The Frail Individual: Uncovering the Complexities in Care and Support Across Three Common Distinct Settings.

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A Thesis Submitted to Imperial College London for the Degree of Doctor of Philosophy

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Declaration of Originality

I, David James Sunkersing, confirm that the work presented in this thesis is my own. Where information has been derived from other sources or carried out in collaboration with others, I confirm that this has been indicated and referenced appropriately in the thesis.
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Acknowledgements

I would like to acknowledge and thank a number of different people who have helped and supported me throughout this process.

I would firstly like to express my sincere gratitude to my supervisors, Professor Derek Bell, Professor Julie Reed and Professor Finbarr Martin, for all their help, kindness and support over the past few years. It has been a privilege to have been supervised by them; their guidance, expertise and insight have been thoroughly invaluable. I have learnt so much from them.

In particular, I am also grateful for the input of all my colleagues I have worked with (past and present) at the Collaboration for Leadership in Applied Health Research and Care North-West London (CLAHRC NWL) and Imperial College London – and for all their advice, encouragement, friendship and humour.

Likewise, I am incredibly thankful to all the participants in the research, who so generously gave up their time to offer advice, support or be interviewed in this study. Without their input, it would not have been possible to conduct some of the research described in this thesis.

I would also like to thank the National Institute for Health Research (NIHR) for funding this study. The NIHR have provided ongoing support and learning opportunities throughout this process, which have been invaluable experiences.

Finally, I would like to thank and dedicate this thesis to my father, mother and brother. I am forever grateful for their constant support, time and encouragement.
Abstract

Introduction

By 2050, an estimated 2 billion people will be 65 years or older, bringing significant implications for health and social care. One implication – frailty – will affect patients, staff and healthcare settings. There is a need for improved recognition and care and support of frail individuals.

Aims

This thesis aims to uncover the complexities in the care and support of frail individuals across three distinct settings. A high-level study investigated the non-acute care setting, followed by investigating three distinct settings: community, acute hospital care and nursing homes.

Methods

A mixed-methods approach was used. Following a literature review, a survey (questionnaire) helped better understand ‘assessments for frailty’ used in the non-acute care setting. In the community setting, semi-structured interviews were undertaken with patients and healthcare professionals, using a participatory approach. In the acute care setting, a cross-sectional study of frail patients was conducted using patient data records. Regarding nursing homes, an online survey (questionnaire) helped investigate how frailty is assessed.

Results

Frailty is often understood and assessed as physical and mental health deficits. The perceptions of healthcare professionals and frail individuals regarding frail care and support networks overlap, but are distinct with different emphases. In acute care, variation in frail individuals’ living arrangement pre-admission and post-discharge was found, with a high proportion being discharged to a nursing home. Great variation in assessing for frailty was found in nursing homes.

Conclusion

Highlighted is the importance of family and friends in the care and support of frail individuals. Many hospital patients were discharged to settings with enhanced care and support availability, demonstrating the importance of care and support. ‘Assessing for frailty’ may require review to ensure holistic consideration of individuals and better frailty recognition. This may help improve the care and support of a frail individual and outcomes.
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Publications, Presentations and Training Courses

Publications


Presentations

Regional

NIHR

- Patient Safety Translational Research Centre (PSTRC)/Centre for Patient Safety and Service Quality Symposium (2016) (Poster Presentation)
- London CLAHRC’s Career Development Conference (2016) (Poster Presentation)

CLAHRC NWL

- Collaborative Learning Event (2016) (Oral Presentation)
- Research Partners Meeting (2016) (Oral Presentation)
- Frailty Steering Group (2016) (Oral Presentation)
- Research Partners Meeting (2017) (Oral Presentation)
- Collaborative Learning Events (2016 - 2018) (Poster Presentations)

IMPERIAL COLLEGE LONDON

- PhD Forum (2015 - 2018) (Oral Presentations)
- Department of Medicine: ‘Rising Scientist Day’ (2017 - 2018) (Poster Presentations)

National


International

• The International Society for Quality in Health Care (ISQua) Conference (2017) *Measuring frailty* (Oral Presentation)

• The International Society for Quality in Health Care (ISQua) Conference (2018) *The Frail Individual: Uncovering the Complexities in Care and Support from Pre-Admission to Discharge* (Poster Presentation)

**Training Courses**

**Imperial College London Training Courses**

• Project Management for Researchers (2015)

• Writing for Publication (2015)


• EndNote (2015)


• An Introduction to Career Planning for 1st Year PhDs: Life Sciences & Medicine (2015)

• Plagiarism Awareness Online Course (2016)

• Mini MBA - Introduction to Business: Organisations (2016)

• Mini MBA - Introduction to Business: Strategy (2016)

• Writing for Success 5: Thesis (2017)

• Maximising Management Skills 2: Time Management Strategies for your PhD (2017)


**Other Courses**

• NIHR Infrastructure Doctoral Research Training Camp: Developing Your Post-doctoral Career: Attracting Health Research Funding (2016)


**The National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) Northwest London: Frailty Theme (2015-
Throughout the PhD programme, I was part of the ‘Frailty Theme’ workstream at NIHR CLAHRC Northwest London, the group hosting the PhD programme. In addition to supporting the work of the theme, I was a frailty steering group member, providing advice and feedback on various studies. I additionally worked on the evaluation of the ‘Frailsafe’ intervention project. This project was an evidence based-checklist aiming to be implemented in hospital settings to improve care for frail older people. My role in the evaluation included hospital site visits to interview staff members on the use of ‘Frailsafe’, contributing to evaluation meetings and learning events with the Frailsafe Collaborative faculty. I was acknowledged in a publication of the evaluation of Frailsafe (Papoutsi et al., 2018).
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<tbody>
<tr>
<td>AAU</td>
<td>Acute Assessment Unit</td>
</tr>
<tr>
<td>A&amp;E</td>
<td>Accident and Emergency</td>
</tr>
<tr>
<td>ACE-R</td>
<td>Addenbrooke's Cognitive Examination</td>
</tr>
<tr>
<td>ADLs</td>
<td>Activities of Daily Living</td>
</tr>
<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td>AMPS</td>
<td>Assessment of Motor and Process Skills</td>
</tr>
<tr>
<td>AMU</td>
<td>Acute Medical Unit</td>
</tr>
<tr>
<td>BGS</td>
<td>British Geriatrics Society</td>
</tr>
<tr>
<td>CAF</td>
<td>Common Assessment Framework for Adults</td>
</tr>
<tr>
<td>CAPE</td>
<td>Clifton Assessment Procedures for the Elderly</td>
</tr>
<tr>
<td>CCG</td>
<td>Clinical Commissioning Group</td>
</tr>
<tr>
<td>CFS</td>
<td>Clinical Frailty Scale</td>
</tr>
<tr>
<td>CGA</td>
<td>Comprehensive Geriatric Assessment</td>
</tr>
<tr>
<td>CLAHRC</td>
<td>Collaboration for Leadership in Applied Health Research and Care</td>
</tr>
<tr>
<td>CLCH</td>
<td>Central London Community Healthcare Trust</td>
</tr>
<tr>
<td>CMHTs</td>
<td>Community Mental Health Teams</td>
</tr>
<tr>
<td>COSMIN</td>
<td>COnsensus-based Standards for the selection of health Measurement INstruments</td>
</tr>
<tr>
<td>CQC</td>
<td>Care Quality Commission</td>
</tr>
<tr>
<td>DHSC</td>
<td>Department of Health and Social Care</td>
</tr>
<tr>
<td>DS</td>
<td>David Sunkersing</td>
</tr>
<tr>
<td>DTOCs</td>
<td>Delayed Transfers of Care</td>
</tr>
<tr>
<td>eFI</td>
<td>Electronic Frailty Index</td>
</tr>
<tr>
<td>EHRs</td>
<td>Electronic Health Records</td>
</tr>
<tr>
<td>ELSA</td>
<td>English Longitudinal Survey of Ageing</td>
</tr>
<tr>
<td>ENRICH</td>
<td>Enabling Research in Care Homes</td>
</tr>
<tr>
<td>EPR</td>
<td>Electronic Patient Record</td>
</tr>
<tr>
<td>FAEs</td>
<td>Finished Admission Episodes</td>
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<td>FCEs</td>
<td>Finished Consultant Episodes</td>
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<tr>
<td>FES</td>
<td>Falls Efficacy Scale</td>
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<tr>
<td>FEWS</td>
<td>Frailty Early Warning Score</td>
</tr>
<tr>
<td>FRASE</td>
<td>Falls Risk Assessment Scale for the Elderly</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GMS</td>
<td>General Medical Services</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
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<tr>
<td>HCP</td>
<td>Healthcare Professional</td>
</tr>
<tr>
<td>HCPP</td>
<td>Healthcare Professional Perspective</td>
</tr>
<tr>
<td>HES</td>
<td>Hospital Episode Statistics</td>
</tr>
<tr>
<td>HOME FAST</td>
<td>The Home Falls and Accidents Screening Tool</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>HRA</td>
<td>Health Research Authority</td>
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<tr>
<td>IADLs</td>
<td>Instrumental Activities of Daily Living</td>
</tr>
<tr>
<td>ICD-10</td>
<td>International Statistical Classification of Diseases and Related Health Problems, Tenth Revision</td>
</tr>
<tr>
<td>ISMS</td>
<td>Information Security Management System</td>
</tr>
<tr>
<td>LTCIOA</td>
<td>Long-Term Care Institutions for Older Adults</td>
</tr>
<tr>
<td>MDT</td>
<td>Multi-Disciplinary Team</td>
</tr>
<tr>
<td>MFGM</td>
<td>Milk Fat Globule Membrane</td>
</tr>
<tr>
<td>MHCLG</td>
<td>Ministry for Housing, Communities and Local Government</td>
</tr>
<tr>
<td>MHRA</td>
<td>Medicines and Healthcare Products Regulatory Agency</td>
</tr>
<tr>
<td>MMSE</td>
<td>Mini-Mental State Examination</td>
</tr>
<tr>
<td>MoCA-BLIND</td>
<td>Montreal Cognitive Assessment</td>
</tr>
<tr>
<td>MUST</td>
<td>Malnutrition Universal Screening Tool</td>
</tr>
<tr>
<td>NEWS</td>
<td>National Early Warning Score</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>NICE</td>
<td>National Institute for Health and Care Excellence</td>
</tr>
<tr>
<td>NIHR</td>
<td>National Institute for Health Research</td>
</tr>
<tr>
<td>NWL</td>
<td>North-West London</td>
</tr>
<tr>
<td>OADR</td>
<td>Old-Age Dependency Ratio</td>
</tr>
<tr>
<td>ONS</td>
<td>Office for National Statistics</td>
</tr>
<tr>
<td>PP</td>
<td>Patient Perspective</td>
</tr>
<tr>
<td>PCTs</td>
<td>Primary Care Trusts</td>
</tr>
<tr>
<td>PPI</td>
<td>Patient and Public Involvement</td>
</tr>
<tr>
<td>PRISMA</td>
<td>Preferred Reporting Items for Systematic Reviews and Meta-Analyses</td>
</tr>
<tr>
<td>PT/BR</td>
<td>Portuguese</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RCGP</td>
<td>Royal College of General Practitioners</td>
</tr>
<tr>
<td>SAP</td>
<td>Single Assessment Process</td>
</tr>
<tr>
<td>SHAs</td>
<td>Strategic Health Authorities</td>
</tr>
<tr>
<td>SMART</td>
<td>Smart, Measurable, Achievable, Relevant and Time-Bound</td>
</tr>
<tr>
<td>SNA</td>
<td>Social Network Analysis</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>STOPIT</td>
<td>Screening Tool of Older People’s Prescription Review</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>US/USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
<tr>
<td>WLMHT O.T.</td>
<td>West London Mental Health Trust Occupational Therapy</td>
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</table>
Chapter 1: Introduction

Globally, we are living longer. Though representative of great advances in medicine, population health, technology and research, many challenges are associated with increases in life expectancy.

Increasing life expectancy increases the risk of disease, disability, dementia and advanced ageing before death (Brown, 2015; Xie et al., 2008, Brayne, 2007). Moreover, with advancing age, the risk of frailty increases (Lunenfeld and Stratton, 2013; Ahmed et al., 2007; Clegg et al., 2013; Hanlon et al., 2018). A recent UK study found that the prevalence of frailty rose with increasing age – from 6.5% in those aged 60-69 years to 65% in those aged 90 and over (Gale et al., 2014).

In the UK, frail individuals can be encountered by clinicians in a wide variety of stages and settings (Busby-Whitehead et al., 2016). However, recognised strains in acute care (e.g. financial and staffing pressures) exemplify the need for better planning in the care and support of frail individuals (Coulter et al., 2013).

The chapters in this thesis aim to investigate the complexities in care and support across three common and often interrelated settings which patients can and do move between (community care, acute care (hospital) and nursing homes). In this thesis, the complexity of care and support of people living with frailty is demonstrated through the intricate or complicated qualities associated with the recognition of and care and support of frail individuals across these three settings.

In the distinct settings studied (community care, acute care and nursing homes) long-held patterns of practice may be combined with newer or emerging methods to address any challenges and opportunities faced (Liebler and McConnell, 2017). The settings may also experience constant change with regards to patient demand, staffing and ways of working within these settings (NHS, 2019; The King’s Fund, 2018).

Moreover, given the broad definitions of frailty in use (and a condition or state that may not even be formally diagnosed) (Young, 2014), this PhD thesis incorporates and examines a number of different perspectives of patients and healthcare professionals regarding the care and support of frail individuals across the settings studied.

1.1 PhD Thesis Structure
This introductory chapter aims to provide insight and background to a current and increasing challenge for health and care systems: frailty. It describes how frailty can be viewed as a complex, multidimensional condition – examining and detailing some of the current and emerging challenges this long term condition brings. Given this, the research and work described in this thesis aims to address the topic of frailty with consideration of different dimensions. Hence, the studies undertaken have been purposefully planned to incorporate a broad range of people and health and social care settings. Particular attention has been made to incorporate patient involvement, especially involving individuals who have a lived, current experience of frailty.

This chapter introduces the topic of ageing and the associated implications for health and social care. The introduction elaborates on one crucial public and population health implication of ageing, namely frailty, the main focus of this PhD thesis. An examination and review of the literature follows, highlighting current frailty care and support and what is known and practised across settings. After identifying research needs and formulating research questions for this thesis, a systematic literature review (regarding assessing for frailty in the non-acute care setting) is detailed (Chapter 2). This is followed by a chapter outlining the research methods used (Chapter 3). Four studies (1 high-level study in non-acute care and 3 studies in distinct care settings (community, acute care and nursing homes)) are then detailed (Chapters 4-7). The studies in this thesis examine different settings, each with a defined group of frail individuals and reflect aspects of a care journey (e.g. from the community setting through to the nursing home setting).

The first study detailed is a high-level study set in the non-acute care setting (Chapter 4). This study investigates the views of health care providers across this setting, including those with academic and clinical expertise (with regards to assessing for frailty) informing future studies in this thesis, particularly the study in the nursing home setting.

The next study (Chapter 5) was based in a specific community setting (a Falls Prevention Service) and used a participatory approach centred on a semi-structured interview. In this thesis, the patients attending a ‘Falls Prevention Service’ are exemplars of individuals likely to be frail while living in the community.

The next study uses data from a routinely used electronic patient record (EPR) system in acute care (hospital) to understand the care and support of frail individuals (over 65 years and classified at risk of falls) pre-admission, during admission and post-discharge (Chapter 6). This
is followed by a study that aims to understand what constitutes an ‘assessment for frailty’ in nursing homes using a survey approach (questionnaire) (Chapter 7).

Overall analysis and discussions are detailed in each chapter, which leads to a general discussion and suggestions for further work in the field (Chapter 8). The studies have taken a tailored approach to the local community, primarily focusing on the practices within North-West London, where the research group that hosts me as a PhD candidate (CLAHRC NWL) is based.

Details of how all these studies are integrated, explaining the rationale behind their choice are explained later in this chapter (1.6.5: Research Settings Selected and How They Are All Linked).

The studies within this thesis have been planned in a way that considers the frail individual, in addition to healthcare professionals and others that may be involved in their care. The care and support of frail individuals is complex; it is hoped that this thesis contributes to the accurate identification of these complexities and potential areas that require more improvement. Moreover, there was an aspiration that through the completion of the studies as detailed within this thesis, there would be a contribution to better services and care of frail individuals.

This thesis closely follows the ‘Compromise Model’ (Dunleavy, 2003). As a brief overview, an initial review of the literature has taken place to provide reasoning and rationale for the research. Following this, there is a move into the core chapters of the study, each of which detail some of the known complexities in the care and support of frail individuals and which an investigation of three distinct settings takes place. Each chapter includes an analysis and discussion of the findings. Finally, the thesis concludes with a general discussion of the findings, their relevance and how they may impact policy and practice. Of note, the term ‘Health and Care’ has been used to encompass health, clinical practice and social care, as is done for The National Institute for Health and Care Excellence (NICE) and other organisations, such as the King’s Fund (The King’s Fund, 2020).

1.2: Setting the Scene

This section gives a background to current global demographics, ageing and implications of ageing for health and social care settings, providing the rationale for the research.

1.2.1: Global Demographics
World population has experienced continuous growth since the 14\textsuperscript{th} Century following the Black Death, when estimates of the global population were approximately 320 million (Caselli et al., 2006). According to the latest figures from the United Nations, the current world population of approximately 7.6 billion is anticipated to reach 8.6 billion by 2030 and 11.2 billion in 2100 (United Nations, 2017). The report indicates that a significant proportion of the future global increase in population will be attributed to a small number of countries – pointing towards higher life expectancy worldwide. Notably, the report cites that over 50\% of global population growth by 2050 is expected to occur in Africa, followed by Asia and Latin America.

Current global demographics suggest there are approximately 102 men for every 100 women, with children under 15 representing roughly 26\% of global inhabitants and older people (aged 60 years or over) representing 13\% (United Nations, 2017).

However, while projected global populations are expected to grow further, Roser et al. (2019) suggest that this growth rate is likely to slow (from an estimated growth rate of 1.08\% in 2019 to 0.1\% in 2100). The projected values and estimates depend on several different variables, including political risk, financial stability and availability of health services (World Bank, 2018). Of importance, the United Nations 2017 report describes that a recent reduction in fertility levels has been a major contributing factor responsible for an older, ageing population.

### 1.2.2: Population Ageing

By 2050, it is estimated that there will be 2.1 billion people 60 years or older (United Nations, 2017), with Europe currently having the highest percentage of population 60 years or older (25\%) (United Nations, 2017). In the UK, the number of individuals between 65-84 years and over 85 is set to increase by 39\% and 106\% respectively from 2012 to 2032 (The King’s Fund, 2012).

The expectation is that all regions of the world apart from Africa will have over 25\% of their population over 60 by 2050 (United Nations, 2017).

The implications of population ageing include a measurable impact on global economic, social and environmental and policy. The current evidence suggests that future populations are more likely to live in cities and experience demographic and family changes that may result in fewer older people with families to care for them (National Institute on Aging, National Institutes of Health and World Health Organization, 2011). This will have several implications, as discussed below.
1.2.3: Implications of Ageing on Health and Social Care

Ageing populations greatly influence – and will further influence – the way that health and social care is managed, posing economic and social challenges to healthcare systems and services. This will impact both a population and individual level. In the UK, a health and social care governmental policy response has been suggested as a requisite to manage this challenge (UK Parliament, 2015).

A recent Department of Health report suggests that individuals with long term conditions (the prevalence of which increases with age) and the associated care provision account for approximately 70% of the total health and social care spending in England (Department of Health, 2013). For example, it is estimated that an 85-year-old is 14 times more likely to be admitted to hospital for medical reasons than people aged between 15 and 39 years (Department of Health, 2008). Recent figures show that one in three people over 65 years suffer a fall – with the cost to the NHS and social care from hip fractures estimated to be £6 million per day, or £2.3 billion per year (NHS England, 2018a). Delirium, another common condition in older people (Young and Inouye, 2007), adds an estimated £1,275 per patient to the costs of an acute hospital episode of care (NHS England, 2014).

Despite the costs outlined above, critics have argued that the economic costs of ageing/old-age dependency have been exaggerated, due to misleading measures of population ageing (Spijker and MacInnes, 2013), for example, with the use of the old-age dependency ratio (OADR) (ONS, 2019). The OADR has been criticised, as it presumes that individuals will be dependent on others when they reach 65 years old (Sanderson and Scherbov, 2010). Additionally, similar indicators have been argued to be less useful as individuals work beyond the State Pension age (ONS, 2019). In contrast, measures that compare economically active and inactive groups (and consider life expectancy) are suggested as more useful indicators that more accurately predict the cost implications related to the dependency of ‘old-age’ populations (Spijker and MacInnes, 2013; ONS, 2019). Either way, there is a recognised economic cost of frailty.

A King’s Fund report highlighted the correlation between increased health and social service use and age, noting that the majority of patients in hospital and the community were over 75 (Cornwell, 2012). Moreover, the majority of people nursed at home with help for various aspects of daily living are also 75 and older. Importantly, work by Thorlby et al. (2018) found that adult social care spending in the UK has fallen by 9.9% between 2009/10 and 2016/17, with a reported 6.6% vacancy rate for the adult social care sector in 2016/17. This reduction in
funding for adult social care will have significant implications, especially with increasing life expectancy and ageing populations.

Presently, Thorlby et al. (2018) indicate that informal carers ‘absorb’ some of the pressures that social care is facing from increasing life expectancy and ageing populations. This is supported by a House of Lords briefing that suggested an estimated 1.1 million people aged 65 and over (21% of the overall population aged 65 and over) provided some form of informal care (House of Lords, 2018). Hence, an urgent need for innovation and improvement in health and social care services exists, to ensure the needs of the population can be met now and in the future. This may be considered especially urgent given a distinctive health state related to the ageing process – frailty.

1.3: Frailty

In this section, definitions of frailty, its pathophysiology, prevalence, methods of identification, assessment, progression, management, transitions of care and settings will be investigated.

1.3.1: Definitions of Frailty

While several definitions of frailty have been proposed, to date, there is no clear consensus on the definition of frailty (Lally and Crome, 2007; Rodríguez-Mañas, et al., 2013; Rockwood and Howlett, 2018). Nevertheless, a shared view of frailty is commonly one of an older person at heightened vulnerability to adverse health status or functional change (Rockwood and Howlett, 2018; Kojima et al., 2019).

Frailty is more prevalent in older people and those with the greatest burden of multimorbidity and disability (Veronese, 2020). Though frailty, multimorbidity and disability are related, Fried et al. (2004) emphasise that clinically, not all frail patients are disabled (and vice versa) and multimorbidities may or may not be present in these patients. Frailty is therefore said to be conceptually and epidemiologically distinct, conferring specific care needs and prognosis (Fried et al., 2004).

The understanding of frailty has developed significantly since the 1960s, where research described frail patients as ‘confused’, ‘restless’, ‘incontinent’ and ‘old’ (British Medical Journal, 1968), to later research that described frail patients as ‘elderly people’ having ‘multiple problems’ (Pawlson, 1988). Cohen et al. (2016) note that since then there has been a progression in the understanding of frailty – and that two main frailty models are commonly
cited in literature. These are the Fried (or phenotypic) model (Fried et al., 2001) and Rockwood (or cumulative deficit) model (Rockwood et al., 2007).

In the phenotypic model, frailty is defined in terms of presence or absence of specific phenotypic characteristics (weakness, slow walking speed, unintentional weight loss, exhaustion, and low physical activity). This approach considers frailty as an age-related health state with treatment aimed at cure, improvement or avoiding progression of the condition (Boers et al., 2015). Although commonly cited, this model has been criticised, as it may not reflect a completely multidimensional view of frailty (e.g. exclusion of cognition and mental health domains, which have shown to be important makers of frailty) (Rodríguez-Mañas et al., 2012; Wou and Conroy, 2013).

In contrast, in the cumulative deficit model, frailty is defined in terms of the total number of potentially adverse age-related deficits (or risk factors) across multiple domains. These deficits, or risk factors, may predispose a person towards a health condition or outcome (e.g. death or hospitalisation) (Boers et al., 2015). These deficits are combined to form a ‘frailty index’ – a value on an interval scale. This ‘frailty index’ reflects the actual deficits an individual scores. The higher the number of deficits, the higher the frailty index and the greater likelihood the individual will be frail. The risk factors can be treated for the condition or outcome to be prevented (or lessen the chance of it occurring) (Boers et al., 2015). Wou and Conroy (2013) point out that while this model offers a more encompassing view of frailty, the suitability in the clinical setting may be limited due to time pressures clinicians have. A further criticism of the model is that the weighting of each deficit may need to be considered, since some deficits may be more associated with adverse outcomes than others (Wou and Conroy, 2013).

Based on these main models of frailty (and that they are commonly cited), it has been suggested that the predominant view and definitions of frailty focus on the risk of future outcomes (Boers et al., 2015).

A review of the available literature provides many examples detailing that frailty represents both physical and functional declines (Fisher, 2005) affecting multiple body systems (Fried et al., 2004; Clegg et al., 2013; Howlett and Rockwood, 2013). By its nature, frailty is multifaceted and highly complex. Multiple long term conditions are said to make frailty as a phenotype more likely and can contribute (with other domains) to deficit frailty (Turner and Clegg, 2014). Notably, however, a distinction must be made between frailty, long-term conditions and disability (British Geriatrics Society, 2014). Importantly, the grade of frailty of
individuals who are low users of health and care services may only be recognised if they suffer a crisis, such as a fall.

As highlighted, some definitions of frailty are limited (Boers et al., 2015) with authors such as Huber et al. (2011) stating that definitions should emphasise the ability to adapt with regards to social, physical and emotional challenges. Arguably, this could result in a more universal understanding of frailty, which could be described as the ‘weakening of health’ (Berrut et al., 2013; Boers et al., 2015). According to Boers et al. (2015, p.2), frailty could be defined as:

‘Frailty is the weakening of (health; health is defined as) the resilience or capacity to cope, and to maintain and restore one’s integrity, equilibrium, and sense of wellbeing in three domains: physical, mental, and social.’

This definition includes broad domains (i.e. a multidimensional nature) to help identify frail people. Multidimensional views of frailty have been argued to encourage an integrated view of human beings, bringing greater attention to the whole individual, as opposed to focussing exclusively on physical components of frailty (Gobbens et al., 2010). Gobbens et al. (2010) stressed the importance of a more inclusive definition, suggesting that viewing frailty as merely physical deficits could lead to care fragmentation, with potentially negative impacts on the care for frail individuals.

Definitions of frailty can be placed into two main categories: conceptual definitions and operational definitions. In conceptual definitions, frailty is defined in terms of other concepts (Gobbens et al., 2010a). In operational definitions, the concept of frailty is defined by the criteria that must be applied to determine whether (and to what degree) the concept exists (Gobbens et al., 2010a). Operational definitions use observable data originating from criteria that have been applied to a population (Gobbens et al., 2010a; Kaethler et al., 2003).

Many definitions of frailty are described in the literature. In a highly cited review of definitions, Gobbens et al. (2010a) highlighted main themes, which are also corroborated by Junius-Walker et al. (2018) and Sezgin et al. (2019) in later systematic reviews. These common themes or components of frailty (both conceptual and operational) are examined and discussed with reference to relevant articles below:

1.3.2: Conceptual and Operational Definitions of Frailty

1.3.2.1: Vulnerability and Relationship with Adverse Health-Related Outcomes
**Conceptual:** As this thesis notes, frailty and its association with ‘vulnerability’ has been highlighted. More specifically, vulnerability towards adverse health outcomes has been described and ‘adverse outcomes’ are apparent in many conceptual definitions.

One example is the condition of ‘unstable disability’ (defined as when an individual’s function fluctuates significantly with minor external events) mentioned in conceptual definitions of frailty (Campbell and Buchner, 1997). Junius-Walker et al. (2018) further identified that adverse health-related outcomes related to frailty manifest themselves in falls, mobility issues and reduced ability to carry out ADLs (Activities of Daily Living) or IADLs (Instrumental Activities of Daily Living). Some definitions are less specific, citing only ‘vulnerability to’ or ‘at risk of’ adverse outcomes’ (Fried et al., 2001; Winograd et al., 1991). These terms, however, could be considered as too ambiguous. For example, as alluded to by Gobbens et al. (2010a), the lack of specificity in adverse outcomes related to frailty is a major limitation of these definitions.

**Operational:** Several operational definitions of frailty have associated validated models, which are predictive of adverse outcomes (Ma et al., 2019; Wu et al., 2018; Rockwood et al., 2005; Mitnitski et al., 2002; Fried et al., 2001). All predict mortality and may also relate to other adverse outcomes, including institutionalisation and functional decline. Ability to predict mortality was noted in 27/51 frailty instruments in a recent systematic review (Faller et al., 2019), indicating its popularity in validated models. Notably, as Rockwood (2005) emphasises, since no ‘gold standard’ for defining frailty exists, predictive validity (i.e. the ability for a definition to predict adverse outcomes) becomes the ‘highest standard’ available.

**1.3.2.2: The Interrelated, Multidimensional Nature of Frailty**

**Conceptual:** Wleklik et al. (2020) note that in the literature, many one-dimensional tools/definitions for frailty exist. It has previously been stated that many definitions focus primarily on physical domains only (Gobbens et al., 2010a). Despite this, an increasing number of definitions point towards frailty being composed of many dimensions (Wleklik et al., 2020; Xue, 2012; Gobbens et al., 2010a).

A multidimensional view of frailty has been argued to be used more in everyday use, as well as being more accepted (Roppolo et al., 2015; Gobbens et al., 2010). However, recent literature continues to stress the need for a more multidimensional view of frailty (Dury et al., 2018; Chen et al., 2018). Often multidimensional views are based on the analysis of interrelations
and complex interactions of physical, psychological and social domains of function (Gobbens et al., 2010a; Markle-Reid and Browne, 2003; Walston et al., 2006). Importantly, however, different views and definitions of frailty may incorporate other domains. For example, other multidimensional views of frailty include physical, nutritive, cognitive and sensory domains of functioning (Cigolle et al., 2009), or psychological domains (van Oostrom et al., 2017; Schuurmans et al., 2004; Strawbridge et al., 1998). Notably, some multidimensional models state the ability of frailty to get better or worse over time – and that frailty is not a binary condition (i.e. frailty viewed as on a continuum).

**Operational:** Despite the ‘physical frailty’ focus in many operational definitions (Theou et al., 2015; Theou and Kloseck, 2007), some include broader dimensions. Deficiencies in ‘physical health’, ‘nutrition’, ‘cognition’ and ‘sensory’ domains are all part of an operational definition in one validated model (Strawbridge et al., 1998). Further validated operational definitions include those by Goldstein et al. (2013) and Tocchi et al. (2014). These definitions use domains in addition to physical (e.g. social support, cognition and mood). Environmental domains can additionally be included (Vernerey et al., 2016; De Witte et al., 2013). Assessment of the psychosocial domain is described as referring to the presence of depression, anxiety or loneliness and is included in other definitions (Olaroiu et al., 2014; Schuurmans et al., 2004). Due to the variety in definition and as there remains no consensus on defining frailty, Rodriguez-Manas et al. (2013) and Rolfson (2018) maintain that additional research is necessary to establish a consensual operational definition of frailty.

1.3.2.3: Frailty on a Continuum

**Conceptual:** Those viewing frailty as on a continuum suggest ‘fitness’ and ‘frailty’ are at opposite ends (Romero-Ortuno and O’Shea, 2013), describing ‘fit’ people as resilient and ‘frail’ people as vulnerable. Viewing frailty as on a spectrum is shared by others (Walston et al., 2018; Harrison et al., 2015; Hubbard et al., 2008) and that frailty may have a dynamic aspect (Clegg et al., 2013; Coker et al., 2019). ‘Dynamic’ refers to the transitions between frailty states over time (e.g. pre-frail to frail or frail to not frail) (Mendonca et al., 2020; Buckinx et al., 2015; Gill et al., 2006; Lang et al., 2009). Of importance to this thesis, research indicates that these transitions can be influenced by a range of health and social-related factors (Lorenzo-López et al., 2019).

**Operational:** Some operational models include different groupings of frailty, reflecting perspectives that frailty can worsen, or improve (Faller et al., 2019; Hanlon et al., 2018;
Winograd et al., 1991; Brown et al., 2000; Fried et al., 2001; Rockwood et al., 1999). This is particularly evident in the Rockwood et al. (1999) model, which classifies older people at nine levels (from ‘Very Fit’ to ‘Terminally Ill’). However, in addition to the limitations highlighted earlier, critics argue that the Rockwood et al. (1999) model is evaluated subjectively and does not account for quantitative parameters (Panhwar et al., 2019). Panhwar et al. (2019) argue this is significant, as quantitative parameters may be needed for an intervention to be considered in anticipation of adverse outcomes in older people.

1.3.2.4: Definitions with Models

Conceptual: Many, but not all conceptual definitions of frailty are accompanied by a conceptual model. Conceptual models are coherent, unified and orderly ways of envisioning related events or processes relevant to a discipline (Fawcett and Desanto-Madeya, 2013; Mock et al., 2007).

A literature review of models of frailty identified that a majority of conceptual models are based on the medical aspects of frailty, arguing this explains why many models have a predominant physical domain focus (Gobbens et al., 2010a). This suggestion is supported by van Campen (2011) who goes further to say that is because most models were developed by medical scientists. He argues that there is dissatisfaction with some models developed on this basis, as psychological and social functioning can largely be ignored (van Campen, 2011). Nevertheless, some models focus on other aspects, such as the individual’s interaction with their environment (Bortz, 1993; Soong et al., 2003), the ability to conduct important aspects of daily living (Raphael et al., 1995), social aspects (Boers and Cruz Jentoft, 2015) or a combination of these (van Oostrom., 2017).

In the literature, conceptual models of frailty have been visualised as: a cascade (Morley, 2016), a cycle/spiral (Fried et al., 2001), a balance between assets and deficits (Rockwood et al., 1994) and as a ‘plot’ (Walston and Fried, 1999). In recent models, a life-course approach with regards to the interaction between multiple domains has been encouraged (Rockwood and Howlett, 2018; Soong et al., 2013; Bergmann et al., 2004). The life-course approaches towards frailty may have arisen after growing arguments supporting this approach, such as by Kuh (2007) and Chapko et al. (2016) – and that age alone cannot sufficiently indicate an individual’s frailty/fitness status (Looman et al., 2018; Romero-Ortuno and O’Shea, 2013).
**Operational:** As noted before, frailty should be considered distinct from disability and comorbidity. Fried et al. (2004) argue this should be reflected in definitions and models of frailty. However, this view is challenged given that many operational definitions of frailty include disability (Rockwood et al., 1999; Raphael et al., 1995; Nourhashemi et al., 2001; Mitnitski et al., 2002; Jones et al., 2004), or disease and/or comorbidity in their measures of frailty (Schuurmans et al., 2004; Winograd et al., 1991; Mitnitski et al., 2002; Jones et al., 2004). For this reason, many operational definitions are not deemed ‘successful definitions’ of frailty, based on their inclusion of disability, disease and/or comorbidity (Gobbens et al., 2010a). The FiND model of frailty (Cesari et al., 2014) does, however, separate frailty from disability, so could be considered an example of a ‘successful definition’.

‘Successful definitions’ or frailty models could also relate to their viability in practice. The viability of a model in practice may be influenced by several factors, including setting, time and resource availability. Recent literature highlights that the viability of a model is important to consider (Aucoin et al., 2020; Ambagsheer et al., 2020b).

As an example, one criticism of operational models of frailty requiring counting impairments (e.g. Fried et al., 2001) is their time-consuming nature, which may explain their lower use in clinical care (Rockwood et al., 2005). Importantly, Rodriguez-Manas et al. (2013) emphasise that operational definitions should be simple to use clinically and guide prevention and care. The Edmonton Frail Scale (a short assessment of nine domains of frailty) (Rolfson et al., 2006) and the Groningen Frailty Indicator (a short assessment of eight domains of frailty) (Schuurmans et al., 2004) have been proposed as viable models in practice by Gobbens et al. (2010a). According to Gobbens et al. (2010a), these are user friendly (as they can be administered as self-reported questionnaires) providing information that a healthcare professional can target with a specific intervention. Also, evidence has emphasised that the viability of models in practice relates to the research and clinical setting and ease of application in a setting (Rolfson, 2018).

**1.3.3: Causes and Development of Frailty**

Given the multifaceted nature of frailty and a disorder of multiple interrelated physiological systems (Clegg et al., 2013), a range of different factors must be considered when investigating the potential causes and development over time.
Whilst agreement in the literature exists that frailty carries a high vulnerability for adverse health outcomes including disability, dependency, falls, hospitalisation and mortality (Bandeen-Roche et al., 2006; Fried et al., 2001; Gill et al., 2006; Graham et al., 2009; Ensrud et al., 2009), it appears that defining causes and its clinical course is a subject of greater debate.

Evidence suggests that the likelihood of an individual becoming frail increases with age – and age-related declines in multiple physiological conditions (Clegg et al., 2013; Song et al., 2010). Nevertheless, though the correlation between frailty and age is recognised (Mitnitski et al., 2002; Gale et al., 2014; Hanlon et al., 2018), it is not necessarily the cause. Mitnitski et al. (2002) emphasise that a distinction, therefore, between an individual’s biological and chronological age must be made. Supporting this, a study investigating the biomarkers of frailty in older persons (Ferrucci et al., 2002, p.1) noted that while ‘normal aging implies a progressive decline of physiological reserve and ability to compensate’, in frail individuals, ‘the decline in functional reserve is accelerated and compensatory mechanisms start failing’. Thus, to better understand the causes of frailty, consideration of factors that may increase an individual’s biological age (i.e. promote ageing) are necessary.

At a cellular level, a result of underlying genetic, environmental and epigenetic factors and mechanisms causes ageing (Kirkwood, 2005; Kahn and Fraga, 2009). These lead to molecular damage to cells, which, in turn, can contribute to an accumulation of cellular defects. Molecular damage and cellular defects produce inflammatory reactions, exacerbating existing damage and, if unrepaired, result in impairments to organ systems. Damage to organ systems including the brain, endocrine and immune system and/or a loss of physiological reserve in other systems such as cardiovascular, respiratory and renal can all result from molecular and cellular damage (Clegg et al., 2013). These can lead to the development of frailty.

Poor physical activity and nutritional deficiencies influence the endocrine, immune and skeletal system – all of which are characteristically associated with the frailty syndrome (Paganelli et al., 2006; Cesari et al., 2006). Importantly, sarcopenia, a progressive decline in skeletal muscle mass and strength, overlaps with frailty; most frail individuals exhibit sarcopenia and some individuals with sarcopenia exhibit frailty (Cruz-Jentoft et al., 2010).

Frailty can predict the incidence of cognitive impairment and dementia (Canevelli et al., 2015) and the reciprocal association also holds, i.e. that cognitive impairment predicts future frailty (Raji et al., 2010). It is believed a common underlying pathophysiological mechanism explains this association (Fougère et al., 2017).
A combination of all or some of these factors can lead to frailty, due to their causal link to a heightened vulnerability to adverse health status or functional change. As a result, common and visible outcomes associated with frailty, such as falls, delirium and disability can present, increasing the likelihood for enhanced care and support, hospital and/or long-term care admission (Clegg et al., 2013).

1.3.4: Non-Medical Aspects of Frailty

As mentioned, frailty can have many different contributing factors, including physical, psychological, social and environmental. This suggests that frailty (and its potential progression) incorporate ‘non-medical’ factors, including social and environmental (Woo et al., 2005; Sezgin et al., 2019). Moreover, Rockwood and Searle (2018) suggest that the interaction between medical and social problems putting an individual at greater risk of adverse outcomes is a characteristic of frailty.

In the literature, several studies confirm that non-medical factors are associated with frailty, which may help inform interventions for individuals at risk of worsening frailty (Cramm & Nieboer, 2012; Fugate Woods et al., 2005; Lang et al., 2009; Szanton et al., 2009; Chamberlain et al., 2016). In some cases, non-medical aspects can be viewed as part of the frailty condition (e.g. social frailty, isolation, loneliness and self-neglect/self-management) (Park et al., 2019; Bunt et al., 2017). In other cases, non-medical aspects can influence the development or progression of frailty (e.g. environmental and socio-economic factors) (Woo et al., 2005). Common non-medical aspects are examined below.

1.3.4.1: Social Frailty, Isolation and Loneliness

If an individual is deemed as at risk of losing (or has lost) resources that are important for fulfilling one or more basic social needs, they may be deemed to have ‘social frailty’ (Bunt et al., 2017). While this may present opportunities to discern frailty, at present, the literature states there is little consensus in defining social frailty (Makizako et al., 2018; de Labra et al., 2018), or how the ‘social aspects’ of frailty could be assessed (Bessa, Ribeiro and Coelho, 2018).

In a recent article by Bessa, Ribeiro and Coelho (2018), a review of frailty assessment instruments focussing on their social components noted that the predominant concepts included: social isolation, loneliness, social networks, social support and social participation. Thus, they argued that social components were important parts of frailty. Importantly, the association between social frailty/social components and frailty is evident in the literature.
Makizako et al. (2018) argue that social frailty may be an antecedent to physical frailty. This argument has been supported in other studies (Strawbridge et al., 1998), with a further concluding that high levels of social loneliness increased a person’s risk of becoming frail (Gale, Westbury and Cooper, 2018). Similarly, Woo et al. (2005) demonstrated an association between a lack of a social support network and increasing frailty.

Social isolation has also been linked to frailty progression (Ganesalingam, 2018; Gale, Westbury and Cooper, 2018). If unaddressed, it has been proposed that this could contribute towards increased demand on health and social care services (Windle, Francis and Coomber, 2011). It would also appear that social isolation can both create and exacerbate health deficits. For example, socially isolated individuals may suffer from nutritional issues and reduced mobility, leading to detrimental health and wellbeing (Dickens et al., 2011; Henderson, 2016). The factors described could also cause sarcopenia (Gale, Westbury and Cooper, 2018), a significant contributor to functional decline and physical frailty (Reginster et al., 2016). More recently, an article highlighted that physical frailty and social isolation were associated with falling (a marker of frailty) in older adults (Hayashi et al., 2020), further demonstrating the dangers of social isolation. Henderson (2016) suggests that loneliness, closely linked to social isolation, may also have similar outcomes in individuals.

Loneliness has been defined as ‘an individual’s personal, subjective sense of lacking desired affection, closeness and social interaction with others’ (Davidson and Rossall, 2015, p.3). In a sense, loneliness may therefore be influenced more by the quality than quantity of relationships (Davidson and Rossall, 2015). It has been linked to frailty (Mehrabi and Beland, 2020), with one study suggesting that ‘feelings of loneliness’ were also associated with a higher risk of mortality in community-dwelling older adults (Tabue Teguo et al., 2016). The presence of poor psychosocial components (e.g. cognitive decline, depression and loneliness) were associated with an increase in frailty in older adults (Mulasso et al., 2016). Further published studies also evidence loneliness as a major factor in the onset and progression of frailty (Chalise, Kai and Saito, 2010; Gale, Westbury and Cooper, 2017; Herrera-Badilla et al., 2015; Zhao et al., 2019).

1.3.4.2: Family and Community Networks

Closely linked to the above is the association between a lack of support from family members and/or community networks and frailty (Obbia et al., 2019). Obbia et al. (2019) explored the views and experiences of healthcare professionals working in primary care finding that support from family, friends and neighbours influenced frailty. These views have been corroborated in
published literature across several settings (Chon et al., 2018; Hoogendijk et al., 2016). The importance of a social network is discussed further in Chapter 5 of this thesis.

1.3.4.3: Self-Neglect/Self-Management

Disorderly households and self-neglect have been linked to mortality (Schafer, Upenieks and MacNeil, 2017) and suggested to be linked to frailty (Schafer, Upenieks and MacNeil, 2017; Lee, Burnett and Dyer, 2016; Choi, Kim and Asseff, 2009). It is proposed that older people with frailty struggle to tend to their appearance following disease or functional decline (Clarke and Korotchenko, 2011; Twigg, 2007). Bunt et al. (2017) argue that the absence of self-management, or having self-management abilities (e.g. feeling empowered or being able to make important decisions) should be considered components of social frailty. Nevertheless, it is important to note that frailty status is only one potential factor that may account for self-neglect, as highlighted by Lee et al. (2016).

1.3.4.4: Socio-Economic Factors

Cross-sectional studies demonstrate that frailty is associated with socioeconomic inequalities in low, middle and high-income countries (Hoogendijk et al., 2018; Szanton et al., 2010). In one study, older adults with low levels of education and income (socioeconomic status) were shown to be at increased risk of frailty (Szanton et al., 2010). This idea was supported in a recent study examining the association between socioeconomic status and frailty, finding that education level was consistently associated with overall frailty (Franse et al., 2017). While this finding is important, this study did not consider the health status of participants, which could also impact socioeconomic status, as noted by Adler and Newman (2002).

Feinglass et al. (2007) argue that a potential explanation between socioeconomic status and frailty may be decreased physical activity, which in turn could lead to sarcopenia (Narici and Maganaris, 2006) – recognised features of frailty (Szanton et al., 2010). Socio-economic factors could also influence access to sufficient nutrition.

1.3.4.5: Environmental Factors

Powell et al. (2017) emphasise that good housing and age-friendly environments help people stay warm, safe and healthy, enabling them to do the things of importance to them. Studies stress the importance of a living environment, particularly for people at risk, or with frailty (Cramm, Van Dijk and Nieboer, 2016). This importance in the literature has translated, in part,
into national recommendations in practice. For example, Age UK recommends home adaptations or modifications as a way in which a home environment can be altered to make living easier (Age UK, 2019).

A review of the role of home adaptations proposed that they can increase the usability of the home environment, which may allow people to sustain independence for as long as they are able (Powell et al., 2017). Key findings included strong evidence that home adaptations were cost-effective interventions for reducing falls and other accidents (NICE, 2013b) and improving everyday activities and mental health (Powell et al., 2017). Further, studies also suggest that home modification in those aged 65 years or older may help prevent the progression of social or health outcomes (which may influence the progression of frailty) (Mitoku and Shimanouchi, 2014) – a view supported by national charities and governing agencies, such as Age UK (2019) and the House of Lords (2013).

A recent study by Coker et al. (2019) investigating the views of community care staff noted the importance of environmental factors when considering frailty. The study suggested that an individual’s living environment could demonstrate the presence of frailty and signify physical health and economic limitations with regards to their ability to clean, care for and maintain their homes (Coker et al., 2019). They also emphasised that the cost implications of maintaining an environment (e.g. rent, heating and home adaptations) could influence the physical environment and frailty in an individual.

While these findings are important, it should be noted that while the role of mental health, psychological and social factors with regards to frailty are recognised, the influence of environmental factors is less recognised (Coker et al. 2019). Coker et al. (2019) argue that this could be because frailty research in individuals living in the community where environmental factors would be apparent is sparse.

1.3.5: Prevalence and Incidence of Frailty

1.3.5.1: Prevalence of Frailty

Due to different methodologies, approaches and operational definitions used to distinguish frailty, statistics regarding the prevalence of frailty vary.

As noted previously, findings from the English Longitudinal Study of Ageing (ELSA) reported that the prevalence of frailty rises exponentially with age, increasing from 6.5% in those aged
60-69 years to 65% in those aged 90 or over (Gale et al., 2014) and noting that frailty was more frequent in women than in men (16% versus 12%). These results are consistent with other international studies (Collard et al., 2012; Harttgen et al., 2013). A further systematic review concluded that the prevalence of frailty and pre-frailty among community-dwelling older adults in upper-middle-income countries was higher than in high-income countries (Siriwardhana et al., 2018). This study also noted the limited evidence on frailty prevalence for low-income and middle-income countries.

1.3.5.2: Incidence of Frailty

The estimated incidence of frailty (defined as new cases of frailty among robust or pre-frail individuals) among community-dwelling adults 60 years or older was 43.4 new cases per 1000 person-years (Ofori-Asenso, 2019). This finding was based on a systematic review and meta-analysis of data from over 120,000 older adults from 28 countries. It found that frailty incidence rates varied by sex, diagnostic criteria and country income level (Ofori-Asenso, 2019).

1.3.6: Identifying Frailty

Frail patients can be found across the health and care continuum, hence frailty can be identified in different settings and by different professional groups. Importantly, frailty can present differently – e.g. a patient with a pressure sore to a district nurse, or with a fall to a community physiotherapist. Two distinct types of interaction exist where frailty manifests and can be identified, namely interactions between:

- Patients and Health and Care Professionals
- Patients and Setting.

1.3.6.1: Patients and Health and Care Professionals

For a frail individual, different types of possible interaction with health and care professionals may occur, including, (but not limited to): informal carers, social care, community nurses, specialists, hospital staff, GPs (General Practitioners) and practice nurses. A frail individual may interact with a single health and care professional, or several.

1.3.6.2: Patients and Setting

Frail individuals may also transition between several different health and care settings. Examples include: their own home, supported living, residential home, nursing home, hospice
or a hospital. Throughout the individual’s lifetime, a frail individual could interact with just one setting, or several.

1.3.7: Assessing for Frailty in Practice

Levels of frailty relate to several interdependent factors that can change over time. To assess this, robust instruments to assess or measure frailty are needed (de Vries et al., 2011). The purpose and level of assessment required for a frailty instrument may dictate what instrument, or how many, are used. They can also range for use at: an individual patient level (micro), an organisational level (meso) and a population and/or organisational level (macro).

As stated earlier, two popular and long-standing methods of identifying frailty are a ‘Phenotypic model’ (Fried et al., 2001) and ‘Cumulative Deficit Model’; (Rockwood et al., 2007). These tools may be useful in different circumstances and for different purposes. For example, it has been suggested that the phenotypic model could be useful for population screening (i.e. at a macro level) and the cumulative deficit model could be useful to discriminate between various degrees of frailty (i.e. at a micro level) (Amblas-Novellas et al., 2018).

1.3.8: Four Domain Model of Frailty

One recent proposition sought to define a frail individual as one with both accumulated and interacting deficits from four domains: physical, social, mental and environmental (Soong et al., 2013). Using elements from both the phenotypic and cumulative deficit model, the model proposes that consideration of these domains will positively affect approaches of care. In this research, the influence of these four domains in assessments for frailty is examined.

1.3.8.1: History of the Four Domain Model of Frailty

In response to a clinical review article regarding the functional assessment in older people (Quinn et al., 2011), a research team proposed the four domain model of frailty (Soong et al., 2013). They argued that a patient-centred approach towards the assessment of frailty in individuals required reframing some of the existing models to manage the multidimensional domains of frailty. The team acknowledged that frailty had been defined as a syndrome comprising multiple physiological systems – which had a resultant increase on external stressors and adverse health outcomes (Soong et al., 2013). Soong et al. (2013) suggested that definitions of frailty were difficult to operationalise in practice, which explained the lack of
consensus (both clinical and academic). They proposed that although the phenotypic and cumulative deficit models (Fried et al., 2001; Rockwood et al., 2007) demonstrated positive attributes, they had recognised limitations. These limitations included significant data requirements (cumulative deficit model) and the exclusion of significant domains, e.g. cognition (phenotypic model).

Given the described interaction between domains and frailty, they proposed the four domain model of frailty. This model consists of accumulated and interacting deficits from the four domains (Soong et al., 2013). The team also emphasised that frailty, although linked with ageing, can occur at any age (e.g. younger patients living with life-long conditions).

1.3.8.2: Validating the Four Domain Model of Frailty

The four domain model of frailty is based on recognised clinical ‘frailty syndromes’ (Royal College of Physicians, 2015) and linked with physical, social, mental and environmental domains. In developing this model, they explored whether the identification of frailty syndromes was a reliable methodology to measure clinically significant frailty within a hospital setting (Soong et al., 2015b). Using the International Classification of Diseases 10th Revision Code (ICD-10 Codes), over 50 million patient hospital spells of care (age > 65 years) (as recorded in Hospital Episodes Statistics (HES)) were analysed (Soong et al., 2015b). The overall prevalence of coded frailty (based on the coding of at least one frailty syndrome) increased from 2005 – 2013 (from 64,559 in 2005 to 150,085 by 2013). The frailty syndromes included in this model were: anxiety/depression, functional dependence, falls (and significant fracture), incontinence, mobility problems, pressure ulcers and cognitive impairment (which was a composite of delirium, dementia and senility). Based on the data, frailty syndromes could be used to reliably quantify frailty within acute care (though the accuracy is dependent on the clinical data). Moreover, it was suggested that the use of frailty syndromes could be used to evaluate health service improvement over time, including risk stratification and optimisation of services (Soong et al., 2015b).

Building on this work, the four domain model was developed and validated in the acute care setting (Soong et al., 2015). This subsequent study of over 2 million patients (age > 65 years) concluded that frailty syndromes (corresponding to the four domains of frailty) are valid predictors of outcomes in the acute care setting (mortality, readmission and functional dependence) (Soong et al., 2015). The domains of frailty and the broad corresponding syndromes included in this model were: physical (pressure ulcers, falls (and significant
fracture), mobility problems, incontinence), mental health (anxiety/depression, cognitive impairment (a composite of delirium, dementia and senility), environmental and social (functional dependence).

It must be noted, however, that a limitation of these studies is that they are retrospective analyses reliant on data coded from hospital data warehouses and then cleaned and formatted into HES. Importantly, this means the validity is dependent on the accuracy of the data coding (Soong et al., 2015b). Also, HES does not include variables that have been previously identified as being predictive of frailty (e.g. polypharmacy or weakness). Therefore, as suggested by Soong et al. (2015), potentially relevant variables (unavailable in HES) may have been excluded.

1.3.8.3: Relation to Other Multi-Dimensional Models of Frailty

The model proposed (Soong et al., 2015b), was first to attempt to use frailty syndromes as an operational definition with an English secondary care data set. Before this, the presence of one or more frailty syndromes in individuals had been recommended as a trigger for a more detailed and multi-dimensional comprehensive geriatric assessment (Banerjee, Conroy and Cooke, 2012).

Several distinctions and similarities between the four domain model of frailty and other multi-dimensional models exist.

For example, a systematic review (Gobbens et al., 2010a), found many conceptual definitions primarily focused on physical problems (Buchner and Wagner, 1992; Bortz, 1993; Hamerman, 1999). Fewer studies referred to domains now associated with frailty (e.g. psychological domain) (Schurrimans et al., 2004; Rockwood et al., 1994; Rockwood et al., 1999; Raphael et al., 1995). Only one study referred to frailty being composed of multiple domains (biological, physiological, social, and environmental) (Nourhashémi et al., 2001) offering close similarity to the four domain model.

Regarding operational definitions of frailty, several multi-dimensional definitions have been suggested (Gobbens et al., 2010a), with similarities to the four domain model. For example, one model suggested ‘physical health’, ‘nutrition’, ‘cognition’ and ‘sensory’ domains should all form part of a definition (Strawbridge et al., 1998). Some included other domains such as social status and mood (Rolfson et al., 2006; Jones et al., 2004). When the four domain model was developed, few models included an environmental domain (De Witte et al., 2013).
Nevertheless, more recent operational definitions and models of frailty include environmental indicators or domains (De Witte et al., 2013; de Labra et al., 2018; Van der Elst et al., 2019).

An example of how the four domain model could be visualised is shown below:

![Four Domain Model Diagram](image)

**Figure 1: Example Visualisation of the Four Domain Model**

**1.3.9: Comprehensive Geriatric Assessment (CGA)**

The CGA is a recommended clinical approach to assessing frail patients (British Geriatrics Society, 2014). The CGA framework provides a multidimensional, interdisciplinary assessment in which the medical, psychological and functional capabilities of an individual are determined (Rubenstein, 1995; Osterweil et al., 2000; Bernabei et al., 2000). The CGA aims to improve the accuracy of diagnoses, optimise treatment and cost-effectively improve prognosis as one approach to improve frailty assessment and management (Ellis and Langhorne, 2005).

Despite the positive aspects of the CGA, critics argue that conducting the assessment is time-consuming – and potentially impractical for many users to adopt due to time constraints (British Geriatrics Society, 2014). A further drawback is that there are variations in the CGA in terms of structure and depth of detail (and consequently dimension coverage), contributing towards variations in the way frail patients may be assessed. Nevertheless, where a CGA can be used, the literature suggests than conducting one can reduce untimely deaths as well as prevent admission to long-term care (British Geriatrics Society, 2018c)
1.3.10: Electronic Frailty Index

Using routine primary care electronic health record data, an electronic frailty index (eFI) was developed and validated, (Clegg et al., 2016). The eFI aims to identify different categories of frailty (fit, mild, moderate and severe frailty) using a ‘Cumulative Deficit Model’ approach, with the purpose of this categorisation to identify individuals potentially at increased risk of mortality within a specific time frame, hospitalisation and nursing home admission (Clegg et al., 2016). The eFI has been implemented into a specific electronic health record system (SystmOne) in primary care practice, aiming to help advance in the care of older people with frailty. However, the eFI is not a clinical diagnostic tool and, as such, clinical judgement is still paramount.

Though the eFI availability in the UK is widespread, some studies have highlighted potential problems. Recently, Millares-Martin (2019) questions the extent to which the eFI is being used, finding only 17.2% of frail patients had a score across 104 UK practices. Further suggested was that clinicians needed better support and training to evaluate the score (Millares-Martin, 2019). Another study highlighted that the eFI relies on routinely recorded electronic data, which can often be missing (Boyd et al., 2018).

It could be argued that the potential problems with the eFI have arisen because of how new the tool is. There could therefore be an expected length of time for its use (i.e. new practice) to be embedded into a new way of working. Ultimately, according to Devereux et al. (2019), the implementation of a robust frailty identification tool (such as the eFI) could aid teams, organisations and national programmes focus preventative care and support on people who are likely to benefit the most.

1.3.11: Frailty Levels

Several factors could contribute towards an individual being considered mildly frail, moderately frail and severely frail. The level of care and support an individual requires is likely to be enhanced as an individual moves from being mildly frail to having severely frailty (and vice versa). Viewed holistically, examples of factors that could place an individual in each of these risk categories are detailed below (using criteria based on Rockwood et al. (2005) and BritainThinks. (2015)):

**Mildly Frail:** Evident slowing (i.e. becoming more sedentary), requires help with high order IADLs (e.g. transportation, housework)
**Moderately Frail**: Require help with all outside activities, often have problems with stairs and bathing

**Severely Frail**: Completely dependent for personal care (due to physical or cognitive reasons). This could be the case for some people in care homes or hospital.

1.3.12: Managing Frailty: Proactive, Not Reactive

Espinoza and Walston (2005) argue that current approaches to managing frail populations have not tackled the challenge comprehensively. Lord Darzi’s ‘High Quality Care for All’ report highlighted meeting and coping with the needs of an ageing population, requires the NHS to be “forward-looking, proactively identifying and mitigating health risks” (Department of Health, 2008, p.27). Hence, good quality data is ‘essential to support this task’ (Nuffield Trust, 2013, p.5) and support efforts aimed at tackling issues earlier before they escalate to potentially costly crises (NHS England, 2014).

Similarly, identifying frail individuals in primary care may provide an opportunity to delay the progression of frailty by adopting proactive interventions, such as exercise therapy (Devereux et al., 2019; Lee et al., 2015). Likewise, awareness of frailty can guide appropriate counselling and anticipatory preventative measures for frail patients or those deemed at risk of frailty (Lee et al., 2015).

1.3.13: Evidence of the Effectiveness of Interventions Which Impact Frailty Status

Several studies examine whether proactive approaches, by way of an intervention, influence frailty development or progression (Travers et al., 2018; Apóstolo et al., 2018; Jadczak et al., 2018; Puts et al., 2017; Lee et al., 2012). Definitions of frailty in these studies vary, though many definitions comprise physical factors (e.g. weakness, weight loss, physical activity), some of which were outlined in the ‘Fried Frailty Index’ model (Fried et al., 2001). Common themes regarding the interventions detailed in the literature have been recently classified by Travers et al. (2018), Apóstolo et al. (2018) and Macdonald et al. (2020). An overview of some of these themes, frailty interventions and their effectiveness is detailed below.

1.3.13.1: Physical Exercise Interventions

The benefits of physical exercise interventions with regards to frailty progression have been well documented in literature. Travers et al. (2018), Apóstolo et al. (2018) and Macdonald et al. (2020) all highlight a wealth of evidence for physical exercise interventions delivered in a
class (Chan et al., 2012; Giné-Garriga et al., 2010; Kim et al., 2015) and delivered in a class followed by home-based practice (Ng et al., 2015). A range of physical exercise interventions has been described as effective at preventing pre-frailty and frailty progression as measured by some frailty indicators (e.g. balance, physical activity and gait speed). Moreover, the review by Apóstolo et al. (2018) suggested that the evidence indicates that the benefits were apparent across a range of ages, types of physical intervention and living arrangement (e.g. in the community or institutionalised) (Apóstolo et al., 2018).

Further, a trial examining the effects of group and home-based exercise programs in older people with sarcopenia (a disease potentially leading to frailty) (Roubenoff, 2000), suggested that group-based exercises were more effective than home-based exercises for improving functional performance and helping to manage sarcopenia (Tsekoura et al., 2018).

Of consideration, however, is that different levels of physical exercise (and starting level of frailty) may have different impacts on frailty progression. Importantly, not all physical exercises will prevent, or slow frailty progression (Wolf et al., 2003). Hence, caution must be applied when associating all physical exercise to reducing frailty progression. For example, a study by Rogers et al. (2017) found that mild physical activity was not sufficient enough to slow the progression of frailty, with only moderate and vigorous physical activity reducing the progression of frailty.

1.3.1.3: Cognitive Interventions

A 6-month cognitive intervention in community-dwelling pre-frail and frail older adults found beneficial effects concerning frailty score and status at 3 and 6 months, persisting at 12 months (Ng et al., 2015). However, a limitation of the study is that the authors were unable to directly examine whether the improvement in frailty status translated to substantial clinical differences in hospitalisation, functional disability and mortality, as these were rare occurrences in the study (Ng et al., 2015). Nevertheless, as Fairhill (2016) states, the effect of cognitive training on reducing frailty is noteworthy, especially when some definitions of frailty have been criticised for not including cognition.

1.3.1.3: Nutritional-Based Interventions

As previously discussed in this chapter, nutritional deficiency has been associated with frailty. Nutritional supplementation with milk fat globule membrane (Kim et al., 2015) or increasing protein-calorie and micronutrients intakes (Ng et al., 2015) had positive effects in preventing
frailty progress. It must be noted, however, that the study by Kim et al. (2015) focussed on older women and therefore the results cannot be necessarily generalised for older men.

1.3.13.4: Hormone Based Interventions

A study hypothesising that hormone replacement therapy may improve the course of frailty (by improving physical performance and the subjective quality of life), found that hormone replacement (with dehydroepiandrosterone and/or atamestane) did not improve the course of frailty (Muller et al., 2006). Frailty was measured by performance in physical tests (e.g. grip strength and physical performance). Another study examining the supplementation of testosterone and calcium in older frail men, found although there were favourable changes in body composition, no significant changes in frailty status (based on the Fried et al. (2001) model) were detected (Kenny et al., 2010). This finding was also echoed in a later study by Hildreth et al. (2013). Given the findings, it would appear that the evidence for the positive effects of hormone-based interventions on frailty remains limited.

1.3.13.5: Personalised Interventions

Based on the evidence, it would appear that personalised interventions, show mixed effects on frailty prevalence. This was a finding corroborated by Apóstolo et al. (2018). Evidence illustrates that some interventions can improve frailty (or outcomes related to frailty), though their long-term effectiveness was not always maintained.

For example, one study investigating the effectiveness of a personalised, activity-oriented intervention program for frail community-living older adults found an improvement in improving basic ADLs and health outcomes associated with frailty (De Vriendt et al., 2016). Frailty was measured in terms of impairment in ADLs. Although the results were positive, the authors of the study did not ascertain the long-term effectiveness of the program. The benefits of a personalised intervention were also evidenced in a study by Cohen et al. (2002). Frail patients treated by specialist services (geriatric units) had significant improvements in ADLs and physical performance versus treatment by non-specialist services. Nevertheless, although improvements were not apparent one year later, these patients scored better in a mental health survey than those treated by non-specialists at one year.

1.3.13.6: CGA-Based Interventions
A study assessing the effectiveness of the CGA with subsequent intervention in pre-frail and frail community-dwelling older people (Li et al., 2010) found that patients who received a CGA-based intervention showed more favourable (but not statistically significant) improvement in their frailty status versus those not receiving a CGA-based intervention. This study used the Fried et al. model (2001) and the Barthel Index (an ordinal scale used to measure performance in ADLs) (Mahoney and Barthel, 1965). A further study assessed the effect of an outpatient CGA, finding that there was evidence to suggest that a CGA could delay frailty progression and/or improve the health of frail outpatients (Mazya et al., 2018). As Macdonald et al. (2020) point out, however, it may be difficult to ascertain whether singular or the combined components of the CGA were responsible for the improvement in frailty status.

1.3.13.7: Group-Based Health Educational Interventions

A study assessing whether multi-professional senior group meetings (comprising patients over 80 years, living at home) could postpone deterioration in frailty in those at risk of frailty, found mixed results (Behm et al., 2016). The meetings postponed the progression of frailty (measured as tiredness in daily activities) for up to one year. However, using a sum of indicators (weakness, fatigue, weight loss, low physical activity, poor balance, gait speed, visual impairment and cognition), did not show the group-based educational meeting effective in postponing frailty.

Conversely, a study providing education and recommendations based on health promotion, disease prevention and self-care through a group session (for patients not at risk of frailty) and individually (for patients at risk of frailty) described positive outcomes (Monteserin et al., 2010). This study found the intervention reduced morbidity and mortality for patients at risk of frailty and had a positive outcome on reversing ‘at risk of frailty’ status in some participants (over 18 months). Risk of frailty was classified based on the CGA. Based on these findings, it would appear the evidence for the effectiveness of group-based educational interventions is inconclusive.

