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**Exploring solutions: addressing non-urgent emergency  
department presentations**

A thesis presented in partial fulfilment of the requirements for the degree of

Doctor of Philosophy

in

Nursing

Massey University

Albany

New Zealand

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2025

## Abstract

**Background:** The Emergency Department (ED) plays a crucial role in delivering healthcare, focusing on the rapid assessment and treatment of serious illnesses or injuries, often providing life-saving resuscitation and stabilisation. However, EDs face increasing pressure from rising patient volumes, increased acuity and limited resources. This growing demand highlights the need for innovative strategies to optimise ED operations and improve patient outcomes. Patients presenting to the ED with non-urgent concerns need to be managed through more appropriate pathways.

**Aim:** This study aims to analyse the characteristics of non-urgent ED presentations and propose a novel care pathway to address the healthcare needs of this patient group effectively.

**Methods:** A mixed-methods approach was employed, combining qualitative and quantitative data. Five focus groups with healthcare professionals provided qualitative insights into non-urgent presentations. A quantitative patient database review spanning eight years (65,000-90,000 annual ED presentations) was conducted to identify trends and inform the new pathway development. The stage-gate process was used to guide the development and refinement of the proposed care pathway, ensuring systematic evaluation and iteration at each stage based on stakeholder feedback and data insights.

**Findings:** Analysis revealed a priority non-urgent patient group defined by specific criteria: 'walk-ins' to the ED, self-referred, Australasian Triage Scale (ATS) four or five, not redirected to urgent care and presenting within six months of a prior ED visit. These individuals predominantly resided in high-deprivation areas, were aged 20–69 years, had low-acuity diagnoses and high ED attrition rates. Using these findings, the Coordination, Assessment, Treatment and Community Hauora (CATCH) model was developed. This pathway integrates ED based nurse practitioners undertaking assessment and treatment alongside community-located patient navigators who empower patients and connect them with appropriate healthcare services. Unlike the conventional ED model, grounded in critical care and triage principles, the CATCH model is tailored to address non-urgent care needs.

**Conclusion:** This research identifies a distinct non-urgent patient group presenting to the ED and introduces a targeted care pathway leveraging nurse practitioners and patient navigators. Future studies could implement the CATCH model to evaluate its real-world effectiveness in improving care and reducing ED demand.

## Acknowledgements

*What counts in life is not the mere fact that we have lived. It is what difference we have made to the lives of others that will determine the significance of the life we lead.*

Nelson Mandela, (1918 – 2013)

First and foremost, I want to express my deepest gratitude to the doctors, nurses and managers who made this research possible. This research could not have been completed without your dedication, expertise and unwavering commitment. Thank you for sharing your knowledge and for making this endeavour a reality.

To Professor Matthew Parsons, thank you for being a constant source of inspiration and guidance throughout the past nine years of my academic journey, from my honours dissertation to this PhD thesis. Your unmatched energy and enthusiasm have been a driving force and I am profoundly grateful for the faith you placed in me, even at times when I doubted myself. You have pushed me to achieve more than I ever thought possible and helped me grow both academically and personally. I deeply admire your remarkable accomplishments and the example you set. Thank you for not only guiding me through academia but also for shaping my aspirations and helping me envision a broader career path. It has been an honour to learn from you and I look forward to the possibility of continuing our work together in the future.

To Professor Paul Rouse, thank you for your unwavering patience and insightful guidance as I navigated the unfamiliar terrain of business processes - an area far removed from the typical experience of a registered nurse. Your exceptional ability to bridge theoretical concepts with practical applications has significantly broadened my understanding of healthcare and its intricacies. Your calm demeanour, wealth of wisdom and unparalleled Excel expertise have been invaluable

throughout this journey. I am deeply grateful for your mentorship and the unique perspective you brought to our discussions.

To Professor Nicolette Sheridan, thank you for your kindness and compassion, which have been a source of reassurance during this challenging journey. Your insights into primary care have opened my eyes to new ways of thinking and expanded my understanding of the healthcare system as a whole. Thank you for your support and for enabling me to complete this PhD through Massey University – a place close to my heart since my undergraduate degree.

To my husband, Joel, there are no words that can truly capture the depth of my gratitude for your unwavering support. You have been my rock, my confidant and my greatest cheerleader, encouraging me to take this leap and standing steadfastly by my side through every step of this journey. You have truly seen the highs and lows of this experience and through it all, your boundless positivity and optimism have been my anchor, giving me the strength to keep going when things felt overwhelming. I could not have done this without you and I will forever cherish the love, patience and encouragement you have so selflessly given me. You are my greatest blessing and I am endlessly grateful to have shared this journey with you.

To my family, thank you for your endless support and encouragement, even as you navigated the unfamiliar territory of academia. Your interest, curiosity and care have meant more than you know. To my friends, whether through kind words, shared laughter, or simply being there when I needed it most, you have been an invaluable source of comfort and inspiration. Your presence has reminded me of the importance of balance and connection, even amidst the demands of academic life. I will be forever grateful for the incredible mountain of support I have received throughout this PhD journey. It has been a collective effort and I am truly blessed to have such an amazing network of family and friends by my side.

## **Contribution**

I, the researcher undertook all aspects of this study under the direct guidance of my supervisors. This entailed selecting the appropriate research design, the data collection and analysis and the publishing of the findings in this thesis.

## **Dedication**

*Ours is not the task of fixing the entire world at once, but of stretching out to mend the part of the world that is within our reach.*

Clarissa Pinkola Estes

To my extraordinary Emergency Department colleagues, who tirelessly put your own wellbeing aside to care for our community. You work gruelling shifts, often missing precious moments and special events with your own families to be there for your patients. Your unwavering dedication, even at the cost of missed moments of rest, showcases an incredible strength and compassion that words cannot fully capture.

In the midst of chaos, your specialised knowledge and skills save lives in the most critical circumstances. As the demands and challenges of Emergency Departments continue to grow, our gratitude for your selflessness and knowledge knows no bounds. This thesis is dedicated to all Emergency Department workers, with heartfelt thanks for the relentless care and hope you provide every single day.

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## **Glossary of terms**

The following terms are used in this thesis and are defined as follows:

**Acuity:** This pertains to the level of severity or intensity of a patient's condition, illness, or injury and the corresponding need for medical attention or resources. High-acuity patients typically require urgent and complex care, such as those in critical or life-threatening situations, whereas low-acuity patients have less severe conditions that can often be managed with routine or less intensive interventions.

**Emergency Department:** A specialised medical facility within a hospital designed to provide urgent treatment for severe injuries, sudden illnesses, or conditions that require immediate medical attention. It operates 24/7 and is staffed by healthcare professionals trained to handle a wide range of emergency cases.

**Hauora:** a Māori philosophy of health and well-being unique to Aotearoa-New Zealand.

**Healthcare stakeholder:** in this study this pertains to the healthcare professionals (clinicians and managers) who participated in the focus group interviews.

**Health needs assessment:** A structured evaluation conducted to identify an individual patient's specific health needs, preferences and barriers to care, enabling the development of an effective care plan.

**Kaitiaki:** a guardian; a person who has been given a responsibility to protect something.

**Long-term conditions:** Health conditions that require ongoing management and medical attention over an extended period, often for life. Examples include diabetes, heart disease, asthma and arthritis.

**Manaaki:** a Māori concept that means to care for, support and uplift others.

**Patient navigator:** A person who guides patients through the complex healthcare system, helping them overcome barriers to care.

**Primary care services:** The first point of contact for individuals seeking healthcare, typically provided by general practitioners, nurses and other healthcare professionals in local clinics. Primary care focuses on general health issues, preventative care, early diagnosis and treatment of common illnesses, as well as managing long-term conditions.

**Re-presentation / reattendance:** Refers to a patient returning to a healthcare facility, often the ED, within a specified time period after an initial visit.

**Triage:** The process of assessing and prioritising patients based on the severity of their conditions or injuries to ensure that those in most urgent need receive timely care.

# Chapter I: Introduction

*Innovation is the key to the future, but basic research is the key to future innovation.*

Jerome Isaac Friedman (1930 – present)

The demands on Aotearoa-New Zealand's (NZ) acute healthcare services are growing at a similar trajectory to other developed countries, as a consequence of the confluence of an ageing population and associated rise in long-term health conditions. NZ also faces issues with the supply of healthcare services, due in part to a large proportion of the healthcare workforce (general practitioners and registered nurses) reaching retirement age, healthcare recruitment not sustaining the numbers of healthcare workers needed and budgetary constraints (Ministry of Health, 2018b). NZ's health system is publicly funded, primarily financed through general taxation and is administered by Health New Zealand - Te Whatu Ora. In 2022, the system underwent significant reform, transitioning from 20 district health boards to a unified national approach (Health New Zealand, 2021).

Primary care forms the foundation of the NZ healthcare system, with general practices, urgent care clinics and community health services providing frontline medical care. General Practitioners (GP) operate as independent businesses, funded through a combination of government subsidies and patient co-payments. The government funds primary care through Primary Health Organisations (PHO), using a system where funding is based on the number of people enrolled. This helps make sure healthcare services are available in different regions. Secondary and tertiary healthcare services, including hospital care and specialist treatments, are primarily funded and provided by Te Whatu Ora (Health New Zealand, 2021). As part of this system, the Emergency Department (ED) is government funded and offers free access to NZ residents and citizens, serving as a critical first

point of contact for acute health issues and a gateway to hospital-level care (Ministry of Health, 2016).

The primary function of the ED is to rapidly assess and treat patients with serious illness or injuries, often providing life-saving interventions of resuscitation and stabilisation to patients that generally require admission to the hospital (Ministry of Health, 2016). However, EDs worldwide are under increasing pressure from rising patient volumes, higher acuity of cases, non-urgent presentations and limited resources. When the demand for ED services exceeds capacity, patient safety and care quality are jeopardised. Such imbalances in supply and demand are associated with ED overcrowding, access block (delayed admissions due to unavailable inpatient beds), longer wait times, reduced job satisfaction for healthcare workers, lower care standards and in extreme cases, higher patient mortality (Australasian College for Emergency Medicine, 2019; Richardson, 2006; Sprivulis et al., 2006). These adverse outcomes highlight the need for innovative approaches that can optimise ED operations, improve patient outcomes, decrease ED demand and enhance the patient experience.

There have been many avenues explored when attempting to address ED demand and one area of focus is on non-urgent presentations. Non-urgent presentations have been described as patients who visit the ED for conditions that do not require immediate medical attention (Durand et al., 2011). The core purpose of the ED is to provide care for serious illnesses and injuries, raising the question of whether non-urgent cases should be managed elsewhere (Ministry of Health, 2016). However, there is no single definition of 'non-urgent' within the literature and various criteria are used to identify these presentations. For instance, the systematic review by Durand et al. (2011) found that non-urgent rates to the ED varied greatly in the studies they reviewed with rates between 4.8 and 90 percent, with a median rate of 32 percent. It was evident within these research studies that they all utilised differing criteria to identify non-urgent presentations. There were some studies

that simply used low-acuity triage scores to define non-urgent presentations, such as triage scales four and five (Al-Raddadi et al., 2020; Jimenez et al., 2021; Unwin et al., 2020). However, these studies were challenged in the literature as overestimating non-urgent rates and not addressing clinical complexity (Nagree et al., 2013). Other studies combine low-acuity triage scores (four and five) with other criteria such as, the patient's mode of arrival, admission status, if they were self-referred and the duration time of their treatment (Durand et al., 2011; Duwalage et al., 2021). It is evident defining non-urgent presentations is complex in nature, with multiple definitions present in the literature.

Notwithstanding, non-urgent presentations are typically those where a delay of several hours in treatment is unlikely to result in a worse outcome (Kelekar et al., 2024). The characteristics of patients who present as non-urgent have been examined in the literature despite the variations in definitions. The most prominent characteristic is that of a patient's age where the majority of studies found that patients who were presenting as non-urgent were younger adults. McHale et al. (2013) found a higher rate of non-urgent attendance among patients aged 16 and under, compared to those over 85. Similarly, a UK study found that younger adults (16 - 44 years of age) had a higher rate of non-urgent ED visits than older people (over 65 years of age) (O'Keeffe et al., 2018), likely as a result of younger patients tending to have less long-term conditions and therefore lower levels of clinical complexity. There were multiple other characteristics discussed in the literature examining non-urgent presentations and these included: healthcare operating hours; proximity to the ED; socioeconomic status; and patients perceptions (Duwalage et al., 2021; McHale et al., 2013; O'Keeffe et al., 2018). Exploring such characteristics can help develop solutions to reduce non-urgent ED presentations, thus easing pressure on services.

Whilst there is considerable literature on the frequency and impact of non-urgent presentations, there is limited focus on interventions to reduce such visits. Key intervention strategies in the

literature include diversion techniques (e.g., ambulance redirection, patient redirection and telehealth), enhanced primary care services (e.g., co-located GP clinics and extended primary care hours), interventions targeting frequent ED users (e.g., case management) and approaches focusing on patient navigation (Chen et al., 2024; Kirkland et al., 2019; Soril et al., 2015; Tohira et al., 2014). Among these, diversion strategies are the most common, aiming to redirect non-urgent patients away from the ED, though the supporting evidence of these techniques remains limited. This study aims to fill research gaps by exploring non-urgent presentations at an ED based in NZ and identify interventions that may more effectively care for these patients whilst reducing non-urgent visits to the ED.

This research explores the characteristics of patients who present to the ED in NZ who do not require emergency care, also known as non-urgent presentations. Further, using a healthcare stakeholder group, the research seeks to develop a new pathway, which enables non-urgent patients to receive appropriate healthcare services without increasing the demand for the ED. More specifically, the research seeks to address the following questions:

1. From the perspective of the Emergency Department healthcare stakeholder group, what are the characteristics of patients attending the ED who could have improved outcomes with alternative pathways?
2. Among patients attending the Emergency Department, which group is prioritised by the healthcare stakeholder group for requiring an alternative care pathway?
3. What alternative approach, informed by both evidence and views of the healthcare stakeholder group, could be implemented to improve the outcomes of this patient group?

This thesis is structured into six chapters. Chapter two, the literature review is divided into two parts: Part one examines the role and implications of the ED, whilst Part two explores innovations in healthcare and interventions used to address challenges faced by the ED. Chapter three is a methodological review, discussing the rationale for employing a pragmatic philosophical worldview and a mixed-methods framework to address the research questions. The methodology that supports this research design is detailed in the Methods chapter four. Chapter five presents the study findings and the final Discussion chapter is divided into three parts: Part one answers the research questions using findings from this study and current literature; Part two discusses the theoretical contributions of this study; and Part three provides limitations, conclusions and recommendations for future research.

## **Chapter II: Literature review**

*Wisdom begins in wonder*

Socrates (470 BC – 399 BC)

### **2.1 Introduction - literature review**

A literature review is the beginning of any research study and serves several purposes. It provides a comprehensive overview and synthesis of existing knowledge, theories and findings relevant to the research topic. The literature review identifies gaps, inconsistencies and arguments within the literature, which inform the rationale for conducting new research. It establishes the conceptual foundation that underpins the research, guiding the formulation of key research questions (Polit & Beck, 2021). Additionally, the literature review evaluates methodologies employed in previous studies, assessing their strengths, weaknesses and applicability to the current research context. Ultimately, the literature review supports the validity and significance of the research and also contributes to the advancement of knowledge by proposing new perspectives and suggesting directions for future research endeavours in the reviewed field (Moule, 2017).

This chapter aims to evaluate the existing literature concerning Emergency Department (ED) demand and is divided into two main sections. Part one provides an overview of Aotearoa-New Zealand's (NZ) current population dynamics and examines how these changes impact healthcare demand, particularly within the ED setting. It explores the structure of the ED system, highlighting existing challenges and the repercussions of increasing hospital demands in NZ. Different patient demographics will be considered, with a specific emphasis on non-urgent presentations. Part two shifts the focus to innovation in healthcare, specifically exploring strategies aimed at alleviating ED demand through alternative pathways. This section synthesises existing research and initiatives designed to optimise ED efficiency and patient outcomes. Finally, the literature review concludes by outlining the research aim and objectives that will guide the study.

## **2.2 Literature search strategy**

This literature review involved a comprehensive search of relevant databases, including: CINAHL Complete, MEDLINE, PubMed, Scopus, Google Scholar and New Zealand-specific resources such as the Ministry of Health publications. These databases were systematically searched to gather a substantial body of literature relevant to the research topic. The search strategy included the following key terms: ‘non-urgent,’ ‘low-acuity,’ ‘avoidable,’ ‘inappropriate use,’ ‘non-emergent,’ ‘Emergency Department,’ ‘New Zealand,’ ‘healthcare innovation,’ ‘Emergency Department utilisation,’ ‘emergency care models,’ and ‘navigation’ to capture all pertinent articles. Various combinations of these terms were used to ensure all relevant literature was captured. This strategy yielded an initial pool of 47,705 records. Following de-duplication and the application of inclusion criteria (peer-reviewed, published within the last twenty years, English language, full-text availability), 34,055 records remained for screening. Titles were screened for relevance to the research topic, resulting in 9,543 records retained for abstract review. Abstracts were reviewed by the primary researcher in consultation with academic supervisors, with additional studies identified through reference and citation tracking. This process culminated in the selection of 87 articles for inclusion.

The final body of literature was thematically analysed and careful consideration was given to ensure the findings were relevant not only to clinicians but also to non-clinical and business-focused stakeholders, such as managers, policymakers, and business leaders. Of the included articles, 20 examine the ED system and clinical context; 32 explore definitions and characteristics of non-urgent presentations; 17 investigate healthcare innovations; and 18 address patient navigation. This structured synthesis provides a clear and comprehensive foundation to inform clinical practice, guide policy development, and support further research into effective, contextually appropriate interventions for managing non-urgent ED demand. The literature highlighted various perspectives and findings, with the predominant themes being discussed in this chapter.

## **Part I: Navigating the Frontline: The Population, Role and Challenges of the Emergency Department.**

*In the midst of chaos, there is also opportunity*

Sun Tzu (544 – 496 BC)

Recent demographic shifts in NZ have profoundly reshaped the healthcare landscape, with notable impacts on EDs. This section of the literature review explores several key aspects: first, it examines how demographic trends, particularly an ageing population, influence ED services. Demographic changes present both challenges and opportunities, necessitating adjustments in ED workload management and resource allocation strategies. The ED plays a critical role as the frontline responder to acute medical crises and a gateway for urgent care needs, functioning as a safety net within the healthcare system by providing essential interventions and stabilising patients during medical emergencies (Ministry of Health, 2016). Reviewing ongoing challenges such as ED overcrowding, prolonged wait times and resource shortages is paramount. These issues not only affect patient outcomes but also strain operational efficiency and will be discussed in this section.

This section also examines non-urgent presentations in the ED. While these cases are not immediately life-threatening, they significantly contribute to congestion and strain on resources. Analysing patterns of non-urgent visits offers insights into healthcare utilisation and identifies opportunities to redirect appropriate cases to alternative care settings. By synthesising these interconnected themes, this part of the literature review aims to offer a comprehensive understanding of current ED operations in NZ.

### **2.3 Demographic trends**

The population of NZ is increasing; as of December 2020, the population was 5.1 million (compared with 3.5 million in 1991) and is projected to rise to 6.1 million by the year 2043 (Ministry

of Health, 2021). The age structure of a population is of great significance to healthcare delivery; the World Health Organization (2021) states that globally, population ageing continues at an unprecedented rate. The statistics from 2020 show that the share of older persons aged 65 years and over in the world population was 9.3 percent which has already surpassed the percentage of children under the age of five (8.7%). Population ageing is predicted to continue at an accelerated rate and by 2050 the proportion of people over the age of 65 years (15.9%) will be more than double that of children under five (7.1%) and will hold an increased share of the whole population when compared to youth (15–24-year-olds) (13.7%). NZ's older population (over 65 years of age) already accounts for 15.2 percent of the total population and is expected to double in the next 20 years (Ministry of Health, 2021).

The ageing population creates challenges for the healthcare system as older people present with more complex conditions (including increased multi-morbidity), consume more resources, are more likely to be admitted to hospital (Lowthian et al., 2011) and the general decline of physical and functional capabilities with age can cause barriers when attempting to access healthcare services (World Health Organization, 2021). Not only this, but the population over the age of 65 years generally utilise more healthcare services than the younger population. This is evidenced by 42 percent of all health funding in NZ being spent on older people who make up only 15.2 percent of the total population. Conditions such as cancer, heart disease and dementia are more common within the older population and therefore it is predicted NZ will likely see an increase in these conditions in the years to come (Ministry of Health, 2021).

With advances in technology, science and medication, people are living longer and this attributes to the ageing population. In 2019, life expectancy at birth in NZ was 80.4 years of age for males and 83.5 years for females (average of 82 years for both), which is an increase from the average life expectancy of both sexes in 1990 which was 75 years of age (World Health Organization, 2021).

Alongside life expectancy, health-adjusted life expectancy has become a key topic of discussion. Whereas life expectancy refers to the mean number of years a baby born today would expect to live, health expectancy refers to the mean number of years lived in good health. The World Health Organization (WHO) describes good health as encompassing complete physical, mental and social well-being, rather than simply the absence of illness or disability. While both life expectancy and health expectancy have increased within NZ over time, health expectancy has not kept pace with the increasing rate in life expectancy (Ministry of Health, 2021; World Health Organization, 2021). This indicates that although people are living longer, they are spending more time in poor health. Poor health has been attributed to the increasing prevalence of noncommunicable or long-term conditions, which are particularly relevant to NZ as discussed below.

## **2.4 Noncommunicable disease**

Noncommunicable diseases, also known as long-term conditions, are generally conditions of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors. Examples of noncommunicable diseases include cardiovascular disease, diabetes, chronic respiratory diseases and cancers. In contrast, communicable diseases are caused by bacteria, viruses, parasites and fungi that can spread from person to person. Examples of communicable disease include tuberculosis, influenza, HIV and viral hepatitis. With the investments in diagnosis, treatment and control of communicable diseases over the past 20 years there has been a decrease in the prevalence, incidence and mortality of infectious diseases at a global scale. These developments combined with changing lifestyle practices have led to a dramatic change in the leading cause of death, with noncommunicable / long-term conditions accounting for the majority of deaths worldwide over the past two decades. Globally, noncommunicable diseases accounted for 60.8 percent of all deaths in 2000, with an increase to 73.6 percent in 2019 (World Health Organization, 2021). However, when looking at high-income countries specifically, noncommunicable diseases account for a large proportion of deaths, with a mortality rate of over

85 percent. NZ is classed as a high-income country and the impacts that lifestyle choices have had on the population of NZ are significant when examining long-term conditions (World Health Organization, 2021).

The increase in long-term conditions is driven by urbanisation, adoption of unhealthy lifestyle practices and importantly, population ageing. Modifiable behaviours including tobacco use, alcohol consumption, unhealthy diets and physical inactivity all increase the risk of developing a long-term condition. The consumption of cigarettes (tobacco smoking) was considered one of the leading modifiable health risks in NZ in 2017 accounting for nearly ten percent of all illness, disability and premature mortality (Ministry of Health, 2020). Tobacco smoking causes harm to nearly every system and organ within the human body and it is the main cause of lung cancer and chronic obstructive pulmonary disease (COPD). Smoking is also a major cause of heart disease, stroke and other cancers. There is also the incidence of being exposed to environmental tobacco smoke which is a known risk factor for Sudden Infant Death Syndrome (SIDS) and respiratory illnesses in children (Ministry of Health, 2021). Overall, the modifiable behaviour of smoking can cause serious harm to the health of the population and causes illness which increases the demand for healthcare services.

Unhealthy diets, alcohol consumption and physical inactivity all have negative impacts on health and are associated with long-term conditions. Obesity is a multifactorial condition influenced by a complex interplay of factors, including dietary patterns, levels of physical activity, genetic predispositions, variations in the gut microbiome, hormonal responses such as stress-related cortisol production and insulin regulation, as well as broader social determinants like socioeconomic status and access to affordable, nutritious food (Lin et al., 2020). NZ has a high prevalence of obesity sitting at 30.9 percent among adults aged 15 years and over which is an estimated 1.24 million adults (Ministry of Health, 2021). Obesity contributes to the development

of multiple long-term conditions such as hypertension, type 2 diabetes, cardiovascular disease, cerebrovascular disease and arthritis (Lin et al., 2020). When conditions are grouped together, the leading causes of death for the total population in NZ in 2018 were ischaemic heart disease, cerebrovascular disease and trachea, bronchus and lung cancer (Ministry of Health, 2021). Cardiovascular disease refers to conditions which affect the heart and blood vessels of the body and these diseases accounted for 15 percent of all health loss in NZ in 2020, mainly comprised of ischemic heart disease and strokes. The implications of lifestyle choices can be seen by the evidence above and obesity alone contributes to several long-term conditions.

When an individual is diagnosed with more than one long-term condition, this is defined as comorbidity or multimorbidity (Stanley et al., 2018). It has been reported that at an individual level, people who experience multimorbidity have poorer health outcomes, worse functioning status, lower quality of life and increased risks from polypharmacy. At a wider level, implications of multimorbidity on the health care system have been identified. Healthcare expenditure is now dominated by the needs of people with long-term conditions in high-income countries and this is exacerbated when people experience multimorbidity. Multimorbidity is not only present in older people, but it is more prevalent and as the population continues to age, multimorbidity will continue to rise (Ministry of Health, 2021; World Health Organization, 2021). Stanley et al. (2018) found in their study that over one-quarter of the NZ population have multimorbidity, calculated utilising pharmaceutical dispensing data. More specifically, they found that multimorbidity was more prevalent among older people, those living in areas of socioeconomic deprivation and amongst Māori and Pacific people.

Socioeconomic deprivation has a large impact on population health. Child poverty has been of particular concern within NZ in recent years and the statistics associated with child poverty can explain why. The rates of child poverty in NZ are rising and child poverty has been linked to

increasing numbers of hospital admissions for asthma, pneumonia, rheumatic fever and serious skin infections (Shackleton et al., 2021). According to the Ministry of Health (2021), data for the year ending June 2020 revealed that children living in poverty have a 40 percent higher risk of dying during childhood, experience acute illness three times more frequently and are more than twice as likely to be admitted to hospital for an acute illness. The impacts of child poverty have also been seen to continue into adulthood with an increased risk of cardiovascular disease, dental decay, lowered longevity and increased mental illness. While all ethnic groups experience poverty, Māori and Pacific ethnic groups experience poverty at higher rates. In the year ending June 2020, there was an average of 11.3 percent of children across NZ experiencing poverty, however, 19.5 percent of Māori children and 26.1 percent of Pacific children were living in poverty (Ministry of Health, 2021). The impacts of poverty within NZ have a significant impact on the healthcare system due to the negative impacts on the overall health and wellbeing of the population.

As the global disease burden has shifted to long-term conditions within NZ, due to the evolving ways in which individuals live, it has created extreme pressures on the healthcare system. The healthcare system within NZ was built to provide acute illness care and this dynamic shift of long-term conditions along with the increasing and ageing population has created challenges for all healthcare services (Ministry of Health, 2021). The healthcare system within NZ comprises multiple organisations of public, private and not-for-profit organisations and without investment in considerable change, the system will remain inefficient and ineffective in delivering services to an evolving population. The number of hospital admissions will continue to rise with the increasing burden of long-term conditions along with the ageing population and the adjustments that have been seen to date have not kept pace with the increases in demand. This research project is specifically concerned with the challenges faced by the ED because of population change. The ED as a system will be described next.

## **2.5 The Emergency Department, a complex and dynamic system**

The ED is a central component of the healthcare system as it interacts with primary healthcare and is the gatekeeper to hospital level care for patients with acute illness. The purpose of the ED is to provide rapid assessment and treatment of patients with serious illness or injuries and this includes providing resuscitation and stabilisation to patients that often require an admission to hospital (Ministry of Health, 2016). EDs in NZ are publicly funded and free for patients, operating 24 hours a day, seven days a week (Ministry of Health, 2016). It is essential for patients who are suffering serious illness or injury to get treatment in a timely manner. An example of this is a patient suffering from a stroke, where the sooner the appropriate treatment begins, the less brain damage occurs and therefore this results in a better outcome for the patient (Sung et al., 2021). This example is important in relation to NZ as stroke is classed as one of the top three leading causes of death (Ministry of Health, 2021). To ensure that patients with the most serious illness receive timely treatment, EDs operate on a priority scale known as the triage system (Corkery et al., 2021; Ministry of Health, 2016).

The Australasian Triage Scale (ATS) assesses the level of urgency of a patient's condition and is the first point of contact for all patients arriving at Health New Zealand - Te Whatu Ora EDs. The ATS was developed in emergency medicine in order to prioritise patient care in the presence of limited time, space, material and staff resources (Australasian College for Emergency Medicine, 2013). Generally, the ATS is completed by a senior emergency nurse as their education and experience provides them with the skills to assess, prioritise and deliver emergency care (Corkery et al., 2021). Although the ATS adequately describes urgency, it does not describe the severity, complexity or the workload associated with delivering care to the patient (Australasian College for Emergency Medicine, 2013). In other words, the ATS measures how long a patient can safely wait for medical assessment and treatment. The ATS is a five-tier scale which is defined in Table 1 below.

**Table 1: Australasian Triage Scale categories**

| ATS Score | Time to treatment | Definition   |
|-----------|-------------------|--|
| 1         | Immediate         | Immediately life threatening   |
| 2         | 10 minutes        | Imminently life threatening, or important time critical  |
| 3         | 30 minutes        | Potentially life threatening, potential adverse outcomes from a delay of more than 30 minutes, or severe discomfort or distress. |
| 4         | 60 minutes        | Potentially serious, or potential adverse outcomes from a delay of more than 60 minutes, or discomfort or distress.              |
| 5         | 120 minutes       | Less urgent or dealing with administrative issues only.  |

Note: Adopted from Australasian College for Emergency Medicine (2013) and Ministry of Health (2016).

Triage not only allows a patient to be categorised by urgency, but it also allows patients to be allocated into the most appropriate assessment and treatment space available within the ED (Corkery et al., 2021). This systematic approach is essential, especially as the demand for ED services continues to increase year after year, while the availability of treatment spaces remains limited. Effective triaging helps manage patient flow and optimises the use of resources. The relationship between supply and demand in the ED will be discussed next along with the impact of resources.

## 2.6 Supply and demand in the ED

Globally, healthcare organisations are experiencing growing demand for services. EDs within NZ have experienced increased attendances, with over a million ED presentations in the 2014/2015 financial year. This was a ten percent increase in presentations from the year 2010-2011 (Ministry of Health, 2016). The evolving population has resulted in patients presenting to the ED with complex health needs which has created a strain on the supply of healthcare resources. EDs have

not only experienced challenges with increased presentations, but the rising number of hospital admissions seen in NZ (Ministry of Health, 2021) and the stagnant supply of hospital beds has created challenges when managing ‘access block’ and subsequent overcrowding.

Access block is defined as a situation where a patient that needs to be admitted to hospital is delayed from leaving the ED to an inpatient unit due to a lack of inpatient beds/insufficient hospital capacity (Cheng et al., 2022). Access block is a major issue within EDs and compromises patient safety. Patients who are delayed from being transferred to an inpatient unit consume the limited resources of the ED whilst they are waiting and this causes increased wait times for other patients’ assessments and treatments. EDs are not designed to function as an inpatient ward and they also are not equipped to deal with the burden of an inpatient load, hence access block has been associated with poor patient outcomes and an increased risk of medication delays, medication errors and adverse events (Burgess et al., 2022; Cheng et al., 2022). When exploring adverse events, a NZ study utilising retrospective data found an association between access block and seven-day mortality. More specifically, the study found that new patients arriving to the ED had a ten percent relative increase in mortality when more than ten percent of the current patients waiting for admission within the ED were experiencing access block (Jones & van der Werf, 2021). Access block is the most common indicator for ED overcrowding, which is a global healthcare challenge that has been shown to cause delays in healthcare service delivery and poor-quality care (Burgess et al., 2022; Cheng et al., 2022).

The increase in the number of ED presentations, the increased demand for resources with the complexity of multimorbidity and the implications of access block all contribute to ED overcrowding (Burgess et al., 2022). Overcrowding is defined as the situation where the functions of the ED are inhibited primarily because the number of patients waiting to be seen, undergoing assessment and treatment, or waiting to depart exceeds the physical or staffing capacity of the ED

(Australasian College for Emergency Medicine, 2021). Put simply, overcrowding occurs when there is an imbalance between the constant increase in ED presentations or patient needs (demand) and the lack of hospital and ED resources (supply) (Savioli et al., 2022). Overcrowding can be characterised by an increased time to triage, the inability of ambulance staff to offload their patients due to limited space, time-critical treatment delays due to a lack of available treatment spaces, patients being treated in corridors and patients waiting to be admitted due to access block (Rocha et al., 2021).

An Australian retrospective stratified cohort analysis found that patients presenting when the ED was overcrowded had a significantly higher 10-day in-hospital mortality than patients who presented when the ED was not overcrowded. The study also observed that patients who presented during overcrowded shifts exhibited higher acuity levels and received care that fell below the standard performance measures (Richardson, 2006). This scenario exemplifies the challenge posed by the imbalance between supply and demand in the ED. Sprivulis et al. (2006) also found a relationship between overcrowding and death, with an associated increase of death on day two, day seven and day 30 after an ED presentation during an overcrowded shift. In addition to mortality, the increased waiting times and delayed initiation of treatment caused by overcrowding has been linked to patient dissatisfaction (Savioli et al., 2022). June-sung et al. (2020) found that maximum ED occupancy was strongly associated with in-hospital cardiac arrest in their observational study in Korea. Overcrowding not only impacts patients negatively, healthcare professionals that work in EDs have identified overcrowding as the most important workplace related stressor (Australasian College for Emergency Medicine, 2019). This review demonstrates that heightened demand and constrained supply in the ED can lead to adverse outcomes for both patients and healthcare professionals.

## **2.7 A conceptual framework of patient flow in the ED**

The ED is a complex and dynamic system and it is important to understand the system to address the acute demand it experiences. There is an input-throughput-output model that has been utilised to display the parameters that regulate the flow and capacity within the ED (Richardson et al., 2005; Savioli et al., 2022). The input of the ED refers to the context within which patients present for treatment and the flow of input can alter for various reasons. The ageing population and the proliferation of long-term conditions have influenced the increase in ED attendances, therefore increasing the input. Other factors which influence input are related to community profiles such as: poverty, availability of alternative services, transport, public education, an individual's perception of what constitutes an emergency along with what patients perceive the role of the ED to be (Richardson et al., 2005). The input of the ED can be widely varied and unpredictable as many factors such as car accidents, workplace accidents, heart attacks and strokes can happen at any point of time. Interventions which have been applied to decrease demand at the input stage have included ambulance diversions, educating the public about the role of the ED, identifying and redirecting 'inappropriate' patients and upskilling primary health care services (Hossam, 2018; Richardson, 2006).

Secondly, there is the throughput phase which reflects how internal factors within the ED impact on patient flow. Throughput is affected by the physical environment, staffing levels, equipment availability, diagnostic testing availability, processing times and staff working patterns and attitudes (Richardson et al., 2005). Interventions which have been established to increase throughput include fast track protocols, executing and reporting radiology tests promptly and adjusting staffing ratios on certain high demand shifts (Hossam, 2018; Savioli et al., 2022). Lastly, there is the output phase, which constitutes the need to move patients on from the ED. Factors that impact output are hospital capacity, access block, delays with inter-hospital transfers, delayed discharges from inpatient wards, admissions through elective surgery along with the availability to community

services (Richardson et al., 2005; Savioli et al., 2022). Interventions that have been utilised to improve output are implementing effective discharge services, postponing elective surgery to decrease planned admissions, assigning bed managers and establishing ED observation areas (Hossam, 2018).

Overall, the ED is a complex and dynamic system, with multiple variables. Access block and overcrowding overwhelm ED resources and result in the ED being unable to fulfil its purpose. When ED resources are overwhelmed, timely assessment and treatment of patients is inhibited and this has been shown to have potentially lethal consequences. The importance of people receiving timely care in their hour of need is essential, as noted with the stroke presentation example earlier in this literature review. Therefore, it is paramount EDs have the capacity to cater for patients with serious illness at any time of the day. The evolving population and the impacts of lifestyle choices (smoking, inactivity, poor nutrition), poverty and comorbidity have all put widespread pressure on hospitals and EDs globally and specifically in NZ. It is therefore essential to be innovative and create new ways of managing acute demand. The ED must be the best place to deliver the right care, at the right time, to the right patient, rather than the only place available. People who need emergency care require time critical service; therefore, the increasing acute demand needs to be addressed to increase patients' safety and staff wellbeing.

This research study is concerned with the input phase of the ED, specifically the management of patients presenting to the ED. Limited research has been conducted that has successfully decreased demand from an input phase and particularly within NZ. For the operation of the ED to be enhanced, this research study will explore patients who present to the ED who do not require emergency care but play a role in increasing the demand. Such patient groups have been referred to as minor, non-urgent, low-acuity, general practice type, primary care, non-emergent and inappropriate presentations within the literature. These presentations will be explored next.

## **2.8 Defining a non-urgent presentation**

There is currently no universal definition of what constitutes a non-urgent presentation to the ED and the term ‘non-urgent’ has been characterised in the literature with a range of terms such as ‘general practitioner type’ (Toloo et al., 2020), ‘low-acuity’ (Nagree et al., 2013), ‘avoidable’ (Liu et al., 2021) and ‘potential primary care’ (Masso et al., 2007; Schütze et al., 2019) presentations. Most of the literature utilises ‘non urgent’ as the favoured term (Afilalo et al., 2004; Al-Raddadi et al., 2020; Durand et al., 2012; O’Keeffe et al., 2018; Unwin et al., 2020) and therefore this term will be used within this review. Although several studies utilise the same term, such as ‘non-urgent’, there are various methods that are used to report these presentations which creates challenges in comparing the prevalence of these presentations. A systematic review by Durand et al. (2011) examining non-urgent presentations found a variation of between 4.8 percent and 90 percent of presentations being identified as non-urgent. The variety of methods used within the literature include exclusively triage score, triage score and presentation criteria (e.g., mode of arrival, admission status, self-referred, specific presenting complaint exclusions, time of treatment) and presentation criteria without the use of triage scores.

Firstly, the most simplistic method employed is the triage score that a patient receives as they arrive at the ED and their urgency is assessed by a health professional. There are two main triage scales used within the literature and these include the ATS, described previously and the Canadian Triage and Acuity Scale (CTAS), which are both five-tier scales used to prioritise patients as they arrive to the ED (Australasian College for Emergency Medicine, 2013; Jimenez et al., 2021). The CTAS utilises the same framework in relation to the ‘time a patient can safely wait’ as the ATS which was described in Table 1, with triage one requiring immediate care to triage five being able to safely wait for two hours. Three studies utilised the CTAS triage scale to define non-urgent presentations, however there were variations in what they classed as non-urgent.

Afilalo et al. (2004) defined non-urgent presentations as patients who were allocated a CTAS of five and classed triage two, three and four patients as urgent. They did not include triage one patients within their study comparisons, this was due to their study being focused on gathering information from patients via questionnaires and patients allocated a triage one score were not appropriate to be approached. Their results showed that 25 percent of the presentations were non-urgent cases. It is important to note this may be slightly over-estimated when compared to other studies as triage one patients were not included. Al-Raddadi et al. (2020) also used the CTAS and excluded triage one patients (life-threatening), however they classed all triage four and five patients as non-urgent. They concluded that 78.5 percent of the study population were non-urgent presentations. The final study that utilised the CTAS was Jimenez et al. (2021), who used triage four and five patients to define non-urgent similarly to Al-Raddadi et al. (2020), however they compared non-urgent presentations with patients with a triage three score which they classed as urgent and they excluded triage one and two patients in their study whom they classed as emergent. They therefore concluded that 50.3 percent of patients in their study were non-urgent and 49.7 percent were urgent. Although these studies use the same CTAS they have differing methods to define non-urgent presentations and comparing their results is therefore challenging.

