to care services brought about by the COVID-19 pandemic.

Later in this protocol we present brief examples of how multimorbidity will be addressed in individual BRACE evaluation projects that are part of the longer-term series.

Research design and methodology

We will include two types of rapid evaluations within the longer-term series, as follows (and see Figure 1):

- **Type 1** evaluations are those in which multimorbidity is not the main focus of the initial evaluation of a service innovation but is one of the lenses through which it is appropriate to view and assess the innovation. For example, BRACE has undertaken an initial rapid evaluation of acute hospitals managing general practice services (vertical integration – Sidhu et al. 2020). The initial evaluation is focused on why and how such vertical integration is being implemented across three sites, how services are affected, and how primary and secondary health care workforces are impacted. Better care coordination, pathway redesign and sharing of patient data are all opportunities that have been linked with vertical integration and are all highly relevant to care for people with multiple morbidities. Multimorbidity is included in the evaluation but is not its principal focus. As is the case with

the protocol for the vertical integration evaluation, some evaluations will have a follow-up evaluation. In the vertical integration example, the follow-up is expected to test the impact on patients' outcomes and experience of care, and on costs. Where the follow-up evaluation has a focus on the impact on people living with multiple morbidities, we characterise this as a Type 1B rapid evaluation, to distinguish it from the more broadly-aimed initial rapid evaluation (which we label Type 1A – see Figure 1).

- **Type 2** evaluations are individual BRACE studies that are focused from the outset on multimorbidity. Examples of such projects are the qualitative evaluation of digital first primary care for those with multiple long-term conditions and the quantitative evaluation of 'telephone first' in primary care and the experience of that by people with multimorbidity.

Figure 1. Typology of evaluations for the overarching study, with examples

Type 1 **Multimorbidity is one factor in the evaluation project but not the principal focus of the first-round evaluation**		**Type 2** **Multimorbidity is the principal focus of the evaluation project from the outset**
1A. Multimorbidity is one aspect among several in our initial rapid evaluation study	**1B. Prompted by findings from the initial study, multimorbidity is a focus of a follow-up evaluation of the same innovation**	
E.g. Acute hospitals managing GP services – Initial evaluation	*E.g. Acute hospitals managing GP services – Follow-up evaluation, including impact on patients, where we examine the impact of these services on people of different ages living with multimorbidity*	E.g. The impact of telephone triage in primary care on inequalities experienced by people with multiple morbidities: a quantitative evaluation E.g. 'Digital first' access to primary health care as experienced by people with multiple morbidities and their carers: qualitative evaluation

Note: Italics => projects for which a topic specification form has been approved but a protocol has not yet been submitted, as of 15 February 2021.

In addition, we propose to include thematic studies of two or more of the BRACE evaluation projects within the overarching study. These **portfolio analyses** will focus on themes identified from our theoretical and conceptual work as being of particular relevance to people living with multimorbidity and their families/carers. For example, this might entail a cross-cutting piece of work examining data from two or more (Type 1 and/or Type 2) BRACE evaluations, on a topic such as: the impact of inequalities of all kinds on health and illness experiences of people with multiple long-term conditions; the use of technology to support the care of people living with multimorbidity; the

specific issues faced by people living with multimorbidity in a rural area; or the adoption of new workforce models when designing care appropriate for people living with multimorbidity.

Not all elements of the longer-term overarching study have been identified at this stage. For that reason, in the remainder of this section we provide three brief examples of the kinds of evaluations that could be included:

- In the first example we describe how the vertical integration evaluation has been seen in part through the lens of multimorbidity, as an example of a Type 1A evaluation that has been completed; and how the intended follow-up study, explicitly referred to in the protocol for the initial evaluation of vertical integration, could include multimorbidity as a focus (a Type 1B evaluation).
- The second example is of a Type 2 evaluation (protocol under review) that will have a qualitative approach with multimorbidity as the focus.
- The third example is a Type 2 evaluation with a quantitative approach (protocol agreed and project under way), focused on whether people with multiple morbidities have better or worse access to primary care than others.

The research questions and designs of all individual evaluations contributing to the longer-term series will be informed by reference to the House of Care and SELFIE frameworks.

Example of Type 1 (1A followed by 1B) evaluation of multimorbidity, within the evaluation of acute hospitals managing general practice services (vertical integration)

Full details on the initial evaluation of vertical integration are available on the BRACE website.