1.3.13.8: ‘Hospital at Home’ Interventions

‘Hospital at home’ interventions (or preventative home visits), which can consist of multidisciplinary team visits by healthcare professionals have shown evidence to suggest the prevention of frailty progression and the displacement from the home of frail older people (Sempe et al., 2019). A study by Behm et al. (2016) suggested home visits postponed the
progression of tiredness in daily activities (used as a measure of frailty) for up to one year. A further study assessing whether nurse home visits were effective in reducing frailty (compared to nurse visits alone and usual care) (Favela et al., 2013), also found a positive effect on frailty scores (based on a Rockwood et al. (2001) frailty model). This was most evident in older adults who had developed frailty during the follow-up period.

Despite the findings from these studies, a literature review by Frost et al. (2010) of interventions in primary care and community settings argued that while hospital at home/home visits as interventions have the potential to achieve positive benefits, the evidence is inconsistent. Although the literature review by Frost et al. (2010) precedes the studies described above, the review notes that the benefits of home visits may be dependent on factors such as: care provider experience, access to provision of follow up services and length of follow up – factors still applicable today. Therefore, the studies describing benefits and/or effectiveness of home visits with regards to frailty should be interpreted with caution.

1.3.13.9: Psychotherapeutic Interventions

Evidence-based psychotherapy approaches teaching people how to solve problems that contribute to their mood-related conditions, demonstrated improvements in mental and physical health (Malouff et al., 2007). However, while these findings are important, they do not specifically address ‘frailty’ – only potential components of it. Research focusing specifically on frailty found that psychotherapeutic interventions showed no pronounced effect on frailty (Chan et al., 2012).

1.3.13.10: Combined Interventions

Ng et al. (2015) demonstrated that combined nutritional, physical and cognitive interventions show significant benefits (described as effective in reversing frailty) in community-dwelling pre-frail and frail older persons. Similarly, combined physical exercise and nutritional supplementation also show effectiveness at preventing frailty progression, with positive long-term outcomes on several frailty outcomes (Bonnefoy et al., 2012; Kim et al., 2015). These types of interventions may therefore help reduce frailty progression.

1.3.13.11: Interventions to Prevent Social Isolation and Loneliness

Gale et al. (2018) show that older people experiencing high levels of social isolation and loneliness are at increased risk of becoming physically frail. To combat this, findings from
literature, such as by Cattan et al. (2005) suggest that group activities including some form of training or education session that target specific groups of people are effective in reducing the subjective feeling of social isolation. A further strategy suggested that successful interventions aimed at reducing social isolation and loneliness made use of existing community resources and interventions aiming to build community capacity (Findlay, 2003). As detailed, there is therefore evidence that some interventions can reduce social isolation and/or loneliness. However, one questions the feasibility of implementing these interventions in practice. This is because many approaches in primary and community care remain reactive, rather than proactive, as recommended in the literature (Turner and Clegg, 2014).

1.3.14: Transitions of Care

Though frailty can be identified, assessed and managed within a care setting at a specific point in time, individuals move between settings and interact with different professional groups. Therefore, importance must be placed on the communication of information regarding a patient’s frailty between settings and between professions. If the frailty tools and content differ, there is a risk that the information will not be understood or recognised across organisational or professional groups, since a common language is lacking.

Figures 2 and 3 provide examples of the potential transfer of care between health and care professionals and between settings:
Figure 2: Patient Interaction with Health and Care Professionals. Illustrated are potential interactions a frail individual may experience between professionals. Frailty related information can be transferred between a patient and a single profession or several professionals in many varying directions.

Figure 3: Patient Interaction with Settings. Illustrated are potential interactions a frail individual may experience between settings. Frailty related information can be transferred between a patient and a single setting or several settings in many varying directions.
Care transitions are complex and multifactorial (Bauer et al., 2009) – even within a somewhat universal healthcare system such as the NHS (Ellins et al., 2012). For example, a frail individual can be transferred multiple times between acute care and non-acute care settings. Moreover, these transitions are ongoing processes, solidifying the need for standardised processes and effective communication (e.g. communication provided promptly, consists of essential information and not containing ambiguities) between services (Johnson et al., 2012; Graham, 2009). Most current research focuses on a pathway from acute care to non-acute care (Foust et al., 2012). One aim of this thesis is to quantify the constituent makeup of assessments used for frailty (Chapters 4 (Non-Acute care setting) and 7 (Nursing Homes)) examining whether standardised processes are taking place in assessing for frailty.

### 1.4 Defining Care and Support

Appropriate care and support is fundamental for many frail individuals’ to manage everyday living. Given the frequent and arguably open usage of these terms in healthcare settings, defining both ‘care’ and ‘support’ is required to recognise the subtle distinction between them. Notably, Simon Stevens, Chief Executive Officer of NHS England stated that,

> ‘Within social care many people including those in government talk about care and support like they are the same thing when I feel they are slightly different and relate well to my understanding of wellbeing and inclusion’ (Stevens, 2012, p.1).

The definitions of ‘care’ and ‘support’ used in this thesis are:

**Care:**

‘**Care**’ refers to the provision of what is necessary for the health, welfare and maintenance of an individual’s wellbeing, ensuring that their ADLs (e.g. bathing, dressing, and eating) are met (“Care”, 2020; Stevens, 2012).

‘**Effective care**’ refers to care, treatment and support that helps maintain quality of life and is based on the best available evidence (CQC, 2018a).

‘**Appropriate care**’ refers to care meeting the needs and preferences of individual patients (Robertson-Preidler et al., 2017). If a procedure/intervention is recommended, this refers to when the expected health benefit (e.g. increased life expectancy, improved functional capacity) exceeds anticipated negative consequences (e.g. mortality, morbidity, time lost from work) by a sufficiently wide margin that the procedure is worth doing (Quality in Health Care, 1993).
**Support:**

‘Support’ refers to additional assistance people need to meet their outcomes in terms of being included as a contributing member of society (Stevens, 2012). The focus of support is often on the completion of activities that more complex than ADLs - IADLs. Examples include: driving, preparing meals, shopping and managing finances.

The ‘Care and support’ of individuals consists of many elements or components (Local Government Association, 2020; Department of Health and Social Care, 2020; Tronto, 1998). Tronto (1993) describes four elements of care: recognition of need (caring about), willing to respond to (take care of) a need, direct action (care-giving) and reaction to the care process (of the care receiver) (Maoi, 2018; Tronto, 1993). In this thesis, these elements have been considered and can be seen in the studies undertaken (shown in Figure 4).

**1.5: Concerns Associated with Frailty in the UK**

Recent concerns have been raised regarding the care of frail people in the UK. For example, major concerns in acute care were highlighted in the Francis Report regarding the Mid-Staffordshire NHS Foundation Trust (Francis, 2013). This report suggested that 400 - 1200 patients died as a result of poor care over 50 months from 2005-2009 at a district general hospital, in Staffordshire. The inadequate care and failings were said to be caused by several factors, including poor decision making, cost-cutting and a chronic shortage of staff. Though the report concerned one particular trust, Francis noted that ‘the system as a whole failed…’ (Department of Health, 2013b, p.5). Particular concerns were raised in the care of older people, including those defined as frail (Department of Health, 2013b).

In light of the Mid-Staffordshire NHS Foundation Trust Inquiry, an independent review into healthcare assistants and support workers in the NHS and social care settings was conducted. This review highlighted challenges the NHS faced and attempted to establish necessary changes to ensure that all individuals were treated with care and compassion (Cavendish, 2013). The report noted that in all discussions carried out within the NHS and social care, the support workforce received the least attention. Importantly, the report identified significant variations in training given to the decreasing numbers of support workers – the workforce largely supporting the growing number of older and often vulnerable population potentially at risk of frailty.
The latest ‘State of Care’ report by the Care Quality Commission found that although most people in England receive good quality care, it was not consistent, with some people unable to access the services they need – or experiencing disjointed care (Care Quality Commission, 2018). One challenge for health and social care organisations was to understand the needs of local people and working together to find sustainable solutions that put people first (Care Quality Commission, 2018). The report highlighted that concerns raised in the Francis and Cavendish reports persist. For example, that ‘older people do not have access to the care and support they need’ and that the number of ‘older people living with unmet care needs continues to rise’ with care and support often provided by friends and family (Care Quality Commission, 2018, p.7).

Recently, several media reports regarding UK nursing home failings have emerged (Gordon, 2016; Bulman, 2017). Many describe inadequate care or living conditions and poor care and support. Further, many later life care environments are privately owned (e.g. nursing homes) which can limit the number of academic studies, especially when data cannot be accessed publicly. However, some research is beginning to materialise, noting the importance of education, communication and training as avenues to help improve the delivery of care in this setting (Kinley et al., 2018; British Geriatrics Society, 2016a).

To meet some of the NHS challenges, including the need for greater care and support of frail populations, the ‘Health and Social Care Act’ (UK Parliament, 2012) was developed, bringing in extensive reforms. A report highlighted that the care act had created ‘a legal framework for introducing a fairer system of funding of long-term care’ (Ham et al., 2015, p.84).

It would appear, however, that many changes resulting from the reviews and recommendations for change were structural and organisational, rather than tackling underlying and fundamental problems of frailty and its associated challenges. Hence, concerns remain regarding the care and support available (and given) to frail individuals – a noted area for improvement (NICE, n.d.).

**1.6: Rationale for the Studies in This Thesis**

**1.6.1: Global Demographics**

This chapter detailed the global demographics and the anticipated increases in ageing populations. Also noted was that ageing populations could contribute to the increasing number of frail elderly people (Reeves et al., 2018; Hanlon et al., 2018; Gale, Cooper and Sayer, 2015;
Howlett and Rockwood, 2013). Importantly, three further points were discussed and highlighted in this introduction:

- Patients with frailty are vulnerable
- Frailty can be described as on a spectrum
- Frailty can present itself in individuals located in a range of health and care settings.

1.6.2: The Care and Support of Frail Individuals is Not Confined to One Setting.

Frail individuals, or populations, are present across many health and social care settings (Coker et al., 2019). To improve the management of frailty thus requires an approach spanning those settings (e.g. primary care, secondary care and social services), not just a single setting (Heaven et al., 2019).

The British Geriatrics Society (2016) state that older people with frailty are susceptible to health crises and may require acute care when a crisis occurs, but importantly, that frail people often wish to remain at home (and independent) for as long as possible (British Geriatrics Society, 2016; University of Oxford, 2020). To support this, care and support at home or in a community setting is needed and may deliver better outcomes compared with hospital admission (British Geriatrics Society, 2016). To achieve this, health, social care and other services are likely to be involved when older people move to or from hospital, or from the community or a care home (NICE, 2016a). Families and carers also provide a significant part of care and support (NICE, 2016a).

1.6.3: Improvements in Care and Support of Frail Individuals Required

As previously described, concerns related to the care and support of frail individuals persist. To best help plan and formulate improvements in the care and support of frail individuals, it is important to first understand what is currently happening in practice (NICE, 2018).

This is the purpose of the research described in this thesis.

1.6.4: Care and Support of Frail Individuals Examined in This Thesis

Consistent with the evidence presented, frailty can be described as on a spectrum and frail people can be seen in many settings encountering different professional groups as well as carers. This thesis was designed to reflect this and to some extent, aspects of the frail individuals’ care journey. Hence, examining the care and support of frail individuals was also
considered across three distinct settings (community, acute and nursing homes), which may reflect different levels of frailty.

**1.6.5: Research Settings Selected and How They Are All Linked**

Chapter 1 critically reviewed the literature, illustrating a current and increasing challenge for health and care systems: frailty. Notably, two crucial points were established regarding the concept of frailty in care: no consensus exists on the definition of frailty and the care and support of frail individuals is not confined to one setting. Chapter 1 also highlighted that a critical aspect of ensuring the right care and support for a frail individual is by recognising and assessing for frailty (Ding et al., 2017; Turner and Clegg, 2014; British Geriatrics Society, 2015).

Therefore, a systematic review (Chapter 2) was undertaken to understand the assessments for frailty in a broad setting (non-acute care) as reported in literature. However, although this setting detailed the published tools that could be used, importantly, this study had no geographical boundaries and did not ascertain what assessments may actually be used in practice. Understanding what assessments are used in practice is important, as research emphasises that significant harm and risks can result if frailty in an individual has not been recognised (British Geriatrics Society, 2014; Chen et al., 2018).

(Chapter 3 described the research methods used).

Hence, a study to greater understand the ‘assessments for frailty’ used in practice in a defined non-acute care setting (North-West London region) was undertaken (Chapter 4) by contacting healthcare professionals and individuals with expertise and/or experience of frailty assessment practices. The research question for this was:

1. What assessment tools for frailty are used in non-acute health and care settings?

While the findings from this study are important, as the non-acute care setting is broad it was evident that the study findings may not necessarily cover all settings that a frail person may be located in (or cover specific settings in detail). Additionally, as the introduction highlighted, a frail person may interact with many settings.

Therefore, it was decided to subsequently investigate a potential frail pathway comprising three common, but distinct care settings (community, acute care (hospital) and nursing homes) to better address the overarching research question (How does the care and support of frail
individuals manifest across the frailty spectrum?). As described previously, these settings could also represent a progression in the level of frailty.

In the **community setting (Chapter 5)**, research stated that frail individuals may require care and support to carry out aspects of daily living (British Geriatrics Society, 2014), encouraging independent living and preventing, or delaying a move away from their residence (Blomgren et al., 2008). A number of different care and support arrangements (Blomgren et al., 2008) to prevent or lessen the progression of frailty may also be required. Hence, an important part of a frail person (or at risk of frailty) living in the community is their care and support networks. Thus, this was examined in this study, using participants from a ‘Falls’ group as an exemplar of a ‘frail’ population. As a healthcare provider’s understanding of a patient’s healthcare preference has been highlighted as important to patient-centred care (Kennedy et al., 2018), this perspective was also integrated. The research question for this was:

2. What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?

This study has important findings, as discussed in the relevant chapter. However, recognition of frailty in individuals living in the community may only be recognised after admission to hospital after suffering a crisis event, such as a fall (British Geriatric Society, 2015). Therefore, a logical progression from this study was the examination of an acute care (hospital) setting.

In the **acute care (hospital) setting (Chapter 6)**, care and support is of great importance (Cornwell and Firth-Cozens, 2009) and hospital admissions can represent a ‘dangerous period’ for vulnerable patients (Hogan et al., 2017). Moreover, frailty progression has shown to be influenced by care and support received (Chen et al., 2018; Hendry et al., 2018; Waring et al., 2014). As no ‘official’ marker of frailty in this setting is currently used (Soong et al., 2016), the care and support of patients over 65 admitted with falls were examined, since together these are known markers/indicators of frailty (British Geriatrics Society, 2014; Anderson, 2008; Royal College of Physicians, 2017). The research question for this was:

3. What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?

This study used a range of methodologies to address this research question (as discussed in the relevant chapters), noting important findings. One important finding from this study was that the most common post-discharge living arrangement was nursing homes. Findings by Harrison
et al. (2017) report that discharge to a long-term institutional care setting (such as a nursing home) is a common occurrence. This is a setting a person’s frailty may be high/severe (Shah et al., 2013) and therefore has high care and support needs. Thus, the nursing home setting was confirmed as the next logical progression from this study to examine.

In a **nursing home setting (Chapter 7)**, a needs assessment is often conducted on new residents (NHS, 2018c) which may include an assessment for frailty (Lee et al., 2020; British Geriatrics Society, 2015). As stated, recognition of frailty (via assessment) is an important component of care and support. Moreover, recent studies found that there is limited evidence for much of the care provided in care homes (Shepherd et al., 2017; Davies et al., 2014), particularly in the UK (ENRICH, 2020). Therefore, this study focussed on investigating what ‘assessments for frailty’ were being used in this setting. The research question for this was:

4. **What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?**

Overall, the studies within this thesis all aimed to help uncover some of the complexities in care and support with respect to frail individuals across non-acute care (high-level) and three common distinct settings. It is hoped that this helps identify current methods or practices used, in addition to identifying the areas that require addressing.

1.6.6: Specific Reasons for Settings Chosen

Comprehensive reasoning and justification for the settings chosen are detailed in each of the respective chapters. Broadly, combined with the links highlighted above, the reasons for selecting the settings can be placed into the following components:

1. **Estimates of Frail Individuals in This Setting**  
   Demonstrating the burden of frailty in this setting and public health importance.

2. **Challenges and Gaps Identified in This Setting**  
   Demonstrating a need for research in this setting to help improve or change practice.

3. **Benefits of Research in This Setting**  
   Demonstrates the benefits of conducting research in this setting, with specific reference to existing research and assessing the gaps in knowledge. The benefits of the research described aim to provide evidence to help improve practice.
Further reasoning behind the choice of settings related to the feasibility to conduct research and ease of data collection, namely:

- Ethical Approval Required
- Clinical Expertise/Training
- Time.

Each setting selected and studied are discussed with respect to these components:

1.6.7: Non-Acute Care Setting (A Study to Understand the Assessment Tools for Frailty Used Across Non-Acute Health and Care Settings)

1. **Estimates of Frail Individuals in the Non-Acute Care Setting**

Globally, 40% of older adults aged 60 years and above live in the community, usually alone, or with their spouse (Verver et al., 2015; United Nations, 2013). According to the eFI data, about half of people over 65 years are living with some degree of frailty (NHS RightCare, 2016).

2. **Challenges and Gaps Identified in the Non-Acute Care Setting**

Guidance states that any interaction between an older person and a health or social care professional should include an assessment for frailty (British Geriatrics Society, 2014). Identifying frailty early can allow interventions to be put into place which may improve outcomes and avoid unnecessary harm (British Geriatrics Society, 2014).

Assessing for frailty earlier is therefore important (NHS England, n.d.2), especially in the non-acute care setting. Currently, with specific regards to the four domain model (Soong et al., 2013), the nature of the frailty assessment tools used in practice is unknown in the non-acute care setting.

3. **Benefits of Research in the Non-Acute Care Setting**

Creating an understanding of the frailty assessment tools used in this setting, in addition to the nature of the assessments can serve to inform healthcare professionals of current practices used in a real-world setting. This could have a positive effect on how quickly a frail individual is diagnosed and their condition managed. This would be a positive outcome for both patients and healthcare professionals alike.

**Three distinct settings are then studied:**
1.6.8: Community Setting (A Study to Understand the Care and Support Networks of Frail Individuals Using a Falls Service as an Exemplar)

1. Estimates of Frail Individuals in the Community Setting

As discussed in detail (5.2.7: Prevalence of Frailty in the Community Setting), UK-based studies detailing the prevalence of frailty in the community are limited. One study found the prevalence of frailty was 8.5% for women and 4.1% for men in community-dwelling participants (aged 64 - 74 years) (Syddall et al., 2009). ELSA reported the prevalence of frailty in participants aged 60 years and over to be 14% (Gale et al., 2015). The eFI reported the prevalence of frailty in patients aged 65-95 to be: 35% (mild frailty), 12% (moderate frailty) and 3% (severe frailty) (Clegg et al., 2016).

2. Challenges and Gaps Identified in the Community Setting

In the community setting, frail individuals may require care and support to carry out aspects of daily living (British Geriatrics Society, 2014). To prevent and delay costly institutional placement (e.g. nursing home), health-care policies in many countries promote independent living in the community for as long as possible (Blomgren et al., 2008).

Coping at home often requires home-based care and support arrangements, including public sector services (Blomgren et al., 2008). Inadequate care and support for vulnerable older people can result in poor health, loneliness and isolation (Drennan et al., 2008) – potentially influencing the progression of frailty (Waring et al., 2014; The Health Foundation, 2013; Hendry et al., 2018). Care and support may therefore be recommended to help prevent or delay the progression of frailty – and enable people to live well with frailty (Hendry et al., 2018). Unfortunately, a recent survey of nearly 4000 adult social care users detailed that approximately 25% of respondents described difficulties with essential activities including getting out of bed or dressing and paid carers rushing visits or reducing care packages (Care and Support Alliance, 2018). This may propel an increase in the use of informal carers, who often provide/absorb the bulk of caring pressures and challenges (The King’s Fund and the Nuffield Trust, 2018).
Concerns regarding access to care and support within the community were echoed by organisations representing community services, noting that a lack of community services had consequent pressures on acute care and GP services and contributed towards delays in discharge from hospital (CQC, 2019).

In light of the above, it is important that frail individuals are receiving care and support tailored to their needs. Understanding the care and support needs of a frail individual (through identification of their care and support network) could help to improve the coordination of care, patient safety and health outcomes (NEJM Catalyst, 2018).

In Chapter 5, a more detailed review of the literature highlights the need for care and support in the community setting (5.2.2: The Need for Care and Support) and the increasing demand for adult social care (5.2.3: Increasing Demand for Adult Social Care).

3. **Benefits of Research in the Community Setting**

The study will contribute to the understanding of the care and support networks for individuals identified as needing a falls service having had falls (falls being a recognised frailty syndrome and marker of frailty – (British Geriatrics Society, 2014)), and the contribution level of each individual providing care and support. A greater understanding of the care and support networks used by older people with falls may help to better target health and social interventions to support frail individuals (Drennan et al., 2008; Keating et al., 2003).

This study will also examine both formal and/or informal care and support contributions. To date, little is known about the ability of informal care and support networks to meet the needs of older people with long-term health problems, including frailty (Drennan et al., 2008; Keating et al., 2003).

1.6.9: **Acute Care Setting (Hospital) (A Study to Understand the Care and Support of Frail Individuals (Classified as Those at Risk of Falls) in the Acute Care Setting)**

**Estimates of Frail Individuals in Acute Care**

Older patients constitute the majority of hospital inpatients (60-70%) (Royal College of Physicians, 2012). For A&E attendances in England, the largest growth by age is for 65 to 79-year-olds (12% of all attendances in 2017-2018) (NHS, 2018b) compared with 10.2% of all attendances in 2007-2008 (NHS, 2017a). In England, one-fifth of hospital admissions in 2014–
15 were from people aged 75 years and older, accounting for approximately 40% of all days spent in hospital (Gilbert et al., 2018; NHS Digital, 2015). Though these statistics relate to older patients in hospital, it is important to note that while not all older people are frail, frailty risk is associated with increased age (Fhon et al., 2018).

The prevalence of frailty in hospitalised older patients varies widely in literature, with reported rates of between 24.7% and 80% (Richards et al., 2019; Joosten et al., 2014; Purser et al., 2006; Andela et al., 2010).

**Challenges and Gaps Identified in Acute Care**

Evidence suggests that hospital admissions can represent a ‘dangerous period’ for vulnerable patients (Hogan et al., 2017). Frail patients are especially susceptible to adverse consequences of admission to hospital (Gill et al., 2011; Hogan et al., 2017; Theou et al., 2018). Moreover, for some older people who may be frail, hospital admission is associated with an increased risk of harm over and above the presenting clinical condition (Gilbert et al., 2018; Hubbard et al., 2017).

It has been suggested that frail patients may benefit from a different approach for their acute care episode, both during admission and post-discharge (Gill et al., 2011; Hogan et al., 2017). This could include personalisation of interventions and modifications of standard protocols (Theou et al., 2018; Clegg et al., 2013; Theou and Rockwood, 2015). Hence, further research to identify frailty early in the acute care setting is needed (Theou et al., 2018; Theou and Rockwood, 2012; Cheung et al., 2017; Bebb et al., 2017).

1. **Benefits of Research in Acute Care**

The results of this study will help understand the care and support for frail individuals prior to and during admission – as well as post-discharge using data extracted from a routinely used hospital electronic patient record (EPR) system.

This is important, as the care and support given prior to admission (as recorded in the EPR system) could help plan frailty-attuned interventions from the point of admission and throughout the hospital stay. Early risk identification of patients with high levels of care and support (and/or frailty) could provide benefits to both the patient and provider of care, especially given that frail individuals are at risk of prolonged length of stay and increased mortality and readmissions (Gilbert et al., 2018; van Oppen et al., 2019). The care and support (as recorded in the EPR system) prior to admission could also help identify the best discharge
living arrangement to support patient recovery following acute care. Improved discharge planning is known to require improvement (Waring et al., 2014; Bull and Roberts, 2001; Summerton, 2013; Cornwell et al., 2012; Glasby, 2003).

This study also examines a novel hospital frailty risk score (Frailty Early Warning Score – FEWS) routinely used in acute care at the site of study (Chelsea and Westminster hospital). Full details of FEWS, in addition to its origin, scoring and use in this study is described in Chapter 3 (Section: 3.3.8). Specifically, this study examines whether ‘quantities of healthcare professional interactions’, length of stay and change in dependency level differ based on FEWS group (explained in 1.10.1). The hospital frailty risk score can help highlight the scale of the issue of frailty in the acute care setting and enable services to plan accordingly (e.g. increasing frailty specific care), which may improve patient and service outcomes.

1.6.10: Nursing Home Setting (A Study to Understand the ‘Assessments for Frailty’ Used in Nursing Homes)

1. Estimates of Frail Individuals in Nursing Homes

Recent estimates state that 410,000 older people aged 65 years and over currently live in UK care homes, which represents 16% of older people aged 85 and over (British Geriatrics Society, 2016a; Competition & Markets Authority, 2017).

The British Geriatrics Society (2018e) notes that the average care home resident has multiple long-term conditions, functional dependency and frailty. Evidence on the prevalence of frailty in nursing homes is limited in the literature (Kojima, 2015). However, a systematic review which analysed 9 studies that reported frailty prevalence estimated that as high as 52.3% of nursing home patients (aged 60 years or older) were frail (Kojima, 2015). The accuracy, however, of these statistics is reliant on the definition and understanding of frailty – and the diagnostic tool used. This can be seen in a further study, which reported the prevalence of frailty in nursing homes to vary from 1.7% to 76.3%, depending on the tool used (Buckinx et al., 2017).

2. Challenges and Gaps Identified in Nursing Homes

Residents living in nursing homes are described as vulnerable and may additionally lack a clear or coherent voice because of dementia, Parkinson’s disease or other communication difficulties (ENRICH, 2020). Nursing home residents have high levels of need, yet concerns exist that their health and social care rights are neglected (ENRICH, 2020).
Recent studies show there is limited evidence for much of the care provided in care homes (Shepherd et al., 2017; Davies et al., 2014), particularly in the UK (ENRICH, 2020). This is consistent with the concept that care provided for older people requiring long term care has historically been under-researched (Cardiff University, n.d.). Recently, there has been an increase in care home research and publications (Davies et al., 2014; Goodman et al., 2016). Nevertheless, recognised differences in the organisation and provision of care in the UK compared with other countries limit the applicability of non-UK based study findings (ENRICH, 2020).

3. **Benefits of Research in Nursing Homes**

Research of frailty and how it applies in nursing homes is important as many residents, by definition, will be frail, with high care and support needs. Moreover, if frailty is not fully recognised in residents, the implications for their clinical and care needs may be severe (British Geriatrics Society, 2015). Understanding the assessments for frailty used can help identify how frailty is recognised in this setting – a component of care and support.

The ‘Enabling Research in Care Homes’ (ENRICH) initiative notes that applying research evidence can be instrumental in raising the standards of care in care homes, providing information to encourage changes in practice and develop new ways of working. Specifically, it can lead to improvements in the quality of life or wellbeing of residents and care teams. Furthermore, research will help develop an evidence base to guide best practice in nursing homes (ENRICH, 2020).

**1.6.11: Additional Factors Relating to the Choice of Settings**

*Further reasoning behind the choice of settings related to the feasibility to conduct research in these settings, specifically:*

**1.6.11.1: Ethical Approval Required**

Investigating the care and support of frail individuals as described in this thesis involves the participation of both frail individuals themselves and healthcare professionals involved in their care and support. These studies required ethical approval from relevant bodies (described in each relevant thesis chapter). This ensured the dignity, rights, safety and well-being of all participants were the primary consideration of the research conducted (Imperial College London, 2020).
1.6.11.2: Time

The thesis studies considered the time taken for all ethical application and approval processes to be finalised, in addition to the time taken to identify and recruit participants. The collection and analysis of data, as well as the write-up of findings, were also included.

1.6.11.3: Clinical Training/Expertise

As a non-clinician, the type and nature of the studies were considered with specific reference to the NHS Health Research Authority (HRA) guidance (NHS Health Research Authority, 2017b).

For example, conducting a clinical trial of an investigational medicinal product, or a clinical trial involving a medical device would not be possible without a team comprising at least one clinical member and the need for additional training or expertise. Also, clinically identifying someone as frail would not be possible without necessary clinical expertise or training.

Hence, studies using questionnaires/interviews for qualitative and/or quantitative analysis and studies working with data were chosen in this thesis. All tests or assessments referred to in the studies used to identify whether an individual was frail were carried out by healthcare professionals with relevant clinical training/expertise.

1.6.11.4: Reasoning For Not Studying a GP/Primary Care Setting

Although it is acknowledged that GPs will manage patients with frailty (and that this setting is important) (see: 5.2.11: Care and Support of Frail Individuals in Primary Care – General Practitioner), this setting was not examined in this thesis for the following reasons.

At the time the data for these studies was collected, it was not a requirement for frailty to be formally diagnosed and recorded in primary care (NHS England, 2017b). Only in the 2017/2018 GP contract was routine frailty identification introduced for patients who are 65 years old (NHS England, 2017b). Therefore, identifying a group of frail patients to study and explore their outcomes and interactions would have been challenging at the time the studies were performed.

Not all GP practices are listed as ‘research active’ and are not obliged to take part in any research study (RCGP, 2020). Data from the Royal College of General Practitioners (RCGP), show that from approximately 7000 UK GP practices, only 562 have identified themselves as ‘research ready’ (NHS Health Research Authority, 2017a) – only 1 in North-West London.
Research involving GP practices requires both relevant ethical approval (e.g. university and HRA approval) and specific site approval. Many primary care providers are independent contractors and decide whether a study should be hosted (NHS Health Research Authority, 2017a). This could mean very few GP practices decide to participate. Given this, the time implications of applying for the required ethics approval would not have allowed time for dedicated data collection, analysis and completion of this thesis.

Going forward, the introduction and use of the eFI (Clegg et al., 2016) will help with identification of individuals with frailty (the results of which could, with relevant training, be interpreted by a non-clinician). However, the eFI was not in routine use at the time of the design of the thesis and even currently, GP practices are not mandated to use the eFI to identify older patients at risk, or with frailty (NHS Digital, 2019).

1.7: Theoretical Position

The studies presented in this thesis investigate frailty through a multi-dimensional lens. The multi-dimensional approach is supported by current academic thinking, which encourages a holistic approach for frailty recognition, assessment and management (Ding et al., 2017; Turner and Clegg, 2014). This approach should ensure that individuals are better placed to receive the necessary care and support (British Geriatrics Society, 2015). Current national guidance (NICE, n.d.), NHS policy (NICE, 2016b) (British Geriatrics Society, 2014; British Geriatrics Society, 2015) all recommended that a frail individual should be assessed and managed with multi-dimensional consideration of their care and support needs.

This thesis considers a four domain model of frailty, which takes into consideration physical, social, mental and environmental domains is adopted (Soong et al., 2013). This provides a multi-dimensional lens and theoretical position as a basis for the studies in this thesis – and is drawn on in the studies (1.3.9: Four Domain Model of Frailty).

It is understood that the results and conclusions identified through the studies in this thesis represent one viewpoint and, as such, will have limitations (discussed in each relevant chapter and associated sections).

1.8: Rationale for Inductive Approach

The studies undertaken are performed using inductive research (using observations and finding patterns from the studies undertaken to reach a conclusion). This was chosen as the studies
aimed to ascertain current practice in distinct settings in North-West London. Also, limited literature detailed current practices in each of the settings studied in North-West London. The inductive approach combined both qualitative and quantitative methodologies to collect data. This approach aimed to generate meanings from the data collected, identifying the presence of any patterns and relationships. Any patterns, relationships or other characteristics identified were used to reach conclusions and formulate recommendations.

1.9: Organisation of the Thesis

This section will describe how the thesis has been organised, taking into consideration the ‘Five W’s’.

1.9.1: Examination of Care and Support Across the Frailty Spectrum.

This thesis examines and considers the complexities of care and support of the frail individual across the spectrum of frailty severity. The thesis chapters aim to investigate the care and support of the frail individual from different levels across the frailty spectrum. For example: as an overview (i.e. with no specific frailty level in particular) (i.e. the non-acute care setting), at a pre-frail or mild frailty level (i.e. the community setting (using a falls service as an exemplar)), at a medium level of frailty (i.e. the acute care setting (hospital)) – and at a higher level of frailty (i.e. the nursing home setting). The work detailed will contribute to the current understanding of frailty, how it is assessed and identify areas to inform future research.

1.9.2: The Five W’s.

This thesis investigates the complexities in care and support of frail individuals in many different ways. A simplified overview of the structure is that the investigative approach taken attempts to answer the ‘Five W’s’ (Hart, 1996) (who, what, where, when and why). An additional question of ‘how’ was also used.

Who

In the thesis introduction, I describe the increases in life expectancy, ageing populations and the associated emergence of frail individuals.

What

The complexities in defining and describing frailty were detailed, in addition to demonstrating many of the complexities involved in the care and support of frail individuals. A review of the
literature of persisting, current and emerging challenges answered many of the ‘Five W’s’, while also unearthing a need to investigate what was happening in practice.

**Where**

It was noted that frailty can occur at various intensities or levels, each of which are recommended to be addressed with differing levels of care and support. The studies investigate the non-acute care setting from a high level, followed by focused investigations in three distinct settings: the community setting (using a falls service as an exemplar), the acute setting (hospital) and the nursing home setting.

**When**

The care and support in each setting was investigated. In the community setting (using a falls service as an exemplar), the care and support given routinely was studied. For patients in acute care, care was studied for pre-admission, during admission and post-discharge. In the nursing home setting the reported ‘assessments for frailty’ used were investigated.

**Why**

Three core settings were investigated, based on the evidence for the likelihood of frail individuals being present in these settings. There is also a research need for frailty studies, particularly across a spectrum health and care settings, as detailed earlier (1.6.6: Specific Reasons for Settings Chosen) and in each of the respective chapters.

**How**

A mixed-methods approach (comprising both qualitative and quantitative research) was used, ensuring that holistic consideration of patients and health and care providers took place.

1.10: Addressing the Research Needs

1.10.1: Primary Research Questions

Drawing on challenges and research needs identified in literature and known practice (as detailed in this introduction), I have formulated relevant research questions.

Firstly, an **overarching research question:**

*How does the care and support of frail individuals manifest across the frailty spectrum?*
The introductory chapter and literature review describes and defines the frailty spectrum: from pre-frail, mild/moderate frailty and severe frailty. It also identifies the rationale for three different and important care settings described in this thesis, namely: the community (using a falls service as an exemplar), acute care (hospital) and nursing homes.

As a result, the overarching research question is addressed with 4 specific research questions:

1. **What assessment tools for frailty are used in non-acute health and care settings?**
2. **What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?**
3. **What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?**
4. **What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?**

Each specific research question is addressed with supporting research questions, using a range of methodologies. The supporting research questions were developed through an iterative approach, with the ultimate aim to help address the overarching research question. These supporting research questions and a summary of the methodologies used are detailed below.

1. **What assessment tools for frailty are used in non-acute care settings?**

   a) *What assessments for frailty are currently used in non-acute health and care settings across North-West London?*

   b) *What components (e.g. purpose, content, and domains) currently contribute towards an assessment for frailty?*

Research question 1 is addressed using a purposive sample (i.e. from 18 people fulfilling specific inclusion criteria) (see: 3.1.3: Study Participants Inclusion Criteria). All worked in a professional capacity with frail individuals (or undertook research of frail individuals), some of whom had an implicit responsibility to assess them. Contact was made via email and/or telephone. A survey (questionnaire) was used to collect the data (see ‘3.1.7: Survey’ for questions). Data was analysed using descriptive statistics.
This study was not based in a specific setting, but focussed on contacting participants across a range of different non-acute care settings. This informed a better understanding of assessing for frailty across the non-acute care landscape.

This study focussed on frailty recognition (i.e. aiming to understand what frailty assessment tools are used to identify whether a person is frail or not).

2. **What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?**

   a) *What does the care and support network look like?*

   b) *Are there any patterns among the networks of the frail individuals?*

   c) *How does the network identified by a frail individual compare to the network of the frail individual as perceived by the healthcare professionals (provider)?*

Research question 2 is addressed using a cross-sectional study design. A semi-structured interview was used to collect the data (see Appendix F and G). This was conducted using a participatory approach. In this study, a participatory approach refers to writing the responses to the semi-structured questions on Post-it notes to help facilitate discussion, allow responses to be checked, changed and sorted (Full explanation in ‘3.2.2.1: Participatory Approach’).

Data was analysed using descriptive statistics and quantitative analysis.

3. **What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?**

   d) *Using a population of people who have been classified at risk of falls (having had a fall as a presenting complaint), what are the descriptive characteristics of these people?* (‘At risk of falls’ has been used to classify ‘frailty’ through a physical lens).

   e) *Using this frail population, what is the living arrangement of patients pre-admission and their proposed living arrangement on discharge?*

   f) *What levels of dependence does this frail population have before admission and post-discharge?*
Using a novel frailty assessment developed in acute care (FEWS) as an indicator of frailty level, does the:

i) Complete healthcare professional interactions a patient received during their hospital admission. (the total number of professions who saw the patient and who recorded an entry for the interaction in the EPR system)

ii) Discrete healthcare professional interactions a patient received during their hospital admission. (the total number of unique professions who saw the patient and recorded an entry for the interaction in the EPR system)

iii) Length of Hospital Stay

iv) Change in Dependency Level at Discharge Destination (i.e. whether the patient has been discharged to a living arrangement that represents a higher dependency level relative to their pre-admission living arrangement).

Differ based on FEWS group

Research question 3 is addressed using an EPR system data extract regarding patients admitted with ‘falls’ to acute care. Quantitative analysis was used to analyse the data.

FEWS aims to be a novel method of predicting a frail and/or vulnerable individual’s outcomes in acute care. It is designed to be simple to calculate and used by clinicians at the point of care. The score is based on a validated model of frailty which took consideration of frailty syndromes and used both historic (e.g. data from HES) and within-spell variables (Soong et al., 2015). The validated model concluded that frailty syndromes were valid predictors of outcomes relevant to acute care (adverse events at 30 days, emergency readmission and institutionalisation).

FEWS consists of 15 descriptors across four domains of frailty (physical, social, mental and environmental) (detailed in ‘Table 7: FEWS Scoring System’). It is based on clinical judgement, with a score of 1 being assigned for each descriptor observed in the patient (a score of 0 if the descriptor is absent).

FEWS was being trialled as part of the routine measurement of frailty by clinicians in the acute assessment unit (AAU) at Chelsea and Westminster hospital. Clinicians using the score had ethical approval and training to assign a FEWS to all patients admitted to the acute assessment unit. The same group of clinicians assigning a FEWS for patients increases the reliability of the score used for analysis.
The setting for my PhD studies is Chelsea and Westminster hospital, in North-West London. I have been granted ethical approval and access to the FEWS data. In the AAU at this hospital, no other tools assessing frailty are currently used. Using other multidimensional tools to assess frailty requires additional ethical and/or site approval, in addition to clinical expertise and training sessions on using the tool (e.g. use of the clinical frailty scale (Rockwood et al., 2005) as previous studies demonstrate (Juma, Taabazing and Montero-Odasso, 2016). These factors, in addition to the time implications associated with each of them also led to the choice of FEWS being used in this study. As a non-clinician without training, I would be unable to accurately score and/or use many of the multidimensional tools in use in acute care.

With regards to i) (Different quantities of the complete healthcare professional interactions a patient received during their hospital admission)

The quantity of complete healthcare professional interactions a patient received during their hospital admission takes into consideration all healthcare professional interactions (e.g. if a patient was seen by a nurse 3 times during their stay, the complete healthcare professional interactions received would be recorded as ‘3’).

A further example involving multiple healthcare professional interactions a patient may have seen in a professional capacity during their hospital stay (as recorded in the EPR system) is shown below. As this part of the question aims to capture the quantity of ‘complete healthcare professional interactions’ for the example patient shown in Table 1, the total quantity recorded would be 6 for their hospital stay.

Table 1: Healthcare Professional Interactions Example

<table>
<thead>
<tr>
<th>Date</th>
<th>Healthcare Professional Interaction (Discrete Healthcare Professional Interactions Highlighted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16/01/2015</td>
<td>Doctor</td>
</tr>
<tr>
<td>17/01/2015</td>
<td>Nurse</td>
</tr>
<tr>
<td>17/01/2015</td>
<td>Nurse</td>
</tr>
<tr>
<td>18/01/2015</td>
<td>Nurse</td>
</tr>
<tr>
<td>18/01/2015</td>
<td>Pharmacist</td>
</tr>
<tr>
<td>18/01/2015</td>
<td>Occupational Therapist</td>
</tr>
</tbody>
</table>
**With regards to ii) (Different quantities of discrete healthcare professional interactions a patient received during their hospital admission)**

The quantity of discrete healthcare professional interactions a patient received during their hospital admission was the total number of unique professions who saw the patient in a professional capacity and who recorded an entry in the EPR system (highlighted in the table). Thus, using the same example above, the number of ‘discrete healthcare professional interactions’ received during their stay recorded would be 4.

During a hospital stay, frequent contact with healthcare professionals has been suggested to help ensure timely identification of patient needs such as pain management, prevent adverse events (e.g. falls) and improve overall patient satisfaction and emotional health (Cohen et al., 2012). Furthermore, hospitalised patients may often require assistance with basic self-care tasks, such as using the toilet, walking and eating (Saleh et al., 2011). Importantly, research has found that the number of interactions between health-care workers and patients should be determined by the severity and complexity of illness (Kirkland and Weinstein, 1999).

Given these statements, one may expect that the frailest patients would require more care than the least frail patients. ‘More care’ may consist of a greater quantity of interactions overall (Kirkland and Weinstein, 1999). In this study, this would be demonstrated by investigating the quantity of ‘complete healthcare professional interactions’.

In addition, a greater need for multidisciplinary care may be present in the frailest individuals (to comprehensively address the needs of the individual) compared to the least frail (NHS Rightcare, 2019; NHS Camden, 2014). Due to the association with frailty and multi-morbidity (Hanlon et al., 2018), a greater number of discrete healthcare professionals may be involved in the care of the frailest when compared with the least frail. In this study, this would be demonstrated by investigating the quantity of ‘discrete healthcare professional interactions’.

Chapter 6 also aims to investigate whether the number of healthcare professional interactions (both complete and discrete) a patient receives during their hospital stay differ based on FEWS group (which may be used as an indicator of the level of frailty). As evidenced in the literature, identifying patients with (or at risk of) frailty early during hospitalisation may help improve treatment strategies including a comprehensive geriatric assessment to improve the care and outcomes of patients (Eckart et al., 2019). The FEWS proposes to help identify patients with (or at risk of) frailty in an acute care setting.
At present, it is not known whether the number of interactions differs based on FEWS group. Testing this could provide further rationale and justification for using FEWS within an acute care setting. Furthermore, testing whether the length of stay and change in dependency level at discharge differ based on FEWS group may suggest benefits of using the score in acute care. For example, knowing these predicted characteristics when a frail individual is admitted to hospital may help with hospital resource allocation and planning, benefitting both patients and healthcare staff alike.

4. What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?

a) In North-West London, what assessment tools for frailty are being used? Are these tools standardised or non-standardised?

b) If assessments for frailty are being used, what is their nature with respect to the four domains of frailty?

c) Is there a difference in the number of assessments used in corporate chain owned nursing homes vs independently owned nursing homes?

d) Which health professionals are using the assessment tools?

e) Why are the assessment tools being used (purpose)?

f) How are the assessments documented, or stored (e.g. electronically or on paper)?

An online survey (questionnaire) was used to address research question 4 to obtain responses from nursing homes across North-West London (see Appendix I for survey questions). Responses to the survey were provided by the nursing home managers of each home. Data analysis comprised both quantitative and descriptive analyses.

Of note (and unlike research question 1), this study was based in a specific non-acute care setting – nursing homes.

1.11: Study of Patients With, or at Risk of Falls (‘Frail Population’)
Individuals from a 'Falls Prevention Group' (Chapter 5) and patients admitted to acute care with a fall (Chapter 6) formed the participants for two studies. The study of participants with falls (who formed the 'Frail Population') was relevant as falls are a recognised potential indicator of frailty in older patients. More background is given in Chapters 5 and 6. Brief reasons why this population has been studied is explained below:

1.11.1: Evidence From the Literature Detailing the Link Between Falls and Frailty

Falls are one of the five recognised ‘frailty syndromes’ (BMA, 2018), along with immobility, delirium, incontinence and susceptibility to side effects of medication. Increasing evidence links frailty specifically to falls (Nowak and Hubbard, 2009) and frail adults are three times more likely to fall than non-frail adults (Nelson et al., 2007). Hence, this now forms part of guidance as an important marker of frailty in older people (Anderson, 2008; Royal College of Physicians, 2017; Institute of Medicine (US), 1992). ‘Falls’ is also listed as one of the 8 symptoms or signs indicating the possible presence of frailty in the eFI (available in many UK primary care settings to identify frailty) (NHS England, n.d.2; Clegg et al., 2016).

1.11.2: As a Target Way of Accessing a Frail Population

Frail, older people have been excluded and under-recruited from research (McMurdo et al., 2011). This may be because they are (or perceived as) hard to reach populations (McMurdo et al., 2011; Age UK, 2009; Kammerer et al., 2019).

Given the known link between falls and frailty, identifying patients with falls provided me as a non-clinician with a well-defined target population for studies on frailty in older individuals without the need for a broad clinical understanding or training. Falls are also a common clinical problem (NHS, 2019b).

In the community study (Chapter 5), individuals who were part of a ‘Falls Prevention’ group represent a ‘Frail Population’. These individuals would have been advised to join the group by their GP, or other healthcare professional, due to their falls history. Accordingly, these individuals are likely to be classified as pre-frail or frail, based on their falls history.

In the acute care study (Chapter 6), data access to patient care and support records pre-admission and following discharge was only made available for patients over 65 years and classified at risk of falls (having had a fall as a presenting complaint). As described, many of these patients will have moderate to severe frailty by definition (and for reasons described in
‘5.2.8: Frailty and Falls’). As such, they represent a ‘Frail Population’ for whose data could be readily accessed and analysed.

1.11.3: Limitations of This Approach

Defining the ‘Frail Population’ this way has limitations.

Firstly, only one diagnostic marker of frailty (falls) is used, although this is well described in literature. Therefore, only a subset of the potential population at risk of frailty is studied. However, falls are the most common cause of emergency hospital admissions for older people, significantly impacting on long term outcomes (NHS, 2019b). Other syndromes associated with frailty were not assessed (e.g. immobility, delirium, incontinence and susceptibility to side effects of medication).

Other studies described in research may define a ‘Frail Population’ differently (e.g. over 65 years old and presenting with delirium), which may influence the size of the population studied. It is possible that defining a ‘Frail Population’ differently may result in different findings to those found in this thesis.

In the community setting study, the ‘Frail Population’ consisted of individuals who were part of a ‘Falls Prevention’ group. In the acute care study, the ‘Frail Population’ consisted of patients over 65 years and at risk of falls. There are recognised biases to this approach; as such, it should be noted that the care and support of frail individuals (and the findings) are limited to those satisfying the criteria defining the ‘Frail Population’ stipulated in each of the studies.

1.12: How Different Perspectives Are Incorporated and Examined in This Thesis

In addition to detailing the structure of the thesis, Chapter 1 details a critical review of the literature regarding frailty, particularly focussing on variations in the definitions of frailty. An examination of the different perspectives regarding the conceptual and operational definitions in the literature is explained, including the range of perspectives regarding different components forming the multidimensional nature of frailty.

In Chapter 2, a systematic literature review is reported concerning assessments tools for frailty in non-acute care settings. This chapter considers information and perspectives originating from both academic and grey literature.

Chapter 3 outlines the research methods used.
Chapter 4 details a high-level investigation of the non-acute care setting – specifically examining the assessments for frailty that were currently being used in practice. This chapter takes into consideration the perspectives of members of a Frailty Steering Group (based at NIHR CLAHRC NWL) to construct a stakeholder map. Further, the perspectives of a range of healthcare professionals and individuals with assumed interaction with frail individuals are gathered and examined (regarding assessments for frailty used).

Chapter 5 examines the care and support networks of ‘Frail Individuals’ in the community setting. In this chapter, the perspectives of both the patient and healthcare professional (regarding the perceived care and support network of the patient) are gathered and examined.

Chapter 6 in the acute care (hospital) setting uses the hospital EPR system as the data source – and is therefore dependent on routine record entries made by healthcare professionals. Here, the care and support pre-admission, during acute admission and post-discharge is examined. The discharge living arrangement is derived from the healthcare professionals’ perspective of the care and support needs of the frail individual. Further, the frailty score (FEWS) of the patients in this study are examined. FEWS is determined by a healthcare professional’s clinical judgement, expertise and perspective.

Chapter 7 is set in a specific longer-term care setting (Nursing Homes), where the tools used to assess for frailty in 24 nursing homes are examined. These tools, or ‘assessments for frailty’ may help devise a care and support plan for frail individuals. Since the ‘assessments for frailty’ would be considered by each nursing home manager (and/or the provider of the nursing home), the ‘provider of care’ is the perspective being studied.

Chapter 8 brings together the literature review and all outputs and perspectives from the studies, providing details of the key findings, and a personal perspective regarding the contributions to new knowledge, the impact on policy and practice areas for future work.

1.13: How Complexities in Care and Support of Frail Individuals are Examined in This Thesis

1.13.1: Defining Complexity

The term ‘complexity’ has been used to characterise something with many parts (or components), where the parts interact with each other in multiple ways, culminating in a higher order of emergence greater than the sum of its parts (Bertram and Dooble, 2019).
In the context of healthcare, complexity is similarly said to be understood as a combination of components that are intertwined (Weydt, 2009), which can be discussed on the level of systems (Kannampallil et al., 2011; Lindberg, Nash and Lindberg, 2010) and the level of patient situations, such as their care (Shippee et al., 2012). In healthcare settings, studies of the complexities of care have illustrated that there is great diversity in the meaning of the concept, with ‘complexity of care’ being not well defined (Guarinoni et al., 2015; Cologna et al., 2010).

The WHO (2012) has highlighted the need to appreciate that health care is inherently complex, listing several reasons which include (WHO, 2012, p.1):

- ‘The diversity of tasks involved in the delivery of patient care
- The diversity of patients, clinicians and other staff
- The huge number of relationships between patients, carers, health-care providers, support staff, administrators, family and community members
- The diversity of care pathways and organisations involved’.

Many reasons listed by the WHO may be evident in the studies undertaken as part of this thesis. However, as Guarinoni et al. (2015) emphasise, there may be difficulty in measuring or quantifying complexity.

For healthcare, it has been suggested that complexity can be considered in three ways: medical complexity, situational complexity and system complexity (Queensland Government, 2011). All of these considerations are subjective and consist of a number of different criteria.

As an example, the criteria for defining medical complexity could include: the severity of the illness or condition, the presence of co-morbidity and difficulties in ascertaining an accurate diagnosis (Queensland Government, 2011). Equally, situational complexity could be determined by considering factors such as: environmental (e.g. the physical and social environment where people live), personal (e.g. age, gender) and activity and participation (e.g. relationships, work and culture). System complexity could be determined by considering factors such as staff availability, pathways for patients and funding (Queensland Government, 2011). All these elements could contribute to the overall complexity concluded – although it would have to be noted that the conclusion would arguably be context-dependent and a subjective notion (Kannampallil et al., 2011).

1.13.2: Difficulties in Measuring Complexity
A recent public health study identified that complexity in health and care had both quantitative and qualitative aspects, noting both aspects are important (Guarinoni et al., 2015). Notably, the study argues that the complexity of care cannot be reliably measured or classified on any scale. For example, though some elements regarding a patient can be standardised and measured it is acknowledged that each patient is unique and experiences such as culture, emotions and the meaning they ascribe to various things (e.g. life and death) are harder to measure (Guarinoni et al., 2015).

The challenges associated with estimating complexity include one which aimed to estimate the relative complexity of ambulatory care (Katerndahl, Wood and Jaen, 2010). It noted that difficulty in counting all possible states of relevant components and a lack of knowledge regarding the full behaviour of a system (if estimating the complexity of a system) will contribute to a potential underestimation of complexity (Katerndahl, Wood and Jaen, 2010).

1.13.3: Examining Complexities in Care and Support in This Thesis

In this thesis, complexities in care and support of frail individuals are examined and detailed (Chapter 8). This has been done by considering the Five W’s and ‘How’ as factors to help identify the components comprising the complexities in care and support (summarised for each research question in Table 2). Examining these factors in detail (as done in the subsequent chapters) will help to uncover some of the complexities in the care and support of frail individuals.
Table 2: Examining Complexities in Care and Support in This Thesis

<table>
<thead>
<tr>
<th>Link to Thesis Research Question</th>
<th>3 Distinct Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Acute Care Setting</td>
</tr>
<tr>
<td>What assessment tools for frailty are used in non-acute health and care settings?</td>
<td>What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?</td>
</tr>
<tr>
<td>Chapter</td>
<td>4</td>
</tr>
<tr>
<td>Examination of the Complexity in Care and Support of Frail Individuals with respect to the following factors:</td>
<td>Who</td>
</tr>
<tr>
<td></td>
<td>Assessments for Frailty' used across non-acute care</td>
</tr>
<tr>
<td></td>
<td>This study concerns 'Frail Individuals' utilising a range of perspectives from individuals working in a professional capacity with frail individuals (or researching frail individuals)</td>
</tr>
</tbody>
</table>
examination of whether a range of outcomes differs based on FEWS group.

<table>
<thead>
<tr>
<th>Where</th>
<th>Non-Acute care settings across North-West London</th>
<th>Community Setting (Participants sampled from 'Falls Prevention Group')</th>
<th>Acute Care Setting (Participant data extracted from an EPR system from 1 hospital)</th>
<th>Nursing Homes (Nursing Homes situated in the geographical region of North-West London were all eligible for the study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>When</td>
<td>The Frail Individuals in this study will likely have a range of frailty levels (and care and support needs).</td>
<td>The Frail Individuals in this study are likely to have low to medium levels of frailty (and care and support needs).</td>
<td>The Frail Individuals in this study are likely to have medium to high levels of frailty (and care and support needs).</td>
<td>The Frail Individuals in this study are likely to have medium to high levels of frailty (and care and support needs).</td>
</tr>
<tr>
<td>Why</td>
<td>This study identifies the assessments for frailty used across non-acute care settings, investigating whether practices are standardised (or not) and providing data which can be used in later studies in this thesis (e.g. some 'assessments for frailty' listed as options in the survey (questionnaire) sent to nursing homes)</td>
<td>The 'patients' in this study are likely to be frail (and/or at risk of frailty) who may call upon their network to assist with their care and support needs. The healthcare professionals participating in the study will offer a secondary perspective of the care and support networks.</td>
<td>The patients investigated in this study are likely to be classified as frail (and/or at risk of frailty). An indication of the care and support needs of the patients will be garnered from the pre-admission and post-discharge living arrangements, in addition to the care and support received during admission.</td>
<td>This study focusses on a setting highly likely to consist of frail individuals (and/or individuals at risk of frailty) who should be assessed for frailty (as recommended by the British Geriatrics Society (BGS)) to help identify their care and support needs and planning.</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>How</td>
<td>Survey used via online/telephone contact</td>
<td>Semi-Structured Interviews with patients and healthcare professionals</td>
<td>Data extraction from an EPR system and analysed quantitatively</td>
<td>Survey (questionnaire) deployed online to nursing homes across North-West London</td>
</tr>
</tbody>
</table>
1.14: Relation to Care and Support Elements

As highlighted earlier (1.4 Defining Care and Support), four elements of care and support have been suggested in literature (Tronto, 1993). Below, these elements of care and support are displayed in coloured segments and a brief description of how these elements have been considered in this thesis is detailed.

- **Recognition of Need (Caring About)**: Recognising and assessing for frailty can help understand the care and support an individual may need. Aspects of this are examined in the systematic review, non-acute care setting, acute care setting and nursing home setting (e.g., examining assessments for frailty used).

- **Direct Action (Care-Giving)**: The care and support an individual receives (care given) may relate to their level of frailty. Aspects of this are examined in the community setting and the acute care setting (e.g., examining frail care and support networks and living arrangements).

- **Willing to Respond to (Take Care Of) a Need**: Healthcare professionals may see a responsibility to respond to the level of frailty a individual has. Aspects of this are examined in the acute care setting (e.g., examining association of FEWS with healthcare professional interactions).

- **Reaction to the Care Process (Of the Care Receiver)**: Aspects of the care receiver’s perception of care and support are examined in the community setting (e.g., examining qualitative aspects derived from patient interviews with respect to a care and support network).

Figure 4: Brief Relation of Studies to Elements of Care and Support Highlighted in Literature
The diagram below illustrates a simplified overview of the studies and the connections between each of them undertaken in this thesis.

**Figure 5: Simplified Overview of Studies Undertaken**
1.15: Link to Next Study

This chapter reviewed the literature, illustrating a current and increasing challenge for health and care systems: frailty. Research highlights an important aspect of ensuring the right care and support for a frail individual is by recognising and assessing for frailty (Ding et al., 2017; Turner and Clegg, 2014; British Geriatrics Society, 2015). Therefore, it was decided that a systematic review would help understand the ‘assessments for frailty’ in a broad setting (non-acute care) as reported in literature (schematically displayed below).

![Diagram showing the research process from introduction and background to systematic literature review and assessing frailty in the non-acute care setting.]

Schematic A: Link to Next Study
Chapter 2: Systematic Literature Review: Assessing For Frailty in the Non-Acute Care Setting

2.1: Introduction and Rationale for Systematic Review

As Chapter 1 details, a shared view of frailty is commonly one of an older person at heightened vulnerability to adverse health status or functional change (Rockwood and Howlett, 2018; Kojima et al., 2019). Recognising and assessing for frailty is important, especially when small events can trigger significant changes in the physical and/or mental wellbeing of a frail individual (British Geriatrics Society, 2015).

Presently, UK guidance and recommendations state that any interaction between an older person and a health or social care professional should include an assessment for frailty (British Geriatrics Society, 2014). Hence, the purpose of this systematic literature review is to gain an understanding of the tools and approaches used to assess for frailty in the non-acute care setting.

An initial review of the literature surrounding the assessments used for the detection of frailty in older adults revealed that a recent systematic review had been published (Faller et al., 2019). This systematic review highlighted the instruments used for the detection of frailty in older adults, making note of the components, application scenarios and their ability to identify pre-frailty (Faller et al., 2019). However, given the growing body of literature on frailty (Fielding et al., 2015), it was possible that since Faller et al. (2019) completed the systematic review, more assessments for frailty may be produced or used. Hence, the systematic review by Faller et al. (2019) has been updated by critically reviewing the assessments/instruments for frailty used specifically in the non-acute care setting.

**Systematic Review Question**

1. What instruments exist to assess frailty in older adults in the non-acute care setting?
2. What domains are covered in these instruments (physical, social, mental and environmental)?

2.2: Methods

This update to the systematic review by Faller et al. (2019) was conducted according to ‘Preferred Reporting Items for Systematic Reviews and Meta-Analyses’ (PRISMA) guidelines.

In preparing this review, five steps were taken. These were:
1. Defining the research question
2. Execution of the searches in the databases
3. Selection of the studies in accordance with the eligibility criteria
4. Extraction of data from the studies
5. Synthesis and discussion of results

The electronic searches were performed on 18th May 2020. Every effort was made to search the databases used by Faller et al. (2019). 12 electronic databases used in their systematic review were searched: Medical Literature Analysis and Retrieval System Online (MEDLINE), EMBASE, Scopus, Ovid, ProQuest, Web of Science, Latin American and Caribbean Health Sciences Literature (LILACS), Pan American Health Organization (PAHO), The Nursing Database (BDENF), MedCarib, WHOLIS and Google Scholar.

Two databases used by Faller et al. (2019) were not included in this study (Cumulative Index to Nursing and Allied Health Literature (CINAHL) and CAPES Theses and Dissertations Catalog). The former was not accessible through Imperial College London; for the latter, an accurate and reliable English translation of the search results could not be guaranteed.

2.2.1: Search Strategy

The search strategy used was identical to that described by Faller et al. (2019) (Detailed in Appendix A). The search strategy was then adapted to all databases used in this study. As with that described by Faller et al. (2019), no restrictions were placed on the scenario or place of publication. Search results were only included from 25th September 2018 (when Faller et al. (2019) concluded their systematic review searches) to 18th May 2020.

The inclusion and exclusion criteria for this systematic review has been adapted from Faller et al. (2019).

2.2.2: Inclusion Criteria

- Participants aged 60 years or over
- Studies describing an instrument created for the assessment of frailty (for use in the non-acute care setting)
- Studies providing details of the frailty assessment (including domain coverage, whether the assessment is an adaptation from another assessment)

2.2.3: Exclusion Criteria
Letters to the editor, review articles, protocols and event summaries

Studies describing an instrument intended for use outside the non-acute care setting.

2.3: Results

Updating the original systematic review by Faller et al. (2019) (i.e. a new search carried out for the period: 25th September 2018 - 18th May 2020) produced the following results, as described. This process was carried out by one person (DS).

A new electronic search carried out (period: 25th September 2018 - 18th May 2020) returned 3638 results. After removing duplicate records, 1668 records remained. 1519 were subsequently excluded after title and abstract screening. 149 full-text articles were read and assessed for eligibility, of which 99 articles were excluded. These articles were excluded because they were either: based in the acute care setting (85), lacking details regarding the nature of the frailty assessment instrument (12) or the full article was not accessible (2). 50 records were included in the final qualitative synthesis (process shown in Figure 6).
Figure 6: Study Flow Diagram (Assessing For Frailty in the Non-Acute Care Setting)
Table 3: Instruments for Frailty in the Non-Acute Care Setting

(Adapted and updated from (Faller et al., 2019)).

Faller et al. (2019) identified 45 instruments constructed and/or validated for use in a non-acute care setting. Table 3 details these instruments, the authors, domain coverage, settings the tool has been used in and a brief description of the instrument (Faller et al., 2019).

Additionally, highlighted in green are 39 new instruments and publications I have identified from updating the systematic review (from 50 records included in the qualitative synthesis).

Highlighted in yellow are publications (I have identified in the updated systematic review) relating to 12 existing instruments identified in the original systematic review.