There were two studies which used the ATS exclusively to define non-urgent presentations, with triage four and five patients being classed as non-urgent. Their results showed that 56.5 percent (Unwin et al., 2016) and 54.1 percent (Unwin et al., 2020) of patients were non-urgent. The latter study concluded their results from a seven-year retrospective database review (Unwin et al., 2020). Defining non-urgent presentations exclusively by triage scores has been challenged within the literature. It is noted within the description of the triage scale that it is a measure of urgency and not a measure of severity or complexity (Australasian College for Emergency Medicine, 2013) which has led to some controversy. Multiple authors have expressed their concern of non-urgent presentations being over-estimated within the literature due to studies using an exclusive triage

method to code presentations (Duwalage et al., 2021; Nagree et al., 2013; Schütze et al., 2019; Toloo et al., 2020).

Duwalage et al. (2021) reported that if triage four and five scores were employed exclusively in their study, 26-40 percent of patients would have been incorrectly identified as non-urgent. It was also noted in the study by Al-Raddadi et al. (2020) that 15.3 percent of their non-urgent (triage 4 and 5) presentations were subsequently admitted to hospital. This is concerning as these patients have been reviewed by healthcare professionals as requiring hospital level care and therefore should not be classed as non-urgent or a primary care type patient. Nagree et al. (2013) uses specific patient examples to describe why it is not useful to use triage scale alone. They explained that an older woman who sustained an arm fracture may be triaged as a scale four (low urgency); however, the patient may live alone and be unable to complete the activities of daily living without assessment and management from a multi-disciplinary team (high complexity) and therefore the patient may be difficult to be managed within primary care. In contrast, they described a younger person who may be triaged as a scale two for a fever and rash due to the differential diagnosis of meningitis, once this patient is assessed and serious illness is excluded, they can usually be discharged, therefore this patient would be high urgency but low complexity and may be able to be managed in primary care by experienced physicians. Therefore, it is important to address more than just triage score when defining non-urgent patients.

In contrast to exclusively using triage scores, some research studies did not include triage scores in their methods of defining non-urgent presentations. Most of these studies retrospectively reviewed patient clinical details to define non-urgent presentations (Akbulut et al., 2008; Liu et al., 2021; O’Keeffe et al., 2018). O’Keeffe et al. (2018) defined non-urgent as a patient who presented to the ED as a first attendance (not a follow-up presentation), who may have had some investigations or treatments, but all of which could have been reasonably completed in a non-emergency care setting

and were discharged home. Their results showed that 15.1 percent (n=555,564) of patients were classed as non-urgent over a three-year data period. A NZ study by Elley et al. (2007) used an expert panel of 12 healthcare professionals (General Practitioners, ED specialists and Registered Nurses) to review patients notes and decide if they were appropriate for the ED. The expert panel reviewed 180 case notes and defined 37 percent of these presentations as primary care appropriate. It is important to note that there was poor agreement between professionals during the process and in some instances (15 percent of cases) panel members gave different responses to the same case at different times. Elley et al. (2007) described the difficulty in ascertaining what constitutes a primary care appropriate presentation, as clinicians within their study could not agree even with full clinical details of patients such as diagnoses. Another NZ study found no clear consensus between healthcare professionals on what constituted 'appropriateness' of an ED attendance (Richardson et al., 2006).

Another method of categorising non-urgent presentations without the triage code is the Australasian College for Emergency Medicine (ACEM) method which is discussed within several studies (Duwalage et al., 2021; Nagree et al., 2013; Toloo et al., 2020). The ACEM method is used to identify the patients attending the ED who could be suitable for general practice services. This method codes patients who are self-referred, have not arrived by ambulance and who have a medical consultation time of less than one hour as being primary care suitable (Duwalage et al., 2021; Nagree et al., 2013; Toloo et al., 2020). Although this method uses patient presentation factors, it has been challenged as it does not include discharge destination (Duwalage et al., 2021). Therefore, patients who come through the ED and have a consultation time of less than one hour, such as urgent trauma cases requiring emergency surgery, would be coded as primary care appropriate. Duwalage et al. (2021) found that utilising the ACEM method in their study classed six percent of patients incorrectly as general practice type, as these patients were either admitted, transferred to another hospital, or died. This resulted in Duwalage et al. (2021) using a modified

ACEM method which included 'not admitted, not transferred and did not die' as additional criteria. Using their ACEM-modified method, they analysed data from four hospitals in Queensland, Australia, over a six-year period and identified variations in GP-type presentations: 33 percent (99,108 cases), 19 percent (75,189 cases), 17 percent (39,388 cases) and seven percent (21,026 cases). These percentages are vastly decreased from the studies which use triage score alone.

Finally, there is a combination of criteria used within multiple studies, where triage score is included with patient presentation data (Masso et al., 2007; Pak & Gannon, 2021; Schütze et al., 2019; Toloo et al., 2020). A widely discussed method is that of the Australian Institute of Health and Welfare (AIHW), which defined a GP type patient as one who has a triage score of four or five, did not arrive by ambulance/police/correctional vehicle, was not admitted, was not referred to another hospital and did not die (Nagree et al., 2013; Schütze et al., 2019; Toloo et al., 2020). Despite these criteria, the AIHW method has been shown to overestimate non-urgent / GP type presentations, as Nagree et al. (2013) found 25 percent of their research population were classed as non-urgent with the AIHW, whereas different methods (ACEM, diagnosis and Sprivulis methods) concluded that 10-12 percent of presentations were non-urgent cases using the same data. The AIHW has since ceased the reporting of statistics analysed with this method due to the concerns of over-estimating non-urgent presentations (Schütze et al., 2019). The Sprivulis method is a more complex method used and is based on the difference between the discharge rate of self-referred patients and that of GP-referred patients, who have a triage score of three, four or five, were not admitted and arrived by self, family or friends (Nagree et al., 2013; Toloo et al., 2020). This method has been described as a more reflective method of GP capability to manage low-acuity presentations due to the analytic approach of discharge rates between self-referred and GP-referred presentations (Toloo et al., 2020). Nagree et al. (2013) and Toloo et al. (2020) found the Sprivulis method to have similar results to that of the ACEM method. Lastly, a code framework was created by Schütze et al. (2019) which had multiple criteria including presenting problems.

Schütze et al. (2019) completed a retrospective audit of ED records from an Australian hospital based in Sydney. An advisory panel which consisted of doctors, nurses, research fellows, GPs and an ED research professor was formed in their study. The panel reviewed existing code frameworks and subsequently created their own. The code consisted of patients who were triage four or five, did not arrive by ambulance, helicopter, police, community transport, or by internal transfer, who were self-referred, had a new episode of care, were not expected to be admitted, did not have a triage speciality code (e.g., trauma call) and did not have any of the 21 of the presenting problems they listed (e.g. chest pain, assault, collapse). The code was then used to analyse three months of data from December 2016 to February 2017 and specificity and sensitivity test of the code frame was performed. They concluded that 29 percent of patients during this time were potentially primary care presentations. They established the code frame had a very high sensitivity (99.9%), which identified patients who were admitted to hospital and therefore not appropriate for primary care. The specificity code was 49 percent, but this was deemed acceptable in the concept of risk aversion. The authors stated that they would prefer to be risk averse and see additional primary care presentations within the ED then send potential ED patients with urgent or complex conditions to primary care. The code was tested on all data from two hospitals for the 2011 to 2016 period to establish if it was consistent, they found non-urgent presentation rates of 28.7 and 28.4 percent. This study was the only one found which created and tested its own coding framework.

The New York University (NYU) ED visit algorithm was widely used in health services research to retrospectively assess the appropriateness of ED visits using retrospective discharge codes from administrative data. Originally developed with International Classification of Diseases, 9<sup>th</sup> edition (ICD-9) diagnosis codes, it has been instrumental in evaluating the impacts of significant health policy changes in the United States of America. Its popularity arose due to its accessibility and simplicity; requiring only primary discharge diagnosis codes. However, its reliance on outdated

ICD-9 codes has posed challenges. As newer diagnosis codes under ICD-10 were introduced, the algorithm's ability to accurately classify ED visits has diminished. While the NYU ED visit algorithm has significantly contributed to understanding ED utilisation and informing health policy, its reliance on outdated coding systems highlights the need for ongoing updates and adaptations (Johnston et al., 2017). While sensitivity rates of the NYU ED algorithm have not been extensively studied in recent literature, its widespread historical use warrants discussion. It serves as a notable example of utilising retrospective discharge codes to evaluate the appropriateness of ED visits and the ICD-10 criteria is used within the hospital system in NZ (Ministry of Health, 2021).

It is evident that defining non-urgent ED presentations is a complex concept, with multiple definitions and codes present within the literature. Simply put, non-urgent presentations typically refer to visits for conditions where delaying treatment for several hours would not likely lead to a worse outcome (Kelekar et al., 2024). Despite there being no universal definition for non-urgent presentations, multiple studies have found similar characteristics within patient groups they have classed as non-urgent. It is important to understand the characteristics of non-urgent presentations to develop interventions which aim to decrease these presentations to the ED. The next section consists of research which underpins the current research study and explores characteristics and interventions related to non-urgent presentations to the ED.

## **2.9 Characteristics of non-urgent presentations**

The most prominent patient characteristic related to non-urgent presentations which has been identified in the literature is age, specifically younger patients. A large database review which included the majority of ED attendances in England over a one year period found non-urgent (or as they described, inappropriate) presentations peaked in early childhood, were elevated throughout teenage and young adulthood years with the odds of a non-urgent presentation reducing from the

age of 27 (McHale et al., 2013). McHale et al. (2013) concluded that patients 16 years of age and under had a 15.04 per 100 non-urgent attendance rate, compared to patients over the age of 85 years who had a 2.43 per 100 non-urgent attendance rate. Another study based in the United Kingdom which analysed adult patient data from 13 EDs found the odds of a non-urgent attendance were significantly higher for 16 to 44-year-olds when compared to 45 to 64-year-olds (OR 1.42, 95% CI: 1.41 to 1.43,  $p < 0.001$ ) and also compared to patients 65 years of age and older (OR 3.81, 95% CI: 3.78 to 3.85,  $p < 0.001$ ) (O’Keeffe et al., 2018). The findings from these two studies in which the younger population are over-represented in non-urgent presentations are consistent with research in Australia (Duwalage et al., 2021; Unwin et al., 2020; Unwin et al., 2016), the United States (Chen et al., 2015; Uscher-Pines et al., 2013) Switzerland (Clément et al., 2010; Diserens et al., 2015) and Canada (Afilalo et al., 2004).

McHale et al. (2013) discuss that for young children the decision to attend ED for their condition solely comes from their parents or caregivers and suggest this may be due to the pressures of parenthood and a view that ED is the best place to receive appropriate care. Duwalage et al. (2021) and McHale et al. (2013) also discuss the prevalence of non-urgent conditions by young adults and teenagers and suggest that this may be due to a poor understanding of ED use, a lack of knowledge of other services, cost, less patience and poor access to primary care. In contrast, the older population may have less non-urgent cases due to the complexity of health that comes with age and the increased prevalence of long-term conditions and co-morbidity (Lowthian et al., 2011).

The time in which non-urgent presentations occur has also been extensively studied. This has stemmed from the concept that primary care services that could appropriately manage non-urgent presentations typically are only available during daytime hours. Unwin et al. (2016) found that two thirds of non-urgent presentations in their study presented during after-hours (16:00 to 08:00 weekdays and all hours on weekends). Duwalage et al. (2021) utilised a different approach to define

after-hours, which focused on the availability of general practitioners rather than using times outside 08:00 to 17:00 Monday to Friday. General practitioners were available in their region from 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturday, they therefore defined after-hours as hours outside of these times. They found that 57 to 76 percent of non-urgent cases occurred during the allocated after-hours times. O’Keeffe et al. (2018) and Unwin et al. (2020) also concluded that non-urgent presentations within their study populations had higher rates during after-hours. McHale et al. (2013) and Duwalage et al. (2021) both specifically found that non-urgent cases were higher during bank holidays. These results suggest that the available hours of primary care services may influence the rates of non-urgent presentations to the ED.

Several studies explored patient presentations that resulted from a referral by a healthcare professional to the ED and were subsequently classed as non-urgent. Unwin et al. (2016) found that 25 percent of the presentations classed as non-urgent in their study had been referred by a GP, similarly Afilalo et al. (2004) found that 20 percent of the non-urgent presentations in their study were referred by a healthcare professional. The definition used to define ‘non-urgent’ in multiple studies incorporates the need for a patient to be self-referred (Masso et al., 2007; Schütze et al., 2019). Therefore, many studies have not examined the characteristic of primary healthcare referrals to the ED; however, after the results from these studies, it may be possible referrals from other services may be non-urgent in nature. The distance to an ED has also been described as a characteristic impacting non-urgent presentations as discussed by reviewing the following systematic review.

A systematic review by Kelekar et al. (2024) explored the relationship between distance as a measure of healthcare access and the utilisation of EDs for non-urgent care in high and middle income countries (USA, Canada, Europe, Italy, Belgium, Germany, Portugal, France, Turkey and Korea). The review included studies that examined non-urgent care, focusing on EDs, non-urgent

health services and distance. The review excluded studies involving patients transported by ambulance services, referred from another hospital, or those measuring distance from another health facility to an ED. Fifteen articles met the inclusion criteria, all demonstrating satisfactory quality. Eight studies (53.3%) found moderate evidence of an inverse association between distance and ED utilisation for non-urgent conditions, indicating that shorter travel distances were linked to higher non-urgent ED use. The remaining studies in this review reported very low or low evidence when they were evaluated using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) framework. These findings suggest that proximity to EDs influences non-urgent presentations, which has important implications for healthcare policies aimed at reducing unnecessary ED use.

Kelekar et al. (2024) found the primary explanation for shorter travel distances being linked to higher non-urgent ED use in the literature were travel costs, including both direct financial costs and time costs. Higher travel costs were perceived to deter the use of EDs located farther from a patient's residence, especially when the presenting complaint was not perceived as urgent or life-threatening. Several studies in the review by Kelekar et al. (2024) found that proximity to an ED drives non-urgent use, with locational convenience being a significant factor. This was particularly noted in two paediatric studies, which highlighted that parents often chose nearby EDs for their children due to convenience (Benahmed et al., 2012; Guckert et al., 2022). Similarly, two studies on adult populations also indicated that the convenience of using a nearby ED influenced non-urgent visits (Naouri et al., 2020; Oh et al., 2018).

Another explanation presented in the Kelekar et al. (2024) review pertains to the lack of access to primary care providers close to patients' residences. Two studies noted that parents might take their children to EDs due to the unavailability of nearby primary care services. Guckert et al. (2022) argued that parents perceive paediatric EDs as better equipped with the necessary resources and

staff to quickly diagnose their child's condition, thus alleviating parental anxiety. This perception of clinical urgency and the desire to relieve anxiety were also discussed concerning adult patients, though it seemed more pronounced among paediatric cases. Only two of the fifteen studies examined the effect of proximity to alternative healthcare providers. These studies found a positive relationship between the distance to community health centres and the utilisation of EDs for non-urgent services, supporting the notion that access to primary care influences ED usage patterns. In summary, the systematic review by Kelekar et al. (2024) highlighted several factors contributing to the distance decay effect in non-urgent ED use. The primary driver from the literature was the cost and convenience of travel, with closer EDs being more frequently used for non-urgent conditions. Parental perceptions of paediatric EDs capabilities and the lack of accessible primary care providers also contribute to this phenomenon. The discussion of the influence of travel costs and patients' residences highlighted the necessity of addressing socioeconomic deprivation and its effects on health and ED utilisation.

Socioeconomic deprivation has been shown to increase the risk of hospital admission (Ministry of Health, 2021) and has been studied as a characteristic which may influence non-urgent presentations to the ED. McHale et al. (2013) examined deprivation levels within their study population and found that patients who lived in the most deprived areas had the highest presentation rates in both urgent and non-urgent categories. However, when they adjusted for age and gender, they found that patients from the least deprived areas had higher odds of being a non-urgent attendance. In contrast, Unwin et al. (2020) found that patients were 4.5 times more likely to be a non-urgent presentation if they were from the most deprived areas when compared to the least deprived. They observed that none of the larger primary care practices with access to pathology and radiology services were in the most deprived areas of the local community they examined, which they suggest highlights the disparities in the ability to access healthcare services.

The examination of deprivation has also been linked to the characteristic of healthcare cost for patients when accessing services. In NZ, the ED is a free service for citizens and residents, whereas primary healthcare incurs a cost to the patient (Ministry of Health, 2016). This concept has created a perspective that patients may access the ED for non-urgent services due to the financial burden of accessing primary healthcare. Masso et al. (2007) conducted a study where patients and healthcare professionals completed questionnaires to explore why patients attend the ED for non-urgent (or as they termed, appropriate for primary care) conditions. They found the perspectives of healthcare professionals and patients varied greatly. The main reason healthcare professionals believed patients presented with non-urgent conditions was cost, whereas patients did not list cost as one of the top reasons for using the ED. Unwin et al. (2016) also found that patients did not believe cost was a main contributor to their decision to use the ED for a non-urgent condition. Most of the characteristics related to non-urgent presentations were identified from patient database reviews, however, it is important to understand the perspectives of patients who present to the ED with non-urgent conditions and their reasoning for doing so.

There have been multiple studies which have explored the perspectives of patients who have presented to the ED with non-urgent conditions. The most prevalent characteristic described by patients in relation to their presentation was their perceived need. Despite the patients being allocated to these studies due to their presentation being defined by the researchers as 'non-urgent' there were patients who believed their need was urgent. Masso et al. (2007) found that 67 percent of patients in their study believed their condition required immediate attention and was too urgent to wait to see a GP. Akbulut et al. (2008) found similar results in their study where 66 percent of patients perceived they had an urgent need although they had been classed as non-urgent. Afilalo et al. (2004), Unwin et al. (2020) and Al-Raddadi et al. (2020) also found patients in their studies categorised their presentation need as urgent. Matifary et al. (2021) concluded that patients overestimated the severity of their conditions. It is understandable that individuals with no medical

education have difficulty in determining the urgency of their condition and it is important to take into consideration patients' perspectives when addressing non-urgent presentations. The second theme which was most prevalent from patients' perspectives was access to healthcare.

Several studies found that a portion of patients had tried to access primary care services prior to arriving at the ED (Al-Raddadi et al., 2020; McKenna et al., 2020; Unwin et al., 2016). Unwin et al. (2016) found that 40 percent of non-urgent patients in their study had tried to contact a primary healthcare practitioner prior to presenting to the ED. This may suggest that these patients decided to utilise the ED as they felt there was nowhere else to go. There was also a patient perception that the ED was better equipped with services, specialists and equipment than primary care (Al-Raddadi et al., 2020; Diserens et al., 2015; Matifary et al., 2021). Other reasons identified by patients for their presentation to the ED was due to the easy accessibility (Al-Raddadi et al., 2020; Diserens et al., 2015), the familiarity and trust of the service (Afilalo et al., 2004) and that it was their usual place of consultation (Diserens et al., 2015). Patients also identified that they were unaware of other emergency care alternatives (Diserens et al., 2015), did not know how to contact after-hours services (Masso et al., 2007) and held a perception that other departments were inaccessible after hours (Matifary et al., 2021). Overall, the reasons for non-urgent presentations from a patient's perspective are multi-factorial.

Understanding the characteristics of non-urgent presentations is crucial for reducing the demand for emergency services. The impacts of age, operating hours, referrals, distance to the ED, socioeconomic deprivation and patients' perceptions and their influences on non-urgent presentations have been examined. While there is a wealth of literature discussing these non-urgent presentations, research specifically addressing interventions to reduce such visits to the ED is limited. Part two of this literature review will focus on change and innovation in healthcare, with particular attention to interventions aimed at reducing non-urgent presentations.

## Part II: Change and innovation in healthcare

*Innovation is seeing what everybody else has seen and thinking what nobody else has thought*

Dr Albert Szent-Gyorgyi (1893-1986)

Innovation in healthcare, particularly within the context of EDs, has become increasingly vital in addressing complex challenges and optimising patient outcomes. Part two of this literature review explores various innovative interventions aimed at transforming ED operations and enhancing patient care. Specifically, it examines strategies to reduce non-urgent presentations, such as diversion interventions, enhanced primary care services and population specific interventions. The role of patient navigation, which is designed to streamline transitions and the continuity of care, is also discussed in the context of promoting efficiency and patient satisfaction within healthcare settings.

In the dynamic healthcare environment, there is increasing acknowledgment of the necessity for transformative improvements to meet the challenges of contemporary healthcare delivery. This section of the literature review also seeks to examine these innovations and their potential to enhance ED efficiency and ultimately improve patient outcomes. Understanding these elements is crucial for navigating healthcare innovation pathways effectively which is essential for this research study.

### **2.10 Interventions to decrease non-urgent presentations to the ED**

There have been four main themes identified when exploring interventional research to decrease non-urgent presentations to the ED which are diverse in nature and these include diversion interventions (ambulance diversion, patient redirection and telehealth services), enhanced primary care services (co-located GP clinics, increased primary care hours), interventions which specifically target frequent attendees to the ED (case-management) and interventions which focus on the older

population. The most prevalent theme is that of diverting non-urgent patients away from the ED, which includes interventions focused on ambulance diversion, patient redirection from the ED and telehealth services.

A systematic review by Tohira et al. (2014) examined research studies that focused on the new role of pre-hospital practitioners who provided care at the scene and/or referred patients to an alternative healthcare service. Studies were eligible for inclusion if they compared the use of one type of pre-hospital practitioner with standard ambulance crew, measured the number of patients discharged at the scene, measured the number of patients transported to ED, reviewed subsequent ED use or the appropriateness of care. The review included 23 studies from differing countries (NZ, Canada and the UK) and most studies evaluated the use of emergency care practitioners in the UK, one evaluated UK paramedic practitioners and other evaluated extended care paramedics in NZ and Canada. All studies concluded that the introduction of the new roles saw a decrease in the rate of patients transported to the ED when compared to conventional ambulance staff. However, Tohira et al. (2014) found a large variation in the rates with results showing patients were 1.6 – 50 times less likely to be transported to the ED. They were unable to draw conclusions on patient safety from the studies as they all used variable outcome measures.

A more recent systematic review by Kirkland et al. (2019) included randomised controlled trials and cohort studies that evaluated the effectiveness of pre-hospital and ED-based redirection interventions. There were 15 studies included in this review, of which 11 evaluated pre-hospital diversion and four evaluated ED-based redirections. The reviewed interventions included pre-hospital diversions, such as nurses or paramedics assessing emergency calls and educating patients on alternatives to dispatching an ambulance. Additionally, advanced practitioners worked alongside ambulance staff onboard ambulances to treat minor conditions at the scene. Other interventions included transporting patients to minor injury clinics and implementing a clinical

protocol for older people, enabling referrals to community-based falls services. ED-based redirection studies included interventions consisting of triage nurses using criteria to redirect patients to primary care. Kirkland et al. (2019) concluded that the quality of the studies ranged from moderate to low and stated the evidence to support or refute the effectiveness and safety of ED diversion practice is lacking. Overall, the percentage of patients who were suitable for diversion was low and many patients were reported to refuse diversion. However, Kirkland et al. (2019) also concluded that diversion practices do not appear to be any less safe or harmful for low-acuity patients than if they were treated in the ED.

Telehealth has been employed as a diversion intervention and NZ has its own government-funded telehealth service, Healthline New Zealand. Introduced in 2001, Healthline was designed to alleviate pressure on EDs by providing free, accessible health advice to the public twenty-four hours a day, seven days a week. This national service connects individuals with qualified health professionals, primarily registered nurses, who offer guidance on a wide range of medical concerns. Whether seeking advice for symptoms, needing information about medications, or deciding whether to visit a healthcare provider, callers receive reliable, evidence-based information. Healthline serves as an essential component of NZ's healthcare system, particularly for those in rural or remote areas where access to immediate medical advice may be limited. Additionally, Healthline plays a critical role during public health crises, providing up-to-date information and advice to the public (Griffin et al., 2017).

Griffin et al. (2017) completed a review examining the impact travel time to EDs had upon Healthline callers' compliance with telephone advice. The review included 277,800 calls completed between July 2010 and June 2012, made between 11pm and 7am. These calls were geocoded, the patients were at their own residences and recommendations were documented. Among these, 36,300 (13%) calls were advised to seek emergency care, while 241,500 (87%) were advised to seek

non-emergency care. Healthline's large user base indicates its potential to divert non-urgent cases away from EDs, thereby reducing overcrowding and easing the burden on healthcare resources. However, it is important to recognise that while many people utilise Healthline for advice, this does not necessarily translate to compliance with the recommendations provided. For instance, the compliance rate for those advised to seek emergency care in the Griffin et al. (2017) review varied significantly based on proximity to an ED, with only 39.4 percent of those living within a five-minute drive following the advice, compared to just 12.5 percent of those more than 40 minutes away. This variability in adherence highlights a critical consideration for ED interventions; the effectiveness of telehealth services like Healthline not only depends on their usage rates but also on patient's willingness and ability to follow the given advice. Thus, while Healthline can potentially reduce unnecessary ED visits, ensuring compliance with its recommendations remains a key challenge that must be addressed to fully realise its benefits in managing the demand for EDs.

The second most prevalent theme to decrease non-urgent presentations to the ED were interventions which increased primary care services. A systematic review by Huntley et al. (2014) included eight studies which explored the relationship between increased primary care hours and ED visits. Five of these studies concluded that increased access to primary care either by extending the hours of operation or increased treatment slots reduced ED visits. Two studies explored the impacts of co-locating a GP with the ED, with one study showing a decrease in ED visits and the other (longitudinal study) showing an increase in ED attendance. Another study found no effect from increased out-of-hours accessibility and ED visits. The evidence from these studies is therefore contradictory. A recent before and after study by Fuhrmann et al. (2021) implemented a walk-in clinic located on the same floor as the ED in a large tertiary hospital in Austria and found that ED visits declined significantly. Patients triaged as four or five were sent to the walk-in clinic (which operated between 16:00 to 22:00 on weekdays and 10:00 to 22:00 on weekends to complement GP practices) and the decrease in ED visits remained stable over a two-year period.

This study was limited due to its before and after design and it did not report the outcomes of the patients who were redirected, therefore conclusions on care appropriateness for patients were unable to be formulated.

Primary care providers play a pivotal role in reducing hospital admissions and easing pressure on EDs beyond just operating hours. Initiatives such as Primary Options for Acute Care (POAC) in NZ exemplify how these providers contribute by offering community-based alternatives for acute medical conditions, aiming to manage patients closer to home and enhance the efficiency of healthcare delivery (Aish et al., 2003). Originating in the early 2000s, POAC aims to manage acute medical needs within primary care settings, thereby reducing the pressure on hospital EDs and inpatient services. The purpose of POAC is to offer timely, appropriate care to patients closer to home, improving their overall healthcare experience and outcomes. By enabling GPs and other primary care providers to deliver acute care services, POAC ensures that patients receive necessary medical attention without the need for hospital admission. This includes services such as intravenous therapy (such as intravenous antibiotics for cellulitis), diagnostic testing and wound management. POAC is particularly beneficial in addressing the needs of patients who require urgent but not emergency care, allowing for more efficient use of healthcare resources. It also aims to reduce healthcare costs associated with hospital admissions and improve patient satisfaction by providing more convenient and accessible care options. Aish et al. (2003) reviewed the use of POAC in an Auckland region in 2001, noting that primary care providers successfully managed enrolled patients. The study concluded that both patients and GPs expressed high levels of satisfaction with the programme. Overall, POAC represents a strategic effort to enhance the efficiency and effectiveness of NZ's healthcare system by optimising the use of primary care services for acute medical conditions.

The final aspect of diversion interventions that were examined concern specific patient populations. Two main groups have been studied in efforts to reduce non-urgent visits to the ED: 'frequent attendees' and 'older people'. Soril et al. (2015) completed a systematic review which examined case-management interventional studies for adults who were classed as frequent ED attendees. They concluded that the outcomes varied: ten studies reported a decrease in ED visits twelve months after implementing case-management interventions, while one study reported an increase in visits and another showed no change. They noted the high-cost of case-management interventions and believed that none of the interventions examined were likely to yield any substantial cost savings for the healthcare system. A recent systematic review by Pritchard et al. (2020) reviewed 53 studies (26 randomised control trials, eight cluster-randomised controlled trials and 19 controlled before-after trials) with the aim to understand what interventions demonstrated effectiveness in decreasing ED use and hospital admissions in patients aged 65 years and older. They concluded that community-based interventions such as comprehensive geriatric assessments and home visits reduced ED visits. However, it was noted that there was variability across individual studies with outcome reporting, analysis and risk of bias, which limited their ability to analyse impacts further. Overall, there have been several research studies completed within each of these themes, however, findings are contradictory and drawing definite conclusions from the studies has been limited.

Efforts to decrease non-urgent ED presentations have encompassed a range of strategies, including diversion programs, primary care options like POAC and case-management interventions. These initiatives aim to optimise healthcare resources, improve patient outcomes and alleviate pressure on emergency services. Another promising approach gaining traction is the use of patient navigation within the healthcare system. These navigators serve to strengthen the continuum of care by enhancing coordination between primary care providers, specialists and community services. By facilitating seamless transitions and ensuring comprehensive patient management,

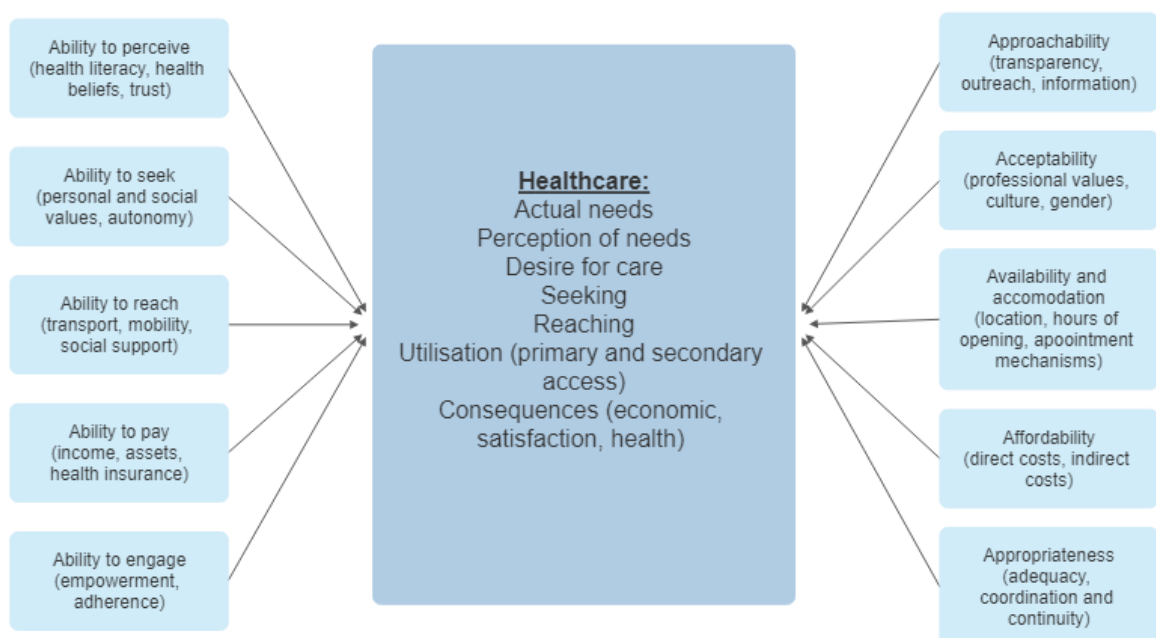
patient navigation has the potential to further streamline healthcare delivery and possibly reduce non-urgent ED visits. To better understand the evidence surrounding patient navigation, it is crucial to first explore the factors that influence a patient's ability to access healthcare. This will be examined in the following section.

## **2.11 Access to healthcare**

Access to healthcare is defined as the opportunity to reach and obtain appropriate services when a perceived need for care arises. It is understood as the outcome of an interaction between individual characteristics, such as those of people, households and social or physical environments and the aspects of health systems, organisations and providers. Factors influencing access can relate to the supply side, such as the features of health systems and organisations, or the demand side, including population characteristics. Additionally, process-related factors which describe how access is achieved, must be considered. Access encompasses the ability to recognise healthcare needs, seek services, reach healthcare resources, utilise services and ultimately receive care that is appropriate to those needs (Levesque et al., 2013).

Levesque et al. (2013) conceptualised a framework of healthcare access which is made up of five core dimensions and five corresponding abilities. The dimensions are: (1) Approachability, which refers to the transparency and ease with which individuals can identify available services; (2) Acceptability, which concerns the cultural and social alignment between healthcare providers and service users; (3) Availability and accommodation, which reflects the extent to which services are provided at times and locations that meet the needs of individuals; (4) Affordability, which reflects the economic capacity for people to spend resources and time to use appropriate services; and (5) Appropriateness, which ensures that services provided are relevant and effective in addressing the specific health needs of the population. Following the dimensions, the model shows that access to healthcare is shaped by five corresponding abilities of individuals, which interact with the

dimensions of accessibility. These abilities include: (1) the ability to perceive healthcare needs, ensuring that individuals can recognise when they require care; (2) the ability to seek healthcare, indicating their capacity and motivation to pursue services; (3) the ability to reach healthcare resources, which encompasses the ability to physically access facilities; (4) the ability to pay, reflecting the financial means to cover the costs of care; and (5) the ability to engage, which refers to the individual's capacity to participate in healthcare decisions and follow through with treatment. Together, these dimensions of accessibility and individual abilities determine the level of access individuals have to healthcare services. The framework is shown below.



**Figure 1: Healthcare access conceptual framework**

Note: this framework was adapted from (Levesque et al., 2013, p.5).

The five dimensions are associated with the supply side of the healthcare system, whereas the five abilities are relevant when addressing demand. The dimensions of access identified are not entirely independent constructs, as they often influence one another and can act at different stages of an illness episode or during the process of seeking care. For example, geographic availability may

interact with the affordability of transportation, together influencing access to health services. Therefore, Levesque et al. (2013) suggest these constructs should be understood as interrelated and that access to healthcare services can be seen as the result of an interaction between factors related to individual characteristics (e.g. place of residence, economic resources, social status) and service characteristics (e.g. availability, location and cost). It is not only the cost of healthcare services themselves that determines affordability, but also an individual's capacity to pay for them. By defining access as an attribute of services, it is emphasised that health services must be responsive to the characteristics of the population to ensure that people are able to use the services when care is needed. The characteristics of resources, individuals and communities may simultaneously shape various dimensions of access (Levesque et al., 2013). It is important to understand that access is multifactorial and complex when examining how patients navigate the healthcare system and it must be considered that patients may need support to manage the interaction between their personal characteristics and the specific services they require.

## **2.12 Equity in healthcare**

The concept of equity in healthcare originates from ethical principles and is closely tied to human rights, specifically the right of all individuals to attain good health. This commitment to equity was first highlighted globally in 1978 at the World Health Organization's Conference on Primary Health Care in Alma-Ata, where health was framed as a fundamental driver of development. The Declaration of Alma-Ata underscored the inequities in health between developed and developing countries as socially, politically and economically unacceptable, calling for a collaborative, cross-sectoral approach to achieve 'Health for All' and prioritising health equity as a global goal. This commitment is encapsulated in the "inverse care law", which states that healthcare availability often inversely correlates with the population's need, meaning those most in need of healthcare tend to have the least access to it (Hart, 1971). This paradox has shaped the understanding of healthcare

access globally and remains a critical framework within which health systems, including NZ's, operate (Ministry of Health, 2018a).

In NZ, despite advances in healthcare and extended life expectancy across populations, Māori, Pacific peoples and those from lower socioeconomic backgrounds continue to experience the greatest disparities in health access and outcomes. The Ministry of Health (2018a) defines equity as the necessity for customised resources and strategies to attain fair health outcomes. It acknowledges that individuals with varying levels of advantage may need different methods and resources to achieve these equitable results. To further address these challenges, equity in healthcare can be operationalised through two key approaches: horizontal equity, which advocates for the equal treatment of equal needs and vertical equity, which addresses unequal treatment for those with unequal needs. This distinction is essential in acknowledging that different groups have distinct health requirements, often necessitating targeted interventions for disadvantaged groups to achieve parity with their more advantaged counterparts. In NZ, the Treaty of Waitangi further underscores the importance of health equity by recognising health as a taonga, or treasured resource, with a focus on guaranteeing equitable outcomes for Māori (Ministry of Health, 2018a).

Healthcare providers in NZ play a critical role in advancing equity. As the initial point of contact for many patients, they are positioned to directly address health disparities. Through culturally competent care, advocacy for patient needs and a commitment to eliminating bias within the healthcare system, providers can help ensure fair treatment for all patients. To fulfil this role effectively, providers must be well-versed in the social determinants of health and how these factors impact patient outcomes. Understanding the complex interplay of race, ethnicity, socioeconomic status and geography with healthcare access enables providers to address the specific challenges facing diverse patient groups. Patient navigation services align strongly with these principles of health equity. By assisting individuals in overcoming barriers to care and addressing social

determinants of health, navigators serve as pivotal agents in creating a more equitable healthcare system, especially for those in marginalised communities (Calhoun & Esparza, 2017). The patient navigation model of care is reviewed next.

### **2.13 Patient navigation: addressing access as both a challenge and an objective**

Patient navigation is a model of care that evolved from a need to guide and support patients through health and social care systems to enable them to meet their healthcare needs (Calhoun & Esparza, 2017; Freeman, 2013). Patient navigation is an evidenced based approach which seeks to reduce the fragmentation of healthcare services and improve access to care for patients. The process of patient navigation is facilitated by patient navigators. Patient navigators are people who are trained to help patients overcome barriers to care and use the healthcare system effectively and efficiently (Chen et al., 2024; Ranaghan et al., 2016). This section explores the theories the navigation model is built on, the historical background of patient navigators, their role, outcomes and future directions, illustrating their contribution to enhancing healthcare delivery and patient outcomes.

The theory of empowerment provides a critical foundation for the concept of patient navigation by emphasising the importance of enabling individuals to take control of their health and well-being (Hickmann et al., 2022). Built on principles of self-efficacy, participation and social change, the empowerment theory acknowledges that individuals thrive when equipped with the knowledge, skills and confidence to navigate complex systems and advocate for their needs (Timothy et al., 2024; Yue et al., 2024). It highlights the interplay between personal choices and systemic barriers, aiming to empower people to overcome obstacles and access resources that enhance their quality of life. In healthcare contexts, empowerment theory underpins strategies to address inequities and

power imbalances often experienced by patients. By fostering a collaborative environment, it encourages patients to become active participants in their care rather than passive recipients. Furthermore, the theory helps address socioeconomic disparities and systemic inequities, that may limit patients' abilities to make informed choices or access care (Timothy et al., 2024; Yue et al., 2024). The empowerment theory underpins the goals of patient navigation, which bridges gaps in care and enhances patient engagement. By cultivating self-efficacy and promoting equitable access, empowerment theory provides a framework to support patients in overcoming challenges and achieving better health outcomes (Timothy et al., 2024).