The relevance to services for people with multiple morbidities was considered in the design, data collection and analysis conducted. In the evaluation report (Sidhu et al. 2020) we have shown how an important part of the rationale for vertical integration at two of three case study sites was to improve care pathways, and the efficiency of the local health economy, for patients with complex or multiple morbidities. At one of the three case study sites (WP2 and WP3), the model of vertical integration between an acute general hospital and a number of GP practices in the surrounding area developed out of a new care model 'vanguard' that specifically targeted people with three or more conditions, as these were contributing to a high proportion of health care costs in the area. The new care model for people with multiple morbidities commenced in April 2014 and the vertically integrated organisation started in April 2016 and has grown in size since (Stokes et al. 2016). We have reported how vertical integration's success in sustaining primary care and stabilising recruitment has enabled the continuation of service innovations for people with multiple morbidities.

Further evaluation – in the planned phase 2 vertical integration study – and comparison across sites will enable us to throw light on the overall long-term project series related research questions listed above about services for people with multiple morbidities. In the follow-up evaluation, we intend to examine outcomes and impacts, including patient and carer experience, associated with hospitals managing general practice services, and to explore the possibility of undertaking an economic evaluation. We would also examine the extent to which this model of service provision helped or hindered care for people with multimorbidity during the period of the COVID-19 pandemic. We will specifically investigate how well vertical integration is adapted to the health care needs of people with multiple long-term morbidities, for whom local access and well-integrated care are particularly important and in respect of whom the impact of vertical integration on the health care system might be expected to be most prominent. In designing this follow-on project, we will seek the advice of our

Patient and Public Involvement Panel members (having reflected on our initial vertical integration evaluation report) to help identify which outcomes are of specific relevance to people with multimorbidity and how those outcomes might be measured.

Example of a future Type 2 (quantitative) evaluation of multimorbidity: the impact of telephone triage in primary care on inequalities experienced by people with multiple morbidities: a quantitative evaluation

The BRACE Team is undertaking a quantitative evaluation of the effect of 'telephone first' routes to access primary care, comparing the experience of patients with multiple morbidities with the experience of other patients. Telephone triage has become much more frequent during the COVID-19 pandemic and hence evaluation of its impact on people with multiple morbidities is timely.

A study of the 'telephone first' approach shows that many problems in general practice can be dealt with on the telephone, but the approach does not suit all patients and is not a panacea for meeting demand for care (Newbould et al. 2019). That study found that comparing 'telephone first' practices to control practices in England, using responses to the national GP Patient Survey, there was a large improvement in how soon after contacting the surgery the patient got to see or speak to a doctor or nurse. But patients with multiple long-term health conditions are more likely to report poorer experiences in primary care than those with fewer health problems (Paddison et al. 2015).

We are therefore undertaking a rapid, focused and quantitative evaluation (using data already held by the research team) of the impact of 'telephone first' in primary care on inequalities, particularly inequalities experienced by people with multiple long-term conditions, in the length of time it takes someone to see or speak to a doctor or nurse. The importance of the issue has been considerably increased by the response to the COVID-19 pandemic, which has resulted in much greater use than previously of 'telephone first' access to primary care. Knowing whether and how much this increases or reduces inequalities is an essential first step to countering any undesired impacts on inequalities.

Further details of this project are available on the BRACE website, projects page.

Example of a future Type 2 (qualitative) evaluation of multimorbidity: digital first primary care for those with multiple long-term conditions: the views of patients, carers and health professionals

Various studies have examined the use of digital approaches in primary care in recent years, mainly focused on understanding the types of platforms used and how, the impact of this on the practice, and the views of practice staff. In addition, some of the literature has explored whether there are disadvantages of using digital approaches for those patient groups who are at risk of digital exclusion, e.g. older patients, those with less digital confidence, those without access to the required technology. There has been little research to understand the impact on patients with multiple long-term conditions of digital approaches to primary care. Digital first primary care services have often been used for patients with urgent problems, typically 'on the day' appointments, and it is not known how well they are able to address more complex needs, such as for patients with multiple long-term conditions. This type 1 evaluation would examine the views of health professionals, patients with multiple long-term conditions and their carers through a rapid qualitative evaluation.