Abbreviations used:

Domains: P: Physical, S: Social, M: Mental and E: Environmental

Settings (The population from which the tool was constructed and/or validated for use): LTCIOA: Long-Term Care Institutions for Older Adults (e.g. Nursing Home)

<table>
<thead>
<tr>
<th>Instrument / Author(s)</th>
<th>Domains</th>
<th>Settings</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>34-item Frailty Index (FI) / Ge et al., 2019; Ge et al., 2019b</td>
<td>✓ ✓ ✓ ✓</td>
<td>LTCIOA</td>
<td>34-item FI. FI Score defined as a ratio between existing deficits and no. of evaluated deficits. (FI Range: 0–1)</td>
</tr>
<tr>
<td>35-item FI (Developed by Authors) / Canevelli et al., 2019</td>
<td>✓ ✓</td>
<td>Community</td>
<td>35-item FI. FI coded as 0 (absence of the deficit) or 1 (presence of the deficit) (FI Range: 0–1)</td>
</tr>
<tr>
<td>39-item FI (Developed by Authors) / Zhu et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
<td>39-item FI. (FI Range: 0-1)</td>
</tr>
<tr>
<td>Name</td>
<td>Authors/Publication Year</td>
<td>DOI/Note</td>
<td>Setting</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------------</td>
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<td>--------------------------</td>
</tr>
<tr>
<td>40-item FI (Developed by Authors)</td>
<td>Zucchelli et al., 2020</td>
<td>✓ ✓ ✓</td>
<td>Community, LTCIOA</td>
</tr>
<tr>
<td>40-item FI (Developed by Authors)</td>
<td>Hutchins-Wiese &amp; Walsh, 2020</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>40-item FI (Developed by Authors)</td>
<td>Ruan et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>40-item FI (Developed by Authors)</td>
<td>Anand et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>41-item FI (Developed by Authors)</td>
<td>Shi et al., 2020; Shi et al., 2020b</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>42-item FI (Developed by Authors)</td>
<td>Hoogendijk et al., 2020</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>42-item FI (Developed by Authors)</td>
<td>Burn et al., 2018</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>44-item FI (Developed by Authors)</td>
<td>Li et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>48-item FI (Developed by Authors)</td>
<td>Xue et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>54-item FI (Developed by Authors)</td>
<td>Arakawa Martins et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>68-item FI (Developed by Authors)</td>
<td>Ma et al., 2016</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>81-item FI (Developed by Authors)</td>
<td>Burt et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Brazilian Frailty Index (26-Item)</td>
<td>Silva and Almeida, 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>British Frailty Index</td>
<td>Kamaruzzaman et al., 2010</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Chinese Canadian Study of Health and Aging Clinical Frailty Scale</td>
<td></td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Telephone Version (CSHA CFS TV)</td>
<td>Chan et al., 2010</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Clinical Frailty Scale (CFS) from the Canadian Study of Health and</td>
<td></td>
<td>✓ ✓ ✓</td>
<td>Community, Hospital</td>
</tr>
<tr>
<td>Aging (CSHA)</td>
<td>Rockwood et al., 2005; Gregorevic et al., 2016; Gordon et al., 2019; Salminen et al., 2019</td>
<td>✓ ✓ ✓</td>
<td></td>
</tr>
<tr>
<td>Clinical Global Impression of Change in Physical Frailty (CGIC-PF)</td>
<td>Studenski et al., 2004</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Cognitive Frailty Index (CFI)</td>
<td>Armstrong et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Comprehensive Frailty Assessment Instrument (CFAI)</td>
<td>De Witte et al., 2013a; De Witte et al., 2013</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Continuous Frailty Scale (CFS)</td>
<td>Wu et al., 2018</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td>Care Partners Frailty Index Comprehensive Geriatric Assessment (CP-FI-CGA)</td>
<td>Goldstein et al., 2013; Goldstein et al., 2015</td>
<td>✓ ✓ ✓</td>
<td>Community, Emergency,</td>
</tr>
<tr>
<td>Instrument</td>
<td>Source(s)</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>------------</td>
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<td></td>
</tr>
<tr>
<td>Edmonton Frail Scale (EFS)</td>
<td>Rolfsen et al., 2006; Fabricio-Wehbe et al., 2009; Fabricio-Wehbe, 2013; Ramirez et al., 2017; Ambagtsheer et al., 2019b; Ambagtsheer et al., 2020b</td>
<td>Assessment of 9 frailty domains. Scale: 0–17. 5 levels (not frail, apparently vulnerable, mild, moderate and severe frailty)</td>
<td></td>
</tr>
<tr>
<td>eFI (Adapted from Clegg et al., 2016)</td>
<td>Ambagtsheer et al., 2020</td>
<td>36-item FI. 3 levels (robust, mild frailty, moderate frailty)</td>
<td></td>
</tr>
<tr>
<td>eFI (Adapted from Clegg et al., 2016)</td>
<td>Pajewski et al., 2019</td>
<td>54-item FI.</td>
<td></td>
</tr>
<tr>
<td>Electronic Comprehensive Geriatric Assessment/Frailty Index (eFI-CGA)</td>
<td>Sepehri et al., 2020</td>
<td>Electronic Version of the CGA</td>
<td></td>
</tr>
<tr>
<td>Electronic Frailty Index (eFI)</td>
<td>Clegg et al., 2016; Abbasi et al., 2019; Ambagtsheer et al., 2019; Brundle et al., 2018; Hollinghurst et al., 2019; Allaboudy et al., 2019</td>
<td>36-item deficit model. Scale: 0–1. 3 levels (robust, mild frailty, moderate frailty)</td>
<td></td>
</tr>
<tr>
<td>Emergency General Surgeries Frailty Index (EGS-FI)</td>
<td>Jokar et al., 2016</td>
<td>15-item FI. Scale (frail—not frail) Range: 0–1</td>
<td></td>
</tr>
<tr>
<td>EuroQol-5 Dimension (EQ-5D)</td>
<td>Curran et al., 2019</td>
<td>4-item questionnaire. Scale: 0-4. Higher scores represent better quality of life.</td>
<td></td>
</tr>
<tr>
<td>Fi-Lab</td>
<td>Yang et al., 2018</td>
<td>30-item FI. Scale: 0-1</td>
<td></td>
</tr>
<tr>
<td>Frail Non-Disabled (FiND)</td>
<td>Cesari et al., 2014</td>
<td>5-item questionnaire. Scale (frail—not frail) Separates disability from frailty</td>
<td></td>
</tr>
<tr>
<td>Frailty GIR Evaluation (FRAGIRE)</td>
<td>Vernerey et al., 2016</td>
<td>19-item instrument. Scale: 0–100. No cut-off point. Higher scores equal greater frailty</td>
<td></td>
</tr>
<tr>
<td>FRAIL Scale</td>
<td>Gardiner et al., 2015; Woo et al., 2015; Gonzalez et al., 2016; Jung et al., 2016; Rosas-Carrasco et al., 2016; Aprahamian et al., 2017; Braun et al., 2018; Dong et al., 2018; Tay et al., 2019; Lim et al., 2020; Chen et al., 2019; Salminen et al., 2019; Ambagtsheer et al., 2019b; Ambagtsheer et al., 2020b</td>
<td>5-item measure. Scale: 0–5. 3 levels (not frail, pre-frail, frail). 0 Robust, 1 to 2 pre-frail, ≥3 frail</td>
<td></td>
</tr>
<tr>
<td>Frailty Measure</td>
<td>Version</td>
<td>Items</td>
<td>Scale</td>
</tr>
<tr>
<td>----------------</td>
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<td>-------</td>
</tr>
<tr>
<td><strong>FRAIL Scale (Arabic Version)</strong></td>
<td>/ Alqahtani &amp; Nasser, 2019</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>FRAIL Scale (Korean Version)</strong></td>
<td>/ Kim et al., 2018a</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty and Autonomy Scoring Instrument of Leuven (FRAIL)</strong></td>
<td>/ De Lepeleire et al., 2004</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>FRAIL-NH</strong></td>
<td>/ Ge et al., 2019; Ge et al., 2019b; Yang et al., 2018</td>
<td>✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Index (FI/CGA)</strong></td>
<td>/ Jones et al., 2004; Jones et al., 2005</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Index for Elders (FIFE)</strong></td>
<td>/ Tocchi et al., 2014</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Index in Rural Elderly – Mental status, Activities of daily living, Depression, and Events (FIRE-MADE)</strong></td>
<td>/ Kumar et al., 2019</td>
<td>✓ ✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Phenotype</strong></td>
<td>/ Fried et al., 2001; Kiely et al., 2009; Tay et al., 2019; Gordon et al., 2019; Lim et al., 2020; Xue et al., 2019; Op het Veld et al., 2019; Kim et al., 2018a</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Phenotype Modified</strong></td>
<td>/ Saum et al., 2012</td>
<td>✓ ✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Predictor Model</strong></td>
<td>/ Aznar-Tortonda et al., 2019</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Screening Questionnaire (FSQ)</strong></td>
<td>/ Ma et al., 2018; Ma et al., 2019</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Frailty Trait Scale (FTS)</strong></td>
<td>/ Garcia-Garcia et al., 2014</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Fried Frailty Phenotype Questionnaire (FFPQ)</strong></td>
<td>/ Chen et al., 2020</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td><strong>Gait Speed Test (GST)</strong></td>
<td>/ Ambagtsheer et al., 2019b; Ambagtsheer et al., 2020b</td>
<td>✓</td>
<td>Community</td>
</tr>
<tr>
<td>Instrument</td>
<td>Description</td>
<td>Community</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Geriatric Functional Evaluation (GFE) / Scarcella et al., 2005</td>
<td>32-item questionnaire. Scale: 3 levels (severely impaired, moderately impaired, totally independent)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Groningen Frailty Indicator (GFI) / Metzelthin et al., 2010; Daniels et al., 2012; Peters et al., 2012; Bielderman et al., 2013; Borges, 2013; Olaroiu et al., 2014; Peters et al., 2015; Braun et al., 2018; Tian et al., 2019; Op het Veld et al., 2019; Ambachtsheer et al., 2019b</td>
<td>15-item screening test. Scale (frail—not frail). Range: 0–15. ≥4 frail</td>
<td>Community, Hospital, LTCIOA</td>
<td></td>
</tr>
<tr>
<td>Health Status Form (HSF) / Brody et al., 1997</td>
<td>16-item self-report screening instrument. Scale (frail—not frail)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Índice de Vulnerabilidade Clínico-Funcional (IVCF-20) / Moraes et al., 2016</td>
<td>20-item questionnaire. Scale: 0–40. 3 levels (robust, potentially frail, frail)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Instrumento Multidimensional de rastreio da Sindrome da Fragilidade (IMSIFI) / Lindoso, 2012</td>
<td>Scale: 0–5. 3 levels (not frail, pre-frail, frail)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>INTER-FRAIL Study Questionnaire / Di Bari et al., 2014</td>
<td>10-item questionnaire. Scale (frail—not frail)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Japanese FRAIL scale (FRAIL-J) / Chen et al., 2020</td>
<td>5-item questionnaire. Range: 0-5</td>
<td>Community</td>
<td>Calculated over 13 categories of diagnostic codes, the accumulation of which is the JFI score.</td>
</tr>
<tr>
<td>Jen Frailty Index (JFI) / Kinosian et al., 2018</td>
<td></td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Kaigo-Yobo Check-List / Shinkai et al., 2010; Shinkai et al., 2013</td>
<td>18-item questionnaire. Scale (frail—not frail). Range: 0–15. ≥4 frail</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Kihon Check-List (KCL) / Ogawa et al., 2011; Sampaio et al., 2014; Satake et al., 2016; Ambachtsheer et al., 2019b; Ambachtsheer et al., 2020b</td>
<td>25-item questionnaire. Scale (frail—not frail) Range: 0–25. No cut-off point</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Klosha Frailty Index (KFI) / Jung et al., 2014</td>
<td></td>
<td>Community</td>
<td>Scale (frail—not frail) Range: 0–1</td>
</tr>
<tr>
<td>Korean Frailty Index / Hwang et al., 2010; Jung et al., 2020; Kim et al., 2018a</td>
<td>8-item questionnaire. Scale: 3 levels (robust, pre-frail, frail)</td>
<td>Community, LTCIOA</td>
<td></td>
</tr>
<tr>
<td>Korean Longitudinal Study on Health and Aging Frailty Index (KLoSHA) / Kim et al., 2018a</td>
<td>5 components. Scale: 0-1. &gt;0.35 frail</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Longitudinal Urban Cohort Ageing Study (LUCAS) / Dapp et al., 2012</td>
<td>12-item questionnaire covering 18 health-related domains. Scale: 0–6. 3 levels (healthy, pre-frail, frail)</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Modelo Fried adaptado / Nunes et al., 2015</td>
<td>6-item questionnaire. Scale: 0–5. 3 levels (not frail, pre-frail, frail), ≥3 frail</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td>Frailty Measurement</td>
<td>Description</td>
<td>Domain</td>
<td>Included</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>Modified Korean Frailty Index (mKFI) / Jung et al., 2020</td>
<td>8-item questionnaire. Scale: 3 levels (robust, pre-frail, frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Motor Performance Tests / Santos et al., 2016</td>
<td>2-item motor performance test. Scale (frail—not frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Neurocognitive Frailty Index (NFI) / Pakzad et al., 2019</td>
<td>42-item questionnaire. Scale: 0-42</td>
<td>Community, Hospital, LTCIOA</td>
<td>✓</td>
</tr>
<tr>
<td>Oral and Maxillofacial Frailty Index (OMFI) / Choi et al., 2019</td>
<td>10-item survey</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>PRISMA-7 / Raîche et al., 2008; Saenger et al., 2016; Braun et al., 2018; Tavares et al., 2018 (Portuguese Version); Salminen et al., 2019; Ambagtsheer et al., 2019b; Ambagtsheer et al., 2020b</td>
<td>7-item questionnaire. Scale (frail—not frail) Range: 0–7, ≥3 frail</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Prognostic Frailty Score / Ravaglia et al., 2008; Widagdo et al., 2016</td>
<td>9-item criteria. Scale: 0–9. No cutoff point Self-report and performance test</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Reported Edmonton Frail Scale (REFS) / Ambagtsheer et al., 2020b</td>
<td>13-item questionnaire. Scale: 0–18. 5 levels (not frail, apparently vulnerable, mild, moderate and severe frailty). Adapted version of the Edmonton Frail Scale</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Modified Short Emergency Geriatric Assessment (SEGA) / Oubaya et al., 2014</td>
<td>13-item assessment. Scale: 0–13. 3 levels (mild, moderate and severe frailty)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Self-Report Frailty Instrument / Barreto et al., 2012</td>
<td>4-item criteria. Scale: 0–4. 3 levels (healthy, pre-frail, frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>SHARE Frailty Instrument / Romero-Ortuno et al., 2010; Romero-Ortuno et al., 2013a</td>
<td>5-item questionnaire. Scale: 3 levels (not frail, pre-frail, frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>SHARE Frailty Instrument 75+ / Romero-Ortuno et al., 2014</td>
<td>Scale: 3 levels (not frail, pre-frail, frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Short Form-36 (SF-36) / Curran et al., 2019</td>
<td>36-item survey. Scale: 0-25</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Short Physical Performance Battery (SPPB) / Perracini et al., 2019</td>
<td>5-item criteria. Scale (frail—not frail). Range: 0–5, ≥3 frail</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Study of Osteoporotic Fracture (SOF) Frailty Criteria / Ensrud et al., 2008; Kiely et al., 2009; Bilotta et al., 2012; Kim et al., 2018a</td>
<td>3-item criteria. Scale: 3 levels (not frail, pre-frail, frail)</td>
<td>Community</td>
<td>✓</td>
</tr>
<tr>
<td>Frailty Indicator (TFI) / Gobbens et al., 2010c; Metzenthin et al., 2010; Daniels et al., 2012; Santiago, 2013; Santiago et al., 2013; Andreasen et al., 2014; Uchmanowicz et al., 2014; Andreasen et al., 2015; Coelho et al., 2015; Freitag et al., 2016; Uchmanowicz et al., 2016; Mulasso et al, 2016; Dong et al., 2017; Vrotsou et al., 2018; Op het Veld et al., 2019</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Touchscreen Assessment Tool (TATOO) / Danial-Saad et al., 2019</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Upper-Extremity Function (UEF) Frailty / Toosizadeh et al., 2015; Toosizadeh et al., 2016; Toosizadeh et al., 2017</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

| Total | 83 | 83 | 33 | 49 | 4 | N/A | N/A |
| As a % | N/A | 100 | 40 | 59 | 5 | N/A | N/A |
### 2.3.1: Domain Coverage

Of the assessment tools identified (considering both Faller et al. (2019) and my findings), all comprised the physical domain (100%). 33 assessment tools covered the mental health domain (40%). 49 assessment tools covered the social domain (59%); only 4 assessment tools covered the environmental domain (5%). 4 assessment tools covered all domains (physical, social, mental health and environmental) (5%). 51 assessment tools covered more than one domain (61%). 32 assessment tools covered one domain only (39%).

### 2.3.2: Setting

All the assessment tools included in the table are constructed and/or validated with populations within the non-acute care setting. As evidenced in the table, in the setting column 71 assessment tools (86%) are listed as community. 9 assessment tools (11%) are listed as multiple settings (e.g. community and hospital). 3 assessment tools are listed as intended for use solely in Long-Term Care Institutions for Older Adults (LTCIO) (4%).

### 2.3.3: Brief Description of Assessments

Using the available information in the studies, noted in this updated systematic review is the range of different assessments published, which present heterogeneous characteristics (e.g. number of assessment items/criteria ranged from 3-81). 19 assessments (23%) described instruments where a person would be classified as either frail or not frail. 28 assessments (34%) described instruments where a person would be classified on several levels (e.g. robust, pre-frail and frail). 23 assessments (28%) described instruments where the scoring scale ranged from 0 to 1. Some of the tools identified are local, translated versions of an established frailty assessment method. These were: FRAIL Scale (Arabic Version), FRAIL Scale (Korean Version) and Japanese FRAIL scale (FRAIL-J) (these were translated versions of the established FRAIL Scale tool).

### 2.4: Discussion

The findings from the systematic review illustrate that a total of 83 tools (80 distinct tools; 3 tools which were translated versions of an established tool) have been identified for use in the non-acute care setting. This number includes the 39 new instruments identified by updating the systematic review. This is complementary to literature stating that multiple tools for frailty have been developed and validated for use (Walston et al., 2018; Chen et al., 2018). The
number of tools this systematic review identified may reflect different understandings of how best frailty should be assessed in the non-acute care setting.

Many tools have a predominant physical and mental health domain bias. However, if definitions of frailty focus predominantly on these factors (which could be reflected in the assessment tool(s) used), opportunities to identify frailty may be missed. As suggested by Gobbens et al. (2010b), this may cause consequent fragmentation of care and potentially inadequate care and support provided to frail individuals. Hence, it is notable that only 4 of the assessment tools identified incorporate an environmental domain. As described earlier in this thesis (See: 1.3.4: ‘Non-Medical Aspects of Frailty) poor environmental conditions have been associated with the risk of frailty (Aranda et al., 2011; Cramm et al., 2012).

The majority of tools (71) were constructed and/or validated in the community setting only, perhaps reflecting the prevalence of frailty within this non-acute care setting (Chen et al., 2018; Collard et al., 2012). Three frailty assessment tools had been constructed and/or validated in a long term care institution for older adults only; nine tools in multiple settings. As Walston et al. (2018) note, this finding may reflect that some assessment tools have been designed with a specific population and context for use.

The authors of the original systematic review (Faller et al., 2019) detail that two assessment tools – the FRAGIRE and CFAI – are noticeable due to the multi-dimensional aspects of the tools. Two further multi-dimensional (i.e. covering four domains) assessments were identified when updating the systematic review: the eFI-CGA and the 81-item FI. This finding is notable as it suggests that there may be a lack of agreement that frailty incorporates all aspects of risk for an individual, as opposed to intrinsic features of the person only. In the literature, Coker et al. (2019) and Freer and Wallington (2019) argue that the consideration of multi-dimensional aspects of a frail individual is important to include. The finding reinforces the lack of consensus regarding frailty definition, which is supported in the literature (Lally and Crome, 2007; Rodríguez-Mañas, et al., 2013).

This updated systematic review also notes that 23% of instruments would classify a person as either frail or not frail. It has been argued these instruments (i.e. those with a dichotomous scoring system) would be less preferable to instruments using a continuous scoring system (or ranking frailty on several levels), which may help capture changes in frailty more sensitively (Mitnitski et al., 2001; de Vries et al., 2011). As evidenced in the results, a number of instruments ranking the level of frailty were identified (34%). Nevertheless, it is important to
note that in practice, the use of certain instruments may be favoured over others, or not used at all. For example, a recent article emphasises that validated tools are seldom used in everyday practice (Hu et al., 2020). Therefore, although these validated assessment tools have been identified in the literature, the assessment tools used in practice may differ.

Further noted in this systematic review is the fact that some assessments for frailty had been adapted (e.g. Japanese FRAIL scale, FRAIL scale (Korean Version) or eFI (Adapted from Clegg et al., 2016)) or tailored for use in a specific population/scenario (e.g. Emergency General Surgeries Frailty Index, Upper-Extremity Function (UEF) Frailty and Neurocognitive Frailty Index). This finding was expected, as it has been highlighted in another systematic review regarding frailty instruments (Azzopardi et al., 2016). This suggests that in some cases, there may be a selective approach to identifying and assessing for frailty – and, as noted earlier, that some tools have been created (or, in this case, adapted) for a specific population or context. This is a finding that could be confirmed with studies having a specific population or context setting (e.g. the study of assessments for frailty used in a nursing home setting).

2.5: Strengths of This Updated Systematic Literature Review

This updated systematic review provides an overview of the assessment tools used for the detection of frailty in the non-acute care setting. According to the authors of the original review, this was the first systematic review presenting the broad range of assessment tools, in addition to further information regarding these tools (e.g. domain coverage) (Faller et al., 2019). At the time of writing, this is, to the best of my knowledge, the most up-to-date review concerning the assessments for frailty in non-acute care. Moreover, the systematic review did not apply any exclusion criteria, unlike other studies that had more restrictive criteria (Sternberg et al., 2011; Clegg et al., 2014). Hence, this updated systematic review offers a comprehensive insight into the available and published assessment tools for the detection of frailty in the non-acute care setting.

2.6: Limitations of This Updated Systematic Literature Review

A major limitation of the utility of the review is that it does not report the tools that are being used in everyday practice (e.g. by location or non-acute care setting).

Moreover, greater understanding is required regarding the nature of the assessment tools used – particularly if the assessment tools used in practice are not published or validated in the
literature. These factors would help ascertain whether a frail individual is being assessed in a holistic, multi-dimensional way, as advised by current guidelines and in the literature.

While evidence from the literature details that assessments for frailty are being used in the non-acute care setting, a further limitation is that the assessment tools reported may be representative of the region that the study was conducted in only (e.g. Korean Frailty Index). Moreover, current evidence from the literature may not give an insight into assessment tools for frailty used that have not been validated or published in the literature. For example, as suggested by Bruyère et al. (2017), this may especially be the case if healthcare professionals are restricted by time or resources to use a validated tool and/or have a preference to use a mixture of clinical judgement (NHCCG, n.d.) and/or use a non-validated tool (e.g. created/adapted by themselves) (NICE, n.d.).

This updated systematic literature review was conducted by one person (DS), which is a noted limitation. The addition of more than one reviewer for screening and exclusion of articles could have resulted in fewer studies (and thus fewer assessment tools used in non-acute care settings) as all final records included would have to be agreed upon for final inclusion.

2.7: Further Evidence of Assessing for Frailty in Community-Dwelling Older People

When undertaking the initial literature review and updating the systematic review, it was evident through the searches that some studies did not necessarily refer to a specific assessment tool for frailty, yet described an approach that could, or should be used.

Recommendations in the literature detail that a CGA is the gold standard for which frail individuals should be managed (British Geriatrics Society, 2014). Furthermore, evidence in the literature details the benefits of using the CGA and interventions that target multiple risk factors in frail older people who live in the community (Li et al., 2010).

Fabacher et al. (1994) state that in-home geriatric assessments were being used as a means of providing preventive health care and improving the health and functional status of community-dwelling older people. In-home geriatric assessments were also reported to be used in other studies (Stuck et al., 1995; Huss et al., 2008).

In primary care, a recent study advised that primary care physicians, community nurses and community social networks should be using frailty screening tools and rapid geriatric assessments (Chen et al., 2018). The study noted the benefits of early CGA with interventions,
yet further suggested using the FRAIL scale in the primary and community setting in time-sensitive cases (Chen et al., 2018; Woo et al., 2015). Other recommendations in primary care have offered greater specificity, advising that frailty should be considered in any older person presenting with falls, delirium or incontinence – and that this could be identified using the eFI (Clegg et al., 2016; Tan et al., 2019).

Although the eFI is relatively new and not available in all GP practices (Clegg et al., 2016), recent evidence has indicated that this tool is used in some practices across the UK (Devereux et al., 2019). Nevertheless, a large retrospective analysis on frailty assessment in primary care found that general practice does not seem to use eFI as the main tool to identify frailty (Millares-Martin, 2019). Based on recommendations on how to identify and assess for frailty, clinical judgement may be used in the first instance, which may then be supplemented with a formal test (e.g. a Gait Speed Test or Timed Up and Go test) (NHCCG, n.d.)

A recent qualitative study set across Cambridgeshire, England (published after data collection in this study had been completed) aimed to understand how community care staff (healthcare assistants, therapy assistants, psychiatric nurses, general nurses, occupational therapists, physiotherapists and social workers) assessed frailty in everyday practice (Coker et al., 2019). However, while the specific assessments for frailty were not disclosed, the assessment approach from the community care staff was detailed.

The study noted that although describing frailty was difficult to define, there was a consensus across specialities that frailty encompassed physical, mental health and psychological, social, environmental and economic factors (Coker et al., 2019). It noted that environmental and economic factors were less recognised, although some studies referenced these aspects (Gobbens et al., 2010a; Nourhashémi et al., 2001; Dury et al., 2018). The study further reported that community care staff noted the importance of assessing for frailty holistically, with professions of different specialities focussing on different aspects (e.g. nurses had a more medical focus, therapy focussed specialities discussed functional abilities and psychiatric nurses on mental health aspects) (Coker et al., 2019). Coker et al. (2019) found that this group of community care staff perceived a holistic assessment for frailty to be facilitated by multidisciplinary team working, meetings, referrals and information sharing. However, this study noted the varying range in the extent of multidisciplinary working across specialities, suggesting holistic assessments for frailty are not always conducted.
Despite these findings, there are recognised limitations. Firstly, the authors note that the participants were a self-selected group who may have had an increased interest in frailty (Coker et al., 2019). Furthermore, this study was only conducted in one NHS foundation trust (Cambridge and Peterborough Foundation Trust). These factors combined may mean that the findings are not representative of community care staff outside this region.

2.8: Conclusions

This updated systematic literature review and further evidence build on the Faller et al. (2019) review, providing evidence that many assessments for frailty are available for use in non-acute care settings. These assessments for frailty differentially cover a range of domains (e.g. physical, social, mental and environmental). Current guidelines and recommendations do not recommend a specific single assessment tool for frailty to use (Bouillon et al., 2013; NHS England, 2014), although suggestions for assessments tools to use have been made (British Geriatrics Society, 2014). This may result in a variation of tools being used, as the literature suggests.

Also noted in this study is the fact that many of the tools suggest that they have been created to be used on a specific population and for a specific context. As mentioned, further research would help to understand the assessments for frailty being used in practice in specific populations. This is the purpose of two studies in this thesis: the non-acute care setting and nursing home setting studies.

2.9: Link to Next Study

This study emphasised that a range of assessments, assessing different aspects of frailty had been constructed/validated for use in this setting. However, this study had no geographical boundaries and did not ascertain what assessments may actually be used in practice. Moreover, the thesis introduction importantly highlighted that the choice of assessments used may be related to their viability in practice (Aucoin et al., 2020; Ambagtsheer et al., 2020b). Hence, a study to understand the ‘assessments for frailty’ used in practice (Chapter 4) in a defined region (North-West London) was decided as a next logical study (schematically displayed below).
Schematic B: Link to Next Study
Chapter 3: Research Methods

This chapter sets out the research methods and design of each study conducted in this thesis.

3.1: The Non-Acute Care Setting (High-Level)

Methods

This section describes the methods relevant to the study conducted in the non-acute care setting (Chapter 4). This study aims to better understand the assessment tools for frailty used across non-acute health and care settings (the assessments of which may influence the care and support given to frail individuals).

3.1.1: Setting

This study is conducted across North-West London, using information gathered from survey (questionnaire) responses from healthcare professionals, patient representatives and others (see ‘3.1.9: Study Participants’ for complete list and justification) who were considered to have professional interaction with frail individuals.

North-West London was chosen for several reasons. One primary reason is due to the host institution of the research, CLAHRC North-West London, being in this catchment area. North-West London consists of 8 boroughs with recognised population, economic, ethnic and health diversity (Parmar et al., 2016).

The geographical area of North-West London – and the boroughs comprising it are displayed below.
Recent estimates state that there are over 2.3 million registered patients across the 8 boroughs (Parmar et al, 2016). Within North-West London, life expectancy has increased over the past 10 years (80 years for men; 84.5 years for women) (NHS Central London Clinical Commissioning Group, 2014), compared to a national average of 79 years for men and 83 years for women (United Nations Department of Economic and Social Affairs, 2015). Individuals aged over 65 in North-West London are estimated to constitute 13% of the population, yet account for approximately 35% of the cost across health and social care in this region (Parmar et al., 2016). Notably, close to half the population aged 65 years and older may be living alone – with over 60% of adult social care users expressing a need for more social contact (Parmar et al., 2016).

The North West London health and care partnership consists of several different constituent clinical commissioning groups (CCG) and NHS Foundation Trusts. As with NHS wider aims, the constituent organisations aim to improve the health and wellbeing of people in the area, including better care for people with long-term conditions and frailty (NHS NWL, 2017). For older people, this includes the provision of health and social care services supporting older people at home and in hospital, focussing on ensuring the right care and support is in place (NHS NWL, 2017).
North-West London has a sizeable older population, many who may have an increased likelihood of frailty. There is therefore a consequent need to investigate the care and support that they may receive.

3.1.2: Sample and Inclusion/Exclusion Criteria

Stakeholder analysis and mapping of individuals who had assumed interaction with frail individuals took place, to help identify whom to contact in this study, as explained below. The individuals identified should have knowledge of the assessments for frailty used in non-acute care.

3.1.2.1: Stakeholder Analysis and Mapping

To certify adequate and strategic planning, stakeholder analysis and mapping formed the initial part of this study. This process took place using academic and grey literature, conversations with healthcare professionals, members of a Frailty Steering group and a research group in North-West London.

3.1.2.1.1: Background to Stakeholder Analysis and Mapping

Stakeholder analysis is the process by which people or organisations (stakeholders) are identified in relation to their relevance to a project or system (Brugha and Varvasovszky, 2000). A stakeholder map provides a visualisation of those stakeholders with whom to engage with in a project, arranged according to key criteria such as interest and influence (Smartsheet, 2019; Expert Program Management, n.d.). Stakeholder analysis and mapping has become increasingly popular in management, development and health policy fields (Brugha and Varvasovszky, 2000; Crosby, 1991; Bjugn and Casati, 2012).

To conduct stakeholder analysis and mapping, distinct steps are suggested, namely:

a) Identifying the stakeholders by creating a list of all the people affected by the project (or who have influence or interest in it) (Stakeholder analysis)

b) Prioritising these stakeholders according to their influence or interest (Stakeholder mapping)

c) Understanding the key stakeholders with respect to the project (NHS Improvement, 2018; MindTools, n.d.) (Stakeholder mapping).
The last two stages describe ‘stakeholder mapping’, as this can be a visual representation and organisation of the stakeholder analysis (Smartsheet, 2019; Imperial College London, 2017).

A healthcare project may require engaging a range of different stakeholders, including clinicians, administrative staff and patients. Creating a stakeholder map can help with planning communication strategies fitting the desired time frame of the project (Schmeer, 2000).

Stakeholder analysis and mapping is a recommended, useful healthcare research approach (Langley, 2011; Makan et al., 2015) and a method used to identify relevant stakeholders and then target them for data collection (e.g. by way of interviews, visits and surveys/questionnaires) (Isle of Wight NHS Trust, 2017; University Hospitals of Leicester NHS Trust; Concannon et al., 2012; Corbett et al., 2017).

3.1.2.1.2: Stakeholder Analysis and Mapping in this Study

The purpose of stakeholder analysis and mapping was to help establish who would be appropriate to contact, based on their perceived level of interest and influence. This method was decided as a way to strengthen the generalisability and representation of the practices taking place within non-acute care in North-West London.

An initial stakeholder analysis (i.e. creating a list of people to contact) was conducted using academic and grey literature, as well as informal conversations with healthcare professionals working within non-acute care in North-West London (these healthcare professionals had an awareness and understanding of frailty and were based at CLAHRC NWL). The stakeholders identified were first written down on post-it notes and then placed on an A3 piece of paper where they could be arranged according to influence and interest (Figure 8).

The stakeholder map was then discussed and presented to members of an NIHR CLAHRC NWL Frailty Steering group for feedback and comments, as well as a ‘Research Partners’ Meeting’, organised by CLAHRC NWL. Both groups consisted of a range of participants with differing expertise and professions within healthcare settings – all of whom had worked or were currently working within North-West London. Participants could add, move and/or suggest removing stakeholders with the post-it notes, as appropriate.
As such, the resultant stakeholder map was created through a collaborative and iterative process, aiming to reflect general perceptions of those working in non-acute care settings across North-West London (Figure 8). This stakeholder map influenced the next stages of work, as described below.

![The Influence-Interest Relationship of Stakeholders Interacting with Frail Individuals](image)

Figure 8: The Influence-Interest Relationship of Stakeholders Interacting with Frail Individuals

Following the completion of the stakeholder map, conversations with known professions identified on the stakeholder map were planned. These professions would also be asked for recommendations on who to further contact, to ensure that a wide range of professions who would likely have knowledge of assessing for frailty had been asked (i.e. snowball sampling).

3.1.3: Study Participants Inclusion Criteria
Based on a similar study involving the use of key stakeholders (Bamford et al., 2018), the following inclusion criteria were decided for this study in the non-acute care setting.

- Participant has academic, clinical, professional and/or lived experience or expertise of frailty in a non-acute care setting.
- Participants had capacity to understand and consent to participate in the study.
- Participants were able to converse in English.
- Participants were based in North-West London.

Examples of participant types satisfying these criteria and an explanation of their inclusion criteria are detailed below:

**Table 4: Example Stakeholder Type and Inclusion Criteria Satisfied.**

<table>
<thead>
<tr>
<th>Participant Type</th>
<th>Inclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Experts</td>
<td>Professionals with academic and/or clinical expertise with regards to frailty in a non-acute care setting; policy experts</td>
</tr>
<tr>
<td>Service Managers</td>
<td>Professionals managing care homes, hospices and home care services for people with frailty; service development leads in non-acute care services</td>
</tr>
<tr>
<td>Frontline Staff</td>
<td>Care assistants, senior care assistants and nurses in non-acute care services providing care to people with frailty.</td>
</tr>
<tr>
<td>People with Frailty</td>
<td>People with frailty, based in a non-acute care setting eligible to take part in research studies.</td>
</tr>
<tr>
<td>Family Carers</td>
<td>Bereaved and current carers of people with frailty who received support from a non-acute care service.</td>
</tr>
<tr>
<td>Healthcare Professionals</td>
<td>Professionals providing care to frail individuals in a non-acute care setting, or knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
</tbody>
</table>

**3.1.4: Study Participants Exclusion Criteria**

- Participant did not have the capacity to consent to participate in the study
- Participant did not speak English
- Participants not based in North-West London

**3.1.5: Selection of a Survey (Questionnaire)**
For this study, a survey (questionnaire) was chosen to address the specific research question for this chapter (What assessment tools for frailty are used in non-acute health and care settings?). Using a survey enabled participants to be asked the same core questions, allowing reliable and comparable data to be gathered, which could be analysed quantitatively.

3.1.6: Designing the Survey

A critical component of this study was ensuring that a range of pertinent questions was asked to all participants to help address the main research question of the study. The design of the survey was informed from literature on best practices and recommendations for survey research (Rowley, 2014; McColl et al., 2002; Burgess, 2001).

The survey design required the study rationale to be explained to all participants at the beginning. It was highlighted that the literature had described the various care and support needs of frail individuals – and that these could be identified through various assessments, e.g. an assessment for frailty. Participants were allowed to ask any questions they may have had before confirming participation in the study (i.e. taking consent). All participants were then asked a list of pre-defined questions designed to build a greater understanding of the characteristics and nature of the assessment(s) being used for frailty (if any), including further information on their specific use within their setting.

3.1.6.1: Testing

The questions were reviewed and tested with academics and clinicians from Imperial College London and CLAHRC NWL. The questions were checked for content, structure and clarity, thereby reinforcing the face, content and construct validity of the survey questions. Notably, members of the test group commented on how well the survey questions related to the overall research question and aim of the study. Accordingly, after all comments had been made, the questions were refined and adjusted before being implemented as part of the research study.

3.1.7: Survey

Participants were initially contacted by email and then completed the survey by email, phone or in person (depending on their preference), following the survey design as stated.

The structured questions asked were:

1. What assessments for frailty are used in your setting?
2. What is the primary purpose of each assessment?

3. Has the assessment been referenced in literature? (Participants did not have to know the answer to this as this was verified after).

4. Has the assessment been locally adapted?

5. Has the assessment been locally constructed?

6. Which health professionals are currently using this assessment?

If participants had reported they used assessments for frailty, they were asked to provide examples of the reported assessment forms by email or post, to aid analysis. Samples were reviewed to assess whether they were recognised tools or methods, whether there had been any local adaptation, or whether they were bespoke local approaches. This was done as some reported assessments may have been locally produced or adapted – and not available outside of the setting the participant was using them in. All examples provided were blank assessment forms and therefore did not contain any patient identifiable data.

3.1.8: Recruitment

A purposive sampling strategy was used to obtain a cohort of 18 people from different professional backgrounds, who were working in a professional capacity with frail individuals (or undertaking research of frailty/frail individuals), some of whom had an implicit responsibility to assess them for frailty. Initial contacts were provided from within the wider CLAHRC NWL team, who subsequently made recommendations of further contacts (snowball sampling strategy). Reference was made to the stakeholder map (Figure 8) to ensure that a wide range of contacts (according to interest and influence) had been spoken to.

Participants were emailed to arrange the initial meetings. The survey (questionnaire) was then completed in person (4/18 people), via phone (9/18) (by reading the questions out one by one) or sent via email (4/18) based on participant preference.

The study was terminated after saturation in assessments mentioned by respondents had been reached (i.e. no more new assessments being mentioned, after a cumulative judgment as
detailed in literature (Saunders et al., 2017)). For this study, this meant that after 18 people from different professional backgrounds had completed the questionnaire (and after examining their responses), no new assessment tools were being mentioned. Therefore, it was deemed that data collection had reached a saturation point.

3.1.9: Study Participants

18 individuals participated, the majority of whom had been highlighted previously on the stakeholder map (Figure 8). Only 2/18 participants had not been previously highlighted on the stakeholder map: ‘Project Manager of a Care Homes Project (Health Service Manager)’ and ‘Senior Commissioning Manager, Adult Social Care’. Detailed below is the participant and how they satisfied the inclusion criteria for this study.

Table 5: Participants and Justification for Inclusion in Study.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Justification for Inclusion in Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Clinical Lecturer in Old Age Psychiatry</td>
<td>Professional with academic and clinical expertise with regards to frailty in a non-acute care setting</td>
</tr>
<tr>
<td>Chief Psychologist and R&amp;D (Research and Development) Director</td>
<td>Professional with academic and clinical expertise with regards to frailty in a non-acute care setting</td>
</tr>
<tr>
<td>Clinical Lead for Falls and Bone Health (Part of Falls Prevention Team)</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Deputy Chief Pharmacist</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>General Practitioner (and Director of Primary Care, Physical Healthcare Lead)</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Hospital Doctor (and Clinical Research Fellow/PhD Candidate)</td>
<td>This was a professional who had previously provided care to frail individuals in a non-acute care setting and had current knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Professional</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Nurse</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Occupational Therapist</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Occupational Therapist (and Improvement Manager)</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Patient Representative (x2)</td>
<td>The patient representatives consisted of 1 bereaved carer and 1 current carer of persons with frailty who received support from non-acute care services.</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Physiotherapist for a Falls Prevention Care Home Project</td>
<td>Professional providing care to frail individuals in a non-acute care setting and knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Project Manager of a Care Homes Project (Health Service Manager)</td>
<td>Professional managing a care home and providing services for people with frailty.</td>
</tr>
<tr>
<td>Psychiatrist (and Honorary Clinical Senior Lecturer)</td>
<td>Professional providing care to frail individuals in a non-acute care setting, or knowledge and/or expertise of frailty care in a non-acute care setting.</td>
</tr>
<tr>
<td>Senior Commissioning Manager, Adult Social Care</td>
<td>Professional with experience of managing care homes, hospices and home care services for people with frailty.</td>
</tr>
</tbody>
</table>
3.1.10: Data Analysis

This consisted of 2 parts: a) listing the reported ‘Assessments for Frailty’ tools used (Assessments Used) and b) mapping the assessments

a) Assessments Used

At a basic level, the reported ‘assessments for frailty’ were listed in an Excel table. Before mapping the assessments, this was done to illustrate the level of variation of reported assessments for frailty in non-acute care settings across North-West London.

b) Mapping the Assessments

The assessments were then mapped comparatively with regards to the following details:

Nature of the Assessment Tool - Whether the tool has been referenced in literature – and whether it is locally adapted or locally constructed (or both).

Purpose of Assessment - Identification of the primary purpose of the assessment.

Use - Which health professions were reported to be using the assessment tool.

Domain Coverage - Each assessment was examined using the four domain model of frailty (Soong et al., 2013), to investigate the domain coverage. The four domain model comprises physical, social, mental and environmental domains. Each assessment was be mapped to examine which of these four domains are addressed.

3.1.11: Ensuring Mapping Accuracy

Two non-clinical researchers carried out the mapping process independently (DS and MW) and cross-checked with each other to ensure accuracy. Clinical accuracy was ensured by cross-checking with two clinicians to ascertain and confirm the domains covered by each assessment.
3.1.12: Ethics

Guidance was sought from the Imperial College London Research Ethics Committee and the Director of Research and Development at Chelsea and Westminster hospital who both advised that formal ethical approval for this study was not required.

3.1.13: Confidentiality

Confidentiality was maintained in all aspects of this study. All analysable data and associated information were stored securely on Imperial College London servers as per the Data Protection Act 1998. The names and contact details of participants have not been included in the analysis of the study and will remain fully confidential.

3.2: The Community Setting (Using a Falls Service as an Exemplar)

Methods

This section focuses on the methods relevant to the study conducted in the community setting (Chapter 5). Social network analysis (SNA) and a participatory activity were used to investigate the care and support networks of frail individuals in the community setting (using a falls service as an exemplar).

3.2.1: Social Network Analysis

SNA is a process by which social structures can be investigated, by examining structural relationships and exploring the channels of communication, information flow, collaboration and disconnects between people (Chambers et al., 2012; Otte and Rousseau, 2002). SNA offers a means of elucidating how the structure – and the structural properties of the network – influence an individual’s behaviour (Cunningham et al., 2012; Valente, 2010). Social networks that can be created following data collection are often depicted visually (Butts, 2008), which provide a basis for exploration and analysis of the social network (Chu et al., 2014).

Using SNA in this study will help address the research questions outlined - and provide a visualisation of the results, which could be used as a vehicle for engaging individuals within the network - and as a tool for facilitating change.

3.2.1.1: Value of Using SNA in Research
Within healthcare settings, many medical and health-related phenomena involve interdependent actors, such as patients, nurses and doctors (O’Malley and Marsden, 2008; Chambers et al., 2012). Himelboim (2017) emphasises a key feature of SNA is that it provides a unique understanding of the patterns of information flow, the identification of key users/individuals within a network – and their potential influence. SNA can also help understand both the strength and types of relationships between people (Chambers et al., 2012).

These characteristics have been reported to be advantageous and valuable for studies in healthcare and for individuals within/that interact with a healthcare setting (e.g. frail individuals) as they can help identify opinion leaders, influencers and could help understand the choices people make (Introcaso, 2005; Brun and McAuliffe, 2018). Moreover, as Brun and McAuliffe (2018) note, although using SNA has only recently been employed in healthcare settings, the potential of the method for use in health research is considerable.

Specifically concerning frailty, it has been proposed that maintaining an active social network could be protective against frailty (Woo et al., 2005). Determining an individual’s ties with friends, relatives or participation in social activities (i.e. their social network) is therefore of scientific importance (Mor-Barak et al., 1991; Keating et al., 2003), of which using SNA can offer the means to investigate this (Chon et al., 2018).

3.2.1.2: Use of SNA in Healthcare Research

The World Health Organisation (2009) highlights that understanding how people (or actors) react and interact with each other is a challenging yet important part of healthcare research.

The use of SNA in healthcare research is growing rapidly (Glegg et al., 2019), having been used in a number of healthcare settings (Chambers et al., 2012). On a macro level, SNA has been used to understand the role of actors within the spread and management of healthcare epidemics such as HIV/AIDS (Helleringer and Kohler, 2005; Latkin et al., 2003). On a more micro, or focussed level, SNA has been described as an appropriate tool to help generate an actor-level analysis within health systems (Blanchet and James, 2011). An example is the study of nurse communication between team members; using SNA helped to understand communication patterns, how often teams worked together and the structure of a nurse network within a hospital setting (Benton et al., 2015; Hurlock-Chorostecki et al., 2014). More recently,
Gandré (2019) highlighted that SNA could be used to explore information within large healthcare datasets, including the study of the networks of healthcare professionals, care pathways and the spread of infectious diseases.

3.2.1.3: Use of SNA in Frailty Research

Previous studies have used SNA to identify and explore the interactions of frail individuals and/or individuals within frailty related settings, for example, in nursing homes (Ayalon and Levkovich, 2019).

One study used SNA to help identify key risk factors that could potentially improve both early diagnosis and treatment/management of individuals at risk of, or with frailty (Franchini et al., 2016). SNA helped identify discrete features within the data that could support a GP’s assessment of frailty in a patient (and could help understand possible temporal changes in a patient’s frailty). The study additionally proposed that network analysis could be used for public health projects to help develop and implement health interventions.

A further study examined the social support networks of adults (aged 60-65 years), comparing the nature, direction and trends of social support between genders (Mathur, 2015). The study took place after the authors noted in the literature the detrimental effects of weak social support on the physical and psychological health of individuals (Ozbay et al., 2007). Using responses from a short questionnaire (covering topics including living arrangement and dependence on people), the cross-sectional designed study then used SNA to highlight individuals of great importance in a social support network.

SNA has additionally been used in longitudinal studies, exploring the effect of networks over time. One study examined the effect of a social network on dementia development in community-based adults comparing the differences in social network between those who developed dementia and those who did not, after an average period of 3 years (Fratiglioni et al., 2000). The study concluded that extensive social networks seem to protect against the development of dementia.
A common method in social network studies concerning frail individuals (or in frailty related settings) is using questionnaires or face-to-face interviews as part of the data collection process (Bahramnezhad et al., 2017; Abbott et al., 2012; Chon et al., 2018; Dong and Chang, 2017).

Abbott et al. (2012) used face-to-face interviews were used in an SNA study to measure social integration among older adults in assisted living. Network visualisations illustrated the level of social integration among and between residents (and staff). It was reported that SNA helped to view patterns and relationships in this defined group (i.e. older adults in assisted living). The study noted that measuring social integration in this setting was challenging, but that SNA was feasible and a potential tool for further studies of groups of people at increased risk of social isolation and illness. Interviews have also been used in large scale studies that focus on older adults’ social networks (some of whom may be frail) (SHARE-ERIC, 2019; NORC, 2019). Notably, however, these studies have focused on a person’s primary, first-level network (ego-centric), rather than an entire social network.

With any method, there are noted limitations. Critics have argued that conducting and interpreting SNA can be time-consuming (Stojmenovic & Lindgaard, 2013; Ahrens, 2018) and may require prepared questions when collecting data for optimal use as a method (Ahrens, 2018). These limitations have been considered when planning this thesis.

3.2.1.4: Creating a Social Network for SNA: The Concentric Ring Model

This study uses a concentric ring model in combination with a participatory activity to help identify an individual’s care and support network (social network). The care and support network (social network) created was analysed using social network analysis (Cheong et al., 2013).

Fundamentally, the concentric ring model has origins in social networks. Borgatti et al. (2013, p.1) explain that social networks are ‘a way of thinking about social systems that focus our attention on the relationships among the entities that make up the system’ (referred to as ‘actors or nodes’). ‘Actors or nodes’ are commonly individuals but also ‘places’ or ‘things’. Each node or actor has specific characteristics (or attributes) making them unique (e.g. age, gender). The relationships between nodes also have unique characteristics. All features can be examined and analysed using SNA.
Social networks are derived from fields including sociology, graph theory and psychology (Barnes, 1969). Many attribute the groundwork for developing social networks to Georg Simmel (Freeman, 2011). As the sociology field progressed, elements of social network analysis developed. Gathering network data using a novel interview method (proposed by John Almack) is credited as a pivotal and early example of social network ideas (Freeman, 2011; Gray and Webb, 2012). Jacob Moreno developed the sociometric approach to collecting data, creating early social network diagrams (Moreno, 1953). These diagrams incorporate a ‘network’ in a similar way to current social network understanding (Gray and Webb, 2012). Following Moreno’s work, several methods and theories have been tested, developed and integrated, forming the academic field of network science and social network analysis.

In this study, examining ego-centric networks took place. The approaches and methods used by Moreno and Northway (Northway, 1940) helped shape the methods and approach in this study. Specifically, Northway’s ‘target diagram’ to quickly display nodes relative to each other and the predominant choices of the individual nodes were noted (Northway, 1940). This, in combination with more recent advances in social network studies (Freeman, n.d.; Cheong et al., 2013) contributed to the approaches used in this study. Research whereby a ‘personal network diagram’ was created (Cheong et al., 2013), provides the basis for the concentric ring model used in this study. This personal network diagram comprises multiple rings, where each ring represents a different contribution level (Figure 9).
3.2.1.5: Ego-Centric Networks

Two main variants of network exist: ego-centric and socio-centric. An ego-centric network has a focus on one subject only, whereby the subject is asked to identify their social contacts and/or relationships (most commonly referred to as ‘actors’ or ‘alters’). Ego-centric networks therefore describe the network of a focal node and the effects of the nodes mentioned on the ego. A socio-centric network takes into consideration the social contacts and/or relationships of the individuals mentioned by the ego, within a given boundary.

In this study, the care and support networks of frail individuals who were members of a Falls Prevention Service were examined (i.e. the care and support networks of frail individuals living in the community). The care and support networks created were ego-centric networks.

Creating a socio-centric network (which would entail contacting each of the frail individual’s reported contacts) was not possible, due to time, logistical and ethical constraints. This would also place limits on how ‘complete’ a socio-centric network could be. Hence, it was decided to focus only on exploring and collecting data on an individual’s ego-centric network, a complete network of which could be determined/created.

3.2.1.6: Name Generator Questions
As a fundamental part of social network analysis, name generators are often used to gather primary data on the nodes or actors that form an individual’s network (Burt et al., 2012). In this study, commonly used name generator questions were used to establish a social network. Guidance for these questions was taken from previous studies, where name generator questions were used to understand the contacts whom respondents know well (Campbell and Lee, 1991), who occupy a significant role (Ashida et al., 2010) and whom they interact with most frequently (Meltzer et al., 2010). The questions for this study were planned carefully to ensure that both the individuals that interact with the ego were noted – but also to understand the contribution level of the individual mentioned.

3.2.1.6.1: Contribution Level

Contribution level was ascertained by asking participants how much they believed the reported individual(s) contributed towards their care and support. They were asked to signify the level of contribution. Four main contribution levels were drawn (Figure 9) (1-4), with level 1 representing the most contribution and level 4 the least level of contribution. Participants could also indicate if individuals contributed halfway between each of the four levels (i.e. level 1.5, 2.5, and 3.5). Post-it notes were used to write down the individuals reported and manually placed on a printed out personal network diagram (see ‘Figure 13: Contribution level’ for an example).

Several different published studies were examined to help the interviewer questions remain free of bias and maximised the amount of information gathered (Bidart and Charbonneau, 2011; Marin & Hampton, 2007; Marin, 2004; Campbell and Lee, 1991).

The completed network diagrams from both the patient and the healthcare professional perspective were quantified to enable quantitative analysis of the networks. To do this, the contribution levels of the individuals on the post-it notes were recorded and numerically tabulated (shown in Figure 10).
Quantification of the completed network diagrams allows numerical comparison between the patient perspective and healthcare professional perspectives. Two main approaches were used: a numerical comparison of network size and a comparison of ‘Closeness’.

3.2.1.6.2: Hypothesis for Numerical Comparison of Networks (Total Number of Connections)

The importance of communication between patients and healthcare providers has been highlighted in the thesis introduction. However, given the many potential professions a patient may interact with and a call for improving standardised processes regarding communication
(Johnson et al., 2012; Graham, 2009), it is possible that healthcare providers may not be fully aware of (or have record of) all the individuals in a patient’s care and support network.

Therefore, I hypothesise that patient-reported networks will contain a higher total number of connections than healthcare professional reported networks. (Null Hypothesis: patient-reported networks will not contain a higher total number of connections than healthcare professional reported networks).

The network size was used as an indicator of the total number of people reported as being part of an individual’s care and support network. The patient and healthcare professional perspectives were compared to see whether there were differences in what they believed was the number of people involved in the care and support of the patient. A t-test was used for comparisons.

3.2.1.6.3: Hypothesis for Average Contribution Level of Relationships (‘Closeness’)

Research highlights that an important part of care is the healthcare providers’ understanding of their patients’ health beliefs and values (Kennedy et al., 2018). However, Kennedy et al. (2018), Hall et al. (1999), Cegala et al. (2004) and Ogden et al. (2002) evidenced that in some cases, healthcare providers’ perceptions of patients’ health beliefs and values were different. Kennedy et al. (2018) in particular noted that patients denoted greater meaning of aspects such as illness severity than healthcare professionals.

Hence, I hypothesise that patient-reported networks will be ‘Closer’ (i.e. lower ‘Closeness’ values) than healthcare professional reported networks. (Null Hypothesis: patient-reported networks will not be ‘Closer’ than healthcare professional reported networks)

The average contribution levels of the reported relationships (referred to as ‘Closeness’) the ego had with the individuals mentioned in both patient perspective and healthcare professional perspectives was also compared using the quantified network diagrams. This was done in accordance with the methodology described in published literature involving egocentric networks (O’Malley et al., 2012). An example of how this was calculated is shown below using Patient 1:

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Level 1</th>
<th>Level 1.5</th>
<th>Level 2</th>
<th>Level 2.5</th>
<th>Level 3</th>
<th>Level 3.5</th>
<th>Level 4</th>
<th>Total No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
1. **Strength of Ties (Connections):**
   
   \[(5 \times 1) + (0 \times 1.5) + (2 \times 2) + (0 \times 2.5) + (0 \times 3) + (0 \times 3.5) + (0 \times 4) = 9\]

2. **Average Strength of Ties (Connections):**
   
   \[\text{Strength of Ties (Connections)} / \text{Total No. of Ties (Connections)}:\]
   
   \[(9 / 7) = 1.28\]

3. **Dividing by 10:**
   
   \[(9 / 7) / 10 = 0.13\]

With this calculation, dividing by 10 means there is a possible range of 0 to 1. ‘Closeness’ values nearer to 0 represented networks where the ties (connections), on average, had a higher contribution level than ‘Closeness’ values nearer to 1. For example, a network with a ‘Closeness’ value of 0.13 represents a network where the individuals mentioned had a higher contribution level (with regards to the care and support of the patient) than a network with a ‘Closeness’ value of 0.26.

**3.2.2: Study Design (The Community Setting)**

A cross-sectional study design (i.e. observational study) was chosen to address the research questions. The research takes a non-experimental (no manipulation of human subjects) participatory approach, using a semi-structured interview. Moreover, a cross-sectional study design was chosen to help describe the care and support network characteristics associated with a particular population (Frail individuals who have used a 'Falls Prevention' service), at a given point in time. Levin (2006) states that the findings of cross-sectional studies often indicate associations; the cross-sectional study findings in this study could help identify areas for future research. Furthermore, compared to a longitudinal study, this type of study design is relatively inexpensive and can be completed in a shorter time period.

**3.2.2.1: Participatory Approach**
3.2.2.1.1: Background to Participatory Approaches

A participatory approach is an overarching term for a research method aiming to increase engagement and maximise participation (van de Riet and Boettiger, 2009; Clark et al., 2013; NCVO, 2016). Engaging individuals in research is described as an important element of healthcare research that can contribute towards improving care and achieving desired health outcomes (Hearld et al., 2017; McNeil et al., 2016). Notably, participatory approaches are based on the notion that change is more likely and sustainable if the process engages the people on whom it focusses on (van de Riet and Boettiger, 2009; Chambers, 1994).

Macaulay (2016) points out that participatory approaches draw on many different influences, finding its origins in both social action research and philosophy. Freire (1982), who discussed participatory research in the area of social research for development and Lewin (1946) are noted as influential proponents of participatory approaches. They argue that undertaking inquiry with an individual (as opposed to on) helps generate solid evidence that can help lead to action (Macaulay, 2016).

Participatory approaches can vary in methodology and can employ visual methods (Clark et al., 2013), be interactive (Becker et al., 2003) and/or use diagrams (Kesby et al., 2005). Participatory approaches are said to de-emphasise verbal fluency and may therefore offer greater engagement in marginalised or disempowered sections of a community (van de Riet and Boettiger, 2009). Such approaches may also encourage a collaborative research process, e.g. research ‘with’ rather than research ‘on’ a particular community (Wallerstein, 1999).

Participatory approaches have been used in a broad range of studies and topics, including climate, governance and public health (ScienceDirect, 2019). Within healthcare, participatory approaches involving collaboration and partnership are now well established (Quah, 2017), being used and noted as mechanisms for engagement in public healthcare projects (Green and Mirzoez, 2008; Mittelmark et al., 2017). The most commonly cited limitation of this method is that it can be a time-consuming process (Amaya and Yeates, n.d.).

3.2.2.1.2: Use of a Participatory Approach in This Study.
The participatory approach of this study has been chosen for several reasons. Firstly, this method is said to improve interview experience compared to traditional, structured interview questions – and is an approach that respondents enjoy using (Hogan et al., 2007). Secondly, based around a hierarchical mapping technique (Antonucci, 1986), this approach enables participants to view the individuals they have identified in relation to each other – and alter their responses more readily than traditional 'question and answer' methods. Lastly, the technique enables the interviewer to potentially gather richer data compared with traditional methods within a given time frame (Hogan et al., 2007).

This approach may also be beneficial for those who have experienced declines in mental domains such as processing speed, reasoning, memory and attention – in addition to potential declines in general cognitive factors (Deary et al., 2009; Commodari et al., 2008). The features of a participatory approach suited the construct of the studies and were intended to help create a rich data set. It enables the consideration of both quantitative and qualitative aspects of an individual's network. The quantitative aspects of an individual's network were recorded (e.g. quantity of individuals mentioned) – in addition to qualitative aspects (e.g. contribution level of each individual and reasoning behind choices). This methodological approach is common to recent studies using Social Network Analysis (Knox et al., 2006; Martinez et al., 2003; Cheong et al., 2013). Although the term ‘participatory approach’ has been used in this thesis in a similar fashion to that used by Macaulay (2016), it is acknowledged that some would also consider this as research involving participants using greatly involved and novel methods (Participate, 2020).

The study involves two types of individual:

1. Patients who have taken part in a 'Falls Prevention' service in the community (Frail Individuals)

   (These individuals were referred to the ‘Falls Prevention’ service by a GP or healthcare professional following a fall, or deemed at risk of falls. For this reason, viewing frailty through a physical lens, they could be referred to as ‘Frail Individuals’. As they are attending a service run by NHS healthcare professionals aiming to improve and protect their health, they are also referred to in this study as ‘Patients’).
2. Healthcare professionals within the 'Falls Prevention' service who have had professional contact with interviewed frail individuals.

Healthcare professionals will be matched with a frail individual, i.e. healthcare professionals working in the 'Falls Prevention' service with direct professional involvement with a frail individual will be interviewed. Healthcare professionals as defined will be asked to take part in the participatory activity as a group. These healthcare professions, by the nature of their work, are likely to have some knowledge of a frail individuals care and support, as well as direct involvement and influence in their care and support. The participatory approach was designed to capture an approximation of a ‘steady-state’ in a frail individual's network.

3.2.2.2: Falls Prevention Groups (‘Falls Groups’)

The Falls Prevention service was established by the Central London Community Healthcare (CLCH) NHS Trust, aiming to prevent falls and unnecessary admission to hospital (CLCH NHS Trust, 2019). CLCH provides this service across 6 boroughs within London: Barnet, Brent, Merton, Hammersmith and Fulham, Kensington and Chelsea and Westminster. The classes take place in a central location within the borough with accessible transport facilities.

For this study, focus was placed on the Tri-borough Falls Prevention Service, which covers Hammersmith and Fulham, Kensington and Chelsea and Westminster. As with the other Falls Prevention services, there are inclusion and exclusion criteria to be eligible to join, which include: being medically fit and well (i.e. not requiring hospital care/currently hospitalised), at risk of falls and able to engage in a group physical activity programme (CLCH NHS Trust, 2019b). Adults who are unable to leave their home with ease, are at risk of imminent hospitalisation due to falls and have an unstable mental health condition are examples of criteria that would exclude individuals from joining the Tri-borough service (CLCH NHS Trust, 2019b). Individuals are only accepted into the ‘Falls Groups’ after referral from either a GP, health and/or social care professional, or self-referral.

Before starting the Falls programme, ‘patients’ will initially be assessed at the ‘Falls Group’, or at a clinic close to their home. The ‘patient’ will then be invited to join the 8-week programme consisting of both education and physical activity. The healthcare professional team includes: physiotherapists, occupational therapists, rehabilitation assistants and clinical psychologists. Each of the 8 sessions lasts 90 minutes. The first 30 minutes consists of an
interactive education talk, whereby the ‘patients’ are provided with information and advice on the benefits of physical activity – and discuss ways in which they can improve their confidence, balance and motivation. This is followed by a physical activity session, whereby ‘patients’ take part in a series of exercises specifically designed to improve their strength, balance and coordination. The 8-week programme aims to reduce the risk of falling. On completing the programme, ‘patients’ are additionally given guidance on further exercise classes, groups and activities to encourage them to maintain the progress made in the ‘Falls Groups’.

**3.2.2.3: Setting and Sampling**

The CLCH ‘Falls Prevention’ services were used as a conduit to access suitable candidates for the study. The Tri-borough Falls service (part of the CLCH Falls Prevention Service) was used in this study and contact was made with the lead clinician who offered advice and support to aid in the selection of suitable frail individuals and healthcare professionals for the study.

Purposive sampling was used; only frail individuals and healthcare professionals within the 'Falls Prevention' service (who are eligible) were interviewed.

All face-to-face interviews were held at Falls Groups in North-West London (New Horizons, St Charles Hospital, Askham Court and Porchester Hall). Their locations, relative to each other are displayed geographically below:
Figure 11: Location of Falls Groups Across North-West London. The 4 Falls Groups are located in 3 London boroughs: New Horizons (Kensington and Chelsea), Porchester Hall (Westminster), St Charles Hospital (Kensington and Chelsea) and Askham Court (Hammersmith and Fulham).

3.2.2.4: Sample Size

The sample size was determined using informed decision from similar studies and qualitative research (Cheong et al., 2013; Guest et al., 2006; Rokstad et al., 2017). These included: recruiting participants until data saturation occurred (Cheong et al., 2013), that data saturation occurs at around 12 participants in a homogenous sample (e.g. participants from the same level in a company) (Guest et al., 2006) and finally, the suggestion that the ‘sweet spot’ sample size for many qualitative research studies is 15-20 homogenous interview participants (Latham, 2019).

This study involves interviewing ‘patients’ and their healthcare providers, which is similar to another study that undertook interviews with 11 frail older people and 11 informal caregivers (van Kempen et al., 2012). Based on the above, 15 interviews with frail individuals (patients) were planned and 15 corresponding interviews with the healthcare professionals (provider) in the 'Falls Prevention' team were also planned (a total of 30 interviews to maximise the potential data collected). Importantly, the ‘Falls Group’ healthcare professionals (who had directly been involved in a specific frail individual's care) were authorised to participate in the study and interviewed as a group to minimise their time commitment.
This number had some flexibility and was able to be altered slightly if theoretical saturation was achieved with fewer or greater numbers – or if a smaller number of participants (both patients and healthcare professionals) were willing to take part in the study. Theoretical saturation is the phase of qualitative data analysis in which the researcher has continued sampling and analysing data until no new data appear (Lewis-Beck et al., 2004). Theoretical saturation in this context refers to no new types of individual/profession being mentioned during interviews with the patients (e.g. the responses 'Patient C' gives are more or less identical to earlier interviews with 'Patient B' and 'Patient A') - in addition to no new network patterns emerging. Interim analysis and data monitoring took place over the course of the study to help identify when theoretical saturation had been reached.

3.2.2.5: Inclusion Criteria

• Patients who had used a 'Falls Prevention' service (provided their health status and capacity allowed for an interview or other research interaction). The 'Falls Prevention' service confirmed whether they were able to participate in interviews.

• Staff members were recruited from sites where a 'Falls Prevention' service was implemented (analogous to the locations where the patients had been selected).

3.2.2.6: Exclusion Criteria

- For Patients:

• Patients who had not used a 'Falls Prevention' service.
• Children (under 18 years).
• Adults unable to consent for themselves because of physical or mental incapacity.
• Adults unable to understand the research information sheet or to give informed consent because of a poor command of English.

- For Healthcare Professionals:
• Healthcare professionals who did not belong to a 'Falls Prevention' service and were not involved in an interviewed patient's care.

3.2.2.7: Sampling Procedure

For All Participants

The 'Falls Prevention' lead was used in the first instance to identify potential participants (both frail individuals and healthcare professionals).

For all potential participants, the rationale behind the study and the methods used were explained. All participants were given a ‘Participant Information Sheet’ and ‘Consent Form’ for consideration before agreeing to take part (see Appendices B - E). Potential participants were given at least 1 week to read the information sheet and consent form.

For Frail Individuals

Participants (patients) interested in taking part indicated their interest by completing the response slip attached to the participant information sheet, bringing this to the next ‘Falls Group’ session they attended. Given this, patients who participated would have attended at least 2 ‘Falls Group’ sessions before completing the interview/activity.

The response slip was returned to the Falls Prevention lead, who informed me. Participants were contacted using the details they provided (email or telephone number). A convenient time (either before or after a ‘Falls Prevention’ class was then arranged for the interview/activity to take place.

Owing to time and resource constraints, only patients able to understand English with full mental capacity were included. Capacity was assessed by the Falls Prevention Lead and additionally consulted with the Falls Prevention team (which includes a range of specialists, including occupational therapists, physiotherapists and clinical psychologists) to reach a reasoned and informed decision.

For Healthcare Professionals
Healthcare professionals willing to take part completed the response slip attached to the participant information sheet (Appendix C) returning it to the Falls Prevention lead (who then informed me). Contact was then made with the healthcare professionals to arrange a suitable time for the interview/activity to take place.

3.2.2.8: Informed Consent

Following NHS guidelines, consent was voluntary and informed - and the person consenting had capacity to make the decision. On the proposed day of the interview/activity, the study was explained again to the individual - and written consent obtained. Informed consent was only taken after all participant questions had been answered and the purpose of the study had been explained fully. The research only included individuals capable to provide informed consent and understand the aims of the study. Only after consent was taken did the interview/activity take place.

3.2.2.9: Patient and Public Involvement

Using NIHR Research Design Service guidance (NIHR, 2019), every effort was made to integrate patients and public involvement in the planning, managing and conduct of this study. Hence, patients and public were involved in key stages of the research process, including: The testing/design phase of the research, undertaking/management of the research and data collection.

3.2.2.10: Testing Phase: Participatory Approach

Before collecting data from the ‘Falls Groups’, the rationale, methods and suitability for participants were tested. This was done to ensure that the methods proposed were appropriate, enabling the required data to be obtained – and addressing each of the research questions detailed.

The testing process followed a phased process, whereby testing was initiated at a general level, before being finalised at the level intended for the interviews/participatory activity. The interview questions were tested (at a general level, with frail individuals and with healthcare
professionals) for purpose and clarity to ensure that they would be suitable and understood by participants.