Empowerment also forms a critical foundation for self-determination in healthcare. Self-determination is achieved when patients feel that three innate needs are met: autonomy (control over their actions), relatedness (a sense of connection with others) and competence (the ability to impact their outcomes). When patient navigation services prioritise these needs, particularly for minority populations, they foster environments that promote autonomous and health-supporting behaviours, leading to improved engagement, satisfaction and outcomes (Timothy et al., 2024). Self-efficacy is a patients' belief in their ability to successfully manage their health and is fundamental within healthcare. By building self-efficacy, navigation programmes empower patients to feel confident in following treatment plans, communicating with healthcare providers and making informed decisions. Self-efficacy reinforces self-determination by instilling confidence and equipping patients with the skills to advocate for themselves when needed. Together, empowerment, self-determination and self-efficacy form the foundation for successful patient navigation programmes, fostering patient independence and resilience (Timothy et al., 2024; Yue et al., 2024). Over time, patient navigation has evolved, but these core principles remain central to its success. Before exploring the evolution of the navigation model, the origins of patient navigators will be discussed.

Patient navigators originated from the need to address disparities in healthcare by assisting minority patients in navigating the fragmented healthcare system. The concept gained prominence in the early 1990s, primarily in oncology, where patients often faced complex treatment regimens and required multidisciplinary care. Dr. Harold Freeman is credited with pioneering the patient navigation model in 1990 to reduce disparities in cancer care in a public hospital located in New York City. His programme aimed to address the barriers that low-income and minority patients faced, such as financial constraints, transportation issues and lack of information (Freeman, 2013). The original programme focused on the period between the identification of an abnormal finding from a cancer detecting procedure to the time of resolution by diagnosis and treatment. Retrospective studies which examined the results of the free or low cost breast cancer screening programme combined with patient navigation found significant results. The results showed increases in early stage breast cancer diagnosis and treatment and an increase in the five year breast cancer survival rate from 39 percent to 70 percent in the study population of minority women (Freeman, 2013). After the success of the original patient navigation model, the scope of the patient navigator was developed to encompass the entire cancer care continuum, including prevention, detection, treatment, survivorship and end of life care.

Over the decades, the role of patient navigators has expanded beyond oncology to various fields, including long-term condition management, primary care and mental health. The evolution of this role reflects the growing recognition of the importance of coordinated care and the need to address social determinants of health that affect patient outcomes. Patient navigators serve multiple roles within the healthcare system, acting as liaisons between patients and healthcare providers. Their primary responsibilities include patient advocacy, care coordination, education and support (Calhoun & Esparza, 2017). Navigators advocate for patients, ensuring their voices are heard and their preferences respected, they help patients understand their rights and facilitate communication with healthcare providers. Additionally, navigators coordinate care across different healthcare

services and providers. This includes scheduling appointments, arranging transportation and ensuring that patients follow through with their treatment plans. Patient navigators have the ability to educate patients about their medical conditions, treatment options and preventive care. They provide emotional support and help patients manage the stress and anxiety associated with medical treatments. Moreover, navigators connect patients with community resources and support services, such as financial assistance, housing and social services, addressing the broader social determinants of health (Chan et al., 2023; Chen et al., 2024; Ranaghan et al., 2016).

The roles of patient navigators are varied depending on the programme that they are working for, their work experience and their qualifications. Freeman (2013) suggested that because there is a wide range of various tasks in patient navigation, patient navigators can come from a variety of backgrounds. Patient navigators can be non-professionals such as lay persons, or health professionals such as nurses, nurse practitioners and social workers depending on the required tasks. Many different trained individuals have been used in patient navigation services as the role of patient navigators is constantly evolving and expanding (Chen et al., 2024). Harvey et al. (2021) describe nurse navigators as an emerging workforce focused on supporting individuals with complex, long-term health conditions. Conducted in Australia, their study demonstrated how nurse navigators play a pivotal role in helping patients re-engage with interdisciplinary healthcare teams, particularly for those who have lost trust in the system. Harvey et al. (2021) emphasised that this re-engagement is essential for addressing unmet needs and preventing hospital admissions. Nurse navigators deliver authentic, holistic and continuous care, utilising advanced interpersonal and decision-making skills to prioritise patient needs. The findings from Harvey et al. (2021) highlight the advanced competencies of nurse navigators and their vital role in bridging gaps in care while fostering meaningful patient engagement. Their study underscores the importance in ensuring healthcare systems remain responsive and centred on patient needs. The integration of

patient navigators into patient care has been shown to provide numerous benefits, which will be described next.

The systematic review by Chen et al. (2024) focused on patient navigation in cancer treatment and encompassed 59 articles, each examining the impact of patient navigation programmes on various aspects of cancer care. A significant portion of the studies reviewed focused on the initiation of cancer treatment, with 70 percent reporting notable improvements in treatment commencement for patients enrolled in patient navigation initiatives. Similarly, 71 percent of the studies dedicated to treatment adherence observed substantial enhancements in patient compliance with prescribed regimens. Moreover, 87 percent of studies assessing patient satisfaction identified significant benefits linked to the use of patient navigators, while 81 percent reported a positive influence on key quality care indicators. Among the 37 studies that concentrated on disadvantaged populations, 76 percent concluded that patient navigators had a positive effect during treatment, particularly in reducing barriers to care and supporting these vulnerable groups through their cancer journey. Overall, the findings of this systematic review provided strong evidence for the effectiveness of patient navigation programmes in cancer treatment. The results indicate that patient navigation plays a vital role in enhancing access to care, improving treatment adherence and fostering better outcomes, especially for disadvantaged cancer patients (Chen et al., 2024).

There was one systematic review which examined patient satisfaction with patient navigator services in adult patients in an ambulatory care setting. This systematic review by Ranaghan et al. (2016) included four studies: two were randomised controlled trials (RCT), one employed a quasi-experimental pre-test-post-test design and one was a cohort study. Collectively, these studies provide evidence suggesting that the implementation of a patient navigator yields beneficial outcomes in terms of patient satisfaction, care coordination and timely access to healthcare services. In one RCT by Ferrante et al. (2008), the effectiveness of a patient navigator in enhancing

the timeliness of diagnosis, reducing anxiety and increasing satisfaction among urban minority women following an abnormal mammogram was assessed. Women with suspicious mammograms were randomly allocated to either standard care (n=50) or standard care with the additional support of a patient navigator (n=55). No demographic differences were observed between the two groups. Women in the intervention group experienced shorter times to diagnostic resolution (mean of 25 days compared to 42.7 days;  $p=0.001$ ), with 22 percent of women in the control group remaining without a definitive diagnosis at 60 days, compared to only 6 percent in the intervention group. Additionally, the intervention group demonstrated lower mean anxiety scores (a decrease of 8 in the intervention group versus an increase of 5.8 in the control group;  $p<0.001$ ) and higher mean satisfaction scores (4.3 compared to 2.9;  $p<0.001$ ). These findings suggest that the involvement of a patient navigator significantly improves key outcomes for urban minority women after an abnormal mammogram.

The other RCT included in the systematic review by Ranaghan et al. (2016) evaluated the impact of patient navigation on treatment completion times, satisfaction with cancer care and psychological distress among patients with newly diagnosed breast or colorectal cancer. A total of 438 patients were randomised to receive either patient navigation or usual care. Trained lay navigators worked with patients in the patient navigation group to assess treatment barriers and identify resources to overcome them. The study employed intent-to-treat analysis to assess outcomes within three months after the initiation of cancer treatment. The sample was predominantly middle-aged (mean age 57), female (90%) and included 44 percent racial-ethnic minorities, 46 percent with lower education levels, 18 percent uninsured and nine percent reporting a non-English primary language. The randomised groups were comparable in baseline characteristics. Primary analyses showed no statistically significant group differences in time to completion of treatment, satisfaction with care, or psychological distress. However, subgroup analyses revealed that socially disadvantaged patients (those without health insurance, with low

English proficiency and non-English speakers) who received patient navigation reported significantly higher satisfaction than those receiving usual care, with odds ratios indicating a greater likelihood of satisfaction for these individuals: an OR of 3.75 (95% confidence interval (CI), 1.60-8.79) for lower English proficiency, OR of 2.37 (95% CI, 1.28-4.40) for less than a high school education and OR of 2.36 (95% CI, 1.41-3.93) for those without health insurance. Although the primary analysis showed no overall benefit from patient navigation, these findings suggest that patient navigation may improve satisfaction with care for certain disadvantaged individuals (Fiscella et al., 2012).

The two additional research articles included in the systematic review by Ranaghan et al. (2016) demonstrated less rigour than the two aforementioned RCTs, yet they still yielded notable findings. The quasi-experimental study reported in the review indicated that participants in the nurse navigator programme experienced higher satisfaction with care. Additionally, the cohort study revealed a slight increase in mean satisfaction among navigated patients (90.7) versus non-navigated patients (85.5), achieving statistical significance ( $p=0.03$ ). Ranaghan et al. (2016) concluded that patient navigators play a crucial role in enhancing patient satisfaction and overall experience. They suggested that the four studies included in their review underscore the positive impact that patient navigators can have on patients.

Although most research conducted on patient navigators focuses on the cancer-care continuum, patient navigators have been used in other patient populations. Wouk et al. (2024) completed a systematic review which examined the use and outcomes of patient navigation models of care during the perinatal period (pregnancy through the first year postpartum) in people who use substances. They reviewed 17 articles and concluded that patient navigation was associated with reduced maternal substance use, increased use of services and improved maternal and neonatal health. They specified that patient navigation programs which co-located care, engaged patients

across the perinatal period and worked to build trust and communication with family members and services providers were particularly successful. There were a lack of control groups in the studies which were included in the systematic review and therefore it was concluded that additional rigorous research is needed to strengthen the arguments for the use of patient navigation in this population group (Wouk et al., 2024). It is known patient navigators are utilised for their impact on vulnerable populations, along with the systematic review discussed previously, there was another systematic review completed which investigated the transitions of care for patients with complex care needs.

Howitt et al. (2024) conducted a systematic review to assess the impact of patient navigation services on individuals with complex care needs (arising from long-term health conditions, severe illness, or social vulnerability) during transitions in care. The review aimed to inform the development of a best practice guideline by evaluating effects on quality of life, ED visits, follow-up visits, patient satisfaction and hospital readmission rates. There were 17 relevant studies reviewed which primarily addressed the transitions of patients from hospital to home. Patient navigation ranged from one month to one-year post-transition and findings suggested that navigation support marginally increased follow-up visits, decreased 30-day readmission rates and improved patient satisfaction. However, no significant changes were observed in quality of life or ED visits within 30 days post-transition. Howitt et al. (2024) concluded that while patient navigation shows potential benefits, the evidence remains inconclusive and further high-quality research is warranted to clarify its effectiveness in this area. In addition to patients with complex care needs, a systematic review was also conducted to explore the impact of patient navigation on those with long-term conditions, which is discussed below.

The systematic review by McBrien et al. (2018) sought to consolidate evidence regarding the effectiveness of patient navigator programmes in individuals with various long-term conditions

compared to usual care. This review included 67 studies: 44 studies focused on cancer, eight on diabetes, seven on HIV/AIDS, four on cardiovascular disease, two on chronic kidney disease and one each on dementia and multimorbidity. Process outcomes, such as disease screening completion and adherence to follow-up procedures, were the most frequently reported primary outcomes (n=50). Patient satisfaction or experience was the primary outcome in one study and three studies reported hospitalisation or emergency room visits as primary outcomes. Of the 67 studies, 45 (67%) demonstrated statistically significant improvements in at least one primary outcome. However, no specific programme characteristics were found to correlate with statistically significant improvements in primary outcomes. McBrien et al. (2018) concluded that while patient navigator programmes improve processes of care, there is limited evidence on their impact on patient experience, clinical outcomes, or cost-effectiveness. The authors underscore the need for consistent definitions and further research to determine the most effective components of patient navigator interventions.

The body of research reviewed underscores the substantial benefits of patient navigation programmes across various healthcare contexts, particularly in cancer care and among vulnerable populations. The systematic reviews by Chen et al. (2024) and McBrien et al. (2018) provide evidence that patient navigators can enhance treatment initiation, adherence and patient satisfaction, especially for individuals facing barriers to care. Despite the overall positive outcomes, the studies also highlight the need for further investigation into the specific elements that contribute to the success of these programmes, as well as their cost-effectiveness and impact on patient experiences. Additionally, the review by Howitt et al. (2024) indicates that while patient navigation shows promise in supporting individuals with complex care needs during transitions, the evidence remains inconclusive, warranting high-quality research to better understand its effectiveness. Overall, this synthesis of literature illustrates that patient navigation is a valuable

strategy in improving healthcare delivery, but further rigorous research is essential to optimise its implementation and refine its role across diverse patient populations.

## **2.14 Patient navigation in ED populations**

Given the focus of this research on the ED, a review of studies was conducted that specifically investigated the role of patient navigation within ED settings and among ED patient populations. One study by Bakshi et al. (2022) was deemed relevant as their study examined patients who were treated and released from the ED. This population is closely aligned with non-urgent presentations, a key focus of this research study, as both groups share similar characteristics and needs. Although the research study by Bakshi et al. (2022) is not a randomised controlled trial, it is included here due to its relevance to the research topic.

Bakshi et al. (2022) completed a retrospective analysis of health care utilisation and costs in the 30 days following an index ED visit, comparing patients who received patient navigation with matched controls. The primary outcome they assessed was all-cause return visits to the ED and the secondary outcomes reviewed were hospital admissions and primary care appointments. The patient navigator programme that was reviewed in the Bakshi et al. (2022) study was conducted at three general acute care hospitals. Each hospital placed a patient navigator who was a layperson with health care or social services experience, in the ED. The navigators' primary roles included: encouraging primary care engagement by scheduling post-ED discharge appointments and addressing access barriers, coordinating care and referring patients to relevant health services and identifying patients' health-related social needs, connecting them to community resources such as housing, food, transport and employment support.

The patient population in the Bakshi et al. (2022) study included patients enrolled in the allocated hospitals from June 2018 through to October 2019, when the patient navigator programme was

fully implemented. Using electronic health records, treat-and-release ED visits were identified. Exclusions included high-acuity visits, defined by an emergency severity index score of 1 or 2; weekend visits, as the patient navigation programme operated only on weekdays; and any visits where complete data was not available. Overnight weekday visits were included, as these often received a next-day follow-up via phone call. The intervention group included patients who engaged with the patient navigator. To create a matched control group, three comparison patients were selected for each intervention patient from individuals who did not use the patient navigator. The groups were matched on prior ED visits, inpatient stays and primary care physician visits within the six months prior to their ED visit (Bakshi et al., 2022).

Bakshi et al. (2022) described that during discharge planning, the patient navigators interacted briefly with patients, drawing on motivational interviewing and trauma-informed care. The navigators utilised a social needs assessment tool and shared regularly updated resource guides, which included translation support. After patients were discharged from the ED, patient navigators followed up via a phone call within 72 hours or coordinated a follow-up visit with the patient's long-term care team. During the study period, a total of 22,557 treat-and-release ED visits were recorded at the hospital EDs participating in the programme. Of these, 12,113 visits met inclusion criteria, comprising 1,315 visits with a patient navigator encounter and 10,798 potential control visits. Following matching, the final sample included 1,117 intervention patients and 3,351 comparison patients.

Overall, no statistically significant difference was found in the likelihood of a return ED visit within 30 days for patients who received ED navigation compared to those who did not (OR, 0.88; 95% CI, 0.71-1.08). However, among patients with no ED visits in the preceding six months, ED navigation was associated with a reduced likelihood of a return visit within 30 days (OR, 0.68; 95% CI, 0.52-0.90). For patients with one or more ED visits in the previous six months, the effect was

not statistically significant (Bakshi et al., 2022). Regarding primary care follow-up, after adjusting for relevant variables, patients who received navigation were significantly more likely to attend a follow-up visit within 30 days (OR, 1.52; 95% CI, 1.29-1.77). However, there was no significant difference in 30-day hospital admission rates (OR, 0.77; 95% CI, 0.47-1.27). The study by Bakshi et al. (2022) was limited by its methodology as it was a retrospective cohort analysis and not a randomised controlled trial, however its specificity to this research study's population and the use of patient navigators deemed it relevant for discussion.

Three randomised controlled trials were identified that investigated the use of patient navigation within ED populations. However, these RCTs focused specifically on patients who frequently utilised the ED and all three studies were conducted in the United States of America. The largest study, in terms of research population size, was conducted by Seaberg et al. (2017). The aim of the RCT by Seaberg et al. (2017) was to determine whether a trained navigator could reduce ED use and cost in 'super utilisers' (patients with five or more visits a year to the ED) over a one year period. They were concerned as although these patients only account for five percent of the patients seen in the ED, they account for 25 percent of the total yearly ED visits. The study employed a prospective, randomised controlled design conducted in an urban ED with an annual adult patient volume of 57,000. A patient navigator collaborated with ED patients to review diagnoses and prescriptions, assist in arranging follow-up appointments and transportation and identify relevant community resources to support patient care. The patient navigator fulfilled these responsibilities at the initial ED visit, at any subsequent visits and during follow-up phone calls within two weeks and 12 months of the initial visit (Seaberg et al., 2017).

The patient navigator in the study by Seaberg et al. (2017) received comprehensive case management training, gaining insight into the social services and medical resources within the community, as well as a foundational understanding of the medical referral system. Eligibility was

limited to patients presenting to the ED five or more times within a 12-month period. Seaberg et al. (2017) justified this inclusion criterion by suggesting that five or more ED visits within a single year indicate a level of frequency that is generally considered non-random. Exclusion criteria included patients unable to provide written consent and those currently receiving hospice or palliative care. The study included 148 patients in the treatment group and 134 in the control group, with an average age of 44.6 years.

At the two-week follow-up, a high rate of retention was achieved, with 94 percent of both groups successfully contacted. In this period, 47 percent of patients in the navigation group had attended an actual primary care physician visit, compared to 43 percent in the control group, showing a marginal increase in primary care engagement within the navigation group. Phone surveys further indicated that patients in the navigation group averaged 4.89 primary care visits (95% CI = 4.36–5.42) in the 12 months prior, while the control group averaged 5.05 visits (95% CI = 4.54–5.56), a non-significant difference ( $p=0.51$ ). Patient satisfaction levels, assessed via a 4-point Likert scale, showed no statistical difference between groups, with both achieving a median satisfaction score of 3.00 (95% CI = 2.86–3.14 for treatment and 2.87–3.13 for control,  $p=0.47$ ). At the 12-month follow-up, 43.3 percent of patients remained engaged in the study (44.6% in the treatment group and 41.8% in the control). During this period, the treatment group demonstrated a significantly higher mean number of primary care visits at 6.42 (95% CI = 5.14–7.70), compared to 4.07 visits in the control group (95% CI = 3.38–4.76;  $p=0.0013$ ). This suggests that patients receiving navigation support may be more consistent in primary care engagement, potentially reducing dependence on ED services. However, satisfaction scores remained consistent across both groups, with a median of 2.00 (95% CI = 1.84–2.16 in both groups,  $p=0.57$ ), indicating that increased primary care engagement did not significantly impact patients perceived satisfaction with care (Seaberg et al., 2017).

In terms of healthcare utilisation, ED visits saw an overall 8.8 percent reduction over the 12-month study period compared to the previous year. This reduction was more pronounced in the treatment group, where visits dropped by 13.2 percent (from 1,148 to 996 visits) compared to a 4.3 percent reduction in the control group (1,101 to 1,054 visits,  $p < 0.0001$ ). These findings suggest that patient navigation may contribute to reducing ED overuse, likely by connecting patients with appropriate non-emergency care. It was also noted that ED visit costs dropped more in the treatment group, decreasing by 26.6 percent compared to a 17.5 percent reduction in the control group, indicating that the programme may effectively lower ED-related costs. Nonetheless, the study's limitations include a small sample size and reliance on patient recall for reporting primary care attendance, which introduces potential inaccuracies. Furthermore, the study's comparison of data from the year prior to enrolment with data from the year following enrolment may introduce a regression to the mean effect and does not fully account for potential systemic changes in healthcare practices or policies during the study period (Seaberg et al., 2017). The study findings suggest that implementing a patient navigation programme in an urban ED setting may enhance primary care engagement, reduce ED reliance and lower healthcare costs. Although patient satisfaction remained similar between groups, the treatment group demonstrated a significant increase in primary care visits and a notable decrease in ED visits and associated costs. These results indicate that such programmes could be valuable in managing healthcare utilisation among frequent ED users, though further research with larger samples and extended follow-up is recommended to confirm these benefits.

The second prospective, randomised controlled trial reviewed was by Kelley et al. (2020) who aimed to determine whether an ED initiated patient navigation programme designed to improve access to healthcare for frequent ED users could decrease ED visits, hospitalisations and costs. Participants were recruited from a large urban academic hospital ED with an annual volume of over 150,000 visits. Eligibility criteria included adults aged between 18 and 62 with active insurance,

fluent in English or Spanish and with four to 18 ED visits in the previous year, including the current visit. Patients were excluded if over 50 percent of their ED visits in the prior year were for mental health or substance use issues, if their current visit was due to mental health or substance-related concerns, or if they had more than 18 ED visits in the past year. Kelley et al. (2020) described the rationale for the exclusion criterion as being a result of these groups typically presenting complex needs beyond the study's scope. This selection process aimed to focus on a population most likely to benefit from patient navigation to enhance engagement with primary and specialty care.

A patient navigator or research assistant spent 20 to 30 hours weekly in the ED, mainly on weekdays, with additional evening and weekend shifts, to ensure broad recruitment coverage. Following enrolment, each participant completed a comprehensive interview, covering demographics, socioeconomic factors, health literacy, medical history, healthcare access and reasons for ED use. Open-ended questions were included to determine the specific ways in which the patient navigator could provide support. Participants were randomly assigned to either the intervention group or usual care group through a stratified randomisation process that accounted for the frequency of ED visits in the prior year. Those in the patient navigator group received 12 months of support from a trained bilingual patient navigator (50% effort) and a nurse navigator (25% effort), selected for their qualifications in cultural sensitivity and communication. The navigators completed two days of intensive training, focusing on identifying and overcoming barriers to care and supporting patients through the healthcare system. The navigators were supervised by a multidisciplinary team, including an emergency physician, a primary care physician, the programme's executive director and a coordinator, who met weekly to discuss each new enrollee's needs and provide ongoing guidance. For each patient, the navigator prepared a summary detailing medical history, ED usage, access barriers, social determinants of health and desired assistance. The team discussed resources and support options for each patient to guide the navigator's work (Kelley et al., 2020).

The patient navigator facilitated primary care appointments, accompanying patients to up to three visits and assisted with any required specialist referrals. For patients without an existing primary care provider, the navigator scheduled appointments based on patient preferences and availability at local clinics or healthcare centres. Before appointments, the navigator reviewed patient concerns, offered support during the visit and developed a follow-up action plan. Regular follow-up calls were scheduled every two weeks initially and then monthly, to monitor ongoing healthcare needs and address any barriers, such as transportation. After each healthcare visit, the patient navigator contacted the patient to review provider recommendations and assist with follow-up tasks. For patients facing social challenges, such as housing instability or food insecurity, the patient navigator provided information on local resources. This structured, continuous support aimed to improve healthcare access, engagement and the overall well-being of participants (Kelley et al., 2020).

A total of 227 eligible patients were identified through screening, among those approached, 100 patients agreed to participate in the study. The 114 patients who declined to participate cited various reasons: 21 percent indicated they did not require navigation services; 18 percent were not interested in or did not want navigation services and 13 percent reported feeling unwell. Notably, 35 percent did not provide a specific reason for their refusal. Of the 100 enrolled patients, 49 were randomised to the ED patient navigator group, while 51 were randomised to receive usual care. The two groups exhibited similar sociodemographic characteristics, as well as comparable numbers and types of long-term conditions, including mental health conditions and similar rates of ED visits and hospitalisations in the year preceding the study. The findings revealed that patient navigator participants averaged 6.37 ED visits in the 12 months prior to enrolment, which decreased to 3.96 visits in the 12 months following enrolment. In contrast, usual care patients averaged 6.94 visits pre-enrolment, decreasing to 5.90 visits post-enrolment. On average, navigated patients had 1.4

fewer ED visits compared to usual care patients ( $p=0.01$ ). Hospitalisation rates also differed, with usual care patients averaging 2.49 hospitalisations pre-enrolment and 2.63 post-enrolment. Conversely, patient navigated patients experienced 1.0 fewer hospitalisations compared to their usual care counterparts ( $p=0.001$ ). Additionally, while navigated patients incurred an average of \$10,202 lower hospital costs per patient compared to usual care patients, this finding did not reach statistical significance ( $p=0.10$ ) (Kelley et al., 2020).

The study by Kelley et al. (2020) has several notable limitations. The small sample size and single-centre design may limit the generalisability of the findings. Additionally, more than half of the patients approached in the ED declined to participate, possibly due to competing concerns related to their illness or apprehension about engaging in research. Kelley et al. (2020) expressed that it is likely those patients who chose to enrol were more motivated and engaged, which may have introduced bias. The study also did not include patients presenting to the ED at various hours, raising questions about the representativeness of the sample (Kelley et al., 2020). In summary, the results demonstrate that implementing a patient navigation programme in the ED can significantly reduce the number of emergency visits and hospitalisations among participants compared to usual care. Although financial benefits from reduced hospital costs were observed, these were not statistically significant. These findings suggest that patient navigation may be a valuable strategy for improving care management and reducing reliance on emergency services. Future research should seek to address these limitations and examine the long-term effects of such programmes across diverse patient populations and settings.

The third RCT reviewed was by Lin et al. (2017) who examined if a navigation intervention improved care coordination and reduced ED visits and hospitalisations among frequent ED users in an urban ED. The study aimed to identify the most frequent ED users, focusing on those who had the highest utilisation in the 30 days and 12 months prior to the intervention. A total of 72

patients were randomised to either receive a pilot intervention or usual care. The intervention included the assistance of a community health worker who helped patients navigate their care and address unmet social needs, alongside an ED-based clinical team that developed interdisciplinary acute care plans tailored to eligible patients. There were 72 patients randomised into the study, with 36 assigned to the intervention group and 36 to the control group. After a period of seven months, the study analysed ED visits, hospitalisations and associated costs for both the intervention and control groups. The results indicated that patients in the intervention group experienced a 35 percent reduction in ED visits ( $p=0.10$ ) and a 31 percent decrease in admissions from the ED ( $p=0.20$ ) compared to those receiving usual care. Furthermore, the average direct costs associated with ED visits per patient were 15 percent lower in the intervention group, while inpatient direct costs per patient were reduced by 8 percent (Lin et al., 2017).

The findings by Lin et al. (2017) suggest that the intervention effectively reduced the reliance on emergency services and hospital admissions among frequent ED users, although the reductions did not reach statistical significance this may be due to the small sample size. The decrease in ED visits and hospitalisations may indicate improved care coordination and support for patients' social needs, potentially leading to better health outcomes and reduced healthcare costs (Lin et al., 2017). In summary, the study highlighted the potential benefits of employing community health workers and interdisciplinary care plans in managing high-utilisation ED patients. The observed reductions in ED visits and hospitalisation rates suggest that such interventions could play a crucial role in optimising care for vulnerable populations. Future research should further explore these interventions' long-term impacts and scalability across diverse healthcare settings to confirm their effectiveness and enhance patient outcomes.

There were no other RCTs retrieved when examining the evidence on patient navigation and ED populations. However, there was an evaluation study completed which reviewed the patient

experience and satisfaction of the patient navigator programme which was completed in the Kelley et al. (2020) RCT. This evaluation study was completed by Samuels et al. (2021) and 80 percent (39 out of 49) of the population from the Kelley et al. (2020) RCT completed a pre and post-intervention survey. Following receipt of patient navigation services, participants were significantly more likely to report 'usually' or 'always' being able to secure medical appointments as needed (94% vs 53%) and to have their medical queries addressed on the same day (96% vs 50%). Participants also noted a reduction in using the ED as their primary site of care (30% vs 70%), fewer barriers to accessing care and increased confidence in coordinating their care and managing their medical conditions independently. Overall satisfaction with patient navigation services was high among participants. Key features identified as most helpful included support with scheduling appointments, receiving appointment reminders, follow-up calls and having someone available to discuss their health. All participants expressed overall satisfaction with patient navigation, with 89.7 percent reporting being 'very satisfied.' Additionally, 87.2 percent were very satisfied with the waiting time for appointments and a majority 87.2 percent found it easier to adhere to treatment recommendations post-navigation. Moreover, 76.9 percent reported improved ease of accessing care and 84.6 percent perceived an overall improvement in their ability to obtain needed care (Samuels et al., 2021).

In addition, Samuels et al. (2021) completed eleven interviews and four primary themes emerged from the analysis: (1) Patient navigators were recognised as effective healthcare coordinators and advocates, offering continuity and personalised support; (2) health-related social needs frequently influenced healthcare utilisation, both driving and hindering access and often required assistance from navigators; (3) utilisation of primary care was largely dependent on the accessibility of clinics and the quality of interpersonal relationships with healthcare providers and staff; and (4) participants described the ED as a convenient, comprehensive source of urgent care, often bridging gaps in primary care access. While the evaluation study is not rated as high-quality evidence, it was

grounded in a randomised controlled trial that demonstrated significant reductions in ED visits and hospitalisations. These findings are encouraging, as they suggest that, alongside the tangible benefits for healthcare systems, patients also experienced high levels of satisfaction with the patient navigation programme. This dual impact highlights the potential of navigation programmes to not only reduce healthcare utilisation but also improve patient experiences, reinforcing the value of integrating such programmes into healthcare systems.

When exploring patient experiences in the literature, a qualitative study exploring patient experiences in NZ was found. The study by Wilkinson et al. (2022) examined the perspectives of individuals receiving health and social care navigation support for long-term conditions in a metropolitan area. They recruited nine former clients (seven women and two men, aged 30–80), who were interviewed individually in their homes by the service manager and navigators. An overarching theme emerged: participants described a sense of restoration of their ‘essence’ or ‘being’ (wairua in Māori) and a sense of belonging (tūrangawaewae), which was achieved through a collaborative and regenerative approach between navigator and client. The researchers described this renewal as being felt deeply, with participants expressing that the navigation experience helped affirm their sense of personhood. While the findings reflect experiences from a single service, the participants included some of NZ’s most potentially marginalised populations, offering valuable insights into the benefits of navigation services for vulnerable groups. Such services were seen to aid in the restoration of both personal identity and wellbeing, fostering self-determination and improved health outcomes. Though not specific to ED settings, this study offers meaningful insights into patient perspectives on navigation services in NZ (Wilkinson et al., 2022).

Patient navigation services have shown statistically significant effectiveness in reducing ED visits, lowering hospitalisation rates, increasing primary care engagement and decreasing ED costs for target populations. Moreover, patients consistently report high satisfaction with navigation

programmes, including those implemented within NZ. This is particularly relevant to the current research, which focuses on the NZ healthcare system and population. As healthcare continues to evolve, the role of patient navigators will become increasingly critical. Future initiatives will aim to optimise and expand these programmes, ensuring that all patients receive coordinated, compassionate care. By prioritising patient needs and addressing social determinants of health, patient navigators are instrumental in fostering a more equitable and efficient healthcare system.

## **2.15 Nurse practitioners within the ED setting**

This research study examines the acute demand for ED services and explores innovative working practices aimed at alleviating pressure on these departments while simultaneously enhancing patient outcomes. As populations evolve, so too must healthcare services adapt to meet their changing needs. An analysis of emerging roles within EDs globally reveals that Nurse Practitioners (NP) have increasingly become integral members of emergency care teams. NPs are highly educated and experienced nursing professionals who play a crucial role in improving health and addressing health inequalities. They operate autonomously or collaboratively within multidisciplinary teams, providing a comprehensive array of assessment and treatment interventions. This includes ordering and interpreting diagnostic and laboratory tests, prescribing medications within their areas of competence and managing patient admissions and discharges across various healthcare settings (Nursing Council of New Zealand, 2017). They also utilise evidence-based practice to ensure patients' care is safe and effective.

The medical literature defines Evidence-Based Practice (EBP) as the conscientious and explicit use of the best available evidence in making decisions about the care of individual patients. The nursing literature has adapted this definition to include not only the best available evidence but also the clinician's expertise and the patient's preferences (Craig & Dowding, 2020). NPs use EBP to guide clinical decision-making, ensuring that the care they provide is based on the best available research,

clinical expertise and patient preferences. EBP involves the systematic review of scientific studies, clinical guidelines and patient outcomes to inform practice. NPs critically evaluate the most recent evidence to ensure it aligns with the patient's needs, thereby enhancing care quality and improving health outcomes. This approach supports informed decisions in diagnosis, treatment and patient education (Melnyk, 2019). In addition to EBP, NPs place a strong emphasis on patient-centred care, which prioritises the individual needs, values and preferences of the patient. This approach fosters active collaboration between the NP and the patient, ensuring that the care plan reflects the patient's perspective and goals. NPs devote time to listening to patients, building rapport and nurturing a therapeutic relationship. By integrating EBP with patient-centred care, NPs provide holistic and effective care that is not only scientifically grounded but also compassionate and responsive to the unique needs of each patient (Defibaugh, 2018).

The interpretive study by Carryer et al. (2007) examined the core role of NPs in Australia and NZ, drawing on various data sources, including published and grey literature as well as interviews with 15 nurse practitioners. The study highlighted that NPs possess a comprehensive understanding of their patients and draw upon an extended body of knowledge to guide clinical decision-making. Three key domains were identified as shaping the core role of NPs: dynamic practice, professional efficacy and clinical leadership. Dynamic practice is characterised by the application of advanced clinical knowledge and skills across diverse settings. Professional efficacy refers to the enhanced autonomy granted to NPs through legislated privileges, enabling them to deliver more effective care. Clinical leadership underscores the responsibility of NPs to advocate for patients and the profession at a systemic level within healthcare. These findings emphasise the evolving role of NPs, particularly the growing importance of clinical leadership, which positions them as key influencers within healthcare systems and policymaking while maintaining their focus on clinical practice and advocacy (Carryer et al., 2007).

The effectiveness of NPs has been widely documented across various healthcare settings, including aged care, where their involvement has resulted in reductions in ED visits, acute hospital admissions and potentially preventable hospitalisations. In NZ, the Ministry of Health and the Nursing Council of New Zealand introduced the NP scope of practice in May 2001, with the first NP registered by the end of that year (Nursing Council of New Zealand, 2017). Today, NPs are employed in a wide range of emergency care settings, spanning diverse geographic locations and serving varied patient populations and clinical conditions. Regardless of the setting, NP practice adheres to nationally established scopes, standards and competencies. Research indicates that NP-led emergency care delivery has a positive impact on patient satisfaction, resource utilisation, ED length of stay, rates of return visits and overall patient and system outcomes (Wilbeck et al., 2023). The holistic nature of nursing, combined with the ability of NPs to collaborate with patient navigators, presents a promising approach to improving patient outcomes and addressing the complex healthcare needs of diverse populations.

## **2.16 Intended outcomes of an optimal framework**

In an ideal healthcare system, a comprehensive framework would effectively alleviate the pressure on EDs by providing an alternative pathway for patients presenting with non-urgent concerns. This study seeks to establish such a framework, prioritising patient and healthcare professional safety. An optimally designed framework would achieve multiple goals: reducing ED demand, enhancing patient outcomes and fostering a stronger engagement with primary care services. Central to this framework is the ambition to decrease the number of patients experiencing prolonged ED waiting times. This shift would be expected to result in improved patient satisfaction by minimising unnecessary delays, as well as cost savings for both patients and the healthcare system. By ensuring patient-centred care, the ideal model would be tailored to meet the specific needs of patients while addressing broader issues of healthcare equity. In addition to improving immediate care outcomes, an ideal pathway would promote health literacy and empower

patients to engage proactively with primary care, potentially reducing their need to revisit the ED for similar complaints and reduce ED reattendance. Additionally, the framework would reduce instances of patients leaving the ED without receiving care, a consequence often associated with extended wait times and dissatisfaction. Advancing towards this ideal, each component must be addressed to ensure that the framework is both comprehensive and sustainable. These aspects of care are pivotal in designing a robust, patient-centred approach that meets the needs of a diverse patient population while improving the functionality of the ED and the broader healthcare system.

## **2.17 Exploring the gap in the literature**

The review of current literature reveals ongoing discourse surrounding non-urgent presentations within EDs. However, defining what constitutes a non-urgent presentation, alongside its distinguishing characteristics, remains a complex challenge. Within NZ, limited research has successfully identified non-urgent presentations and even fewer studies have sought to actively reduce the prevalence of non-urgent ED usage. This highlights a clear need for further research and evidence-based strategies aimed at effecting sustained change in ED attendance patterns, specifically tailored to the healthcare landscape of NZ.

The proposed research aims to address this critical gap in understanding by focusing on the identification and management of non-urgent presentations to an ED within NZ. While current literature suggests the complexity of identifying non-urgent cases, mere classification is insufficient for alleviating acute ED demand. There is a pressing need to investigate and develop innovative interventions that can mitigate the impact of non-urgent ED presentations within the context of NZ's healthcare system. Such interventions should not only enhance health system efficiency but also prioritise improved patient care and satisfaction as essential outcomes.

## **2.18 Research aim and questions**

This research aims to explore the characteristics of patients who present to the ED who do not require emergency care, also known as non-urgent presentations. Further, the research seeks to develop a new pathway that facilitates access to appropriate healthcare services for non-urgent patients, thereby alleviating demand for the ED. In exploring the aims of this research, three supporting research questions have been identified:

- i. From the perspective of the Emergency Department healthcare stakeholder group, what are the characteristics of patients attending the Emergency Department who could have improved outcomes with alternative pathways?
- ii. Among patients attending the Emergency Department, which group is prioritised by the healthcare stakeholder group for requiring an alternative care pathway?
- iii. What alternative approach, informed by both evidence and views of the research stakeholder group, could be implemented to improve the outcomes of this patient group?

## Chapter III: Methodology

*Let us not be content to wait and see what will happen but give us the determination to make the right things happen.*

Horace Mann (1796 – 1859)

### 3.1 Introduction

Methodology can be defined as the systematic and theoretical framework which is used to conduct research. It consists of a set of methods which are applied to interpret or solve problems within a particular discipline (Polit & Beck, 2021). Methods are steps, procedures and strategies for gathering and analysing data within a research study (Creswell, 2009). The methodology provides a framework for new knowledge to be acquired and enables defensible conclusions to be drawn from research.

This chapter explores the theoretical foundations of research methodologies pertinent to addressing the research questions. A mixed methods approach has been adopted to address the research questions and understand the management of patients arriving at the Emergency Department (ED). A stage-gate process is followed to devise a new pathway aimed at improving patient experiences and alleviating the demand for the ED.

### 3.2 Philosophical worldviews or paradigms

A philosophical framework which offers a general perspective on the world has been referred to as a ‘paradigm’ by Guba and Lincoln (2005) and a ‘worldview’ by others (Creswell, 2018). Paradigms or worldviews influence a researcher’s choice of ontology (nature of reality), epistemology (theory of knowledge) and methodology (approach) as each paradigm has its own assumptions in relation to these concepts. By adopting a paradigm, researchers are supported to

conceptualise their beliefs and select specific methods which will enable them to answer their research questions (Allemang et al., 2022). There are four main paradigms used within research: positivism/post-positivism, constructivism/interpretivism, advocacy/participatory (critical) and pragmatism (Creswell, 2018).

The positivist paradigm was the prevailing method of inquiry in the 19th century and emphasises the use of logical and scientific methods to study the objective reality of the world. This philosophy is commonly known as the scientific method as it predominantly uses controlled quantitative measurements to determine the causes for outcomes, establishing the absolute truth (Polit & Beck, 2021). The traditional notion of establishing the absolute truth in the positivist paradigm has been challenged as it has been recognised that it is difficult to suggest that there is one truth relevant for all, when studying the behaviour and actions of humans. This thinking has led to the postpositivist paradigm, which represents the thinking after positivism. As the postpositivist paradigm recognises the difficulty in finding the absolute truth when studying human behaviour, the focus of this paradigm is on probabilistic evidence and learning what the state of a phenomenon is with a high degree of likelihood (Creswell, 2018). Thus, the postpositivist paradigm is utilised in research to explore the causes that influence outcomes, such as in experimental research and therefore is closely aligned with quantitative research methods (Polit & Beck, 2021).