Although the digital first approach is similar to that of telephone first, methodologically, the proposed evaluations are very different: qualitative primary data collection for the digital first primary care study and quantitative secondary data analysis for the telephone first evaluation. In addition, these two evaluations are designed to give insights into different areas of service

innovation. The telephone triage analysis, although focusing on a more established technology, will provide a quantified analysis of access inequalities for people with multimorbidity. The digital first project provides insight into the experience of patients with multiple long-term conditions and the professionals who care for them. The insights from both projects will inform future primary care delivery in general practice.

Another potential BRACE project for inclusion in our overarching study

Beyond these examples, another topic that has come to our attention through BRACE's horizon scanning activities and that might be considered for inclusion in the longer-term and overarching study is: **Medically unexplained symptoms services in acute trust accident and emergency (A&E) departments**. We know of a small number of hospitals in England that operate an A&E-based medically unexplained symptoms service. An audit at one of these hospitals found that, over a six-month period, 269 patients with medically unexplained symptoms were seen in a total of 1,113 A&E attendances. Following the introduction of the service, there was a 22% reduction in A&E attendances and a 36% reduction in length of stay for those admitted. On the strength of these early data, such services merit more systematic evaluation, including how they work for people with multiple morbidities (which would thus be a Type 1 evaluation).

Synthesis across projects within the overarching study

As set out in our BRACE proposal in 2017 (section 3.3.3), the key elements of our analysis and synthesis work are as follows:

- *Examining what works, and how, at project level* – analysis of data from different sources and methods within each project;
- *Developing cross-cutting themes within and across BRACE projects* – exploring themes emerging from studies, and also as informed by our Health and Care Panel (e.g. workforce redesign, person-centred approaches, use of technology, integration across services and settings, sustainability of new models and approaches);
- *Comparison and synthesis with the wider evidence base* – contextualising findings and deepening understanding, and exploring the overall learning about rapid evaluation within health services research and practice colleagues.

Based on the advice of the BRACE Steering Group, we believe that using a longer-term thematic framework we can organise and situate the three sets of analysis and synthesis activities described in our full BRACE proposal and summarised here. Specifically, we plan to use the longer-term overarching framework as follows.

1) **Undertake synthesis of emerging findings and lessons in relation to what works and how, within each of our evaluations** of service innovations for people living with multimorbidity; and prepare and publish a range of outputs aimed at decision-makers. Further details of these are given in the dissemination and outputs section of this protocol. The work will be undertaken within the set of overall research questions, described earlier, for the BRACE longer-term study, and according to the typology of evaluations shown in Figure 1. The House of Care and SELFIE frameworks will be used throughout the overarching study to provide a comparable structure to the constituent evaluations.

2) **Develop and publish cross-cutting analytical work about common issues that emerge across our portfolio of BRACE projects**. This analytical work will be grounded in the overall research questions that we have developed as a result of reviewing theories and frameworks of multimorbidity and listed above. It is also being shaped by a programme of engagement and challenge work undertaken with our service user and public engagement partners, and our BRACE Health and Care Panel, informed by James Lind Alliance principles and facilitated by Katherine Cowan. The first stage of this work was held on 19 September 2019, when we explored with the Panel themes and concerns associated with multimorbidity – further details are provided in the 'service user and public involvement' section on pages 6-7 of this protocol.

3) **Compare and synthesise the findings from BRACE work in an end of grant report that explores our rapid evaluation work with the wider evidence base**. Topics within this report may include: our experience of using the James Lind Alliance partnership approach in setting and refreshing BRACE priorities; reflections on the methods that work most effectively within a rapid evaluation approach and what these mean for health and social care services researcher skills development; the role and experience of professional and service user partners in a rapid evaluation approach; and how rapid service evaluations might be commissioned in such a way that they are truly rapid, responsive and rigorous.

Expected outputs and dissemination plans

Project-specific outputs

As set out in the previous section (synthesis across projects within the overarching study), individual Type 1A project reports will draw learning about services innovations as experienced by people of all ages living with multimorbidity. In addition, we will, as part of our overarching study, develop papers and other outputs that explore in more depth the implications of our studies for people living with multimorbidity and their carers. These outputs will range from research signals via social media; through concise summaries in podcasts, blogs and pieces for the media; to more detailed briefings for practice, policy and academic audiences – see Boxes 2-4 for possible examples of outputs related to our overarching study for three different types of evaluation within our BRACE portfolio.