3.2.2.11: Testing Phase: General Testing

General testing took place at Imperial College, with academics (4), clinicians (2) and project managers (2) (8 people). The rationale was explained to all involved in the testing process and the ‘Circle of Influence’ participatory activity was undertaken with a number of individuals – both on a one-to-one basis and as a group.

3.2.2.12: Testing/Design Phase: With Frail individuals

Two individuals were contacted and took part in the testing phase. Both individuals were of a similar age and demographic to the individuals who would be recommended to one of the ‘Falls Groups’ in North-West London.

One individual provided feedback, comments and advice on the exercise after conducting the study in the way intended for ‘real’ ‘Falls Groups’ attendees. One individual was unable to complete the ‘Circle of Influence’ diagram due to mobility issues, but provided advice on the number of questions and their phrasing.

3.2.2.13: Testing/Design Phase: With Healthcare Professionals

During the ‘General Testing/Initial Testing’ phase, some of the testing was completed by healthcare professionals. However, following on from this testing, it was decided to test the study (including the populating of the ‘Circle of Influence’ diagram) with the healthcare professionals who form part of the ‘Falls Group’ teams. 13 healthcare professionals from the ‘Falls Groups’ took part in the testing phase, which was conducted as a group (consisting of: 1x Clinical Lead, 1x Consultant Physiotherapist, 2x Physiotherapists, 1x Nurse, 3x Occupational Therapists, 4x Rehabilitation/Physiotherapist Assistants, 1x Support Worker). This enabled the views of the healthcare professionals from the ‘Falls Groups’ to advise and comment on the appropriateness of the interview/activity – as well as understand more about the time commitments, availability and likely study participant numbers. The latter insight was especially important to ensure the correct planning and access across each of the four ‘Falls Groups’ across North-West London.
Notably, after testing with the healthcare professionals from the ‘Falls Groups’, it was reported that the use of a coloured dot in the exercise (to represent domain coverage) would be too time-consuming and not easily understood by the patients. Therefore, this element from the initial design of the study was removed.

3.2.2.14: Data Collection

Using the participatory activity, data was collected from both the frail individual and healthcare professionals. The participatory activity was completed and conducted at the site of the ‘Falls Prevention’ service associated with the frail individual. This ensured that the activity/interview was completed in a familiar environment and helped to minimise any unnecessary travel arrangements for the frail individual or healthcare professional. Data collection for the frail individuals and healthcare professionals took place as described and with patient consent, interviews were audio-recorded and transcribed to provide an accurate record.

3.2.2.15: Frail Individual Interviews

Using a participatory activity approach, with a semi-structured interview (see Appendix F for all questions), the network of the frail individual was established. The duration of the face-to-face interview was approximately 30 minutes, having three stages:

1. Name Generation

a) Patients were asked questions to help establish the individuals/professions involved in their care and support network. Name generator/name interpreter questions (e.g. who do you discuss your day-to-day needs with) in addition to name cueing exercises (where a list of potential healthcare professionals/people/resources are read out to prompt the patient) were also used.

b) As each individual/resource was generated, it was written on a Post-it note (illustrated below).
2. Contribution level (‘Circle of Influence’ diagram)

a) The Post-it notes with the named individuals/resources were then moved and placed onto a ‘Concentric Circle of Influence’ diagram. Patients were asked to place the Post-it notes on the appropriate concentric circle; the innermost ring corresponding to ‘Substantial contribution’; the outer ‘Least contribution’.

b) Patients were allowed to alter positions of individuals/resources if necessary.
Figure 13: Contribution Level

3.2.2.16: Healthcare Professional Interviews

The participatory activity/interview questions were structured in a similar way to those for the patient, but re-worded to determine the perceived network of the patient (see Appendix G for all questions asked).

Notably, with regards to HCP interviews:

- Conversations with the HCPs about how best to interview them concluded that it should be done electronically.
- HCPs were given the same questions as the Patients and completed the ‘Concentric Circle’ Diagram using Microsoft PowerPoint.
• The HCPs completed the diagrams as a group and were asked to only complete the diagrams for Patients that they had contact with (e.g. HCPs running the course at New Horizons only completed the diagrams for patients that attended the New Horizons course).
• The HCPs were able to refer to the Patient notes they had on file to complete the diagrams.

3.2.3: Withdrawal Criteria

Participants were reminded that they could withdraw from the activity/interview at any time. Appropriate details of counselling and support following the activity/interview were available for patients, if necessary.

3.2.4: Adverse Events

Participant information sheets outlining the purpose and overview of the interview were explained and distributed before a proposed interview.

Patient and staff participation in the research involved a small time commitment for interviews. This was minimised to avoid any obstruction to normal working routines – and interviews were organised at the convenience and preference of participants. For staff interviews, participants were only interviewed with agreement from their managers to engage in the interview/activity during work hours.

During the participatory activity, it was possible that patients may have become upset on realisation of their 'network', due to the number of individuals mentioned, or a lack of particular type of individual involved in their care. To minimise this happening, the patients chosen had completed at least one 'Falls Prevention' class, ensuring the presence of some (healthcare professional) individuals in their network (i.e. not 0). Moreover, the patients were assured that there was no 'correct' or 'expected' number of individuals. They were also made aware that they were free to withdraw from the research at any time; interviews were able to end early if discomfort to either party was experienced. It was also made clear to participants that if they decided to withdraw from the study, any personal data that had already been collected would be destroyed.
All identifiable features from all participants were removed and pseudonymised. The location of each ‘Falls Group’ interview was not identified to protect individual privacy and confidentiality. Interviews and data were only handled and accessed by one researcher (DS).

3.2.5: Ethics Approval

This study was granted ethics approval from the Imperial College Research Ethics Committee and the HRA (REC reference: 17/EE/0292). The study was conducted following recommendations for physicians involved in research on human subjects adopted by the 18th World Medical Assembly, Helsinki 1964 and later revisions.

3.2.6: Confidentiality

The confidentiality of all participants in this study was preserved per the Data Protection Act. All recorded and/or transcribed information has been securely stored on Imperial College servers, which are password protected and backed up daily. Access was only permitted to approved researchers.

The data presented in this thesis has no identifiable factors (e.g. names, organisations) and has been replaced with pseudo-identifiable names e.g. Interviewee A; Organisation 1. Any quotes used in thematic analysis do not include personally identifiable information. Audio recordings from the interviews have been destroyed after checking the transcripts for accuracy.

3.2.7: Undertaking/Management of the Research

The healthcare professionals who were part of the ‘Falls Groups’ took an active role in the management of the research. Across North-West London, 4 ‘Falls Groups’ were targeted. The healthcare professionals in each of these groups were contacted and the study was detailed to them. Each ‘Falls Group’ was visited and the study was explained to attendees of the group.

Not all ‘Falls Groups’ could be visited weekly. As such, attendees to each of the groups were reminded of the study by the healthcare professionals – and completed consent forms from attendees who wished to take part in the study were collected by the healthcare professionals. Communication via email was maintained with the healthcare professionals who were responsible for the organisation of each of the 4 ‘Falls Groups’, ensuring that the maximum
number of interviews could take place in one visit with the minimum disruption to the ‘Falls Groups’.

The healthcare professionals additionally provided advice on each visit on when best to conduct interviews. This was either done before (or at the end of) the ‘Falls Group’ session. Conducting interviews at the end of the session was not always possible, due to pre-arranged travel for some of the ‘patients’ within the ‘Falls Groups’. Seeking advice on scheduling interviews was invaluable to ensure enough time was available, yet also ensuring that the ‘patients’ did not miss out on any of the ‘Falls Group’ session.

3.2.8: Data Analysis

Following data collection, the results were interpreted and analysed to address the supporting research questions, as follows:

a): What does a care and support network of a frail individual who has received care from a 'Falls Prevention' service look like?

In this study, an 'ego network' was created, which places the frail individual (the ego) at the centre of the network diagram, surrounded by all the connections (ties) which were mentioned. The participatory activity enables one to observe what the network of a frail individual looks like upon completion of the activity, at a basic level.

At a higher level, the software programs 'NetDraw' and Microsoft PowerPoint was used to draw and visualise these network diagrams electronically, incorporating more information from the activity – and to aid the recognition of any patterns present.

b): Are there any patterns in the care and support networks of a frail individual?

Firstly, the network diagrams of the frail individuals constructed using NetDraw and Microsoft PowerPoint were visually inspected for any patterns present.
The software SPSS (Statistical Package for the Social Sciences), version 24, was used to perform statistical analyses. The analyses undertaken helped establish the potential presence of patterns, by interrogating the numerical aspects of the networks, such as the network size (a count of the number of unique individuals within a network).

Qualitative data, derived from a number of questions during the activity, was analysed using the principles of thematic analysis using cross-case comparisons (Ziebland and McPherson, 2006).

c): How does the perceived care and support network identified by a frail individual (patient) compare to the perceived care and support network of the frail individual identified by the healthcare professionals within the 'Falls Prevention' service (provider).

This research question was answered using both quantitative and qualitative reasoning. As above, the perceived network of the frail individual was first visually inspected and compared with that of the perceived network identified by the healthcare professionals.

Qualitative aspects of the different perspectives were compared through thematic analysis. Content analysis was performed, which included grouping categories into themes. The common themes arising from the participants were then examined and analysed with regards to the care and support received.

Quantitative aspects of the network (e.g. network size and ‘Closeness’ of the network) were compared individually and as a comparison of averages. Statistical tests (using SPSS version 24) were used for numerical comparison between the patient perspective and healthcare perspective. After normality tests (Shapiro-Wilk), comparisons of a) the number of reported connections (non-parametric tests) and b) the ‘Closeness’ of the networks (t-test) were undertaken. The network size was used to indicate the number of people reported as being part of an individual’s care and support network. The ‘Closeness’ values were used to indicate the contribution levels (with regards to care and support) of the reported individuals in the network.

Following independent quantitative and qualitative analysis, these two analyses were combined and used for further examination as previously done in similar studies (Cheong et al., 2013) to
address the research questions. This consisted of combining thematic and quantitative analyses to help understand the patient and healthcare professional reasoning behind the networks. Moreover, this was done to help understand why any differences were present between the patient and healthcare professional perspectives.

3.3: The Acute Care (Hospital) Setting

Methods

This section focuses on the methods relevant to the study conducted in the acute care setting (Chapter 6).

3.3.1: Use of an Existing Database

An existing data set consisting of 1903 patient admissions to acute care within one hospital (Chelsea and Westminster) between June 2015 and January 2016, was studied, combined with a review of the EPR system (LastWord).

From the database, details concerning the care and support of patients (i.e. their location pre-admission and post-discharge) could be manually extracted from the EPR system.

Choosing to manually extract the data from the EPR system was favoured over obtaining a data extract from the data service. This is primarily due to the time constraints to complete the study; requesting and obtaining a data extract directly from the data service would not fit within the timelines planned to complete the thesis.

3.3.2: Determining a ‘Frail’ Population in Hospital

The introduction gave a background to frailty, in addition to evidence regarding how frailty can be defined, recognised and assessed. The frail patients in this study were identified through a physical lens – i.e. all patients over 65 years of age who were classified as being ‘at risk of falls’, having being admitted to acute care with their primary complaint recorded as being ‘Fall’ in the first instance. The reasoning for the study of patients with falls has been explained in Chapter 1 (1.11). Other domains of frailty (physical, social, mental and environmental) were explored via the use of a frailty score (FEWS) once the patient group were identified.

In this study, as an EPR system has been used to abstract data, a method to identify patients who may be deemed frail had to be decided. The frail patients in this study were identified through a physical lens and classified ‘at risk of falls’. Patients had been classified at risk of
falls by a clinician using NICE guidelines (i.e. all patients aged 65 years or older and having been admitted with falls as a presenting complaint) (NICE, 2013a; NICE, 2015).

3.3.3: ‘LastWord’ EPR System

At Chelsea and Westminster hospital, the EPR system used is ‘LastWord’. This system was implemented at the hospital in 1999 as part of a full EPR rollout. This system has a record of patient details, their outpatient appointments and provides a comprehensive overview of admission, discharge and transfer information across the entire trust (including patient-related free-text notes by the healthcare professional groups). In theory, using the EPR system enables healthcare organisations such as hospitals to create and maintain lifetime patient records of an individual.

3.3.4: Details Abstracted

Within the EPR system, details can be recorded in a standardised structure (e.g. age or gender) and/or in a non-standardised structure (e.g. free-text regarding the current patient social and care support). This study interrogated both standardised and non-standardised details to gather the necessary data. In particular, data was collected on the current living situation of each patient, including the care and support each patient received using the free-text responses. Though time-consuming, this process enabled an accurate representation of the recorded living arrangement of each patient pre- and post-discharge to acute care.

As there are many variations in living arrangements (in addition to care and support received), a more detailed and accurate picture of ‘the frail individual’ was possible from these records rather than using a more binary system with limited living arrangement details (e.g. HES).

After all recorded living arrangements had been abstracted, all data collected was double-checked for accuracy to avoid data entry errors (by DS). They then underwent a data cleaning process and placed into specific categories (described under ‘Data Cleaning’).

3.3.5: Study Sample

Four distinct stages dictated the resulting sample size analysed in this study, as shown below.
3.3.6: Patient Flow Diagrams (Alluvial Diagrams)

Alluvial diagrams were selected as a way of illustrating patient living arrangements pre- and post-admission to acute care. Alluvial diagrams represent how things change (or remain the same) over time, providing a mechanism to visualise change, or lack thereof, in the patient sample, in terms of their pre-and post-hospital admission. They have previously been used to demonstrate the mapping of change in large networks (Rosvall and Bergstrom, 2010).

An open source data visualisation software tool, SankeyMATIC (Bogart, 2013) was used to create the alluvial diagrams by uploading a cleaned Microsoft Excel table of the patient living arrangements pre- and post-admission.

3.3.7: Data Cleaning
3.3.7.1: For Alluvial Diagram

As part of the cleaning process, distinct pre-admission and post-discharge living arrangements were recorded.

The data derived from the patient notes within the EPR system was used to ascertain what living arrangements should be used, after careful reading of the content regarding the recorded pre-admission and post-discharge living arrangements. Careful reading was required as these patient notes were not all written in a standard way (as they were free-text responses) and may have included typographical errors or misspellings. This resulted in the formation of 17 pre-admission living arrangements; 19 post-discharge living arrangements.

3.3.7.2: Dependency Levels

Dependency has been defined as when people require social, family or institutional support, due to temporary or definitive loss of their abilities (Doubova et al., 2010).

In this study, the dependency level for each individual has been estimated by using:

- the recorded care and support for each individual pre-admission
- the proposed care and support required for each individual post-admission

Four distinct categories were selected for this study, which offered simplification to classify dependency pre-and post-admission: low dependency, medium dependency, high dependency and N/A (Deceased). These categories were based on similar groupings in literature (Kingston et al., 2017; Kingston et al., 2018).

The EPR record for each individual was examined and used to place the individuals into these categories. After categorisation, the categories were cross-checked with clinicians (geriatrician, acute medics (x2) and an occupational therapist) for suitability and face validity and represent what the dependency levels could be categorised as (Table 6).
### Table 6: Classification of Dependency Level

<table>
<thead>
<tr>
<th>Low Dependency</th>
<th>Medium Dependency</th>
<th>High Dependency</th>
<th>N/A (Deceased)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient does not have a record of having any care and support. Record may also state patient as being ‘Independent with all ADLs’ (this is likely to refer basic (personal) care and not IADLs).</td>
<td>Patient has a record of having care and support. The care and support recorded indicates that it may occur at regular intervals each day (For example, ‘Home with Care Provision 1x Daily’).</td>
<td>Patient has a record of having care and support. The care and support recorded indicates that the patient may require help at any time, or constant supervision, often 24-hours a day. This may be often seen in patients residing in a hospital or nursing home.</td>
<td>Deceased following admission</td>
</tr>
</tbody>
</table>
3.3.8: The Frailty Early Warning Score (FEWS)

At present, no routinely available and reliable clinical score assessing frailty in patients for use within the acute care setting exists (Soong et al., 2015). FEWS aims to be a novel method of predicting a frail and/or vulnerable individual’s outcomes in acute care, to be calculated easily and simply by a clinician at the point of care.

FEWS was being trialled as part of the routine measurement of frailty by clinicians in the AAU at Chelsea and Westminster hospital. A group of clinicians have been granted ethical approval and trained to assign a FEWS to all patients admitted in the AAU at the hospital. The same group of clinicians assigning a FEWS for each patient increases the reliability (specifically the inter-rater reliability) of the score in this study.

FEWS consists of 15 descriptors across four domains of frailty (physical, social, mental and environmental) (see Table 7). Based on clinical judgement, a score of 1 is assigned for each descriptor observed in the patient (a score of 0 if the descriptor is absent). A maximum FEWS of 15 is therefore possible.

3.3.8.1: Origins of FEWS

FEWS is based on a validated model of frailty by Soong et al. (2015) which took consideration of frailty syndromes using both historic data from HES and within-spell variables. The model evaluated that frailty syndromes were valid predictors of outcomes relevant to acute care (adverse events at 30 days, emergency readmission and institutionalisation). FEWS consists of all the frailty syndromes present in the validated model, in addition to two variables that were not coded in HES, but routinely collected within the acute care setting (polypharmacy and weight loss (originally defined as ‘nutrition risk’)). Combined, these form 15 descriptors comprising a FEWS score.

Table 7: FEWS Scoring System

The FEWS scoring system is detailed in the table below. 15 descriptors were assessed by a clinician upon admission to the AAU. A patient scored 1 point for each descriptor present on
admission. 0 was assigned to descriptors absent on admission. The sum of the individual scores gave the final FEWS. A maximum FEWS of 15 was therefore possible.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Descriptors</th>
<th>Score (0 = Absent on Admission, 1 = Present on Admission)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Pressure Ulcers (Present on Admission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Falls (Present on Admission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduced Mobility (Does the patient need assistance with mobility/are they dependent on someone for mobility)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incontinence (Present on Admission)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weight Loss (Determined by assessing if 'Weight is below average (BMI) or 'Low food intake' (a clinical judgement based on the asking the patient their normal patterns of daily nutrition)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polypharmacy (≥ 5 Medications) (Present on Admission)</td>
<td></td>
</tr>
<tr>
<td>Mental</td>
<td>New confusion or deterioration from baseline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New or deterioration of severe enduring mental illness (e.g. Psychosis or Suicide attempt)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New or worsening anxiety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New or worsening depression</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>No regular (&lt; once a week) contact with friends or family</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Receives social or nursing care in community</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resides in care facility (nursing home or residential home)</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Dressing and Toileting (e.g. does the patient report encountering problems in their home in relation to dressing and/or toileting, such as access to toilet in house being an issue, bathroom area is slippery (which caused a fall). Patient may also report that they have toilet adaptations or clothing altered to make toileting easier (e.g. Velcro fasteners and/or elasticated waist bands).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cooking or Housework (a judgement of the suitability of the patient's housing environment to allow the patient to cook and complete housework - e.g. does the patient report encountering problems in their home in relation to cooking and/or housework, such as poor lighting, slippery floors, hard to reach cupboards in their living environment))</td>
<td></td>
</tr>
</tbody>
</table>

An example patient, demonstrating how the scoring was calculated is shown below. Descriptors deemed present after assessment by a clinician have been scored 1:
### Table 8: Example FEWS for a Patient

<table>
<thead>
<tr>
<th>Domain</th>
<th>Descriptors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Pressure Ulcers (Present on Admission)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Falls (Present on Admission)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Reduced Mobility (Does the patient need assistance with mobility/are they dependent on someone for mobility)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Incontinence (Present on Admission)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Weight Loss (Determined by assessing if 'Weight is below average (BMI) or 'Low food intake' (a clinical judgement based on the asking the patient their normal patterns of daily nutrition))</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Polypharmacy (≥ 5 Medications) (Present on Admission)</td>
<td>1</td>
</tr>
<tr>
<td>Mental</td>
<td>New confusion or deterioration from baseline</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>New or deterioration of severe enduring mental illness (e.g. Psychosis or Suicide attempt)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>New or worsening anxiety</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>New or worsening depression</td>
<td>0</td>
</tr>
<tr>
<td>Social</td>
<td>No regular (&lt; once a week) contact with friends or family</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Receives social or nursing care in community</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Resides in care facility (nursing home or residential home)</td>
<td>0</td>
</tr>
<tr>
<td>Environmental</td>
<td>Dressing and Toileting (e.g. does the patient report encountering problems in their home in relation to dressing and/or toileting, such as access to toilet in house being an issue, bathroom area is slippery (which caused a fall). Patient may also report that they have toilet adaptations or clothing altered to make toileting easier (e.g. Velcro fasteners and/or elasticated waist bands).</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cooking or Housework (a judgement of the suitability of the patient's housing environment to allow the patient to cook and complete housework - e.g. does the patient report encountering problems in their home in relation to cooking and/or housework; such as poor lighting, slippery floors, hard to reach cupboards in their living environment).</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Score:</strong></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

For this patient, there are 5 descriptors scored (indicating their presence on admission). Each of these descriptors scores 1. Therefore, the FEWS for this patient is 5.

3.3.8.2: Predictiveness of FEWS
Notably, recently presented research has demonstrated that FEWS appears to be a better predictor of overall mortality (30-day and 90-day) than NEWS (national early warning score) in acutely admitted patients 65 years and older (Dinesen et al., 2016a). (NEWS is a tool consisting of six physiological parameters reflecting acuity of illness that may be used in an acute setting to improve the detection and response to clinical deterioration in adult patients (NHS England, 2019a)). The FEWS has been presented and discussed at the 1st National Frailty Conference in Leeds in 2015, as well as the CLAHRC NWL Research Partners meeting in 2017.

3.3.8.3: Choice of FEWS in This Study

This score was chosen given its current use as a measurement of frailty by clinicians in the AAU at Chelsea and Westminster hospital (since 2015). As mentioned previously, FEWS has been approved for hospital use, with clinicians trained and responsible for assigning a FEWS to each admitted patient. This is the host organisation at which my PhD programme is based. I have been granted ethical approval from the Research and Development department at Chelsea and Westminster hospital for access to this data and data analysis (IRAS ID: 188851).

FEWS was also chosen due to its foundation in four domains of frailty (physical, social, mental and environmental) (Soong et al., 2015). Some domains (e.g. social and environmental) are not captured in other frailty scores currently in use (Wou et al., 2013). As discussed earlier, assessing and recognising frailty holistically and multi-dimensionally has been reported as important within the literature (Ding et al., 2017; Turner and Clegg, 2014), contributing to the greater likelihood of individuals receiving the care and support they require (British Geriatrics Society, 2015). This has further contributed to FEWS being used in this study. The FEWS is derived from a model which used a large historical dataset for validation (Soong et al., 2015), thus strengthening the rationale for use in this study. As FEWS was developed in the same research department as my PhD studies, queries relating to FEWS could be addressed first-hand with experienced clinicians and researchers that used/developed the score.

In the AAU at Chelsea and Westminster hospital, no other tools assessing frailty in patients are in use. Introducing another multidimensional tool to assess frailty in patients would require additional training and clinical expertise and as well as requiring ethical and/or site approval from the hospital. For example, introducing the clinical frailty scale (Rockwood et al., 2005)
would require site and ethical approval and clinical training (Juma, Taabazuing and Montero-Odasso, 2016). As FEWS is used within the hospital, additional research using FEWS was also a pragmatic choice for grading of frailty in this study, particularly as a non-clinician without prior training in other frailty assessment tools used in acute care.

3.3.8.4: FEWS Groupings

The FEWS (Range: 0-15) scale is ordinal and this scale is used in the study. Further studies are required to determine the weighting of the domains, the impact on patient outcomes and the sensitivity of the final score. Groupings of FEWS (e.g. low, medium, high) have yet to be determined.

For data analysis, 295 patients were categorised into 3 groups according to the tertile of aggregate FEWS scores, in alignment with previous studies involving frailty scores (Baek et al., 2016). These groups were categorised as ‘Group 1’ (low FEWS), ‘Group 2’ (medium FEWS) and ‘Group 3’ (high FEWS). Group 1 consists of FEWS 0-3; Group 2 consists of FEWS 4-6; Group 3 consists of FEWS 7-11.

Full details of the FEWS in each of these groups, in addition to a graph illustrating the frequency and distribution of FEWS, are shown in Figure 24.

3.3.9: Statistical Analysis

In this study, one of the aims was to establish whether the complete number of healthcare professional interactions, the discrete healthcare professional interactions a patient received during their hospital admission, length of stay and changes in dependency level status at discharge destination differed based on FEWS group.

3.3.9.1: Hypothesis Using FEWS

As the introduction evidenced, frailty has been associated with adverse outcomes (Fried et al., 2001; Winograd et al., 1991), with frail patients especially susceptible to adverse consequences of hospital admission (Gill et al., 2011; Hogan et al., 2017; Theou et al., 2018). As discussed, frail patients will have varying care and support needs, with potentially the most frail requiring
more care than the least frail. This may be seen through the number of interactions received (Kirkland and Weinstein, 1999) and/or the range of professions seen (NHS Rightcare, 2019; NHS Camden, 2014). Moreover, a recent study by Gilbert et al. (2018) found that higher frailty risk scores were associated with poorer outcomes (e.g. 30-day mortality and emergency re-admission).

Therefore, using FEWS as a measure of frailty, I hypothesise that the:

- Complete number of healthcare professional interactions a patient receives during their hospital episode
- Discrete number of healthcare professional interactions a patient receives during their hospital episode
- Length of stay a patient has
- Change in dependency level status at discharge destination

Differ based on FEWS group

(Null Hypothesis: the quantities of complete interactions, discrete interactions, lengths of stay or changes in dependency level status do not differ based on FEWS group)

This was carried out using the following statistical tests:

A Kruskal-Wallis test was used to compare if there was a statistically significant difference between the different FEWS groupings with regards to the a) complete healthcare professional interactions b) discrete healthcare professional interactions, c) lengths of stay and d) changes in dependency level status at discharge destination. The Kruskal-Wallis test was chosen as it is a non-parametric test used to determine if there are statistically significant differences between two (or more) groups of independent variables or ordinal dependent variables. As this test does not tell us which groups are different, post-hoc tests are needed to determine this. For this study, a Mann-Whitney U test was used.

A Mann-Whitney U test was used to establish whether a statistically significant difference was present between independent groups, again with regards to a)-d) outlined above. As this process involved multiple comparisons, a Bonferroni correction was applied, reducing the chance of committing a Type 1 error (i.e. reducing the chance for a false-positive result).
All data analyses that were undertaken are detailed in the results section. SPSS (Version 24) was used to perform these analyses.

### 3.3.10: Ethics

Given the patient identifiable data involved in this study, particular attention was needed to ensure the study was carried out in an appropriate, secure and ethical manner. Guidance was sought from the Imperial College London Research Ethics Committee and the Director of Research and Development at Chelsea and Westminster hospital who both advised on ethics approvals.

This study used data from an existing data source. This data had ethics approval for use within CLAHRC NWL of which I (DS) was added as an additional researcher to the ethics application (IRAS ID: 188851). This covered the use of the data and subsequent secondary data analysis of routinely collected data that followed. At no time did any identifiable data leave the site where ethics approval had been granted (Chelsea and Westminster Hospital).

### 3.3.11: Confidentiality

Confidentiality was maintained in all aspects of this study. All analysable data and associated information were stored securely on Imperial College London servers per the Data Protection Act 1998. All patient names in this study were coded to become anonymised. No identifiable data is mentioned or detailed anywhere in this study.

Accessing and viewing of data was made available only to those with explicit authorisation. Data collection was only made available on one secure hospital computer. A password was required to access or view any data.

### 3.4: The Nursing Home Setting

#### Methods

This section focuses on the methods relevant to the study conducted in the nursing home setting (Chapter 7).

#### 3.4.1: Survey Design

An online survey (questionnaire) was developed using Qualtrics (Qualtrics, Provo, UT) to address the research questions.
An online survey approach was chosen for several reasons: the duration for completion (shorter than postal surveys), cost (no postage fees), accuracy (fewer illegibility issues) and ease of use. Moreover, the use of an online survey approach (as opposed to a face-to-face interview), removed the need to liaise with each nursing home to find an opportunity to conduct an interview – especially given that staff time was a noted challenge highlighted earlier in this thesis. An online survey method may also have been viewed by the nursing homes as less intrusive than a face-to-face visit or interview. The online survey additionally allowed the results of completed surveys to be received as soon as the survey was completed, enabling earlier analysis to take place.

Before sending the survey to each nursing home, the purpose of the study was explained to each of the nursing homes via telephone (3.4.3 Recruitment). It was explained that the purpose of the study was to gather an understanding of what the nursing homes believed constituted an assessment for frailty of residents.

As frailty can present and be recognised in various ways (Turner & Clegg, 2014), participants were able to select from a number of assessments that are commonly used to assess various aspects of an individual patient or resident. The options were selected from the assessments highlighted to be in use in North-West London from the findings in the non-acute care study (Chapter 4) in addition to guidance from the British Geriatrics Society (British Geriatrics Society, 2014) regarding ‘reasonable assessments for frailty’. Including options directly derived from the high-level non-acute care setting study ensured that a range of perceived ‘assessments for frailty’ were available – some of which were also specific to North-West London.

The reported assessments might be used by a nursing home to indicate impairments associated with frailty and therefore understood to be and used by a nursing home as an ‘assessment for frailty’. Participants were able to provide free text responses if no predefined options were suitable. The onus, however, was on the nursing home to report all the assessments that they were using that could relate their view of ‘assessment for frailty’.

While some of these ‘assessments for frailty’ are not distinct frailty indices or scales, the high-level non-acute care setting study informed that ‘in practice’ these were likely to be used to identify if an individual was frail. For this study, they were classified as ‘assessments for frailty’. Referring to these as ‘assessments for frailty’ in the survey was done to denote that if the nursing homes reported their use, they were using these as assessments for frailty – and not...
just as health status assessments (and as explained when the purpose of the study was detailed to each nursing home).

The survey design and administration was informed from literature (McColl et al., 2002; Kelley et al., 2003) and tested with academics and clinicians (from Imperial College London and CLAHRC NWL) and checked for content, structure and clarity, thereby reinforcing the face validity of the survey. After testing, changes were made to the number of questions, phrasing and logic flow of the survey.

3.4.2: Survey Questions

The following questions were used in the survey:

- Which structured assessments for frailty are used? Please select as many options that apply. If partial assessments are being used, please specify this under 'Other'.

23 predefined options of assessments for frailty were available for selection. In the high-level non-acute care setting study, it had been established that two key types of assessment were being used: ‘comprehensive’ and ‘partial’. For this reason, an option to detail ‘partial assessments’ being used was additionally provided.

For each assessment that was mentioned, the following questions were subsequently asked:

- Which health professionals are using the [Assessment mentioned]? Please list as many that apply.

Users were able to select from 7 predefined options, or select ‘Other’, where they could specify a health professional not listed. MDT refers to Multi-Disciplinary Team.

- Why is the [Assessment Mentioned] being used? For example: in clinical decision making/resource allocation/end of life planning either by a single profession or as part of a wider MDT group or colleagues.

Users were able to provide a free-text response to this question.

- How are the responses to the [Assessment Mentioned] stored? Please select only one option.

Users were able to select from 3 predefined options (Paper, Electronically or ‘Don’t Know’), or select ‘Other’, where they could specify storage not listed.
Lastly, users were asked whether they could provide a copy of the assessments for frailty mentioned

_We would appreciate it if you could upload a copy of the assessments for frailty you mentioned. Please could you state whether this is possible_

Users were able to select from 3 predefined options, whereby they could upload the assessments electronically via the survey, arrange a site visit to see the assessments being used (if they could not be uploaded electronically), or indicate that none of these were possible.

A copy of the questionnaire is included in Appendix I of this thesis.

### 3.4.3: Recruitment

All Care Quality Commission (CQC) regulated nursing homes within North-West London (NWL) were eligible for this study [n=87].

A single geography (NWL) was chosen as a convenience sample, with a view to scaling up to a wider geography in future studies. It further enabled depth of analysis, site visits (if necessary) and the building upon existing relationships and networks within the NWL community.

As described in earlier chapters, NWL consists of eight boroughs, with great demographic, social and economic diversity. In NWL, an estimated 30,000 have been identified as being in the last phase of life (Spicer, 2017), with roughly 20% of these (6000) living in nursing or residential homes (Spicer, 2017).

Using the information publically accessibly on the CQC website, each nursing home was contacted by telephone inviting them to participate. Information concerning the purpose and aims of the study, confidentiality and dissemination was given. Participants were advised that the proposed survey was to be completed by the manager of the nursing home, with staff input as necessary. For those who gave verbal consent to participate, an email address of the nursing home manager was requested; a link to the survey was subsequently sent to the manager.

The survey was accessible from 30th September 2015 to 30th April 2016. No incentives were offered.

### 3.4.4: Mapping of Assessments
Assessment tools reported were mapped against frailty domains (physical, social, mental and environmental) (Soong et al., 2013). Every effort was made to obtain a copy of the individual assessment tool to ensure mapping accuracy.

Structured and widely used assessment tools were obtained online, to help accurately identify frailty domain coverage. These tools were examined to ascertain whether they were standardised, i.e. characterised by reliability, validity, and consistency in test administration (Asher, 1996; Polgar and Thomas, 2000). Standardised assessment tools were identified using online resources, references (College of Occupational Therapists, 2016) and confirmed as being standardised with clinicians based at CLAHRC NWL.

Contact was made with nursing homes requesting a copy of ‘in-house’ assessment tools, or those unavailable online. These tools were categorised as non-standardised – often having no clear guidance in test administration or interpretation of results. Unlike standardised assessments, non-standardised assessments will often have unknown levels of reliability, validity and utility (College of Occupational Therapists, 2015; Fawcett, 2007; de Klerk et al., 2015). ‘Non-Standardised’ assessment tools were also identified if short, generic names were given, that could not be conclusively associated with known standardised assessment tools.

Two non-clinical researchers (DS and MW) undertook the mapping exercise independently and further cross-checked with clinicians to ensure accuracy.

The ownership of each nursing home was obtained to allow the examination of potential differences in ‘assessments for frailty’ used across nursing homes. Two categories of ownership were used: corporate chains (homes belonging to a large company owning multiple nursing homes with a similar aim and organisational structure) and independently owned homes (homes often belonging to one family, not part of a chain of homes).

3.4.5: Statistical Analysis

Comparison of the number of assessments used between corporate chain owned nursing homes and independently owned nursing homes was performed using the Mann-Whitney U test. The statistical software package SPSS (version 24) was used to perform this analysis.

3.4.6: Ethics

Guidance was sought from the Imperial College London Research Ethics Committee and the Director of Research and Development at Chelsea and Westminster hospital who both advised
that formal ethical approval was not required, since no patient-level data was collected. Informed verbal consent to participate was received from all nursing homes taking part in the study.

The need for written consent was waived by the ethics committee, given the study made use of an online survey (questionnaire), it was classified as low-risk and involved non-invasive and non-sensitive information. Participants in this study were not defined as being ‘vulnerable’ and all responses remained confidential.

The study involved contact with nursing home staff only – and the nature of the study was to further understand the localised process in each of the nursing homes. For this reason, per NHS guidelines (Central and North West London NHS Foundation Trust, 2019d), the study was classified as ‘service evaluation’. Service evaluation studies do not need NHS Research Ethics Committee and/or local level NHS Research and Development approval.

3.4.7: Confidentiality

Confidentiality was maintained in all aspects of this study. All analysable data and associated information were stored securely on Imperial College London servers per the Data Protection Act 1998. All individual nursing home names in this study have been anonymised. The names, job titles and contact details of those who participated have not been included in the analysis of the study and will remain fully confidential.

The survey was distributed using Qualtrics (Qualtrics, Provo, UT). Qualtrics was chosen for its compliance with the requirements for a secure and confidential information security management system (ISMS), having received ISO 27001 certification. Qualtrics provides high protection and reliability of customer data, using Transport Layer Security (TLS) encryption for all transmitted data.

Accessing and viewing of data was made available only to those with explicit authorisation. A password was required to access or view any data.
Chapter 4: The Non-Acute Care Setting (High-Level)

The findings presented in this chapter have been published in BMC Geriatrics (Sunkersing et al., 2019). As lead and corresponding author of the published article, I was responsible for the initial study aim, design, analysis, interpretation of results, conclusions, writing of the first draft and contributing to revisions. Parts of the data collection in this study were conducted with an additional researcher, Ms. Maria Woringer (MW). MW was involved in contacting some participants and recording which assessments for frailty were being used. At all times, this was done under the supervision of DS. Two of my supervisors, Professor Derek Bell and Professor Finbarr Martin provided clinical knowledge and expertise for the mapping of the assessments. All authors on the final publication contributed to the final data interpretation and revisions.

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The presented text is adapted and/or expanded from the published article.

4.1: Introduction

The purpose of this chapter is to build upon the rationale for the research questions outlined in the introduction of this thesis (1.6.6: Specific Reasons for Settings Chosen) aiming to answer them, in relation to a non-acute care setting. This study did not take a targeted view of a specific non-acute care setting. Instead, the work was designed to better understand the assessment tools for frailty used across a range of non-acute health and care settings, which, as a result, may influence the care and support given to patients.

The care and support needs of people considered frail are strongly identified by initially assessing for frailty (NHS England, 2014; Reeves et al., 2018; NICE, n.d.). As such, interviews with healthcare professionals and individuals with assumed interaction with frail people were undertaken to understand the reported assessments for frailty being used in North-West London and the elements of the reported assessments. All participants included, in addition to their justification in the study is detailed in ‘3.1.9: Study Participants’.

This study specifically examined the four domains of frailty previously described (Soong et al., 2013).
Currently, as reported by Pritchard et al. (2017), no gold standard method consistently used to assess for frailty by researchers and clinicians exists. While the CGA has been noted as arguably the best way to assess the overall health of an older adult, research data suggests that conducting the CGA is resource-intensive and other easier and quicker assessments may be favourable (Pritchard et al., 2017). Moreover, it is acknowledged that undertaking a CGA in community settings may be difficult, due to time constraints and the need for specific training required to conduct the assessment (Seematter-Bagnoud and Büla, 2018; Jiang and Li, 2016). Additionally, the potential benefits of the CGA may pose challenges in community settings, due to difficulties in selecting suitable patients coordinating multidisciplinary team working (Welsh et al., 2014).

To combat potential resource and time constraints, NHS England (2014) emphasises that a growing body of evidence suggests a more integrated approach in assessing for frailty, highlighting the benefits for patients, staff and healthcare systems. The four domain model of frailty (Soong et al., 2013) used in this study is consistent with this. By recognising and assessing for frailty holistically and multi-dimensionally (Ding et al., 2017; Turner and Clegg, 2014), individuals may be better placed to receive the care and support they require (British Geriatrics Society, 2015). This study investigates what assessments for frailty are used in non-acute care, examining the constituent domains covered in each of the assessments reported.

4.2: Setting the Scene

This section gives a background to the non-acute care setting, the associated patients and individuals within this setting – and examples of the care and support given in this setting.

4.2.1: Non-Acute Care and Support in the UK – A Background

Non-acute care is an umbrella term used to differentiate from other types of care, notably sub-acute and acute care. Its definition includes, but is not limited to: home care, palliative care, adult day care, long term care and care in a hospice. Ongoing care and support provided in non-acute care settings may help avoid unnecessary admission to hospital, support discharge from hospital or provide novel models of community care (Carpenter et al., 2002).

Many individuals receiving care and support in a non-acute setting will be susceptible to varying degrees of frailty (Bourgault-Fagnou and Hadjistavropoulos, 2009); assessments for frailty should therefore be undertaken to help ensure their care and support needs are addressed (British Geriatrics Society, 2014a).
Table 9 details common non-acute care settings and some of their characteristics.

### Table 9: Examples of Common Non-Acute Care and Support and Associated Characteristics

<table>
<thead>
<tr>
<th>Type of Non-Acute Care and Support</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Term Care Settings – e.g. nursing or residential home</td>
<td>Provision of a variety of care and support services to individuals unable to manage ADLs and IADLs independently. Often a setting representing individuals with high levels of frailty.</td>
</tr>
<tr>
<td>Home Care</td>
<td>Provide care and support services to individuals in their own home. Flexibility in the level of care, e.g. one hour per week to several hours per day or a live-in carer.</td>
</tr>
<tr>
<td>Community equipment and adaptations</td>
<td>Enhances the safety and ease in undertaking various ADLs or IADLs. These changes can be big or small and include: adding a bath lift, installing a stairlift and widening doorways.</td>
</tr>
<tr>
<td>Adult Day Care Centres</td>
<td>A non-residential facility often offering care and support through social, nutritional, health and other needs. Can also provide activities, counselling and special needs services.</td>
</tr>
</tbody>
</table>

4.3: This Chapter in Relation to the Overall Thesis

This chapter describes the first study in the thesis, which, along with the systematic literature review (Chapter 2), provides rationale for the subsequent studies. The non-acute care setting is broad (as described) and depending on the specific setting, individuals are likely to have varying levels of frailty, ranging from low to potentially very high levels – ultimately influencing the care and support that may be needed.

To develop a strategic approach towards addressing the overarching research question of this thesis, this study aims to provide a better understanding of the non-acute care landscape with regards to frail individuals, informed by the current literature.

The literature describes that the care and support needs of frail individuals are often ascertained by initially carrying out a number of assessments, which may include assessing for frailty (NHS England, 2017; British Geriatrics Society, 2014; Chen et al., 2018). Many methods are
described, ranging from: using a CGA (Zubair et al., 2017), a carer’s or needs assessment to help formulate a care and support plan (NHS, 2018) and/or assessing ADLs, which may themselves help to identify frailty (NHS England, 2017; British Geriatrics Society, 2015).

The British Geriatrics Society recommends all encounters between health and social care staff for older people in community and outpatient settings should include an assessment for frailty (Turner and Clegg, 2014). Moreover, the British Geriatrics Society and NHS England suggest several ways to recognise frailty, citing: gait speed, a timed-up-and-go-test, the PRISMA 7 questionnaire, or using any other ‘appropriate assessment tool’ (British Geriatrics Society, 2018; NHS England, n.d.2). Also suggested is that common clinical presentations of frailty (falls, delirium and sudden immobility) can alert health and social care professionals to the possible presence of frailty (Turner and Clegg, 2014; British Geriatrics Society, 2018).

Since frailty is a complex and multi-dimensional syndrome (Chen et al., 2018), assessing for frailty should be multi-dimensional and holistic (British Geriatrics Society, 2014). However, there is no gold standard method consistently used in practice to assess for frailty (Pritchard et al., 2017; Dent et al., 2016). More details regarding assessing for frailty in the literature are provided in Chapters 1 and 2.

There is increasing evidence to suggest that frailty is potentially reversible with early screening and addressing needs with personalised care and support (e.g. an intervention) (Chen et al., 2018). Identifying the presence of frailty in individuals can help in the creation of an individualised care and support plan, which could potentially improve patient outcomes (British Geriatrics Society, 2014).

In the non-acute care setting, individuals may be in pre-frail or mild-frail states. As such, an early assessment for frailty could contribute towards specific care and support (e.g. an intervention), which could reduce the risk (and in some, the potential reversal) of frailty (Arc-Chagnaud et al., 2019). This study aims to understand what assessments for frailty in the non-acute care setting are being used, which may, in turn, be influencing the care and support a pre-frail or mildly frail individual in this setting receives.

4.4: Overall Aim

The overall aim of this study was to establish a general overview of the reported assessments for frailty being used in non-acute care settings across North-West London – and how these assessments vary by content, purpose and process, noting the extent to which frailty domains
were considered. This was established by examining the responses to a questionnaire completed by healthcare professionals and individuals who provided care and support to frail individuals.

4.4.1: Research Questions

The specific research question and the supporting research questions addressed in this study are listed below.

The specific research question:

**What assessment tools for frailty are used in non-acute health and care settings?**

Supporting research questions addressing this specific research question:

- **a) What assessments for frailty are currently used in non-acute care health and care settings across North-West London?**

- **a) What components (e.g. purpose, content, and domains) currently contribute towards an assessment for frailty?**

4.5: Method Summary

A purposive sampling strategy was used to obtain a cohort of 18 people from different professional backgrounds, who were working in a professional capacity with frail individuals (or undertaking research of frailty/frail individuals), some of whom had an implicit responsibility to assess them for frailty. This cohort completed a questionnaire to help understand what assessments for frailty were being used in the non-acute care setting. Full details of methods are described in Chapter 3 of this thesis.

4.6: Results

4.6.1: Reported ‘Assessments for Frailty’ Used

21 unique assessments for aspects of frailty were reported from the 18 individuals, as shown in Table 10 below. The health professionals who reported to be using the assessments are also detailed.
Table 10: Reported ‘Assessment for Frailty’ Tool Used

<table>
<thead>
<tr>
<th>Reported ‘Assessment for Frailty’ Tool</th>
<th>Health Professionals Using ‘Assessment for Frailty’ Tool</th>
<th>Nature of Reported ‘Assessment for Frailty Tool’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Referenced in Literature?</td>
</tr>
<tr>
<td>CLCH (Central London Community Healthcare Trust) Multifactorial Falls Assessment</td>
<td>Physiotherapists, Occupational Therapists, District Nurses</td>
<td>N</td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>Physiotherapists, Occupational Therapists and the Falls Prevention Team (MDT)</td>
<td>Y</td>
</tr>
<tr>
<td>30 Second Sit to Stand</td>
<td>Physiotherapists, Occupational Therapists and the Falls Prevention Team (MDT)</td>
<td>Y</td>
</tr>
<tr>
<td>Short Form FES - (Falls Efficacy Scale International)</td>
<td>Physiotherapists, Occupational Therapists, District Nurses</td>
<td>Y</td>
</tr>
<tr>
<td>BERG (Full Form Version)</td>
<td>Physiotherapists, Occupational Therapists and the Falls Prevention Team (MDT)</td>
<td>Y</td>
</tr>
<tr>
<td>BERG Balance Scale (7-Item Short Form Version)</td>
<td>Physiotherapists, Occupational Therapists and the Falls Prevention Team (MDT)</td>
<td>Y</td>
</tr>
<tr>
<td>Tinetti Problem-Oriented Assessment of Mobility (used alone or together with Gait Score)</td>
<td>Physiotherapists, Occupational Therapists</td>
<td>Y</td>
</tr>
<tr>
<td>HOME FAST (The Home Falls and Accidents Screening Tool)</td>
<td>Occupational Therapists</td>
<td>Y</td>
</tr>
<tr>
<td>Cohen-Mansfield Agitation Inventory</td>
<td>Nurse</td>
<td>Y</td>
</tr>
<tr>
<td>MoCA-BLIND (Montreal Cognitive Assessment)</td>
<td>Nurses (Community Mental Health), Psychiatrists</td>
<td>Y</td>
</tr>
<tr>
<td>Tool/Questionnaire</td>
<td>Conductors</td>
<td>Pharmacists</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>STOPIT (Screening Tool of Older People's Prescription Review)</td>
<td>Pharmacists</td>
<td>Y</td>
</tr>
<tr>
<td>WLMHT O.T. (West London Mental Health Trust Occupational Therapy) Functional Assessment</td>
<td>Occupational Therapists</td>
<td>N</td>
</tr>
<tr>
<td>ACE-R (Addenbrooke's Cognitive Examination)</td>
<td>Nurses (Community Mental Health), Psychiatrists</td>
<td>Y</td>
</tr>
<tr>
<td>Mood / Depression Assessment Questionnaire</td>
<td>Psychiatrists</td>
<td>Y</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>Psychiatrists</td>
<td>Y</td>
</tr>
<tr>
<td>Neuropsychiatric Inventory (Comprehensive Assessment of Psychopathology in Patients with Dementia)</td>
<td>Psychiatrists</td>
<td>Y</td>
</tr>
<tr>
<td>MMSE (Mini-Mental State Examination)</td>
<td>Psychiatrists, Occupational Therapists, Doctors (GP), Physiotherapists and Nurses (Community Mental Health)</td>
<td>Y</td>
</tr>
<tr>
<td>Hospital Anxiety and Depression Scale</td>
<td>Nurse</td>
<td>Y</td>
</tr>
<tr>
<td>eFI (electronic Frailty Index)</td>
<td>GPs (With Potential Communication with Community Care Providers)</td>
<td>Y</td>
</tr>
<tr>
<td>AMPS (Assessment of Motor and Process Skills &amp; ADL Functioning)</td>
<td>Occupational Therapists</td>
<td>Y</td>
</tr>
<tr>
<td>Barthel Index of Activities of Daily Living</td>
<td>Nurses (Community Mental Health), Occupational Therapists</td>
<td>Y</td>
</tr>
</tbody>
</table>
4.6.2: Nature of the Reported Assessment Tools

Referenced in Literature: 19/21 (90%) were; 2/21 (10%) were not.

Locally Adapted: 1/21 (5%) was; 20/21 (95%) were not.

Locally Constructed: 2/21 (10%) were; 19/21 (90%) were not.

4.6.3: Primary Purpose of Reported ‘Assessment for Frailty’ Tools

Assessment of Falls Risk, Dementia Diagnosis and Diagnosis of Depression and Anxiety were the most commonly defined purpose.

Figure 14: Primary Purpose of Assessment

4.6.4: Domain Coverage of Individual ‘Assessment for Frailty’ Tools Reported

Considering all the assessments mentioned in the study, the domains represented were mapped in a 4-set Venn diagram (Figure 15), the colours of which took reference from general heat map colour conventions (Harrower and Brewer, 2003). A copy of each assessment tool was examined to ensure mapping accuracy (completed for all assessment tools).
Each assessment tool could cover a single or multiple domain: 8 cover the Mental health domain only (38.1%), 8 cover the Physical domain only (38.1%), 0 assessments cover the Social domain only, 1 assessment covers the Environmental domain only (4.8%), 2 assessments cover both Physical and Mental health domains (9.5%) and 2 assessments cover Physical, Social, Mental health and Environmental domains (9.5%).

![Venn Diagram Illustrating Domain Coverage of Individual ‘Assessment for Frailty’ Tools Reported.](image)

**Figure 15: Venn Diagram Illustrating Domain Coverage of Individual ‘Assessment for Frailty’ Tools Reported.** Domains: Physical (P), Social (S), Mental Health (M) and Environmental (E). Values are displayed for domains that had coverage, rounded up to 1 decimal place. Colours respond to general heatmap colour guidelines.

**4.7: Discussion**

To my knowledge, this is the first study aiming to discern the different methods used by healthcare professionals to assess for frailty in non-acute care settings across North-West London. Though lists of frailty assessment tools have been compiled (Healthcare Improvement
Scotland, 2017), there is less research detailing tools currently used in practice in a specific geography (Coker et al., 2019). This study establishes some of the assessments used to assess a potentially frail individual within North-West London.

In this study, saturation in assessments occurred with responses from 18 participants, who reported a total of 21 unique assessment tools, the majority (90%) of which were referenced in the literature. Only 5% of assessment tools were locally adapted (covering physical and mental health domains) and 10% locally constructed (covering a physical view of frailty only). The presence of adapted frailty assessments is an expected result, having been noted in the systematic review (Chapter 2) and in the literature by Azzopardi et al. (2016) and Lee et al. (2020).

Other than the eFI (Clegg et al., 2016), no further frailty indices or frailty scales as described in literature (Dent et al., 2016; Rockwood et al., 2018) were mentioned across the 21 reported assessment tools. Instead, the reported ‘assessments for frailty’ were those assessing the presence of potential health deficits, many evidenced to be associated with frailty, such as falls risk and mental state (e.g. FES and MMSE assessments) (Lee et al., 2018). These assessments were the reported ‘assessments for frailty’, rather than established frailty indexes or frailty scales as described in literature (e.g. Dolenc and Rotar-Pavlič, 2019; Theou et al., 2018).

Though no frailty indexes or frailty scales were mentioned (other than the eFI), this could reflect the fact that multiple measurements or assessments can be used to identify frailty, as evidenced by Dent et al. (2016). Moreover, the lack of an international standard measurement for frailty, along with a large quantity of frailty assessments in circulation may present difficulties when selecting a frailty measurement/assessment to use (Dent et al., 2016; Faller et al., 2019). A recent study by Walston et al. (2018) stated that though multiple frailty assessments have been developed and validated to improve feasibility in clinical practice, frequent lack of agreement between frailty instruments or assessments has slowed broad implementation of these tools. This could also provide reasoning for the assessment tools found to be used in this study.

Though only 1 frailty index was reported, the ‘Timed-up-and-go’ test and the test of ‘Gait speed’, which are both described as frailty assessment tools by the British Geriatrics Society (2018b), were mentioned. Importantly, all reported assessments examined different aspects of health status, addressing some of the domains and elements that may have been part of a CGA. Furthermore, many reported assessments helped identify ‘frailty syndromes’ (previously
referred to as ‘geriatric giants’) such as falls, immobility and delirium (British Geriatrics Society, 2014b), which may have been used to indicate the presence of frailty in an individual (Turner and Clegg, 2014; NHS England, 2017).

Further comparison with the literature suggests that these findings should not be totally unexpected. In a scoping review investigating how frailty was measured in acute care, ‘non-frailty tools’ were being used in 24% of the cases identified (Theou et al., 2018). These tools were validated scales (e.g. short physical performance battery) but had not been developed to specifically identify or assess frailty. The study described in this chapter demonstrates that ‘non-frailty tools’ were being used as ‘assessments for frailty’ – a similar finding to the scoping review.

Some degree of commonality in assessments reported is expected, since recommendations for assessment use in people living with frailty exist from a number of different health and care organisations (NHS England, 2017; British Geriatrics Society, 2014a). However, this study did reveal one locally adapted and two locally constructed assessments being used. Further work could be undertaken to fully understand the reasoning behind this – and whether the locally constructed assessments offered any advantages over assessments that had been referenced in literature. Notably, however, the use of adapted instruments was identified in the systematic review, as well as in the literature by Bruyere et al. (2017) and Lee et al. (2020), so this finding could be considered as expected.

The health professionals reported to be using the assessments were predominantly occupational therapists, followed by physiotherapists and nurses. Pharmacists were the professional group that reported the lowest use of assessments for frailty. This finding is expected; as found by Foot et al. (2014) many non-acute care settings (e.g. community nursing, end of life care, intermediate care, physiotherapy, occupational therapy and specialist services) will have a similar workforce to the health professionals who contributed to this study.

All participants were asked to explain the primary purpose of the assessments reported. This study illustrated that assessing for falls risk, dementia diagnosis and diagnosis of depression and anxiety commanded the highest counts (Figure 14). This is consistent with the published literature, as the association between falls and frailty is well recognised (Karlsson et al., 2013; Jensen et al., 2002; Cadore, 2013). Similarly, the association between poor mental health and frailty has been evidenced in literature (Strawbridge et al., 1998; Mezuk et al., 2011; Bilotta et al., 2010). Both falls and mental health status have been suggested as markers of frailty.
(Institute of Medicine, 1992; Semprini et al., 2012; Nascimento et al., 2016). This may help explain the high number of assessments with a primary purpose pertaining to falls and mental health.

Concerning the four domain model of frailty, while all four domains were represented across the range of the 21 assessment tools reported, a predominant physical and mental health domain coverage was evident. Though several reasons may explain this, the predominant physical domain finding could perhaps echo the phenotypic model outlined by Fried et al. (2001), which is a common view of frailty. As emphasised by Xue (2011, p.1), Fried et al. (2001) operationally defined frailty as:

‘meeting three out of five phenotypic criteria indicating compromised energetics: low grip strength, low energy, slowed walking speed, low physical activity, and/or unintentional weight loss’.

These criteria focus on a physical view of frailty which Lally and Crome (2007) stress is a common, often visible and tangible manifestation of frailty. The nature of ‘visible frailty’ may help to provide some justification for the predominant physical and mental domain coverage seen in the assessments for frailty in this study. Furthermore, as physical manifestations of frailty can be objectively confirmed, they may be viewed as more treatable by medical means than social or environmental manifestations of frailty (Lally and Crome, 2007). This could, in part, explain the large proportion of reported ‘assessments for frailty’ encompassing a physical domain (57.1% in this study).

This study reports a lower coverage of social and environmental domains in the reported assessments. This finding is notable, as the BGS recommends and highlights the importance of assessing an individual’s social and environmental needs (British Geriatrics Society, 2018a). Several reasons may explain this finding in the study. One could be that there may be fewer assessments for frailty that would take into consideration the social and environmental domains, or that assessments are setting specific. For example, in care homes, the environmental and social aspects may be ‘managed’ by the home and therefore not be deemed necessary to assess at an individual level. Establishing setting-specific domain coverage in the reported assessments for frailty used may help further understand the recognition of care and support needs in these settings.
This study did not question whether the assessments were chosen because they had been recommended – e.g. from the NHS, literature, or other published reports. If specific assessments for frailty are recommended (e.g. via BMJ recommendations such as by Quinn (2019)), this would explain at a high level why certain assessments were used – and, as such, impact on the domains covered. Also, participants were not asked to distinguish between practices used in public or privately owned non-acute care settings, yet differences in the reported assessments for frailty may be distinguished. This is possible, as differences in practices between public and privately owned healthcare settings have been highlighted by Kruse et al. (2018).

The British Geriatrics Society has produced recommendations for how best to assess and manage frailty, in collaboration with Age UK and the Royal College of General Practitioners (British Geriatrics Society, 2014a). These recommendations present a framework based around the core principles of the CGA, to be used within community and outpatient settings. Ostensibly, the assessments reported to be used in this study may be derived from these initial recommendations. Notably, although the ‘General Medical Services’ contract from the NHS requires GP practices to routinely identify moderate/severe frailty for patients aged 65 years and older, it is up to the discretion of the GP and the GP practice to choose an appropriate tool to use. For example, while using the eFI is recommended, NHS Digital (2019) states that it is not mandatory for GPs to use it.

Multiple reasons may explain the causes behind the results of this study. However, without further work in each specific case, there remains a danger of oversimplifying or speculating. Nonetheless, research has pointed towards healthcare staffing and funding being major factors that influence what procedures can be done (Health Foundation, 2016; Humphries et al., 2016), in addition to associated time pressures affecting what levels of care can be given (Ball et al., 2013). Though non-acute care settings cover a mixture of both publically and privately funded entities, these would be important factors to consider for both.

This study additionally illustrated that, though all participants were situated within North-West London, no standardisation in responses was given – nor was there report of a ‘mandated’ assessment or set of recommended assessments. This suggests either a lack of recommended or structured approach within non-acute care settings, or that a recommended approach is not strictly adhered to. As described earlier, North-West London has a sizeable older population (13% aged over 65), many of whom will have an increased likelihood of frailty (Parmar et al.,
2016). Consistent with the aims of the NHS, there is a focus on improving the health and wellbeing of older people, including the better care those with long-term conditions and/or frailty in North-West London (NHS NWL, 2017). Given this is an NHS priority, the findings may offer transferability to similar regions in the UK, or other settings (e.g. acute care). As such, this study should be of interest to health and care settings across the UK, as has been seen with other studies set in North-West London (Mastellos et al., 2014; Smith et al., 2019)

While no consensus on frailty definition exists, in addition to the physical manifestations Fried et al. (2001) identified, several current definitions of frailty incorporate other domains (Rockwood, 2005; Soong et al., 2013; McGough et al., 2013). It is possible that these definitions influenced the understanding of what frailty comprises of – and subsequently what elements should form part of an assessment for frailty. Moreover, since the knowledge and research of frailty and how best it should be assessed and managed is constantly growing (Kim and Jang, 2018), this may have influenced how frailty is assessed.

Overall, this study illustrated the variation in the reported assessments for frailty currently used in practice in NWL. This study illustrates the lack of standardisation in non-acute care settings and that of the assessments reported, frailty is perceived in a number of different ways. Given the lack of consensus on how best frailty should be defined, there is an expectation that many assessments would be in use. However, given the recommendations from several sources (British Geriatrics Society, 2014a; NHS England, 2016; NHS England, 2017), it is surprising that few participants reported ‘assessments for frailty’ that took into consideration a holistic view of frailty encompassing several domains. Over time, with continued growth in the knowledge and understanding of how frailty should be best assessed and managed, it is likely that there will be a consequent change in the nature of the assessments for frailty used.

4.7.1: Generation of New Evidence

This study contributed to the knowledge of the reported ‘assessments for frailty’ used in practice in non-acute care settings within North-West London. It could be argued that the patterns and results observed in this study are some reflections of the wider practices that take place on a larger geographical scale (such as Greater London or nationally), yet further research would be required to confirm this. This study adds to this literature in an important setting for many frail individuals: non-acute care.

4.7.2: Strengths
The study enabled one to establish the tools used in assessing for frailty from a range of different healthcare professionals. Since the study was presented as research (with consent and confidentiality maintained) rather than an inspection or performance review, it is more likely that participants were open and honest in their responses, thus limiting potential bias associated with observational studies. Many of the participants had a working relationship with CLAHRC NWL, or some knowledge of the research group, potentially increasing the willingness of participants of being involved in the study. The snowball sampling strategy enabled a wide range of participants to be contacted that may have been difficult to contact if other sampling methods were used. The sampling strategy was low in cost and a relatively time-efficient method of contacting people compared with face-to-face interviews/conversations, which would involve more planning and/or travel.

Though this study was set in one region of the United Kingdom (a recognised limitation), the professional roles of the participants were common throughout the UK. Notably, all healthcare professionals recruited had current roles in an NHS organisation and were recruited from multiple settings. This approach increases the representativeness of the sample and the generalisability of the findings. As there is national guidance from the NHS regarding frailty (NHS, n.d.1), it is anticipated that the findings in this study will be similar to other areas across the UK.

When the findings of the study are compared with the literature, they further suggest that the study findings may be transferable beyond North-West London and/or outside of the non-acute care setting. For example, a systematic review (Theou et al., 2018) identified that ‘non-frailty tools’ (validated scales but not specifically developed to identify or assess frailty) were used in 24% of the articles identified, which was set in the acute care setting. This is a similar finding to that noted in this study.

4.7.3: Limitations

This study had a focus on the healthcare professionals who were working in North-West London only and it is therefore possible that not all groups who potentially interact with frail individuals are included. However, the stakeholder analysis and mapping exercise (as described in Chapter 3) was undertaken to ensure that all stakeholders had been considered.

Methodologically, the snowball sampling strategy has limitations, including sampling bias and hence incomplete representation of the healthcare professional population within North-West
London. Efforts were made to mitigate this by undertaking a stakeholder map to ensure a range of individuals were contacted.

Due to ethical approvals required, potential patient consent and time considerations of the PhD, a further limitation of the study is that the assessments for frailty mentioned could not be verified as being used in person (e.g. as part of an observational site visit).

4.8: Conclusions

This study illustrated the complexity involved in assessing for frailty in non-acute care settings across North-West London, with 21 ‘assessments for frailty’ being reported in use. The study also illustrates that of the assessments reported, there was a physical and mental health domain bias. The finding that assessing for frailty primarily covers these two domains may point towards incomplete assessment processes taking place, which could influence the overall care and support for individuals. As many frail individuals in the non-acute care setting potentially live by themselves, or in supported living, the results suggest some crucial aspects of their day-to-day living may have not been comprehensively assessed. This is potentially a concern, as a proactive and preventative approach towards frailty, which can be achieved through comprehensive assessment practices, has been encouraged (Bleijenberg et al., 2012; Harrison et al., 2015).

Less than 10% of the assessments assessed all four domains (physical, social, mental and environmental) with most assessments (81%) focussing on a single domain. Given that frailty is multidimensional (Chen et al., 2018), many, if not most patients with frailty, would benefit from a holistic and multidimensional medical review (British Geriatrics Society, 2014). Moreover, it has been suggested that amongst other characteristics, a successful frailty instrument should be multidimensional (Rockwood, Theou and Mitnitski, 2015). The findings in this study suggest that a multidimensional assessment for frailty is not routine. Although multidimensional assessment tools for frailty exist, there are feasibility issues related to these methods and there is no universal ‘clinical standard’ in assessing for frailty (Toosizadeh et al., 2017). These factors may have contributed to their low uptake and absence from the findings in this study.

Nevertheless, while this study demonstrates a snapshot of current frailty assessment practice in non-acute care settings across North-West London, further in-depth study of specific non-acute care settings could provide a more detailed insight of the practices used to assess for frailty.
4.8.1: Key Points

- This study used a snowball sampling strategy to gather a greater understanding of the nature of assessing for frailty across non-acute care settings in North-West London.
- The results illustrated that many of the assessments used covered the physical and mental health domains and covered social, environmental domains to a lesser extent.
- The most common primary purpose of the reported ‘assessments for frailty’ was to assess falls risk and diagnose dementia (Figure 14).

4.8.2: Implications for Practice

The evidence from this study can be used to strengthen the knowledge regarding the complexity involved in assessing for frailty in non-acute care settings. The study can also serve to inform healthcare professionals of current practices used – and provide further details of the assessments used, such as domain coverage.

The findings of this study could be used to emphasise and exemplify the lack of assessment of the social and environmental domains (in comparison to physical and mental health domains), potentially contributing to improvements in how assessing for frailty takes place. Moreover, the results could highlight the need to improve practice with regards to assessing for frailty, e.g. incorporating the use of tools with four domains. This could, to some extent, improve the holistic and multi-dimensional care an individual may receive.

The variation in assessment use exemplified in this study could be used to encourage the uptake of a more integrated and standardised approach to assessing for frailty in the non-acute setting. As a result of this, integration and communication with acute settings (and other settings) may be improved. Ultimately, this could have a positive effect on how quickly a frail individual is diagnosed and moves through the ‘healthcare system’ – a positive outcome for both patients and healthcare professionals alike.

4.8.3: Implications for Research

This study used a number of methods, which may have implications for future research.