Contrastingly, the social constructivism paradigm (often combined with interpretivism) relies on subjective findings to seek an understanding of the world. Social constructivists assume that individuals seek understanding in the world in which they live and work (Creswell, 2018). This paradigm is aligned with qualitative research methods as it focuses on describing and understanding the lived views and experiences of individuals to gain an understanding of human reality. Interviews and observations to gather information are commonly used within the social constructivism paradigm as researchers intend to make sense of the subjective meanings individuals

have about the world (Polit & Beck, 2021). In contrast to the postpositivist paradigm, social constructivist avoid exerting any control or influence during data collection to ensure they capture the meanings of experiences within the context of those living them. Constructivists develop a theory or pattern of meaning from their research studies, rather than starting with a theory such as in the postpositivist paradigm (Creswell, 2018).

The advocacy or participatory paradigm arose from individuals who were concerned that the postpositivist assumptions imposed theories and laws that were unable to be used to suit all individuals. Inquirers also felt that the social constructivist paradigm did not focus enough on advocating for an action agenda to help marginalised people. The advocacy paradigm therefore addresses social justice and focuses on marginalised individuals in society whilst intertwining politics and political agendas. The aim of research within this paradigm is to develop an action reform agenda that may change the lives of participants, institutions in which individuals work and live and the researcher's life. This paradigm addresses specific social issues such as empowerment, inequality, oppression, domination, suppression and alienation. Qualitative research is normally aligned with the advocacy paradigm, however this paradigm can be the foundation for quantitative research as well (Creswell, 2018).

The pragmatic paradigm focuses on solving practical problems in the real world through inquiry. Unlike the postpositivist paradigm which focuses on finding the truth, the pragmatic paradigm has a goal to utilise human experiences to derive knowledge and create an understanding of the world (Creswell, 2018). Pragmatism is the paradigm which influences this research study and is discussed in more detail below.

### **3.3 Pragmatism**

Pragmatism was established in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries in the United States and can be traced to John Dewey, Charles Sanders Peirce and William James who are known as the founding philosophers of pragmatism. The theory of pragmatism rejects the notion of absolute truth and instead focuses on the importance of experience, action and experimentation in guiding human understanding and solving practical problems (Johnson & Onwuegbuzie, 2004). In other words, pragmatists prioritise what works best in a given context, focusing on problem-solving and practical outcomes rather than seeking absolute truths or abstract principles. Thus, research within the pragmatic paradigm is situated in an action-oriented framework, where the researcher seeks to address practical issues arising directly from communities by eliminating doubt and producing action (Creswell, 2018).

Pragmatists view organisms as constantly changing to new situations and environments. They suggest our thinking follows a dynamic homeostatic process of belief, doubt, inquiry, modified belief, doubt, new inquiry and so on, in an infinite loop. The researcher in this loop constantly tries to improve upon past understandings in a way that is relevant to the world in which they live and operate. The present time in this loop is always a new starting point (Johnson & Onwuegbuzie, 2004). This view bodes well with the current research study which is concerned with healthcare delivery – a concept that is constantly changing to meet the demands of its ever-changing population. This study has also been influenced by the philosophical assumptions of the pragmatism paradigm, being problem and solution centred and focused on real world practice (Creswell, 2018).

Pragmatism as a paradigm offers distinct strengths and weaknesses within the context of healthcare research. One notable strength lies in its emphasis on practical outcomes and real-world applicability. In healthcare research, where the translation of research into practice is critical for

improving patient care and outcomes, pragmatism's focus on practical outcomes aligns well with the field's objectives. By prioritising the real-world applicability of research findings, pragmatism facilitates the development of interventions and strategies that address pressing healthcare challenges and contribute to the advancement of patient-centred care. Therefore, pragmatism serves as a valuable paradigm for guiding healthcare research aimed at generating actionable insights and informing evidence-based practice (Creswell, 2018).

However, a weakness of pragmatism is the potential for eclecticism, which is the tendency to select elements from various methodologies or paradigms without ensuring their coherence or logical consistency. This can lead to a lack of theoretical rigour and consistency in research design and interpretation. Furthermore, the emphasis on practical outcomes may sometimes overshadow broader philosophical considerations, limiting the depth of theoretical insights in research studies. To address eclecticism, researchers can strive to maintain theoretical awareness, justify methodological choices, integrate multiple perspectives, engage in reflexivity and seek peer review and collaboration. By adopting these strategies, researchers can navigate the tension between pragmatism and eclecticism, ensuring that their healthcare research remains both practically relevant and theoretically grounded (Onwuegbuzie & Leech, 2005). Overall, pragmatism offers valuable strengths in promoting relevance and flexibility in healthcare research, however researchers must remain mindful of the need to balance practical considerations with theoretical rigour to ensure the integrity and credibility of their findings.

As pragmatism is focused on gaining an understanding of real world problems, theorists within this paradigm encourage researchers to select methodological mixes which aid them to better answer their specific research questions, rather than focusing on one specific method as seen in other paradigms (Creswell, 2018; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). This notion has also been contended by Biesta (2010) and Onwuegbuzie and Leech (2005) who

favour pragmatism as a way to provide tools to address problems and agree that utilising mixed approaches to research allows researchers the best opportunities to address their research questions. Hence, there is an alignment between the pragmatic paradigm and a mixed methods research approach (Johnson & Onwuegbuzie, 2004). This study aims to improve the management of patients who present to the ED but do not require emergency care, by first understanding the reasons patients present and then creating a pathway in which these patients can have their needs met. Due to the nature of this research and the complexity of the issues, a mixed-methods approach has been chosen and the reasons for this are explored and critiqued below.

### **3.4 A mixed methods research approach**

Mixed methods research is when a researcher combines qualitative and quantitative research techniques, methods and approaches into a single study (Johnson & Onwuegbuzie, 2004; Polit & Beck, 2021; Tashakkori & Teddlie, 2010). Mixed methods research is increasingly being recognised across disciplines as a credible and pragmatic approach (Creswell, 2018; Ivankova & Wingo, 2018) however, it has not come without disputes. Disputes arose from the purist perceptions of qualitative and quantitative methods and their related research paradigms and these disputes are referred to as the ‘paradigm wars’ (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). The purist perception believes the philosophical differences between qualitative and quantitative methods and their related paradigms (positivism/post-positivism and constructivism) are so vast that they cannot be combined in a single research project (Creswell & Plano Clark, 2018; Johnson & Onwuegbuzie, 2004).

Quantitative purists are concerned with data that is objectively measured and believe only these data can lead to scientific results. Due to this formal and objective approach, quantitative purists align tightly with the positivism paradigm. In contrast, qualitative purists reject the positivist paradigm and align with the constructivism perspective that the world is constructed by plural

realities (Creswell, 2018; Creswell & Plano Clark, 2018). Thus, knowledge within qualitative methods and the constructivism paradigm are obtained in a subjective manner (Creswell, 2018). Purists believe that their own paradigm is the ideal research approach (Tashakkori & Teddlie, 2010). However, research has developed and has become increasingly complex and dynamic. This has led to the development of mixed methods studies as researchers aim to draw on the strengths of both quantitative and qualitative methods. Mixed methods researchers integrate qualitative and quantitative methods in order to offer the best opportunity to answer their research questions (Johnson & Onwuegbuzie, 2004).

To understand the strengths of integrating qualitative and quantitative data as in mixed methods research, it is important to understand the characteristics of both approaches. Qualitative research aims to explore human perspectives and focuses on the subjective reality of individuals. This approach is often classified as part of the social and behavioural sciences, with a focus on understanding social settings holistically (Creswell & Plano Clark, 2018). The researcher is seen as the primary instrument within qualitative research as the collection of data involves the collaboration of the researcher and participants, which generally occurs in a natural environment. This method allows the researcher to gain in-depth information from participants about their experiences, thoughts and feelings which increases the quality of data collection. Researchers commonly use interviews, observations and focus group sessions to gather qualitative data and the researcher analyses data by inductively building the participants views into general themes (Klassen et al., 2012). The researcher uses these themes to interpret the meanings of the data (Creswell, 2018; Johnson & Onwuegbuzie, 2004). Qualitative research is useful in a healthcare context as it enables researchers to understand the feelings and lived experiences of individuals whom work or receive care within the healthcare system.

In contrast, quantitative research takes an objective approach to generate numerical data that can be analysed using statistics (Creswell, 2018). This type of research is commonly used as a means for testing objective theories and to examine the relationship between variables. Quantitative methods are ideal for exploring associations of phenomena, including inferencing causality (Klassen et al., 2012). Quantitative research includes experimental, quasi-experimental and non-experimental research designs. Experimental research aims to reject (or fail to reject) a starting hypothesis by utilising manipulation, control and randomisation within a study. When a researcher is able to use manipulation and introduce controls over a research situation but is unable to establish randomisation, this is known as a quasi-experimental design. There is also non-experimental designs which explore the effects of potential cause without using manipulation. This is done by utilising correlational designs to examine relationships between variables (Creswell, 2018). Quantitative non-experimental research designs are commonly used within healthcare research due to its ethical safety of not using manipulation, which can cause dilemmas when working with multiple human characteristics' (Polit & Beck, 2021). In contrast to qualitative research methods, where the researcher can more easily influence results with their idiosyncrasies, quantitative results tend to be independent of the researcher (Johnson & Onwuegbuzie, 2004).

It can be seen these two research approaches have different perspectives to offer and by combining the two the continuum of understanding a phenomenon is more diverse. Adopting a mixed methods approach enables researchers to address complex research questions and reveal a fuller picture of a problem in practice, which might be unable to be accomplished with a single quantitative or qualitative approach (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). Both quantitative and qualitative approaches have strengths and weaknesses, however, a mixed methods design aims to draw on the strengths of both whilst minimising the weaknesses and biases they have (Ivankova & Wingo, 2018). Other reasons for utilising a mixed methods approach are to compare and validate results, to examine experiences along with outcomes, or to have one set

of results build on another (Klassen et al., 2012). It is thought that if results from different approaches such as quantitative and qualitative methods can be corroborated the researcher can have a greater confidence in their conclusion. However, if the results conflict with one another the researcher has still gained a greater knowledge of the research topic and can interpret their findings appropriately. The goal of mixed methods research is not to search for corroboration but instead to expand one's understanding of the research phenomenon (Onwuegbuzie & Leech, 2005).

This research study will employ a mixed methods approach to investigate the challenges encountered in managing patients who present to the ED. Initially, qualitative methods will be employed to explore the perspectives of healthcare professionals, aiming to identify services they provide that may not align with emergency medicine. These insights will then inform a quantitative analysis of a patient database, providing a numerical context to the identified challenges. The quantitative research findings will complement and deepen the understanding gained from qualitative perspectives. By merging healthcare stakeholders' viewpoints with patient statistics, specific patient cohorts that could benefit from a new pathway will be identified. Subsequently, the research will focus on developing a new pathway to address the healthcare concerns of these identified patient groups.

A sequential mixed methods procedure will be followed, wherein the findings of one method inform and enrich the insights gained from the other (Creswell, 2018). This is seen in each stage of this study as qualitative findings are used to explore a concept (healthcare stakeholders perspectives) and then quantitative data (patient data) is utilised to expand on the findings of the qualitative data. This iterative process will allow for a comprehensive exploration of the research questions. Moreover, a stage-gate approach will guide the phased decision-making process of the

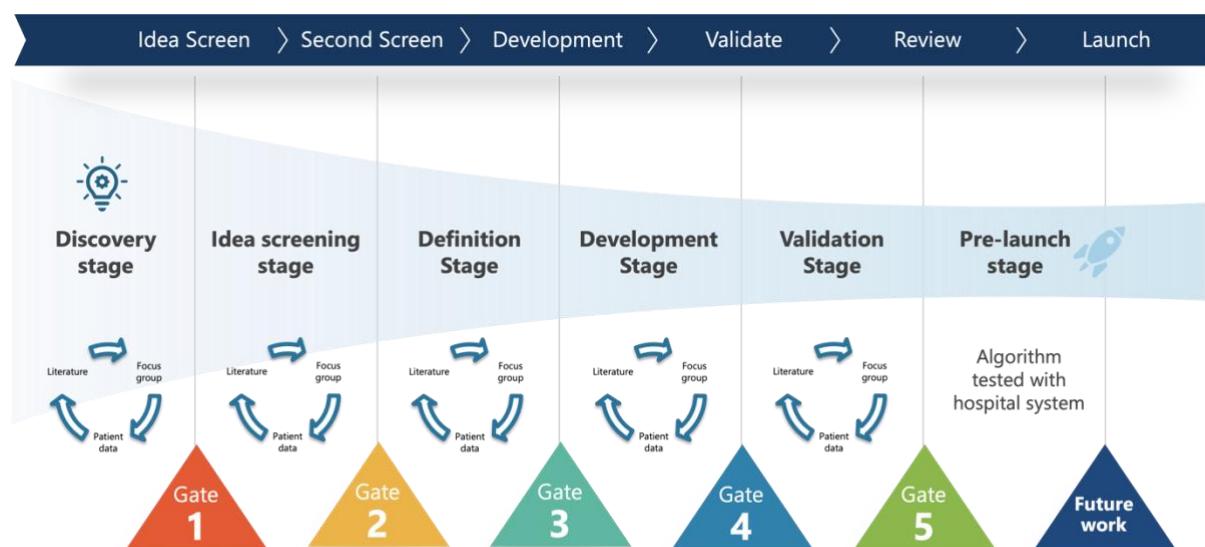
research. This approach involves systematically evaluating and progressing through different stages of the study, ensuring thoroughness and relevance to the research objectives.

### **3.5 Stage-gate process**

The stage-gate process was created by Dr Robert Cooper in 1983. Dr Cooper was renowned for being an expert in the field of innovation management and he made significant contributions to the understanding and improvement of the innovation process within organisations. Through his work, Dr Cooper found common difficulties and insufficiencies in the innovation process, specifically poor decision-making, a lack of structure and high failure rates of newly launched products. The stage-gate process was created by Dr Cooper as a way to address the common difficulties he had observed. He conceptualised the stage-gate process as a structured framework for managing innovative projects from the ideation phase all the way through to launch. The process was created to provide clear stages and decision points where project managers and stakeholders could assess progress, make informed decisions, evaluate success and allocate resources effectively. Dr Cooper first published his stage-gate process model in 1986 and since then it has become widely adopted by organisations around the world as a best practice tool for managing innovation and new product development (Cooper, 1990, 2008).

The stage-gate process has evolved over the years and has been adapted to different industries and contexts, with companies customising the framework to suit their specific requirements. Despite the evolution of the stage-gate process, the core principles remain the same and these emphasise structured decision making, risk management and continuous improvement along the process (Cooper, 2022). The stage-gate process aligns with a pragmatist worldview, as it emphasises practicality and utility, adaptability in problem-solving and prioritises outcomes over theoretical principles. The stage-gate process is used within this research study as a visual road-map for the researcher and stakeholders, with multiple check-in points along the way with shared decision

points. The stage-gate process will be described next and it will be applied to this research study within the methods chapter of this thesis. Below is a visual overview of the stage-gate process:



**Figure 2: An overview of the stage-gate process**

The stage-gate process diagram above illustrates an overview of the model, which depicts a process built up of stages and gates. The stages are known as the workstations and the gates are decision points. In other words, the stages are where the work is completed and the gates are in place as quality control points which determine if the project is meeting the deliverables and can move onto the next stage or if the project needs to be discontinued, paused or revised. Figure 2 shows a stage-gate process consisting of six separate stages and gates, however the stage-gate process can involve four to seven stages and gates depending on the project (Cooper, 1990). Each stage represents a phase of the development or evaluation process. The process generally includes a discovery stage (idea generation), idea screening, definition, development, validation and a launch stage. Each stage will have allocated activities which need to be completed before getting to the decision point at the gate. It can be seen that the entrance to each stage is a gate; these gates control the continuation of the process and act as decision points (Cooper, 1990).

The gates are characterised by a set of inputs, exit criteria and an output. The inputs to the gate include the deliverables from the work that has been completed in the current stage, which the project leader brings to the gate. The exit criteria are the criteria against which the work completed in that stage will be judged and this criteria must be met and evaluated by a decision-making body or gate-keepers (often composed of managers or stakeholders). It is important that the gate-keepers for the project are multidisciplinary and sufficiently senior to have authority to approve resources needed for the project. The gate-keepers will evaluate the inputs and the criteria in order to make a decision whether to proceed to the next stage, refine the stage and then reassess, put it on hold for further investigation or to terminate the project (Cooper, 2022). Although the stage-gate process provides structure and discipline, it also allows for flexibility. If new information arises or circumstances change, projects can be adjusted and redirected accordingly. The stage-gate process has evolved as the world has changed and there are now many different and tailored versions of the stage-gate model (Cooper, 2008).

Cooper (2008) himself has reviewed ways in which companies have used the stage-gate model in their work and he has spoken about the common errors which have been made when implementing the stage-gate system. The most common complaint when using the stage-gate system is that the gates are ineffective and can lead to unsuccessful products or projects being launched. Cooper (2008) argues that this is because the gates are not being used as decision points but instead as project update meetings or milestone checkpoints. It has been observed that once a project has moved past the first gate (idea screen) it has continued down a tunnel where there have been no decision points and instead the process turns into a one-gate, five-stage process, instead of a five-gate, five-stage process. Cooper (2008) suggests that the stage-gate process should act as a funnel and not a tunnel. The second common complaint is that proper resources are not committed to the project after decisions at the gates are made. In these situations gate-keepers should be changed to include stakeholders who have the ability to control the resources needed to fund the project.

By ensuring gates work as decision points and gate-keepers deliver appropriate resources, the stage-gate system has shown to be successful (Cooper, 2008; Cooper, 2022).

The strengths which have been identified as the stage-gate process has evolved over the years, are its ability to be a flexible process and be scaled to suit different projects. The stage-gate process is a guide that suggests best practices but the project team has discretion over which activities it executes and which it decides not to do (Cooper, 2008). This adaptable innovation process has the ability to be adjusted to evolving conditions and fluid, unstable information which is why it has been chosen as a framework for this research study, as the healthcare system and patients healthcare needs are ever-changing in our society. In selecting the most appropriate methodological framework, alternative approaches such as the Delphi model and the action research cycle were carefully considered but ultimately deemed unsuitable. The Delphi model, while effective for building consensus, is more static and does not easily accommodate the iterative, innovation-focused development needed in this project (Nasa et al., 2021). Similarly, the action research cycle was not adopted, as the study design evolved to exclude a pilot phase, precluding the implementation and evaluation elements fundamental to action research (Bradbury, 2015). By contrast, the Stage-Gate process provides a structured yet flexible phased approach that supports systematic progression and robust decision-making, while aligning with the innovative aims of this study. Each stage in this research study will integrate qualitative and quantitative data, which will be explained further below.

### **3.6 Qualitative data collection and analysis**

Qualitative research methods provide valuable insights into understanding human behaviours, perspectives and motivations as discussed previously. Among qualitative research, focus groups have emerged as a useful method for gathering insights into people's experiences, preferences and attitudes which is helpful when examining the healthcare system and more specifically, healthcare

delivery (Wong, 2008). Focus groups will be used throughout the stages of this research project and their methodologies, applications, strengths and limitations will be examined next.

Focus groups became popular in social research in the 1980s after being prominently used in marketing research. Focus group research involves bringing together a small, diverse group of people or participants to engage in discussions facilitated by a moderator (Doody et al., 2013; Lee, 2010). Focus groups have been successfully used to gain insights into peoples' experiences of using healthcare services and to explore the attitudes and needs of healthcare professionals. The interaction among participants aims to generate a dynamic exchange of ideas and thoughts, which allow researchers to explore complex issues in more depth. Understanding the perspectives of healthcare providers and service users is crucial for enhancing service delivery and garnering support for new developments, ensuring the developments are perceived as necessary by those directly affected. The findings from focus group discussions have therefore been used to inform decision-making, improve healthcare services and enhance patient outcomes (Doody et al., 2013; Wong, 2008).

Conducting a focus group is resource extensive and there are several steps involved from planning the focus group all the way through to reporting the findings. Firstly, the researcher must formulate research questions that will be discussed at the focus group by the selected participants. Participants are selected based on their experience or involvement related to the research topic and then are recruited by the researcher. The ideal size of a focus group is between six and 12 participants, so that there are enough people to provide significant data but not so large that all members find it difficult to participate (Doody et al., 2013). Once recruitment has been completed the researcher will arrange the venue and time for the focus group (if not already established during recruitment) to take place. The researcher will then facilitate the focus group by guiding the conversation, encouraging participants to express their perspectives, share their experiences and

respond to each other's viewpoints. Discussions are often audio-recorded and transcribed by the researcher, who then analyses the data using a general inductive approach (Wong, 2008).

A general inductive approach to qualitative data analysis is a methodical process of uncovering insights from raw data without being constrained by preconceived ideas. Researchers begin by immersing themselves in the data, engaging in a thorough examination of transcripts and recordings, to gain a comprehensive understanding. Through open coding, they systematically assign descriptive labels (codes) to segments of the data that represent key ideas. As coding progresses, researchers identify similarities and patterns among codes, organising them into categories that encapsulate broader concepts. These categories serve as the foundation for further analysis, as researchers delve deeper to identify overarching themes that cut across multiple categories. Themes represent concepts that provide insight into the underlying meaning or significance of the data. Throughout the process, researchers maintain flexibility and openness, allowing for the discovery of new perspectives directly from the data itself. By embracing this iterative approach, researchers can uncover insights and generate knowledge that is grounded in the data and reflective of the perspectives of participants. It is recommended that consistency checks are completed throughout this approach to identify any inconsistencies within the data or analysis process, this includes having another person code the raw data into the established categories and themes (Polit & Beck, 2021). This approach will be used within this research study.

As with any research method there are strengths and limitations when using focus groups to collect and analyse qualitative data. The strengths and rationale for using focus groups in research include rich data collection, diverse perceptions and flexibility. The interactions within a focus group encourage participants to develop attitudes and perceptions on the research topic and this depth of understanding can be difficult to access in other forms of data collection such as individual interviews (Doody et al., 2013; Wong, 2008). In other words, participants are able to build upon

one another's viewpoints which can stimulate discussion, generate new ideas and a more in-depth understanding of the topic. The moderator is also able to enhance the quality of the data by responding to questions, ask for clarification and solicit responses from participants which are more detailed than originally spoken. However, focus groups have their own limitations and complications that researchers need to be aware of.

The most discussed limitations of focus groups include difficult group dynamics, susceptibility to bias and that they are resource intensive. It is possible for one group member to be more dominant than others in the discussion and this can lead to the discussion being swayed by the dominant individual and leading to bias. This can be remedied by ensuring the moderator is equipped with tools and phrases to encourage views from other participants. It is also possible for the moderator to impose bias by swaying the discussion in certain ways, therefore it is essential the moderator understands and recognises their own opinions prior to commencing focus groups (Doody et al., 2013). As discussed previously, focus groups are resource extensive (recruiting, organising, facilitating, transcribing, analysing, reporting) and they can be difficult to assemble and response rates can be low. These limitations can be addressed by sending reminders about recruitment and the focus group timing along with over-recruiting to prepare for participants declining or being unable to make the specified time (Wong, 2008). Overall, it is believed the strengths of this method outweigh the limitations and therefore focus groups will be used to collect qualitative data in this research study. The specifics of this will be discussed in the methods chapter of this thesis.

### **3.7 Quantitative data collection and analysis**

Quantitative data collection aims to gather accurate, valid and insightful data. In order to fulfil this aim, quantitative research often utilises large-sample sizes to ensure sound statistical evidence is gained, promoting the validity and reliability of research findings (Polit & Beck, 2021). Utilising a standardised approach to gather numerical data facilitates the generation of results that are readily

comparable. There are multiple ways to collect quantitative data, but in this research study a retrospective design will be employed. Retrospective data are used to explore previous events that may have impacted on the topic of interest within a study. The aim of retrospective study designs is to analyse archived material to understand current practice and use new information to inform future practice (Moule, 2017).

The archived material in this study includes patient data from an ED in a tertiary hospital in NZ. These data have already been collected as an integral part of the hospital's patient-management database. The data collection aspect of the quantitative phase of this study is therefore simplistic in nature as it involves retrieving pre-existing data from the hospital's data scientists. Once the data is collected it will go through a data cleaning process by the researchers. This process will include reviewing the data and identifying and correcting errors, inconsistencies and inaccuracies to improve the quality and reliability of the dataset for analysis. The data cleaning process specifically involves removing duplicate entries, handling missing values, correcting formatting issues, standardising data types and detecting and correcting outliers. Data cleaning is essential prior to analysis and throughout the process to ensure the findings are accurate, valid and complete, therefore facilitating more reliable insights and conclusions (Wickham, 2014).

Once the data collection phase has been completed and the research team refines the dataset through data cleaning procedures, the quantitative analysis phase will begin. Quantitative analysis aims to understand patterns, relationships and trends within the data. In order to do this, descriptive statistics, inferential statistics and data visualisation can be used. This research study will focus on using descriptive statistics to understand the demographics of patients who use the ED. Descriptive statistics refer to the quantitative measures used to describe and summarise the main features of a dataset. These statistics provide a summary of the central tendency, variability and distribution of the data, allowing researchers to understand the basic characteristics of their

data without making inferences beyond the sample (Polit & Beck, 2021). Through the use of descriptive statistics, this research study endeavours to explain the fundamental characteristics and dynamics of the patient population frequenting the ED. By refining complex datasets into summaries, descriptive statistics will facilitate a comprehensive understanding of the health needs and issues that are prevalent within the patient population.

### **3.8 Credibility and trustworthiness**

Credibility in research refers to the confidence in the accuracy of collected data and the validity of their interpretations (Polit & Beck, 2021). Researchers must adhere to ethical standards, transparency and methodological rigour to assure credibility and reliability of their research findings. This entails accurately documenting all stages of the research process, including data collection, analysis and the interpretation of results. Moreover, researchers must acknowledge potential biases and limitations, ensuring transparency in their work. The data collection and analysis of qualitative data can be largely dependent on the skill of the researcher, therefore it is essential that validity and consistency checks are completed throughout phases of the research. In this research study, one type of validity check used within the qualitative aspect is that of inter-coder reliability assessments also known as cross-checking (Creswell, 2018).

Inter-coder reliability refers to the degree of agreement or consistency between two or more coders (researchers) who independently code the same data set or transcripts. It is an essential measure in ensuring the quality and trustworthiness of qualitative data analysis. Inter-coder reliability assessments help researchers identify any discrepancies or inconsistencies in coding interpretations. If agreement levels are low, researchers may need to clarify coding instructions, refine code definitions, or provide additional training to coders. By establishing high inter-coder reliability, researchers enhance the validity and credibility of their qualitative data analysis (Creswell, 2018). When assessing the credibility of quantitative data collection and analysis, the main question is

whether the data collected accurately measures what it is intended to measure. To ensure the data is accurately interpreted in this study, the researchers will complete a process of data-cleaning as previously described, along with comparing the data of patients over a number of years to identify if the data is producing consistent results (Creswell, 2018).

Methodological triangulation in mixed methods research significantly contributes to enhancing the credibility and validity of study findings through a comprehensive and rigorous approach (Creswell, 2018). In this research study, triangulation involves the integration of different research methodologies, such as qualitative and quantitative approaches, to investigate a research question from multiple angles. Firstly, methodological triangulation allows researchers to utilise the strengths of each method while compensating for their respective weaknesses. Qualitative methods, such as focus groups in this case, excel in capturing rich data that offer deep insights into participants' experiences and perceptions. On the other hand, quantitative methods, including retrospective database reviews, provide statistical rigour, allowing for generalisability and the identification of patterns or associations within large datasets. By combining these methodologies, a more comprehensive understanding of the research topic can be made, thereby increasing the credibility of research findings (Creswell, 2018; Polit & Beck, 2021).

Secondly, methodological triangulation enables researchers to validate and corroborate findings across different data sources and methodologies. For instance, qualitative data may provide insights into participants' motivations, while quantitative data can confirm the prevalence or significance of these themes within a broader population (Polit & Beck, 2021). This cross-validation strengthens the reliability of the findings by demonstrating consistency and convergence across multiple perspectives and methods and will be used within this study. Methodological triangulation also fosters a deeper exploration of research questions by uncovering complexities that may not be apparent when using a single method. By employing a variety of data collection

and analysis techniques, researchers can capture diverse viewpoints and identify unexpected patterns. This depth of inquiry enhances the richness and depth of the findings, increasing their credibility and relevance to theory, policy and practice (Creswell, 2018; Tashakkori & Teddlie, 2010). By acknowledging and addressing potential biases inherent in each method, researchers can enhance the rigour and trustworthiness of their study and these will be discussed next.

### **3.9 The researcher's role**

At the outset of a study, particularly in qualitative research where the researcher serves as the primary data collection instrument, it becomes imperative to recognise and comprehend personal values, assumptions and biases (Creswell, 2009). The researcher in this study is a registered nurse and works clinically in an ED within NZ. It is important to emphasise that the researcher is not employed within the ED where this research was conducted. As a result, the researcher lacks pre-existing relationships with the stakeholders involved in the study beyond their roles within the research project. Although the researcher does not work within this specific ED, the researcher will have preconceived ideas on the roles and functioning of EDs which may influence the study. Firstly, the first-hand experience and knowledge of EDs operations and workflow provide valuable insights into the challenges, priorities and reality of patient care delivery. This perspective can inform the research process, guiding the selection of research questions, methodologies and outcome measures that are most relevant and impactful for improving patient outcomes and healthcare delivery in the ED.

However, being a nurse in the ED also introduces potential biases that the researcher must be aware of and actively mitigate. The researcher's experiences with specific patient demographics may influence their perceptions of healthcare needs, treatment efficacy, or resource allocation, potentially biasing their research interests or interpretations of findings. The researcher's experience with organisational culture, policies and practices within the ED may also shape

perspectives and research agendas. For example, institutional priorities, resource constraints, or clinical guidelines may influence the types of research questions pursued or the feasibility of conducting certain studies. Therefore, it is essential for the researcher to maintain objectivity, reflexivity and transparency throughout the research process along with completing validity checks (Creswell, 2018). Cross-checking of the qualitative analysis will decrease researcher bias in this instance along with methodological triangulation as discussed previously.

Having obtained a Bachelor of Nursing degree, the researcher pursued further education, completing a dissertation and earning a Bachelor of Nursing Honours certification. The dissertation research encompassed a mixed-methods study conducted within the healthcare domain, indicating the researcher's experience in both qualitative and quantitative research methodologies. Therefore, the researcher is equipped with the skills necessary to navigate and confidently complete this research project.

### **3.10 Methodology summary**

This methodology chapter has provided the rationale for the use of a mixed methods approach within a stage-gate framework for this study. It has explored the impact of pragmatism on mixed methods research and how a stage-gate process can be applied in this context. The next chapter will outline the methods for this research study which will be employed in order to answer the research questions.

## Chapter IV: Methods

*Research is to see what everyone else has seen and to think what nobody else has thought.*

Albert Szent-Gyorgyi (1893 – 1986)

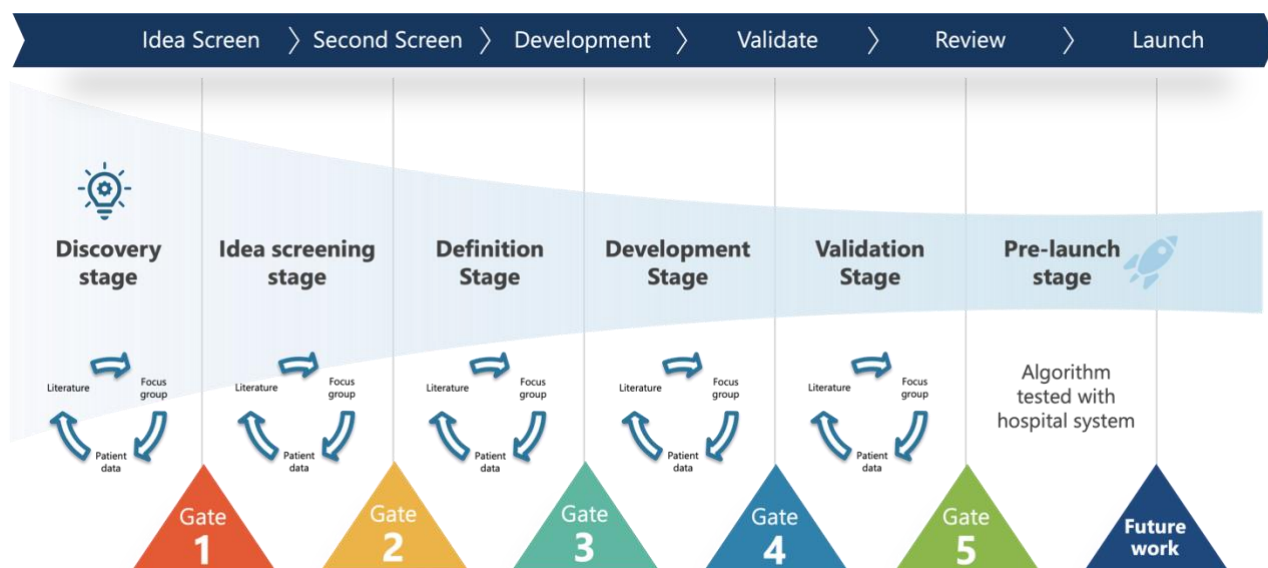
### 4.1 Introduction

Research methods are the techniques researchers use to structure a study in order to answer the research questions. This includes the steps, procedures and strategies for collecting and analysing data (Creswell, 2018). Since this study utilises a mixed methods approach, varying techniques of data collection and analysis were used.

This chapter will explore in detail the mixed methods design and describe the stage-gate process and how it has been used as a framework for this research study. The research populations will be explored along with the procedures for data collection and analysis. Ethical considerations will also be described. This chapter will lay the foundation for the research study and will be succeeded by its findings.

### 4.2 Research design

The research design as discussed previously is an integration of a mixed methods approach and the stage-gate process. There are six stages to this research design with five gates that need to be opened in order to continue onto the next stage, as depicted in the Figure 3 below.



**Figure 3: The research design**

The study commenced in the discovery phase, where a focus group was convened to discuss the characteristics of patients visiting the ED who do not require emergency medical expertise or resources. Following the focus group, patient groups and themes were identified through analysis, subsequently informing a quantitative retrospective database analysis targeting these specific groups and themes. Concurrently, relevant literature pertaining to the discussed patient groups was examined. The findings were compiled into a report, which was presented to healthcare stakeholders at the start of the subsequent focus group session. The stakeholders reviewed the report during the session to determine if the established gate criteria had been met. Once the criteria were confirmed, the group engaged in a focused discussion about the findings. This iterative process continued through subsequent stages, following a structured cycle of data collection, analysis, report preparation, stakeholder review at the beginning of each focus group and group discussions. The criteria for each gate are outlined below.

**Table 2: Stage-gate process gate criteria**

| Stage          | Gate       | Criteria /criterion to be met:  |
|----------------|------------|---|
| Discovery      | Gate one   | <ol style="list-style-type: none"> <li>1. Patient cohorts can be formed based on the themes identified in the first focus group.</li> <li>2. Corresponding insights gleaned from patient data are considered adequate.</li> </ol>               |
| Idea screening | Gate two   | <ol style="list-style-type: none"> <li>1. Patient cohorts are refined based on the themes identified in the second focus group.</li> <li>2. Corresponding insights gleaned from refined patient data groups are considered adequate.</li> </ol> |
| Definition     | Gate three | <ol style="list-style-type: none"> <li>1. Prospective patient criteria are defined based on the focus group and patient data findings.</li> </ol>   |
| Development    | Gate four  | <ol style="list-style-type: none"> <li>1. A concept for the patient pathway is developed using the findings from the focus group session and current research evidence.</li> </ol>  |
| Validation     | Gate five  | <ol style="list-style-type: none"> <li>1. Patient pathway validated</li> </ol>  |

These criteria provided a framework for focus group discussions, ensuring each stage had a clear agenda. During the idea screening stage (stage two), emphasis was placed on reviewing patient groups and their associated quantitative data, while also engaging in discussions to refine the understanding of non-urgent presentations to the ED. In the definition stage (stage three), discussions centred on patient complexity, healthcare functionality and potential alternative pathways for specific patient cohorts, guided by insights gleaned from the previous stage's report. The development stage (stage four) concentrated on logistical considerations surrounding transitional care and the formulation of a new pathway for a targeted patient group. The validation stage (stage five) involved reviewing the proposed new pathway and assessing the readiness for implementation. Finally, the pre-launch stage entailed collaborating on a patient criteria algorithm

derived from the proposed pathway and testing it against live data for potential future implementation, albeit outside the scope of the current research study.

### **4.3 Research populations**

This study involves two distinct research populations: one concerning the qualitative aspect of the study and the other concerning the quantitative aspect. Firstly, healthcare professionals with expertise in the functioning and management of the ED were recruited for focus group sessions, these experts made up the qualitative research population. Subsequently, data from patients who visited the research hospitals ED over an eight-year period were collected, comprising the quantitative research populations. These are described in more detail below.

#### **4.3.1 Focus group population and recruitment**

The research study commenced by recruiting participants for focus group sessions to gather qualitative data. The recruitment period commenced in December 2021 after gaining ethics approval from the Massey University Human Ethics Committee. The focus group population was purposefully sampled to include individuals with extensive expertise in ED management. This strategic sampling approach aimed to gather insights from professionals who possess a deep understanding of the challenges, processes and intricacies involved in managing EDs. Selection criteria for participants in the focus group sessions prioritised individuals currently employed in roles closely associated with ED management within the research hospital. These professionals were chosen based on their demonstrated experience, qualifications and responsibilities in overseeing various aspects of ED operations. By purposefully sampling individuals with expertise in ED management, the research study ensured that the insights and perspectives gathered during the focus group sessions were highly informed and relevant. These participants were well-

positioned to offer observations, practical insights and valuable recommendations based on their experience and in-depth knowledge of ED dynamics.

Ensuring the voluntary participation of individuals in the focus group sessions was paramount. Prospective participants were approached with transparency and respect, providing clear information about the study objectives, procedures and their potential role in the research. Individuals were given the freedom to make an informed decision about their involvement based on their interest, availability and willingness to contribute to the study. Additionally, confidentiality was emphasised assuring participants that their views and opinions would be treated with utmost respect and would not have any repercussions. By upholding ethical standards and promoting voluntary participation, the researcher aimed to create a safe and inclusive environment for meaningful engagement and dialogue within the focus group sessions.

Ten purposely sampled healthcare professionals were sent participant information sheets for the study via email by an administrator unaffiliated with the research, inviting them to participate in up to five focus group sessions. This number was chosen because it aligns with the recommended range of 6 to 12 participants for effective focus group sessions. These prospective participants were encouraged to contact the researcher directly via email or phone to express their interest. The five focus group sessions took place over a timeline of twelve months and the focus group session dates and times were mutually agreed between the researcher and the participants to ensure those who consented to the study could take part. Details regarding the final number of participants in the focus group sessions will be provided in the subsequent chapter. Ultimately, the purposeful sampling of this focus group population enriched the qualitative data collection process, fostering a more comprehensive understanding of the challenges and opportunities inherent in ED management.