Box 2. Example of a Type 1B evaluation output (prompted by findings from two initial BRACE evaluations, multimorbidity is a focus of a more detailed follow-up evaluation of the one of these innovations)

Hospitals managing GP services (vertical integration) and primary care networks

This study is intended as a follow-up to the initial evaluation of how hospitals are managing general practice services (Sidhu et al. 2020). It would include study of impact on patients, by use of routine activity data and qualitative interviews or surveys with patients and carers, where we will examine particularly the impact of these services on people of different ages living with multimorbidity. There would be a **chapter in the main vertical integration (phase 2) project report focused on multimorbidity**.

As part of our longer-term and overarching study, we would use this report chapter as the basis of a range of outputs as described above: from headlines on social media through to **7,000-word BRACE paper (potentially published as an academic journal article)** exploring whether vertical integration brings about better, similar or worse outcomes for people living with multimorbidity. This output

would likely also entail cross-analysis of data and overall themes from the BRACE study of primary care networks (Smith et al., 2020), examining the role and function of vertical integration in helping or hindering efforts by primary care networks to bring about better integrated care (across primary and secondary care) for people with multimorbidity. This **additional analysis of primary care networks evaluation project data** would explore how these organisational networks within primary care might operate in a context of vertical integration of general practice, distilling the risks and opportunities for the provision of well-coordinated services for people living with multimorbidity.

The research questions that we would seek to answer in our multimorbidity focused analysis of vertical integration of general practice would likely include: do these arrangements contain any specific service requirements, payments, incentives or other factors related to the care of people living with multimorbidity? Has vertical integration influenced the extent and type of health service provision in primary care specifically for people with multiple morbidities and, if so, how? And are any of these impacts specifically relevant to people with multiple morbidities and their carers?

The BRACE paper or article will be supplemented by **social media outputs**, **infographics, content for non-peer-reviewed media directed at decision-makers**, **conference presentations** and web-based resources. These will likely include: a **blog by a BRACE researcher**; a **blog by one of the GP members of our Health and Care Panel and another by an acute trust executive director where vertical integration with general practice is in place**; and **podcast or vodcast summaries** by our patient and public involvement advisers of key insights drawn from the analysis.

Box 3. Example of a potential type 2 quantitative evaluation output (multimorbidity is the principal focus of the evaluation project from the outset)

A quantitative evaluation of 'telephone first' in primary care

This study comprises a rapid, focused, quantitative evaluation of the impact of 'telephone first' in primary care on inequalities, particularly those experienced by people with multiple long-term conditions. It builds on and extend prior research by members of the BRACE team (undertaken before the BRACE contract started), with analysis being undertaken of data from the General Practice Patient Survey. The General Practice Patient Survey collects information on long-term whether someone is a carer, and their age, sex and occupation. We are seeking to provide robust, quantitative evidence on the impact of telephone triage on access inequalities with a particular focus on multimorbidity.

The **BRACE evaluation project report and other outputs from this study will have multimorbidity as their main focus**. Questions being addressed include: does a 'telephone first' service affect how quickly people with multiple morbidities contacting a GP practice see or speak to a GP or nurse?; what is the size of that effect relative to the effect on people contacting a GP practice who do not have multiple morbidities? And are any subgroups of the population with multiple morbidities affected particularly beneficially or detrimentally by 'telephone first?

We will prepare and submit **a journal article or BRACE paper**, based on the material in the project report. We will also develop **social media outputs**, **infographics, media content** (including material aimed at GPs and other local decision-makers), **conference presentations,** a **blog by a BRACE researcher**; a **blog by one of the GP members of our Health and Care Panel**; and **podcast or vodcast summaries** by our patient and public involvement advisers.

Box 4. Example of a potential type 2 qualitative evaluation output (multimorbidity is the principal focus of the qualitative evaluation project from the outset)

Digital first primary care for those with multiple long-term conditions: the views of patients, carers and health professionals

This study would explore the experiences of digital first primary care of those with multiple long-term conditions. The evaluation would be undertaken from the perspectives of patients, their carers and health care professionals. We would prepare, as part of our overarching study, a **BRACE briefing paper in digital format (of maximum 7,000 words and for either the NIHR Journals Library or a peer-reviewed journal)** that summarises what can be learned from this evaluation about how digital first forms of primary care affect adults living with multiple long-term conditions.

This paper would respond to research questions including: the experience of digital first primary care for patients with multiple long-term conditions and their carers; the perspectives of health professionals; the impact on the nature of consultations; the advantages and disadvantages for patients; and lessons learned for the future care of patients with multiple long-term conditions.