As highlighted in the ‘Strengths’ and ‘Limitations’ of this study, there are some methodological advantages and disadvantages to using a snowball sampling strategy. Nevertheless, it was decided that for this study, the advantages of using a snowball sampling strategy outweighed the possible disadvantages of this methodological technique. Although the sampling method
used in this study is not novel, future studies could rely on a similar sampling method to understand the reported assessments for frailty used in non-acute care on a wider landscape; establishing a national overview, for example, could be achieved using this method.

The data in this study was analysed using simple descriptive analysis. The process of ‘mapping’ the assessments to their respective domains relied on both researchers and clinicians. Since this is a novel study, the process of ‘mapping’ these domains has not been done before. As such, ‘mapping’ an assessment to its constituent domains required secondary confirmation and ratification, to ensure consistency and clinical accuracy. This would have to be a fundamental consideration if similar, future studies were to take place.

4.8.4: Further Work

This study found that a variety of ‘assessments for frailty’ were being used across non-acute care settings. Notably, this study encompassed conversations with healthcare professionals across many non-acute settings. However, in some non-acute care settings, there may be limited knowledge regarding the ‘assessments for frailty’ used in practice (e.g. nursing homes) – and, importantly, their relation to the four domains of frailty used in this study. Hence, further work, using a similar methodology could be undertaken to investigate specific non-acute settings in detail, helping to understand whether the findings in this study are applicable in these settings.

This study took into consideration the views of healthcare professionals and individuals who were primarily located within North-West London. These healthcare professionals and individuals would have roles common nationally (as many were employed by the NHS). Expanding the study to encompass a wider geographical area, or compare with another region, could help understand whether any similarities in the ‘assessments for frailty’ used in practice are evident.

4.8.4.1: Link to Other Studies in This Thesis

Stakeholder Mapping

The stakeholder mapping exercise (described in Chapter 3) provides further evidence that, in practice, many stakeholders are likely (and perceived) to be involved in assessing for frailty in individuals. This confirms that a range of different professional groups may be involved in the care and support of frail individuals (i.e. multidisciplinary).
The range of different professional groups providing care and support to frail individuals will be located in more than one setting. As such, this further provides rationale for the study of the care and support of frail individuals in more than one setting. In this thesis, the community setting, the acute care setting and the longer-term care setting (nursing home setting) are investigated.

‘Assessments for Frailty’ Mentioned

This study evidenced that a variety of ‘assessments for frailty’ may be used to assess for frailty – a small number that had been locally constructed for use (e.g. West London Mental Health Trust Occupational Therapy Functional Assessment and CLCH Multifactorial Falls Assessment)

This study was not set in a specific non-acute care setting. As a result, some of the assessments mentioned may be used across many different settings. Moreover, as this study was based in North-West London, some of the ‘assessments for frailty’ mentioned could be distinctive to this geographical area. Prior to this study, some of the ‘assessments for frailty’ may not have been known to be in use.

In this thesis, a specific setting (longer-term care setting – i.e. nursing home) was investigated to understand what assessments were being used to assess for frailty. As a direct link from this study, several ‘assessments for frailty’ mentioned in this study were provided as options in a survey sent to nursing homes located in North-West London (study described in Chapter 7).

4.8.5: Link to Next Study

This study supported findings from the systematic review (e.g. a range of assessments used, a predominant physical and mental health domain bias), yet importantly, also found ‘non-frailty tools’ were used to assess for frailty. However, the non-acute care setting is broad and the study findings may not necessarily cover all settings that a frail person may be located in (or cover specific settings in detail). Additionally, as the introduction highlighted, a frail person may interact with many possible settings. Hence, a potential frailty pathway (NHS RightCare, 2019; Age UK, 2019d) was investigated with regards to care and support: community setting, acute care setting and nursing home setting. The first setting investigated in this pathway was the community setting (schematically displayed below).
Schematic C: Link to Next Study
Chapter 5: The Community Setting

5.1: Introduction

This chapter describes the study investigating the care and support networks of frail individuals within a community setting. This study uses a participatory approach to interview both patients and healthcare staff (‘providers’ of care) who were part of a Falls Group, situated within North-West London. ‘Patient’ and ‘provider’ views regarding the individuals mentioned – and their contribution level in each personal care and support network were then compared. This study endeavours to understand the care and support of individuals living within the community, who could be classified as having low to medium levels of frailty, from a patient and care provider perspective. This study adhered to the principles outlined in the UK policy framework for health and social care research (NHS Health Research Authority, 2017). It was conducted in compliance with the Data Protection Act and other regulatory requirements, as appropriate.

5.2: Setting the Scene

This section provides background to the community setting, associated residents and care and support given in these settings.

5.2.1: Community Setting in the UK - A Background

In the UK, it has been acknowledged that many older people living in the community will have complex health and care needs, which may be addressed with personalised care and support (British Geriatrics Society, 2014c). As highlighted by the British Geriatrics Society (2014c), these complex health and care needs may span medical, functional, psychological and social aspects, potentially increasing the likelihood of an individual being considered pre-frail, or frail. For older people living in the community, this care and support may be referred to as ‘adult social care’. Adult social care has been described as personal and practical support aiming to help adults of all ages retain their independence and the best quality of life possible (House of Commons, 2019). As described in Table 11, a range of needs may exist, such as managing and maintaining nutrition, help with toileting, help with transportation and maintaining a habitable home environment.

Care and support can be provided in several ways. For example, care and support may be provided by family, friends or others without payment (informal care), or through services paid
for by their local authority, or themselves (formal care) (House of Commons, 2019). Individuals may receive care and support from formal or informal care – or a combination of the two. Research details that the tasks performed by informal carers are often similar to those performed by formal carers, but as The King’s Fund (2006) notes, these may vary in the time dedicated to different types of support. It has been further indicated that tasks including preparing meals, shopping, laundry and help with mobility are often the most common tasks performed by the majority of informal carers (Maher and Green, 2002; The King’s Fund, 2006).

The provision of adult care services such as health services (e.g. GP services, district nursing), welfare and benefits (e.g. housing benefits, employment support), housing (e.g. housing-support, sheltered housing) and leisure and wellbeing (e.g. community centres, library services) form some of the public services which can address aspects of the complex care and support needs of individuals.

5.2.2: The Need for Care and Support

The 2011 Census indicated that 18% of people in England and Wales had a long-term activity-limiting illness (Office for National Statistics, 2011). The latest ‘Health Survey for England’ (2017) reported 23% of men and 28% of women (aged 65 and over) needed help with at least one ADL (Activities of Daily Living) (e.g. having a bath or using the toilet); 22% of men and 30% of women needing help with at least one IADL (Instrumental Activities of Daily Living) (e.g. doing routine housework or shopping for food) (NHS Digital, 2018). The ‘Health Survey for England’ additionally highlighted unmet needs from individuals aged 65 and over: 20% of men and 25% of women had some unmet need with at least one ADL; 12% and 15% had some unmet need with at least one IADL (NHS Digital, 2018a). This finding is significant: if an older person does not receive the care and support they require, they are likely to become weaker, less well and possibly frail (Age UK, 2018a).

5.2.3: Increasing Demand for Adult Social Care and Support

Recent evidence details an increasing demand and pressure for and on adult social care and support in the UK (The King’s Fund, 2019). A number of studies have investigated the demand from older people for social care, supporting conclusions that a significant increase in demand should be expected (Desai et al., 2008; Dilnot, 2017).
For example, the demand for social adult social care services has increased by 1.6% since 2015-2016, according to the latest report from NHS Digital (NHS Digital, 2018). This represents an additional 5000 requests for support received per day by local authorities (The Health Foundation, 2018). Further, a report projecting the demand and expenditure on adult social care from 2015-2040, suggests that public expenditure on social services for older people (65 years and older) and younger adults (18 – 64 years) are both set to increase (from 0.45% of GDP to 0.75% GDP for older people; from 0.55% of GDP to 0.85% of GDP for younger adults) (Wittenburg, Hu and Hancock, 2018).

Projections for the increase in demand for adult social care are further supported when the OADR is used as an indicator. This is a measure of the number of people of state pension age per 1000 people of working age (Office for National Statistics, 2018). While it is noted that demand for adult social care is not age-dependent, a link between higher ages and an increased likelihood for multiple health conditions is recognised (World Health Organization, 2018). As such, it has been anticipated that individuals with higher ages are more likely to require assistance with day to day tasks (Office for National Statistics, 2018). With regards to OADR, in 2016, a figure of 302.8 per 1000 working-age people was quoted; this is estimated to rise to 348.7 by 2046 (Office for National Statistics, 2018). Using OADR in the same manner as the Office for National Statistics indicates a future increase in the demand for adult social care.

Notably, a recent report suggested that more older people than ever are not receiving the care and support needed, also highlighting that delayed hospital discharges are likely to be caused by a lack of social care (Age UK, 2018c). The report estimated that 1.4 million older people were affected, with over 300,000 needing assistance with three or more essential everyday tasks (Age UK, 2018c). Furthermore, it was proposed that over half of those requiring assistance (>150,000), receive no help from paid carers, family or friends (Age UK, 2018c). This may suggest that, at present, demand for social care and support outweighs the available supply.

An adult social care sector briefing in England summarised key challenges that may explain the projected increases in need and demand (The King’s Fund, 2018). The key challenges reported were: high levels of unmet need, lack of investment in prevention and demand – and increasing future demand from older people and working-age adults (The King’s Fund, 2018).
Many of these key challenges are stated in peer-reviewed literature. For example, Abdi et al. (2019) noted that the number of older people with unmet care and support needs is increasing substantially, suggesting that challenges facing the formal and informal care system in the UK provide reason for this. Moreover, increased funding pressure and a significant decrease in the health and social care workforce are further challenges highlighted (House of Lords, 2017).

Linked to the increasing demand in adult social care, (and as mentioned) services in England are said to have faced notable funding pressures, having arisen from a combination of a growing and ageing population, increases in complex care needs, increasing care costs and decreases in local authority funding (House of Commons, 2019). It has been argued that a historic underfunding of adult social care and overall council funding pressures have contributed towards a funding gap in adult social care (Local Government Association, 2016). Increased demand in adult social care especially will be a serious challenge for all UK councils (Desai et al., 2008). Similar statements were also made in a study by Kingston et al. (2017), which investigated dependency of older people. The study predicted that if the dependency prevalence remained constant, by 2025, there would be an additional 353,000 older people with substantial dependencies. The study claimed that these older people would likely require sustained input from family carers and/or community health and social care teams (which may be provided by the council) to facilitate independent living (Kingston et al., 2017).

One study that forecasted the care needs of older people in England over the next 20 years, acknowledged that while there will be increases in the number of independent individuals, there will also be increases in those with complex care needs (Kingston et al., 2018). It has also been estimated that the number of older people who are unable to perform at least one instrumental activity of daily living or having difficulty with one activity of daily living, will increase by 67% from 2015-2040 (National Audit Office, 2018). As a result, the increase in demand for adult social care and support should be expected. Therefore, the importance of ensuring that health and social care services adapt (for them to adequately respond to the needs of an increasing older population with complex care needs) must be strongly considered (Kingston et al., 2018).

An emerging demand for care and support that increasingly cannot be provided by councils, organisations or others may have significant repercussions for those who need it most. This may encourage an individual requiring care and support to rely on many people or services (i.e.
a network of care and support providers) that may not necessarily be paid, or formally trained to provide care and support.

5.2.4: Costs of Care and Support

NHS Digital cited that the total gross expenditure on adult social care by local authorities in 2017-2018 was £17.9 billion, which was £402 million more than the previous year (NHS Digital, 2018b). With regards to privately funded care, estimates have amounted to £10.9 billion between 2016 and 2017 (National Audit Office, 2018). In contrast, informal care has been estimated to be valued at between £58.6 billion to approximately £100 billion per year (National Audit Office, 2018). The latest census estimates that 5.4 million people in England and Wales provide unpaid care for a friend or family member, representing over one-tenth of the population (Office for National Statistics, 2013).

5.2.5: Accountability and Regulation of Care and Support in the Community Setting

The Department of Health and Social Care (DHSC) has accountability for delivering care and support in England, working with arms-length bodies including: Public Health England, the Medicines, Healthcare Products Regulatory Agency (MHRA) and The Ministry for Housing, Communities and Local Government (MHCLG). Prominent regulators of care and support in the community in the UK include: the CQC, NHS Improvement and the National Institute for Health and Care Excellence (NICE).

5.2.6: Frailty, Care and Support

As detailed in the thesis introduction, frailty is a common clinical syndrome in older adults, with evidence indicating that frail adults are at increased risk for adverse health outcomes such as falls, hospitalisation and increased risk of death. Frail older adults may be living in various settings, of which the care and support received in the setting can influence the severity of the syndrome.

In the community setting, research by Puts et al. (2017) evidenced that a number of interventions can prevent or reduce the level of frailty experienced. These interventions can range from being exercise-based (Kwon et al., 2015) to prehabilitation programs (Gill et al., 2003) to completing a comprehensive geriatric assessment (Li et al., 2010). Since many of
these interventions can be planned as part of an individual’s care and support plan, there have been efforts to prioritise and improve the care and support for pre-frail and frail individuals in the community (NICE, n.d.; NHS England, n.d.1; Department of Health & Social Care, 2018). Moreover, in the recently published NHS Long Term Plan, an action has been placed to provide ‘better social care and community support to slow the development of older people’s frailty’ (NHS, 2019).

5.2.7: Prevalence of Frailty in Older Persons in Community Settings

The estimated prevalence of frailty in community settings can vary greatly (e.g. from 4.0 to 59.1%), largely due to the different criteria used to define and assess for frailty (Collard et al., 2012). On examination of the literature, many studies detailing frailty prevalence in community settings are based in the United States of America (US). For example, one US-based study detailed that from 5,317 community-dwelling men and women aged 65 years and older, 6.9% were deemed frail, using Fried’s frailty definition (Fried et al., 2001). Conversely, a further US study found a 25% frailty prevalence in women over 65 years old, among 749 moderately to severely disabled community-dwelling women 65 years and older (Boyd et al., 2005). Another study studying 4,657 women aged 65 and older in the US ‘Women’s Health Initiative Observational Study’, classified frailty in 16.3% of participants (Fugate Woods et al., 2005). Finally, a study using data from six US clinical centres found that from 5,993 community-dwelling men aged 65 and older, 4% were classified as frail (with 40% classified as pre-frail) (Cawthon et al., 2007). As evidenced by the studies above, the stated prevalence of frailty in the community setting varies.

UK-based studies detailing the prevalence of frailty in the community appear to be more limited. Nevertheless, one study found that in community-dwelling participants aged between 64 and 74 years old, the prevalence of frailty was 8.5% among women and 4.1% among men (Syddall et al., 2009). Using data from the ELSA, Gale et al. (2015) reported the prevalence of frailty in 5,450 participants aged 60 years and over to be 14%. Estimates using the electronic frailty index (eFI), which has been implemented across many GP practices, report the prevalence of frailty to be 35% at ‘mild frailty’, 12% at ‘moderate frailty’ and 3% at ‘severe frailty’ (Clegg et al., 2016).

5.2.8: Frailty and Falls
To date, there is no standard method in which frailty is formally ‘diagnosed’ or identified with a specific ‘code’ (NHS England, 2014). Systematic case-finding and proactive care are therefore difficult (NHS England, 2014). In the community setting, several methods may be used to identify whether or not a person is frail. However, one reported method used by healthcare professionals identifying frailty in a community setting is the recognition of ‘geriatric syndromes’ or ‘frailty syndromes’. These ‘frailty syndromes’, as referred to by The British Geriatrics Society are: falls, immobility, delirium, incontinence and susceptibility to side effects of medication (BMA, 2018). Notably, as reinforced by Nowak and Hubbard (2009), increasing evidence links frailty specifically to falls.

For example, in a study of 6724 older women living in the community, frailty was found to be an independent predictor of falls (Ensrud et al., 2007). This finding was confirmed in a further study by Nelson et al. (2007) involving 111 participants 75 years and older, finding that frail adults are 3.61 times as likely to fall as non-frail adults. Another study also found that frailty significantly and independently predicted falls on a geriatric rehabilitation unit (Speciale et al., 2003). Research has also evidenced that frail older adults are likely to experience recurrent falls (and even pre-frail older adults are likely to experience falls) (Cheng and Chang, 2017). The evidence therefore shows that falls are common among older persons, continuing to be a major, global public health concern with potentially severe consequences, especially in community settings (Hester and Wei, 2013; Burton, 2018; Vieira et al., 2016). An estimated 28-35% of people aged 65 years and older fall each year, with this figure rising to 32-42% for those aged over 70 years old (World Health Organization, 2007).

Hence, the link between falls and frailty is of importance. In support of this, recommendations have also stated that falls should be identified as a marker of frailty (Royal College of Physicians, 2017; Institute of Medicine (US), 1992). This is also evident in the eFI, which may be used by a general practitioner to identify people aged 65 and over who may be living with frailty (NHS England, n.d.2; Clegg et al., 2016). In the eFI, ‘Falls’ is listed as one of the 8 symptoms or signs indicating the possible presence of frailty (TPP, n.d.; Clegg et al., 2016).

5.2.9: Use of Falls as an Indicator of Frailty in This Study
Individuals living in the community who have recently fallen (or perceived at risk of falls by a healthcare professional) will form the participants in this study. Specifically, these individuals would have been recommended to join a Falls Prevention Group (see 3.2.2.2 for further details) by a healthcare professional. Many individuals participating in this study would additionally be at an age classifying them as an ‘older person’ (NHS, n.d.1). Given these characteristics and the evidence presented above, it is likely that the participants in this study would be classified as frail or pre-frail. Moreover, the participants had close enough contact with community workers to enable the opinions of both community-dwelling individuals and their care providers to be collected. Since no specific ‘frailty service’ is in place, falls were used as an indicator of frailty in this study. This is relevant as the purpose of this chapter is to examine the care and support networks of frail individuals in the community setting.

5.2.10: Care and Support in the Community Setting.

A number of different care and support avenues may be available and accessible to individuals in the community. Providers of these services include the NHS, charities, privately-owned companies and family or friends. Common examples (not an exhaustive list) of care and support services available in the community setting (as evidenced in academic and grey literature) are detailed below. It is possible that some of these services would be mentioned or noted by the participants in the study.

Table 11: Examples and Characteristics of Care and Support Services in the Community

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<tr>
<th>Examples of Care and Support Services in the Community</th>
<th>Characteristics</th>
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<tr>
<td>Care and Support at Home (also called: Support at Home, Home Care, Home Help and Domiciliary Care) (Age UK, 2019a)</td>
<td>Can vary depending on needs. Carers roles can include: assistance with ADLs (e.g. washing, dressing, meal preparation), cleaning, dealing with finances and transport help. Home meals (e.g. ‘meals on wheels’) may be provided by the council or local organisations.</td>
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<tr>
<td>Day Services (Age UK, 2019b; CLCH NHS Trust, 2019)</td>
<td>Provision of social and/or other activities to help people remain active and avoid isolation (e.g. day care and community centres, offering services such as organised leisure activities, falls groups, arts, crafts and music).</td>
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Community Mental Health Teams (CMHTs) (Mind, 2017; CQC, 2019a) - Support community-dwelling people with mental health problems. CMHTs may include: social workers, community support workers, occupational therapists and psychologists.

Equipment and Home Adaptations (NHS, 2019a) - Provision of equipment and/or home adaptations to make aspects of daily living easier (e.g. handrails, stairlifts, and long shoe horns).

Hospital at Home (Oxford Health NHS Foundation Trust, 2018; North Bristol NHS Trust, 2019; Cambridgeshire and Peterborough NHS Foundation Trust, 2018) - Provide healthcare to patients in their own home, often supporting family and carers if needed. Can comprise several different healthcare professionals including: nurses, paramedics, occupational therapists and healthcare assistants.

5.2.11: Care and Support of Frail Individuals in Primary Care – General Practitioner

In the UK, there has been an increased focus on the complex interplay between the multiple health problems encountered in older people and the need to develop integrated and multidisciplinary health and social services (Reeves et al., 2018). In particular and as noted by Chen et al. (2018), GPs have important roles in the identification of pre-frail and frail individuals. This is because, for many people, the first point of contact with a health service is primary care. Primary care in the NHS is predominantly delivered by GPs, who, as Reeves et al. (2018) state, are said to act as gatekeepers to specialist service providers. Notably, there are approximately four times as many patient contacts with these services compared to hospitals (NHS England, 2019).

The 2017/18 general medical services (GMS) contract for England introduced a new requirement for general practices to identify and appropriately manage all patients aged 65 or over with moderate or severe frailty (NHS England, n.d.2). This routine frailty identification targets several key interventions (falls assessment, medicines review and promotion of the additional information in the summary care record) at those most at risk of adverse events including hospitalisation, nursing home admission and death (NHS England, n.d.2). As stated on NHS guidance, early identification alongside targeted support can help older people living with frailty to stay well and live independently for as long as possible (NHS England, n.d.2).

However, while the NHS does not enforce the use of a particular tool or assessment to confirm frailty in an individual, it does recommend the use of a validated tool. NHS guidance
recommends four validated tools (Clinical Frailty Scale, Gait Speed Test, PRISMA-7 and Timed Up and Go test) (NHS England, n.d.2). In many cases, NHS England anticipates that GPs will use the validated eFI to stratify people by frailty risk (NHS England, 2017b). This is because eFI is available in many GP Electronic Patient Record Systems (EPRS) (NHS England, 2017b). Despite this, while the eFI identifies people at risk of frailty, it is important to consider that not all electronic patient record systems will have the eFI – and, as Lansbury et al. (2017) state, the need for clinical judgement remains. The assessment of an individual with regards to frailty will influence the care and support that may be recommended by a GP.

For practices that do not have access to the eFI, NHS England has suggested that the primary care record may be used to identify patients aged 65 years or older in the following groups, who may be considered for further assessment (e.g. gait speed test/PRISMA7 score followed by the Clinical Frailty Scale) (NHS England, 2017, p.7):

- Care home residents
- People known to be living with dementia
- People aged over 65 who have experienced one of the major frailty syndromes (falls, immobility, delirium, incontinence and susceptibility to side effects of medication)
- People aged 65 and above with multimorbidity due to 4 or more long term conditions
- Those on over 10 medications
- Those with complex neurological conditions (e.g. stroke or Parkinson’s disease)
- Those housebound or known to community nurses
- Those on community matron, district nursing, end of life register or cancer care lists
- Those known to adult social care and support services requiring continuous support
- All those aged over 85.

The new requirement for the identification and management of patients with moderate or severe frailty will bring about a series of advantages and challenges.

5.2.11.1: Potential Advantages of Identifying Frailty in Primary Care

One advantage to identifying frailty in primary care is the provision for an opportunity for constructive dialogue with patients and families (or carers) about their care goals and the services required (Reeves et al., 2018). This may contribute towards improving the coordination of care and outcomes for individuals with frailty. A further advantage of identifying those at risk (or with frailty) in primary care is the targeting of preventative
programmes or interventions. As Marcucci et al. (2019) evidence, some programmes or interventions may prevent, delay or reverse frailty in older people. This is an important statement, as with these programmes, there may be an improved ability to identify frailty earlier, decreasing potential treatment burden for patients had their frailty not been recognised as promptly (Reeves et al., 2018). The effectiveness of frailty interventions is discussed in Chapter 1 of this thesis. Lastly, identifying and managing frailty in a primary care setting (e.g. via a GP) may also encourage healthcare professionals to focus on managing the person as a whole, rather than focussing on care for single diseases and issues (Reeves et al., 2018).

5.2.11.2: Potential Challenges of Identifying Frailty in Primary Care

As suggested by Reeves et al. (2018), there are a number of potential benefits to patients but also challenges to primary care providers in proactive recognition of frailty. These include: possible increases in practice workload without adequate compensatory benefits and a lack of anticipated improvements in clinical outcomes or quality of life.

It has also been proposed that the ultimate success of the initiative is dependent on a) reducing the workload of GPs while simultaneously b) improving outcomes for frail older patients (Ambagtsheer et al., 2018). To do this, suggestions that GPs and health service providers require additional support through the provision of policy and funding, tools and resources, education, training and public awareness of frailty have been proposed (Ambagtsheer et al., 2018). Moreover, a recent article stated that identifying and managing frailty in a primary care setting would only be acceptable if there are significant benefits from the interventions suggested, patient acceptability and cost-effectiveness (Hamilton and Round, 2017).

5.2.11.3: Key Messages

The development of the eFI, as well as the requirements with regards to identifying and managing frailty in the new GMS contract, have been described as potential ‘game changers’ for frailty care in England (Seymour, 2018). However, as Reeves et al. (2018) note, making frailty an integral component of primary care practice is challenging. Moreover, it has been suggested that GPs will need convincing that this new requirement will help to reduce, rather than increase professional burden – in addition to benefitting the older patients living with frailty (Reeves et al., 2018).

5.2.11.4: Benefits of This Study to the Primary Care Setting.
For many frail individuals, primary care is likely to be the first point of contact when health advice or treatment is needed. This study could provide valuable insight into the care and support networks of community-dwelling frail individuals for primary care healthcare professionals, such as GPs. This is especially important as a GP could use the networks to identify routes to help prevent the progression of frailty – and the promotion of community-based care and support is encouraged (NHS England, 2016c; King, 2016).

The findings in this study could also assist the primary care setting in helping understand the choices and perceptions frail individuals have regarding their care and support networks. This could aid in care and support planning and resource allocation, enhancing networks where necessary. Also, it could help support strategies that aim to incorporate out-of-hospital and preventative care (NHS England, 2016c). Ultimately, the findings could help support the primary care setting act as a gateway to other care services. This could both aid in improving outcomes for patients, in addition to having economic benefits (King, 2016).

5.2.12: Trends in Social Care Provided by Family Members (Informal Care)

In the UK, the number of people caring for a family member has reached 7.6 million (Marsh, 2018). Reports state that when parents reach an age of 70 years and older, they begin to receive more care than they give (Dykstra and Komter, 2012; Government Office for Science, 2015). This supports research by Wittenberg et al. (2001) which suggests those aged 85 and over have the greatest needs for care.

Care given by family members is often regular, ongoing and without payment (informal care). Informal care, particularly by family members, has been reported to be the most important source of care for many older people (Pickard et al., 2000). According to estimates from the Family Resources Survey, there are at least 5.3 million informal carers in the UK (New Policy Institute, 2016; Department for Work and Pensions, 2015a). This is supported by historical evidence suggesting that the majority of care for older people in England was provided either by spouses or adult children (Arber and Ginn, 1991). More recent evidence supports this statement, with one study finding that over half of informal carers were looking after a parent; 18% were caring for their spouse or partner and 8% for their child (Maher and Green, 2002; New Policy Institute, 2016). One reason for this could be because family carers live in the same household; indeed, one study by Wolff et al. (2018) found that approximately 75% of caregivers lived in the same household as the older person they cared for.
Over the next 30 years, care by spouses is projected to increase substantially (Pickard et al., 2007). In the literature, this has been proposed due to increasing life expectancies (Hirst, 2001; Henz, 2004). Moreover, neurodegenerative conditions, such as dementia, are projected to increase to over 1 million patients by 2025 and over 2 million by 2051 (Alzheimer’s Society, 2014). Neurodegenerative conditions or diseases are likely to cause increasing dependence in the care recipient and increasing care tasks over time for the caregiver (Chiong-Rivero et al., 2011). This is significant, as this could further contribute towards the increase in care over the next 30 years. Furthermore, work by Pickard et al. (2007) suggests that if current patterns of care remain the same, care by children will need to increase by approximately 60% by 2031.

Importantly, recent literature has expressed concerns over the future of family caregiving, citing greater longevity and declining fertility as potential threats to the availability of family and unpaid carers to an increasing number of older, frail adults (Wolff et al., 2018). Moreover, research indicates that informal caregivers are 2.5 times more likely to experience psychological distress than non-carers (Simon et al., 2009). This finding is supported by evidence showing that being a family caregiver has detrimental effects on health (Mackenzie et al., 2007). In light of these statements and the evidence presented, family carers will need support in the short term and longer term to ensure the sustainability of the health and social care system (Carers UK, 2019). This may also encourage the reliance of frail individuals on other people or services for care and support.

5.2.13: Challenges with Informal Care

As described above, family carers are said to be crucial in enabling people requiring care and support to stay at home. Despite this, studies have evidenced that they are frequently unprepared for the role and receive little support from formal health and social care services (Caswell et al., 2019; Holm et al., 2015). For example, a recent review of family care practices suggested that privatisation of professional formal care and informal family care is on the rise across Europe (Della Guista and Jewell, 2014). This is significant, with these rises potentially impacting care provision and making the monitoring of care difficult (Folbre, 2001; Himmelweit, 2005). Moreover, these trends may influence the quality of life of caregivers and care recipients, especially when evidence suggests that care-giving can be a stressful job (Kim and Antonopoulos, 2011). Further (and as noted above), regarding the health and well-being
of caregivers, evidence states that informal carers are 2.5 times more likely to experience psychological distress than non-carers (Government Office for Science, 2015).

5.2.14: Importance of a Social Network

An individual’s ties with friends, relatives or participation in social activities would constitute their social network. Similarly, an individual’s ties with people, services or organisations that provide care and support would constitute their care and support network. A background to networks and SNA is detailed in ‘3.2: Community Setting’.

5.2.14.1: Social Ties

Evidence from the literature has shown that more socially connected adults are healthier and live longer than their more isolated peers (Umberson and Montez, 2011). Similarly, a recent study by Sakurai et al. (2019) found that a poor social network is associated with an incidence of adverse health outcomes in older adults. Given this, the importance of a social network must be recognised. As suggested by Umberson and Montez (2011), for populations that are at greater risk for illness and disease (e.g. older people) the importance of a social network should influence national policies. This is additionally supported by research indicating that a social network, which may be used as a source of care and support has been evidenced as a link to emotional, cognitive and physical well-being (Charles and Carstensen, 2010). It has been emphasised that an important condition for living independently is the existence of a well-functioning social network (Cramm et al., 2011). Based on the literature, the care and support networks of older adults may vary in a number of different ways, of which the most commonly cited are discussed below.

5.2.14.1.1: Gender

A review of the literature provides evidence to indicate that there are patterns regarding gender in a care and support network. A survey investigating caregiving and social support for individual’s aged 65 years and older suggested that the proportion of men and women caregivers are similar (Cranswick, 2003). This finding was corroborated in another study, which took into consideration middle-aged (aged 45-64) and older (aged 65 and older) individuals (Stobert and Cranswick, 2004). However, Stobert and Cranswick (2004) found that though the proportion of men to women was said to be similar, women were likely to dedicate
more than twice the amount of time per month to tasks than men. This distinction between men and women caregivers should therefore be noted.

Further, a recent study investigating the social support received by informal caregivers, found that women received help mainly from women with a similar profile to them – and men had a network of care that was broader and more diverse (Rodriguez-Madrid et al., 2018). While this finding is important, caution should be taken with reporting, as these results were not statistically significant.

5.2.14.1.2: Age Composition

Concerning age composition, a study that examined the personal networks of adults aged between 55-89 years old found that a diverse range of ages formed part of their personal networks (Uhlenberg and De Jong Gierveld, 2004). This finding is echoed in another study by Penrod et al. (1995), which indicated that caregivers of all age groups were caring for frail older adults. However, a notable finding from one study was that there was a large deficit of young adults in the networks of older people – and that few older people had regular contact with younger, unrelated adults (e.g. children) (Uhlenberg and De Jong Gierveld, 2004). The study additionally found that participating in organisations that often comprise a range of different ages (e.g. a place of employment or a volunteer setting) increase the likelihood of an older person having a wider range of ages in their personal network.

Another study illustrated that older adults (defined in this study as over 65 years) spend more time helping other older adults than younger adults (defined in this study as aged 40-59 years) (Gallagher, 1994). In the literature, it would appear that little is known about how age influences the type of care and support given – a statement corroborated by Fast et al. (2004). Nevertheless, one study found that care and support networks with older adults provided more help with transportation (Tennstedt, Crawford and McKinlay, 1993).

Overall, while these findings are important, they are not without limitations. Fast et al. (2004) point out that much of the existing information regarding the age composition concerns primary caregivers. Therefore, the findings cannot necessarily be extrapolated if all members in a caregiving network (i.e. not just primary caregivers) are to be considered.
5.2.14.1.3: Relationship Composition

A study suggested that assistance is given, in part, to reciprocate assistance which has been received in the past (Ikkink and van Tilburg, 1998). Given this, many of the individuals providing care and support in the network could consist of people who have received care and support previously from the frail individual and/or had a long-existing relationship with the individual (Ingersoll-Dayton and Antonucci, 1988). Children, neighbours and friends are potential examples of this – all of which have been demonstrated to contribute significantly in supporting older people in their own homes (Nocon and Pearson, 2000). Therefore, the relationship an individual has with respect to their caregiver(s) is of importance. Furthermore, it has been proposed that there are greater normative expectations for family to provide care and support (Fast et al., 2004; Campbell, Connidis and Davies, 1999). Hence, the care and support networks of frail individual’s may commonly comprise family members. Research has demonstrated that family caregivers play an important role in engaging and empowering older adults living with frailty (Holroyd-Leduc et al., 2016).

Evidence has also shown that friends and neighbours may provide intensive and frequent help and play a key role in coordinating other services a frail older person may require (Nocon and Pearson, 2000). This may especially be the case if the frail older person does not have children or family that they can rely on (Barrett and Lynch, 1999; Nocon and Pearson, 2000). Nevertheless, caveats to this finding have to be considered – it has been suggested that friends and neighbours may not maintain intense care over the long term or if the health status of an individual declines rapidly (Nocon and Pearson, 2000; Fast et al., 2004). Therefore, the level of frailty and/or health status is an important factor when considering the relationship composition of a network.

5.2.14.1.4: Network Size

A study investigating informal care for frail individuals found that a care network consists of between 3 to 5 people (Tennstedt, Crawford and McKinlay, 1993). A literature review, which detailed studies that had separated ‘care’ from ‘support’ estimated that a range of between 5-10 people was expected for older adults (Fast et al., 2004). Findings from English and Carstensen (2014) suggest that as age increases, the social network size decreases, with the number of close contacts staying the same. However, caution has to be applied when
considering these findings. For example, it has been argued that there is little direct evidence concerning the size of care networks (Fast et al., 2004). Also, it has been reported that little is known about whether network size influences the type or mix of care and support received (Fast et al., 2004). More research, therefore, is needed to fully address these.

5.2.14.1.5: Proximity of Members within Networks

With regards to the networks of older, frail individuals, Fast et al. (2004) suggest that it is likely that the care and support would require hands-on and potentially frequent visits. This may explain why informal carers have been demonstrated to be provided by individuals living within close proximity, such as family, friends or neighbours (Matthews and Rosner, 1988; Barker, 2002). Moreover, Barker (2002) reports that many older care recipients lack kin to whom they may otherwise ask for care and support – which may explain the friends and neighbours being common caregivers. Nevertheless, while all these findings in the literature have been reported, it is important to consider that individuals are unique and thus their care and support networks would also be unique too. This statement is supported by Jarrett et al. (2015), where the uniqueness of networks is highlighted.

5.2.15: Why Investigate Care and Support in the Community?

For the successful diagnosis, management and care of frail individuals, a wealth of evidence highlights that a focus on integrated and collaborative communication of care and support across and within settings and professions is required (Leonard et al., 2004; O’Daniel and Rosenstein, 2008; Fuji et al., 2013; Hanratty et al., 2012). Understanding the care and support that a pre-frail or frail individual at risk of falls may have (i.e. their care and support network) could therefore prove beneficial. Furthermore, understanding an individual’s care and support network, from their perspective and the perspective of a healthcare professional involved in their care could aid in improved patient flow and experience through care settings, in addition to unifying systems within care.

With regards to patient flow, understanding the care and support network of an individual could help improve the coordination of care, patient safety and health outcomes (NEJM Catalyst, 2018). For example, should an individual living at home be admitted to hospital, knowledge of their care and support network may help to recognise whether they could be discharged back
home quicker, while maintaining quality and patient/provider satisfaction (NEJM Catalyst, 2018). This could be through better understanding of the services, local authorities or people identified (or available) in these care and support networks, which could ultimately help with care planning, transfers and discharges (Waring et al., 2014; The Health Foundation, 2013). Knowledge of an individual’s care and support network could additionally aid in reducing the risk of a crisis event, such as a fall. This could be done by identifying people/services who already contribute to the care and support of an individual – and offer them support (e.g. carer’s support) (Age UK, 2019c). Identifying and offering support for carers (e.g. informal carers) could contribute towards preventing unnecessary admission to hospital or other healthcare settings, such as a nursing home.

Comparison of a frail individual's perceived care and support network with that of their network perceived by healthcare professionals could additionally be useful for the healthcare professionals in understanding how similar, or different the networks are. This could help the healthcare professionals identify people/services who offer care and support, but are not currently recognised, or captured as doing so in the records for each of the individuals (and consequently not included on the networks perceived by healthcare professionals). If common themes regarding these people/services are identified, the information could be used to further help and plan how care and support can be given for a frail individual.

**5.3: This Chapter in Relation to the Overall Thesis**

Using a physical lens of viewing frailty, the identification of a care and support network of someone who has had a fall, or is deemed to be at risk of falls (and could therefore be classified as frail) will give an insight into the care and support in the community setting.

This study is novel in the sense that it provides an insight into the networks of frail individuals within the UK, who have used an NHS Foundation trust initiative ('Falls Prevention' Service/'Falls Group') - and their perceived networks from the NHS healthcare providers involved in their day-to-day living or care. This study may also give further insight into how multidisciplinary the care and support networks of frail individuals are. Multidisciplinary care has been a recommendation for frail individuals in the literature (Cornwell, 2012; NHS England, 2014).

**5.4: Overall Aim**
This study aimed to investigate the care and support network of individuals living in the community, who had been referred to a ‘Falls Group’. The care and support networks have taken consideration from the perspective of both the frail individual and healthcare professional.

This study was addressed with one specific research question and 3 supporting research questions.

5.4.1: Research Questions:

The specific research question:

What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?

Supporting research questions addressing this specific research question:

a) What does the care and support network look like?

b) Are there any patterns among the networks of the frail individuals?

c) How does the network identified by a frail individual compare to the network of the frail individual as perceived by the healthcare professionals (provider)?

5.5: Method Summary

Social network analysis (SNA) and the use of a participatory activity was used to investigate the care and support networks of frail individuals in the community setting (using a falls service as an exemplar). A concentric ring model was used in combination with a participatory activity to help identify an individual’s care and support network (social network). The participatory activity additionally consisted of a semi-structured interview to understand the placement of individuals/professions on the care and support networks created. Both quantitative and qualitative methods were used for analysis. Full details of methods are described in Chapter 3 of this thesis.

5.6: Results

5.6.1: Participation
All participants completed the activity/interview fully (i.e. no withdrawals from the study during data collection). No withdrawals from the study post-data collection were requested.

- 44 participant sheets were handed out to the Falls Groups across North-West London.
- 18/44 patients (41%) completed a consent form indicating a willingness to take part in the study.
- 16 patients took part in the study (along with 16 healthcare professionals).
- Patients were not expected to explain non-participation. However, 3 non-participants mentioned that time issues to conduct the interview (especially apparent if they had pre-arranged transport to and from the ‘Falls Group’) restricted them from participation.

5.6.2: Participant Characteristics

A total of 32 interviews were conducted; 16 patient interviews and 16 complimentary healthcare professional interviews.

Patient interviews:

- 13 women (81%).
- 3 men (19%).
- Mean age was 72 years (Range: 64 – 81 years). Standard Deviation: 4.99.
- *(During the interviews and ongoing analysis it was found that no new topics were introduced after 16 interviews with patients and 16 with the healthcare providers, i.e. when saturation had been reached (theoretical saturation explained in 3.2.2.4.))*

5.6.3: Referrer

The study found that 12 patients were referred to the ‘Falls Group’ by their GP (75%), 1 Self-Referral (6.25%), 1 from their Podiatrist (6.25%), 1 from Age UK (6.25%) and 1 from a Falls Clinic Hospital Consultant (6.25%).

*(This section addresses the supporting research question a): ‘What does the care and support network look like?’*)

5.6.4: Collating the Networks
The Patient Perspective Network diagrams were collated to form 1 Egocentric Social Network Diagram (Figure 16). Similarly, the HCP Perspective Network diagrams were collated to form 1 Egocentric Social Network Diagram (Figure 17).

When carrying out the activity with both the patients and healthcare professionals, many different individuals/activities (nodes) were mentioned. To assist with visual and mathematical comparison, these were grouped into 5 distinct categories. These 5 categories were: Family/Friends, Health care Professionals, Regular Classes (e.g. dance classes), Carers/Helpers and Other.

Once these categories had been defined, the ego-centric networks could be created, as displayed below:
Lines indicate a link between ego (Patient) and a node (individual/activities). Shorter lines represent stronger ties, longer lines represent weaker ties.

Figure 16: Collated Networks (Patient Perspective)
Figure 17: Collated Networks (HCP Perspective)

Lines indicate a link between ego (Patient) and a node (individual/activities). Shorter lines represent stronger ties, longer lines represent weaker ties.
5.6.5: Qualitative Reasoning Behind Choices: Thematic Analysis

When the patients were interviewed, they were asked to provide reasoning behind their placement of individuals on the concentric circle (contribution level). Few patients responded with unique answers for each of the individuals (nodes) that were mentioned. Instead, most gave a brief summary statement explaining the placement of all the nodes in relation to each other.

With each of the statements from the individuals, a thematic analysis was conducted using principles from Braun and Clarke’s (2006) framework and other references (Maguire and Delahunt, 2017). From here, a process of reading through the statements, generating initial codes, searching for themes and reviewing themes took place. Finally, the themes were defined, to produce a thematic map, as shown below:

![Thematic Map](image)

**Figure 18: Final Thematic Map**

In this thematic map, 3 overarching themes have been identified: helpfulness of individual, personal contacts and frequency of contact.

A number of the patients (4) stated that they were ‘independent’ or that they do most things on their own at the beginning of the interview. This may have had an impact on how many
individuals they mentioned, as well as their placed ‘level’ on the concentric ring model. Notably, however, no mention was made by the interviewer on the number of individuals mentioned in previous interviews, or what would constitute an ‘ideal’ network.

‘Personal contacts’ was identified as another overarching theme, with many participants placing these contacts towards the centre of the ring model.

All the patient interviews in this study took place in the location where the ‘Falls Group’ was held. The majority of patients had positive statements towards the ‘Falls Group’. Though this could be due to the actual quality or excellence of the ‘Falls Group’, the location of the interview has to be taken into consideration when analysing the results. Of note, it was explained to all ‘patients’ that the study was not part of the ‘Falls Group’ class and that the interviewer was not part of the ‘Falls Group’ team. Details of the study intentions and the institutions hosting the study were explained in the information sheet given to all participants, in addition to verbally in site visits and before starting the interview/activity.

Due to time and location preferences, the HCPs were not interviewed face-to-face. Nevertheless, when asked to provide reasoning behind how the placement of individuals had been decided, they responded that it was based on the reported or assumed frequency of interaction with the patient in the patient record system.

Example quotes that contributed to the three themes being identified from the patient interviews are listed below:

5.6.5.1: Helpfulness of Individual

A number of statements led to ‘Helpfulness of Individual’ being identified as a theme which provided reasoning behind the contribution level of the nodes. Some of the patients pointed to specific nodes or concentric rings on the concentric ring model, followed by a statement explaining why the individuals had been placed there. Examples of these which included a reference to the helpfulness of the individual(s) they were pointing to included:

“The falls group have been really helpful and [Falls Staff Member] in particular has been in each session” (Patient 1) (Falls Staff Member (Physio) placed in level 1 of the concentric circle)

“The other ones are helpful, but not as much” (Patient 5) (Referring to those that are placed outside level 1)
“These people have all been helpful day by day” (Patient 9) (All individuals placed on level 1 of the concentric circle)

“All have helped me a lot” (Patient 4) (All individuals placed on level 1 of the concentric circle)

5.6.5.2: Personal Contacts

‘Personal Contacts’ was a further theme identified which provided reasoning behind the contribution level of the nodes. As before, some patients pointed to specific nodes or concentric rings on the concentric ring model, followed by a statement explaining why the individuals had been placed there. Examples of these which included a reference to the personal contact(s) they were pointing to included:

“My family and friends are the most important and helpful to me” (Patient 12) (Family and Friends placed on level 1 of concentric ring model)

“I rely as much as possible on my daughters” (Patient 15) (Daughter placed on level 1 of concentric ring model)

“I would count on my family the most if I had an emergency – that’s why my sister is right in the middle” (Patient 16) (Family (Sister) placed on level 1 of concentric ring model)

5.6.5.3: Frequency of Contact

‘Frequency of Contact’ was the final theme identified which provided reasoning behind the contribution level of the nodes. As before, some patients pointed to specific nodes or concentric rings on the concentric ring model, followed by a statement explaining why the individuals had been placed there. Examples of these which included a reference to the frequency of contact included: “…these are the people I see quite regularly [pointing to centre]” (Patient 6)

“I see these people often at the moment [pointing towards level 1]” (Patient 7)

“…these people have all been helpful day by day” (Patient 9) (Individuals all placed on level 1 of concentric ring model)

“Just the people I see regularly really [reference to ring 1]. I put [Hospital] there [ring 2] because I’m not there very often…” (Patient 13)

5.6.5.4: Notable Theme: Independence
Although ‘Independence’ was not an overarching theme, a number of statements from the patients were given that suggested that being independent was a notable finding from the study. Examples of statements made which support this include:

“I would describe myself as being independent” (Patient 2)

“I do most things myself” (Patient 8)

“Even though I do most things on my own” (Patient 9)

“I am quite independent” (Patient 15)

5.6.6: Synthesised Analysis of Thematic and Network Findings

To facilitate the interpretation of network structures, the relationship between the patients and each of the connections mentioned was explored. The findings of these are described below.

5.6.6.1: Healthcare Professionals

The overall composition of healthcare professionals in the patient perspective networks was 55%, which represented the highest category out of the five categories created. As shown in the ‘Collated Networks (Patient Perspective)’ figure, the healthcare professionals mentioned by the patients have been placed at a number of different levels. For example, while there are a large number of healthcare professionals in the centre of the network, a greater number have been placed outside the centre. Nevertheless, the inclusion of healthcare professionals in the network demonstrates their contribution with regards to the care and support of an individual. Some comments were made by the patients with regards to healthcare professionals. These comments were often concerning the healthcare professionals in the Falls Prevention group (as a team and as individual members). The majority of these comments were positive, which provided justification from the patients as to why they had been placed at, or close to the centre of the concentric ring. Examples of these comments include:

“The falls group have been really helpful and [Falls Staff Member] in particular has been in each session” (Patient 1) [Placed on level 1 of concentric ring]

“The falls group has been good too” (Patient 2) [Placed on level 2.5 of concentric ring]

“The falls team have been good encouragement and good support” (Patient 11) [Placed on level 1 of concentric ring]
The comments regarding the falls groups, or individual members within them may have resulted as a consequence of the location of the interview (at the site of the Falls Prevention group). Nevertheless, specific references to other healthcare professionals not part of the falls prevention group were also made. These include:

“…the GP referred me here” (Patient 5) [Placed on level 1 of the concentric ring]

“The OT who assessed my house wasn’t very effective” (Patient 11) [Placed on level 4 of the concentric ring]

“The other people like GP and neighbours would be there to assist with my care but don’t contribute as much” (Patient 16) [GP placed on level 2 of the concentric ring]

As evidenced above, the comments above are arguably not all positive. While many patients included healthcare professionals in their concentric ring model, in some cases, their contribution level (relative to the other nodes mentioned) was noted to be not as high as other nodes. This resulted in some healthcare professionals being placed in outer rings in the concentric ring model (e.g. level 4).

The overall composition of healthcare professionals in the healthcare professional perspective networks was 63%, which (as also evidenced in the patient perspective networks) represented the highest category out of the five categories created. However, as illustrated in the ‘Collated Networks (Healthcare Professional Perspective)’ figure, though a number of healthcare professionals are positioned in the centre of the network, there is greater dispersion of the positioning of healthcare professionals – and a greater number positioned on the outermost levels of the network. As stated earlier, for all networks created by the healthcare professionals, the placement of individuals was based on the reported or assumed frequency of interactions with the patient. This may provide some reasoning as to why there is a difference between the two perspectives investigated in this study. Nevertheless, though some healthcare professionals may interact with patients less frequently than other individuals, the inclusion of this group by several patients indicates recognition and importance of their contribution.

5.6.6.2: Family/Friends

The overall composition of Family/Friends in the patient perspective networks was 27%, which represented the second highest category out of the five categories created (Family/Friends, Health care Professionals, Regular Classes, Carers/Helpers and Other). As shown in the ‘Collated Networks (Patient Perspective)’ figure, the majority of the Family/Friends mentioned
by the patients are concentrated in the centre of the network, indicating that Family/Friends are amongst those contributing the highest level with respect to the care and support needs of the patients. Although the comments from each patient were brief, some patients made specific reference to the Family/Friends they placed on their concentric ring model when asked to comment on the network produced. Some of these statements include the following:

“...the people who care for me most would be my family” (Patient 2)

“My family and friends are the most important and helpful to me” (Patient 12)

“I would count on my family the most if I had an emergency” (Patient 16)

In the comments made, there was no mention of the frequency of interaction, even though in many cases participants may have lived and/or socialised with Family/Friends regularly.

The overall composition of Family/Friends in the healthcare professional perspective networks was 29%, which (in similarity to the patient perspective networks) represented the second highest category out of the five categories created. However, as illustrated in the ‘Collated Networks (Healthcare Professional Perspective)’ figure, though many Family/Friends are positioned in the centre of the network, there is greater dispersion of the positioning of Family/Friends – and a greater number positioned outside of the centre of the network. For all networks created by the healthcare professionals, the placement of individuals was based on the reported or assumed frequency of interactions with the patient. The positioning of ‘Family/Friends’ by the healthcare professionals suggests that the perceived range of care and support given is greater than that perceived by the patients. Moreover, the differences in the two networks may indicate that the frequency of interaction is not necessarily an indicator of the contribution level of care and support.

5.6.6.3: Regular Classes

The overall composition of ‘Regular Classes’ in the patient perspective networks was 8%, which represented the third highest category out of the five categories created. As shown in the ‘Collated Networks (Patient Perspective)’ figure, just over half the regular classes mentioned by the patients are positioned at the centre of the network, indicating a high level of contribution with regards to the care and support needs of the patients. Nevertheless, just under half the regular classes mentioned by the patients were positioned outside the centre of the network, indicating that the patient perceived level of care and support was less than some of the other individuals/categories mentioned.
No specific comments were made regarding the regular classes from the patients. However, some general comments were made regarding the overall positioning of individuals (of which those categorised in ‘Regular Classes’ would fall in). These included:

“I’m here with my friend and the GP referred me here [placed in level 1]. The other ones are helpful, but not as much” (Patient 5) ['Regular Classes’ placed on level 3 of the concentric ring].

“… these people have all been helpful day by day. I don’t have a bad word to say about them, so I’ve put them all as 1” (Patient 9) ['Regular Classes’ placed on level 1 of the concentric ring].

The overall composition of ‘Regular Classes’ in the healthcare professional perspective networks was 5%, which (as in the patient perspective networks) represented the third highest category out of the five categories created. However, as illustrated in the ‘Collated Networks (Healthcare Professional Perspective)’ figure, the majority of the ‘Regular Classes’ have been positioned outside the centre of the network. Only one regular class was positioned in the centre of the network diagram. This contrasts the patient perspective, where a greater number of the regular classes mentioned were placed in the centre of the network. This suggests that, though the % contribution level of ‘Regular Classes’ is similar from both perspectives, overall the patients would deem those classified within ‘Regular Classes’ to contribute more to their care and support needs than from the healthcare professional perspective.

5.6.6.4: Carers/Helpers

The overall composition of Carers/Helpers in the patient perspective networks was 7%, which represented the fourth highest category out of the five categories created. As shown in the ‘Collated Networks (Patient Perspective)’ figure, the Carers/Helpers mentioned by the patients have been placed at a range of different levels. The Carers/Helpers have been positioned at the centre of the network, in the middle of the network and at the outermost end of the network. This category was one of the lowest represented groups. As such, there are fewer comments regarding the placement of individuals within this category. The majority of the comments made regarding individuals within this category concern the network as a whole (i.e. general comments), such as:

“I put the ones who contribute the most here” [Points to the centre of the network] (Patient 14)
“All have helped me a lot” (Patient 4) [‘Carers/Helpers’ placed on level 1 of the concentric model].

However, along with these comments, some specific ones were made describing the placement of the Carers/Helpers. Examples of these include:

“Social services have been rubbish” (Patient 8) [Placed on level 4 of the concentric ring model]

“[Carer/Helper Provider] I only saw once” (Patient 7) [Placed on level 4 of the concentric ring model]

Given these comments, it appears plausible to suggest that the placement of Carers/Helpers has been based on the helpfulness of the individual and the frequency of contact. These were two of the overarching themes identified in this study.

The overall composition of ‘Carer/Helper’ in the healthcare professional perspective networks was 2%, which (as in the patient perspective networks) represented the fourth highest category out of the five categories created. However, this represents less than half of the overall composition stated in the patient perspective networks. This may be because information regarding carers or helpers may not be as readily recorded in the patient record system accessible by the healthcare professionals in this study.

Moreover, as illustrated in the ‘Collated Networks (Healthcare Professional Perspective)’ figure, the ‘Carers/Helpers’ have been positioned outside the centre of the network – one of which is at the furthest distance from the centre of the network. This contrasts the patient perspective, where a ‘Carers/Helpers’ had been placed at a range of levels. This illustrates that overall, the healthcare professionals do not perceive the Carers/Helpers to contribute as great an amount to the care and support of the patient as the patients do.

5.6.6.5: Other

The overall composition of ‘Other’ in the patient perspective networks was 2%, which represented the lowest category out of the five categories created. As shown in the ‘Collated Networks (Patient Perspective)’ figure, the individuals classified in the ‘Other’ category have been placed in the outer ends of the network. No specific comments were made with regards to the individuals classified as ‘Other’. The lack of individuals who would be classified as
‘Other’ and their positioning in the network suggests there are more notable nodes/categories that contribute towards the care and support of the patient.

The healthcare professionals who participated did not mention any individuals that would be classified as ‘Other’ in this study. This could be because these were not recorded in the patient record system accessible by the healthcare professionals in this study. This may additionally suggest that the healthcare professionals deemed individuals contributing to the care and support.

(This section addresses the supporting research question c): How does the network identified by a frail individual compare to the network of the frail individual as perceived by the healthcare professionals (provider)?)

5.6.7: Descriptive Analysis

On observance of the reported networks (shown in Figures 16 and 17), a number of similarities and differences can be noted. For both the Patient Perspective (PP) and HCP Perspective (HCPP) Networks, the ‘Health Care Professionals’ category was perceived as the one with the most contribution to a patient’s care (55% in PP; 63% in HCPP). This was followed by the ‘Family/Friends’ category (27% in PP; 29% in HCPP). Regular Classes followed next (8% in PP; 5% in HCPP). The PP reported more ‘Carers/Helpers’ than the HCPP (7% in PP; 2% in HCPP). Notably, only the PP Networks reported nodes that could be placed in the ‘Other’ category (2%) (all displayed in Table 12 below).

Table 12: Overall Composition from Different Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Overall Composition (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient Perspective</td>
</tr>
<tr>
<td>Healthcare Professionals</td>
<td>55</td>
</tr>
<tr>
<td>Family/Friends</td>
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</tr>
<tr>
<td>Regular Classes</td>
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</tr>
<tr>
<td>Carers/Helpers</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
</tbody>
</table>
The biggest range in contribution levels (as shown in Figures 16 and 17) was evident in the ‘Family/Friends’ category in PP Networks (contribution range: 1-4). For HCPP networks, it was evident in both the ‘Family/Friends’ and ‘Health Care Professionals’ category (contribution range: 1-4).

5.6.8: Quantified Representation of Network Diagrams

The quantified representation of the network diagrams from both the patient perspective (16) and the healthcare professional perspective (16) are shown in Table 13. The quantification of the patient perspective is shown in the blue shaded columns; the healthcare professional perspective shown in the grey shaded columns.

The data in this table was also used to compare both the total number of connections and the ‘Closeness’ values (contribution levels).
Table 13: Quantification of Networks

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Level 1</th>
<th>Level 1.5</th>
<th>Level 2</th>
<th>Level 2.5</th>
<th>Level 3</th>
<th>Level 3.5</th>
<th>Level 4</th>
<th>Total No.</th>
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<td>2</td>
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<td>0</td>
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<td>4</td>
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</tr>
<tr>
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</tr>
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<td>3</td>
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</tr>
<tr>
<td>16</td>
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<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
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</tr>
</tbody>
</table>
5.6.9: Numerical Comparison of Networks (Total Number of Connections)

In this study, the networks reported by the ‘patients’ were compared numerically with the reported networks from the healthcare professionals.

In the patient reported networks:

- A mean of 5.3 total connections was reported per social network (Range: 3-9). Standard Deviation: 1.70.

In the healthcare professional reported networks:

- A mean of 5.8 total connections was reported per social network. (Range: 4-8). Standard Deviation: 1.38.

A Shapiro-Wilk test confirmed that the ‘Total Number of Connection’ values for both perspectives were not normally distributed. As such, a non-parametric test (Mann-Whitney U test) was used to statistically compare the patient-reported networks versus the healthcare professional reported networks.

Using a Mann-Whitney U test, this study found that the patient reported networks did not have a statistically significantly lower total number of connections than that reported in the healthcare professional networks ($U = 98$, $p = 0.254$). The results do not, therefore, support the hypothesis that patient-reported networks will contain a higher total number of connections than healthcare professional reported networks.

5.6.10: Individual Comparison of ‘Closeness’ Values

Analysis was undertaken to calculate the strength of the relationships (Closeness) the ego had with the individuals mentioned in each of the reported networks.

‘Closeness’ values were calculated for both patient and healthcare professional perspectives, for each of the 16 patients. This was done following the methodology described in published literature involving egocentric networks (O’Malley et al., 2012).
The table below additionally details whether the ‘Closeness’ values from the patient perspectives were higher or lower than the healthcare professional perspectives.

Table 14: Individual ‘Closeness’ Values

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Patient Perspective 'Closeness' Value</th>
<th>Healthcare Professional Perspective 'Closeness' Value</th>
<th>‘Closeness' Values: Patient Perspective values compared to Healthcare Professional Perspective values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.13</td>
<td>0.21</td>
<td>Lower</td>
</tr>
<tr>
<td>2</td>
<td>0.16</td>
<td>0.26</td>
<td>Lower</td>
</tr>
<tr>
<td>3</td>
<td>0.23</td>
<td>0.18</td>
<td>Higher</td>
</tr>
<tr>
<td>4</td>
<td>0.10</td>
<td>0.19</td>
<td>Lower</td>
</tr>
<tr>
<td>5</td>
<td>0.18</td>
<td>0.28</td>
<td>Lower</td>
</tr>
<tr>
<td>6</td>
<td>0.20</td>
<td>0.25</td>
<td>Lower</td>
</tr>
<tr>
<td>7</td>
<td>0.20</td>
<td>0.13</td>
<td>Higher</td>
</tr>
<tr>
<td>8</td>
<td>0.18</td>
<td>0.24</td>
<td>Lower</td>
</tr>
<tr>
<td>9</td>
<td>0.10</td>
<td>0.26</td>
<td>Lower</td>
</tr>
<tr>
<td>10</td>
<td>0.18</td>
<td>0.25</td>
<td>Lower</td>
</tr>
<tr>
<td>11</td>
<td>0.21</td>
<td>0.24</td>
<td>Lower</td>
</tr>
<tr>
<td>12</td>
<td>0.18</td>
<td>0.20</td>
<td>Lower</td>
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<tr>
<td>13</td>
<td>0.13</td>
<td>0.20</td>
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<tr>
<td>14</td>
<td>0.14</td>
<td>0.21</td>
<td>Lower</td>
</tr>
<tr>
<td>15</td>
<td>0.18</td>
<td>0.18</td>
<td>Equal</td>
</tr>
<tr>
<td>16</td>
<td>0.20</td>
<td>0.22</td>
<td>Lower</td>
</tr>
</tbody>
</table>

5.6.11: Average Contribution Level of Relationships (‘Closeness’)

The average strength of the relationships (Closeness) the ego had with the individuals mentioned in each of the reported networks (both patient perspective and healthcare perspective) was then calculated.

In the patient reported networks:

- A mean ‘Closeness’ value of 0.17 was reported (Range: 0.10 – 0.23). Standard Deviation: 0.039.
A mean ‘Closeness’ value of 0.22 was reported (Range: 0.13 – 0.28). Standard Deviation: 0.039.

A Shapiro-Wilk test confirmed that the ‘Closeness’ values for both perspectives were normally distributed. As such, a parametric test (t-test) was used to statistically compare the means.

Using a t-test, this study found that the patient reported networks had statistically significantly lower ‘Closeness’ values (i.e. had networks where the reported individuals contributed more to the care and support of the ‘patient’) compared to the healthcare professional reported networks, $t(30) = -3.654, p = 0.001$. These results support the hypothesis that patient-reported networks will be ‘Closer’ than healthcare professional reported networks.

5.7: Discussion

To my knowledge, this is the first study that has examined the care and support networks of a frail individual from both the perspective of the frail individual and a healthcare professional involved in their care (i.e. patient-provider perspective).

This study considered the opinions of 16 ‘patients’ who attended a ‘Falls Group’ — and the opinions of 16 ‘healthcare professionals’ involved in the ‘Falls Groups’. In terms of patient representation, there were significantly more women (81%) than men (18%). This finding may relate to research suggesting that women are more susceptible to falls than men (Gale, 2016). However, more research (notably, a greater sample size), would be required to accurately conclude whether this explains the higher representation of women versus men in this study.

The age range of 64 – 81 years, with a mean age of 72 years is an age where there is an increased risk of frailty (Xue, 2012). Hence, the care and support networks reported are likely to give justified insight into the networks of frail individuals.

The results indicated that the majority of individuals were referred to the ‘Falls Groups’ by a GP. This finding could indicate that the GPs had identified and recognised the individual’s risk of frailty and/or the potential benefits the ‘Falls Group’ may provide to the individuals, a noted role and scenario in the literature (Mackenzie and McIntyre, 2019).

Overall, the networks reported by patients show some similarity in many aspects to those perceived by HCPs. This may give evidence to good practices in the recording of patient information (Mathioudakis et al., 2016), good communication between patient and provider (Ha and Longnecker, 2010) and an insight into their understanding of the general contribution levels of different individuals involved in care and support. However, while there were
similarities in several aspects (e.g. overall composition of categories), the study evidences differences in the placement of some of the individuals.

On average, this study additionally illustrated that the reported patient network had a mean very similar to the perceived network from HCPs, with a similar range from both parties also being reported. Since there is limited evidence comparing both perspectives on the care and support networks of frail individuals, it cannot be stated whether the network sizes reported are similar to previous findings. Nevertheless, early research in this field has suggested that as we age, there may be a reduction in network size (Cumming and Henry, 1961), though, as Cornwell et al. (2008) note, this view has often been challenged. However, a claimed sense of independence by four of the patients may explain ‘low’ numbers of individuals in their care and support network, as mentioned by some of the patients (detailed in results).

Many of the reported care and support networks in this study were composed of a variety of different healthcare professionals, friends, family members and/or services. This may represent evidence of holistic care and support – and provides further insight into the contribution level perceived by both patients and healthcare professionals of a range of different people and/or services. This lends support to research, such as by Reeves et al. (2018), that suggests that the changing healthcare needs of an ageing population would be supported with holistic care approaches – especially in frail populations (British Geriatrics Society, 2014c; Winfield and Burns, 2016). Furthermore, some patients reported classes that would be held during the day, such as yoga or dance classes, recognising the importance of this as part of their care and support network. This gives an insight into pre-frail or frail individuals who wish to maintain continuities of self and valued social or physical activities, as has been reported in literature (Bundon et al., 2011). Moreover, as detailed in the introduction, social (Cattan et al., 2005; Findlay, 2003) and physical (Apostolo et al., 2018; Macdonald et al., 2020) activities can also prevent or lessen the progression of frailty.

Both patients and providers had a similar overall percentage representation of ‘Family/Friends’ (27% in PP; 29% in HCPP), though there was less dispersion in the range of contribution level in patient-reported versus healthcare professional reported networks (as shown in Figures 16 and 17). Nonetheless, there is a general agreement with both parties on the overall percentage representation of the Family/friends, potentially indicating the value that family and friends bring. This is a characteristic reported in literature, where the value and importance of family and friends have been noted (Luong et al., 2011; Huxhold et al., 2013), particularly on the
progression of frailty (Obbia et al., 2019). However, this finding may additionally reflect upon the high number of informal carers caring for family (Office for National Statistics, 2013). Questions need to be raised to understand whether the contribution level of care and support to an individual’s network is due to preference (Broese van Groenou et al., 2016) or necessity, due to the availability of NHS care and support (Ismail et al., 2014) or the expense of suitable private care and support.

Though the ‘Health Care Professionals’ category was perceived as the one comprising the most to a patient’s care from both parties, there was an 8% difference between them (55% in PP; 63% in HCPP). This suggests that while the patients view the ‘Health Care Professionals’ as a high contributor to their care, other categories were also importantly noted by the patients that may not have been known by the healthcare professionals (e.g. ‘Other’). Furthermore, on inspection of Figures 16 and 17, it is evident that the ‘patients’ placed the healthcare professionals closer to the centre of the ring model (indicating high contribution levels to care and support) than the healthcare professionals.