### **4.3.2 Patient population**

Following the analysis of the initial focus group, distinct patient groups and themes emerged. To delve deeper into these findings from a different perspective, quantitative data were gathered. The researcher obtained eight years of patient presentation data to the ED at the research hospital from the hospitals data analyst team. This dataset encompassed presentations from 2014 to 2021 and was de-identified to ensure patient anonymity. The dataset included all patients who attended the research hospitals ED over this eight-year period and was sourced from a routinely-collected patient management database, which records approximately 80,000 presentations annually. As these data were retrospective and there were no active participants for this phase, no recruitment strategy was needed.

## **4.4 Qualitative data collection and analysis**

The qualitative data for this study was collected through focus group sessions. Consistency was maintained in both the data collection and analysis processes across all focus group sessions. These methods will be described next.

### **4.4.1 Focus group data collection**

The participants who contacted the researcher to show their interest in the study were emailed with a date, time and location where the first focus group would be held. During the initiation of the first focus group session, participants were provided with consent forms outlining the details of their involvement in the research study. Prior to commencing discussions, participants were required to sign these consent forms, indicating their willingness to participate in the study and their understanding of the procedures involved, including audio recording. This ensured that participants were fully informed about the purpose and objectives of the research, as well as their rights as contributors. The signing of consent forms underscored the ethical principles of voluntary

participation, informed consent and confidentiality, thereby safeguarding the rights of the participants throughout the research process. To foster a conducive atmosphere for open dialogue and exchange of ideas, the focus group sessions were conducted in a quiet and comfortable environment, free from distractions. This environment encouraged participants to express their thoughts, opinions and experiences candidly, thus enriching the qualitative data collected (Doody et al., 2013). The duration of each focus group session was carefully managed, typically lasting for an hour. However, flexibility was incorporated into the scheduling to accommodate for discussions to continue until theme saturation occurred.

Theme saturation is a critical concept in qualitative research, representing the point at which no new themes, patterns, or insights emerge from continued data collection or analysis. It signifies that researchers have reached a point of exhaustive exploration and understanding of the phenomenon under investigation within the given dataset. Achieving theme saturation is essential for ensuring the depth and comprehensiveness of qualitative findings. It allows researchers to confidently conclude that they have captured the full range of perspectives, experiences and interactions related to the research topic. Once theme saturation is reached, further data collection may be deemed unnecessary as additional data are unlikely to contribute substantially to the understanding of the phenomenon (Creswell, 2018). The focus group aimed to achieve theme saturation, ensuring that key themes were thoroughly explored. However, if time constraints prevented saturation during a session, participants had the opportunity to address pressing concerns in subsequent focus groups. Upon either reaching theme saturation or the conclusion of the allocated time, the session was brought to a close. Following each focus group session, the researcher transcribed the audio recordings verbatim to ensure accurate documentation of the discussions. While these transcripts were not provided to healthcare stakeholders for review, their views were incorporated into the reports, which included patient data results generated from the analysis. Healthcare stakeholders were then given the opportunity to review these reports and

clarify if their perspectives were misinterpreted or did not align with their intended meaning. The transcripts served as the basis for further analysis using a general inductive approach, which will be elaborated upon next.

#### **4.4.2 Focus group data analysis**

Thematic analysis was employed as the method to identify, analyse and report themes within the qualitative data. The research considered two primary approaches: the deductive or theoretical approach (top-down) and the inductive approach (bottom-up), with a preference for the latter. This choice was based on a deliberate focus on an inductive process, driven by the data itself, free from the constraints of preconceptions or existing frameworks. Through inductive analysis, themes emerged organically from the data, capturing both categorical and divergent information, thereby reflecting the complexity of reality. The general inductive approach entailed multiple readings of raw data (transcripts) by the researcher, to meticulously develop codes, categories and ultimately, themes (Braun & Clarke, 2023; Polit & Beck, 2021).

Writing played a pivotal role throughout the analysis, commencing with the initial transcription of verbal data to facilitate familiarisation with the content, initial ideas and potential codes. These codes were subsequently interpreted and organised into broader, data-driven themes, which underwent continuous review, definition and refinement to construct a cohesive thematic map. This active process demanded a profound understanding of the data, cultivated through transcription, purposeful reading and re-reading, aimed at discerning meaningful patterns and relationships. The collation of codes into themes necessitated careful consideration of their interrelationships and interpretation, ensuring the accuracy of the resulting analytic themes (Braun & Clarke, 2023). To enhance the validity of the analysis, another coder (academic supervisor) also coded the data independently as part of an inter-coder reliability check. This process was completed for every focus group discussion.

## **4.5 Quantitative data collection and analysis**

The quantitative data included archived patient presentation data to the ED. A single dataset was collected for the quantitative phase which was used across all stages of the research. Descriptive statistics were applied at each stage to analyse and interpret the quantitative data.

### **4.5.1 Patient presentation data collection**

The collection methods of the quantitative data of this study involved gathering patient presentation data to complete a retrospective database review. The patient management system used by the research hospitals ED was utilised to pull eight years of patient presentation data. The data was de-identified prior to being provided in an Excel document and given to the researcher. This means there was no identifiable information such as patients' names, date of birth or national health index numbers. This data was excluded as the database was expected to have approximately 80,000 presentations per year making it inconceivable to gain consent from all individual patients. The research hospital has legal rights to collect patient data and the research hospital granted the researcher permission to analyse the de-identified information. The use of de-identified information did not impact the validity of the data.

The data variables included in the dataset were: age, gender, ethnicity, domicile, date and time of arrival, mode of arrival, referral source, triage score, presenting complaint, speciality team referral, time of departure, discharge diagnosis and discharge destination. Prior to analysis, the researcher meticulously examined and cleaned the data, addressing issues such as duplicate entries, missing values, formatting discrepancies, data type standardisation and outlier detection and correction.

#### **4.5.2 Patient presentation data analysis**

Descriptive statistics were the major form of analysis of patient data in this study to summarise and describe the key characteristics of the patient population under investigation. Measures such as mean, median and mode were employed to provide insights into various aspects of the dataset, including demographics, clinical presentations and outcomes. For instance, the average age of patients, the most common presenting complaints, the distribution of triage scores, the length of stay in the ED and the frequency of different discharge destinations. Additionally, graphical representations such as histograms, bar charts and pie charts were utilised to visually depict the distribution and patterns within the data. These descriptive statistics provided the researcher with a comprehensive understanding of the patient population and trends and patterns over the eight years that informed subsequent analyses and interpretations of this large population.

#### **4.6 Ethical considerations**

Ethics approval for this research was gained from the Massey University Human Ethics Committee on December, 7<sup>th</sup>, 2021 for three years (Reference number NOR 21/77). Focus groups adhered to ethical guidelines, with all participants receiving verbal and written information (participant information sheets) about the study before they decided to give written informed consent. The patient data that was collected was de-identified to ensure patients anonymity was maintained. Permission was also granted from the research hospital to conduct this research study. These documents are attached as appendices in this thesis.

#### **4.7 Methods summary**

This chapter examines the research design, describes two distinct research populations, elaborates on the data collection and analysis processes of both qualitative and quantitative phases, while also addressing ethical considerations. The methods employed in this study aim to facilitate an

understanding of patient cohorts visiting the ED without necessitating emergency care, as a basis for the creation of an innovative solution to tackle this challenge. The findings of this research study will be presented in the next chapter.

## Chapter V: Findings

*The voyage of discovery is not in seeking new landscapes, but in having new eyes.*

Marcel Proust (1871 – 1922)

### 5.1 Introduction

This research study employed a mixed methods approach and the findings presented in this chapter are derived from both qualitative and quantitative data analyses. The results are structured into five stages: the discovery stage, idea screening stage, development stage, definition stage and validation stage. Each stage corresponds to a specific focus group session and is supplemented by relevant quantitative data analysis. The qualitative component involved conducting focus group sessions with healthcare stakeholders who specialise in managing the Emergency Department (ED). These sessions aimed to address the research questions and create an innovative pathway to meet patients healthcare needs along with managing the demand of the ED.

The quantitative component used patient presentation data from the ED. These data were utilised to explore themes identified in the focus group sessions and to gather numerical insights into healthcare professionals' concerns and ideas. Consequently, the qualitative thematic analysis informed quantitative data reviews, with each focus group session informing the subsequent patient data analysis. Additionally, the patient data reports served as discussion points in the succeeding focus group sessions. This chapter presents the findings from this research study and will follow the framework of the stage-gate process.

### 5.2 Focus group recruitment and population

Of the ten healthcare professionals approached, six contacted the researcher to partake in the study. Three participants declined as they were going to be on leave whilst the focus groups were being completed and another declined to participate due to workload capacity issues. The six participants

who consented to take part in the study all had various roles within the management of the ED. To ensure the anonymity of participants in this study it was decided to use two groups to describe the roles rather than specific titles. Participants were allocated into one of two groups within the focus group sessions: managers or clinicians. The below synopses give an overview of the focus group participants and their employment background and expertise:

**Manager 1:** a male senior executive responsible for managing the operations of the ED and general medical wards, with over 20 years of experience as a clinician.

**Manager 2:** a female senior executive responsible for the operations of medicine and older persons health, with over 20 years' experience in nursing management, education and leadership.

**Manager 3:** a female senior executive with a role in business management and a background in nursing with over 25 years of experience in healthcare services.

**Manager 4:** a female service manager with over 20 years' experience in managing healthcare services.

**Clinician 1:** a male Senior Medical Officer (SMO) who specialises in emergency medicine with 28 years experience and has over ten years of clinical and managerial experience within the research ED.

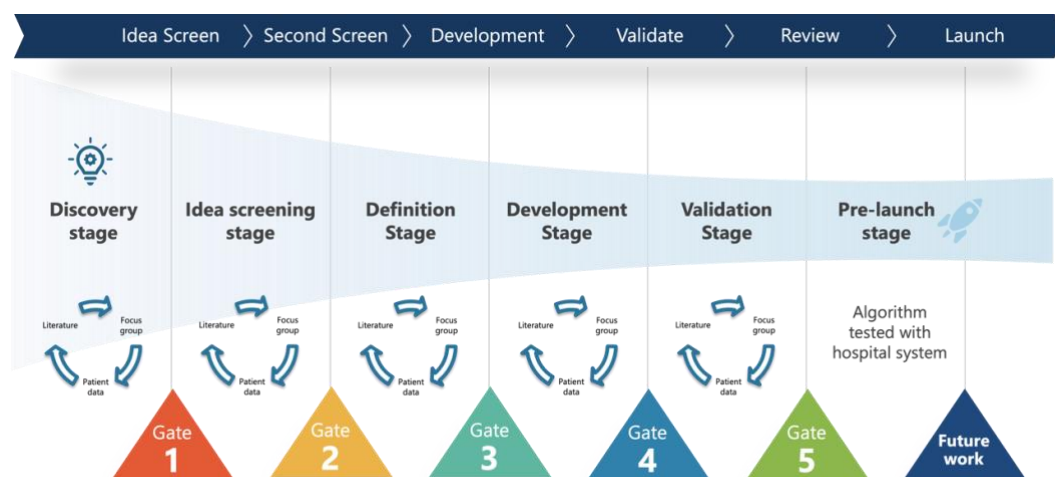
**Clinician 2:** a male Senior Medical Officer (SMO) who specialises in emergency medicine with 25 years experience and has over ten years of clinical and managerial experience within the research ED.

All focus group members were healthcare professionals, who had either management or clinician roles. For the purposes of the thesis the focus group participants will be referred to as 'healthcare stakeholders'.

The direct quotes from the thematic analysis will be labelled with the healthcare stakeholders' identifiers as described above. There were five focus groups completed in order to establish the qualitative data needed for this research study. Thematic analysis was utilised to discern and formulate recurring themes from the gathered data. After each focus group session, the audio recordings were transcribed before undergoing coding. These transcripts were methodically examined to generate initial codes, which were then scrutinised to construct broader categories. From these categories, the primary areas of interest emerged, forming the basis for the main themes discussed in the qualitative segment of this research. Accompanying each theme are quotes from the participants of the focus group interviews, providing deeper insight into their perspectives and attitudes towards the management of patients presenting to the ED. These findings will be presented after the stage-gate process is reviewed below.

### 5.3 The stage-gate process

The remainder of this chapter will be structured utilising the stage-gate process as shown below:

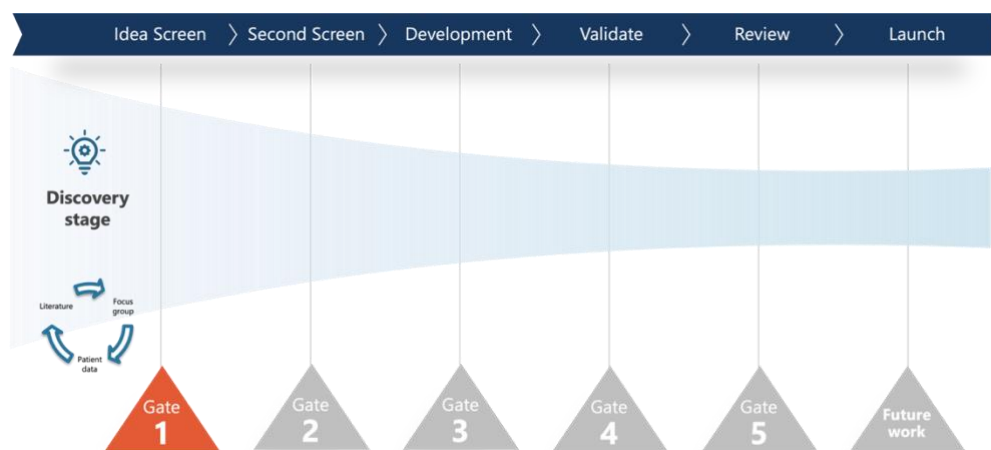


**Figure 4: Stage-gate framework for findings**

Every stage from the discovery to the validation stage incorporates a mixed methods approach, therefore there are qualitative and quantitative findings presented in each stage. The end of each stage has a decision point which determines if the project continues through the gate and onto the next stage. The criteria of each gate are evaluated at the end of each stage and the outcome identified before continuing on with the study. The results of the thematic analysis and the quantitative analysis for each stage are provided in the form of a report to the focus group for discussion in the following stage.

### 5.4 The discovery stage (stage one)

The findings begin with the discovery stage where the first focus group session was completed and analysed which then informed the first retrospective patient database review. The completion of these two analyses were then used to make a decision at Gate One whether to proceed. Figure 5 below displays the discovery stage of this project which ends with Gate One:

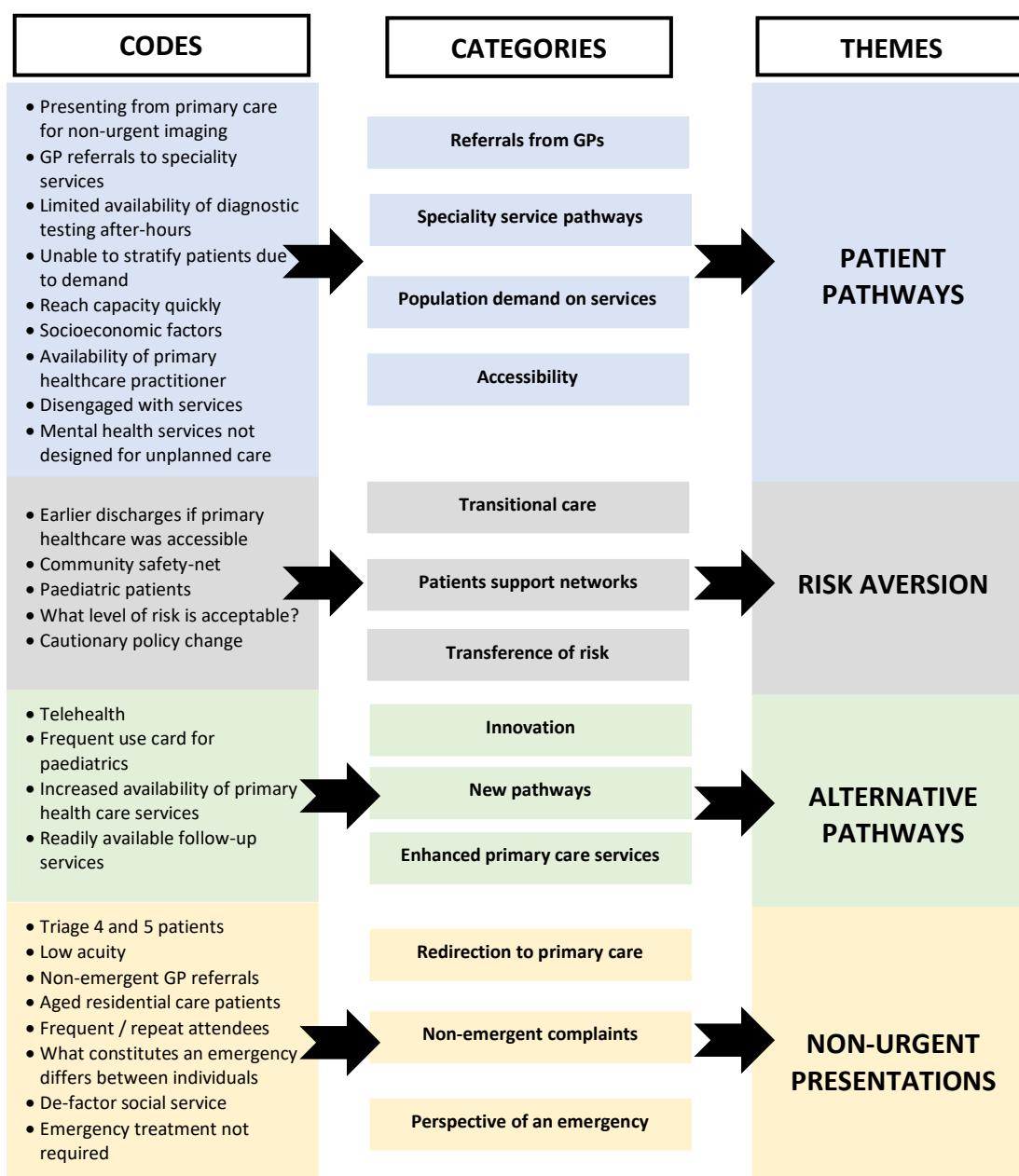


**Figure 5: The discovery stage**

The following section provides an overview of the codes, categories and themes identified during the first focus group session, accompanied by relevant quotes. The quotes are grouped under the corresponding themes from which they emerged.

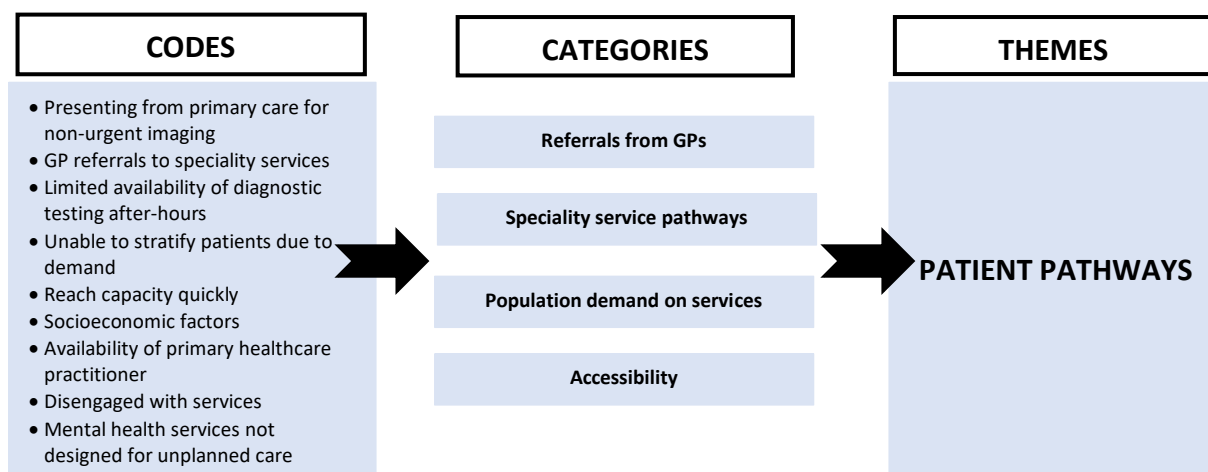
## Discovery stage (stage one): Focus group one

The aim of the first focus group session was to discuss the first research question: What are the characteristics of patients attending the ED who could have improved outcomes with alternative pathways? There were five themes developed from focus group one: (i) patient pathways; (ii) risk aversion; (iii) alternative pathways; (iv) defining non-urgent. Figure 6 shows an overview of the codes, categories and themes from focus group one.



**Figure 6:** Focus group one thematic analysis theme construction

## 5.5 Theme one: Patient pathways



**Figure 7: Patient pathway theme focus group one**

The analysis revealed the theme of patient pathways in relation to the ED. The theme of ‘patient pathways’ arose from the aggregation of nine codes, which were condensed into four categories. This theme encompasses the entirety of the patient journey, beginning from the events leading up to the patient’s arrival at the ED and extending through to their discharge processes. In this section, the different stages of patient pathways are explored as revealed by the healthcare stakeholder’s narratives.

There are multiple pathways in which a patient can arrive at the ED. Patients may arrive on their own accord, be referred in by another healthcare professional (e.g. a general practitioner, midwife, dentist), be accompanied by police along with many others. The main discussion regarding patient pathways focused on the processes which happened prior to patients arriving at the ED. Two clinicians described their frustration with patients being referred to the ED with non-urgent complaints from primary healthcare services (mainly GP referrals), resulting from a lack of community diagnostic services, specifically after-hours. The clinicians believed these patients did not need to come to the ED:

*I know one which occurs too frequently is a lot of GPs will send patients to the ED to expedite the work up, because they feel they can't get it in the community. And then, unfortunately, historically occurs mostly on Friday evening, Saturday and Sundays. When we are least staffed. So, it creates a double problem.*

(Clinician 1)

*Unfortunately, it occurs a lot of times during after hours, they will send someone here let's say for kidney stones, but their pain could be controlled and they send them at night or 1am in the morning and they should know by now we aren't going to be able to get it done (CT) at 1am in the morning. So, what happens is we put the patient in the bed and they lock that bed up. You know? Yeah, you can't argue when they say well, can it be done in the morning? Well yeah there is a few cases, but most cases could wait and could be done the next day.*

(Clinician 2)

Clinicians also discussed the cascading effects of patients being referred to the ED to then wait for diagnostic services which could be organised for the following day by primary care services. The main impact that was discussed was patients adding to the capacity of the ED without needing any ED services:

*Yeah, like I called one (GP) up. I said, you know? She didn't seem in that much pain and you could of booked her an USS, they could have arranged that for her in the morning. Instead, you send her here and she lays in the bed for six hours. And what that creates to flow, I forget what amount of money we came up to keep a bed tied up per hour, in the hundreds of dollars. So then the GPs thinking well, what's the big deal then laying there for six hours? It wasn't necessary, we did nothing for her other then bring her a sandwich.*

(Clinician 1)

The clinicians also discussed frustration at the ED being used to run clinics for speciality services when the patients do not require the expertise or equipment of the ED. When talking about speciality referrals, the clinicians were speaking of patients who have been seen by a GP or primary care service and referred to an accepting medical team in the hospital (e.g., orthopaedics, plastics, medical team etc). These patients arrive to the ED but are not seen by the emergency medicine team and instead wait in the ED for the speciality team they require to arrive. These patients therefore add to the capacity of the ED when they do not require the services of the ED. The clinicians spoke about ED being a 'default' service when there is nowhere else to go and that the ED is not designed to function in this way.

*A lot of times, it's like a holding area, they will get a call say from orthopaedics from an outside practitioner will say oh, send them to the ED and all you're doing is creating another step. We help out with a lot of things, but, I think a lot of these things like these referrals. Yeah, I mean the default for the speciality services is just to send them to the ED.*

(Clinician 2)

*So if you go to any of your GPs or acute care and you have.. I don't know broke a couple of things. You know, bones in your hand and they think I know that's plastics. Oh well, then off to ED you go. You might get a cohort of people come and you end up running plastics and vascular and orthopaedic clinics through the consult area and the main waiting room. Now these guys they're all single system, fairly stable injuries. Yet they don't flow them through to any of the clinics. There's nowhere else that's set up in those services to have them just turn up at any point and so we have this bizarre run of them, even if they've seen in the afternoon by someone like Orthopaedics. They (orthopaedics) will say just come back to ED tomorrow morning and I'll come down and see you.*

(Clinician 1)

The discussion highlighted that these patients are medically stable (as above) and add to the capacity of the ED and utilise the physical environment such as consult rooms of the ED but do not require emergency medicine services. A manager spoke about the need to change this pathway system to aid the functioning of the ED:

*Actually, all patients that come from a GP with the specialty referral should go somewhere else. They have already been seen by a doctor and referred on. That's a big step.*

(Manager 1)

Overall, the main issue with patient pathways that was discussed by the focus group participants were that patients were being referred to the ED unnecessarily and utilising the ED when it was not clinically appropriate to do so. They were frustrated that the ED was being used as a 'default' service and believed new options should be in place to aid the flow of the ED.

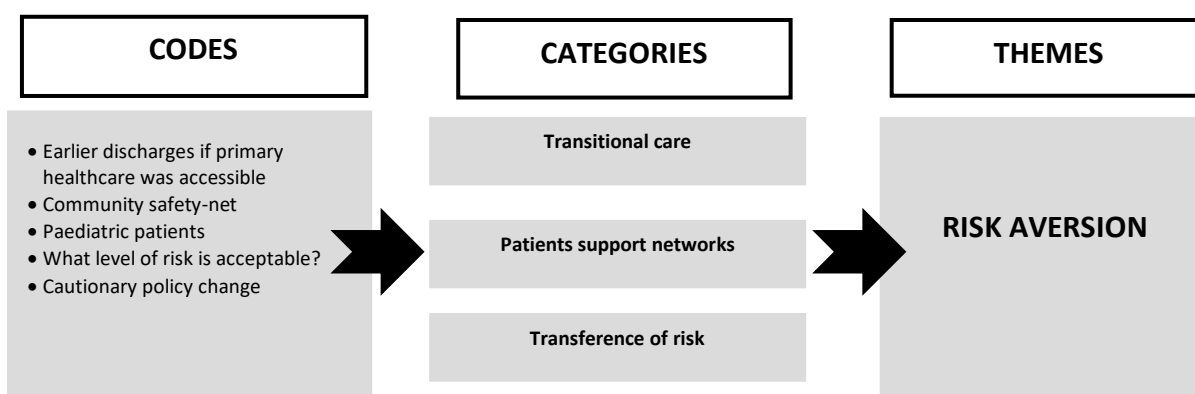
The accessibility of healthcare was also a category within the patient pathway theme. The ED is a service that is open 24 hours a day and seven days a week, it is also a free service for citizens and permanent residents of NZ. A manager spoke about the difficulties patients currently face when attempting to access primary care services:

*GP's are expensive. They (patients) can't get appointments when they want one. They don't want to wait. People are disengaged with GP practice.*

(Manager 2)

Clinicians and managers agreed that primary care services were under pressure and this creates difficulty for patients as they feel they have nowhere else to go. It is evident from this theme that clinicians and managers of the ED perceive that patient pathways are influenced by primary care services capabilities and capacity.

## 5.6 Theme two: Risk aversion



**Figure 8: Risk aversion theme from focus group one**

There was a prominent theme of risk aversion from the focus group data. The theme of 'risk aversion' arose from the aggregation of five codes, which were condensed into three categories. Clinicians spoke about the tendency to avoid risk in different settings and within the ED and how this impacts ED flow and patient outcomes. There was a specific discussion about keeping patients for longer than necessary in the ED due to risk aversion and one manager believed patients could be discharged with education and follow-up support:

*So paediatrics, we have the issue of people who bring their kids to EDs as a default GP and often get held here 'just in case'. I think too long. Sorry to make that statement about SMOs and their judgment, but that sort of 'we will keep them overnight just in case' but they could have gone home with a phone number and some education and a follow up. (Definition: SMOs – senior medical officer)*

(Manager 1)

Another manager spoke about risk and the professional responsibility that doctors feel within the medical field:

*So are we just becoming too risk averse in those situations? Cardiology would be another good example - when you look over people in the cardiology beds who are there 'just in case'. It's interesting because we know the risks there and right in front of us. We think we have to own it.*

(Manager 3)

A clinician talked about the pressure of making clinical decisions as there is always risk involved and the transference of risk between specialities when a patient is referred to another team or 'passed around':

*That's interesting, 'cause we talk about that in medicine all the time, around being anxious about the decisions we make. You know the risk that goes with it, 'cause there's risk with everything. Now the whole position from an emergency physician standpoint is risk. And this one is exactly what you said, it well, I'd rather you know have 'John' take the risk or you take the risk then me, so the patient gets passed around.*

(Clinician 1)

When talking about the transference of risk the focus group participants spoke about patients who live in aged residential care (ARC) and how they believed they would be better cared for within the rest home than coming to the ED:

*Rest home patients wherever possible, treat within the home.*

(Manager 4)

There was also a discussion around patients being admitted to hospital due to risk aversion and having no follow-up options in place:

*I said to cardiology, are these people being admitted because they need to be admitted? or because inadvertently, they have no other safe options.*

(Manager 1)

The ED clinicians also spoke about challenging situations where other professions or teams may request diagnostic tests which are not clinically indicated. They felt that some patients are referred

to ED for diagnostic tests that would not alter the patients treatment plan and therefore were deemed unnecessary:

*So that becomes a battle at times where they will want blood tests on someone that we don't think is necessary. Like some toxicology bloods – but it doesn't make a difference.*

(Clinician 1)

There was also a discussion around patients who are under police custody being escorted into the ED with non-urgent complaints. This was discussed as being due to risk aversion:

*Yeah, there's been a cautionary change through the police force as well, about holding people in cells. So, they've ended up bringing them up to the ED rather than holding them there in case something happens.*

(Manager 3)

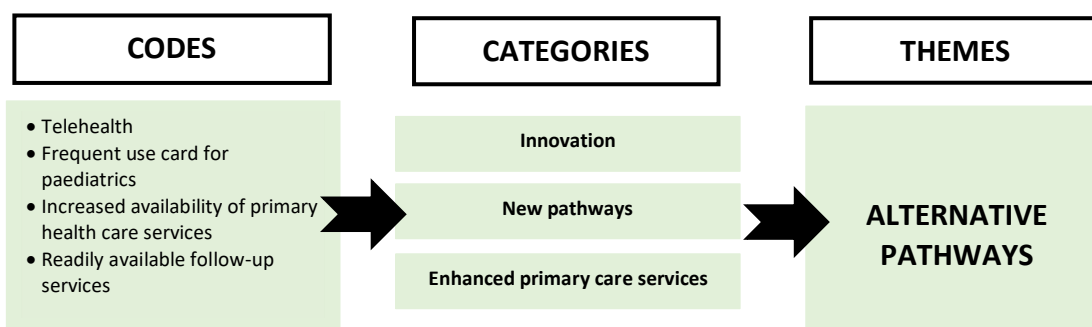
The clinicians felt that if there were more accessible community services or follow-up services for patients, it would reduce patients being kept in ED from a risk aversion point of view:

*I think we all feel a community service safety net needs to be established. So, the kid with bronchiolitis or something, yeah he's a little bit tachycardic but he's smiling and looking OK, but some of the key indicators might be a tad off, if you were sure he could be seen the next day. Which we're not, yeah, he could go home.*

(Clinician 2)

In conclusion, risk aversion was discussed as a reason why patients are held in the ED longer than they should be or referred to the ED in the first place which may be unnecessary. It was clear that clinicians believed this was the case but felt they had no other 'safe' options at times to discharge patients from the ED. It is evident from this theme that it is essential to understand risk in healthcare and the implications of risk, especially when working towards creating a new pathway which needs to be safe for patients and healthcare professionals.

## 5.7 Theme three: Alternative pathways



**Figure 9: Alternative pathways theme from focus group one**

As the focus group concentrated on the inappropriate use of the ED, there was a dominant theme that was solution focused. This included how to better manage patients to assist with the demand of the ED by the means of alternative pathways. The theme of ‘alternative pathways’ arose from the aggregation of four codes, which were condensed into three categories. There were discussions around the future of healthcare and what care delivery might look like:

*It's predicted in 10-15 years, you're just going to have, ICU, HDU and the rest will be hospital at home. So, someone could get a nebuliser like in a COPD patient, it could be done in their home just as easily by a visiting nurse like two or three times a day. So, I think the whole model paradigm needs to be shifted.*

(Clinician 1)

When speaking about a new model of healthcare the managers and clinicians spoke about the use of telehealth and how they thought it could be implemented to improve services. They spoke about the use of telehealth and how it could be used to direct patients to the most appropriate services if their condition is not emergent:

*I think a lot of patients with chronic things like back pain. You know in a few questions (via telehealth) you could determine if it's emergent or not. You know, establish the risk of what people worry about like cauda equina.*

(Clinician 2)

*And this is where telehealth could be such a huge opportunity, because if you establish a culture where you don't just turn up to the ED, ring someone first and that person says you don't need to go to the*

*ED, but you do need to talk to this service and I can see they've got a space so they'll meet you on Monday or Tuesday.*

(Manager 4)

*In parts of the UK that's the case now just 'cause of the demands. But like in North Wales, you just don't think I'll go to ED. You ring up a number and they'll give you advice and they'll name a time. Yeah, 'cause if you turned up now you wouldn't want to wait 10 hours so you'd think oh if it's not that urgent I'll wait until tomorrow.*

(Manager 1)

A manager made a comment about telehealth and how it would enable patients to get faster health advice than if they were alternatively going to wait in the ED for assessment:

*you actually might even get better advice from Telehealth, yeah then you wouldn't be sitting around waiting to see someone for 6-8 hours. You might actually be able to remedy or mitigate some of that yourself.*

(Manager 2)

There was also a discussion around utilising telehealth services such as educational websites patients can be directed to:

*You could say well, you can wait here for six hours or here's a link if you go home, follow this link someone will speak to you immediately.*

(Manager 3)

*You could probably make a link like New Zealand Health Ministry has guidelines for back pain and I show people what it says in there. You know, you're not going to get imaging if you don't have this for two to four weeks.*

(Clinician 1)

Telehealth was perceived by the focus group participants as having the ability to give patients health care advice without having to wait for long periods of time in the ED. They are of the opinion that telehealth has an opportunity to direct patients to the right services, so they do not attend the ED for conditions which do not require emergency services.

The focus group also discussed the abilities and scope of practice of Nurse Practitioners (NP) and how they could be used more effectively in healthcare delivery:

*You could utilise nurse practitioners in EDs in high deprivation areas because if you had a nurse practitioner who can independently practice then you really hitting the hot spot aren't you.*

(Manager 2)

*We could have a nurse practitioner lead service in acute care and the primary NP liaises with community nursing teams.*

(Manager 3)

*Along with nurse practitioners in rural. Any good support follow-up service with CNS, NP or GP follow-up that people can access the next day.*

(Manager 4)

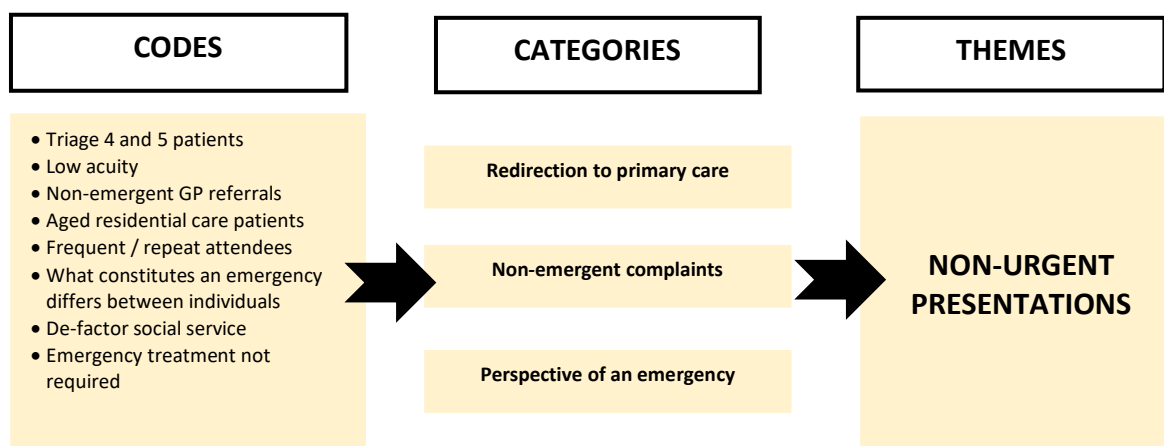
There was also an idea about helping people reconnect with primary / community care, instead of giving them a free-voucher and redirecting them to other services:

*Follow-up in two days time to make sure they're alright and then reconnect them with the community. That way more than just a free voucher and hopefully you do get it sorted out.*

(Manager 1)

This was spoken about in terms of transitional care and the benefits of patients having a continuity of care into the community, instead of a cycle of coming to the ED to be assessed and treated and having no follow-up services.

## 5.8 Theme four: Defining non-urgent presentations



**Figure 10: Non-urgent presentations theme from focus group one**

The theme of ‘defining non-urgent presentations’ arose from the aggregation of eight codes, which were condensed into three categories. It was evident from the focus group that there was no simple definition for patients who should not present to the ED, but there was a dominant theme of non-urgent or non-emergent presentations. One clinician spoke about the ability to complete a quick exam to decipher if the patient’s condition was emergent:

*A quick physical exam, just their vitals and history can tell you if it's emergent. You know it's just, there's this thought process - You know we'll send them to ED. I'm sure GPs are under pressure, both from the timeline and financial aspect. So at times it's not emergent care, it's actually just advice more than anything else or another opinion.*

(Clinician 2)

This clinician was discussing that at times it was perceived GPs needed a second opinion and therefore would send patients to the ED, even when the condition was not emergent. One clinician spoke about the difficulty in defining emergent as everyone’s perception of what is an emergency can be vastly different:

*You know if you ever call your doctor... if this is an emergency call 111 and that's the interesting thing I just read an article this morning about what constitutes an emergency to a person. What constitutes an emergency to you is completely different to what constitutes an emergency to you.*

(Clinician 1)

This perception of an ‘emergency’ therefore can create difficulty when addressing non-urgent care as some patients believe what they have presented with does constitute an emergency. When patients arrive to the ED and are assessed as having a low-acuity complaint they may be redirected to other services such as an urgent care clinic and one manager had the opinion that these patients should not arrive at the ED in the first instance:

*So triage 4 and 5s we are triaging them and redirecting them. This year we redirected about 6000 people. Which is significant, but they shouldn't be turning up in the first place.*

(Manager 1)

There were also statements which focused on patients who arrived at the ED but do not require any medical input and thus the focus group participants believed that these patients should be cared for elsewhere:

*There's just so many other factors. I would say one of the hardest things if you're looking for a group is people here for more social problems. We're definitely the defacto social service.*

(Manager 4)

*Yeab, I'm being anecdotal now, but this is a few months ago now that was walking around the mall and there was this young couple asking for money. And the woman they walked up to said, just go to ED they will sort it out for you.*

(Manager 1)

*You do get the mental health patients that are the overdoses and you know that's fine. That requires medical input, but then you do see quite a few of these coming through, you know, depressed or sad? Or, you know, wants to see somebody and they come to ED and there's no requirement to be there whatsoever and it's not a good environment for them.*

(Clinician 2)

This discussion included talking about patients who arrived with social needs rather than medical needs and mental health needs that were not able to be treated with the services of the emergency medicine model of care. It was evident from the focus group that managers and clinicians did not have a definition of a non-urgent presentation or a black and white criteria for who should not utilise the ED. It has been described as a complex issue with multiple variables that need to be

addressed and investigated. However, they did believe that there were many patients who present to the ED who could be cared for by alternative services.