The BRACE briefing paper would be supplemented by: **conference presentations; infographics and social media outputs**; a **blog by a BRACE researcher**; a **blog by one of our PPI colleagues**; and **talking head video summaries** by our health professional and patient and public involvement advisers of key insights drawn from the analysis.

Cross-cutting outputs

In addition to the dissemination of specific evaluation projects proposed above, we will develop **cross-cutting analysis, focused on the needs and issues of specific relevance to people living with multimorbidity, their carers, families and professional supporters**.

This will be published in a BRACE paper (or 2-3 papers, depending on the depth and extent of material gleaned) and will cover cross-cutting issues such as:

- implementing service innovations for people with multimorbidity in and with general practice;
- the role of digital service innovations in disrupting (or not) general practice and community health services with a view to enabling better integrated care for people with multimorbidity;
- the role of organisational and professional networks in enabling or inhibiting service innovations in primary care and community settings for people with multimorbidity;
- the ways in which service innovations for people living with multimorbidity proved effective (or not) during the upheaval in society and the health and care system during the COVID-19 pandemic and its aftermath; and
- where we have available data from our BRACE studies, the similarities and differences across different age groups or geographic regions (e.g. urban, rural).

The paper(s) will have a concise **executive summary that will be published as a stand-alone report** in digital format, highlighting the overarching findings from each study or thematic analysis in relation to service innovations for people living with multimorbidity, focused on shared learning for the future implementation and development of services, which may be of particular interest to NHS and social care commissioners and providers. This **executive summary report will also be produced**

in a lay format (including in a range of accessible media), this being guided and developed with our PPI advisers. We will also develop **infographics, and pod-/vodcasts** to enable different forms of dissemination to a wider range of audiences.

Some of the material for this paper will come from synthesis of the analyses and outputs from the proposed projects described in Boxes 2-4 above. Other data and insights will be gleaned from specific additional interrogations of our evaluation data, along with targeted reviews of published research evidence, and as necessary survey or focus group work to test out and refine emerging themes. This testing out will include close working with our patient and public involvement advisers, Health and Care Panel, and National Voices co-applicant, on an ongoing and iterative basis.

Project timetable

One of the individual projects that falls within the overarching study is the evaluation of acute hospitals managing general practice services (vertical integration). Scoping work for that evaluation commenced in January 2019 and the report was published in December 2020. A follow-up study is envisaged, commencing in summer of 2021 and lasting one year, to examine outcomes and impacts on patients, including a focus on those with multimorbidity, and to explore the possibility of undertaking an economic evaluation. The precise timing of this follow-up study will be determined by the course of the COVID-19 pandemic, and extent to which hospital-managed general practice is functioning in a way that enables us to undertake evaluation with the sites.

The protocol has been approved for a (type 2) quantitative evaluation study of inequalities in access to GPs and nurses in primary care with telephone triage, with a focus on people with multiple long-term morbidities. The project started in January 2021 and will be completed in summer 2021.

A protocol has been submitted for a (type 2) qualitative evaluation of digital first primary care, with a central focus on how such services work for patients of all ages living with multiple morbidities, and their carers. Subject to approval of the full protocol for this project, an evaluation of digital first primary care will commence in summer 2021 and last approximately nine months.

Rapid evaluations for inclusion in the longer-term overarching study of multimorbidity will start no later than March 2022, so that all are completed by the end of March 2023. The total number of evaluations within the overarching study is yet to be determined but we expect that the majority of the total evaluations undertaken by BRACE over the five years to March 2023 will be within the remit of the longer-term series of projects.

Research team

The principal investigator (PI) for the overarching study is Professor Judith Smith, and the overall project manager is Jon Sussex. Judith and Jon receive administrative support from within their respective University of Birmingham and RAND Europe teams. Dr Brandi Leach (RAND Europe) provides research support to Judith and Jon across the overarching study; and other members of the BRACE team of researchers contribute as appropriate to particular evaluation projects and/or portfolio analysis within the overarching study.