These findings suggest that the healthcare professionals in this study may not be fully aware of the level of care and support that they contribute – in addition to the contribution levels of family and friends. This potentially signifies a low level of communication between healthcare professionals, patients and family carers, as has been demonstrated in other settings (Caswell et al., 2015). This finding is pronounced, as it may pave the way for more responsibility or collaboration if a care and support plan is produced (NHS England, 2016). While the logistics of involving family or friends may not always be possible, studies have shown that having ‘familiar’ carers or helpers can reduce the chances of illness – in addition to improving the social and mental aspects of an individual (Roth et al., 2015; Obbia et al., 2019).

The patients mentioned over double the percentage of individuals who were placed in the ‘Carers/Helper’ category than the HCPs (7% in PP vs 2% in HCPP). Moreover, the patients placed the ‘Carers/Helpers’ in higher contribution levels (as shown in Figures 16 and 17). This suggests that these individuals may not have necessarily been captured in the patient record system – or were perceived to have a higher contribution level to the patients than by the HCPs. As a result, this finding may demonstrate the fragmented nature of health and social care – and the continued need to further integrate care and support services (Ham et al., 2012; National Audit Office, 2017).
Both patients and healthcare professionals mentioned that ‘Regular Classes’ contributed to the care and support networks (8% in PP vs 5% in HCPP). The ‘Falls Group’ was mentioned by both the patients and healthcare professionals (placed in the ‘Regular Classes’ category). The benefits of falls groups and similar schemes have been noted in the NHS Long Term Plan (NHS, 2019) (as well as in the thesis introduction – e.g. by Travers et al. (2018) and Macdonald et al. (2020)), citing evidence that these groups can reduce the likelihood of falls and are cost-effective in reducing admissions to hospital (Public Health England, 2018b). Given that this study took place at a ‘Falls Group’, it is expected that the ‘Falls Group’ may have been included in the care and support networks from both patients and healthcare professionals. Nevertheless, the results indicate that the positive aspects of the ‘Falls Group’ with regards to care and support were enough for both parties to place this on the care and support network.

This study found that only the patients mentioned individuals who could be placed in the ‘Other’ category (2% of the overall composition in PP networks). It may be possible that the healthcare professionals did not want to speculate on individuals or services that would have been placed in the ‘Other’ category, especially if not recorded in their notes or in informal discussions they had with the patients.

This study found that there was not a statistically significant difference in the total number of connections between patient and healthcare professional reported networks. However, the strength of the relationships (closeness) was statistically significantly different between patient and healthcare professional reported networks. The study indicated that overall, the patients viewed the individuals they reported to be closer (i.e. contribute more to their care and support) than perceived by the healthcare professionals. Specifically, this finding (as previously noted) supports the notion that the healthcare professionals in this study may not be fully aware of the level of care and support (i.e. closeness) that they/individuals contribute. As highlighted before, this could signal a need for greater communication, which Kelley et al. (2014) emphasise is key when considering the care and support of an individual. Nevertheless, this may also highlight the intangible aspects or values of care and support received that cannot be adequately recorded on a system. Examples of intangible aspects in healthcare that have been stated in the literature include: empathy, a relationship of mutual respect, dignity and understanding of illness (Tomes and Chee Peng Ng, 1995; Arantzamendi and Centeno, 2017).
Overall, these findings give some insight into the choices and perceptions of various care and support, which may help to influence how best to deliver care and support to frail, or at-risk populations.

5.7.1: Generation of New Evidence

This type of study, utilising a participatory approach has limited evidence of being used in research. Involving patients and public in this study, per NIHR PPI (Patient and Public Involvement) incorporation suggestions (NIHR, 2014) with several aspects of the research process (identifying and prioritising, design, undertaking/managing and monitoring and evaluation) ensured that the ‘study target’ had an active involvement in the research process. Since this is an emerging approach to research in this ‘study target’, the study generates new evidence in a more comprehensive way than what has been done previously.

5.7.2: Strengths

While other studies may have focussed on external sources, such as data systems, patient notes or interviewing healthcare professionals only to address the research question, the value of patients in this study has been recognised. Though (as Liabo et al. (2018) point out) there are many definitions of patient involvement in research, this study has followed NIHR guidelines on patient and public involvement, with patients having been part of the ‘involvement’ and ‘participation’ processes. The dissemination of research findings through public presentations has encouraged ‘engagement’ with the study, which is intended to continue with published material on the study.

The participatory approach used in this study is another strength of the study. The participatory approach was designed to be a more interactive and accurate method of data acquisition than traditional interview methods. Moreover, the approach enabled the participant to see exactly what information had been recorded, additionally allowing them to alter and update their responses, if required.

5.7.3: Limitations

A limitation of the study is the geographical area that many of the participants were situated. Thus, geographical variation would be anticipated if the study were replicated elsewhere. It is also possible that the care and support networks of non-participants in this study may have differed to the findings evidenced in this study.
5.7.4: Non-Participants

As stated previously, participants were not expected to explain why they did not take part in the study. This study did note time issues restricting the ability of 3 members of the Falls Groups from participating. In addition, during the course of arranged interviews, severe weather conditions meant that some participants (patients) were unable to attend some ‘Falls Groups’ independently – and did not return to future ‘Falls Groups’. A further study could be conducted to interview patients in their place of residence. This was not done in this study, however, due to the ethical and practical challenges of interviewing in a home setting (Sivell et al., 2019).

5.8: Conclusions

Research illustrates the growing importance of an individual’s care and support, especially with increasing risk of frailty (Oliver et al., 2014). This study supports these findings in literature, particularly emphasising the importance of family and friends in the care of an individual.

Family and friends have been shown to play an influential role in the management and care of a frail, or pre-frail individual (Luong et al., 2011; Huxhold et al., 2013). As evidenced in the literature, examples of this could include: by offering assistance in coordinating services (Bunn et al., 2017), assisting with aspects of daily living (Nicholson et al., 2012; Age UK, 2014) and offering company (Centre for Ageing Better, 2015).

It is also possible that the family and friends mentioned in these networks were acting as informal carers (Broese van Groenou et al., 2016; OECD, 2011). This finding could contribute towards explaining the relatively lower number of Carers/Helpers mentioned in this study. Further research, however, would help confirm the reasoning behind the lower number of Carers/Helpers.

This study additionally found both similarities and differences (e.g. ‘Closeness’) between the ‘patient’ and ‘provider’ care and support networks. Although the findings may suggest good communication in some areas, the study also highlights the need for greater communication between ‘patient’ and ‘provider’. This is important, as communication between ‘patient’ and ‘provider’ has been noted as a fundamental component that can influence the care and support of patients (Ha et al., 2010). Moreover, as individuals with frailty are at increased risk of adverse health outcomes, greater communication could result in better planning and/or
targeting of care and support. This could help towards overall efforts aimed at reducing, delaying or even reversing frailty.

The examination of the networks in this study also provides valuable insight into understanding the choices and perceptions frail individuals have regarding their care and support. The qualitative nature of the study helps to provide in-depth reasoning to care and support choices that may not have been as easily gathered from a healthcare record. The information presented in this study could be used to help frailty care and support planning and resource allocation in the community.

Given the contribution and importance of Family/Friends reported in this study (who may be acting as informal carers), a further study could be conducted to understand the efforts made to contact, integrate and involve these groups of people (e.g. via NHS services) in care.

5.8.1: Key Points

- This study aims to investigate the care and support networks of frail individuals within a community setting from the perspective of both the ‘patient’ and a ‘provider’ of care.
- A participatory approach was used to interview both patients and healthcare staff who were part of a Falls Group.
- In the care and support networks that were reported, when the overall composition is considered, the ‘Healthcare Professionals’ category were perceived to contribute the most to an individual’s care from both the ‘patient’ and the ‘provider’. The ‘Healthcare Professionals’ category comprised 55% of the overall patient perspective network and 63% in the overall healthcare professional perspective network.
- The study illustrated that on average, the ‘patients’ placed the healthcare professionals closer to the centre of the concentric ring model than the healthcare professionals did (Figures 16 and 17). This suggests that the healthcare professionals may not fully recognise the perceived level of care and support they give. This partial disconnect may represent evidence of a lack of communication between ‘patient’ and ‘provider’.
- Research has illustrated the value of good communication between ‘patient’ and ‘provider’ – and proactive approaches towards the care and support of frail, at-risk individuals. This study illustrates some congruence between the ‘patient’ and ‘provider’ networks – yet also highlights areas that could be improved.

5.8.2: Implications for Practice
Though there was some expected disconnect between the perspectives of the patient and healthcare professional highlighted in this study, there is evidence to suggest that this ‘disconnect’ could be removed significantly with improvements in patient health record systems that encourage greater communication and collaboration (Ueckert et al., 2003; Tang and Lansky, 2005). This study may also point towards a continued, or further need for better integration between care services and communication with patients (or users of the NHS).

This study found that both the ‘patient’ and ‘provider’ reported the ‘Family/Friends’ to contribute highly to an individual’s care and support. ‘Family/Friends’ should therefore be recognised as vital partners in the provision of health services and provided with access to support, training and information. While this may be already occurring in some NHS Trusts, there is recognition that greater support is required for family and friends who may offer care (Nottinghamshire Healthcare NHS Foundation Trust, 2015; NHS England, 2016b; Carers UK, 2017).

Providers of care can be informed through the study about the choices and perceptions frail individuals have about their care and support. While this study noted the importance of ‘Family/Friends’, the study also emphasised that, in general, patients had placed Family/Friends closer to the centre of the concentric ring model (indicating high levels of care and support contribution) compared to the healthcare professionals. The findings in this study could be used to help plan care and support – and for resource allocation.

5.8.3: Implications for Research

As evidenced by Jagosh et al. (2012) and Cargo and Mercer (2008), the use of a participatory activity in research has shown to have rich benefits. This study demonstrated that conducting a participatory activity in research was feasible, allowing a depth of data to be gathered. Given the increase in global life expectancy (United Nations, 2017) and the need for proactive research in frail populations (Bleijenberg, et al., 2012), utilisation of participatory approaches could prove a beneficial way to research frail or at-risk populations within community settings.

Opportunities exist to extend the examination of the care and support networks further, such as investigating the reasoning behind the lower number of Carers/Helpers (compared to other individuals mentioned) identified in this study.

5.8.4: Further Work
This study took place in a defined geographical area (North-West London), which was governed by one NHS Trust (Central London Community Healthcare Trust). As noted previously, there may be regional variations in the makeup of healthcare professionals or services that formed a care and support network. Hence, further work could expand the study to cover different geographical locations governed by other NHS trusts. The findings could then be compared for similarity to this study.

This study asked a select group of healthcare professionals that made up a ‘Falls Group’ their perception of a patient care and support network. Further research could investigate the opinion of other healthcare professionals, carers or providers on their perception of a ‘patients’ network. For example, no GPs formed the ‘Falls Group’ healthcare professionals interviewed in this study. In many cases, GPs were responsible for the referral. Conducting the study with the referring healthcare professional or provider could indicate, on average, whether they have a better perception of the ‘patients’ network and the care they receive. Ascertaining this could help in efforts to bridge the gap between ‘patients’ and ‘providers’ - ultimately contributing to services and approaches that would act proactively. For individuals at risk of falls, this is of importance, as prevention of a fall will have wide-reaching benefits for both the ‘patient’ and ‘provider’.

5.8.5: Link to Next Study

This study highlighted the importance of care and support networks within the community, taking consideration of both patient and healthcare professional perspectives. These care and support networks may help to prevent, or delay a move away from their own residence (Blomgren et al., 2008). However, recognition of frailty in individuals living in the community may only be recognised after admission to hospital after suffering a crisis event, such as a fall (British Geriatric Society, 2015). Therefore, a logical progression from this study was the examination of an acute care (hospital) setting. This is also the next setting in a potential frailty pathway (schematically displayed below).
Schematic D: Link to Next Study
Chapter 6: The Acute Care Setting

6.1: Introduction

This chapter describes the study which aims to ascertain the living arrangements in which frail individuals have prior to admission to acute care and post-discharge from acute care. This may help to provide an insight into the levels of care and support associated with these individuals – and potentially highlight areas for further research. In this study, data was used from an EPR system based at Chelsea and Westminster hospital, in which health and care staff routinely add to a repository of information regarding in-patients.

6.2: Setting the Scene

This section gives a background to the acute care setting with a specific focus on frail individuals within this setting. Frail individuals are a common group within the acute care setting. Many individuals will be admitted to this setting having lived with frailty prior to admission; others will be discharged to a setting where many frail individuals will reside, such as a nursing home.

6.2.1: The Acute Care Setting in the UK – A Background

NHS statistics report that between 2017-2018, 23.8 million attendances were recorded at Accident and Emergency (A&E) in England – an increase of 2% since 2016-2017 and 22% since 2008-2009 (NHS, 2018b). Further, there have been marked increases in the average number of attendances over 4 hours – the reported figure from 2017-2018 of patients who spent over 12 hours in A&E is 5 times greater than in 2011-2012 (NHS, 2018b). This has discernible implications for patients’ care and poses operational challenges for providers. These implications and challenges may increase as the number of hospital admitted patients increases.

The most recent report from the National Audit Office (2018) states that the real-terms cost of emergency admissions between 2015-2016 was £13.7 billion, an increase of 2.2% since 2013-2014. Notably, however, while there has been an increase in the cost of emergency admissions, there has been a decrease in the average number of available general and acute beds, which have fallen by 5.8% from 2010-2011 to 2016-2017 (National Audit Office, 2018a). This figure is significant, as bed occupancy rates have been increasing since 2010-2011, reaching a peak of 91.4% occupancy in 2016-2017 (National Audit Office, 2018a).
Moreover, using data collected from 72 hospital trusts across the UK, the number of emergency readmissions has risen by 22.8% from 2012-2013 to 2016-2017 (Healthwatch, 2017). Though emergency readmissions may happen for several reasons (which may be unpreventable), questions remain as to whether this is representative of inappropriate decisions to discharge and/or a lack of care and support in their living arrangement post-discharge.

6.2.2: Frail Individuals in Acute Care

Although older people comprise about 12% all patients attending the emergency department, a higher proportion of patients in this group are admitted hospital mainly through the acute medical unit (AMU) and constitute the majority of overall hospital inpatients (60-70%) (Royal College of Physicians, 2012) with patients aged 70-74 representing the age group with the largest number of critical care records (NHS Digital, 2018a). In terms of attendances recorded in A&E in England, the biggest growth in the age band is for 65-79-year-olds (12% of all attendances in 2017-2018) (NHS, 2018b) compared with 10.2% of all attendances in 2007-2008 (NHS, 2017a). Importantly, though not all older people will have frailty, studies have shown that greater frailty risk was associated with increased age (Fhon et al., 2018; Hanlon et al., 2018).

For some older inpatients, evidence suggests that hospital admission may result in multiple adverse outcomes – particularly in those classified as frail (Hubbard et al., 2017). As a result, much of the research into identifying individuals at risk of poor outcomes has often focussed on the frailty status of the individual (Buurman et al., 2011; Hubbard et al., 2017). Research has shown that a variety of frailty tools are used in practice (Gilbert et al., 2018; Bruyère et al., 2017; Farhat et al., 2012) each of which vary to different degrees of agreement (Aguayo et al., 2017; Theou et al., 2013). This complicates the ability to universally quantify the prevalence of frailty in acute care, with results varying by tool, index or scale used (Theou et al., 2018). However, as highlighted by Oliver (2016), there is a continued need to make a hospital setting fit for frail patients.

Methods to help quantify the prevalence of frailty in the UK acute care setting have been detailed in literature. Examples include: the hospital frailty risk score (Gilbert et al., 2018) using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) coding system (WHO, 2010); the Clinical Frailty Scale (which has been validated for use in the inpatient setting) (Rockwood et al., 2005) and a novel methodology using routinely collected data from the HES database, with a basis on using frailty
syndromes, demographics and previous hospital utilisation (Soong et al., 2015) to help predict and quantify frail populations.

In recent years, delayed patient discharges from hospital have been highlighted as a major concern in the NHS (Gaughan et al., 2017; Gaughan et al., 2015; NHS England, 2016a). Delays in the care pathway increase the overall cost of treatment for admitted patients and have been associated with increased mortality, infections, depression, reductions in patients’ mobility and activities of daily living (Rojas-García et al., 2017). Evidence that many older patients can be ‘stranded’ within acute care (Oliver, 2016a), or experience delayed discharge is growing concern (Williams et al., 2009). A recent National Audit Office survey indicated that 85% of individuals recorded as DTOC (delayed transfer of care) were 65 years or over (National Audit Office, 2015a).

A DTOC in acute care occurs when an adult patient is ready to go home and is still occupying a bed (NHS England, 2018). In the media, this has been described as ‘bed-blocking’ (The King’s Fund, 2018a). According to guidelines from the NHS, a patient is ready to be transferred home when all three conditions listed below are met (NHS England, 2018b, p.3):

- a clinical decision made that the patient is ready for transfer home
- a MDT decision made that the patient is ready for transfer home
- the patient is considered safe for discharge/transfer home

No sole reason for DTOCs exists, yet delays in the completion of necessary assessments, formalising a care package and housing issues have all been suggested (The King’s Fund, 2018a). Moreover, the National Audit Office reports that although hospitals are financially incentivised to reduce DTOCs, there is no similar incentive for community health and local authorities for them to speed up receiving patients discharged from hospital (National Audit Office, 2016).

**6.2.3: Identifying and Assessing for Frailty in Acute Care**

Research reports that, at present, there is no consensus on how to clinically assess and manage older, frail individuals in the acute care setting (Soong et al., 2016). This is notable, as older people living with frailty are frequent users of acute care services (Quinn et al., 2019). Many methods and/or tools for identifying and assessing for frailty acute care exist (Theou et al., 2018).
The Clinical Frailty Scale (CFS) phenotypic model of frailty (Fried et al., 2001) and the cumulative deficit model (Rockwood and Mitnitski, 2007) (discussed in Chapter 1), were highlighted to be the most common tools used to identify and assess for frailty in acute care (Theou et al., 2018). Further, a modified Delphi analysis (where consensus from a panel of experts responding to previously prepared information was gathered) suggested that measures of accumulated deficit and high resource usage in individuals were deemed most useful and appropriate for quantifying frailty in acute care (Soong et al., 2016). However, in practice, time and resource constraints may restrict the use of some assessment tools (Quinn et al., 2019). Also, reports suggest that the acute care system is currently not fit to optimally manage frail patients (Oliver, 2016b).

Given this, using simple tools to identify frail patients (e.g. short structured assessments or questionnaires like the CFS), followed by more comprehensive assessments, such as the CGA (for those recognised as frail), is a suggested approach, which may also improve patient outcomes (Quinn et al., 2019; Oliver, 2016b). This approach has also been suggested by the NHS for use in multidisciplinary acute frailty services, a service provided in all emergency departments (NHS Improvement, 2018a). Though the assessment tools used may vary, this is a recommended approach to identify and assess for frailty in the acute care setting (Quinn et al., 2019).

Table 15 describes common tools or approaches for use in acute care.

Table 15: Frailty Identification or Assessment Methods in Acute Care

<table>
<thead>
<tr>
<th>Frailty Identification/Assessment Method</th>
<th>Short Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Frailty Scale (Rockwood et al., 2005)</td>
<td>Used to help detect frailty in individuals and those at risk of complicated and longer stays in hospital. Uses 9 clinical descriptors and pictographs to aid clinicians with a quick tool to stratify patients according to level of frailty, based on what the patient was like 2 weeks earlier (or when the patient was last stable).</td>
</tr>
<tr>
<td>Identification of Seniors at Risk (McCusker et al., 1999)</td>
<td>A questionnaire comprising 6 questions aimed to be completed by hospital staff with the patient or caregiver. A total score of 6 is possible, with...</td>
</tr>
</tbody>
</table>
each item being scored either 1 if the patient reports a problem; 0 if they do not. Higher scores aim to help identify patients at risk of adverse outcomes such as functional decline, readmission and mortality.

| Comprehensive Geriatric Assessment (British Geriatrics Society, 2018c) | Often referred to as the gold standard for caring for frail individuals within hospital. Consists of a multidimensional and multidisciplinary process aiming to improve outcomes for frail individuals, including the aim to reduce length of stay, reduce readmission rates and reduce rates of long-term care use. |

6.2.4: Why Investigate Acute Care?

This chapter has detailed the increases in frail attendances and DTOCs that primarily affect older people (who may also be frail). DTOCs are major concerns – especially given the detrimental effect for both the older person and the hospital (NHS England, 2014). Research also details that frail individuals admitted to acute care are at risk of early readmission (Brennan et al., 2015; Hao et al., 2019), longer length of stay and higher short and long-term mortality (Theou et al., 2018; Arora et al., 2007). There is a need, therefore, particularly for acute care systems, to improve the recognition and management of this group of patients (NHS England, 2014). This need has further been exemplified by NICE, encouraging efforts aimed at ensuring care and support is given as needed to frail individuals in acute care, as well as maintaining this care (if needed) post-discharge (NICE, n.d.).

Arguably, better understanding the level of care and support an individual has pre- and post-admission can also help in improving future recognition and management of frail individuals (NHS England, 2014). A better understanding could help future care and support planning, which could improve self-management of the person and their family/carers. (British Geriatrics Society, 2015). This may also contribute towards improved health and wellbeing of a frail individual and a reduction in hospital length of stay should they be admitted (NHS Rightcare, 2019).
6.2.5: Challenges and Opportunities to Research in Acute Care

Undertaking research in acute care with sick or frail patients poses a number of challenges. Engaging with stakeholders, recruiting and gaining consent of frail or vulnerable patients and managing the potential impact of interviews are reported challenges of research which Whitehead and Clark (2016) highlighted in this setting.

Research opportunities in acute medicine have been reported to be largely untapped (Bell, 2017). Amongst the opportunities include the use of large datasets (e.g. HES), which would be routinely populated in acute care – and provide demographic, clinical and geographic information. The information available in datasets such as HES can prove beneficial, for example in cohort and longitudinal studies (Boyd, 2018).

Using existing datasets provides a further opportunity which becomes more feasible as the use of Electronic Health Records (EHRs), or Electronic Patient Record (EPR) systems grow in the acute care setting (Boonstra et al., 2014). Such systems offer the ability to exchange health information electronically combined with access to accurate, up-to-date information regarding individual or groups of patients. Dominantly, these systems have been introduced to improve administrative and clinical data to help in reducing medical errors, helping contribute towards safer care, allowing patients access to their records and reducing costs (Boonstra et al., 2014; Hoover, 2017). Use of the data available in these systems presents opportunities for research (House of Parliament, 2016; Bosanquet and Evans, 2014). Although EPR or EHR systems come with research challenges, such as biases and missing data (Myers and Stevens, 2016), the benefits of using these systems in research is growing (Sutherland et al., 2017; Cowie et al., 2017). As adoption of these systems increase and begin to cover different settings (e.g. primary care, hospitals and community organisations) they can help to establish a holistic overview of a patient’s medical information and care and support needs at the point of care (Neves et al., 2017).

6.2.6: Electronic Patient Record Systems in Practice

Of the over 100 suppliers of EPR systems, prominent suppliers include: Cerner, CSS and IMS Maxims (House of Parliament, 2016). As reported by Clarke et al. (2015), implementation varies across health and care settings, but most are used with the same intention of providing timely access in one place to key clinical and administrative patient data (Martin et al., 2007), with increased legibility of clinical information and increased accuracy of data. In a case study detailing the benefits of an EPR system, the replacement of paper forms with electronic
requesting and labelling was quicker and said to reduce the risk of samples being mislabelled (Oxford University Hospitals NHS Trust, 2015b). In many EPR systems, patient confidentiality is increased; access is usually only possible after being authorised with approved user and login details (Peckham et al., 2015).

6.3: This Chapter in Relation to the Overall Thesis

This study forms part of a modular approach to address the research questions outlined in the aims and introduction to the overall thesis. The thesis has so far investigated the non-acute setting from a high level and the community setting. This study represents a move into the acute care setting – a setting where frailty is likely to have progressed and/or patients being admitted to acute care would have suffered from an event potentially linked to frailty, such as a fall. In this setting, inpatients will have come from settings with varying levels of care and support. Notably, importance will be placed on the discharge living arrangement – and how this compares (with regards to care and support) to their living arrangement pre-admission.

The overarching research question of the thesis is to understand how the care and support of frail individuals manifest across the frailty spectrum. Frail individuals will have specific care and support needs; using an EPR system to understand the care and support that admitted patients receive before and after admission may help to further understand where care and support needs are. A detailed explanation of how the care and support needs of individuals in this study are examined – and the research needs addressed, are explained in 1.10: Addressing the Research Needs.

6.3.1: Defining ‘Frail Population’ in This Study – Presenting at Risk of Falls

In this study, data access to patient records detailing care and support pre-admission and the proposed care and support following discharge was only made available for patients over 65 years and classified at risk of falls. Patients had been classified at risk of falls using NICE guidelines (i.e. all patients aged 65 years or older and having been admitted with falls as a presenting complaint) (NICE, 2013a; NICE, 2015). Evidence from the literature detailing the link between falls and frailty, with falls being noted as a specific marker of frailty, are described earlier in this thesis (‘5.2.8 Frailty and Falls’). In acute care, falls are recognised as a common frailty syndrome (NHS Rightcare, 2019; Gilbert et al., 2019).

Taking these elements into consideration – and given the approved access to data – patients aged over 65 years of age and classified at risk of falls (having had a fall as a presenting
complaint) constituted the ‘Frail Population’ in this study. It is noted that classifying a ‘Frail Population’ in this way has limitations, which are discussed in the limitations section of this chapter.

As the patients in this study have been defined as a ‘Frail Population’ (and would have been defined as frail in hospital by some definitions), this study examines the care and support of this population. These patients will have specific care and support needs related to their existing conditions and their recent spell in hospital. As such, it is expected (by way of reasonable judgement) that the care and support received pre-admission and post-discharge will be related to these conditions and stay in hospital. Since frailty is not formally diagnosed in Chelsea and Westminster hospital (the site of study), the care and support detailed in the discharge summary is often described as relating to patient needs (which combined may reflect frailty), rather than being described as specifically due to frailty. It is noted, however, that in this study, the care and support reflects those who are over 65 and have had a fall only (the ‘Frail Population’) – a noted limitation of the study.

The use of FEWS as an indicator of frailty was used in this study to help identify frailty in patients – and establish whether the complete number of healthcare professional interactions and discrete healthcare professional interactions that occurred during a hospital stay differed based on FEWS group. FEWS is based on a model of frailty proposed by Soong et al. (2015), in which four domains are considered to help quantify frail and vulnerable patients.

6.4: Overall Aim

This study aimed to establish what care and support frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge.

6.4.1: Research Questions

The specific research question for this study:

**What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?**

Supporting research questions:

a) Using a population of people who have been classified at risk of falls (having had a fall as a presenting complaint), what are the descriptive characteristics of these
people?

b) Using this frail population, what is the living arrangement of patients pre-admission and their proposed living arrangement on discharge?

c) What levels of dependence does this frail population have before admission and post-discharge?

d) Using a novel frailty assessment developed in acute care (FEWS) as an indicator of frailty level, does the:

i) Complete healthcare professional interactions a patient received during their hospital admission. (the total number of professions who saw the patient and who recorded an entry for the interaction in the EPR system)

ii) Discrete healthcare professional interactions a patient received during their hospital admission. (the total number of unique professions who saw the patient and recorded an entry for the interaction in the EPR system)

iii) Length of Hospital Stay

iv) Change in Dependency Level at Discharge Destination (i.e. whether the patient has been discharged to a living arrangement that represents a higher dependency level relative to their pre-admission living arrangement).

Differ based on FEWS group

6.5: Method Summary

A routinely used hospital EPR system was used to abstract appropriate and relevant data necessary to answer the specific research question. Using an existing data set of 1903 patient admissions to hospital, 295 unique patients (with accessible FEWS data) were identified as at risk of falls. The descriptive characteristics of these patients were then examined. The pre-admission living arrangements and proposed living arrangement post-discharge were examined and represented diagrammatically using an alluvial diagram. Dependency level pre- and post-admission was categorised into 4 groups: low dependency, medium dependency, high dependency and N/A (deceased people). Dependency was examined to understand the levels pre-admission and post-discharge. The complete and discrete healthcare professional
interactions and patient outcomes were investigated to see whether they differed based on a novel frailty score (FEWS) (d). An example of i) and ii), in addition to an explanation as to why this matters for the study is explained in Chapter 1 (Within ‘1.10.1: Primary Research Questions’). Kruskal-Wallis and Mann-Whitney U tests were used for statistical analyses. Full methods are described in Chapter 3 of this thesis.

6.6: Results

6.6.1: Descriptive Statistics

A total of 295 individuals 65 years and older were studied (this represented all patients satisfying the inclusion criteria with available FEWS data taken during the study period June 2015 – January 2016).

The mean age of the group was 83 years. Standard Deviation: 8.26

There were 198 women; 97 men.

The age range of individuals was 65-102 years old.

![Age Distribution](image)

Figure 19: Histogram Illustrating Age Distribution of Patients

6.6.2: Ethnicity
The ethnicity of all 295 individuals in this study is detailed below. Ethnic categories have been classified in accordance with the Office for National Statistics codes used by the NHS (NHS Digital, 2018c).

**Table 16: Ethnicity of Individuals**

<table>
<thead>
<tr>
<th>Ethnic Category</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (British)</td>
<td>65.4</td>
</tr>
<tr>
<td>White (Any other White background)</td>
<td>14.9</td>
</tr>
<tr>
<td>Other Ethnic Groups (Any other ethnic group)</td>
<td>7.1</td>
</tr>
<tr>
<td>White (Irish)</td>
<td>4.7</td>
</tr>
<tr>
<td>Asian or Asian British (Any other Asian background)</td>
<td>2.0</td>
</tr>
<tr>
<td>Black or Black British (Caribbean)</td>
<td>1.4</td>
</tr>
<tr>
<td>Black or Black British (African)</td>
<td>1.0</td>
</tr>
<tr>
<td>Not Stated</td>
<td>1.0</td>
</tr>
<tr>
<td>Mixed (White and Black Caribbean)</td>
<td>0.3</td>
</tr>
<tr>
<td>Mixed (Any other Mixed background)</td>
<td>0.3</td>
</tr>
<tr>
<td>Asian or Asian British (Indian)</td>
<td>0.3</td>
</tr>
<tr>
<td>Asian or Asian British (Pakistani)</td>
<td>0.3</td>
</tr>
<tr>
<td>Asian or Asian British (Bangladeshi)</td>
<td>0.3</td>
</tr>
<tr>
<td>Black or Black British (Any other Black background)</td>
<td>0.3</td>
</tr>
<tr>
<td>Other Ethnic Groups (Chinese)</td>
<td>0.3</td>
</tr>
</tbody>
</table>

6.6.3: Patient Flow Diagrams

Over the following pages, the study findings are presented visually.

**Figure 20** illustrates the living arrangement of individuals prior to admission and their proposed living arrangement on discharge. The figure shows that there were 17 different pre-
admission living arrangements; 19 post-discharge living arrangements. The most common pre-admission living arrangement was ‘Home with care (Family/Friends)’ (60 individuals). The most common post-discharge living arrangement was the ‘Nursing Home’ (42 individuals). The second most common pre-admission living arrangement is ‘Home (Independent with all ADL)’; this is the fifth most common post-discharge living arrangement. Patients from the ‘Home (Independent with all ADL)’ living arrangement are placed in several different living arrangements post-discharge. The ‘Hospice’, ‘Continuing Care Unit’ and ‘Extra Care Housing’ living arrangements were the least common pre-admission and post-discharge. The ‘Supported Living’ pre-admission living arrangement was not a patient living arrangement post-discharge. ‘Enhanced home/care setting with carers/family (frequency unknown), ‘Deceased’ and ‘Rehab Unit’ were post-discharge living arrangements not present pre-admission.

**Figure 21** is a Box Plot of FEWS by living arrangement (Pre-Admission). The box plot shows the range of FEWS for each of the living arrangements recorded.

**Figure 22** represents the dependency level of patients pre-admission and post-discharge from acute care. Of note, a large proportion of patients in this study were classified as ‘Medium’ dependency pre-admission (163 individuals) and were discharged to a setting also classified as ‘Medium’ dependency level (128 individuals).

**Figure 23** is a bar graph of the change in dependency level at discharge destination. The bar graph illustrates that the highest percentage of patients were discharged to a living arrangement that represented an unchanged dependency level from their pre-admission living arrangement (61%). 29% of patients were discharged to a living arrangement that represented a higher dependency level from their pre-admission living arrangement. 9% of patients died after being admitted. 1% of patients were discharged to a living arrangement that represented a lower dependency level from their pre-admission living arrangement overall.
Figure 20: Living Arrangement of Patients: Pre-Admission and Post-Discharge from Acute Care. On the left, the recorded Patient living arrangement (Pre-Admission) is displayed. On the right the recorded Patient living arrangement (Post-Discharge) is displayed. The number of individuals in each category is displayed in a box beside each category. Colours were automatically generated by the software used.
Figure 21: Boxplot of FEWS by Living Arrangement (Pre-Admission). The boxplot illustrates each of the pre-admission living arrangements that the patients in this study were recorded to be in and the corresponding Frailty Early Warning Score (FEWS) distribution for each of these living arrangements. On the box plot shown, the outliers (FEWS scores that lie outside the overall pattern of FEWS distribution) have been displayed. ‘Out’ outliers are represented with a small circle.
Figure 22: Dependency Level of Patients: Pre-Admission and Post-Discharge from Acute Care. The results illustrate the movement from each dependency level in patients pre-admission to the dependency level in patients post-discharge. The number of individuals in each category (Low, Medium and High) is displayed in a box beside each category. The number of individuals moving from each dependency level is also displayed in a box on each bar. Colours were automatically generated by the software used.
Figure 23: Bar Graph of Change in Dependency Level at Discharge Destination. The bar graph illustrates the change in dependency level at the final discharge destination as a percentage for all 295 patients admitted to acute care.
6.6.4: FEWS (Frailty) Groups

The patients were first categorised into 3 groups according to the tertile of aggregate FEWS scores, as has been done in similar studies involving frailty scores (Baek et al., 2016). These groups were categorised as ‘Group 1’, ‘Group 2’ and ‘Group 3’.

Figure 24 illustrates the frequency distribution of FEWS for the 295 patients, as well as the groupings.

![Figure 24: Distribution of FEWS](image)

**Figure 24: Distribution of FEWS.** This figure illustrates the frequency distribution of the FEWS from all 295 patients admitted to acute care. The patients have been categorised into 3 groups according to the tertile of aggregate FEWS scores. ‘Group 1’ (100 patients) has a FEWS of 0-3; ‘Group 2’ (127 patients) has a FEWS of 4-6 and ‘Group 3’ (68 patients) has a FEWS of 7-11. Cut-off points have been displayed with a black solid line.

6.6.5: Tests of Normality

Tests of normality were then undertaken (Kolmogorov-Smirnov and Shapiro-Wilk), for:

- ‘Complete Healthcare Professional Interactions’ (Dependent Variable) with FEWS group as the grouping variable (Independent Variable)
- ‘Discrete Healthcare Professional Interactions’ (Dependent Variable) with FEWS group as the grouping variable (Independent Variable)
• Length of Stay (Dependent Variable) with FEWS group as the grouping variable (Independent Variable)
• Discharge Destination (Dependent Variable) with FEWS group as the grouping variable (Independent Variable)

For all tests of normality undertaken, a p-value of less than 0.05 was reported, indicating that the data was not normally distributed (See Appendix H for ‘Tests of Normality’ SPSS output).

Hence, two non-parametric tests were used for further analyses: the Kruskal-Wallis test and the Mann-Whitney U test.

Of note, the Kruskal-Wallis H test does not inform which specific groups of the independent variable (FEWS Group) are statistically significantly different from each other; rather, it only informs that at least two groups were different. Determining the specific FEWS Groups that were statistically significantly different from each other (e.g. having statistically significantly different quantities of ‘Complete Healthcare Professional Interactions’), is important as there are three FEWS groups. This aids in answering the research question with greater detail. To achieve this, a Mann-Whitney test was performed.

A further advantage of these tests is that non-parametric tests (which are based on ranks or medians) are not affected by extreme values and are therefore referred to as being ‘robust’ to outliers.

6.6.6: Distribution of Healthcare Professional Interactions, Length of Stay and Change in Dependency Level at Discharge Destination by FEWS Group

The following figures illustrate the distribution of:

• The Complete Healthcare Professional Interactions by FEWS group
• The Discrete Healthcare Professional Interactions by FEWS group
• Length of Stay by FEWS group
• Change in Dependency Level at Discharge Destination by FEWS Group
Figure 25: Distribution of The Number of Complete Healthcare Professional Interactions by FEWS Group. On the box plot shown, the outliers have been displayed. ‘Out’ outliers are represented with a small circle; ‘far out’/‘extreme outliers’ are represented with asterisks.
Figure 26: Distribution of The Number of Discrete Healthcare Professional Interactions by FEWS Group. On the box plot shown, the outliers have been displayed. ‘Out’ outliers are represented with a small circle.
Figure 27: Length of Stay by FEWS Group. On the box plot shown, the outliers have been displayed. ‘Out’ outliers are represented with a small circle; ‘far out’/‘extreme outliers’ are represented with asterisks.
Figure 28: Stacked Bar Graph of FEWS Group by Change in Dependency Level at Discharge Destination. The change in dependency level status at discharge destination has been grouped into 3 categories (Higher, Unchanged and Lower), with reference to each patient’s care level pre-admission.
6.6.7: Investigating Different FEWS Groupings and Complete Healthcare Professional Interactions

6.6.7.1: Kruskal-Wallis Test

A Kruskal-Wallis H test showed that there was a statistically significant difference in complete healthcare professional interactions between the different FEWS groupings, $\chi^2(2) = 12.901$, $p = 0.002$, with a mean rank in the complete healthcare professional interactions of 123.17 for FEWS group 1, 159.50 for FEWS group 2 and 163.04 for FEWS group 3.

Of note, the Kruskal-Wallis H test does not inform which specific groups of the independent variable (FEWS Group) are statistically significantly different from each other; rather, it only informs that at least two groups were different.

6.6.7.2: Comparison of FEWS Groups (Using the Mann-Whitney Test)

A Mann-Whitney U test was used to compare the difference between two independent groups. The complete number of healthcare professional interactions in:

- FEWS group 2 was statistically significantly higher than in FEWS group 1 ($U = 4792.5$, $p = 0.002$).
- FEWS group 3 was statistically significantly higher than in FEWS group 1 ($U = 2474.0$, $p = 0.003$).
- FEWS group 3 was NOT statistically significantly higher than in FEWS group 2 ($U = 4221.5$, $p = 0.797$).

A Bonferroni corrected $\alpha$ of 0.017 (0.05/3 corrections) was applied as a correction for multiple comparisons.

The tests performed appear to support the hypothesis that the complete number of healthcare professional interactions a patient receives during their hospital episode differ based on FEWS group.

6.6.8: Investigating Different FEWS Groupings and Discrete Healthcare Professional Interactions

6.6.8.1: Kruskal-Wallis Test

A Kruskal-Wallis H test showed that there was a statistically significant difference in the discrete number of healthcare professional interactions between the different FEWS groupings,
\( \chi^2(2) = 9.854, \ p = 0.007 \), with a mean rank of 127.01 for FEWS group 1, 161.23 for FEWS group 2 and 154.17 for FEWS group 3.

### 6.6.8.2: Comparison of FEWS Groups (Using the Mann-Whitney Test)

The discrete number of healthcare professional interactions in:

- FEWS group 2 was statistically significantly higher than in FEWS group 1 (\( U = 4870.0, p = 0.002 \)).
- FEWS group 3 was statistically significantly higher than in FEWS group 1 (\( U = 2780.5, p = 0.041 \)). *(Not significant after Bonferroni correction applied)*
- FEWS group 3 was NOT statistically significantly different than FEWS group 2 (\( U = 4118.0, p = 0.586 \)).

*A Bonferroni corrected \( \alpha \) of 0.017 (0.05/3 corrections) was applied as a correction for multiple comparisons.*

The tests performed suggest that while the lowest FEWS grouping was statistically significantly different from the other FEWS groupings (only statistically significantly different from FEWS grouping 2 after the Bonferroni correction applied) the higher FEWS groupings do not statistically significantly differ. Therefore the tests performed only partially support the hypothesis that the discrete number of healthcare professional interactions a patient receives during their hospital episode differ based on FEWS group.

### 6.6.9: Investigating Different FEWS Groupings and Length of Stay

#### 6.6.9.1: Kruskal-Wallis Test

A Kruskal-Wallis H test showed that there was a statistically significant difference in the length of stay between the different FEWS groupings, \( \chi^2(2) = 11.400, p = 0.003 \), with a mean rank in the length of stay of 124.69 for FEWS group 1, 158.61 for FEWS group 2 and 162.46 for FEWS group 3.

#### 6.6.9.2: Comparison of FEWS Groups (Using the Mann-Whitney Test)

The length of stay in:

- FEWS group 2 was statistically significantly longer than in FEWS group 1 (\( U = 4886.0, p = 0.003 \)).
- FEWS group 3 was statistically significantly longer than in FEWS group 1 (U =2533.0, p = 0.005).
- FEWS group 3 was NOT statistically significantly longer than in FEWS group 2 (U =4202.0, p = 0.757).

A Bonferroni corrected α of 0.017 (0.05/3 corrections) was applied as a correction for multiple comparisons.

The results indicate a statistically significant difference between FEWS groups 1 and 3 and FEWS groups 1 and 2 in terms of length of stay. The tests performed support the hypothesis that the length of stay a patient has differs based on FEWS group.

6.6.10: Change in Dependency Level Status at Discharge Destination

The table below shows the change in dependency level status (grouped into 4 categories, with reference to each patient’s care level pre-admission) at the discharge destination for each of the patients in the study. These were: 1 (Lower) (i.e. a lower level of dependency than pre-admission), 2 (Unchanged) (i.e. a dependency unchanged since pre-admission), 3 (Higher) (i.e. a higher level of dependency than pre-admission) and N/A (Deceased).

Table 17 describes the classification of changes in dependency level.

For example, a patient who had a pre-admission living arrangement reported as ‘Home with care (Family/Friends)’ and a discharge living arrangement reported as ‘Nursing Home’ would be categorised as ‘Higher’ with respect to the dependency level status at discharge destination.

For statistical analysis, ‘Deceased’ was not included, as this was not considered a discharge destination.

Table 17: Change in Dependency Level Status at Discharge Destination

<table>
<thead>
<tr>
<th>Change in Dependency Level Status at Discharge Destination</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Lower)</td>
<td>2</td>
</tr>
<tr>
<td>2 (Unchanged)</td>
<td>180</td>
</tr>
<tr>
<td>3 (Higher)</td>
<td>87</td>
</tr>
<tr>
<td>N/A (Deceased)</td>
<td>26</td>
</tr>
</tbody>
</table>
6.6.11: Investigating Different FEWS Groupings and Change in Dependency Level Status at Discharge Destination

6.6.11.1: Kruskal-Wallis Test

A Kruskal-Wallis H test showed that there was not a statistically significant difference in the change of dependency level status with respect to the different FEWS groupings, $\chi^2(2) = 1.296$, $p = 0.523$. Therefore, the results do not support the hypothesis that change in dependency level status at discharge destination differs based on FEWS group.

6.7: Discussion

The results presented in this study confirm that many patients in this study admitted at risk of falls could be considered frail, based on the care and support they received and their FEWS scores. As explained previously, this is supported by evidence linking falls to frailty, that falls should be identified as a marker of frailty (Royal College of Physicians, 2017; Institute of Medicine (US), 1992) and that, in practice, it is used as a symptom or sign indicating the possible presence of frailty (TPP, n.d.; Clegg et al., 2016). The study additionally highlighted that the healthcare professional interactions a patient receives during a hospital episode differ based on FEWS group. From my understanding, this is one of the first studies to use data from an EPR system to investigate the care and support in this way of frail individuals.

Overall, the age group and gender mix of the sample is similar to findings in existing publications concerning older patients at risk of falls admitted to hospital (Matarese and Ivziku, 2016; NICE, 2013b; Zhang et al., 2018).

The results illustrate that there was a higher number of women (198) than men (97) in the sample. Given the sample was composed of individuals identified at risk of falls on admission to acute care, this represents some consistency with research (Hubbard, 2015; Hubbard and Rockwood, 2011). Using the EPR system, the ages of each patient were also established. In this sample, the age range concentrated around 75 to 95 years, with a mean of 83 years. This age group is consistent with expectant ages of frailty (Xue, 2011). Research illustrates that a quarter to over a half of people over 85 years are frail (Clegg et al., 2013), having increased risk of falls, long-term care and death (Fried et al., 2001; (Song et al., 2010). Based on these statistics alone, it is highly likely that a sizeable quantity of the sample would be classified as frail.
The results illustrated the predominant ethnicity of the sample being classified as ‘White (British)’ (65.4%) and ‘White (Any other White background)’ (14.9%). This is comparable to the ethnicity classifications in the borough of Kensington and Chelsea reported in the latest census, where a majority of 59.8% were classified as ‘White’ in the latest census (Baker, 2013).

17 distinct pre-admission living arrangements and 19 post-discharge living arrangements were identified from the sample, illustrating the diversity in living arrangements for frail individuals. Although stratified differently, studies have also captured the diverse living arrangements of frail people (Chamberlain et al., 2016; McCann et al., 2011). The living arrangements potentially give an insight into the various levels of frailty present – and the varying levels of care and support that may help to address the needs of frail patients. The patient flow diagram also demonstrates the complexity in patient living arrangement pre-admission and post-discharge, illustrating in some cases the varying levels of care and support that would be associated with each of the different living arrangements (e.g. in the Home setting). These may provide evidence of different levels of ‘fitness’ or ‘frailty’ and, as a result, patients who would be placed along different positions on a fitness-frailty spectrum.

Furthermore, the patient flow diagrams illustrate that although many patients may have been located in a home setting prior to admission, the frequency of care given (e.g. once daily – four times daily) could vary greatly between patients. Therefore, the availability and type of care and support each patient receives post-discharge will require great consideration and, as Waring et al. (2014) notes, the potential co-ordination and collaboration with multiple health and social care agencies. The importance of good discharge planning and post-discharge support, especially for frail patients has been evidenced in the literature (NHS England, 2014; Potthoff et al., 1997).

Though the type of location/living arrangement is not necessarily indicative of the presence of frailty, frailty can be present in individuals living in a number of different locations/living arrangements and at different levels (NHS England, 2014). The results in this study are supportive of this statement. The boxplot illustrating the distribution of FEWS by pre-admission living arrangement (Figure 21) illustrates that a range of FEWS were recorded at each of the different pre-admission living arrangements. On the boxplot, the ‘Home (Independent with all ADL)’ setting (where no external care and support has been recorded as being provided) illustrates a FEWS range of 0 to 8, suggesting a range of frailty level in individuals in this setting. In the nursing home setting, where a high level of care and support
is given, the range of FEWS is 1-11, which was setting with the highest range of FEWS in this study. Again, this suggests that a range of frailty level is present in this setting, consistent with evidence that notes the individual course and level of frailty can vary in settings (Kojima et al., 2019). Many of the other pre-admission living arrangements exhibit a similar pattern with regards to a range of FEWS recorded, apart from the Continuing Care Unit, Extra Care Housing, Hospice and Supported Living settings. Only 1 individual was recorded at each of these 4 named settings and therefore a range of FEWS are not possible. The next smallest range in FEWS was the ‘Home with care provision (1x Daily)’ setting (FEWS range of 3-6), suggesting that those in this setting had a narrower range of frailty level (compared to the other settings in this study).

Noted in this study is the living arrangement of the majority of individuals pre-admission to acute care: the home setting. This finding aligns with research by Scheibl et al. (2019) and Roy et al. (2018) who emphasise that many older people (who may be frail) prefer to live in their own residence. The results further illustrate the highest proportion of individuals reside in their own home receiving care from family and friends. This is significant, as it suggests that individuals in this setting (who are identified as being at risk of falls) do have enhanced care and support needs and may be frail.

Although numerous reasons may explain why individuals may exercise a preference to receive the care and support from family and friends, a number of reasons have been supported in literature. These include: the ability to receive care in their own home (as a preference) (Fox et al., 2017; Canadian Institute for Health Information, 2011), the cost implication of nursing home care (Sixsmith and Sixsmith, 2008) and limited knowledge of alternative housing options (Fox et al., 2017; Boyle, 2012). This study additionally evidenced individuals recorded as living at home and receiving care from once daily to 24-hour care. These individuals may have able to carry out ADLs and IADLs living at home (in some cases, with support) not requiring nursing home admission. However, research also indicates that living at home may be associated with a higher quality of life over living in a nursing home (Olsen et al., 2016), a potential perception shared by the patients in this study. Moreover, this may have fed into some of the negative ratings and articles regarding various nursing homes in the United Kingdom (Merrifield, 2017; Campbell, 2017; Matthews-King, 2018), which may further influence the decision to receive care and support at home over nursing home care.
The second highest pre-admission living arrangement was ‘Home (Independent with all ADL)’. It is possible that these people were not frail and not in need of any care and support. However, this could also represent a population that did not address or recognise their frailty – and therefore did not receive any care and support. For example, a study that took into consideration 641 older patients found that 47% of the patients with frailty did not recognise frailty, or the increased care and support needs associated with frailty in themselves (van Campen, 2011; Nicholson et al., 2016). In this study, a high proportion of individuals who may have required enhanced care and support may have actively chosen to remain independent, because of the association with frailty and the need for care and support (NICE, n.d.). This may be because ‘frail’ has been shown to be a negative label, associated with higher levels of dependency, end of life and cancer syndromes (BritainThinks, 2015).

Although there was not a statistically significant difference between FEWS groupings and change in dependency level at the discharge destination, this study noted the care and support given to the patients. In Figure 22, many (but not all) living arrangements both pre-admission and post-discharge are classified as having ‘Medium’ levels of dependency, suggesting that overall, the patients in the sample have a range of care and support needs.

Of all the transitions observed, the highest post-discharge living arrangement recorded was the nursing home setting. This setting is indicative of an elevated need for day-to-day care and support, which may not be available in an individual’s place of accommodation pre-admission. As such, as Kojima (2015) notes, the expected level of frailty in individuals residing in nursing homes is said to be high. Moreover, access to specific care and support, such as managing a condition, or providing the right types of food or drink may be better delivered in a nursing home setting, as pointed out by Lloyd et al. (2019) – especially if standard services do not provide sufficiently accessible support (British Geriatrics Society, 2018e). These factors may have influenced the discharge decision regarding the individuals in this study. Of note, however, is that the EPR data does not detail whether a move to a nursing home was temporary (i.e. for re-enablement), which could be a significant number (as highlighted by Steventon and Roberts, 2012) or permanent.

As frailty has been defined as a dynamic process (Lang et al., 2009) that can be made better or worse (British Geriatrics Society, 2014), more research is needed to fully understand the levels of individual frailty pre-admission and post-discharge. For example, in this study, a large proportion of individuals were discharged to a nursing home, who did not previously have this
living arrangement. It may be possible, however, that the care and support provision available in a nursing home was required (but not given) pre-admission – which is why the individual is being discharged to this location. Alternatively, it could also transpire that an individual has become more frail after their fall (i.e. prior to admission) – and upon admission to acute care. As a result, they may require care and support that would be deemed (by the discharge team) best available in a nursing home setting, which Lloyd et al. (2019) also suggest may prevent a potentially avoidable emergency admission in the future.

Also noted in this study is the large proportion of patients dying after admission. A decision to admit a patient to acute care is based on a need for tests, medical treatment or surgery, as the patient is not deemed medically fit enough to return home (NHS, 2019a). However, as Hyatt et al. (2018) note, the health status of admitted patients may worsen during their hospital episode, with the individual becoming more frail. It has been stated in the literature that frailty is associated with a higher likelihood of death (Hogan et al., 2017). In this study, evidence of this association may be substantiated by a large proportion of individuals dying after being admitted to acute care.

This study also established patterns in the lowest pre-admission living arrangements and post-discharge living arrangements, giving evidence that the hospice and continuing care unit settings had the lowest proportion of the sample in these locations. In Kensington and Chelsea, where the hospital in this study was based, the mental health continuing care unit is described as a place for ‘older people who have advanced cognitive impairment or severe and enduring mental health needs’ (Central and North West London NHS Foundation Trust, 2019c). This study did not investigate the presence of any comorbidities each patient had been admitted to hospital with, which Finch et al. (2015) suggest may especially be apparent in ‘Falls’ patients. Further research could be undertaken to understand whether and how the lowest pre-admission and post-discharge living arrangements are related to the quality of care, choice of the patient and/or other factors.

The majority of patients in this study exhibited evidence to suggest that they were not dependent on healthcare professionals for their care and support needs, choosing to be dependent on their family and friends. Low levels of dependence (compared to post-discharge) could represent a desire to foster autonomy, dignity and quality of life (Vernooij-Dassen et al., 2011), especially if dependency threatens the self-esteem of the individual (Bolger and Amarel, 2007).
The higher level of dependence has been evidenced through a large proportion of patients being discharged to a nursing home, or care setting with carers or family support. Harrison et al. (2017) report that discharge to long-term institutional care, such as a nursing home following acute hospitalisation is a common occurrence. Comparing this outcome with HES data could indicate whether the proportion discharged to nursing homes is more/less than expected for this classification of ‘Frail Individual’. Of importance, however, is to consider that the discharge setting is not necessarily an endpoint – and may form one of several transitions within a patient care journey (Waring et al., 2014; Ellins et al., 2012). At Chelsea and Westminster hospital, the discharge policy is to discharge a patient to their home as soon as they are medically ready, with community services should they be required (NHS Chelsea and Westminster Hospital, 2017). A ‘Home first’ initiative, aiming to discharge a patient with therapies and social care taking place in the patient’s home, may further explain the study finding of a higher number of individuals with enhanced care in their own home when compared to pre-admission (NHS Chelsea and Westminster Hospital, 2018).

Using FEWS as an indicator of frailty, this study illustrated that the complete number of healthcare professional interactions differed based on FEWS group, with a statistically significant difference between the lowest and middle FEWS groups (1 and 2) and lowest and highest FEWS groups (1 and 3). A statistically significant difference was not found in the middle and highest FEWS groups. As research has highlighted resource and workforce challenges or pressures (Berwick and Ham, 2017; NHS, 2017b), knowledge of the complete number of healthcare professional interactions a patient has during their stay may support the discharge decisions and the necessary care and support received post-discharge (Age UK, 2016). This finding could indicate that in the acute location patients in this study were admitted to, increasing frailty scores resulted in an increasing number of the complete healthcare interactions received. Arguably, however, the results in this study do not demonstrate a predictiveness good enough to be used in acute care with regards to the complete number of healthcare professional interactions.

The results in this study additionally illustrated that the discrete healthcare professional interactions a patient received during their hospital admission differed based on FEWS group. The results further illustrated that there was a statistically significant difference between the lowest group of FEWS scores and the highest FEWS scores, suggesting that patients with higher frailty scores (as defined by FEWS) would, on average, interact with a higher number of discrete healthcare professions than those with lower frailty scores. This finding may
indicate that in the acute location the patients in this study were admitted to, increasing frailty scores resulted in an increasingly multidisciplinary approach. Addressing the needs of a frail individual with a multidisciplinary approach has been recommended in the literature (Cesari et al., 2016) – and has been described as an ‘essential element of good practice’ (Parker et al., 2006).

This study also found that different lengths of stay a patient has during their hospital episode differed based on FEWS group. Again, given the fact that FEWS is derived from routinely collected data, this finding could be useful for hospital planning. For example, predicting length of stay on admission could aid in helping schedule the admission of elective patients and/or the allocation of healthcare professionals (Robinson et al., 1966; Walczak, Pofahl & Scorpio, 2003). Tsai et al. (2016) emphasise that this may especially be the case when resources are limited. Given that literature has suggested that length of stay is difficult to predict and only often done retrospectively (Walczak, Pofahl & Scorpio, 2003), this finding may offer benefits to the planning of resources within hospitals.

The change in dependency level of the discharge destination did not differ based on FEWS group. This illustrates that FEWS is not predictive of change in dependency level of the discharge destination. Nevertheless, this study did evidence that many patients in this study were receiving varying levels of care and support (based on the recorded living arrangements pre-admission and post-discharge). This could support the notion that as frailty can present in several different ways and levels, personalised care planning and tailored care may be needed to address the range of care and support required (NHS, n.d.1; NHS England, 2014).

Overall, identifying frail older people in hospital (e.g. using FEWS) can highlight this group of people (as ‘frail’ people not routinely captured in hospital coding systems), which can help contribute towards efforts to provide frailty-attuned care and improve patient and service outcomes (Gilbert et al., 2018).

6.7.1: Generation of New Evidence

This study adds further understanding to the living arrangements of patients pre-admission and post-discharge, many of whom could be classified as ‘frail’. Moreover, an insight into the care and support of the patients is illustrated in these locations. The use of FEWS as an indicator of frailty to greater understand how professional interactions differ based on FEWS group is a novel use of this score. In addition, the study findings evidence how length of stay and change in dependency level at the discharge destination differ (or do not) based on FEWS group.
6.7.2: Strengths

There are many strengths to this study. One strength of the study is the ability to examine and investigate a relatively large sample of frail individuals with high fidelity. Using an EPR system to abstract the necessary data enabled one to investigate more individuals (295) than would be possible with face-to-face interviews within the given time frame. Moreover, abstracting the data from the EPR system offered more information and granularity than requesting a larger data extract from the NHS, such as through the HES data warehouse.

6.7.3: Limitations

One of the main limitations of the study is the method in which the data was abstracted from the EPR system. Requesting a data extract from the data warehouse would not have been possible within the given time frame. Therefore, the data concerning each individual was manually abstracted, which has time implications. Every effort was made to avoid data abstraction/entry errors; all data collected was double-checked for accuracy (by DS). Only one person was responsible for data collection and checking (DS), ensuring that the data entry process remained standardised throughout. Accuracy was prioritised over speed throughout the data collection process.

Another limitation is the classification of the ‘Frail Population’. In this study, due to data access approvals, the ‘Frail Population’ consisted of patients over 65 years and classified at risk of falls (having had a fall as a presenting complaint). This is a recognised bias; as such, it should be noted that the data presented here is of the care and support of frail individuals limited to those satisfying this criterion. Other studies may define a ‘Frail Population’ differently (e.g. over 65 years old and presenting with delirium), which may influence the size of the population studied and may result in different findings to this study.

The data abstracted from the EPR system could not be confirmed in person with clinicians in the hospital for each of the 295 patients studied. Although the policy at Chelsea and Westminster hospital is to record all interactions in the EPR system, it is possible that not all interactions were recorded. Further, the recorded EPR data does not detail whether a move to a location (e.g. nursing home) was temporary or permanent.

As the FEWS score assigns a score of 1 for each descriptor, it is possible that the extent of an individual’s frailty may not be accurately captured by the score. More research is required to determine the weighting of each descriptor, so that the extent of an individual’s frailty is
accurately captured. As such, the range of FEWS for ‘low’, ‘medium’ and ‘high’ frailty (as used in this study) may change slightly as the score is refined.

6.8: Conclusions

This study highlights the many different places that this ‘frail population’ may be located pre-admission to acute care and post-discharge. As shown, a range of living arrangements could be home to a frail individual, representing a range in levels of care and support. Use of a frailty score such as FEWS could be used in the acute care setting to identify frail individual and the score could help contribute towards care and support planning. For example, this study established that regarding the complete healthcare professional interactions a patient received and length of stay, there was a statistically significant difference between the lowest and highest FEWS groups (1 and 3). This suggests that patients in FEWS group 3 received more interactions and had a longer length of stay patients in FEWS group 1. This information may help to identify patients who would benefit most from a CGA. Further research would be required to ascertain whether patients with a higher number of discrete healthcare professional interactions during their hospital admission were in fact getting a CGA. As a result of this information, patients may receive the care and support that they require – potentially reducing hospital readmissions and increasing the ability for them to live longer in better health.

6.8.1: Key Points

- This study aims to investigate the complexities involved in the care and support of different frail individuals – and how they change pre- and post-admission to acute care
- This study illustrates a significant number of locations/living arrangements in which frail individuals can reside in, in addition to the variation in the levels of care and support that they receive in each of these locations/living arrangements.
- Of the sample of 295, the most common transition was from a home setting (with various levels of care and support) to a nursing home setting.
- This study illustrated that in the sample analysed, the complete number of healthcare professional interactions, discrete healthcare professional interactions and length of stay differed based on FEWS group.

6.8.2: Implications for Practice

Many implications for practice can be drawn from this study. The study supports the notion that frailty is influenced by many interactive pathways, at multiple temporal and spatial scales
Fried et al., 2005). Notably, the results of the study illustrate that a large proportion of the sample who were not initially in a nursing home pre-admission were discharged to a nursing home after their stay in acute care. This raises several different questions. There are questions concerning why such a large proportion of the patients are discharged to the nursing home setting – a setting which represents frail individuals needing enhanced care and support. This finding may suggest that individuals were not receiving adequate care and support prior to admission. The finding that the complete number of healthcare professional interactions and discrete healthcare professional interactions differed based on FEWS group could be used in acute care to help teams with resource planning in acute care and with discharge processes.

6.8.3: Implications for Research

This study employed various techniques to help investigate the care and support of frail individuals. Although using large data sets is not new, there is limited research using an EPR system to investigate pre- and post-admission living arrangements. This method could have many advantages; one can investigate in relative detail a large population without having to interview each patient face-to-face. Moreover, the information recorded in the EPR system is likely to be more detailed than what is recorded in other systems, such as HES.

This study used FEWS as an indicator of frailty to understand whether healthcare professional interactions during admission, length of stay and change in dependency level differed based on FEWS group. Opportunities exist for other researchers to examine whether other events during admission and post-discharge differ based on FEWS group. Other research could also extend the approach by using a different score to indicate frailty in acute care (e.g. use of the CFS). The findings could then be compared to those found in this study examining the agreement between the two scores.

6.8.4: Further Work

The population deemed ‘frail’ in this sample were taken from data collected from June 2015 – January 2016. Hence, the findings in this study may only apply to this time period. Therefore, this study could be extended to incorporate a population over a period of greater than one year could be done (and therefore a larger population) to establish whether similar patterns are evident across a bigger timescale.

Also, this study used data collected from one hospital site. Expanding the sample to include hospital data from multiple hospitals across the UK would help to understand if there are
variations in care and support across a larger geographical area. Limitations, however, will have to be considered – the methods used in this study are time-consuming and could have implications on how further work in additional hospitals is conducted. Moreover, given the non-standardisation in EPR systems used, there is no guarantee that the same type of data will be able to be abstracted from the EPR systems used in the other hospitals (if EPR systems are even used).

6.8.5: Link to Next Study

This study examined the use of a novel frailty score, FEWS to investigate whether different patient outcomes differed based on FEWS group. Also, this study investigated the care and support pre-admission and post-discharge (via living arrangement). Importantly, this study found the most common post-discharge living arrangement was nursing homes. This is a setting a person’s frailty may be high/severe (Shah et al., 2013) and therefore has high care and support needs. Thus, the nursing home setting was confirmed as the next logical progression from this study to examine (the last setting in a potential frailty pathway) (schematically displayed below).
Schematic E: Link to Next Study
Chapter 7: The Nursing Home Setting

The findings presented in this chapter have been published in BMC Geriatrics (Sunkersing et al., 2019). As lead and corresponding author of the published article, I was responsible for the initial study aim, design, analysis, interpretation of results, conclusions, writing of the first draft and contributing to revisions. Parts of the data collection and mapping exercise in this study were conducted with an additional researcher, Ms. Maria Woringer (MW). Two of my supervisors, Professor Derek Bell and Professor Finbarr Martin provided clinical knowledge and expertise for the mapping of the assessments. All authors on the final publication contributed to the final data interpretation and revisions.

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The presented text is adapted and/or expanded from the published article.

7.1: Introduction

This chapter describes the study which aims to understand the ‘assessments for frailty’ used in nursing homes across North-West London.

In this thesis, ‘care homes with nursing’ are referred to as ‘nursing homes’. In the previous chapters, two distinct and different settings were investigated: the community setting and the acute setting. In this setting, many individuals are likely to be frail – and their ability to carry out activities of daily living independently has been reduced. They are therefore likely to have varying care and support needs. This study will further demonstrate the variation and complexity that exists in assessing for frailty (which would help identify care and support needs), giving some insight into the domains of frailty that are currently considered important in the assessment of nursing home residents.

7.2: Setting the Scene

This section gives a background to care homes and specifically nursing homes, the associated residents and care and support given in these settings.

7.2.1: Care Homes in the UK - A Background
Recent UK estimates state that 410,000 older people aged 65 years and over currently live in care homes, with this figure representing 16% of older people aged 85 and over (British Geriatrics Society, 2016a; Competition & Markets Authority, 2017). The older people’s UK care home industry has a £15.7 billion market value, which is approximately 1% of gross domestic product (GDP) (Laing, 2017). Recent statistics suggest that there are 5,500 different UK care home providers, operating 11,300 care homes (Competition & Markets Authority, 2017), with a 91% average occupancy rate (Laing, 2017). At the time of writing, costs for care homes range from £500 per week to over £1000 per week (Laing, 2017).

‘Care home’ is an umbrella term, referring to a number of different types of care environment, each offering a distinct range of services and level of care to residents, dependent on need. Individuals may be advised to transition to a nursing home by a healthcare professional, family/friends or on their own accord.

Detailed below are common types of care home currently in existence.