## **5.9 Discovery stage - qualitative summary**

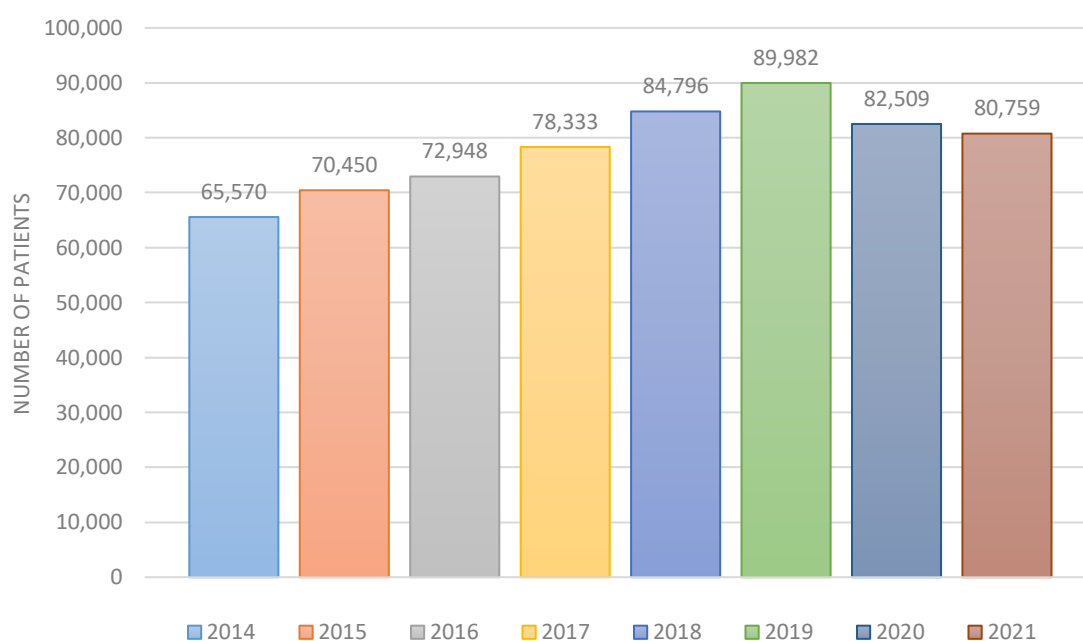
This analysis describes the identified themes of patient pathways, risk aversion, alternative pathways and defining non-urgent presentations. Various patient characteristics were identified and further examined by analysing data from patients who visited the ED at the research hospital between 2014 and 2021. The findings, guided by the thematic analysis of focus group one, are presented in the following section.

## Discovery stage one: Quantitative analysis findings.

This section contains an overview of the trends seen in patient presentations at the research hospitals ED over an eight-year period. The topics of concern were identified from the first focus group discussion and the results are reported under each relevant theme. The themes include patient pathways, risk aversion and non-urgent presentations. The theme of alternative pathways is not included in this analysis as it focuses on a future healthcare pathway, which is beyond the current discovery stage. The analysis begins with an overview of the patient population studied.

### 5.10 Population characteristics

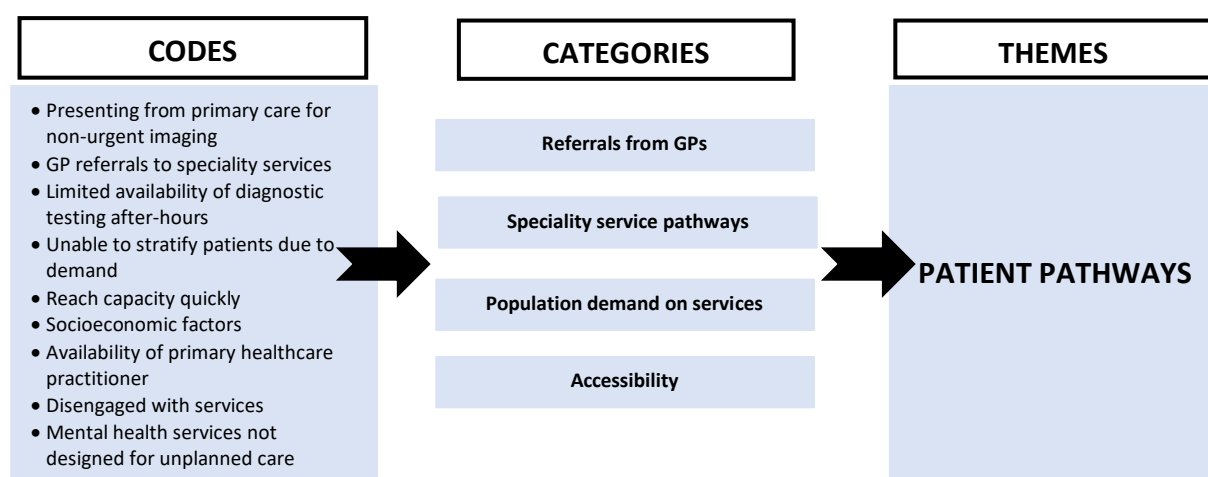
Below is an overview of the total presentations to the ED over an eight-year period from 2014 to 2021. The years are calculated by calendar years e.g., 1<sup>st</sup> January 2014 to 31<sup>st</sup> of December 2014.



**Figure 11: Overall presentations to the ED**

There has been an overall increase of 23 percent in patient presentations from 2014 to 2021. The overall increase in presentations from 2014 to 2019 was 37 percent, the period before the COVID-19 coronavirus disease pandemic appeared in NZ. The COVID-19 pandemic had a notable impact on decreasing ED numbers due to the nationwide lockdown in 2020 and 2021 due to public health measures and restrictions. Nonetheless, the ED experienced a significant growth over the period between 2014 and 2021 regardless of the decrease in presentations due to the COVID-19 pandemic.

### 5.11 Theme one: Patient pathways



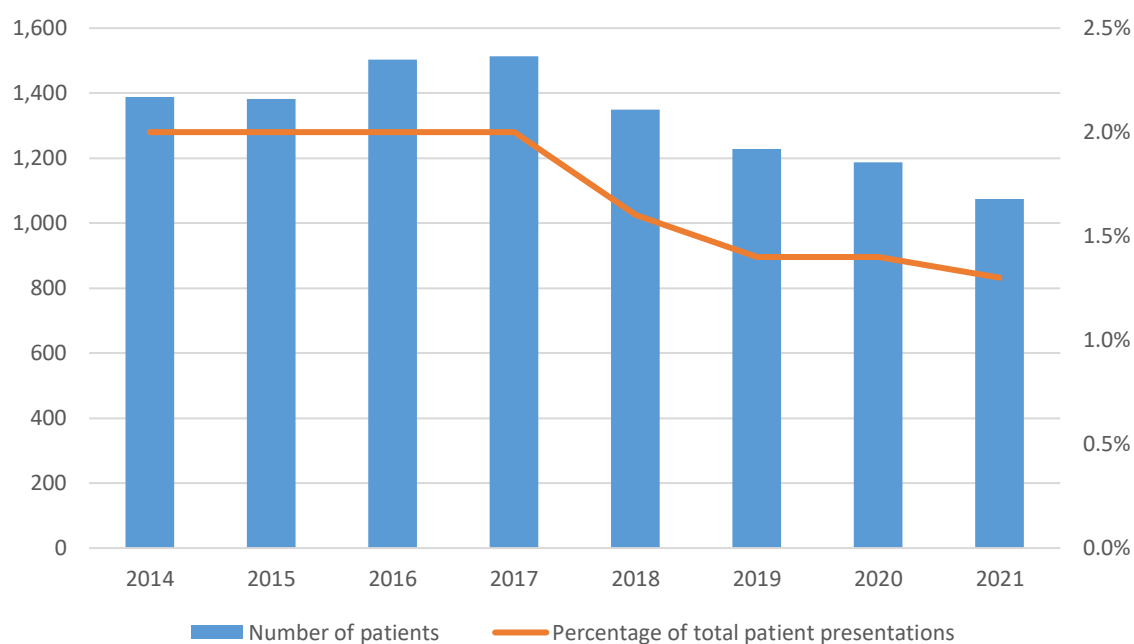
**Figure 12: Patient pathway theme from the qualitative analysis**

There was discourse in the first focus group session regarding patients attending the ED who had been seen by a primary care practitioner and referred to the ED for a ‘second opinion’, ‘after-hours work-up’ and non-urgent diagnostic imaging. There was also discussion around patients who are referred to specialist services within the hospital but utilise the ED environment in order to receive their assessments and treatment. These patient populations were identified as areas the focus group participants were interested in reviewing further. This section therefore focuses on these populations and their journeys in the ED.

### 5.11.1 General practitioner referrals

There was a discussion on patients who were seen by their General Practitioner (GP) and then referred to the emergency medicine team. The concern was that occasionally this was for a second opinion rather than for emergency care / services. This section provides an overview of patients who were seen by their GP and then referred to the emergency medicine team, termed ‘Emergency Medicine’ here, with a focus on the patients that are discharged from the ED after both a GP assessment and an emergency medicine assessment.

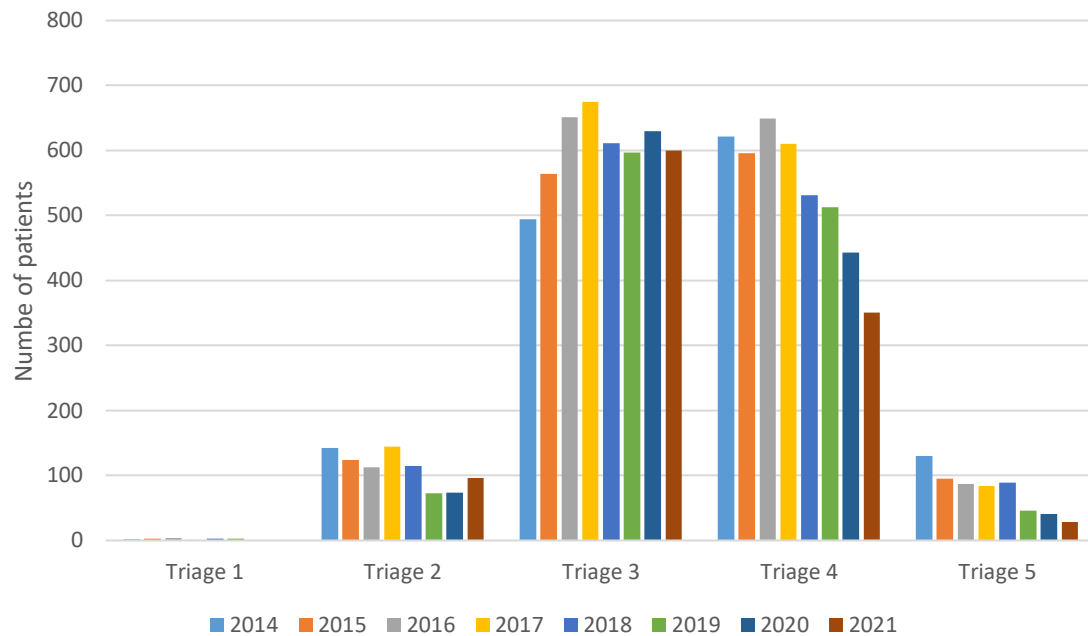
### 5.11.2 General practitioner referrals to Emergency Medicine



**Figure 13: GP referrals to Emergency Medicine**

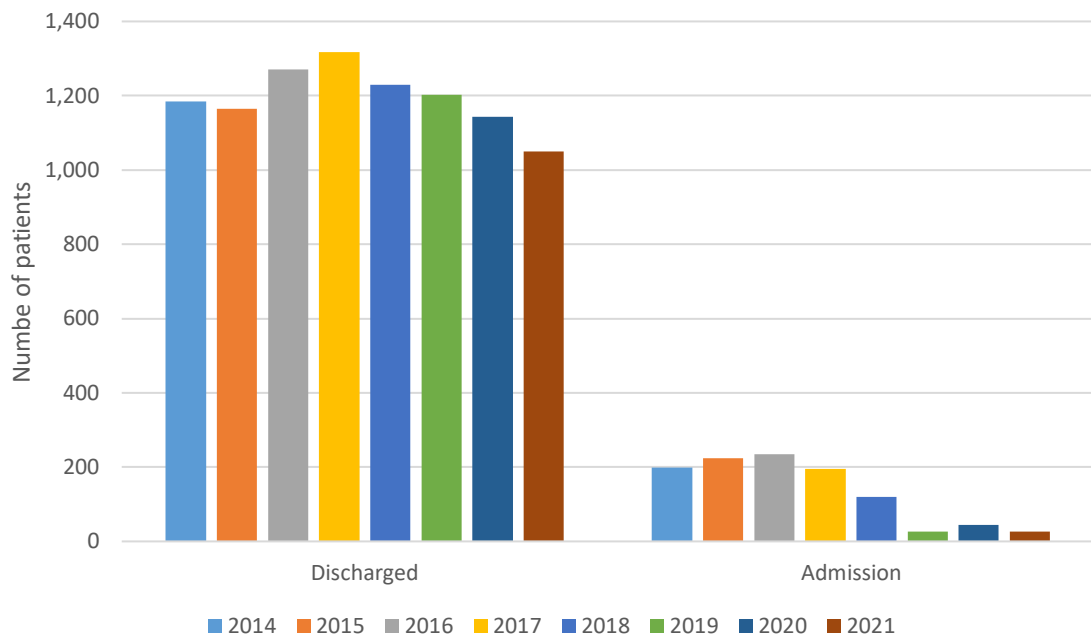
Figure 13 shows the total number of patients referred from their GP to the Emergency Medicine team at the research hospital’s ED over an eight-year period. The trendline shows what percentage the GP referrals to Emergency Medicine contribute to the overall presentation population for each

year e.g., from 2014 to 2017 referrals from GPs to Emergency Medicine made up two percent of the total presentation population.



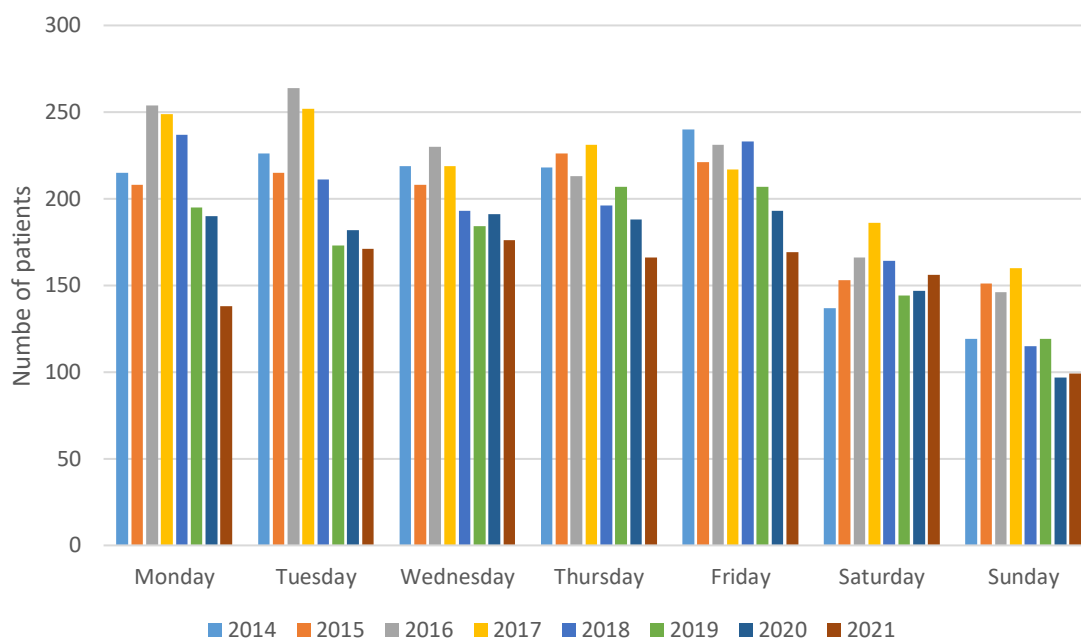
**Figure 14: GP referrals to Emergency Medicine by triage scale and year**

Figure 14 shows the triage scale for all patients who were seen by their GP and then referred to the Emergency Medicine team over an eight-year period. The majority of these patients were categorised as a triage three or four, showing medium to low acuity. The outcome of these presentations are shown in Figure 15.



**Figure 15: GP referrals to Emergency Medicine by discharge or admission**

Figure 15 shows the number of GP referrals to the Emergency Medicine team and the outcome of either admission or discharge. The majority of patients who attend the ED after being referred by their GP are assessed and treated by the Emergency Medicine team and then discharged from the ED without requiring an admission to hospital. The next graph depicts these patients' day of arrival at the ED.



**Figure 16: GP referrals to Emergency Medicine by day of the week**

Figure 16 shows the number of GP referrals to the Emergency Medicine team and the day of arrival. It was expected that Saturday and Sundays would have decreased numbers due to the limited accessibility of GPs on these days. Otherwise there are no significant trends seen in these data.

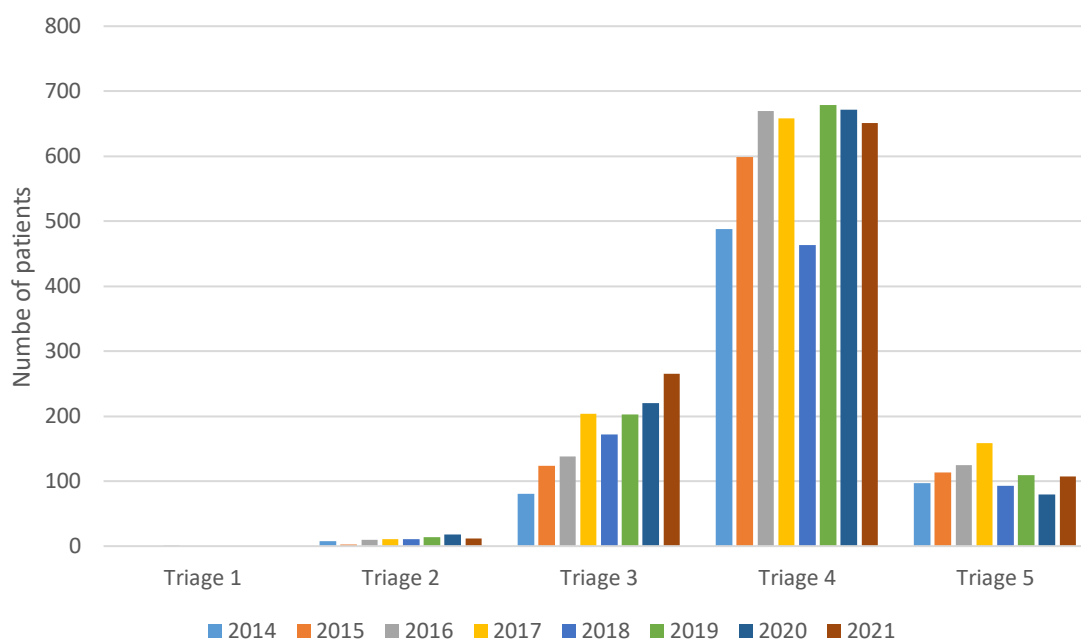
The next patient cohort that was analysed, based on the findings from focus group one consisted of referrals from GPs to the specialist services of the hospital. Although these patients are not referred to the Emergency Medicine team, they are seen in the ED and therefore utilise ED resources. The findings of this cohort will be discussed next.

### 5.11.3 General practitioner referrals to specialist services

The specialities with the highest numbers of GP referrals who were seen in the ED and then subsequently discharged were Plastics non-burns, Orthopaedics and Ophthalmology. The focus group session discussed the concern that often these patients have single system injuries, low-urgency triage scores and utilise the clinic rooms in the ED without requiring hospital admission following their assessment. Therefore, there was a discussion around the ability for these patients to be treated elsewhere and an interest in reviewing these data.

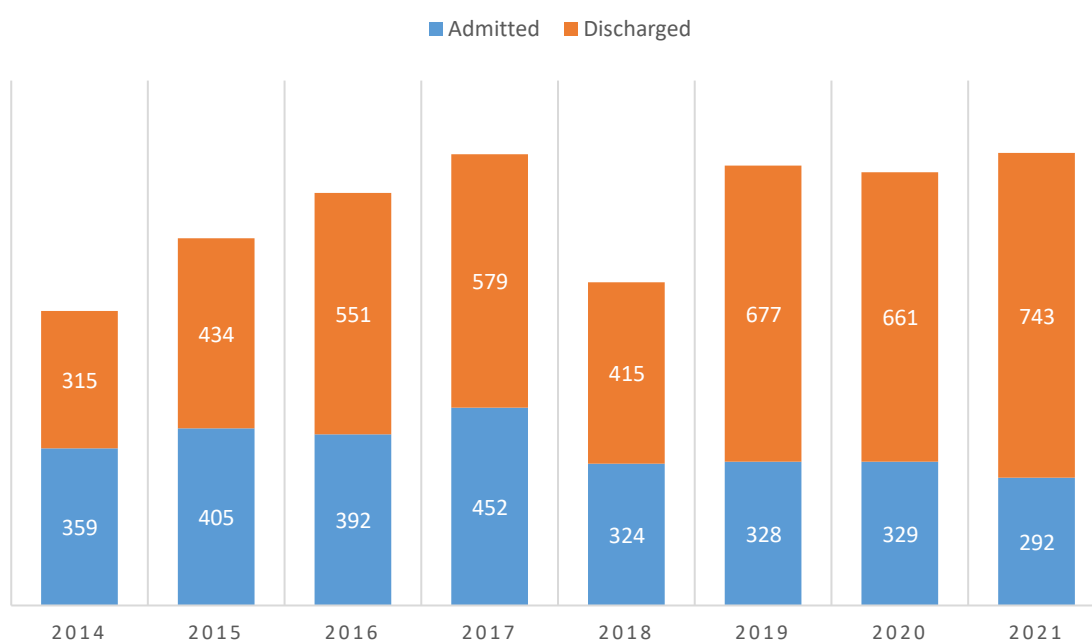
### 5.11.4 GP referrals to the 'plastics non-burns' speciality

This section includes patients who are seen by their GP and then referred to the Plastics non-burns team and seen in the ED.



**Figure 17: GP referrals to plastics non-burns by triage scale and year**

Figure 17 shows the number of GP referrals to the ‘plastics non-burns team’ and their allocated triage scales. It is notable that the majority of these patients are categorised as a triage four on arrival (low acuity). It was the perception of the healthcare stakeholders that these patients often are not admitted to hospital, leading to an analysis of the outcome of these patient journeys displayed in Figure 18.

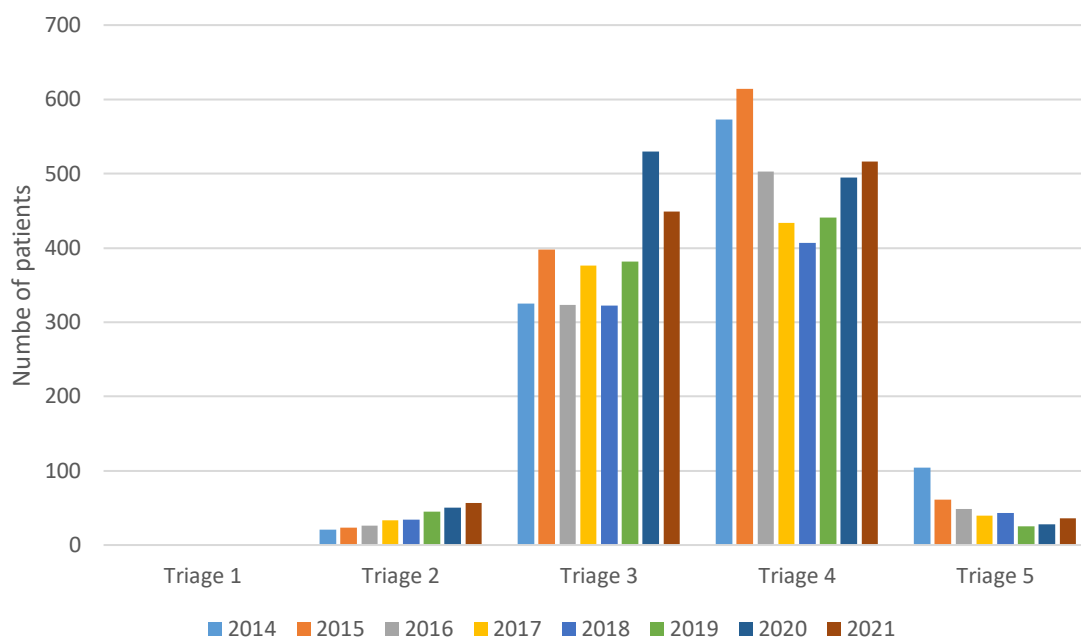


**Figure 18: GP referrals to plastics non-burns by outcome and year**

Figure 18 shows the number of GP referrals to the ‘plastics non-burns team’ and the outcome of either admission or discharge. It can be seen that apart from 2014 (359 admitted versus 315 discharged), the majority of these patients are discharged from the ED. The next patient cohort examined were patients who had been to their GP and then been referred to the ED to be seen by the on-call Orthopaedic hospital team.

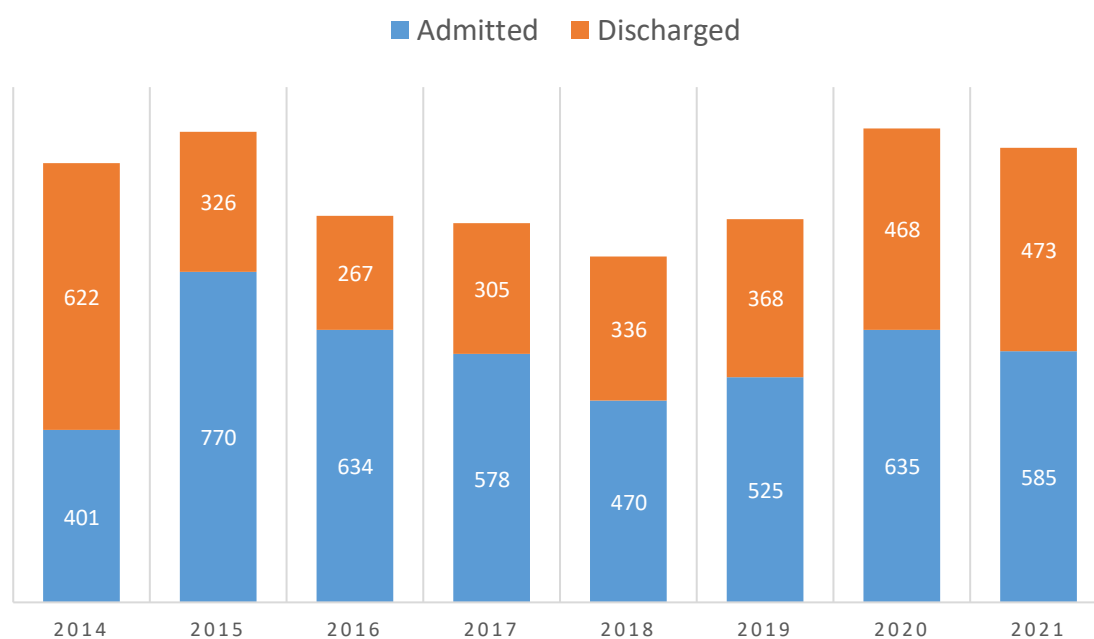
### 5.11.5 GP referrals to the Orthopaedics team

This section examines patients who are seen by their GP, then referred to the on-call Orthopaedic hospital team and seen in the ED.



**Figure 19: GP referrals to Orthopaedics by triage scale and year**

Figure 19 shows the number of GP referrals to the Orthopaedics team and their allocated triage scales. The majority of these patients are again categorised as triage three and four (medium to low acuity). The researcher also examined the outcome of these patient journeys which are shown in Figure 20.

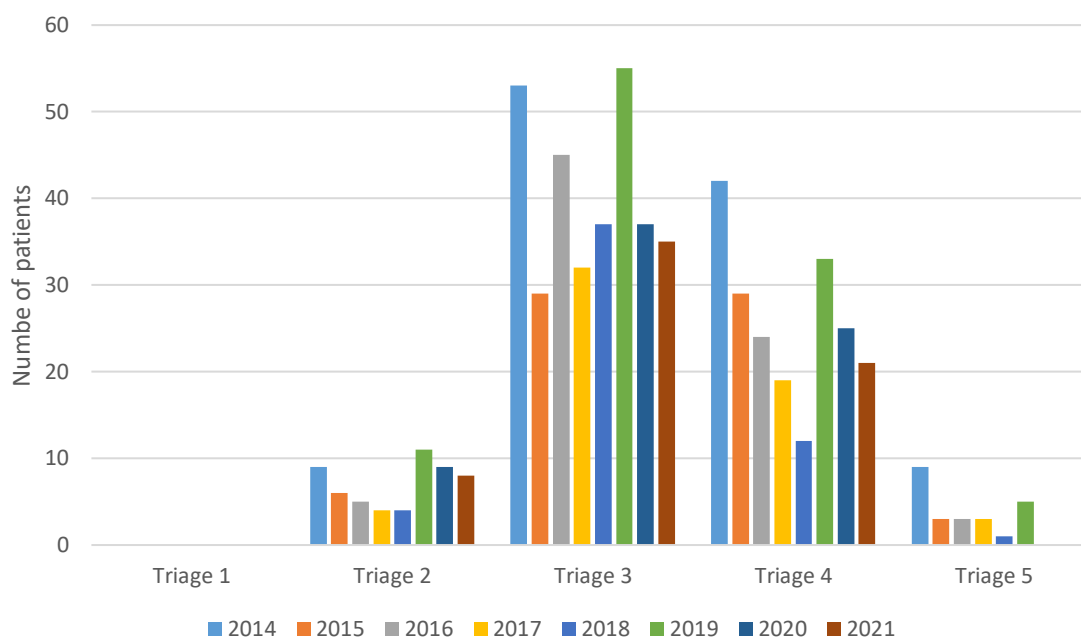


**Figure 20: GP referrals to Orthopaedics by outcome and year**

Figure 20 shows the number of GP referrals to the Orthopaedics team and the outcome of either admission or discharge. The outcome of these patients is in contrast to the previous cohort, with the majority of these patients requiring admission to hospital. The next patient cohort examined were patients who had been to their GP and then been referred to the ED to be seen by the Ophthalmology team.

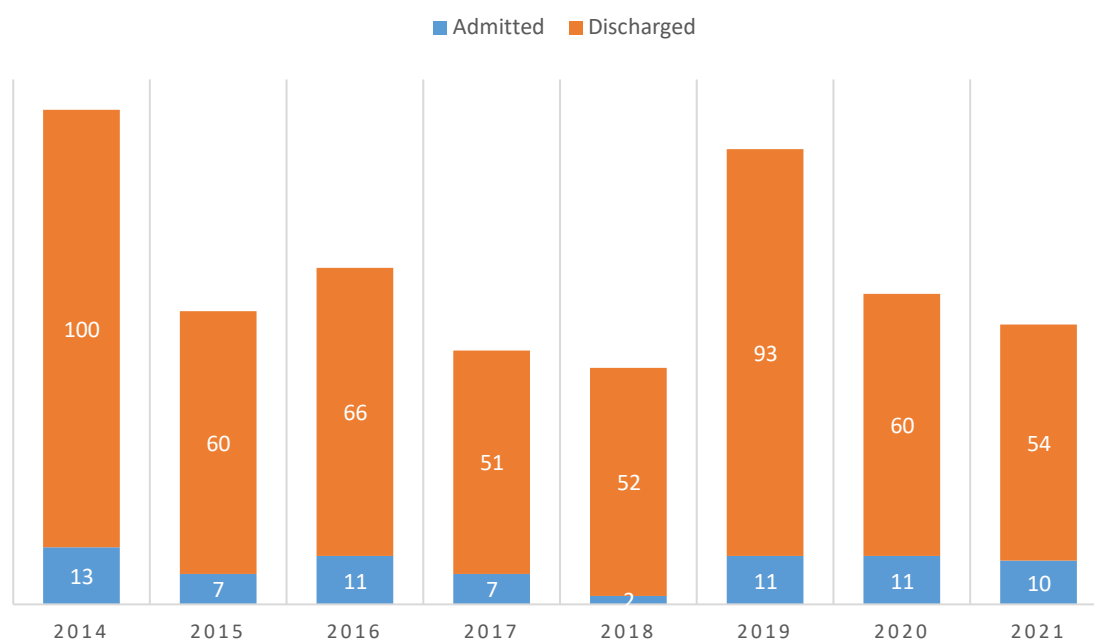
### 5.11.6 GP referrals to the Ophthalmology team

This section includes patients who are seen by their GP and then referred to the Ophthalmology team and seen in the ED.



**Figure 21: GP referrals to Ophthalmology by triage scale and year**

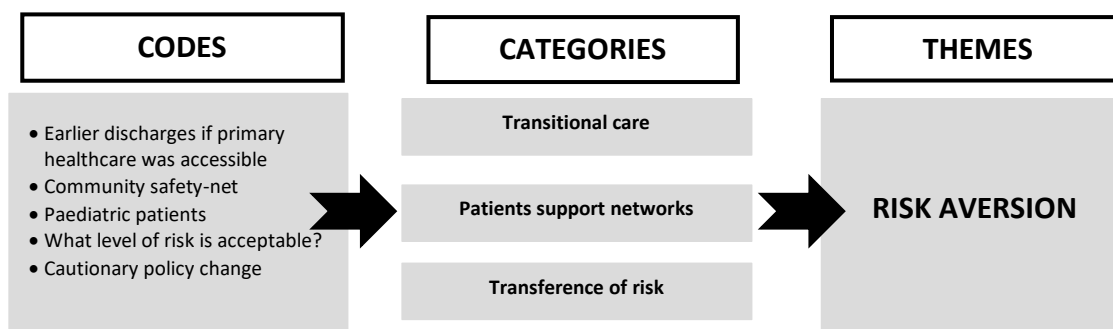
Figure 21 shows the number of GP referrals to the Ophthalmology team and their allocated triage scale with the majority of these patients categorised as triage three and four (medium to low acuity). The outcome of these patient journeys was also examined and are shown in Figure 22.



**Figure 22: GP referrals to Ophthalmology by outcome and year**

Figure 22 shows the number of GP referrals to the Ophthalmology team and the outcome of either admission or discharge. The outcome of these patients contrasts with the previous orthopaedic cohort, with the majority of these patients being discharged from the ED. This concludes the analyses for the ‘patient pathways’ theme. The analyses relevant to the theme ‘risk aversion’ theme are examined next.

## 5.12 Theme two: Risk aversion

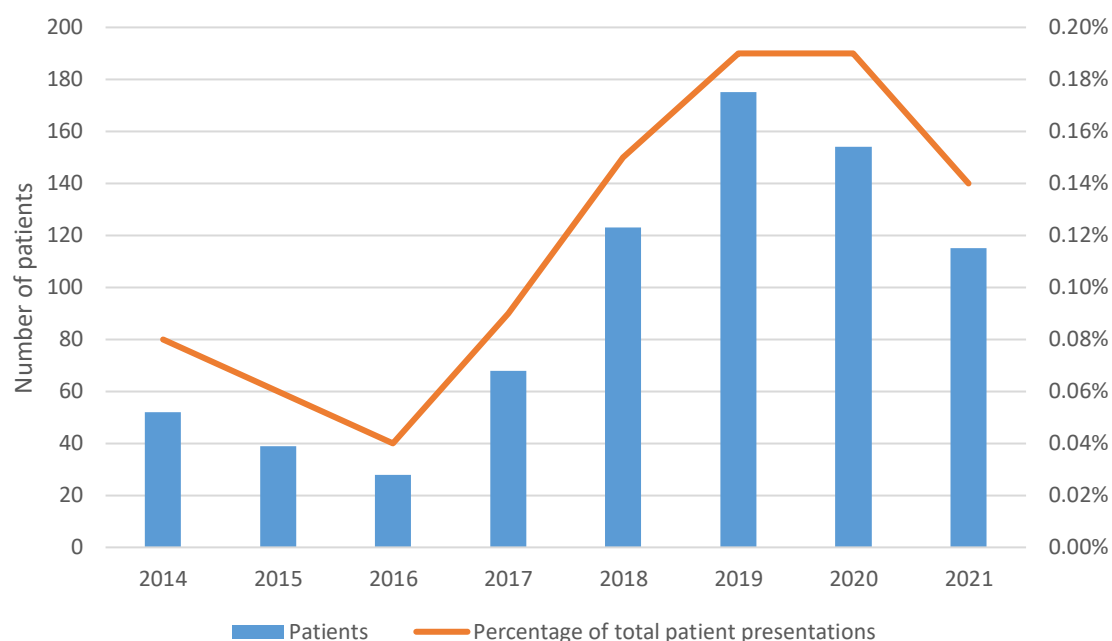


**Figure 23: Risk aversion theme from qualitative analysis**

Clinicians and managers spoke about risk during focus group one and how risk influences patients arrivals into the ED, patient flow in the ED and patients discharges. There were a few patient populations which were specifically discussed in terms of risk aversion and these were; police referrals, aged residential care patients and paediatric patients. The patient data for these groups will be examined in this section.

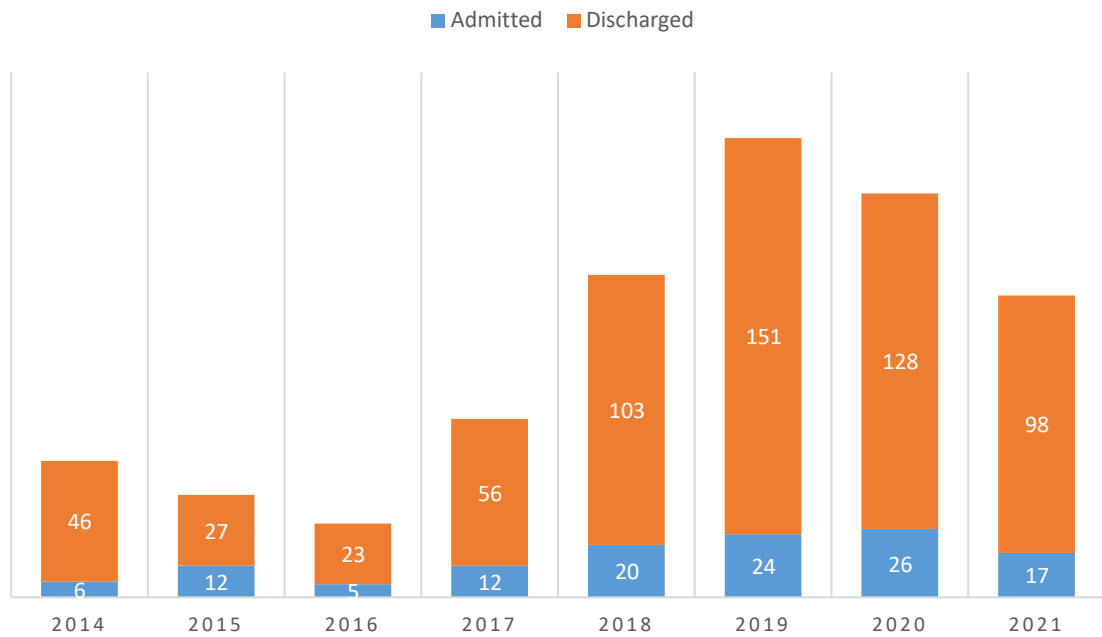
### 5.12.1 Police referrals

There was a discussion around a cautionary policy change with the police force and focus group participants believed they were getting higher numbers of presentations from patients who were in police custody. The patients who were classed as being referred by the police to ED are shown in Figure 24.