Individual projects within the BRACE portfolio each have their own research teams. For example, the (Type 1A) vertical integration project described earlier had a project team of: Jon Sussex (RAND Europe) as Principal Investigator, Dr Manbinder Sidhu (University of Birmingham) as Project

Manager, and Akis Gkousis (RAND Europe) as the additional researcher. The principal investigator for the quantitative evaluation of the impact of telephone triage in primary care on inequalities experienced by people with multiple morbidities is Dr Catherine Saunders (University of Cambridge) and supported by colleagues from RAND Europe and the University of Cambridge. Future projects will have similar staff structures, with project team members drawn as appropriate from the BRACE partner organisations: University of Birmingham, RAND Europe and University of Cambridge. For example, the principal investigator for the evaluation of digital first primary care for those with multiple long-term conditions will be Dr Jennifer Newbould (RAND Europe), supported by a research team from RAND Europe and University of Birmingham.

Project management, governance and delivery

Each evaluation within the overarching study has a principal investigator, who is responsible for the overall delivery and quality assurance of the project, and a project manager, who is responsible for the day to day management of inputs by the BRACE research team. Professor Judith Smith is principal investigator for the longer-term overarching study and Jon Sussex is the project manager for this. Judith and Jon are supported by Dr Brandi Leach across the study.

We will apply the following project management principles and processes to each constituent evaluation in the series: ensuring clarity of team members' roles, and the delegation of tasks and reporting duties; internal team meetings and catch-ups; and use of project planning tools (such as Gantt chart, timesheets, internal monitoring reports). RAND Europe's approach to project management is guided by its ISO 9001:2015 certification. Detailed management arrangements for individual projects may vary but they will always include team teleconferences/meetings held at least monthly and sometimes weekly in order to update progress and address any arising issues promptly. Project teams will report to the BRACE Executive team, BRACE Steering Group, and to NIHR Health Services and Delivery Research secretariat as and when required. Examples of typical potential risks to individual projects and corresponding mitigation strategies are described in Table 1.

Table 1. Potential risks and mitigation strategies for individual evaluation projects and the overarching study as a whole

Risk	Impact	Likelihood	Mitigation
Loss of key staff	Medium	Low/ Medium	Although the team working on any individual project may be small (e.g. the team for the vertical integration evaluation comprises three main researchers), BRACE can call on a much larger team of experienced health services researchers within the University of Birmingham Health Services Management Centre and RAND Europe. In the event of one member leaving, there exists the capacity and resources for this person to be replaced, as has been demonstrated with staffing changes made in the first two years. Over the life of the longer-term project series there is a greater risk than for an individual evaluation project. Continuity of most, particularly senior, staff can be relied

			upon over a three to four-year period. If there were to be an unavoidable change in senior staffing, University of Birmingham Health Services Management Centre and RAND Europe are committed to ensuring substitution of appropriately qualified senior staff, and doing so in close consultation with NIHR Health Services and Delivery Research Programme. In addition, explicit handovers between outgoing, remaining and incoming team members will be implemented and all project documentation filed and kept up to date by the individual project managers and the overall series manager.
Non-engagement by key stakeholders or case study sites	High	Medium	The success of a rapid evaluation depends on the co-operation of interview targets and case study sites in support of processes associated with appropriate governance approvals, participant recruitment, and data collection in a timely fashion. Our project teams put particular effort into building and maintaining relationships with key stakeholders including at case study sites.
Delays obtaining data	Medium	High	We have applied for, and received, Hospital Episode Statistics data from NHS Digital, ahead of specifying the details of individual evaluations, to avoid delays obtaining data post-scoping of individual projects. General Practice Patient Survey data, for the quantitative evaluation of the impact of telephone triage in primary care on inequalities experienced by people with multiple morbidities, are already held.
Loss of data	High	Low	Although unlikely that data loss would occur, the University of Birmingham and RAND Europe have resilient, well-tested IT systems with data from all computers backed up in multiple locations which would enable the recovery of any lost data on local servers. Transfer of data from evaluation sites to RAND Europe, University of Birmingham and University of Cambridge is always done according to GDPR guidelines.
Delays due to inability to recruit participants/ accessing data/ observations of meetings	High	Medium	There is a risk that we may be delayed in recruiting participants and completing observations in a timely manner, including if local research governance approvals prove to be slow. At each evaluation site, the project team will identify a key point of contact who will facilitate recruitment and data collection. The team will produce detailed, descriptive information sheets to inform potential participants of the importance of the

			evaluation, why we have asked them to take part, their involvement, and associated risks and benefits. Our researchers are available to conduct interviews, attend meetings, and so on, outside normal 'office hours' to ensure maximum flexibility in meeting or speaking to research participants at times convenient to them.
Changes to NHS or social care policy while the evaluation is in progress	High	Medium	There is always a risk that changes to NHS or social care policy may be introduced during an evaluation and may influence the nature of the data we collect and the relevance of the consequent findings. This risk is commensurately greater the longer the project duration and is likewise greater for the overarching study. Such changes are unavoidable, when they happen, but our team members keep up to date with actual and potential NHS and social care policy changes, which gives the maximum opportunity to adjust data collection and to analyse data appropriately.