**Table 18: Type of Care Home and Associated Characteristics**

<table>
<thead>
<tr>
<th>Type of Care Home</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Care (Care Homes)</td>
<td>Provide help with personal care and ADLs such as washing, dressing, taking medication, often available 24 hours per day. May offer social activities, such as day trips.</td>
</tr>
<tr>
<td>Care homes with nursing (Nursing Homes)</td>
<td>Provide 24-hour personal and nursing care and help with ADLs, delivered by or under the direction of qualified nurses.</td>
</tr>
<tr>
<td>Specialist Care Homes</td>
<td>Provide specialised care for young and physically disabled, or if an individual suffers from neurodegenerative diseases or disorders such as Alzheimer’s disease, dementia or Parkinson’s disease.</td>
</tr>
<tr>
<td>Dual-registered Care Homes</td>
<td>These care homes will accept residents initially requiring personal care – and potentially requiring nursing care at a later stage.</td>
</tr>
</tbody>
</table>
The ownership of care homes can be by local councils, private organisations or charity organisations. Nursing homes can generally be placed into two categories: corporate chains (homes belonging to a large company owning multiple nursing homes with a similar aim and organisational structure) and independently owned homes (homes often belonging to one organisation or family, not part of a chain of homes).

An individual may decide to move into a care home for several reasons. For example, a move may be decided due to a progression in their care and support needs, or following a crisis, such as a hospital admission. As Alaszewski et al. (2003) highlight, the decision to move into a care home may also occur after a ‘joint assessment’ has been conducted. Joint assessments are one-off meetings conducted where the patient is (e.g. a hospital or community setting), intending to assess care requirements and plan provision accordingly.

The key professional members usually present at these meetings are: a nurse, a care manager, occupational therapist/physiotherapist, the patient and often immediate family or informal carers. This group considers the professional assessments of the multidisciplinary team together with the patient’s preferences as part of the care planning process (Alaszewski et al., 2003). Once consensus is reached, the resulting package of care is recommended and issued. This package of care can be provided by the NHS or social services (or a mixture of both) (Alaszewski et al., 2003; Age UK, 2018b). Packages of care can range from domiciliary care services and adaptations or equipment in the patient’s place of residence, through to a recommendation of a move into a care home (NHS, 2018c).

7.2.1.1: Care Home Residents

Many residents in care homes live with complex health and social care needs, with many classified as frail (Kojima, 2015). Likewise, a recent report published in The King’s Fund stated that it is ‘increasingly rare for anyone to enter a care home without very high levels of frailty, complex health care needs, dementia or disability’ (Oliver, 2016, p.1). As such, moving into a care home often indicates that an individual requires elevated care and support on a day-to-day basis – and that this care and support may not be available in their current place of accommodation (Gugliucci, 2014).
Within a care home setting, a number of different and specific services may be available for residents, influencing their decision, or recommendation from a social or healthcare professional, to move into a care home. Since the health needs of residents are likely to be complex with many exhibiting some form of disability, specific care and support access, (e.g. managing a condition, or providing the right nutrition) may be better delivered in a care home setting. This may be especially the case if standard services available and accessible to individuals do not provide sufficient care and support (British Geriatrics Society, 2016a). In care homes, the presence of staff 24 hours a day, some of whom will be qualified as care assistants, may help to reduce predictable acute events (e.g. urinary infections or pneumonia), unnecessary progression of long-term conditions and reduce the risk of injuries such as falls and fractures (British Geriatrics Society, 2016a; Oliver, 2016).

A Bupa commissioned report established that approximately 27% of people live in care homes for more than three years (Forder and Fernandez, 2011). The report additionally established that after admission to care homes, residents had a 55% chance of surviving the first year – and of those living nearly 70% of surviving a second year, before falling back over the years that followed. As such, moving into a care home can be a critical life experience, with potentially significant changes in physical, social, mental and environmental domains, as well as financial implications (Riedl et al., 2013; Competition & Markets Authority, 2017).

Arguably, the life expectancy of residents will be intrinsically linked to their physical, social, mental and environmental health needs. The specific needs of each individual would be best understood by assessing an individual for these needs – e.g. by assessing for frailty. Moreover, as people’s needs change over time, there is a need for ongoing assessment, enabling the adjustment of care and support received, in addition to regular liaison with external health and social care agencies.

7.2.1.2: Regulation of Care Homes

All care homes must be compliant with CQC general standards. The CQC is the regulator for health and social care in England responsible for setting standards, monitoring and inspecting registered services and potentially closing services.

Presently, the CQC lists 13 ‘Fundamental Standards’ online which health and social care services, such as care homes must adhere to – and are measured against (CQC, 2019b). These standards cover aspects such as care and treatment, the experience level and training of staff.
and the cleanliness of premises and equipment. In addition, in an inspection of a care setting, the CQC asks five key questions to help identify any risks associated with the care setting and help understand whether the setting is safe. These questions are: ‘are they safe?’, ‘are they effective?’, ‘are they caring?’, ‘are they responsive to people’s needs?’ and ‘are they well-led?’ (CQC, 2016b). Despite this, recent evidence proposes that the measurable impact of CQC inspections are small and mixed (Smithson et al., 2018; Hawkes, 2018).

Other than demonstrating compliance with the expected standards and regulations detailed by the CQC, there are no mandatory requirements regarding how care homes should be run and/or managed. Accordingly, care homes can exercise some degree of autonomy, which Gartshore et al. (2017) emphasise can lead to variations in care homes.

7.2.2: Nursing Homes in the UK

The number of UK nursing homes registered with the CQC has declined since 2013, where there were 4,660 nursing homes, to 4,438 nursing homes in 2018 (CQC, 2018). This has occurred while the UK population – and, notably of individuals aged 65 and over, has increased dramatically over the past decade; around 18.2% of the UK population were aged 65 years or over at mid-2017, compared with 15.9% in 2007 – with this figure projected to grow to 20.7% by 2027 (ONS, 2018).

A nursing home may be advised as best to help meet the specific care and support needs of an individual, particularly if access to a registered nurse 24 hours a day is deemed important. This is not available in a care home. Despite this, given the increase in the likelihood of individuals requiring help with care and support, a reduction in nursing home places constrains the capacity of health and social care. This is especially notable when several health and care organisations are reported to be struggling to recruit, retain and develop their workforce to meet the needs of the people they provide care for (CQC, 2018).

7.2.3: Life in a Nursing Home

As a move into a nursing home can be a significant transition (Riedl et al., 2013), nursing homes have a responsibility to ensure that the care and support given sufficiently meets the national standards of quality and safety outlined by the CQC. This includes certifying that the nursing home is safe, effective, caring, responsive and well-led (CQC, 2016b). Moreover, being an environment consisting of a multidisciplinary range of health and social care staff, a ‘duty of care’ is expected from all occupations and levels (UNISON, 2013). To achieve this,
a number of different elements should be considered for nursing home residents, including the recognition and importance of distinguishing between ‘ageing’ and ‘ageing well’ (Department for Work & Pensions, 2015; Department of Health, 2014).

Research acknowledges that ‘ageing well’, is composed of a range of different factors, including physical, mental and social domains (Department of Health, 2014). In line with this, when older individuals were asked what they believed ‘successful ageing’ to be, answers including ‘contentment with life’, ‘socially connected’ and ‘able to pursue their own interests’, were some of the responses given (Department of Health, 2014; Friedman, 2012). Evidently, ‘successful ageing’ encompasses several domains; the difference between ‘ageing’ and ‘ageing well’ is dependent on a whole range of different factors.

Given that over 400,000 people are estimated to be living in care homes (a term encompassing both nursing homes and residential homes) in the UK (NIHR ENRICH, 2019; Laing, 2017), addressing the complex and multidimensional aspects of the ageing process (Dionigi, 2015), can help ensure a good quality of life is achieved for this significant population.

7.2.3.1: Formation of Care and Support Initiatives in a Care Home/Nursing Home

Given the many UK providers of care homes (approximately 5,500), several initiatives and vanguards have been set up to focus on and, in some cases, improve the care and support in the nursing home setting. Within some of these vanguard areas, nursing homes work closely with the NHS, local authorities, the voluntary sector, carers and families (NHS, 2016). Some themes identified by one initiative included: facilitating a positive transition for residents and relatives, maintaining dignity and identity, sharing decision making and creating and maintain community links (Penney, 2015). The UK Government has an additional role in encouraging and promoting good care and support practices, providing initiatives and national care provider organisations with training, support and finance where needed (HM Government, 2012).

One initiative, ‘My Home Life’, notes that the increasing levels of frailty within care homes (both nursing and residential homes) is a fundamental issue needing consideration when care and support is given (Owen et al., 2012). While defining ‘good’ care and support practices is subjective, as mentioned earlier in this thesis, national guidance emphasises that any interaction between an older person and a health or social care professional should include an assessment for frailty (British Geriatrics Society, 2014). Recently, frailty care and support has been further highlighted in the NHS ‘Frailty Toolkit’ (NHS Rightcare, 2019). The document noted that an
action to take across health and care settings was to better understand, identify and assess for frailty (NHS Rightcare, 2019).

7.2.4: Frailty in Nursing Homes

Given many residents of nursing homes will be 65 years older with enhanced care and support needs, the prevalence of frailty is likely to be high – and arguably higher than in other settings. In the nursing home setting, the prevalence of frailty has been investigated in a range of studies, often using different operational definitions of frailty. At present, no standard operational definition on frailty in nursing homes exists, leading to variations in reported prevalence of frailty. As an example of this, one study reported a range of 1.70% to 76.3% depending on the diagnostic tool for frailty used (Buckinx et al., 2017). Using the Fried criteria, 68.8% of individuals were classified as frail (González-Vaca et al., 2014), in 85% of individuals using a range of different frailty related assessments (Kanwar et al., 2014) and in 34.9% of individuals using the Rockwood criteria (Matusik et al., 2012).

Evidence has additionally suggested that there is an association between frailty and higher risk of institutionalization (Rockwood et al., 2006) and that many conditions related to frailty were apparent in nursing homes (Kojima, 2015).

Nevertheless, reported values of frailty prevalence in nursing homes will vary due to different degrees of dependence, age range or operational definition of frailty used (Buckinx et al., 2017).

7.2.5: Identifying and Assessing for the Presence of Frailty in Nursing Homes.

As in other settings, identifying frailty is problematic, due to its multifaceted and highly complex nature (Bergman et al., 2007). At present, limited evidence exists regarding the practices used to identify and/or assess for the presence of frailty in the nursing home setting (Shepherd et al., 2017; Davies et al., 2014). According to the BGS ‘Fit for Frailty’ publication, there are five frailty syndromes (falls, immobility, delirium, incontinence and susceptibility to side effects of medication), which may help identify frailty in nursing home residents (British Geriatrics Society, 2014). In practice, the identification and assessment for frailty may not be carried out by permanent nursing home staff – and instead by GPs and/or geriatricians.

Despite this, a CQC report found that, from a sample of 81 care homes, only 44% of care homes indicated that GPs undertook scheduled surgeries or visits in the care home (CQC, 2012). Although all residents will have a GP by legal entitlement, the report suggests that some care
homes only call upon GPs in response to issues that may arise (i.e. a reactive approach). Conducting assessments for frailty (and of frailty) may help identify a resident’s needs and help to proactively manage and/or reduce potential issues.

In other settings with likely frail individuals, recommendations for the identification and assessing for frailty suggest comprehensive assessment and holistic consideration across a patient’s physical, social, mental and environmental health circumstances (British Geriatrics Society, 2014; Welsh et al., 2014). However, multidisciplinary assessments such as the CGA, which Oliver et al. (2014) report have demonstrated to improve the health and wellbeing of older patients with frailty, have ‘not yet been implemented at scale and pace across the care home sector’ (Gordon, 2015, p.1). A recent study suggests that conducting a CGA may not even be a feasible way of assessing ongoing needs (Chadborn et al., 2019). This is significant, as this setting is where many of the frailest individuals in the population will live.

Besides the possibility of a needs assessment being carried out via a local council before admission into a nursing home (NHS, 2018c), recent studies have emphasised there is limited evidence for much of the care provided in care homes (Shepherd et al., 2017; Davies et al., 2014), (which includes the individual practices of identifying and assessing for frailty in nursing homes) particularly in the UK (ENRICH, 2020).

Importantly, research indicates that nursing home residents have complex healthcare needs (British Geriatrics Society, 2018e). These complex care needs include multi-morbidity, functional dependency and frailty. Assessing for frailty is important, as, along with other factors, nursing home residents are likely to have better health outcomes if comprehensive, multidisciplinary assessments are conducted from trained specialists (British Geriatrics Society, 2018e).

**7.2.6: Why Investigate Assessment Use in Nursing Homes?**

As stated, there is limited evidence for much of the individual practices regarding care and support in nursing homes (Shepherd et al., 2017; Davies et al., 2014), in addition to recent calls for further research in this setting (ENRICH, 2020). Further, improving the care and support of older people (of which an ‘assessment for frailty’ is a component), particularly in care and/or nursing homes remains a major UK government priority (NHS, n.d.1, NHS Rightcare, 2019; ENRICH, 2020).
Further, while compliance with general standards set out by the CQC must be met, there are no mandatory requirements regarding the specific methods or tools to assess the frailty of residents. To better understand the assessment(s) for frailty of residents within this setting, there is a need to first establish what is being used, including tool usage and domain coverage. This could support improvements in the overall care and support of frail individuals, having an additional benefit on their day-to-day living in the nursing home. Moreover, appropriate levels of care and support engender a proactive approach, which may reduce the likelihood of crises, such as a fall.

7.2.7: Challenges to Research in Nursing Homes

7.2.7.1: Research/Academic Level

Though nursing homes represent an important sector of care in the UK and globally (Competition & Markets Authority, 2017; UBS, 2017), research highlights the many challenges that persist regarding research in nursing home care (Quadagno and Stahl, 2003; Lam et al., 2018). These challenges can span several areas and can present methodological issues towards researching this setting. One study conducted by Hall et al. (2009) identified that in London, many concerns were identified through qualitative interviews in two nursing homes. These included finding opportunities to conduct interviews and the involvement of care home staff. At a conference, several concerns were raised around nursing home care including the care given, access to care, consumer preferences and decision making (Quadagno and Stahl, 2003). Challenges and concerns such as these affect the way research has been targeted towards nursing homes – and attitudes of nursing homes to participate in research studies.

7.2.7.2: Public/Social Concerns

One further challenge that nursing homes are facing, is their current perception from the public – largely influenced by media reports alluding to findings such as poor leadership, staff shortages and poor standards of care (Campbell, 2017; Cawley, 2018; Atkinson, 2016). Combined with the ability of the CQC to monitor, inspect and regulate nursing homes – they additionally can place a nursing home into ‘Special Measures’, whereby services are not deemed to provide adequate care. Nursing homes placed in ‘Special Measures’ will be provided with a specific framework which must be adhered to within a stated timeframe. If the CQC determines that insufficient improvements have been made upon re-inspection, the nursing home could ultimately be closed down (CQC, 2015).
As evidenced previously, many UK nursing homes are facing increased pressure and scrutiny from both internal and external sources. This may perpetuate a reluctance to participate in research – or any practice that could potentially highlight inadequate care or management within a nursing home.

7.2.8: Potential ‘Assessments for Frailty’ in Nursing Homes

Presently, many frailty assessment tools and resources have been reported, which are used across different disciplines and settings (Buta et al., 2015; NHS England, 2018a). Many UK nursing homes will assess an individual before they become a resident of the home. This would commonly be referred to as a ‘Pre-admission’ checklist or assessment, though this would potentially vary between homes. Assessing for frailty in individuals may not necessarily form part of this ‘Pre-admission’ checklist or assessment and other assessment tools or practices may be used to determine frailty, if at all (Royal College of Nursing, 2020).

Based on previous thesis findings, a number of different ‘types’ of assessment exist. These can range from a comprehensive assessment, which often covers many different aspects of an individual’s health – to a partial assessment, where an assessment will be shorter in nature. Nursing homes may conduct an ‘ongoing assessment’, whereby an individual will be assessed at multiple stages throughout their residence with the same assessment (Royal College of Nursing, 2020).

7.2.9: ‘Assessments for Frailty’ Used as an Indicator of Care and Support

In this study, the ‘assessments for frailty’ used in each participating nursing home are used as an indicator of one aspect of care and support in the nursing homes. In the thesis introduction, the many components of care and support were described, one of which was the recognition of need, which can be ascertained using an assessment (Figure 4).

Although not examined in this study, the assessments used could additionally indicate the quality of care in nursing homes. For example, in the literature, the quality of care in nursing homes has been defined both as an input measure and as an outcome (Kruzich, Clinton and Kelber, 1992). Further to this, the Institute of Medicine (IOM) details that quality can be approached in terms of three concepts: structure, process and outcome (Wunderlich, Sloan and Davis, 1996). ‘Assessment’ has been identified as a process measure of the quality of care in nursing homes (Wunderlich, Sloan and Davis, 1996). Process measures, such as ‘assessment’, have been said to examine the actual services provided to or on behalf of residents (Wunderlich,
Sloan and Davis, 1996). Moreover, it has been stated that given the length of stay of residents in nursing homes is often long (commonly months or years), process measures often assume greater importance than they do in hospitals (Wunderlich, Sloan and Davis, 1996).

In a similar vein, the British Geriatrics Society states that nursing home residents are likely to have better health outcomes if health services reflect their needs, with attention to comprehensive, multidisciplinary assessment (British Geriatrics Society, 2018).

7.3: This Chapter in Relation to the Overall Thesis

This study forms part of a modular approach to address the research questions outlined in the aims and introduction to the overall thesis. The thesis has so far investigated two distinct settings: the community setting and the acute setting. These settings have been chosen for their correlation with the progression of frailty in an individual – and the correlation between the ability to carry out ADLs independently. The nursing home setting represents a setting where there is a likely and discernible progression of frailty (potentially at the highest level compared to other settings studied in this thesis) and an increased need for support with conducting ADLs.

The overarching research question of the thesis is to understand how the care and support of frail individuals manifest across the frailty spectrum. Frail individuals will have specific care and support needs; assessing for frailty in individuals will give an insight into how these care and support needs are identified.

7.4: Overall Aim

This study aims to establish what constitutes an assessment for frailty within nursing homes, including the key components and frailty domains contributing towards the assessments for frailty.

7.4.1: Research Questions

The specific research question for this study was:

**What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?**

Supporting research questions addressing this specific research question:

*a) In North-West London, what assessment tools for frailty are being used? Are these tools standardised or non-standardised?*
b) If assessments for frailty are being used, what is their nature with respect to the four domains of frailty?

c) Is there a difference in the number of assessments used in corporate chain owned nursing homes vs independently owned nursing homes?

d) Which health professionals are using the assessment tools?

e) Why are the assessment tools being used (purpose)?

f) How are the assessments documented, or stored (e.g. electronically or on paper)?

7.5: Method Summary

An online survey (questionnaire) approach was used to address the research questions to obtain responses from nursing homes across North-West London (Appendix I). Responses to the survey were provided by the nursing home managers of each home. Data analysis comprised both quantitative and descriptive analyses. The four domains of frailty referred to (physical, social, mental, environmental) are based on the Soong et al. (2013) model of frailty. Full details of methods are described in Chapter 3 of this thesis.

7.5.1: Rationale for Not Conducting an Observational Study

One common method which could be used to investigate whether assessing for frailty is taking place (and is multidisciplinary) is by conducting an observational study. An observational study would document the ‘assessments for frailty’ actually received in practice by residents of the nursing homes.

In this study, all eligible nursing homes within North-West London were contacted to ask whether a site visit and/or access to data would be possible. Two nursing homes agreed to a site visit, yet this was restricted to a discussion with the nursing home manager only. No data access from any nursing home was possible. Patient confidentiality, ethical reasons and privacy were stated as reasons (if given) why data access could not be granted.

The factors detailed above precluded an observational study in the nursing home setting within North-West London. Therefore, as an alternative, I opted for an online survey only to ascertain
what the nursing homes stated that they did for ‘assessments for frailty’. The ‘assessments for frailty’ used could be seen as a component of the service (i.e. care and support) received by residents in nursing homes.

7.5.2: Rationale for Not Using CQC Ratings in This Study.

As explained, an ‘assessment for frailty’ could indicate the quality of care provided by nursing homes for older residents. The only systematic assessment of the quality of nursing homes is that done by the CQC (CQC, 2019a; CQC, 2019c). Therefore, using the CQC ratings may have enabled a further investigation between the assessments and the quality of general care in the nursing home setting. Thus, the CQC database was interrogated to understand whether the inspection reports and ratings could be used to understand the quality of care, particularly for frail individuals residing in the nursing homes. However, for this study, it was decided that the CQC database would not be suitable for the following reasons:

- **Participating nursing homes were not rated with a consistent CQC rating system (either old or new CQC rating criteria used)**

  Participating nursing homes had all been CQC rated. However, when using the most recent CQC rating (to the time the online survey (questionnaire) was completed), the nursing homes had either been rated using an old rating system or a new, presently used, rating system. The new CQC rating system consists of new categories and metrics not present or used in the old CQC rating system. Therefore, the two rating systems are not directly transferable. This means that the comparison of a nursing home rated with the old CQC rating criteria with a nursing home rated with the new rating criteria cannot be done reliably and accurately.

- **Date of latest CQC rating**

  Participating nursing homes were able to complete the online survey (questionnaire) between September 2015 - April 2016. However, on inspecting the CQC ratings for each of the participating nursing homes, the closest CQC rating given was often months apart from when the online survey was completed. Notably, in some cases, the most recent CQC rating given was approximately a year apart from when the online survey was completed. This could result in inaccurate inferences being made if efforts were made to associate the ‘assessments for frailty’ used with the CQC rating. This is because the practices and/or ‘assessments for frailty’ used may have varied between the time of the CQC inspection and the completion of the online survey in this study. This is highly likely in nursing homes that have been rated by the CQC as
‘Requires Improvement’ or ‘Inadequate’, that subsequently went on to complete an online survey months after this rating had been given (and would have been required to improve their practices, which may include their ‘assessments for frailty’ used).

- **Nature of the CQC rating**

This study focussed on the ‘assessments for frailty’ used in nursing homes across North-West London. While the CQC rating can indicate the quality of care in each of the nursing homes, the rating does not specifically reference frailty, nor can the quality of care in relation to the assessment for frailty or care and support of frail individuals in each nursing home be extracted from a CQC rating or report.

**7.6: Results**

A total of 24/73 nursing homes completed the survey (33%). Responses were received from all 8 boroughs within North-West London.

For clarity in this chapter, each individual ‘assessment for frailty’ reported will be referred to as an ‘assessment tool’. A nursing home may have reported multiple ‘assessment tools’ which forms their overall ‘assessment for frailty’.

**7.6.1: Assessment Tools Reported**

77 individual assessment tools were reported, composed of standardised (43) and non-standardised assessment tools (34).

13 unique standardised assessment tools were reported; 18 unique non-standardised assessment tools were reported.

It could not be concluded whether non-standardised tools reported were identical for participants who detailed a non-standardised tool with an identical generic name to other participants. For example, there were 4 non-standardised assessment tools which participants detailed only as ‘Falls’ or ‘Falls Assessment’. In Table 20, these are categorised under the assessment tool heading ‘Falls’. Classification of ‘Standardised’ and ‘Non-Standardised’ tools are explained fully in the methods chapter of the thesis (3.4.4: Mapping of Assessments).

**Table 19: Standardised Assessment Tools Reported**

<table>
<thead>
<tr>
<th>Assessment Tools</th>
<th>Quantity</th>
<th>% of Total Assessment</th>
</tr>
</thead>
</table>

282
<table>
<thead>
<tr>
<th>Assessment Tools</th>
<th>Quantity</th>
<th>% of Total Assessment Tools Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falls</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td>Mood / Depression Assessment Questionnaire</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td>Nutrition</td>
<td>4</td>
<td>5.2</td>
</tr>
<tr>
<td>Pre-Admission</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>3</td>
<td>3.9</td>
</tr>
<tr>
<td>Environmental</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>Medication</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>Mobility Assessment</td>
<td>2</td>
<td>2.6</td>
</tr>
<tr>
<td>Pre- and Post-Assessment (1 tool)</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Activities</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Continuing Tool</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Table 20: Non-Standardised Assessment Tools Reported
<table>
<thead>
<tr>
<th>Daily Living</th>
<th>1</th>
<th>1.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency Tool</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Eyesight</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Functional Assessment</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Memory and Dementia Screening</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Mental Capacity Assessment</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Overall Health</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>

### 7.6.2: Domain Coverage

Reported assessment tools most frequently measured the physical domain (48.4%) (e.g. mobility, falls assessments), mental health domain (16.1%) (e.g. mood and depression assessments), environmental domain (6.5%) (e.g. Home Falls and Accidents Screening Tool) and social domain (3.2%) (e.g. Social activities assessment). 19.4% of reported tools covered all domains. Some tools covered both physical and social domains (3.2%), in addition to both physical and mental domains (3.2%) (all illustrated in Figure 29).
Figure 29: Venn Diagram Illustrating Domain Coverage of Individual Frailty Assessment Tools Reported from All Nursing Homes. Domains: Physical (P), Social (S), Mental (M), and Environmental (E). The colours used take reference from general heat map colour conventions and references (Harrower and Brewer, 2003).

7.6.3: Assessment Tool use by Nursing Home

An average of 3.2 assessment tools (Range: 1-6) was used per nursing home. A statistically significant difference in the number of assessments used in corporate chain owned nursing homes (Assessment tool range: 1-6; Average no. of assessment tools: 3.9) versus independently owned nursing homes (Assessment tool range: 1-3; Average no. of assessment tools: 2.1) was observed (U = 21, p = .005).

13 nursing homes used more standardised than non-standardised assessment tools. 7 nursing homes used more non-standardised assessment tools than standardised assessment tools. 4 homes used an equal number of standardised and non-standardised assessment tools.

Table 21: Assessment Tool use by Nursing Home
Table 21 details for each nursing home their ownership (Corporate Chain or Independent), the number of standardised and non-standardised assessment tools and the total number of assessment tools reported. Of note, nursing homes C, L and N all belong to Corporate Chain 3; nursing homes F and J both belong to Corporate Chain 6.

<table>
<thead>
<tr>
<th>Nursing Home (Anonymised)</th>
<th>Ownership</th>
<th>No. of Standardised Assessment Tools</th>
<th>No. of Non-Standardised Assessment Tools</th>
<th>Total No. of Assessment Tools Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Corporate Chain 1</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>Corporate Chain 2</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>Corporate Chain 3</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>D</td>
<td>Corporate Chain 4</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>E</td>
<td>Corporate Chain 5</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>F</td>
<td>Corporate Chain 6</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>G</td>
<td>Corporate Chain 7</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>H</td>
<td>Corporate Chain 8</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I</td>
<td>Corporate Chain 9</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>J</td>
<td>Corporate Chain 6</td>
<td>0</td>
<td>4</td>
<td>4</td>
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<tr>
<td>K</td>
<td>Corporate Chain 11</td>
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<td>3</td>
<td>3</td>
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<tr>
<td>L</td>
<td>Corporate Chain 3</td>
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<td>0</td>
<td>3</td>
</tr>
<tr>
<td>M</td>
<td>Corporate Chain 13</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>Corporate Chain 3</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>O</td>
<td>Corporate Chain 15</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>P</td>
<td>Independent</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Q</td>
<td>Independent</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>R</td>
<td>Independent</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>S</td>
<td>Independent</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>T</td>
<td>Independent</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>U</td>
<td>Independent</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>V</td>
<td>Independent</td>
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<td>2</td>
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<tr>
<td>W</td>
<td>Independent</td>
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<td>0</td>
<td>1</td>
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<tr>
<td>X</td>
<td>Independent</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

7.6.4: Health Professionals Using the Assessment Tools
The health professionals stated to be using the assessment tools were: nurse (54.2%), doctor (14.6%), occupational therapist (8.3%), manager (7.3%), nurse assistant (5.2%), physiotherapist (5.2%), MDT (4.2%) and community psychiatric nurse (1.0%). Where MDT (Multi-Disciplinary Team) was reported, no further details were given.

7.6.5: Purpose of Assessment

Assessment tools were used: to help inform clinical decision making (47.4%), for resource allocation (26.8%), for funding (7.2%), for care planning (6.2%) and 12.4% classified use as ‘Other’.

7.6.6: Documentation and Storage of Assessment Tools (Electronic or Paper Based)

Details of storage were received from 21 of the 24 nursing homes (88%). The majority of respondents stated that assessment tools were paper-based (85.9%) rather than electronic (14.1%).

7.6.7: Non-Participants: Ownership

The ownership of the 14/87 eligible nursing homes declining to participate after initial telephone contact was: 7 owned by corporate chains; 7 independently owned.

The ownership of the 49/73 nursing homes who were sent the online survey (questionnaire) after expressing interest, but did not complete the online survey was: 26 owned by corporate chains; 23 independently owned.

Some nursing homes that did not complete the online survey belonged to corporate chains 1, 2, 3, 4, 6, 9 and 13 – corporate chains owning nursing homes that completed the online survey (Table 21).

7.7: Discussion

To my knowledge, this is the first study that has looked at the nature and number of the reported ‘assessments for frailty’ used in nursing homes across North-West London. A single geographic focus (North-West London) provides an initial understanding of assessments for frailty used in nursing homes, strengthening the knowledge on how frailty is currently perceived in this setting.

The results illustrated more reported standardised assessment tools (43) than non-standardised assessment tools (34) overall. Similarly, a greater number of nursing homes used more
standardised assessment tools in their reported assessment for frailty than non-standardised assessment tools. The introduction of the ‘Single Assessment Process’ (SAP) (Department of Health, 2001), whereby thorough accurate and recognisable assessments were encouraged nationally could provide reasoning behind the higher usage of standardised assessment tools reported in this study over non-standardised assessment tools. There have also been recommendations from the Royal College of Physicians and British Geriatrics Society for the use of standardised assessments (Dickinson, 1992). Standardised assessment tools offer consistency, validity through an evidence base and transferability across several healthcare settings. A historical encouragement within health and social care services through recommendations such as the SAP and the ‘Common Assessment Framework for Adults’ (CAF) (a framework designed to improve outcomes for adults suffering from complex, long-term health and social care needs, such as frailty) (Department of Health, 2009) may also explain the higher use of standardised assessment tools versus non-standardised assessment tools reported in this study.

This study additionally indicated that 9 nursing homes used a combination of non-standardised and standardised assessment tools – and 5 nursing homes used only non-standardised assessment tools. Several studies have suggested that the use of non-standardised assessment tools is not uncommon - and perhaps related to skill, time and motivation (Wales et al., 2016; Burton et al., 2011; Bowman, 2006). Despite this, further research (e.g. through observation) is required to fully understand the reasoning behind these assessment choices – especially when many valid and reliable standardised assessment tools are in existence.

Another key finding was that the predominant domain assessed related to physical assessment (physical domain), followed by assessments pertaining to an individual’s mental health (mental domain). Arguably, these are the most visible domains that frailty affects, perhaps explaining the dominance of these two domains in the assessment tools used. Lally and Crome (2007), suggest that these visible, or ‘tangible’ aspects of frailty may also be more likely to be treated by medical means, which could further provide reasoning to the result in this study. In contrast, the lower number of assessment tools covering the social and environmental domains could be directly related to the nursing homes’ perceived ability to have sufficient control over these aspects of care, which Rijnaard et al. (2016) note are important aspects of nursing homes. These results, however, perhaps represent a deviation from recommendations for holistic, multidimensional assessments (British Geriatrics Society, 2014; Chen et al., 2018). Moreover,
this finding could illustrate that frailty is not being recognised or assessed for as comprehensively as it should be.

Overall variation in the number of reported ‘assessments for frailty’ used was found in this study. This study indicated a statistically significant difference in the number of assessments used in corporate chain owned nursing homes (higher) versus independently owned nursing homes, suggesting different levels of comprehensiveness in assessing for frailty between the two. One corporate chain of nursing homes (corporate chain 6) used the same number of assessments for frailty in both nursing homes they owned. Conversely, one corporate chain owning three nursing homes (corporate chain 3), responded with varying numbers of assessments for frailty used (2, 3 and 5). Overall, there was greater variation in the number of assessments for frailty reported in nursing homes owned by a corporate chain (1-6) than in independently owned nursing homes (1-3). It must be questioned why so much variation exists in the number of ‘assessments for frailty’ used across North West London, but also, why variation exists within nursing homes belonging to the same corporate chain. Further research could be undertaken to understand whether decision making regarding assessments used in the corporate chains studied is up to the discretion of the nursing home manager, or is part of corporate chain policy.

The finding that the majority of assessments were being used by nurses (54.2%) and doctors (14.6%) is a somewhat expected result. All nursing homes in the UK are required to have a registered nurse on duty at all times (NHS, 2019a). Nevertheless, the results also indicate that managers and nurse assistants were reported to be using the assessments. This finding could also indicate that the managers and nurse assistants were using tools that did not require specific clinical expertise to use. However, it could also suggest that the managers were qualified nurses (as was the case in a study by Schreuders et al. (2020)), although this was not verified in this study.

The survey revealed the most common reason explaining the assessment purpose was to help inform clinical decision making (47.4%) and for resource allocation (26.8%). This finding is supported with several references detailing the importance of recognising the different grades of frailty (Winograd et al., 1991; Brown et al., 2000) – and an understanding that different grades of frailty will have different clinical consequences and resource requirements (Rockwood et al., 2015).
The majority of respondents stated that assessment tools were paper-based (85.9%) rather than electronic (14.1%). Recent studies have suggested no difference in the quality of documentation content from an electronic system versus a paper-based system within a nursing home setting (Wang et al., 2015). However, evidence from research in healthcare environments such as acute care has indicated that an electronic system can bring improved advantages over that of a paper-based system, contributing to improved efficiency, improved care and patient safety (Eden et al., 2008; Pollak et al., 2007). As evidenced by Brooks and Grotz (2010), however, there may be cost, time and training implications in the implementation of an electronic system. Despite this, over the long term, the advantages documented in acute care may also carry forward into the nursing home setting.

Despite the presence of ‘assessments for frailty’ in all nursing homes, the variation in the characteristics of the assessments may influence the extent to which frailty is recognised and managed. This variation is a potential barrier to the integration and ease of communication between different healthcare settings and professionals.

This study additionally found a similar proportion of corporate chain owned versus independently owned nursing homes who were sent, but did not complete, the online survey (questionnaire) (26 corporate chain owned nursing homes; 23 independently owned). Further research is required to fully understand why these nursing homes did not complete the survey after initially expressing interest and following up non-respondents via telephone. However, it is possible that the nursing homes not completing the survey were related to time and resource availability (Burns et al., 2016), potential staff shortages (Care Quality Commission, 2017) – or no longer willing to be involved in the study. Lastly, given the finding that some corporate chains owned both nursing homes that participated and nursing homes that did not participate in the study, it is possible that for some corporate chains, their policies regarding research were not clear – or participation was at the discretion of the manager of each home.

In this study (as with Chapter 4), it is noted that the reported ‘assessments for frailty’ were those that assess the presence of potential health deficits, many of which are evidenced to be associated with frailty, such as falls risk and mental state (e.g. FRASE and MMSE assessments) (Lee et al., 2018). These assessments were the reported ‘assessments for frailty’ used in nursing homes, rather than established frailty indexes or frailty scales as described in literature (e.g. Dolenc and Rotar-Pavlič, 2019; Theou et al., 2018). This is an important finding which illustrates the variety in an understanding of ‘assessments for frailty’.
Although no frailty indexes or frailty scales were mentioned by the nursing homes, this could also reflect the fact that multiple measurements or assessments can be used to identify frailty (Dent et al., 2016). Moreover, as mentioned previously, the lack of an international standard measurement for frailty, along with a large quantity of frailty assessments in circulation may help to explain the range in assessment tools identified in this study (Dent et al., 2016; Faller et al., 2019). Further, a recent study stated that though multiple frailty assessments have been developed and validated to improve feasibility in clinical practice, frequent lack of agreement between frailty instruments or assessments has slowed broad implementation of these tools (Walston et al., 2018).

In a scoping review investigating how frailty was measured in acute care, it was noted that ‘non-frailty tools’ were being used in 24% of the cases identified (Theou et al., 2018). These tools were validated scales (e.g. short physical performance battery) but had not been developed to specifically identify or assess frailty. The study described in this chapter demonstrates that ‘non-frailty tools’ were being used as ‘assessments for frailty’ – a similar finding to the scoping review. It is noted, however, that the pre-listed options (many of which were ‘non-frailty tools’) that the nursing homes were able to select in the survey (derived from findings in the non-acute care setting study) would have also influenced the findings in this study. Participants were, however, able to detail any other ‘assessments for frailty’ than the options provided, if they wanted to.

7.7.1: Generation of New Evidence

This study provides some understanding of ‘assessing for frailty’ in nursing homes. The study results reflect the views of care home managers in what they believe constitutes an ‘assessment for frailty’. It also provides an insight into the domain coverage of the assessments used, whether the tools used are standardised and potential differences between corporate chain owned and independently owned nursing homes.

The results of this study may help progress the field of assessing for frailty further. For example, the findings in this study could be compared to a wider, potentially national study.

With any study, there are both strengths and limitations. These are listed below.

7.7.2: Strengths

Choosing a specific area (North-West London) enabled the understanding of a specific area, highlighting great variation even on a local level. Given the study had a mixture of both
corporately owned and independently owned nursing homes, this may demonstrate some generalisability to other areas in London, or even nationally. Nevertheless, further work would have to be undertaken to confirm this.

Though the response rate was 33%, this is reflective of what is expected for a survey that has been distributed online (Nulty, 2008).

For participants, a strength of the study is that they were able to access and complete the survey quickly. As soon as the survey was completed and submitted, the survey results were viewable.

7.7.3: Limitations

Response bias may have influenced responses given, perhaps reflecting what should be done under ‘normal conditions’ rather than what actually happens day-to-day (i.e. ‘work-as-imagined’ vs ‘work-as-done’).

Evidence from a recent systematic review highlighted that many long term care facilities such as nursing homes were reluctant to participate in research – and some were prohibited from participating in research due to corporate policies (Lam et al., 2018). This may help explain the response rate and reasoning behind the 14 non-participating nursing homes who declined to take part in the study following initial telephone contact. Findings in research suggest that in general, chains have less flexibility when there is a corporate-wide policy that prohibits research; independently owned homes may be restricted by resources or staff (Lam et al., 2018). It is also possible that non-participants may have been reluctant to take part in the study for fear of their facilities being subjected to further inspection as a result of the impact of the research activity (Zapka et al., 2014).

It is noted that by examining assessment use in North-West London only may not necessarily be reflective of nursing home practices in a wider geographical area.

This study took into account each nursing home manager and staff’s perspective on what assessments for frailty were being used. However, the assessments for frailty used by any visiting GPs or geriatricians to each nursing may not have been captured.

7.8: Conclusions

This study suggests that not all four domains of frailty were being assessed in individuals in nursing homes across North-West London - and suggest that frailty is still primarily viewed as a condition of deteriorated physical condition. This is an important finding as research has
illustrated that frailty is a multifactorial health state (Wleklik et al., 2020) and, as such, assessments for frailty should reflect this. Despite the presence of assessments for frailty in all nursing homes, the variation in quantity and nature of assessments chosen may influence the extent to which frailty is managed. This variation could pose challenges with regards to the integration and ease of communication between different healthcare settings and professionals.

7.8.1: Key Points

- This study aimed to gather a greater understanding of the nature and number of assessments for frailty used in the assessment of residents within a nursing home.
- Many assessments for frailty are used in nursing homes across North-West London.
- Of the assessments reported, a strong physical domain bias exists – perhaps reflecting current perceptions of what frailty is.
- Research has illustrated that frailty is composed of several components, which can be broadly placed into four domains (physical, social, mental and environmental). Therefore, for a ‘good’ assessment of a frail individual, all these domains should be considered.

7.8.2: Implications for Practice

To best reduce some of these potential pressures, proactive approaches towards frailty identification and management must be in place. Assessing for frailty in a number of different settings can help achieve this. One setting where a large number of frail individuals may be present is in nursing homes and therefore assessing for frailty in this setting could be viewed as vital.

Assessing for frailty requires the assessment of all four domains: physical, social, mental and environmental. Frailty should not be seen as just a physical condition, as has traditionally been viewed and assessed for (Khezrian, 2017). Ensuring that all the care and support needs of frail individuals in nursing homes have been identified, which may occur through an assessment for frailty, may result in residents being able to ‘age well’ instead of simply ‘ageing’.

This study illustrates that of the participating nursing homes, very few are assessing for frailty in residents with all domains considered. Of the assessments reported to be in use, a predominant physical domain was found. This suggests that the assessments for frailty were not inclusive enough to assess all aspects of frailty – and additionally gives evidence to suggest that frailty is still viewed as something that is predominantly physical.
It is hoped that this study will highlight some of the inconsistencies across nursing homes with regards to assessing for frailty in residents. Moreover, the study can also illustrate that not all aspects or domains are commonly assessed in the reported assessments. This highlights a need to assess frailty more comprehensively. The findings in this study could illustrate to policymakers the inconsistencies in assessing for frailty in nursing homes and the great variation in assessment tools that exist. This could be used to help form recommendations or encourage more comprehensive frailty assessment practices within nursing homes.

7.8.3: Implications for Research

This study used a survey approach to abstract reported information from a potentially hard-to-research setting. Though there are limitations to this approach, the study did reach an expected number for online surveys in research (Nulty, 2008). Given some of the negative ratings, articles and public perception of various nursing homes in the United Kingdom (Merrifield, 2017; Campbell, 2017; Matthews-King, 2018), a reluctance to participate in voluntary research that could potentially highlight areas of weakness could have contributed heavily to the eventual number of participants.

As this target population could be described as within a ‘hard to reach research setting’, this study methodology (although not novel) could be used as a method for other perceived hard to reach research settings. A survey approach additionally offered a level of anonymity and time benefits; participants were able to answer as many, or as few questions as desired, which may have been influential in whether or not a nursing home was willing to participate in the study.

While this methodology was used for this study, it is likely that for similar studies or settings, it will have to be modified and refined. Nevertheless, through feedback and refinement, it may prove a valuable research tool or methodology, especially in the nursing home setting.

7.8.4: Further Work

Though this study established that there was great variation in the assessments used to assess for frailty, the results are confined to a regional area: North-West London. Therefore, further work could expand the target area to a wider region noting the similarity of the findings.

While difficulties in conducting research at the site of the nursing home have been highlighted, there are benefits to doing so (if possible), especially when considering further work. For example, this study noted the reported ‘assessments for frailty’ used. Taking the information from this study, an observational study could be conducted to establish whether the reported
assessments for frailty being used from the survey match those that are used in practice. They could also help clarify individual nursing home expertise, in addition to ascertaining the time and cost implications of assessments used. This could help to explain the extent of variation that exists in the nature and number of assessments used.
Chapter 8: General Discussion

8.1: Introduction

This chapter summarises the results and the key findings from the research undertaken in this thesis and how the overarching research question has been addressed. The additions to current literature, impact on policy and practice, methodological considerations and limitations of the thesis are also highlighted. Lastly, areas for future work are considered and brief recommendations provided.

The studies undertaken use both qualitative and quantitative approaches to help answer the overarching and supporting research questions. The thesis has been organised to answer these questions, ensuring that ‘who, what, where, when, why and how’ have been considered with respect to the care and support of frail individuals.

8.2: Background

This thesis has aimed to uncover and investigate the complexities in care and support with respect to frail individuals in the non-acute care setting (high-level) and then across three common, but distinct settings. Stemming from increasing global life expectancies and consequent increases in the likelihood of frail populations, the introduction in this thesis outlined a clear need for the research.

Moreover, in the UK, given a recent succession of scrutiny and concern surrounding the provision, regulation and integration of care and support – especially for frail individuals – specific research studying the underlying challenges in the care and support for older people is a public health priority, if progress is to be made.

The introduction described the Francis Report of the Mid Staffordshire NHS Foundation Trust (Francis, R., 2013), highlighting several concerns associated with health and care settings – and which emphasised a need for improvements in the care and support of patients. Several challenges were further highlighted in the introduction, including the many possible transitions between health and care professional and setting for frail individuals. These all led to the development of the overarching research question.

The overarching research question was:

How does the care and support of frail individuals manifest across the frailty spectrum?
Chapter 1 critically reviewed the literature, illustrating a current and increasing challenge for health and care systems: frailty. Notably, two crucial points were established regarding the concept of frailty in care: no consensus exists on the definition of frailty and the care and support of frail individuals is not confined to one setting. Chapter 1 also highlighted that a critical aspect of ensuring the right care and support for a frail individual is by recognising and assessing for frailty (Ding et al., 2017; Turner and Clegg, 2014; British Geriatrics Society, 2015).

Therefore, a systematic review (Chapter 2) was undertaken to understand the assessments for frailty in a broad setting (non-acute care) as reported in literature. However, although this setting detailed the published tools that could be used, importantly, this study had no geographical boundaries and did not ascertain what assessments may actually be used in practice. Understanding what assessments are used in practice is important, as research emphasises that significant harm and risks can result if frailty in an individual has not been recognised (British Geriatrics Society, 2014; Chen et al., 2018).

(Chapter 3 described the research methods used).

Hence, a study to greater understand the ‘assessments for frailty’ used in practice in a defined non-acute care setting (North-West London region) was undertaken (Chapter 4) by contacting healthcare professionals and individuals with expertise and/or experience of frailty assessment practices. The research question for this was:

1. What assessment tools for frailty are used in non-acute health and care settings?

The findings from Chapter 4 aligned with findings from the systematic review, yet importantly, also found ‘non-frailty tools’ were used to assess for frailty, as also found by Theou et al. (2018) in acute care. However, as the non-acute care setting is broad it was evident that the study findings may not necessarily cover all settings that a frail person may be located in (or cover specific settings in detail). Additionally, as the introduction highlighted, a frail person may interact with many settings.

Therefore, it was decided to subsequently investigate a potential frail pathway comprising three common, but distinct care settings (community, acute care (hospital) and nursing homes) to better address the overarching research question. As described previously, these settings could also represent a progression in the level of frailty.
In the **community setting (Chapter 5)**, research stated that frail individuals may require care and support to carry out aspects of daily living (British Geriatrics Society, 2014), encouraging independent living and preventing, or delaying a move away from their residence (Blomgren et al., 2008). A number of different care and support arrangements (Blomgren et al., 2008) to prevent or lessen the progression of frailty may also be required. Hence, an important part of a frail person (or at risk of frailty) living in the community is their care and support networks. Thus, this was examined in this study, using participants from a ‘Falls’ group as an exemplar of a ‘frail’ population. As a healthcare provider’s understanding of a patient’s healthcare preference has been highlighted as important to patient-centred care (Kennedy et al., 2018), this perspective was also integrated. The research question for this was:

2. **What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?**

It is worth noting that many of the individuals interviewed regarded themselves as ‘independent’ and would place reliance on their friends and family to address many of their care and support needs. Similar perspectives from the viewpoint of the healthcare provider were gathered, confirming the influence and importance of friends and family in the support of these individuals. This is a characteristic also reported in literature, where the value and importance of family and friends has been noted (Luong et al., 2011; Huxhold et al., 2013), particularly on the progression of frailty (Obbia et al., 2019). However, recognition of frailty in individuals living in the community may only be recognised after admission to hospital after suffering a crisis event, such as a fall (British Geriatric Society, 2015). Therefore, a logical progression from this study was the examination of an acute care (hospital) setting.

In the **acute care (hospital) setting (Chapter 6)**, care and support is of great importance (Cornwell and Firth-Cozens, 2009) and hospital admissions can represent a ‘dangerous period’ for vulnerable patients (Hogan et al., 2017). Moreover, frailty progression has shown to be influenced by care and support received (Chen et al., 2018; Hendry et al., 2018; Waring et al., 2014). As no ‘official’ marker of frailty in this setting is currently used (Soong et al., 2016), the care and support of patients over 65 admitted with falls were examined, since together, these are known markers/indicators of frailty (British Geriatrics Society, 2014; Anderson, 2008; Royal College of Physicians, 2017). The research question for this was:

3. **What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?**
For this study, an EPR system was interrogated to understand a patient’s care and support (via living arrangement) pre-admission, during and post-discharge. As previously highlighted, recognising frailty is an important aspect of care and support. Moreover, calls for research to identify frailty early in acute care have been made (Theou et al., 2018; Theou and Rockwood, 2012; Cheung et al., 2017). Thus, a novel frailty score, FEWS, was examined to investigate whether different patient outcomes differed based on FEWS group. This study found that a majority of individuals pre-admission to hospital were living at home, receiving care and support from their family and friends. Although there may be numerous reasons to explain this finding, the literature states this could be due to a preference to stay in their own home (Fox et al., 2017; Canadian Institute for Health Information, 2011), cost implication of nursing home care (Sixsmith and Sixsmith, 2008) and limited knowledge of alternative housing options (Fox et al., 2017; Boyle, 2012). A further important finding from this study was that the most common post-discharge living arrangement was nursing homes. Though the specific reasons for the transfer to this setting were not able to be examined on a case-by-case basis, this result aligns with findings by Harrison et al. (2017) that reports that discharge to a long-term institutional care setting (such as a nursing home) is a common occurrence. This is a setting a person’s frailty may be high/severe (Shah et al., 2013) and therefore has high care and support needs. Thus, the nursing home setting was confirmed as the next logical progression from this study to examine.

In a nursing home setting (Chapter 7), a needs assessment is often conducted on new residents (NHS, 2018c) which may include an assessment for frailty (Lee et al., 2020; British Geriatrics Society, 2015). As stated, recognition of frailty (via assessment) is an important component of care and support. Moreover, recent studies found that there is limited evidence for much of the care provided in care homes (Shepherd et al., 2017; Davies et al., 2014), particularly in the UK (ENRICH, 2020). Therefore, this study focussed on investigating what ‘assessments for frailty’ were being used in this setting. The research question for this was:

4. What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?

This study demonstrated the variation in types of assessments used and suggested different understandings of ‘frailty’, a lack of a standard (as noted by Dent et al. (2016) and Faller et al. (2019)) and how it is assessed. The assessments were examined in detail, with particular attention to their domain coverage. This study illustrated that many assessments in use
dominantly assessed physical and mental aspects of frailty and less the social and environmental aspects of frailty. These may be some of the most ‘visible’ signs of frailty, as suggested by Lally and Crome. (2007), leading to a predominance in the assessments of these domains in use. However, the finding could suggest that in this setting, frail individuals may lack the care and support they need to address frailty most holistically. This is because the results in this study perhaps represent a deviation from recommendations for holistic, multidimensional assessments (British Geriatrics Society, 2014; Chen et al., 2018). Better understanding the assessments used to assess how best to manage and look after these individuals helps to understand the care and support they would receive in this setting.

Overall, the studies within this thesis all aimed to help uncover some of the complexities in care and support with respect to frail individuals across non-acute care (high-level) and three common distinct settings. It is hoped that this helps identify current methods or practices used, in addition to identifying the areas that require addressing.

8.3: Key Findings

Each specific research question was addressed with supporting questions, thereby ensuring a comprehensive response could be given through sufficiently granular consideration of the questions.

A summary of the main findings from each of the studies is detailed below.
Table 22: Main Findings from Each Study Within the Thesis.

<table>
<thead>
<tr>
<th>Study and Specific Research Question</th>
<th>Summary of Main Findings</th>
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<tr>
<td><strong>Non-Acute Care Setting Study:</strong> What assessment tools for frailty are used in non-acute health and care settings?</td>
<td>Variation in the reported ‘assessments for frailty’ established. This supports findings from the systematic review (Chapter 2) and by Faller et al. (2019) evidencing that many ‘assessments for frailty’ had been constructed for use. It also highlights that multiple measurements or assessments can be used to identify frailty, as also evidenced by Dent et al. (2016). Many reported ‘assessments for frailty’ comprised assessments addressing predominantly physical and mental aspects of frailty, with a lesser focus on the environmental and social aspects concerning an individual. This may be because physical manifestations of frailty can be objectively confirmed and viewed as more treatable by medical means than social or environmental manifestations of frailty, as suggested by Lally and Crome (2007).</td>
</tr>
<tr>
<td><strong>Community Setting Study:</strong> What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?</td>
<td>A range of different healthcare professionals, friends, family members and/or services was reported, indicating the unique needs and choices of the frail individuals and potentially indicating holistic care and support. This finding lends support to research, such as by Reeves et al. (2018), that suggests that the changing healthcare needs of an ageing population would be supported with holistic care approaches – especially in frail populations. The networks of the frail individuals illustrated that family/friends were perceived to contribute highly to an individual’s care. This characteristic is emphasised in literature, where the value and importance of family and</td>
</tr>
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</table>
friends has been noted (Luong et al., 2011; Huxhold et al., 2013), particularly on the progression of frailty (Obbia et al., 2019).

This study demonstrated some congruence between the perspective of the care networks as reported by the frail individual and the healthcare professionals. However, the healthcare professionals, on average, did not view their care to be as highly influential as the patients did (as shown in Figures 16 and 17). This could signal a need for greater communication, which Kelley et al. (2014) emphasise is key when considering the care and support of an individual.

**Acute Care Setting Study**: What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?

This study established that several different living arrangements pre- and post-admission to acute care were recorded. Of note, home with care from friends and family was the most common pre-admission living arrangement. The literature suggests several possible reasons for this including: a preference to stay in their own home (Fox et al., 2017; Canadian Institute for Health Information, 2011), the cost implication of nursing home care (Sixsmith and Sixsmith, 2008) and limited knowledge of alternative housing options (Fox et al., 2017; Boyle, 2012).

The study also found that the majority of patients in this sample were discharged to a living arrangement representing an unchanged dependency level. However, the next highest percentage of patients were discharged to a living arrangement that represented a higher dependency level. Of note, the nursing home setting was the most common living arrangement post-discharge. This finding supports evidence by Harrison et al. (2017) who reported that discharge to long-term institutional care (e.g. a nursing home) following acute hospitalisation is a common occurrence.
This study additionally examined the utility of a novel frailty score (FEWS) against a number of patient outcomes. The tests performed suggest that the complete number of healthcare professional interactions a patient receives during their hospital episode and the discrete number of healthcare professional interactions a patient receives during their hospital episode differ based on FEWS group. Similarly, the length of stay a patient has during their hospital episode differs by FEWS group. While the weighting of FEWS needs establishing, the use of a score to identify frail individuals in acute care (as ‘frail’ individuals are not routinely captured in hospital coding systems) could help towards efforts to provide frailty-attuned care and improve patient and service outcomes (Gilbert et al., 2018).

<table>
<thead>
<tr>
<th>Nursing Homes Setting Study: What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?</th>
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<tbody>
<tr>
<td>Nursing homes were each found to be using a variation of ‘assessments for frailty’. These assessments varied in length, purpose, standardised vs non-standardised and who would usually carry out the assessment(s). Assessment choice could perhaps be related to skill, time and motivation (Wales et al., 2016; Burton et al., 2011; Bowman, 2006). Notably, great variation was recorded in the domain coverage of each of the assessments. Many of the reported assessments assessed predominantly for physical and mental attributes of frailty and less on social and environmental domains, a similar finding to the systematic review and non-acute care study. A statistically significant difference between the number of assessments used in corporate chain owned nursing homes versus independently owned nursing homes was observed. Again, the use of ‘non-frailty tools’ was evident; this could illustrate the variety in an understanding of ‘assessments for frailty’. Notably, this finding echoes that found by Theou et al. (2018) in the acute care setting.</td>
</tr>
</tbody>
</table>
8.3.1: Addressing the ‘Five W’s’.

As Chapter 1 outlined, investigating the care and support of frail individuals took an approach answering the ‘Five W’ questions (and ‘how’). These have been addressed as detailed below:

**Table 23: Addressing the Five W’s.**

<table>
<thead>
<tr>
<th>Question</th>
<th>How Addressed</th>
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<tbody>
<tr>
<td><strong>Who</strong></td>
<td>The introduction described increases in global life expectancies and ageing populations, noting an emergence of frail individuals had been identified to accompany these increases. These frail individuals could reside in many different settings. This thesis specifically investigated people likely to be considered frail across: the community setting, the acute care setting and nursing home setting, where individuals may experience different levels of frailty (e.g. from low levels to higher levels).</td>
</tr>
<tr>
<td><strong>What</strong></td>
<td>Frail individuals, the nature and prevalence of frailty were detailed in the introduction, additionally outlining the current concerns associated with frailty as well as how different perspectives and complexities are examined in the thesis.</td>
</tr>
<tr>
<td><strong>Where</strong></td>
<td>Frailty was described to affect many individuals, illustrating that different levels of frailty may be present in a number of different settings, each of which can be addressed with different levels of care and support. The studies investigated the non-acute care setting from a high level (Chapter 4), followed by a focussed investigation in three core settings that potentially represent increasing levels of care and support: the community setting, the acute care setting and the nursing home setting (Chapters 5-7).</td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>Investigating the different settings also helped to understand when different levels of care and support were given. From a high-level investigation of non-acute care, Chapter 4 detailed conversations with healthcare professionals, gave evidence to suggest that the care and support of many frail individuals was determined after an ‘assessment for frailty’ was completed.</td>
</tr>
</tbody>
</table>
In the community setting, many ‘Falls Groups’ attendees were referred by their GP, indicating that parts of their care and support needs were influenced after seeing a healthcare professional. A common theme in the networks of these individuals was their care and support provision from family and friends, indicating the presence of informal support, potentially as and when needed.

In the acute care setting, an investigation into the care and support given to patients admitted with ‘Falls’ took place. This study noted a large proportion of admitted patients lived in their own residence and a similarly large proportion received care and support from family and friends. Notably, the study highlighted that a marked number of patients moved into enhanced care and support settings post-discharge, consistent with findings in the community setting study that identified that enhanced care and support (in the form of attendance at a ‘Falls Group’) was proposed by a healthcare professional.

In the nursing home setting, an investigation into the ‘assessments for frailty’ used took place. Earlier studies in the thesis established that the care and support of frail individuals in non-acute care settings was ascertained after completing an ‘assessment for frailty’. The study in the nursing home setting established that many different assessments comprised an ‘assessment for frailty’, predominantly focussing on physical aspects of an individual. Of significance in this study, was the predominance of the assessment of physical and mental domains only; environmental and social aspects of an individual were considered, but to a far lesser degree. As such, care and support for these aspects of an individual may not have been adequately addressed.

<table>
<thead>
<tr>
<th>Why</th>
<th>Examination and review of literature regarding frail individuals and the various settings they may reside in clarified that person-centred or tailored care and support can help to manage frailty and aid in an individual living independently for longer. The acute care study in this thesis also noted that for many individuals, a setting with enhanced care and support availability was proposed upon discharge, demonstrating the importance of care and support.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How</td>
<td>The overarching research question of this thesis was: ‘How does the care and support of frail individuals manifest across the frailty spectrum?’</td>
</tr>
</tbody>
</table>
In this thesis, three distinct settings were investigated, potentially corresponding to a progression in the level of frailty.

Importantly in this study was evidence illustrating that as the level of frailty progressed, there were changes in the care and support that was given. In the community setting where there were likely to be many pre-frail, or individuals with low levels of frailty, in addition to healthcare professionals, the care and support was often reported to be given by family and friends – or carers within the individual’s own residence. Following a crisis, (e.g. admission to hospital following a fall), which was investigated in the acute care setting, the results illustrated that number of frail individuals were often discharged to enhanced care and support settings (compared to their pre-admission setting). Lastly, a setting where there would be a high proportion of frail individuals was investigated: the nursing home setting. In this setting, residents had access to 24-hour nursing care and different aspects of their health-related to frailty were assessed. This study found that there was a predominant assessment of physical and mental domains – and consequently found evidence to suggest that the social and environmental care and support needs of a resident may not be assessed to the same degree.

8.3.2: Examining the Complexities in Care and Support in This Thesis

Several different complexities in the care and support of ‘the frail individual’ were uncovered in the studies undertaken. For each specific research question outlined, the complexities in care and support identified in each of the studies are detailed in the tables below.

Each of the ‘Five W’s’ detail areas where complexities in care and support have been identified. Moreover, each ‘W’ described could represent the multiple components contributing to the care and support of a frail individual. In the literature, multiple components that interact in non-linear, unpredictable ways have been identified as evidence of complexity, especially in healthcare settings (Katerndahl, Parchman & Wood, 2010).

**Table 24: Identification of Complexities in Care and Support (High-Level Non-Acute Care Setting)**
<table>
<thead>
<tr>
<th>Factors</th>
<th>Identification of Complexities in Care and Support (High-Level Non-Acute Care Setting)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>(Research Question: What assessment tools for frailty are used in non-acute health and care settings?)</em></td>
</tr>
</tbody>
</table>

**Who**

This study involved participants across a range of settings working in a professional capacity with frail individuals (or researching frail individuals), some of whom had an implicit responsibility to assess them. The diversity of participants in this study, in addition to the diversity of assessments reported (which could be used to plan the care and support of a frail individual), are all characteristics and evidence of the complexities in care and support (WHO, 2012; Wells et al., 2012).

Individuals in this setting are likely to exhibit varying levels of frailty, with different care and support needs (Kojima et al., 2019). These individuals may not necessarily be confined to a particular setting, with a potentially high number of relationships between the individual and other people who may contribute towards their care and support needs (as evidenced in the study). Since the care and support is likely to consist of several components (which may not always be clearly defined), several potential people involved in the delivery (as evidenced in the stakeholder mapping part of this chapter), several professional groups and potentially across more than one setting, the care and support would be defined as complex (Wells et al., 2012). These characteristics are all evidence of complexity in a healthcare setting (WHO, 2012; Plsek and Greenhalgh, 2001).

**What**

The ‘assessments for frailty’ used for assessing individuals across non-acute health and care settings. The assessments are likely to have been used to determine the care and support needed, as advised by national guidelines (British Geriatrics Society, 2014; NICE, n.d.). This study demonstrated great diversity in the ‘assessments for frailty’ used, in addition to the high quantity of potential professions/people conducting these assessments and thus involved in the individuals care and support. These interrelated characteristics (high quantity of potential relationships involved in care, diversity of people/organisations involved in care and support and the human interaction required to deliver any possible intervention) are all evidence of the complexity in the care and support of the frail individual in this setting (WHO, 2012; Wells et al., 2012).
Participating in this study were based in a non-acute setting (within North-West London); however, there was no restriction on the profession of the participant (providing they had clinical/non-clinical knowledge and/or expertise of frailty care and support). The diversity of environments in which the 18 study participants would be based is evidence of complexity with regards to the care and support of frail individuals in this setting (Plsek and Greenhalgh, 2001). Furthermore, the non-acute care settings which the participants in this study would be based in would be embedded in a locality and the wider society, which may influence the care and support a frail individual in this setting receives. This situation has been identified as complex in the literature (Plsek and Greenhalgh, 2001).

Individuals assessed for frailty within this setting are likely to have had a range of levels of frailty (or no frailty). This diversity of patients has been noted as a characteristic of complexity in health, which is likely to influence the care and support each individual receives (WHO, 2012). Given that there will likely be frail patients in this setting, (with frailty itself being referenced as complex (Chen et al., 2018; Looman et al., 2018)), this further adds complexity to the care and support of the patients in this study.

This study was chosen due to the non-acute care setting being where frail (or at risk of frailty) populations would be located. The study additionally provided evidence of the diversity of people (e.g. doctors, carers, physiotherapists) potentially involved in the care and support of frail people in this setting (evidence of the complexity in care and support (WHO, 2012)). Further, the assessments for frailty used by the participants in the study were investigated – and the findings were used in a later study (nursing homes). Likewise, the quantity of ‘assessments for frailty’ reported, alongside the different domain coverage of each is evidence of high complexity with regards to care and support (Wells et al., 2012).

| Table 25: Identification of Complexities in Care and Support (Community Setting) |
|---|---|
| Factors | Identification of Complexities in Care and Support (Community Setting) |
(Research Question: What are the care and support networks of frail individuals, as perceived by the frail individual and their healthcare provider, within a community setting?)

Who

The ‘Frail Individuals’ in this study were sampled from a ‘Falls Prevention Group’. Although all participating ‘patients’ were from a ‘Falls Prevention Group’, they would each have different socioeconomic, cultural, biological/genetic and environmental aspects of individual health, potentially influencing both the patient and healthcare perspective care and support networks created. This diversity in patient, in addition to the nature of potential interactions they may have influenced their care and support network (the networks of which were investigated in this study), are all components requiring consideration when investigating the care and support of these individuals. These components demonstrate complexity in health care (WHO, 2012).

Moreover, the individuals in this study were likely ‘Frail’, at least from a physical perspective. Frailty itself has been described as a complex condition or syndrome (Chen et al., 2018; Looman et al., 2018). Further, research has evidenced the ability for the level of frailty to improve (Kojima et al., 2019) and has defined frailty as on a spectrum (Bellary and Sinclair, 2019). This indicates the changeable level of frailty; this inherent variability has been identified as an example of complexity in healthcare (Plsek and Greenhalgh, 2001).

These characteristics of who (i.e. the ‘frail individual’) and the potential interactions would have to be considered with regards to their care and support. As this study evidences, there are multiple components to consider, which potentially interact in non-linear, unpredictable ways (Katerndahl, Parchman & Wood, 2010). Combined, these demonstrate complexity with regards to the care and support of the frail individual in this setting.

What

The care and support networks – these varied between patient and by perspective (i.e. from a patient perspective versus a healthcare professional perspective), although there were also similarities.

This study also noted the diversity of people involved in the care and support of the patients, in addition to the variation in the quantity reported for each of the patients. Although not explored in detail, based on the professional background of the individuals
contributing to the care and support of the patients, it is reasonable to suggest that there was additionally diversity in the tasks involved in the delivery of patient care and support in this study (e.g. role of a doctor is likely to be different from a family member). These characteristics have been highlighted as evidence of high complexity in healthcare (Wells et al., 2012).

Furthermore, the networks created in this study would be embedded within wider social, political and cultural systems, which may have had an influence on the care and support received – a further example of complexity in this study (Wilson, Holt and Greenhalgh, 2001).