**Figure 24: Patients who arrived by police**

Figure 24 shows the number of patients who arrived with a referral code of ‘police’ to the research hospitals ED. These patients constitute less than one percent of the total patient population in the ED, however numbers have increased in the last four years when compared to the initial four-year period studied. The focus group participants were interested in the outcomes of these presentations, specifically whether patients were admitted to the hospital or discharged. The results are shown in Figure 25 below.

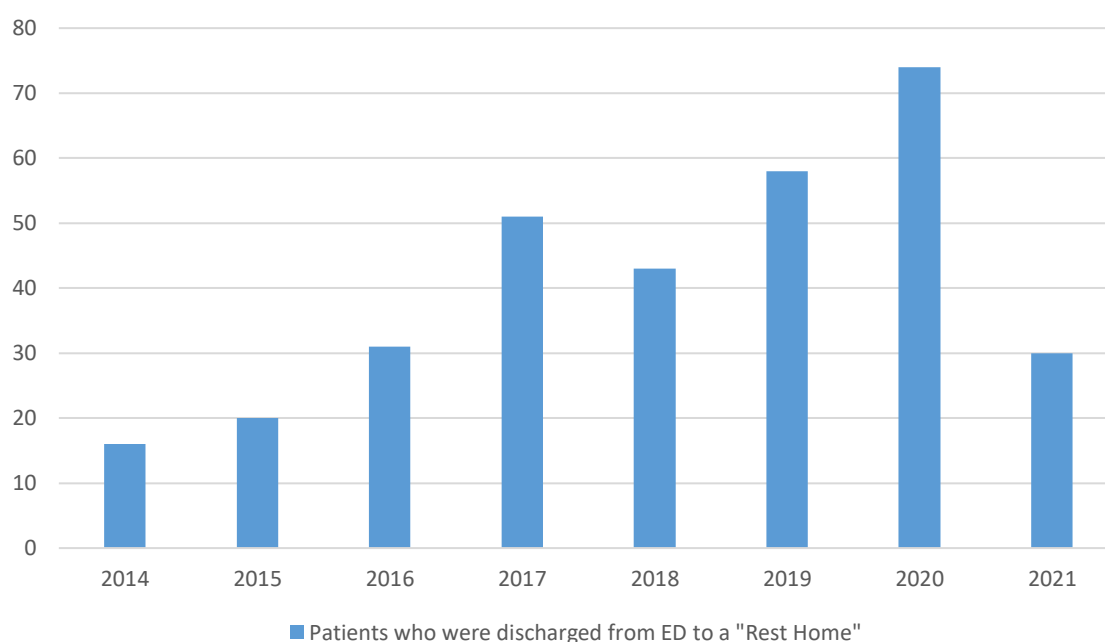


**Figure 25: Patients who arrived by police and outcome**

Figure 25 displays the number of patients who arrived with a referral source of 'police' and their subsequent outcomes of either admission or discharge. Although the majority of these patients were discharged from the ED, their total numbers are small compared to other patient cohorts. These findings were discussed when the next focus group was convened. The next cohort relevant to the theme of risk aversion consists of aged residential care patients.

### 5.12.2 Aged residential care

The ‘aged residential care’ (ARC) patients could only be identified from the data if their discharge destination code was ‘Rest Home’. There were very few numbers of these presentations. More patients likely arrive from ARC, but if they are not discharged from the ED, they are not coded as coming from an ARC facility. This made it difficult to assess the outcomes of this patient group.

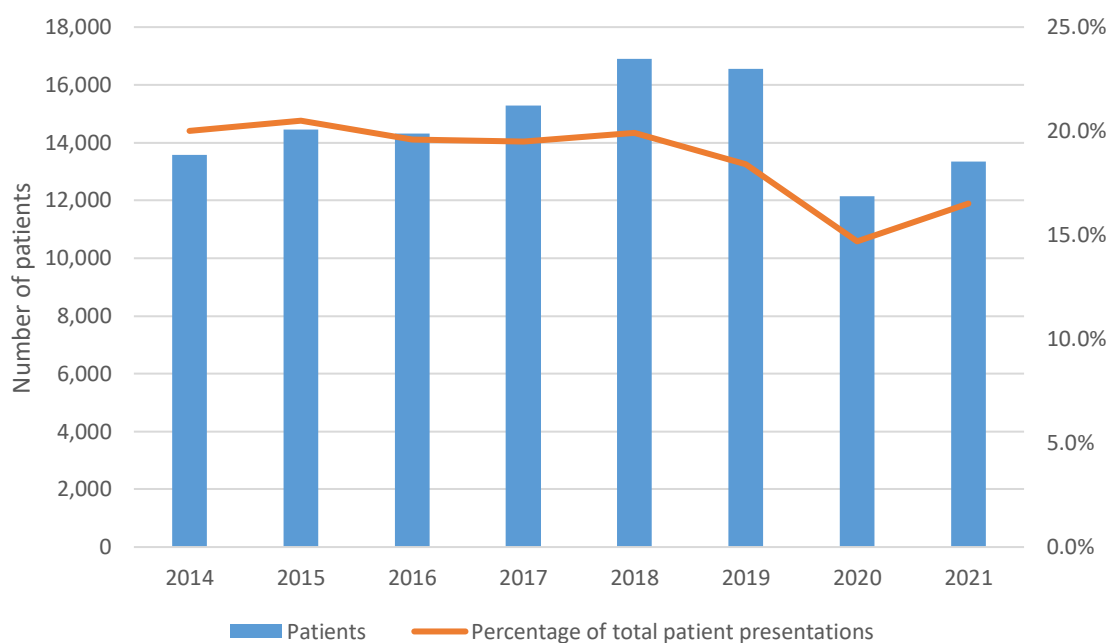


**Figure 26: Patients who were discharged from ED to a ‘Rest Home’**

Figure 26 shows the number of patients with a discharge destination of ‘Rest Home’ based on the data available to the research team. The presentation numbers of the ARC group did increase over time, however they only comprised less than one percent of total ED presentations each year. The difficulties with classifying these patients were discussed with the healthcare stakeholders when the next focus group was convened.

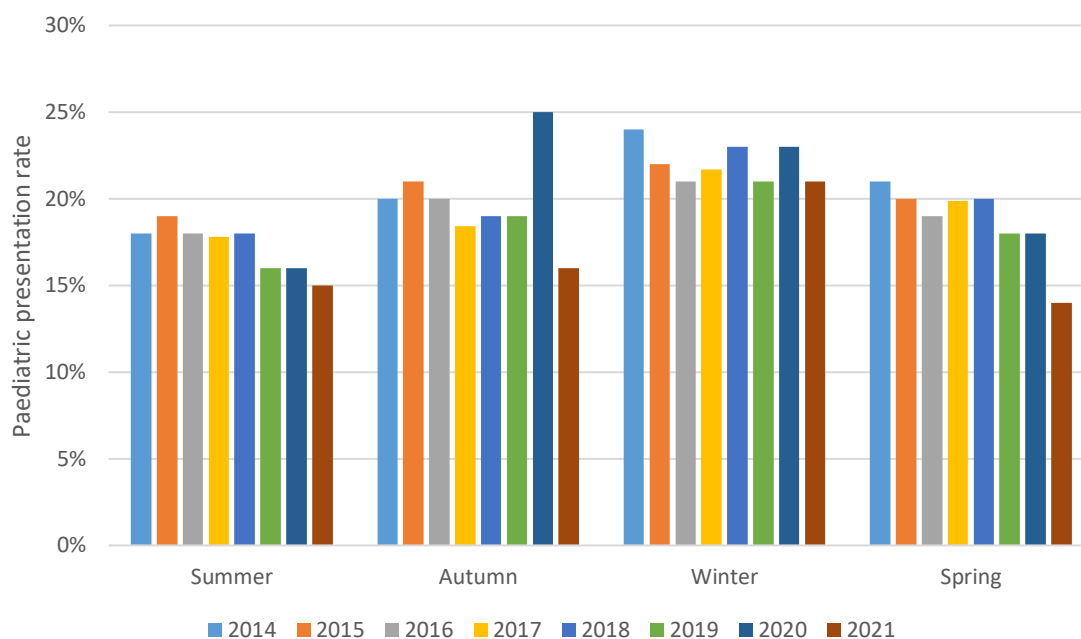
### 5.12.3 Paediatrics

The focus group discussed paediatric presentations, noting the varying volumes across different seasons and expressing concern about keeping paediatric patients longer than necessary due to risk aversion. This section highlights the trends in paediatric presentations.



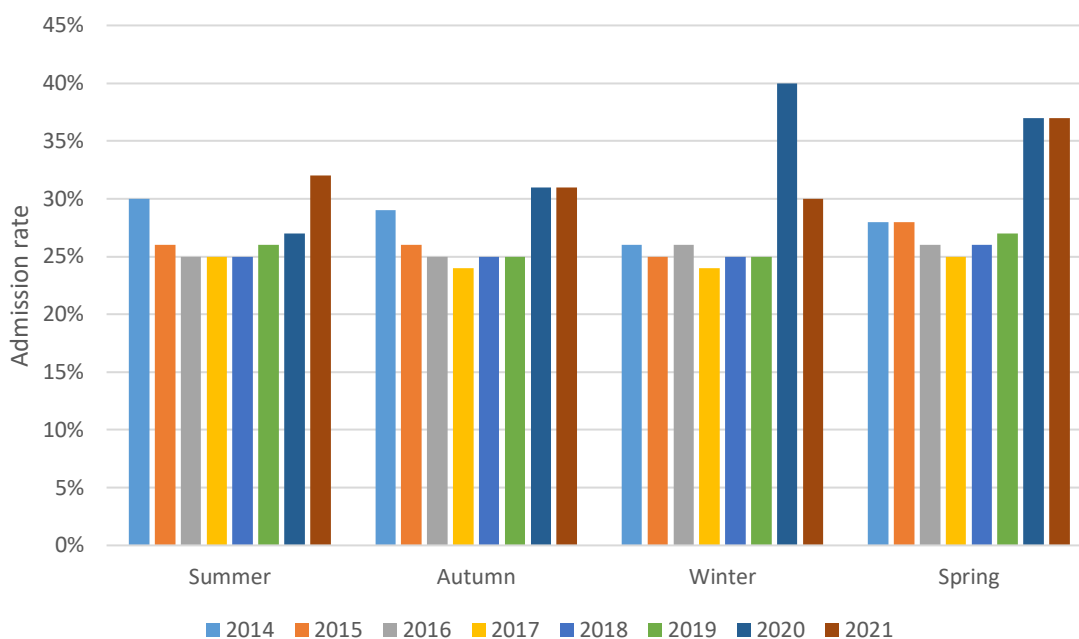
**Figure 27: Presentations of patients between 0-15 years of age (paediatrics)**

Figure 27 displays the number of paediatric presentations (ages 0–15) over an eight-year period. Paediatric presentations decreased during the COVID-19 pandemic in NZ from 2020 to 2021. Overall, this group constitutes between 15 and 20 percent of the total ED patient population. The following section examines the seasonal changes.



**Figure 28: Paediatric presentation rate by season (% of total ED presentations)**

Figure 28 illustrates the presentation rate of paediatric patients (0–15 years of age) to the ED by season. It is evident that there is a higher presentation rate during winter compared to other seasons. The admission rates to hospital of these patients are shown next.



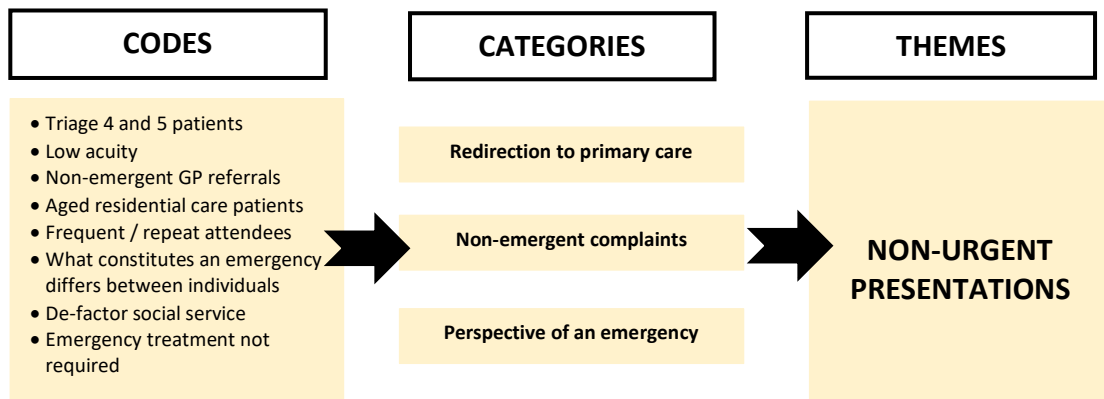
**Figure 29: Paediatric admission rate by season**

Figure 29 displays the admission rate for paediatric patients (0-15 years of age) by season. The rates appear relatively stable across the seasons, despite the varying presentation rates observed previously. The years 2020 and 2021 show higher admission rates, possibly due to greater availability in the paediatric ward during these years owing to lower presentation rates.

#### **5.12.4 Conclusion of risk aversion data**

Overall, there were challenges in examining ARC patients due to data coding issues. Police custody presentations had a high discharge rate, but overall, patient numbers were minimal. Paediatric patient trends were examined and each of these cohorts were discussed when the next focus group was convened.

## 5.13 Theme four: Defining non-urgent

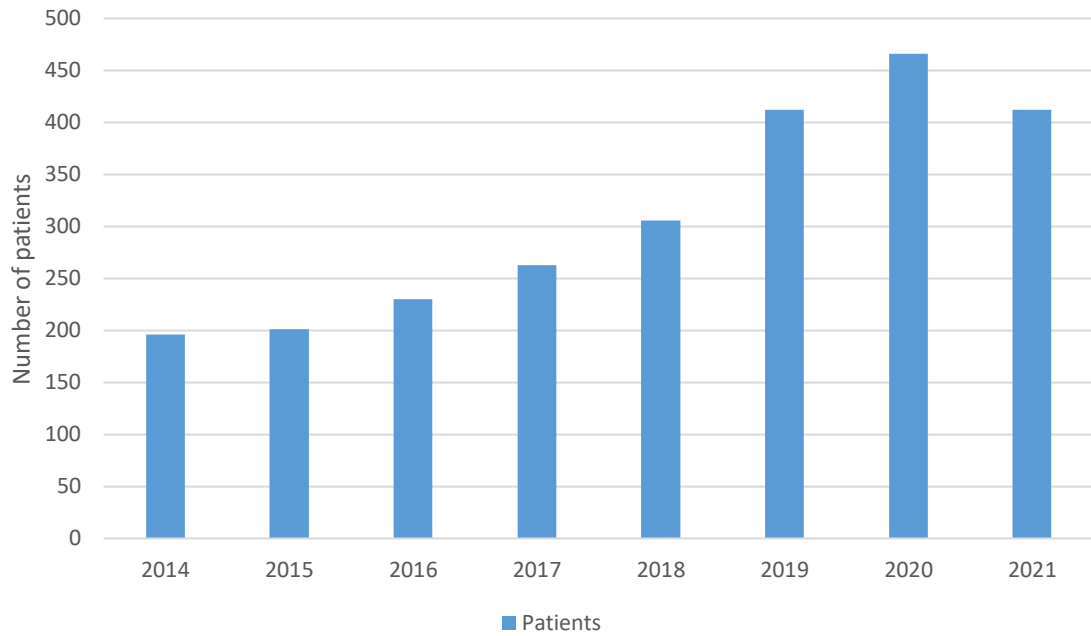


**Figure 30: Non-urgent presentation theme from qualitative analysis**

There was a discourse on non-urgent presentations in the first focus group session. Although there was acknowledgment of the challenge in defining non-urgent presentations, as each individual has a differing perception of what constitutes an emergency, there were specific patient groups that focus group stakeholders were interested in exploring further. These included mental health presentations and patients with low-acuity triage scores who were redirected. The data for these populations are presented below.

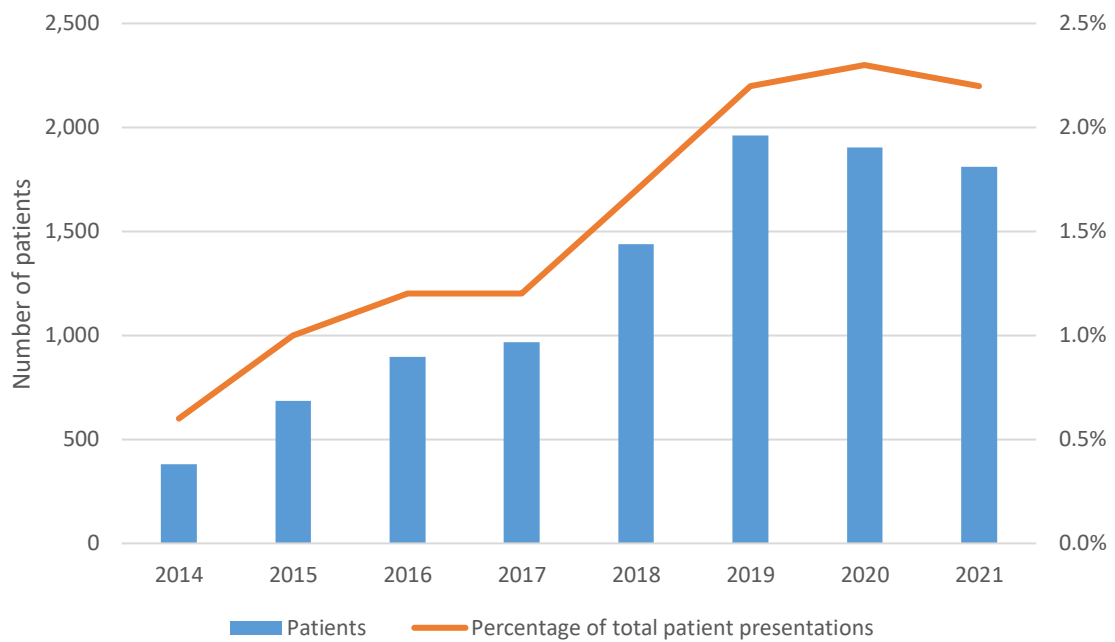
### 5.13.1 Mental health presentations

It was challenging to accurately determine the full extent of mental health presentations within the database. There was an attempt to group patients by discharge diagnosis; however, this proved inaccurate because some patients had diagnoses such as 'laceration to left arm' but were admitted to the mental health facility. Therefore, patients did not appear to be classified as mental health patients by diagnosis alone, although it was a self-harm diagnosis. Additionally, the 'Crisis Team' was used as the discharge specialty code, but in 2015, it was found that 78 patients admitted to the mental health ward had a discharge specialty listed as 'Emergency Medicine'. Therefore, an admission to the mental health ward and patients seen by the 'Crisis Team' have been used to show trends in mental health presentations over the past eight years.



**Figure 31: Mental health ward admissions by year**

Figure 31 shows the number of admissions to the mental health ward from the ED over an eight-year period. It can be seen that these patient numbers have increased over the eight-year period. Patients who were discharged from the ED by mental health services are shown in Figure 32.

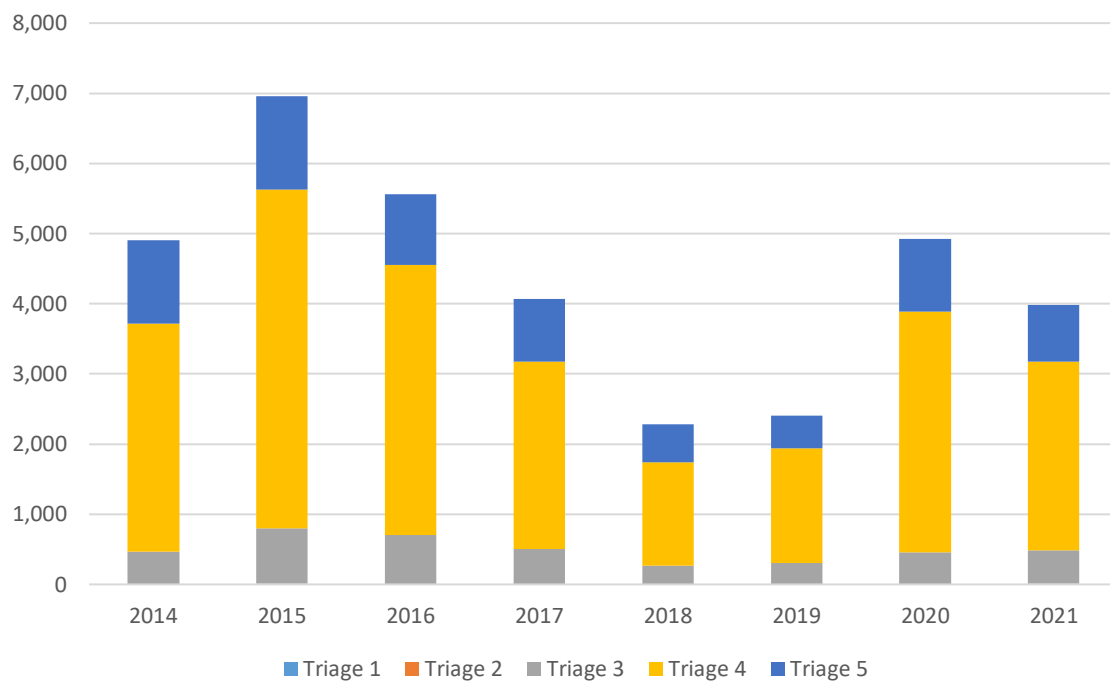


**Figure 32: Patients discharged by the 'Crisis Team' by year**

Figure 32 displays the number of patients discharged from the ED under the discharge specialty of 'Acute Mental Health Services – Crisis Team'. It also shows the percentage of total ED presentation numbers seen by the Crisis team each year. Overall, identifying specific mental health presentations from the data provided for this research study proved challenging and was discussed when the next focus group was convened.

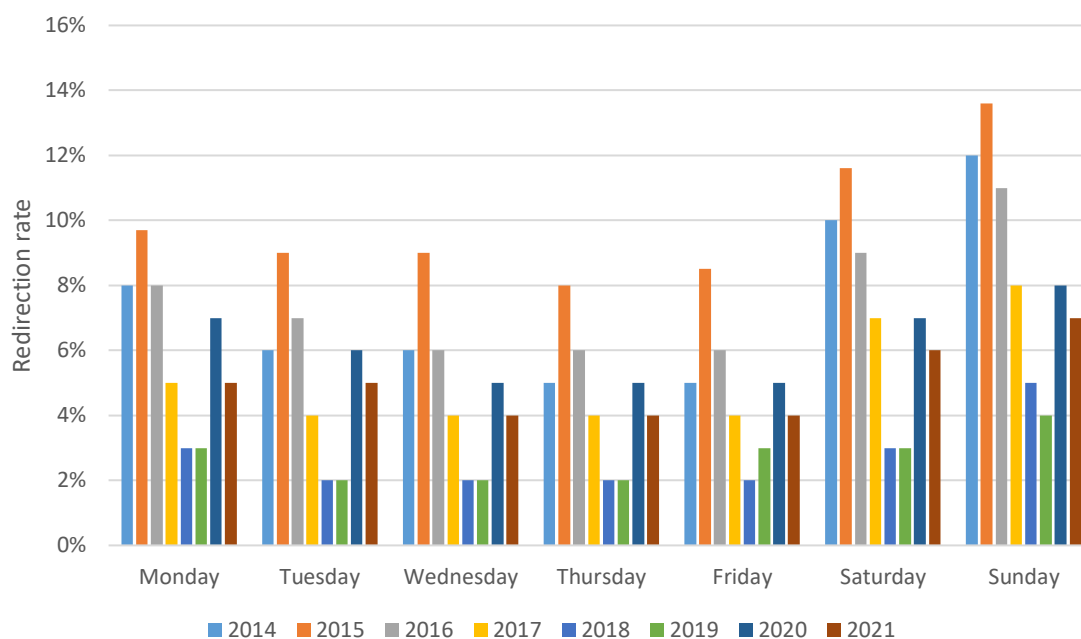
### 5.13.2 Redirected patients

This section includes the data of patients who presented to the ED and were redirected to primary care services also known as urgent care. This is an established pathway used to decrease the demand for the ED.



**Figure 33: Redirected patients by triage scale and year**

Figure 33 shows the number of patients redirected from the ED and their allocated triage scale. There is no discernible overall trend seen here, however these presentations are all low acuity triage scores. The day of the week of these redirections are shown in Figure 34.



**Figure 34: Redirection rate by the day of the week**

Figure 34 illustrates the percentage of all presentations that were redirected by the day of the week. For example, in 2014, eight percent of all presentations on Mondays were redirected to primary health care services. It is evident that the redirection rate on weekends tends to be higher than on weekdays. The reasons for these trends were discussed when the next focus group was convened.

### 5.13.3 Conclusion for defining non-urgent data

Difficulties in examining the mental health data in this section arose from issues with data entry and classification, which were discussed with healthcare stakeholders in the subsequent focus group session along with redirection rates and trends. The researcher created an ED outcome model with the research data.

## 5.14 ED outcome model:

Previous research studies have categorised non-urgent presentations in retrospective database reviews by combining triage levels with patient presentation characteristics. The researcher categorised all patient presentations from the dataset into three categories: ‘non-urgent presentations’, ‘Admitted patients’ and ‘ED treatment needed’. The non-urgent presentation cohort is discussed here, with the findings from the associated data analysis. Details of the admitted and ED treatment group analyses are provided in Appendix 8 of this thesis.

### 2019 DATA ANALYSIS RESULTS

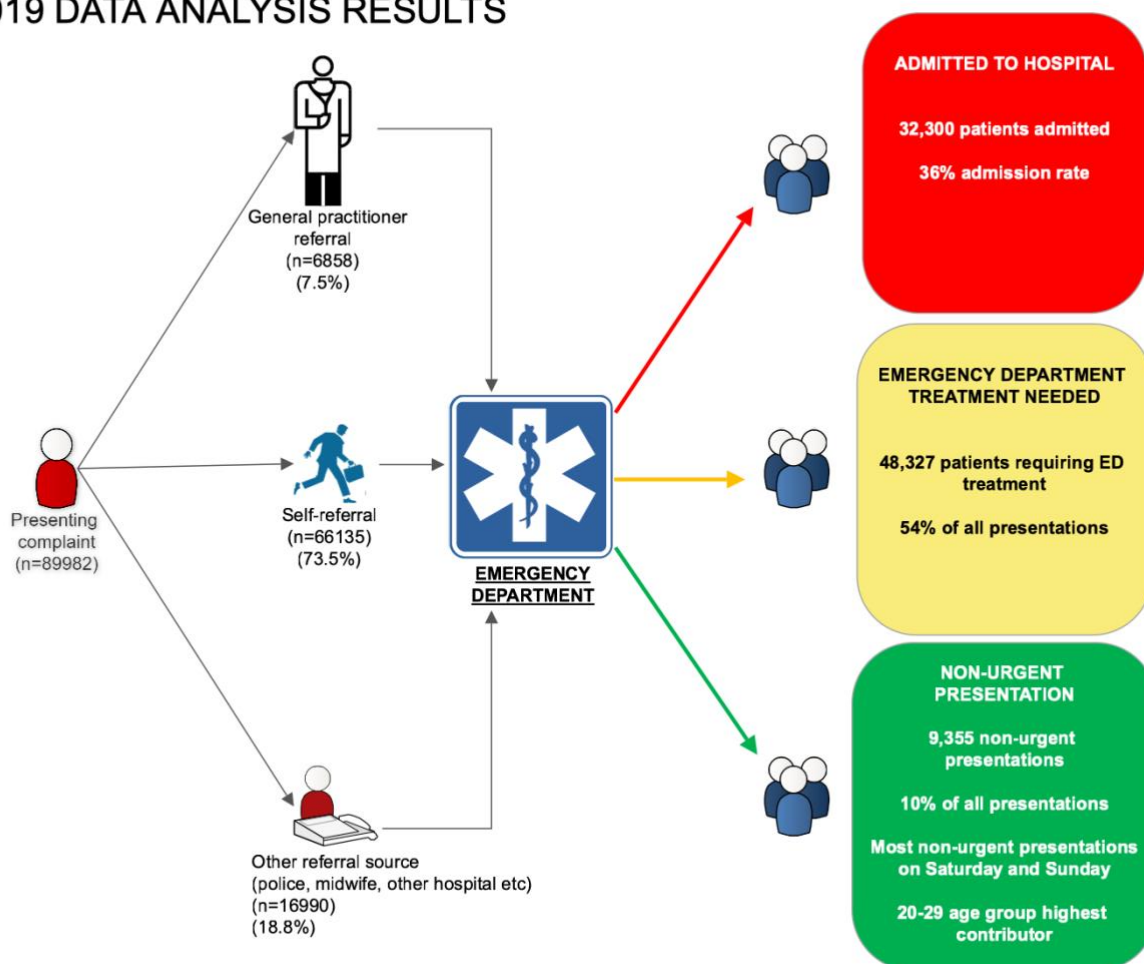


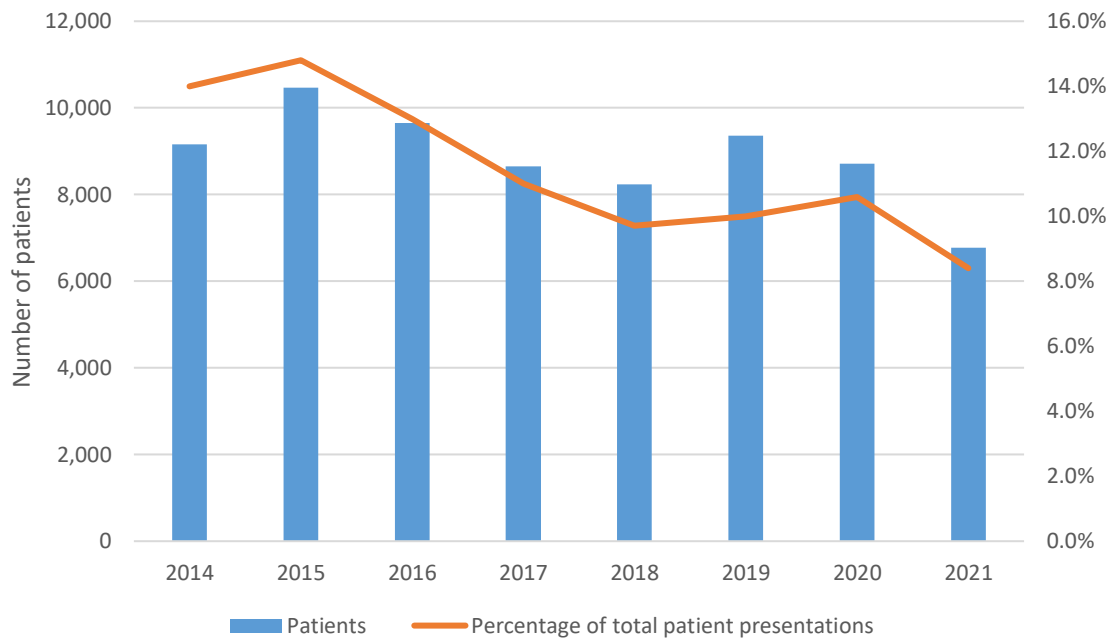
Figure 35: Overview of presentations in 2019 using the ED outcome model

### 5.14.1 Non-urgent presentations

An algorithm for non-urgent presentations was created using evidence from the current research literature and healthcare stakeholders views. The algorithm is specific to increase accuracy.

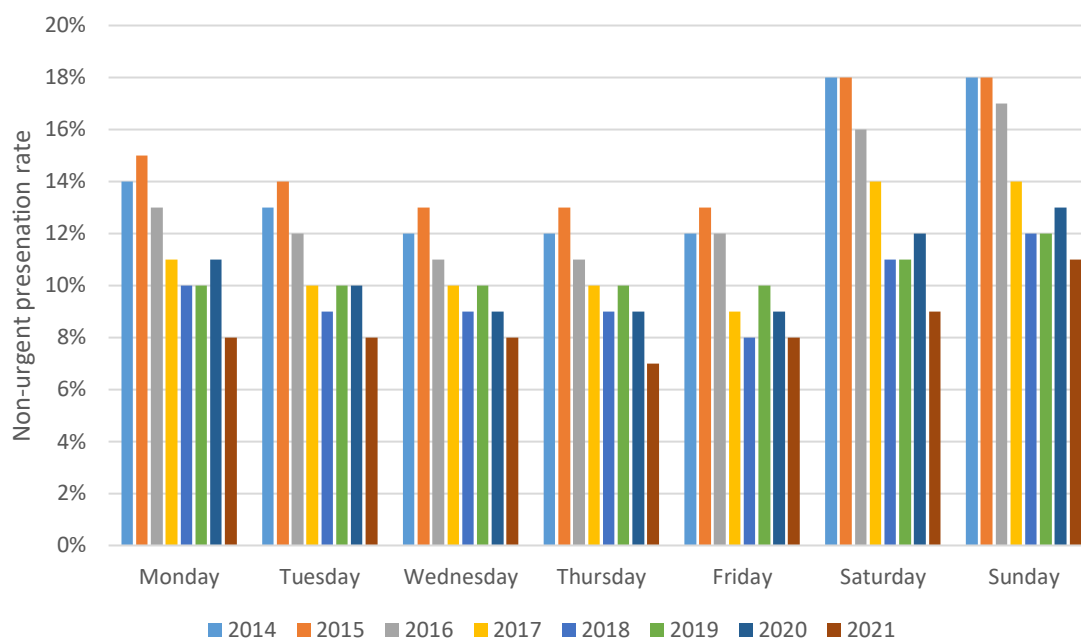
Patients who met **all** of the following criteria were classed as non-urgent:

1. Self-referred;
2. Walk-in (e.g., not an ambulance arrival);
3. Treatment duration of less than 60 minutes;
4. Not admitted;
5. Did not die during their time in the ED;
6. Did not get transferred to another hospital; and
7. Had a triage scale of 4 or 5.



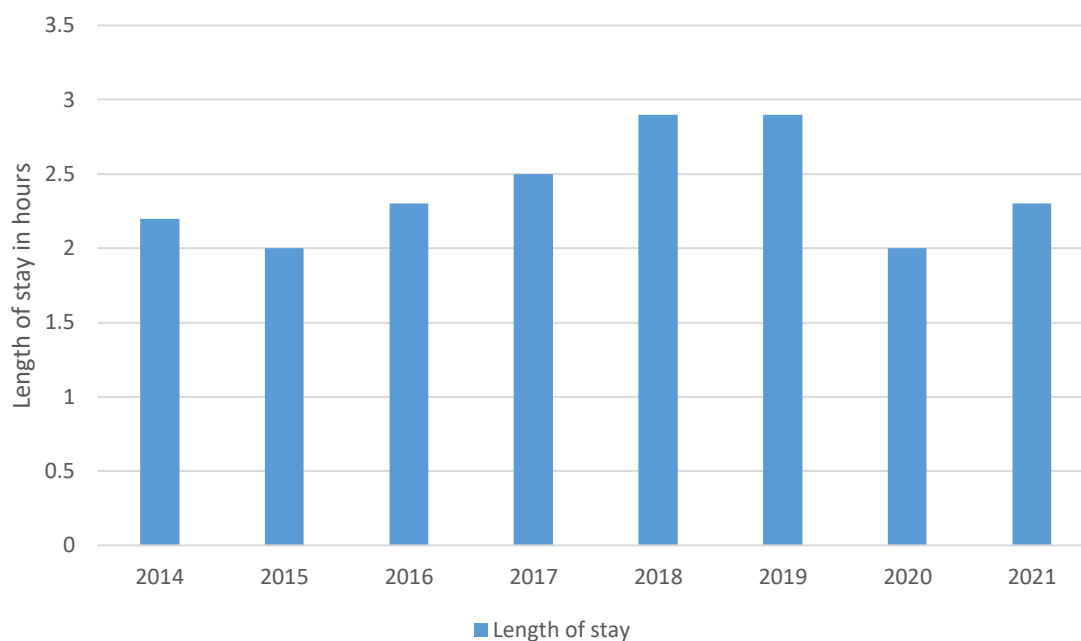
**Figure 36: Total non-urgent presentations by year**

Figure 36 shows the number of patients classed as ‘non-urgent’ from the algorithm. The trendline shows what percentage ‘non-urgent’ presentations contribute to the overall patient presentation population for each year. The day of arrival of these patients is shown in Figure 37.



**Figure 37: Non-urgent presentation rate by the day of the week**

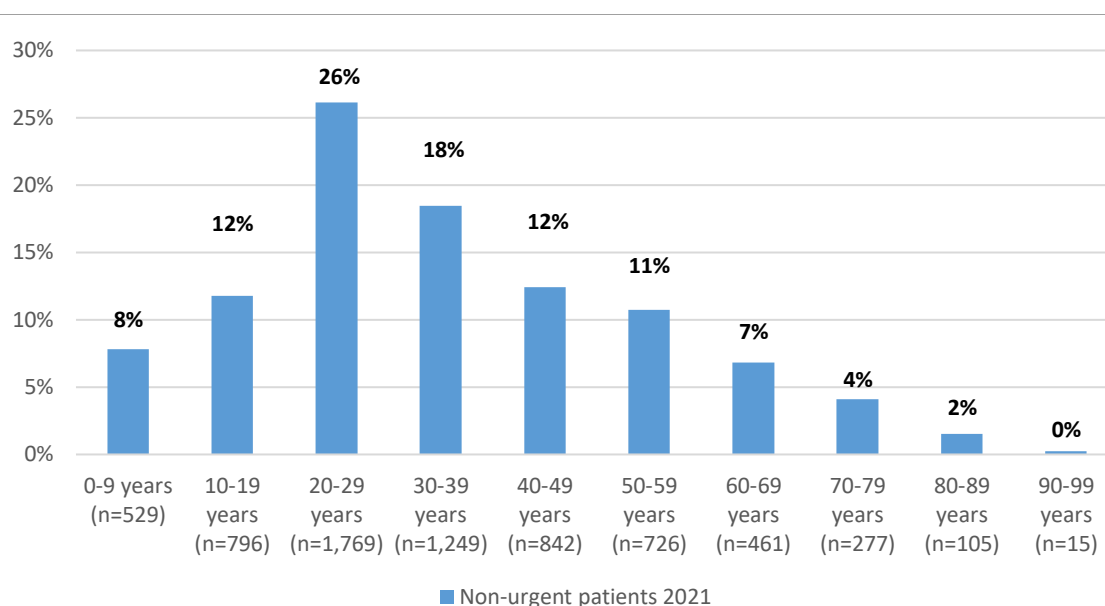
Figure 37 shows the rate of non-urgent presentations by the day of the week. For example, in 2014, 14 percent of all presentations on Mondays were classed as non-urgent and 18 percent of presentations on Saturdays and Sundays were classed as non-urgent. The rate of non-urgent presentations is higher on the weekends compared to weekdays. The length of stay of these patients is shown in Figure 38.



**Figure 38: Non-urgent presentations mean length of stay in ED**

Figure 38 shows the mean length of stay in the ED in hours for patients who were classed as ‘non-urgent’ from the algorithm. These patients spend a mean of two to three hours within the ED. These patients all had a treatment time of less than one hour, however they may wait in the ED for two hours before being seen by a doctor and their treatment time commencing. The age group breakdown of these patients is presented next.

Figure 39 shows the non-urgent presentation rates by age group in 2021, with the largest non-urgent presentation rates observed in patients between the ages of ten and sixty years.



**Figure 39: Non-urgent presentation rate by age group in 2021**

Patients between 20-29 years of age have the highest presentation rate in this group. This trend is seen across all years of data analysed, as shown in the Table 3.