An overall project plan based on this protocol will be developed for the overarching study, and kept updated as new projects are drawn into the study, thematic analyses are planned and completed, and outputs scoped and delivered. Judith Smith, Jon Sussex and Brandi Leach will meet on a quarterly basis specifically to review progress of, and plan further, for the elements of the overarching study. This is in addition to their fortnightly team meetings. Other members of the BRACE team will be invited to the quarterly review meeting as appropriate to the constituent project(s) being worked on, and wider team members involved in portfolio analyses.

All reports and other deliverables will be peer reviewed by the BRACE Director (Professor Judith Smith) and a minimum of three people, drawn from: BRACE's academic critical friends (Professors Mary Dixon-Woods (University of Cambridge) and Russell Mannion (University of Birmingham)), the BRACE Health and Care Panel (including PPI colleagues, and the BRACE Steering Group.

Ethical issues

For each of the evaluations within the BRACE portfolio we will seek, as appropriate, governance and research ethical approval from the University of Birmingham ethics committee (as sponsor) and the NHS Health Research Authority, and local NHS Research and Development governance committees to recruit participants and collect data. We will work closely with the University of Birmingham's Head of Research Governance and Integrity, seeking her advice as appropriate.

We provide information sheets – hard copy and/or online as appropriate – to all participants taking part in each evaluation, which detail each evaluation's aim, study design, risks, benefits, who the participant may contact if they have further questions, and their right to withdraw from the study at any point. Potential participants in interviews will receive an email of invitation along with a participant information sheet or link to an online equivalent, and they will only be included if they give written consent.

Where meeting observations are part of the evaluation method, due to the possibly sensitive content of discussion in stakeholder meetings, some participants may feel uncomfortable being observed. Along with explaining the purpose of the study and rationale for completing observations, meeting participants are given the opportunity to state if they would like to be omitted from the recording of observations. We will obtain written consent for those who agree to be observed.

The University of Birmingham holds the relevant insurance cover for this longer-term series of projects, as confirmed via the BRACE contract with NIHR.

The University of Birmingham will act as the overall sponsor and guarantor for this overarching study.

Interview and observation data collected on NHS sites are anonymised before leaving the premises and data is brought back to the University of Birmingham or RAND Europe or the University of Cambridge in a secure and encrypted format. Data are stored on research team laptops where they are both password and bit locker protected. Electronic data are held securely on a restricted access network and any paper-based data are stored in a locked filing cabinet. Participant identifier codes are stored separately from the anonymised interview transcripts.

The project team will store data at the University of Birmingham (except for data from NHS Digital, which will be held at RAND Europe as described in the following paragraph) for up to five years after data collection is complete or until it is no longer necessary. These data will then be archived in accordance with University of Birmingham research governance processes.

RAND Europe, on behalf of BRACE, has requested and received record-level, pseudonymised data from NHS Digital from the following four data sets: Emergency Care Data Set; Hospital Episode Statistics (HES) Admitted Patient Care; HES A&E; HES Outpatient. This data request has been made to allow the team to undertake rapid quantitative evaluative studies of emerging service innovations, including those which are parts of the overarching study. Data flow from NHS Digital to RAND Europe by secure transfer and are stored on a secure server at RAND Europe. The data will be managed by RAND Europe and all data processing will also be carried out on site at RAND Europe's offices.

Data will be shared with University of Birmingham or University of Cambridge colleagues or any other third parties only in aggregated form with small numbers suppressed in line with the HES Analysis Guide. Data will only be accessed by named individuals who will sign a project-specific user agreement (specific to each rapid evaluation) before they are allowed to access the data. This will be drafted to reflect the terms of the data sharing agreement signed between the three BRACE organisations and NHS Digital, and will ensure that staff working with the data understand their obligations and the restrictions on permissible use. Access to the data will only be for the purposes of BRACE evaluations, by BRACE staff and on a need to know basis.

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