**Where**
The setting for this study was the community. Although the community setting can be defined broadly (i.e. outside of an inpatient, acute care setting or clinic setting), on a more micro-level, variations in the individual’s residence (e.g. whether the individual lives with a partner or family, to accessibility within the residence) may have influenced the care and support networks reported from both perspectives. This setting could, therefore, be described as one with ‘fuzzy boundaries’ – a term denoting that this setting is not necessarily fixed, or well-defined (Plsek and Greenhalgh, 2001). This is a characteristic of a complex system (Plsek and Greenhalgh, 2001, highlighting that the care and support of the individuals in this setting will not be identical for all.

**When**
Though all the individuals in this study were from the community setting, they are likely to have had low to medium levels of frailty, based on their care and support networks and selection from the ‘Falls Prevention Group’. Moreover, some patients in this study referred to themselves as ‘independent’, suggesting that (at the time the study was conducted) they may have had fewer care and support needs than other participants in the study. Notably, however, this study only captured the care and support of individuals at one point in time. This is important, as, given the ability for the level of frailty to change (Kojima et al., 2019), an individual’s care and support needs may also change. This changeability and potential unpredictability over time is a characteristic of complexity (Plsek and Greenhalgh, 2001) and an important consideration denoting the complexity in the care and support of a frail individual.

As this study only considers care and support networks at one point in time, the unpredictability of people/professions involved in the future care and support of the
individual (e.g. if there is a progression of frailty) is a further indicator of complexity (Plsek and Greenhalgh, 2001).

**Why**  
This study was chosen since the ‘patients’ in the study would likely be frail (or at risk of frailty), who may call upon their network to assist with their care and support needs. This study identified (through thematic analysis) three themes providing rationale behind the inclusion and placement of individuals within a patient’s care and support network: helpfulness of individual, personal contacts and frequency of contact. However, the weighting for each of these themes is unknown. The finding that no single reason can explain the placement of individuals on the care and support network indicates the multiple components involved in the decision to include them (as identified in the thematic analysis), in addition to the diversity of individuals in a care and support network – some individuals of which would have specialised skills (e.g. doctor). These components have been identified as characteristics of complexity in health care (WHO, 2012; Wells et al., 2012).

### Table 26: Identification of Complexities in Care and Support (Acute Care Setting)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Identification of Complexities in Care and Support (Acute Care Setting)</th>
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<tbody>
<tr>
<td></td>
<td><em>(Research Question: What care and support do frail individuals who have been admitted to acute care have: prior to admission, during admission and post-discharge?)</em></td>
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</tbody>
</table>

**Who**  
295 acutely admitted patients aged 65 years and older (listed ‘at risk of falls’) were investigated in this study. As with the previous study, these patients would each have different socioeconomic, cultural, biological/genetic and environmental aspects of individual health. These are all characteristics demonstrating complexity (WHO, 2012) that would have to be taken into consideration with regards to their care and support pre-admission and post-discharge.

In addition, some of these individuals are likely to be frail, which in this study was further suggested by their FEWS score. This diversity in the makeup of patients and the complex nature of frailty (Chen et al., 2018; Looman et al., 2018) are all components which give evidence to the complexity in care and support (WHO, 2012).
This study also noted the number of healthcare professional interactions a patient received during admission, in addition to the different types of healthcare professionals a patient interacted with during their stay. The high quantity of relationships between patients, carers, health-care providers, support staff and family members has been noted as evidence of complexity in health care (WHO, 2012). Moreover, the interactions with the healthcare professionals and others during an acute stay is indicative of a complex system (Plsek and Greenhalgh, 2001) and evidence of the complexity in the care of individuals in this setting (Wilson, Holt and Greenhalgh, 2001).

<table>
<thead>
<tr>
<th><strong>What</strong></th>
<th>This study investigated the care and support of patients during their admission to acute care, in addition to investigating their pre-admission and post-discharge living arrangements. These living arrangements could indicate the care and support received by the patients. The diversity in the number of potential tasks required to deliver patient care, the diversity of patients, clinicians (and other staff) in addition to the vulnerability of patients are all indicators of complexity in the care and support of the patients in this study (Wilson, Holt and Greenhalgh, 2001; WHO, 2012).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where</strong></td>
<td>The study was primarily based in the acute care setting. The study evidenced that the patients would receive care and support interactions from a wide range of healthcare professionals, staff, family members and carers. The diversity of people involved, in addition to the diversity of tasks required to deliver the care and support within the acute care setting (as well as post-discharge), are all evidence of the complexity in the care and support of the patient (frail individual). Moreover, a small change in this setting (e.g. removal of a particular healthcare professional that may be required for the discharge process) could lead to a much larger change (e.g. delayed discharge). This has been noted as a particular characteristic of complexity with regards to clinical care and support (Wilson, Holt and Greenhalgh, 2001), which would be inherently present in this setting.</td>
</tr>
<tr>
<td><strong>When</strong></td>
<td>All individuals in this study were admitted to acute care with their primary complaint being listed as ‘Fall’. Given the age of the patients, their primary complaint – and their admission, it is likely that the individuals at the time they were admitted, would be classified as frail. The range of FEWS reported could indicate varying levels of frailty. The nature of frailty being described as complex (Chen et al., 2018; Looman et al., 2018), in addition to the health status of each of the patients in this study (which could vary</td>
</tr>
</tbody>
</table>
during their admission) are further characteristics adding complexity to the care and support of the patients in this study (Wilson, Holt and Greenhalgh, 2001; WHO, 2012).

| Why    | This study was chosen given the likelihood of frail individuals in this setting, in addition to providing a greater understanding of the care and support received in care. This study additionally aimed to understand whether the number of interactions received in acute care differed based on FEWS group. The high quantity of interactions between the patient and carers, healthcare professionals, family members and others during an acute admission (who would be providing care and support) evidenced in this study signifies complexity (WHO, 2012).

Notably, however, given the nature of frailty being complex (Chen et al., 2018; Looman et al., 2018), it has been suggested that in clinical care a simple ‘cause and effect’ relationship (e.g. between frailty level and care and support received) cannot be safely modelled, due to the complexity inherent in human beings (i.e. the patient) (Wilson, Holt and Greenhalgh, 2001). As with the other studies conducted as described in this thesis, the hospital that the study was conducted in would be influenced and embedded in a locality and wider society, which is a characteristic of complexity (Plsek and Greenhalgh, 2001) that would feed into the care and support of the patients in this setting.

| Table 27: Identification of Complexities in Care and Support (Nursing Home Setting) |
| Factors | Identification of Complexities in Care and Support (Nursing Home Setting)

(Research Question: What does the perceived ‘assessment for frailty’ of care home residents mean in practice in North-West London?)

| Who | This study investigated nursing home managers’ perspective on what ‘assessments for frailty’ are used in nursing homes to assess for frailty in residents. Although these nursing home managers are situated in North-West London, each nursing home may follow different care and support practices for their residents, especially since they may be run by different operators (e.g. private companies, charities, or local councils) and are distinct from NHS services. This variation in management and ownership (as the study detailed), is evidence of the diversity in the nursing homes across North-West London, which itself has been identified as a characteristic of complexity (WHO, 2012). |
Many of the residents in this setting are likely to be frail and have a range of care and support needs (Fougère et al., 2015; Kwong, Lai and Chan, 2014). As with the other thesis studies, this diversity in the makeup of patients and the complex nature of frailty (Chen et al., 2018; Looman et al., 2018) are all components contributing to the complexity in care and support (WHO, 2012).

What

The ‘assessments for frailty’ used for the assessment of residents in each participating nursing home was investigated. This study indicated that a number of different ‘assessments for frailty’ were used across the nursing homes, varying in a number of aspects, including: the standardisation of the assessments used (or lack of), domain coverage and the health professionals using the assessments. Given that ‘assessments for frailty’ have been shown to help ascertain the care and support required (British Geriatrics Society, 2014; NICE, n.d.), the diversity in the nature of the assessments identified in this study, in addition to the number of people who may be needed to a) assess the individual and b) deliver their care and support are further examples of the complexity in care and support in this setting (WHO, 2012; Wells et al., 2012).

Where

24 nursing homes participated, comprising both corporate chain owned and independently owned nursing homes. As stated previously, other than complying with expected CQC standards and regulations, there are no mandatory requirements regarding how care homes should be run and/or managed. Accordingly, care homes can exercise some degree of autonomy, (e.g. as evidenced in ‘assessments for frailty’ used as reported) leading to a number of variations in care homes, which could also include in quality and safety of care (Gartshore et al., 2017). This variation in nursing home, in addition to the variation in assessment practices conducted within each nursing home, are all evidence of the complexity in care and support in this setting (WHO, 2012; Wells et al., 2012).

When

Research has illustrated that people in nursing and residential homes are more likely to suffer frailty (Craig, 2019) and is a setting designed to house and care for frail individuals (Alpert and Powers, 2007). In comparison to the other settings examined in this thesis, it is possible that the nursing home residents had greater care and support needs than the other settings. The likely presence of frailty in individuals and the diversity of tasks and number of relationships (e.g. between patients and healthcare providers, support staff or
administrators) all contribute towards the complexity required to deliver care and support (WHO, 2012; Wells et al., 2012).

| **Why** | This study was chosen due to the setting being likely for frail residents to reside in (Craig, 2019), of which they may have had a range of care and support needs. An assessment for frailty has been recommended to help ascertain the care and support required in frail individuals (British Geriatrics Society, 2014; NICE, n.d.). In addition to the characteristics discussed above (e.g. number, type and diversity of assessments being used), the discussion of the chapter aimed to provide reasoning for the assessments being used. Based on similar findings from the literature, the chapter discussed that variations in assessments used could be due to a number of factors, including: the ownership of the nursing home, staffing levels, expertise required to conduct the assessments. As seen with other studies, complexity in care and support is demonstrated given the multiple, interrelated components influencing why something is done (i.e. assessments used) (WHO, 2012) in addition to the nursing homes being a ‘system being embedded within another system’ (i.e. the nursing homes are embedded within a locality and wider society) (Plsek and Greenhalgh, 2001). |
8.4: Contributions to New Knowledge

A summary of the contributions to new knowledge are listed below:

- Literature has highlighted that frail individuals are present across many health and social care settings (Coker et al., 2019) and that improving their care and support requires an approach spanning several settings (Heaven et al., 2019). Hence, the study of how the care and support of frail individuals manifests across three distinct settings, using evidence from acute and non-acute care settings is important. The evidence described in this thesis spans several domains including: academic literature, grey literature, an EPR database and conversations with healthcare professionals and patients. Overall, the findings presented in this thesis add to the body of current literature and contribute new, empirical knowledge regarding the care and support of frail individuals across these settings.

- Faller et al. (2019) conducted a systematic review of assessments for frailty used. At the time of writing, this was the most up-to-date systematic review on the topic. This systematic review was updated, highlighting and examining the assessments for frailty in the literature for use in the non-acute care setting. Given the criteria for this systematic review, many of the new papers included have only been recently published (e.g. in 2019/2020). Thus, detailing, examining and investigating the assessments for frailty and the domain coverage of new tools (with respect to the four domain model) identified demonstrates a progression and contribution in the knowledge of assessments for frailty in this setting.

- As highlighted throughout this thesis, guidance emphasises that any interaction between an older person and a health or social care professional should include an assessment for frailty (British Geriatrics Society, 2014). This thesis provides new information regarding the types of assessment tools used in an ‘assessment for frailty’ in non-acute care settings across North-West London. Notably, some of the findings align with new, emerging evidence that ‘non-frailty tools’ are being used for the assessment of frailty (Theou et al., 2018). While the study by Theou et al. (2018) highlighted the use of ‘non-frailty tools’ in acute care, this thesis highlights the use of ‘non-frailty tools’ in non-acute care. Also, an examination of how these assessments vary by purpose and content was conducted, with particular reference made to the four domain model of frailty (Soong et al., 2013). This especially adds to the body of literature regarding the multidimensional nature of assessments for frailty, with particular reference to this specific four domain model.
• Investigating and establishing the care and support networks of frail individuals living in the North-West London community, using perspectives from both the frail individual and healthcare professionals involved in their care and support. Although studies examining the patient perspective have been previously conducted (Grøndahl et al., 2018; Kemper-Koebrugge et al., 2019), this thesis examines a specific group of individuals (participants from a Falls prevention service) in a specific community (North-West London), importantly comparing their view directly with a healthcare professional perspective. Moreover, this study further supports and contributes towards growing evidence (e.g. Abbott et al., 2012; Franchini et al., 2016) that face-to-face interviews and SNA are feasible methods to investigate patterns and relationships of people at increased risk of social isolation, illness and/or frailty. Further, it contributes towards a greater understanding of the individuals comprising a care and support network in the community and their contribution levels, directly comparing ‘patient’ and ‘provider’ perspectives.

• Investigating the care and support of frail individuals admitted to acute care in North-West London, pre-admission and post-admission, making use of an EPR system. This thesis additionally investigated whether different scenarios relating to a patient (e.g. interactions, length of hospital stay, change in dependency level) differed based on FEWS group. This study helps contribute towards new knowledge regarding the utility of FEWS with respect to different patient outcomes. It can also contribute towards efforts made to highlight the potential benefits of identifying frailty on admission in acute care (as noted by Theou et al. (2018)). Furthermore, this study complements and contributes towards recent literature that emphasises the benefits of using data from electronic patient records to improve the care and support of patients (Wyatt et al., 2020; Wallace et al., 2013).

• Investigating what constitutes an ‘assessment for frailty’ in the nursing homes with care setting across North-West London. This study contributes new knowledge of the ‘assessments for frailty’ used in nursing homes and elements of the assessments (e.g. domain coverage). This study was published and is further evidence of the contribution to new knowledge in the field of frailty (Sunkersing et al., 2019).

8.5: Impact on Policy and Practice
A number of implications for policymakers and practitioners working with frail individuals or populations could be considered based on the thesis findings. Arguably, the findings provide some insight into NHS Commissioning of care (a process by which services are planned, agreed and monitored) for frail individuals in the community and acute care setting. Additionally, an insight into the nursing home setting – a setting not commissioned by the NHS is given. Three implications for policy and practice in health and social care are highlighted below.

8.5.1: Right Care, Right Time, Right Place

In this thesis, the studies took place in settings commissioned by both CCGs and NHS England, (e.g. community health services and acute care services). One ‘Five Year Forward View’ objective (NHS England, 2014d, p.21) was to help patients receive the ‘right care, at the right time, in the right place’. This may be achieved by ‘more appropriate use of primary care, community mental health teams, ambulance services and community pharmacies’ (NHS England, 2014d, p.21).

This thesis evidences, in part, whether patients are receiving the ‘right care, at the right time, in the right place’. The high-level non-acute care study established many different methods of assessing for frailty, a finding complementary to the literature (Walston et al., 2018; Chen et al., 2018). However, as many of the different assessments mentioned had a physical and mental health domain bias, opportunities to identify frailty may be missed. As suggested by Gobbens et al. (2010b), this may cause fragmentation of care, with frail individuals potentially not receiving the right care at the right time.

The community setting study (Chapter 5), confirmed that while patients may receive multidisciplinary care from a healthcare professional, many individual’s reported care was also provided or facilitated by family members. Although the value of family and friends has been noted in literature (Luong et al., 2011; Huxhold et al., 2013), this finding could suggest a high number of informal carers caring for family (Office for National Statistics, 2013). However, informal care may not be appropriate for some frail individuals – as suggested by Kehusmaa et al. (2013), those in the poorest health require formal services, regardless of available informal care. Therefore, it is possible that some frail individuals may not be receiving the right care at the right time.

This suggestion may be evidenced by the findings in the acute care setting study (Chapter 6). This is because this study found that many admitted patients were living in their own homes
pre-admission – and consequently placed in areas with higher care and support availability and facilities post-discharge.

A lack of ‘right care’ could be considered reinforced by the nursing homes study. In this study, the majority of reported ‘assessments for frailty’ focussed on physical aspects or manifestations of frailty – and often less on social and environmental aspects. Hence, frailty in this setting may not be assessed in accordance with the way it should be, as has been described in the literature (Marshall et al., 2015; British Geriatrics Society, 2014). Thus, the suggestion that frail individuals, or patients, are not receiving the ‘right care’ at the ‘right time’ cannot be ruled out because they are potentially not being assessed in the ‘right way’.

8.5.2: Proactive, Not Reactive

The thesis results suggest that some UK services intended for frail individuals operate on a reactive, not proactive approach. Although ‘Falls Groups’ services are evidence of proactive measures available to pre-frail or frail individuals, the access to the service and short-term nature of the classes, may be a limitation for frail individuals, as suggested by Quadagno and Stahl. (2003). This may lead an individual to seek opportunities on their own (if any). However, this could lead to social isolation and loneliness – factors evidenced in the introduction that could be considered ‘non-medical’ aspects of frailty (Bunt et al., 2017; Makizako et al., 2018).

Further, a European study suggested that access to health and care services for frail, older adults was a major concern – and something requiring improvement (Kurpas et al., 2018). A lack of available or accessible care and support (which Oliver et al. (2014) suggest is a proactive measure) may lead to frailty developing in individuals unnoticed and result in reactive measures only put into place when, or if, a crisis develops.

The lack of congruency reflected in the assessment tools reported could reflect the fragmented nature of health and social care settings. Further, not recognising or assessing for frailty multidimensionally could foster an environment where care and support is suboptimal (Kojima et al., 2019) only given when a crisis occurs, i.e. reactively. Turner and Clegg (2014) already stated that the existing response to frailty is predominantly reactive.

This study found that the post-discharge living arrangement from acute care was often to a living arrangement with higher care and support than pre-admission. Some admitted patients therefore may not have been receiving care and support that would prevent a frailty related crisis in the first instance. This is a real possibility, given evidence from the literature that
details the benefits of interventions to reduce or prevent the progression of frailty, which could potentially limit admission to acute care (Travers et al., 2018; Apóstolo et al., 2018; Purdy, 2013).

8.5.3: Comprehensive Care

While the ability to provide comprehensive care can result in tailored care and support for a frail individual, efforts are needed to improve frailty recognition and its consideration. This can be evident from the studies in this thesis. For example, in the systematic review, high-level non-acute care study and nursing homes study, it was evident that the ‘assessments for frailty’ had a predominant physical and mental health domain bias. Frail individuals should receive a review of physical, social, mental and environmental needs (i.e. a comprehensive review (Bleijenberg et al., 2012; Harrison et al., 2015; British Geriatrics Society, 2015; NIHR, 2017)), which can be helped by using assessments such as the CGA. This can also help enhance an individual’s ability to live independently, understand their long-term conditions and ultimately reduce harm, the need for urgent care and a crisis (NHS England, 2014).

To encourage comprehensive care, encouraging the training of health and care professionals to recognise and appreciate that frailty may present itself in atypical and nonspecific ways other than physically, can help to succeed in ensuring that frailty is identified, quantified and managed appropriately through the right, comprehensive care. This can help ensure that the right care and support for a frail individual is given, as noted in the literature (Ding et al., 2017; Turner and Clegg, 2014; British Geriatrics Society, 2015).

8.6: Implication on Commissioning

Current guidelines for managing frailty are stated to lack evidence on which to base service design and commissioning (British Geriatrics Society, 2015). Nevertheless, NIHR statements detail that an increase in research regarding frail individuals will help clinical staff, managers and commissioners develop practices based on the best available evidence – and a strong foundation for growth in this field (NIHR, 2017).

This thesis gave evidence to suggest that the assessment and management of frailty (and therefore the care and support of individuals with frailty) varied greatly within settings. Moreover, the finding that many assessments for frailty used consider predominantly physical and mental health domains suggest that the knowledge of frailty – and the practices used to identify it – could be further improved. This would better align with evidence indicating that
frailty is multidimensional in nature (Wleklik et al., 2020; Xue, 2012; Gobbens et al., 2010a) and should therefore be addressed in a multidimensional way (Ding et al., 2017; Turner and Clegg, 2014).

While CCGs are accountable for commissioning secondary and acute care, local authorities commission a large majority of care homes. NHS England alongside CCGs work together to commission GP services (NICE, 2014). CCGs and local authority commissioners may also work together (i.e. joint commissioning), potentially supported by using joint-funding arrangements (NICE, 2014). This may be especially beneficial for frail populations, who may exhibit a range of aspects of frailty (e.g. physical and social), that could require addressing from both NHS services and local authorities. Domiciliary care and voluntary sector services could additionally be partners in this arrangement.

A result of joint commissioning could be a more shared understanding of frailty – and, as a result, more standardisation in the assessment and care and support of a frail individual. Moreover, it has been argued that integrating care commissioned by CCGs and local authorities can offer benefits (Dickinson et al., 2013; Newman et al., 2012) including reducing emergency hospital admissions and delayed discharges – in addition to offering economic savings (House of Commons, 2019a).

Table 28 below summarises suggested commissioning actions and potential resource implications for commissioners working towards improving the care and support of frail individuals or populations. These suggestions have been derived from the results presented in this thesis.
### Table 28: Suggested Commissioning Actions and Potential Resource Impact

<table>
<thead>
<tr>
<th>Improvement Area</th>
<th>Commissioning Actions</th>
<th>Provider Implications</th>
<th>Resource Impact</th>
</tr>
</thead>
</table>
| Assessment and diagnosis of frailty | The findings in this thesis suggest that frailty is not always assessed in a multidimensional way (and that focus is often placed on physical and mental health domains). Therefore, CCGs and local authorities should ensure that those at risk of frailty (or with frailty) have been assessed for frailty in a holistic, multidimensional way. This could also be achieved by encouraging the uptake of recommended, validated and standardised assessments for frailty, in addition to encouraging the use of assessments that cover more than just a physical and mental health domain. | All settings should ensure that healthcare professionals are made aware of:  
The importance of assessing for frailty in patients (e.g. acute care and nursing home setting).  
The holistic nature of frailty – and that it does not only affect physical and mental health domains, as is common in some assessments used.                                                                 | Potential costs for local authorities, hospitals and/or longer-term care settings (e.g. nursing homes) if additional training, time and/or a lack of capacity is available to conduct assessments for frailty.  
Potential savings for local authorities, hospitals and/or longer-term care settings by way of potentially reducing acute admissions or nursing home admission by identifying frailty and acting upon it (e.g. through care and support advised and given). This could also result in greater staff availability and hospital bed availability. |
| **Care and support networks** | This thesis highlighted the importance of a care and support network, in addition to some of the individuals who were deemed important in that network. As such, CCGs and local authorities should ensure that those at risk of frailty (or with frailty) have access to personalised care and support – and a care and support network that can help address any care and support needs. This could range from in-home care to preventative support in the community (e.g. a falls prevention group). Informal carers, such as family and friends (who were highlighted to contribute highly to the care and support of individuals) should have access to training and advice with regards to frailty. | Hospitals, GPs and care homes should ensure that care and support recommended is personalised and addresses all the needs of the individual. Preventative measures may also be advised for those who are not frail, but at risk of frailty (e.g. falls prevention group). | Potential costs for local authorities, hospitals and/or longer-term care settings (e.g. nursing homes) to train a workforce to provide personalised care and support to frail individuals. Potential savings include a reduction in the number of non-elective acute admissions due to personalised care and support given. This could result in an overall saving for healthcare services. |
| **Collaborative communication and/or commissioning** | This thesis highlighted the variation in ‘assessing for frailty’ and the diverse range of living arrangements of a frail individual. As such, CCGs and local authorities should ensure that healthcare services have a | All settings should ensure that healthcare professionals are made aware of: | Potential costs for local authorities, hospitals and/or longer-term care settings (e.g. nursing homes) to train a workforce that is |
| for healthcare services | greater shared understanding regarding the nature, assessment and management of frailty (of which the variation in understanding of frailty was highlighted in this thesis). This may make it easier for NHS healthcare professionals and social care professionals to work more closely together, potentially across many settings. This may also help to reduce the number of services running in isolation, which could be a cause of the variation in the understanding, assessment and management of frailty. For example, many nursing homes are operated outside of NHS governance, which may have led to a lack of standardisation in assessments for frailty used (as evidenced in this thesis). | The recommended assessments for frailty and best management practices (e.g. as detailed in guidance from the BGS (British Geriatrics Society, 2015)) Available care and support services – especially services that are not necessarily provided by the NHS (e.g. local buddying schemes or exercise groups run by third parties), but have been highlighted as potential care sources (e.g. as detailed in Community Setting Chapter). | flexible in working across different health and social care settings. Potential savings include a reduction in the number of non-elective acute admissions due to a greater understanding (and consequent planning) and recognition of frailty. This could result in an overall saving for healthcare services. |
8.7: Recommendations to Provide Better Care and Support to Frail People

Table 29 below summarises unique findings in each of the studies conducted, followed by suggested recommendations to provide better care and support.
With specific mapping against the four domain model proposed by Soong et al. (2013), the results illustrated that many ‘assessments for frailty’ used across non-acute care settings in North-West London covered a physical and mental health domain bias, with social and environmental domains considered to a lesser extent. This was a primary finding from the study, despite increasing evidence depicting the multidimensional nature of frailty (Wleklik et al., 2020; Xue, 2012; Gobbens et al., 2010a).

Although assessing predominantly physical and mental health domains will capture individuals who have frailty, other individuals who have frailty may not be identified if social and environmental domains are not considered, as suggested by De Witte et al. (2013).

Therefore, when assessing an individual for frailty, physical, social, mental and environmental domains should be considered, reflecting the multidimensional nature of frailty. In circumstances where conducting a CGA is feasible, this would be advised, as recommended previously by the BGS (British Geriatrics Society, 2014).

A more holistic approach with regards to the assessment for frailty (which should be conducted in all patient interactions with a health or social care professional) could help to reduce mortality, improve independence and reverse the progression of frailty (British Geriatrics Society, 2014).
If the care and support needs of a frail individual have been identified (through holistic and/or multidimensional assessments), these are more likely to be addressed.

| Community Setting | 5 | This partial disconnect between the healthcare professionals and patients may evidence a lack of communication between ‘patient’ and ‘provider’. Improving communication (e.g. via information stored in clinical records), is noted as an integral component in good professional practice and the delivery of quality healthcare (Mathioudakis et al., 2016). These records should be updated (as and where appropriate), by all members of a multidisciplinary team that may be involved in a patient’s care (Mathioudakis et al., 2016). This would be one method of improving the communication between ‘patient’ and ‘provider’, potentially leading to better care and support planning of a frail (or at risk) individual.

A further recommendation is to note the importance of Family/Friends in a care and support network, potentially as an ‘informal carer’. When a care and support plan for a

The study illustrated that on average, the ‘patients’ placed the healthcare professionals closer to the centre of the concentric ring model than the healthcare professionals did (Figures 16 and 17), suggesting that the healthcare professionals may not fully recognise the perceived level of care and support they give.

Family/Friends were noted as the second highest reported category with regards to an individual’s care and support network (from both ‘patient’ and ‘provider’ perspectives).

Some ‘patients’ who were interviewed stated that they were independent.
frail individual is formulated, Family/Friends must be recognised and considered (providing agreement from the frail individual). Family/Friends should be provided with adequate information and support if they have a significant caring responsibility. ‘A practical guide to healthy caring’ could be an initial source of information (Public Health England, 2016).

This ‘independence’ stated from ‘patients’ should be recognised, with a range of group-based/one-to-one activities and volunteering opportunities meeting the needs and interests of local populations being supported (or provided if not available). This is likely an area for CCGs and local authorities to consider.

| Acute Care Setting | 6 | This study illustrates a significant number of living arrangements in which frail individuals can have, in addition to the variation in the levels of care and support that they receive in each of these locations/living arrangements. The most common discharge living arrangement in this study was a nursing home setting. | Further research is required to fully understand the reasons behind the most common discharge living arrangement. However, as discussed, this may be due to inadequate care and support being available in other settings, such as home and/or community care. Thus, a recommendation for the greater direction of resources and investment in social care services and local CCGs may help to prevent potentially |
Use of FEWS at the point of admission supports evidence suggesting frailty could be described or identified on a scale (e.g. low, medium, high relative to score). Although the weighting of FEWS needs defining, the study established that the highest FEWS group (3) was statistically significantly different to FEWS group 1 with respect to the number of complete healthcare professional interactions a patient received during their hospital admission.

Although the weighting of FEWS needs defining, the study established that the highest FEWS group (3) was statistically significantly different to FEWS group 1 with respect to the number of complete healthcare professional interactions a patient received during their hospital admission. Further, improvements in social care may help to reduce delayed transfers of care, ensuring patients leave safely and to a familiar environment (e.g. their own home) (Jayanetti, 2020).

A recommendation to identify frailty at the point of admission (e.g. with FEWS or another) in a hospital may help to tailor frailty-attuned care and/or interventions during a hospital stay and contribute towards improving patient and service outcomes (Gilbert et al., 2018). Use of a frailty score (e.g. FEWS) could additionally help with hospital resource allocation and planning, as suggested in this thesis. Further, identifying frailty early may help to pinpoint patients who would benefit most from a CGA. Conducting a CGA may ensure that patients receive care and support they require, particularly upon discharge, helping reduce hospital readmissions and increase the ability for them to live longer in better health.

| Nursing Home Setting | 7 | This study found that many ‘assessments for frailty’ are used in nursing homes across North-West London. Of the domains of frailty (e.g. as outlined by Soong et al. (2013)) were being assessed. Hence, one recommendation is for | The results in this study suggested that not all four domains of frailty (e.g. as outlined by Soong et al. (2013)) were being assessed. Hence, one recommendation is for |
assessments reported, a strong physical domain bias exists—perhaps reflecting current perceptions of what frailty is.

Despite the presence of assessments for frailty in all nursing homes, there was variation in the quantity and nature of assessments reported. For example, the results illustrated more reported standardised assessment tools (43) than non-standardised assessment tools (34) overall. Moreover, a statistically significant difference in the number of assessments used in corporate chain owned nursing homes (higher) versus independently owned nursing homes was found, suggesting different levels of comprehensiveness in assessing for frailty between the two.

These findings illustrate different approaches to the assessment for frailty, which could reflect a different understanding of the nature of frailty across nursing home. Further to this, the variation could pose challenges with regards to the integration and ease of communication between different healthcare settings and professionals. the multidimensional nature of frailty to be reflected in the assessments for frailty used.

This is important, as this enables care providers to identify and anticipate the multidimensional needs of individuals with, or at risk of frailty (Wleklik et al., 2020). It can also be used to tailor care, reducing harm and improving outcomes (British Geriatrics Society, 2014; Coker et al., 2019).

A further recommendation is for training and greater collaboration between and among healthcare professionals/nursing homes with regards to frailty. The purpose of this training would be to facilitate a shared understanding of frailty, in addition to promoting consistent and shared approaches towards the assessment for frailty across the nursing home setting. The overall aim of a shared approach and understanding would be to help improve the care and support of frail residents in this setting. This has also been highlighted as important by Coker et al. (2019).
8.8: Methodological Considerations

This thesis uses both qualitative and quantitative methodologies to aid in holistically addressing the overarching, specific and supporting research questions. Consideration of both patient and provider perspectives has also taken place. Each study helps describe a picture of what was happening in that setting, as discussed in this thesis.

8.8.1: Regional Scale

The studies undertaken were conducted regionally in North-West London. This was the catchment area that the CLAHRC was associated with and, as a result, enabled one to utilise existing contacts and known services, if available.

Using a defined geographical area additionally allowed in-depth examination of services which may not have been possible within the time limits if done on a larger population scale. Moreover, undertaking research first with a regional focus enabled research methodologies and practices to be tested and confirmed as feasible methods, which could then be replicated in other regions and/or scaled up to larger regions.

8.8.2: SMART Criteria

Each study conducted has been planned, conducted and achieved following ‘SMART’ (‘specific, measurable, achievable, relevant and time-bound’) objectives (Doran, 1981).

Each study conducted had a specific goal, aligned to a specific research question, detailing what was to be accomplished. Each study methodology was planned to ensure that the findings could be measurable. Using experience and evidence from previous research helped provide certification that the research questions were addressable and achievable. All studies were relevant to the field of frailty, had clear links and progression, feeding into the overarching research question outlined at the forefront of the thesis.

Lastly, each study was planned to allow analysis and consideration of the data within the time-frame allocated for completion. Notably, the studies conducted were planned to allow capability and scope for adaptation should processes take longer than anticipated (e.g. ethics applications, availability of interview participants).

8.9: Limitations

There have been inevitable limitations to the work presented, which have been addressed in the conclusion of each study comprising this thesis. Nevertheless, a shared limitation of the
studies presented is the defined geographical area that they took place in (North-West London). While this may give a representation of some of the practices that may occur in North-West London, further studies in different geographical locations would be required to greater understand the care and support of a frail individual. For example, frail individuals living in a different geographical location, who may not have accessibility or the availability of a ‘Falls Group’ (or similar) may have different care and support networks to those found in this study.

Further, the community and acute care studies sampled individuals designated at risk of falls, or having had a fall. While it is appreciated that the nature of frailty is multidimensional (and that sampling in this way may restrict the potential ‘frail’ population studied), this strategy was chosen due to time limitations and clinical expertise requirements. However, for future publications, sampling individuals across multiple frailty domains will be considered.

8.10: Future Work

The studies highlight several areas for further research, of which critical areas are detailed below.

8.10.1: Frailty as a Concept

At present, the term ‘frailty’ encompasses many different viewpoints and consequent definitions, with no ‘standard’ definition of frailty (Lally and Crome, 2007; Rodriguez-Mañas, et al., 2013; Rockwood and Howlett, 2018). While some definitions focus primarily on physical attributes, others have a more holistic perspective (Wleklik et al., 2020). This was also evidenced in some of the studies conducted in this thesis. However, as argued by Gobbens et al. (2010), a more inclusive definition is needed, suggesting that viewing frailty as merely physical deficits could cause care fragmentation, with potentially negative impacts on the care for frail individuals.

Thus, to ensure that healthcare professionals and carers all contribute to a safer, committed and compassionate and caring service (Francis, 2013), a shared understanding of ‘frailty’ may help achieve this. This study illustrated some of the variations of perspective and understanding of frailty. Future work could establish where frailty definitions are most commonly derived from – and what practical efforts need to take place to allow a holistic definition to be considered and addressed in the prognosis, assessment and management of frailty.

8.10.2: Integration of Care and Support Services
Future work could take a longitudinal approach to frailty studies, following pre-frail or mildly frail individuals over a period of time, identifying events including: the sequence of care service, how the frailty of the individuals may develop over time – and how the care and support of the frail individual has contributed to these events.

This study could additionally greater ascertain the integration and communication of care services and how these affect the trajectory of a frail individual. Ham and Curry (2011) state that the current level of integration has been viewed as a persistent barrier to aspects of the improvement of health and care services. Thus, repercussions on the capacity and capability in the care and support of frail individuals could occur. Investigating the impact of the integration (or lack of) of services may help provide further insight into the care and support of frail individuals. This could be considered important, as these are noted areas of improvement from both the government (HM Government, 2015) and charity organisations (Age UK, 2020).

A number of challenges may be associated with this study, including incomplete and/or interrupted follow-up of individuals and the temporal and financial demands required to carry out the study.

8.10.3: Availability of Care

This thesis evidences that many patients received care from family, friends or carers in their own home, dependent on their needs. This finding may suggest a preference for care and support being received in familiar settings. Therefore, studies could be undertaken to understand whether frail individuals are sufficiently equipped to be able to live the life they want, receiving care and support on their terms.

This study may consider services such as in-home care, social services and/or the provision of people, services or education that ensures a proactive recognition and management of frailty. Indeed, studies have evidenced known factors that determine adverse outcomes for older populations living in the community, such as depression (Sarkisian and Lachs, 1996), caregiver problems (Tsuji et al., 1995) and housing conditions (Zhao et al., 1993). Hence, this study would be useful in understanding what programmes are known, used and exist to prevent some of the known determinants of frailty.

8.10.4: The Future of Frailty Assessment, Management and Care

As discussed above, proactive approaches rather than reactive approaches with regards to frailty must be encouraged. These may help frail patients with the care and support needed
earlier, reducing length of stay and/or unnecessary hospital admissions. This may ultimately increase overall patient and clinician satisfaction, as suggested by Bleijenberg et al. (2012).

Research suggests that in the future, interventions that promote and facilitate independence, such as re-enablement and restorative care could become crucial (Dent et al., 2019; Dubuc et al., 2013). Further, strategies that remove potential accessibility issues that older people (who may have frailty) face with regards to health and social care access are likely to become more pertinent (Dent et al., 2019).

In the community setting, an extensivist service is being trialled and may indicate the future direction of frailty assessment, management and care.

An extensivist service is a clinical service aimed at older people aged 60 and above with multiple long-term conditions (NHS Confederation, 2017). Patients are referred to their GP and undergo an initial assessment with a range of healthcare professionals and other supporting staff all working together as part of a multidisciplinary team (NHS Confederation, 2017). Taking place in one ‘hub’, it aims to reduce the burden on acute service (British Geriatrics Society, 2018f). It is hoped by using this service that contact with a wide range of healthcare professionals at one point in time can be beneficial for both patients and healthcare professionals (NHS Confederation, 2017). Recent findings from one sample found there was a reduction in A&E attendances, non-elective admissions and elective admissions (NHS Confederation, 2017). However, further research to determine the sustainability and viability of the service and whether the benefits can be seen in a larger sample is needed.

8.10.5: NHS Long Term Plan

Recently, the NHS Long Term Plan (NHS, 2019) details a plan aiming to make the NHS fit for the future. The plan notes that there is an aim for new and integrated models of primary and community mental health care and for older adults to have ‘greater choice and control over their care and support’ and an aim to support people to age well. Future work regarding the care and support of frail individuals could investigate how these aims are being put into place – and the effect that this is having on an individual’s care and support.

8.11: Conclusions

The introduction to this thesis established the importance of care and support of a frail individual. This thesis describes frailty on a spectrum, of which evidence from the literature supports the notion that care and support should be addressed through holistic consideration
across many domains (e.g. physical, social, mental and environmental). Importantly, it was emphasised that frailty is not confined to one setting and equally, the care and support of frail individuals should not be confined to one setting.

Hence, this thesis demonstrates that the care and support of frail individuals can alter over setting and aspects of care and support can be influenced by many factors including level of frailty (e.g. ascertained using FEWS), health and care setting and provider. Also described are the many different tools used to help assess for frailty in individuals, which may also influence the care and support they receive (Turner and Clegg, 2014). A greater understanding of what an ‘assessment for frailty’ constitutes was additionally gathered in this thesis, providing further insight into the understanding, recognition and diagnosis of frailty.

Notably, the studies in this thesis demonstrate that many individuals are receiving care and support in their own home or attending a day class such as a falls group – environments enabling them to retain a sense of independence and autonomy. This may also evidence a preference to remain in a setting such as their own home rather than a nursing home, though further work is required to ascertain this, as this was not investigated in this study.

The studies in this thesis also provide compelling evidence to signify that more progress is needed to achieve a care and support system across settings that is truly proactive, holistic and preventative, as recommended in literature (Dixon et al., 2013). This is an important finding from the studies, as the care and support of individuals with conditions such as frailty, which can be long term, has been acknowledged as an important challenge for the NHS.

In the acute care setting, records abstracted from an EPR database detailed the pre-admission and post-discharge locations/living arrangements of frail individuals (classified by being over 65 and at risk of falls). The importance of a living arrangement that may be familiar and preferred was highlighted. Moreover, the benefits were discussed in relation to the literature – living arrangements tailored to the individual, that have been assigned based on shared decision making (i.e. both clinicians and patients) may help the individual to manage their frailty potentially helping to reduce readmission.

In settings where frailty is likely to be present and of a mild or high level, particular consideration of an individual’s physical, social, mental and environmental care and support needs, (fundamental domains of a CGA), are recommended ways of managing frailty in individuals (British Geriatrics Society, 2014c). Despite this, the work undertaken as described
in this thesis (e.g. in nursing homes) highlights that in some settings, consideration across all four domains may not be taking place.

The studies as described in this thesis endeavour to investigate how the care and support of frail individuals manifests across the frailty spectrum. Each study highlights areas that lend support to conforming to guidelines which have been recommended as best practice. Nevertheless, the findings do suggest that further progress is needed in some areas to ensure that the care and support of frail individuals continues to improve.
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Software Used:

CARTODB: Figures 7 & 11 were created using open source ‘Carto’ software by CARTODB Inc. For more information about ‘Carto’ software, please visit https://carto.com/

Qualtrics: The data described in Chapter 5 was generated using Qualtrics software, Version 2.5 of Qualtrics. Copyright © [2018] Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. https://www.qualtrics.com

Appendices

Appendix A: Further Details Regarding Systematic Review

Review Question

1. What instruments exist to assess frailty in older adults in the non-acute care setting?
2. What domains are covered in these instruments (physical, social, mental and environmental)?

Searches

This systematic review aims to update an existing systematic literature review (Faller et al., 2019). As such, every effort will be made to use the same databases the authors of that study used. Hence, searches will be performed in: PubMed, Scopus, EMBASE, Ovid, ProQuest, Web of Science, LILACS, PAHO, BDENF, MedCarib, WHOLIS, CINAHL, CAPES Theses and Dissertations Database and Google Scholar (a total of 14 databases). Manual searches will also be conducted in unpublished studies and grey literature.

Search Strategy

The search strategy and terms used are identical to that used by Faller et al (2019) and adapted to each of the databases searched. An example search strategy for Scopus is given below:

( TITLE-ABS ( aged ) OR TITLE-ABS ( "aged, 80 and over" ) OR TITLE-ABS ( aging ) OR TITLE-ABS ( older ) OR TITLE-ABS ( elder ) OR TITLE-ABS ( "older adults" ) OR TITLE-ABS ( "oldest old" ) OR TITLE-ABS ( "very old" ) OR TITLE-ABS ( "very elderly" ) ) AND ( TITLE-ABS ( psychometric* ) OR TITLE-ABS ( "validation studies" ) OR TITLE-ABS ( clinimetric* ) ) OR TITLE-ABS ( "internal consistency" ) OR TITLE-ABS ( tool ) OR TITLE-ABS ( tools ) OR TITLE-ABS ( instruments ) OR TITLE-ABS ( instrument ) OR TITLE-ABS ( screening ) OR TITLE-ABS ( "predictive value" ) OR TITLE-ABS ( sensitivity ) OR TITLE-ABS ( questionnaire ) OR TITLE-ABS ( assessment ) OR TITLE-ABS ( evaluation ) OR TITLE-ABS ( "self-reported" ) OR TITLE-ABS ( "self-report" ) OR TITLE-ABS ( validity ) ) AND ( TITLE-ABS ( "frail elderly" ) OR TITLE-ABS ( "frailty elderly" ) ) OR TITLE-ABS ( "frailty index" ) OR TITLE-ABS ( "frailty syndrome" ) OR TITLE-ABS ( "frail scale" ) OR TITLE-ABS ( fragility ) OR TITLE-ABS ( "pre-frailty" ) ) AND ( LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 )

The studies will be assessed for their relevance to the research question and duplicate articles will be removed. Each title and abstract of the remaining articles will be examined; potentially relevant articles will be examined thoroughly (reading of full-text articles).

Type of Study Included

No restrictions

Condition being Studied

Assessment of frailty in older adults in the non-acute care setting. Frailty has been defined as an individual with heightened vulnerability to adverse health status or functional change (Martin and Brighton, 2008; Rockwood and Howlett, 2018).
**Population/Participants**

As with the review by Faller et al (2019), the review includes studies regarding the development, validation or cultural-adaptation of instruments to assess frailty in the non-acute care setting. Included will be studies assessing frailty in those 60 years of age, or older. No restrictions are placed on gender or country of publication. Excluded are studies referring to an assessment for frailty intended for use outside of the non-acute care setting (e.g. hospital). Studies in a language other than English that cannot be accurately translated and assessed will also be excluded. Only studies published after the end of the systematic review by Faller et al (2019) will be included (i.e. from 25th September 2018 – 18th May 2020).

**Interventions(s)**

N/A

**Comparator(s)/Control**

N/A

**Main Outcomes(s)**

To describe the instruments to assess frailty in older adults in the non-acute care setting. To describe the domains used in these instruments (physical, social, mental and environmental).

**Additional Outcome(s)**

None

**Data Extraction (Selection Process)**

After completing the searches in the databases the following processes will take place:

- Removal of duplicate records
- Screening of title/abstracts for eligibility according to research questions posed. Each study must have either developed an assessment for frailty – or aimed to assess, validate or adapt an assessment for use in a non-acute care setting
- Full-texts of the articles will then be reviewed for the criteria above
- The remaining articles will be examined and investigated in terms of their domain coverage and other details.

The extracted data will include:

- Author(s) and date of publication
- Assessment used. This will also include investigating the domain coverage of the assessments, the setting the assessment is used in (e.g. community or nursing home) and a brief description of the instrument used.

**Risk of Bias Assessment**

None conducted

**Type and Method of Review**

Systematic Review
Appendix B: Participant Information Sheet (Patients)
Participant Information Sheet:

Exploring the networks of individuals within a community setting

(IRAS ID: 218673, DATE: 05/05/17, VERSION: 1.1)

Investigators: Mr David Sunkersing, Professor Derek Bell, Professor Finbarr Martin, Dr Julie Reed. Department of Medicine, Imperial College London & NIHR CLAHRC NWL

Dear Participant,

Please take some time to read though the following information. If at any point you have any questions, or would like more information, please do not hesitate to ask the researcher, Mr David Sunkersing, or email at a later date at: d.sunkersing@imperial.ac.uk.

What is the purpose of the study?

This study seeks to explore the care networks of individuals within a community setting who have recently used a ‘Falls Prevention’ service. This study could provide useful information for healthcare professionals and influence the way care is delivered and provided for those in the community. This study is part of my final year for my PhD project at Imperial College London.

Why have I been invited?

You have been invited as you have recently used a ‘Falls Prevention’ service – and therefore have first-hand experience of some of the care that is delivered across central London. You may also have further experience and/or insights into other types of care or support with aspects of day-to-day living.

Do I have to take part?

Your participation is entirely voluntary. You can refuse to participate without penalty and you can stop your participation at any time. Your refusal will not impact current or future relationships with Imperial College London or NIHR CLAHRC NWL.

How will the study be conducted?

You have been invited to participate in a confidential and anonymous face-to-face interview and activity lasting around 30 minutes. If you agree to participate, a suitable time and date will be arranged prior to the end of December 2017.
This interview and activity will consist of one, single interview where a series of questions will be asked to elicit the individuals involved in your day-to-day living, or care. There will be a short activity based on these responses, whereby Post-it notes will be placed on a circle to create a visual output.

With your permission, we will also ask the healthcare professionals within the ‘Falls Prevention’ service/team who they believe is involved in your day-to-day living, or care – and ask them to complete the same activity.

**What are the possible advantages of taking part?**

You may find the study interesting and enjoy answering questions about aspects of care you have experienced. The information we get from the study will help us to understand more about the care provision and delivery in central London. These experiences and insights are valuable to us – and could help in contributing to improvements in the way care is delivered.

**What are the possible disadvantages of taking part?**

You may not be comfortable talking about the experiences and insights you have with your care, or aspects of your day-to-day living.

**What if there is a problem?**

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone’s negligence, then you may have grounds for a legal action. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been treated during the course of this study then you should immediately inform the Investigator (David Sunkersing - 020 3315 8144; d.sunkersing@imperial.ac.uk). The normal National Health Service complaints mechanisms are also available to you. If you are still not satisfied with the response, you may contact the Imperial AHSC Joint Research Compliance Office (jro@ic.ac.uk).

The Patient Advice and Liaison Service (PALS) at Central London Community Healthcare Trust (CLCH) is also available to offer confidential advice, support and information on health-related matters (0800 368 0412; clchpals@nhs.net).

**Will my taking part in the study be kept confidential?**

Yes. All of the information that you give will be anonymised so that those reading reports from the research will not know who has contributed to it.
With permission, the study will additionally be audio-recorded by the researcher - on the understanding that the recordings will be kept in a secure locked cabinet at Chelsea and Westminster Hospital and destroyed after transcription.

Nobody other than the researchers will have access to the data, which will be saved securely on password protected computers and stored securely for 10 years on Imperial College London premises in accordance with the Data Protection Act 1998.

**What will happen to the results of the research study?**

We aim to publish the results of the study in academic papers and present at academic conferences. We also aim to engage healthcare professionals, the NHS – and the general public with the results.

You will not be identified in any report/publication.

**Who is sponsoring the research?**

The research is sponsored by Imperial College London.

**What happens now?**

Thank you for reading this information sheet and for considering taking part in this research.

If you are interested in taking part in the study, you are asked to complete the attached response slip and return it to a member of the ‘Falls Prevention’ team, who will contact one of the researchers. You will then be contacted to arrange a meeting at a suitable time and date (to be held at where you usually attend your ‘Falls Prevention’ class).

*Please retain this document for your records*
Response Slip

By my signature below, I confirm that I am willing to be contacted by one of the researchers about organising a suitable date and time for the interview and activity. The interview and activity will take place where you usually attend your ‘Falls Prevention’ class.

Please print the following information:

Name: __________________________________________________________________

Date: __________________________________________________________________

Contact Number: __________________________________________

Contact Email: ________________________________________________

Signature: _________________________________________________________
Appendix C: Participant Information Sheet (Healthcare Professionals/Staff)
Participant Information Sheet:

Exploring the networks of individuals within a community setting

(IRAS ID: 218673, DATE: 05/05/17, VERSION: 1.1)

Investigators: Mr David Sunkersing, Professor Derek Bell, Professor Finbarr Martin, Dr Julie Reed. Department of Medicine, Imperial College London & NIHR CLAHRC NWL

Dear Participant,

Please take some time to read though the following information. If at any point you have any questions, or would like more information, please do not hesitate to ask the researcher, Mr David Sunkersing, or email at a later date at: d.sunkersing@imperial.ac.uk.

What is the purpose of the study?

This study seeks to explore the care networks of individuals within a community setting who have recently used a ‘Falls Prevention’ service. This study could provide useful information for healthcare professionals and influence the way care is delivered and provided for those in the community. This study is part of my final year for my PhD project at Imperial College London.

Why have I been invited?

You have been invited as you are a member of a ‘Falls Prevention’ service – and therefore have first-hand knowledge and experience of some of the care that is delivered across central London. You may also have further insights into other types of care or support with aspects of day-to-day living.

Do I have to take part?

Your participation is entirely voluntary. You can refuse to participate without penalty and you can stop your participation at any time. Your refusal will not impact current or future relationships with Imperial College London or NIHR CLAHRC NWL.

How will the study be conducted?

You have been invited to participate in a confidential and anonymous face-to-face interview and activity lasting around 30 minutes. If you agree to participate, a suitable time and date will be arranged prior to the end of December 2017.
This interview and activity will consist of one interview where a series of questions will be asked to elicit the individuals involved in a patient’s day-to-day living, or care. There will be a short activity based on these responses, whereby Post-it notes will be placed on a circle to create a visual output.

**What are the possible advantages of taking part?**

You may find the study interesting and enjoy answering questions about the different aspects of care. The information we get from the study will help us to understand more about the care provision and delivery in central London. These experiences and insights are valuable to us – and could help in contributing to improvements in the way care is delivered.

**What are the possible disadvantages of taking part?**

You may not be comfortable talking about the insights you have regarding care.

**What if there is a problem?**

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone’s negligence, then you may have grounds for a legal action. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been treated during the course of this study then you should immediately inform the Investigator (David Sunkersing - 020 3315 8144; d.sunkersing@imperial.ac.uk). The normal National Health Service complaints mechanisms are also available to you. If you are still not satisfied with the response, you may contact the Imperial AHSC Joint Research Compliance Office.

The Patient Advice and Liaison Service (PALS) at Central London Community Healthcare Trust (CLCH) is also available to offer confidential advice, support and information on health-related matters (0800 368 0412; clchpals@nhs.net).

**Will my taking part in the study be kept confidential?**

Yes. All of the information that you give will be anonymised so that those reading reports from the research will not know who has contributed to it.

With permission, the study will additionally be audio-recorded by the researcher - on the understanding that the recordings will be kept in a secure locked cabinet at Chelsea and Westminster Hospital and destroyed after transcription.
Nobody other than the researchers will have access to the data, which will be saved securely on password protected computers and stored securely for 10 years on Imperial College London premises in accordance with the Data Protection Act 1998.

**What will happen to the results of the research study?**

We aim to publish the results of the study in academic papers and present at academic conferences. We also aim to engage healthcare professionals, the NHS – and the general public with the results.

You will not be identified in any report/publication.

**Who is sponsoring the research?**

The research is sponsored by Imperial College London.

**What happens now?**

Thank you for reading this information sheet and for considering taking part in this research.

If you are interested in taking part in the study, you are asked to complete the attached response slip and return it to Ms. Natasha Booton who will forward it on to me. You will then be contacted to arrange a meeting at a suitable time and date (to be held at where you usually run the ‘Falls Prevention’ class).

**Please retain this document for your records**
Response Slip

By my signature below, I confirm that I am willing to be contacted by one of the researchers about organising a suitable date and time for the interview and activity. The interview and activity will take place where you usually run the ‘Falls Prevention’ class.

Please print the following information:

Name: __________________________________________________________________
Date: __________________________________________________________________
Contact Number: ______________________________________________
Contact Email: _________________________________________________________
Signature: _______________________________________________________________
Appendix D: Consent Form (Patients)

Consent Form
Exploring the networks of individuals within a community setting

Please read and confirm your consent to participate in this study by initialing the appropriate box(es) and signing and dating this form.

1. I understand that my participation is voluntary, and that I am free to withdraw at any time without giving any reason and without any implications for my legal rights.

2. I give permission for my participatory activity sheet to be stored securely on Imperial College London premises and any other responses to be kept on a secure password protected computer server and stored for 10 years following completion of the study (all anonymised).

3. I understand that anonymised quotes may be used in publications stemming from the research but not in any way that might allow for identification of individual participants.

4. I understand that all personal and survey response data will be kept confidential at all times.

5. I agree for my contact details to be kept on secure, password protected Imperial College London computer systems/premises, in accordance with the 1998 Data Protection Act. These will be used only to contact you and inform you of the results of the study. This information will be destroyed at the end of the study.

6. I agree that my data may be accessed by responsible persons from the Sponsor, NHS Trust, or regulatory authorities, in order to check that the study has been conducted correctly.

7. Optional: I give permission for the interview to be audio-recorded by the researcher, on the understanding that the recordings will be kept in a secure locked cabinet at Chelsea and Westminster Hospital and destroyed after transcription.

8. I give permission for the healthcare professionals within the Falls Prevention team to complete an activity sheet based on their perception of my day-to-day living/care.

9. A copy of this consent form will be kept for 10 years following completion of the study.

10. I agree to take part in this study.

Name of participant __________________ Date __________________ Signature __________________

Name of researcher __________________ Date __________________ Signature __________________
Appendix E: Consent Form (Healthcare Professionals)

Consent Form
Exploring the networks of individuals within a community setting

Please read and confirm your consent to participate in this study by initialing the appropriate box(es) and signing and dating this form.

1. I understand that my participation is voluntary, and that I am free to withdraw at any time without giving any reason and without any implications for my legal rights.

2. I give permission for my participatory activity sheet to be stored securely on Imperial College London premises and any other responses to be kept on a secure password protected computer server and stored for 10 years following completion of the study (all anonymised).

3. I understand that anonymised quotes may be used in publications stemming from the research but not in any way that might allow for identification of individual participants.

4. I understand that all personal and survey response data will be kept confidential at all times.

5. I agree for my contact details to be kept on secure, password protected Imperial College London computer systems/premises, in accordance with the 1998 Data Protection Act. These will be used only to contact you and inform you of the results of the study. This information will be destroyed at the end of the study.

6. I agree that my data may be accessed by responsible persons from the Sponsor, NHS Trust, or regulatory authorities, in order to check that the study has been conducted correctly.

7. Optional: I give permission for the interview to be audio-recorded by the researcher, on the understanding that the recordings will be kept in a secure locked cabinet at Chelsea and Westminster Hospital and destroyed after transcription.

8. A copy of this consent form will be kept for 10 years following completion of the study.

9. I agree to take part in this study.

_________________________  ______________________  __________________
Name of participant        Date                     Signature

_________________________  ______________________  __________________
Name of researcher         Date                     Signature
Appendix F: Participatory Interview Guide (Patients)

Participatory Interview Guide (Patients)

The interview guide described is intended to be conducted in a semi-structured fashion. The interview will help populate a ‘Concentric Circle of Influence’ diagram.

IRAS Number: 218673
Version: 1.1
Date: 16/06/17
Name Generator Questions (1)

Questions:

Q1 From time to time, you may discuss your day-to-day needs with various people in different roles. Who are the people you discuss these needs with?

Q2 Are any of the following people involved with your day-to-day needs:

- Doctor (GP)
- Nurse
- Community Pharmacist
- Dietician
- Physiotherapist
- Occupational Therapist
- Carer
- Family
- Friends

(Questions 3-6 aim to establish the names of the individuals who would help out with specific aspects of day to day living – and are ordered to loosely cover the four domains of frailty: physical, social, mental and environmental).

Q3 Is there anyone who helps you with the physical aspects of day-to-day living? For example, this could be someone who helps you get from one place to another or helps you with walking or mobility. [Physical Domain]

Q4 Who are the people you enjoy socialising with? [Social Domain]

Participatory Action:

- Doctor
- Bob (Friend)
- Carer

As each individual/resource is generated from the questions, it will be written on a Post-it note (Examples shown).
Name Generator Questions (2)

Questions:

Q5 Is there anyone who checks up on your feelings, thoughts and actions or your memory? [Mental Domain]

Q6 Is there anyone who visits you to ensure that the inside and outside of your home is looked after? This could be someone who ensures you can easily and safely: walk around your house, get in and out of bed, see clearly due to the lighting, use the toilet and bath, reach items in the kitchen, use steps/stairs and are wearing well-fitting footwear. [Environmental Domain]

Q7 If you had an accident, such as a fall, who would you immediately contact?

Q8 Do you use any resources in relation to your care needs? Some examples:

- Internet Search
- Social Media Networks (e.g. Health Unlocked)
- Leaflets
- Books

Participatory Action:

- Doctor
- Bob (Friend)
- Carer
- Son
- Internet Search

As each individual/resource is generated from the questions, it will be written on a Post-it note [Examples shown].
Domain Coverage (Removed After Testing)

Questions:

Q9 Looking at the individuals you have mentioned, who do you feel help with your:

- Physical aspects of day to day living [Use of question 3 to help understand what is meant by this term]
- Social aspects of day to day living [Use of question 4 to help understand what is meant by this term]
- Mental aspects of day to day living [Use of question 5 to help understand what is meant by this term]
- Environmental aspects of day to day living [Use of question 6 to help understand what is meant by this term]

Participatory Action:

- Doctor
- Bob (Friend)
- Carer
- Son
- Internet Search

Upon participant reflection of the domains covered by each individual mentioned, a corresponding coloured dot will be placed on the Post-it note to represent the domain(s) covered.

For example: Red - Physical, Blue - Social, Green - Mental, Yellow - Environmental
Contribution

Questions:

Q10 How would you describe the level of contribution of this individual/resource in your care? (Participant will place Post-it note on ‘Concentric Circle of Influence’ diagram to signify answer).

Participatory Action:

The Post-it notes with the named individuals/resources will be moved and placed onto the ‘Concentric Circle of Influence’ diagram.

The inner most ring (1) corresponds to ‘Substantial contribution’; the outer (4) ‘No contribution’.
Review

Questions:

Q11 How do you feel about the current diagram that has been produced. Is there anything that you would change?

Participatory Action:

Participant will be allowed to alter positions of individuals/resources if necessary – and/or alter domains covered.
Appendix G: Participatory Interview Guide (Healthcare Professionals)

Participatory Interview Guide (Healthcare Professionals)

The interview guide described is intended to be conducted in a semi-structured fashion. The interview will help populate a ‘Concentric Circle of Influence’ diagram.

IRAS Number: 218673
Version: 1.1
Date: 16/06/17
Name Generator Questions (1)

Questions:
Q1 From time to time, [Patient X] may discuss their day-to-day needs with various people in different roles. Who are the people they discuss these needs with?

Q2 Are any of the following people involved with [Patient X’s] day-to-day needs:
- Doctor (GP)
- Nurse
- Community Pharmacist
- Dietician
- Physiotherapist
- Occupational Therapist
- Carer
- Family
- Friends

(Questions 3-6 aim to establish the names of the individuals who would help out with specific aspects of day to day living – and are ordered to loosely cover the four domains of frailty: physical, social, mental and environmental).

Q3 Is there anyone who helps [Patient X] with the physical aspects of day-to-day living? For example, this could be someone who helps them get from one place to another or helps you with walking or mobility. [Physical Domain]

Q4 Who are the people [Patient X] enjoys socialising with? [Social Domain]

Participatory Action:

As each individual/resource is generated from the questions, it will be written on a Post-it note (Examples shown).
Name Generator Questions (2)

Questions:

Q5 Is there anyone who checks up on [Patient X’s] feelings, thoughts and actions or their memory? [Mental Domain]

Q6 Is there anyone who visits [Patient X] to ensure that the inside and outside of their home is looked after? This could be someone who ensures they can easily and safely: walk around their house, get in and out of bed, see clearly due to the lighting, use the toilet and bath, reach items in the kitchen, use steps/stairs and are wearing well-fitting footwear. [Environmental Domain]

Q7 If [Patient X] had an accident, such as a fall, who would they immediately contact?

Q8 Does [Patient X] use any resources in relation to their care needs? Some examples:

- Internet Search
- Social Media Networks (e.g. Health Unlocked)
- Leaflets
- Books

Participatory Action:

As each individual/resource is generated from the questions, it will be written on a Post-it note (Examples shown).
Contribution

Questions:

Q9 How would you describe the level of contribution of this individual/resource in [Patient X's] care? (Participant will place Post-it note on 'Concentric Circle of Influence' diagram to signify answer).

Participatory Action:

The Post-it notes with the named individuals/resources will be moved and placed onto the 'Concentric Circle of Influence' diagram.

The inner most ring (1) corresponds to 'Substantial contribution'; the outer (4) 'Least contribution'.
**Review**

**Questions:**

Q10 How do you feel about the current diagram that has been produced. Is there anything that you would change?

**Participatory Action:**

Participant will be allowed to alter positions of individuals/resources if necessary – and/or alter domains covered.
Appendix H: Tests of Normality (SPSS Output)

For Complete Healthcare Professional Interactions (‘FEWS Group’ is the grouping variable)

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* a. Lilliefors Significance Correction

For Discrete Healthcare Professional Interactions (‘FEWS Group’ is the grouping variable)

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* a. Lilliefors Significance Correction

For Length of Stay (LoS) (‘FEWS Group’ is the grouping variable)

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* a. Lilliefors Significance Correction

For Discharge Destination (‘FEWS Group’ is the grouping variable)

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* a. Lilliefors Significance Correction
Appendix I: Online Survey (Questionnaire) Sent to Nursing Homes

Assessments for Frailty in Nursing Homes

Which structured assessments for frailty are used? Please select as many options that apply. If partial assessments are being used, please specify this under ‘Other’.

☐ Central London Community Hospitals (CLCH) Multifactorial Falls Assessment
☐ Timed Up and Go
☐ 30 Second Sit to Stand
☐ Falls Efficacy Scale International (FES)
☐ Falls Efficacy Scale International (Short Form FES)
☐ BERG Balance Scale
☐ Short Form BERG Balance Scale (7-Item version)
☐ Balance Assessment (Tinetti Performance Oriented Assessment of Mobility)
☐ Gait Assessment (Tinetti Performance Oriented Assessment of Mobility)
☐ The Home Falls and Accidents Screening Tool (HOME FAST)
☐ Cohen-Mansfield Agitation Inventory
☐ Montreal Cognitive Assessment / MoCA-BLIND
☐ Screening Tool for Older Peoples’ Inappropriate Treatment (STOPIT) review
☐ West London Mental Health NHS Trust Occupational Therapy (WLMHT O.T.) Functional Assessment
☐ Addenbrooke’s Cognitive Examination (ACE-R)
☐ Mood / Depression Assessment Questionnaire
☐ Beck Depression Inventory
☐ Neuropsychiatric Inventory
☐ Mini Mental State Examination (MMSE)
☐ Hospital Anxiety and Depression Scale
☐ Electronic Frailty Index (eFI)
☐ Assessment of Motor and Process Skills (AMPS)
☐ Barthel Index of Activities of Daily Living
☐ Other (Please fill in the blank) (Text-Entry Box)
☐ Other (Please fill in the blank) (Text-Entry Box)
☐ Other (Please fill in the blank) (Text-Entry Box)
☐ No assessments for frailty are used

(For each option reported to be in use, the following questions were asked. ‘Assessment Example’ has been used to represent an option reported to be in use)

Which health professionals are using the ‘Assessment Example’? Please list as many that apply.

☐ Doctor (Please specify type) (Text-Entry Box)
☐ Nurse (Please specify type) (Text-Entry Box)
☐ Physiotherapist
☐ Dietician
☐ Occupational Therapist
☐ Nurse Assistant
☐ Admin/Support Employees
☐ Other (Please specify) (Text-Entry Box)
Why is the ‘Assessment Example’ being used? For example: in clinical decision making / resource allocation / end of life planning either by a single profession or as part of a wider MDT group or colleagues.

(Text-Entry Box)

How are the responses to the ‘Assessment Example’ stored? Please select only one option.

☐ Paper
☐ Electronically (if so, what database?) (Text-Entry Box)
☐ Other (please specify) (Text-Entry Box)
☐ Don't Know

We would appreciate it if you could upload a copy of the assessments for frailty you mentioned. Please could you state whether this is possible.

☐ Yes - Assessments will be uploaded here
☐ No - Assessments cannot be uploaded here, but a site visit can be arranged to view assessments used
☐ No - Assessments cannot be uploaded here and a site visit cannot be arranged