**Table 3: Non-urgent presentation rates by age groups 2014 - 2021**

| Year | 0-9 years | 10-19 years | 20-29 years | 30-39 years | 40-49 years | 50-59 years | 60-69 years | 70-79 years | 80-89 years | 90-99 years |
|------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 2014 | 14%       | 17%         | 25%         | 13%         | 12%         | 9%          | 5%          | 3%          | 1%          | 0%          |
| 2015 | 13%       | 17%         | 25%         | 15%         | 11%         | 8%          | 6%          | 3%          | 1%          | 0%          |
| 2016 | 12%       | 16%         | 27%         | 15%         | 12%         | 8%          | 5%          | 3%          | 1%          | 0%          |
| 2017 | 12%       | 16%         | 26%         | 14%         | 12%         | 9%          | 6%          | 3%          | 1%          | 0%          |
| 2018 | 13%       | 15%         | 27%         | 15%         | 11%         | 9%          | 6%          | 3%          | 1%          | 0%          |
| 2019 | 11%       | 12%         | 26%         | 16%         | 11%         | 10%         | 8%          | 4%          | 2%          | 0%          |
| 2020 | 8%        | 12%         | 27%         | 18%         | 12%         | 11%         | 6%          | 3%          | 1%          | 0%          |
| 2021 | 8%        | 12%         | 26%         | 18%         | 12%         | 11%         | 7%          | 4%          | 2%          | 0%          |

Non-urgent presentation rates begin to decrease after 49 years of age and are the highest among patient between 10 and 49 years of age. The diagnoses of these patients are shown in Table 4.

**Table 4: Top two diagnoses of non-urgent patients by year**

| Year | Diagnoses  |
|------|--|
| 2014 | Other specified general symptoms and signs: 2,007 patients<br>Sprain and strain of ankle, part unspecified: 275 patients |
| 2015 | Other specified general symptoms and signs: 2,044 patients<br>Sprain and strain of ankle, part unspecified: 374 patients |
| 2016 | Other specified general symptoms and signs: 1,493 patients<br>Other and unspecified abdominal pain: 310 patients         |
| 2017 | Other specified general symptoms and signs: 1,534 patients<br>Sprain and strain of ankle, part unspecified: 252 patients |
| 2018 | Other specified general symptoms and signs: 1,091 patients<br>Other and unspecified abdominal pain: 233 patients         |
| 2019 | Other specified general symptoms and signs: 2,842 patients<br>Unknown and unspecified causes of morbidity: 218           |
| 2020 | Other specified general symptoms and signs: 5,104 patients<br>Unknown and unspecified causes of morbidity: 144           |
| 2021 | Other specified general symptoms and signs: 3,985 patients<br>Unknown and unspecified causes of morbidity: 82            |

The diagnoses provided for these patients are very broad, which limits their usefulness when examining the reasons for ED attendance. The domiciles where these patients live were also examined, as there was interest in exploring whether certain areas may contribute to individuals presenting to the ED. The domiciles reviewed were assessed along with their socioeconomic deprivation levels. In NZ, socioeconomic deprivation is measured by the New Zealand Index of Deprivation (NZDep).

Higher levels of deprivation are associated with worse health outcomes. The NZDep is an area-based measure of socioeconomic deprivation based on nine census variables (income, home ownership, employment, qualifications, family structure, housing, access to transport and communications) and is displayed in deciles (Atkinson et al., 2019). The least deprived areas are represented as decile one, while the most deprived areas are represented as decile ten. The top three domiciles for each year in the table below were linked to high deprivation zones. Consequently, the researcher used Domicile D, one of the least deprived areas in the region, as a comparison zone. The top three domiciles per year are in Table 5 in the form of non-urgent presentation rates.

**Table 5: Top three domiciles with the highest non-urgent presentation rates per year**

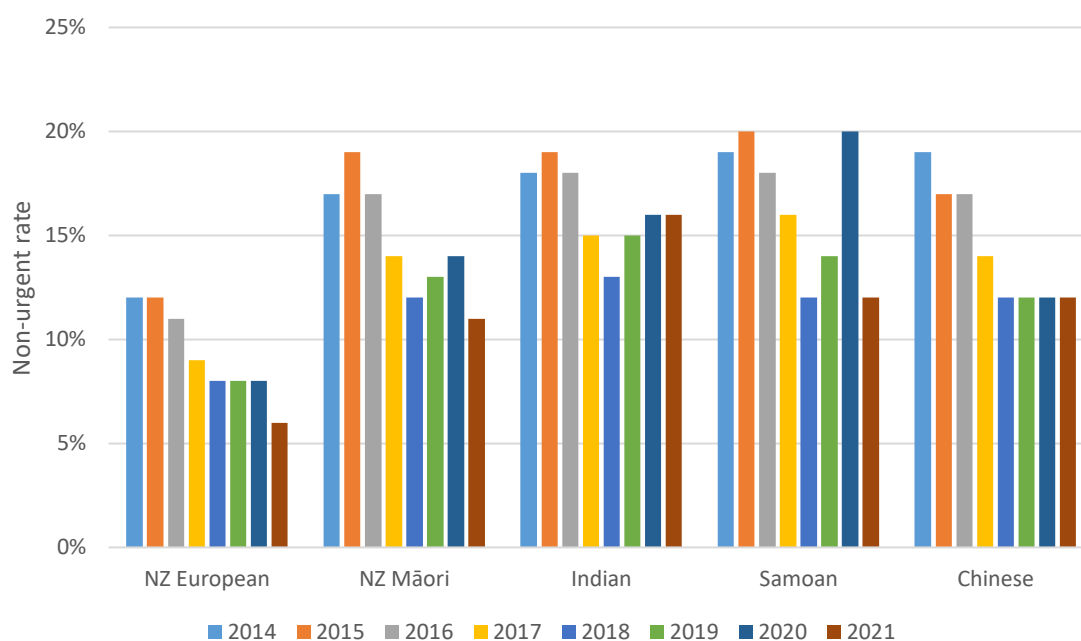
| Domicile | NZDep | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|----------|-------|------|------|------|------|------|------|------|------|
| <b>A</b> | High  | 19%  | 21%  | 19%  | 17%  | 15%  | 15%  | 17%  | 14%  |
| <b>B</b> | High  | 23%  | 24%  | 22%  | 18%  | 17%  | 18%  | 20%  | 17%  |
| <b>C</b> | High  | 22%  | -    | -    | -    | -    | -    | -    | -    |
| <b>E</b> | High  | -    | 30%  | 21%  | -    | 15%  | 18%  | 19%  | 13%  |
| <b>F</b> | High  | -    | -    | -    | 12%  | -    | -    | -    | -    |
| <b>D</b> | Low   | 11%  | 9%   | 8%   | 6%   | 5%   | 8%   | 6%   | 6%   |

Table 5 indicates that areas with high levels of deprivation had higher rates of non-urgent presentations compared to Domicile D, which was among the least deprived areas. Table 7 shows the non-urgent patient numbers for these domicile by year.

**Table 6: Top three domiciles of non-urgent presentations – patient visits**

| Domicile | NZDep | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|----------|-------|------|------|------|------|------|------|------|------|
| <b>A</b> | High  | 493  | 607  | 620  | 532  | 456  | 498  | 596  | 477  |
| <b>B</b> | High  | 314  | 393  | 335  | 298  | 305  | 305  | 346  | 266  |
| <b>C</b> | High  | 311  | -    | -    | -    | -    | -    | -    | -    |
| <b>E</b> | High  | -    | 434  | 324  | -    | 258  | 258  | 281  | 194  |
| <b>F</b> | High  | -    | -    | -    | 251  | -    | -    | -    | -    |
| <b>D</b> | Low   | 127  | 115  | 114  | 95   | 79   | 124  | 91   | 81   |

Table 6 displays the non-urgent patient numbers per year instead of the non-urgent presentation rate. Along with domiciles, the ethnicities of this patient group were also examined and the main ethnic groups are shown below with their respective non-urgent presentation rates to the ED.



**Figure 40: Non-urgent presentation rates by ethnicity**

Figure 40 illustrates the rates of non-urgent ED presentations across the most prevalent ethnic groups in 2021. Among all presentations, six percent of NZ European, 11 percent of Māori, 16 percent of Indian, 12 percent of Samoan and 12 percent of Chinese cases were categorised as non-urgent. To compare these findings with patients who require hospital treatment, it was decided to examine the trends of patients admitted to hospital over the eight-year period in this research study. The hospital admission rates by ethnicity were contrasting to the non-urgent rates, with 2021 data showing that among all presentations, 43 percent of NZ European, 35 percent Māori, 29 percent Indian, 36 percent Samoana and 31 percent Chinese cases were admitted to hospital. The graphs showing these data findings and further analysis of admitted patients and ED treatment patients are attached in Appendix 8.

### **5.15 Conclusion of the discovery stage quantitative analysis**

The preceding section explored patient data pertinent to the themes discussed during the first focus group session. These findings formed the basis for the next stage, which involved gathering healthcare stakeholders' perspectives. This marks the conclusion of the discovery stage. The following section presents the stage-gate process, including the decision made at Gate One.

## 5.16 Discovery stage (stage one): Gate one decision

The discovery stage concluded upon the completion and analysis of the focus group discussion, as well as the review of associated patient data. The project to this point is depicted in Figure 41 below:



**Figure 41: Gate one decision**

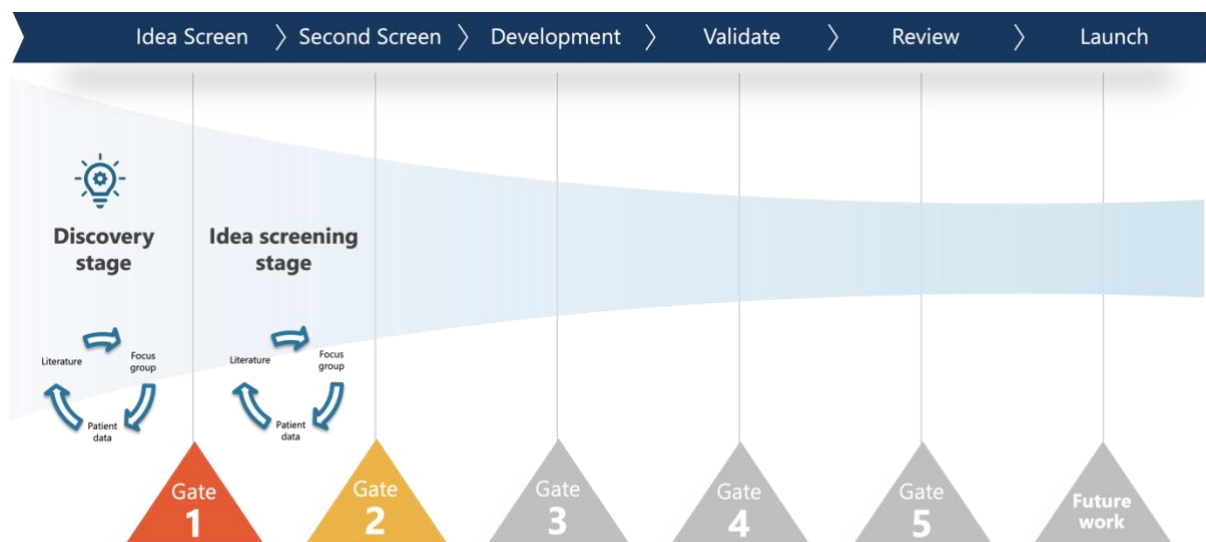
The stage-gate process involves making a decision at each gate regarding the projects continuity. There are inputs, exit criteria and an output associated to each gate, with the relevant aspects for the discovery stage shown in the Table 7.

**Table 7: Gate one decision point**

| Gate one decision point:               |   |
|--|---|
| <b>Inputs:</b>                         | <ol style="list-style-type: none"> <li>1. Focus group one data collection and analysis report.</li> <li>2. Patient database review and analysis report.</li> </ol>  |
| <b>Exit Criteria:</b>                  | <ol style="list-style-type: none"> <li>1. Patient cohorts can be formed based on the themes identified in the first focus group.</li> <li>2. Corresponding insights gleaned from patient data are considered adequate.</li> </ol> |
| <b>Output:</b><br>Go/Hold/Stop/Recycle | <ol style="list-style-type: none"> <li>1. <b>Go:</b><br/>The exit criteria for the discovery stage were successfully met, the decision to advance to the next stage was made.</li> </ol>  |

## 5.17 Idea screening stage (stage two)

As the project passed through the first gate, it moved onto the idea screening stage. An overview of the project at this stage is shown in Figure 42.

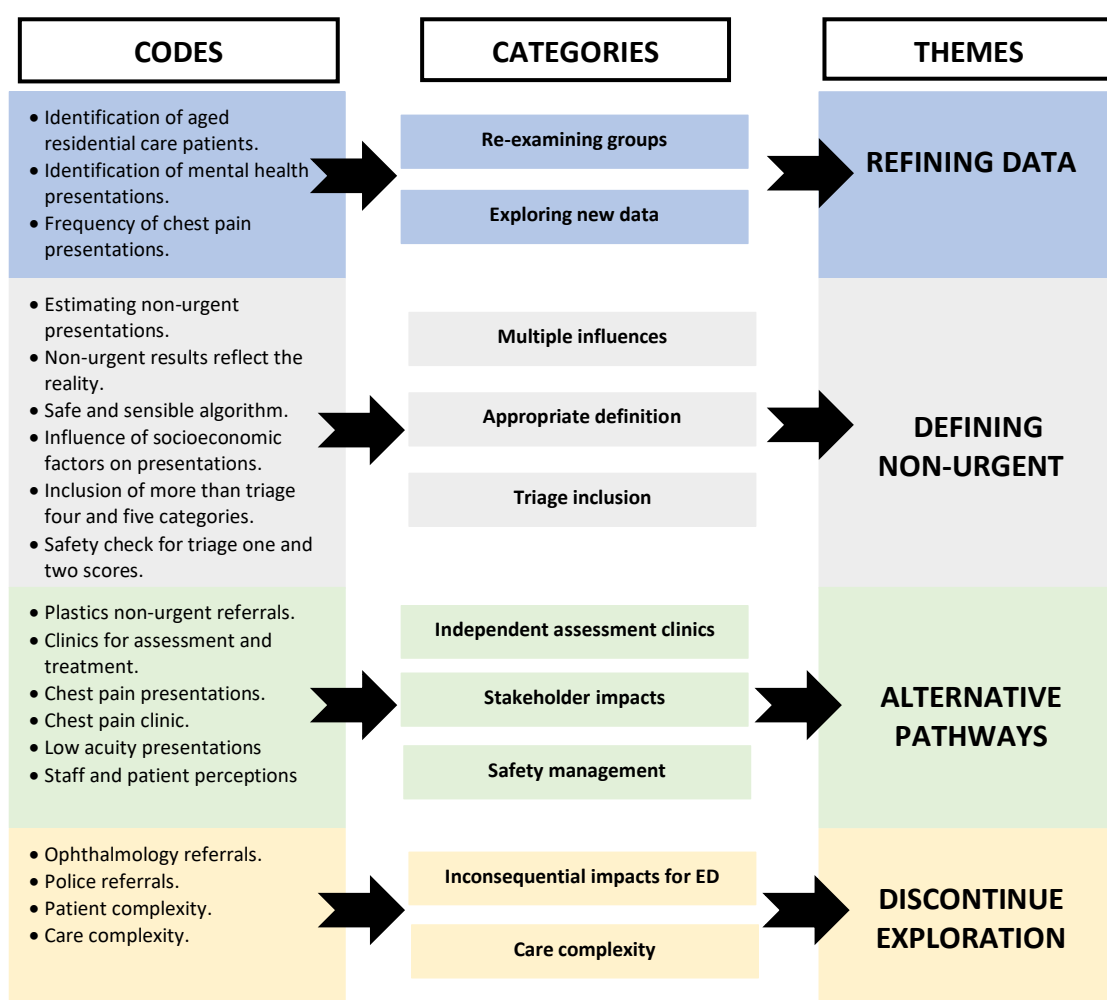


**Figure 42: Overview of the idea screening stage**

During the idea screening stage (stage two), a focus group session was conducted along with another analysis of the patient database. The quantitative data report from the discovery stage served as the basis for discussion during the second focus group session. This report facilitated a focused conversation on relevant patient data, allowing for an exploration of the reasons behind the data findings from the perspectives of the healthcare stakeholders. Following this section, the thematic analysis findings of the idea screening stage are presented.

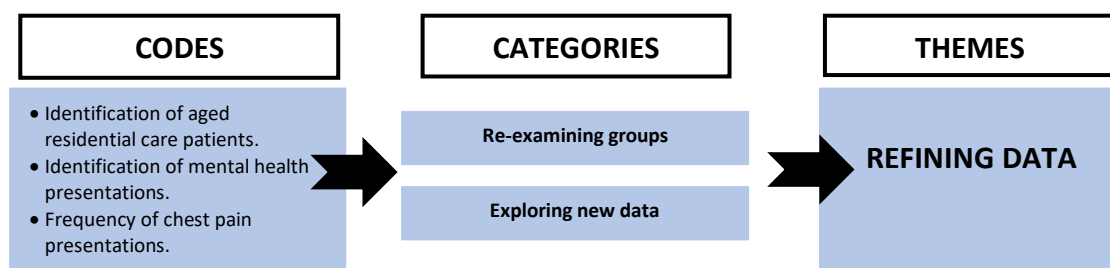
## Idea screening (stage two): Focus group two

The second focus group was conducted with the same healthcare stakeholders as focus group one. The second focus group was also analysed utilising thematic analysis and the four key themes identified were: (i) refining data; (ii) defining non-urgent; (iii) alternative pathways; and (iv) discontinue exploration. The figure below displays the codes, categories and themes were which produced from the thematic analysis of focus group two. These themes will be discussed in detail in this section.



**Figure 43:** Focus group two thematic analysis theme construction

## 5.18 Theme one: Refining data



**Figure 44: Refining data theme**

The theme ‘refining data’ arose from three codes which were collapsed into two categories. This dominant theme, identified by all focus group participants, primarily stemmed from a lack of trust in the quality of the data. There were controversial opinions when it came to the ‘aged residential care’ (ARC) patients with some focus group participants sharing the opinion that there were high numbers of ARC patients who presented to the ED. However, others held an opinion that these patients are complex and required more time and attention than others which may create a perception that the presentations are higher than they are in reality. The healthcare stakeholders were interested in seeing more specific data on patients who lived in aged residential care and patients who presented with mental health concerns. One clinician spoke about their perception of ARC presentation being higher than the data showed:

*I’m going to disagree, a big change in 2019 we tried to do an acute geriatric assessment area and I know that there would be at least 4-5 patients that were kept overnight and I would say that 50 percent of those patients were rest home patients.*

(Clinician 2)

A manager spoke about the perception of these patients and how it might alter one’s view of the volume of patients the ED attends:

*I’m happy to agree with the numbers and I think it is the same issue as, what I mentioned with the police these are patients that we notice out of proportion to the numbers because they are complex and tend to spend a long time in the ED.*

(Manager 1)

A clinician agreed with the above opinion and stated that they believed ARC patients created more discussion and frustrations within the ED team and hence created more ‘noise’:

*..our impression is that the aged residential care problem is a question of as much of appropriateness as anything else and the issue for us and the ED is that, one patient who obviously doesn't need to be here generates far more noise than 20 patients who don't need to be here. So you hear all about them for the next 24 hours at least, if you get one.*

(Clinician 2)

Another clinician was interested in reviewing arrivals of ARC presentations by the day of the week due to an anecdotal perception in the ED:

*It would be interesting to see how many are referred from rest homes on Fridays, I mean it's a myth, but the feeling is they try to lower the census in rest homes over the weekends as their staffing is less.*

(Clinician 1)

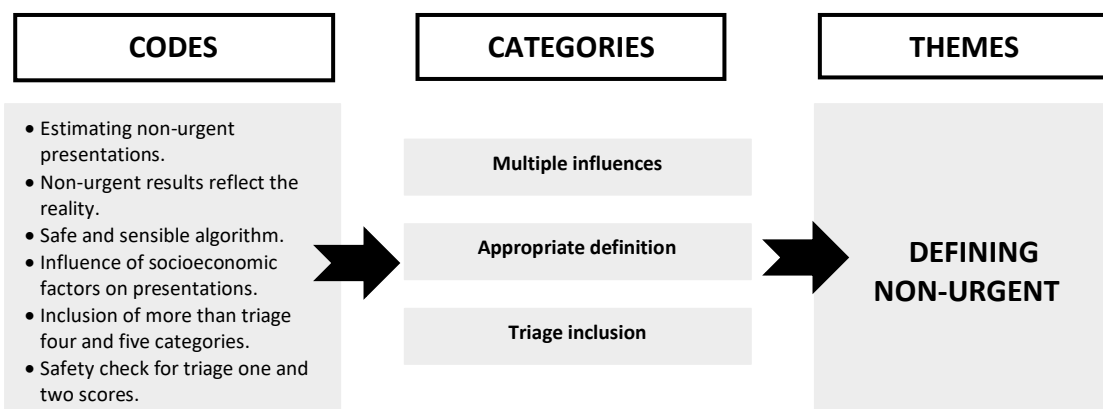
Presentations from ARC patients were therefore reviewed in further detail in the subsequent quantitative database review. There was difficulty defining mental health presentations from the patient data in the first quantitative database review and to assess each individual presentation was out of the scope of this research topic. A clinician had the following view on the data:

*For the reasons you stated it seems so problematic, but I feel like we are seeing more (mental health patients) with the stresses of COVID and everything else. But yeah I can see all the problems you have classifying them.*

(Clinician 2)

The mental health patient population remained an area of interest, which is addressed in the second quantitative data report. The theme of refining data therefore helped guide the second quantitative database review.

## 5.19 Theme two: Defining non-urgent presentations



**Figure 45: Defining non-urgent theme**

The theme of non-urgent presentations has been prominent throughout this research as clinicians and managers looked at identifying a cohort of patients who could receive their assessment and treatment in an alternative setting to the ED. The theme ‘defining non-urgent presentations’ arose from six codes which were collapsed into three categories. The focus group participants discussed the term non-urgent and their views on the term:

*I think non-urgent is the term most used in the literature when I read about it, I mean it always difficult defining it, but I would still use that term.*

(Clinician 1)

*yeah, you need a term that really highlights a group that can be offered a service that doesn't need our service, there is no easy name for it.*

(Manager 3)

The focus group participants also discussed the ‘ED Outcome Model’ from the quantitative database findings report in the discovery stage. They were focused on the non-urgent group within this model and the characteristics that were used to define this population:

*These numbers feel right to me, like you know in the literature I've seen anywhere from 7 to 50 percent of presentations being non-urgent. It's all a matter of defining it and I think this model does a good job of that.*

(Clinician 2)

*I'm more than happy with the definition, it probably underestimates the group that we could potentially provide alternative services for, but I think this is a safe and sensible definition.*

(Clinician 1)

*We are overrepresented with this cohort of patients compared to some other regions. So it starts to give us a really strong business model that we could put forward on how we can work with these people differently.*

(Manager 1)

There was a discussion around the inclusion of triage four and five within the non-urgent algorithm.

Focus group participants had views that utilising triage scores alone can be quite complicated:

*The problem is, Triage 3 and 4 are such difficult triage scores that people cannot really differentiate between the two, so yeah, I've seen triage 4 end up in HDU and I've seen triage 4 be sent home in an hour, triage 5 is pretty clearly defined, it's always triage 3 and 4 when you do this stuff it's really difficult.*

(Clinician 1)

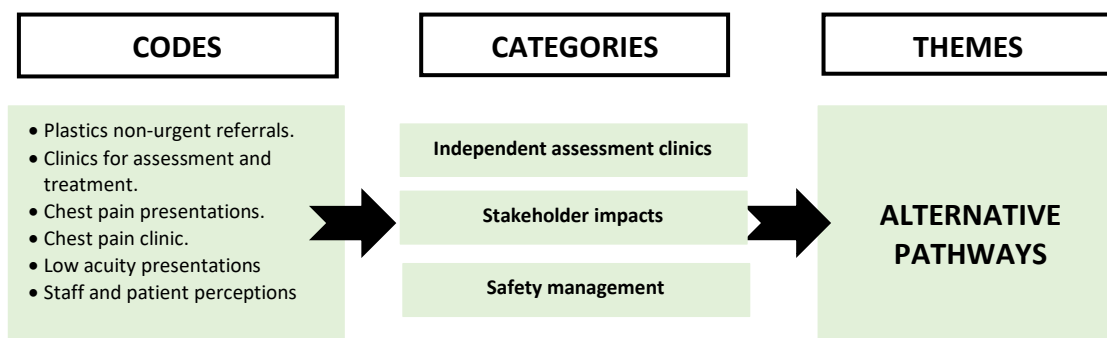
Another clinician highlighted that the main role of triage is to prioritise treatment by how long a patient can safely wait. However, as the ED is often operating in a way that demand exceeds supply some patients that are deemed as a triage two (can safely wait ten minutes) are often waiting longer in reality:

*If you look at it, triage is how long someone can safely wait, if you look at it, by definition most of our patients are triage 5 as they are waiting over two hours to be seen or wait over two hours without an adverse event.*

(Clinician 2)

There was a consensus that utilising triage four and five scores along with: self-referred, walk-in, treatment time less than 60 minutes and being safely discharged was a safe and sensible way to categorise patients who are deemed 'non-urgent'.

## 5.20 Theme three: Alternative pathways



**Figure 46: Alternative pathways theme**

The theme, ‘alternative pathways’ arose from six codes which were collapsed into three categories. When looking at new ways of working i.e., alternative pathways, there was a discussion around equity and the importance of acknowledging the social economic determinants of health:

*Yeab there is a whole lot of drivers for this that are complicated aswell, um. we haven't discussed equity in this discussion which is a driver for people coming to the ED, going to your GP costs money, going to urgent care costs money, there are those drivers.*

(Manager 2)

*It is really consistent with our admission avoidance referrals from GPs, they are all decile nine and 10 people who are living in poor accommodation and have low-incomes.*

(Manager 1)

It was established that equity and access would need to be addressed when developing a new pathway. There were also specific discussions around patient groups and how they could be managed differently. Patients who are referred by their GP to the plastics speciality and wait in ED to be seen was one of these groups with one clinician’s perception being:

*Can I play devil's advocate on this patient group? I think they are noise rather than a major problem for us and yes there is definitely potential for them to be seen somewhere else, but the majority of these patients spend most of their time sitting in our waiting room, so yes there is a resource implication for looking after them but they are not the patients that are blocking the sick elderly patient with sepsis or heart failure or any of the other things that we see into an assessment cubicle.*

(Clinician 2)

A manager replied to the above opinion and highlighted the impact this patient group can have on nursing staff:

*I would say I totally agree with you around the impact it has on our beds, but it does have an impact for our nursing staff who oversee the waiting room and it causes them unnecessary anxiety and distress that they are seeing these people just sitting and waiting there for the teams to arrive and it is unnecessary noise.*

(Manager 2)

Another manager spoke about the implications from a patient perspective:

*I guess though from a patient perspective; they could be supported in a much better way than sit in our waiting room. A clinic is a fantastic idea for these patients and to see them at a sensible time of the day in a more efficient way would be a better option.*

(Manager 4)

The discussion regarding patients waiting to see the plastic surgery specialty highlighted the importance of considering the impacts on patients, staff and the environment when exploring new ways of working.

There was a discussion around patients who attend the ED for chest pain and if there was an ability to investigate these patients' data and create a new pathway for them:

*To play devils advocate a large proportion of our triage 2 patients are chest pains and it would be in the realm to set up a chest pain clinic in the community for these patients.*

(Clinician 2)

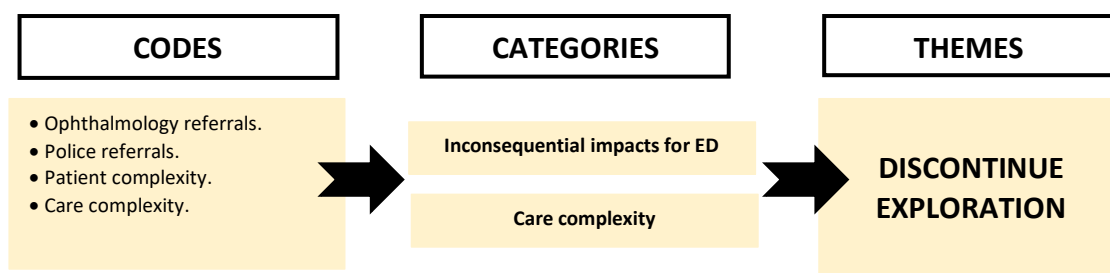
The participants discussed changes to the admission criteria for patients with chest pain:

*They actually changed it, where initially when we did chest pain work ups a lot of people were admitted for exercise tolerance testing, but then they changed their algorithm and that was to be organised by the GP within seven days.*

(Clinician 1)

Patients presenting with chest pain were addressed in the subsequent quantitative patient database review.

## 5.21 Theme four: Discontinue exploration



**Figure 47: Discontinue exploration theme**

The theme, ‘discontinue exploration’ arose from four codes which were collapsed into two categories. There were several areas from the database report that were no-longer of interest at the conclusion of the second focus group session. One of these areas was Ophthalmology referrals and it was decided that this group has inconsequential impacts for the ED:

*The majority of them go straight through to clinic. You might argue that at any point of that journey is stopping in ED a valuable part, my experience that the majority of all ophthalmology patients go to clinic even if they will be admitted as they are far better set up to do an examination there than the ED.*

(Manager 3)

There was also a discussion regarding police referrals and that this population was not large enough to justify continuing to investigate:

*These are very visible patients that you notice, so we probably have a selection bias for this patient group, because they are often the ones that are causing us an issue. There aren't enough numbers here to give cause for a new pathway.*

(Clinician 2)

Patient and care complexity was discussed and it was concluded that social attendances can be driven by a medical deterioration and therefore can be more complex than they appear:

*Most elderly patients with that bad term of acopia or social attendances usually have something medical which has tipped them over the edge.*

(Clinician 2)

One clinician also highlighted that some orthopaedic patients require ED services and dual-care and therefore can also be more complex than they appear:

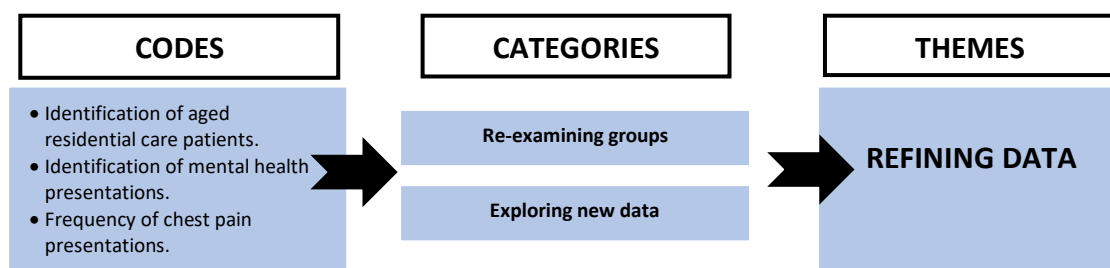
*Quite a lot of orthopaedic discharges have dual care with emergency medicine, this is quite often the group that get their limb reduced and plasters put on and things so they need to be there.*

(Clinician 1)

This quote reinforces the view that patients requiring emergency medicine input are seen as appropriate users of the ED.

Overall, the second focus group session revealed new areas of interest for further data analysis. Clinicians and managers agreed with the definition and categorisation of ‘non-urgent’ presentations from the ‘ED Outcome Model’ established in the first database analysis. Initial discussions began on developing a new pathway, emphasising the need to consider the impacts of social determinants of health as well as the perspectives of patients and healthcare workers. The themes identified in this focus group analysis informed the second quantitative database analysis, which is detailed in the following section.

## Idea screening (stage two): Quantitative analysis findings



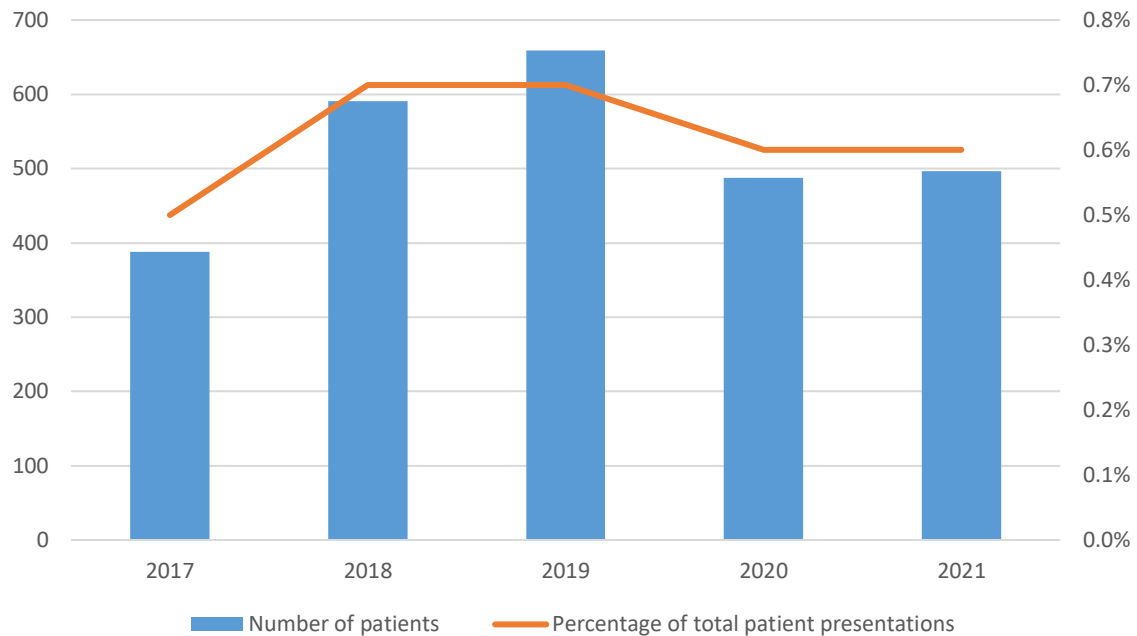
**Figure 48: Refining data theme from qualitative analysis**

The theme of 'refining data' encompasses the categories of aged residential care, mental health and chest pain presentations. Focus group participants expressed interest in further exploring data related to these three groups. Therefore, new data was collected and analysed to delve deeper into these categories. The questions relevant to these categories will be explored in detail and new data findings will be presented where appropriate.

### 5.21.1 Aged residential care (ARC)

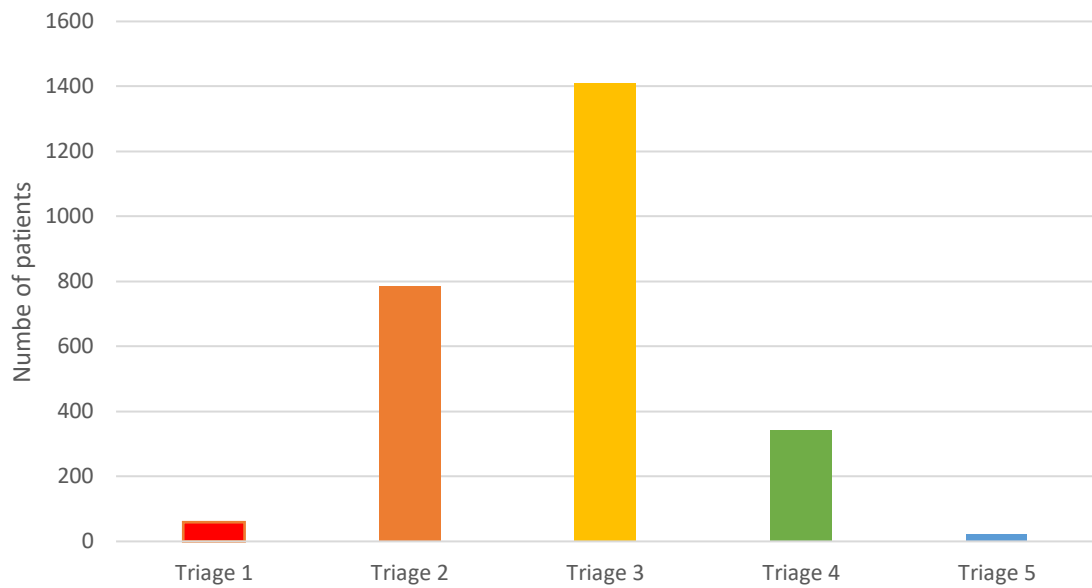
In the previous data analysis, it was discovered that patients residing in aged residential care (ARC) were not comprehensively categorised in the available data. This area remained of interest to healthcare stakeholders, prompting further analysis. The researcher reviewed the data and extracted patients who had a long-term care facility assessment (i-LTCF) completed, indicating they resided in ARC. The research team then explored these patients' presentations to the ED at the research hospital from 2017 to 2021, as this period aligned with the availability of i-LTCF data. The overall presentations of the ARC group are shown below.

### 5.21.2 ARC patient presentations to the ED



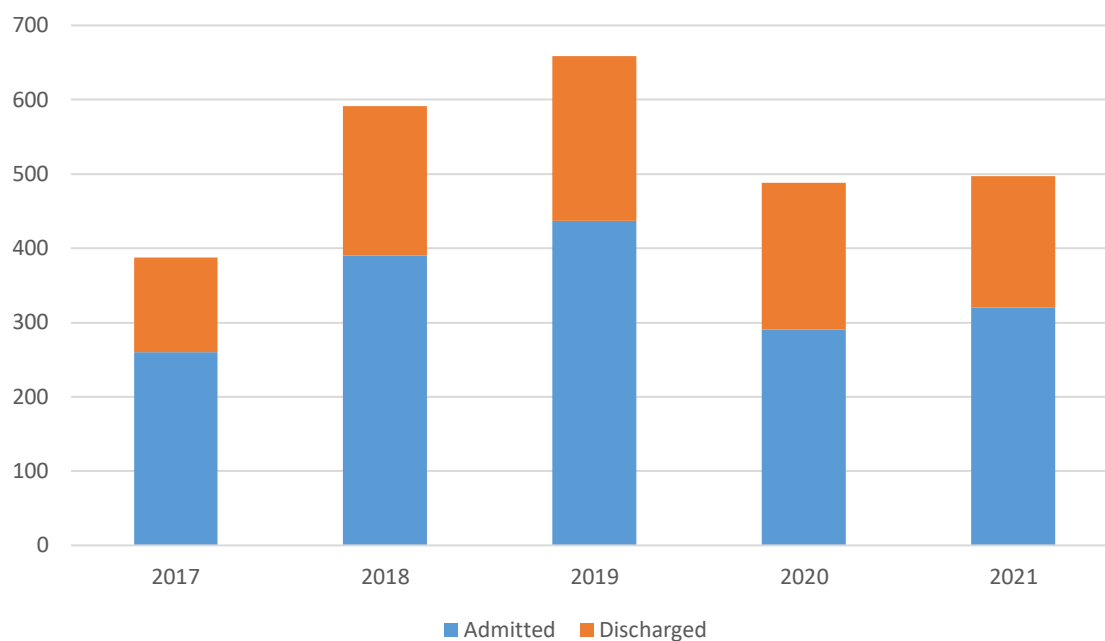
**Figure 49: ARC presentations to the ED**

Figure 49 shows the total number of patients that were residing in aged residential care facilities and presented to the ED from 2017 to 2021. This graph also shows the percentage ARC patients contribute to the total number of ED presentations each year. The year with the lowest ARC presentations was 2017 with a mean of 1.06 ARC patients per day. In contrast, the year with the highest ARC presentations was 2019 with a mean of 1.8 ARC presentations a day. The triage scores of these patients were also examined and an overview is shown in Figure 50.



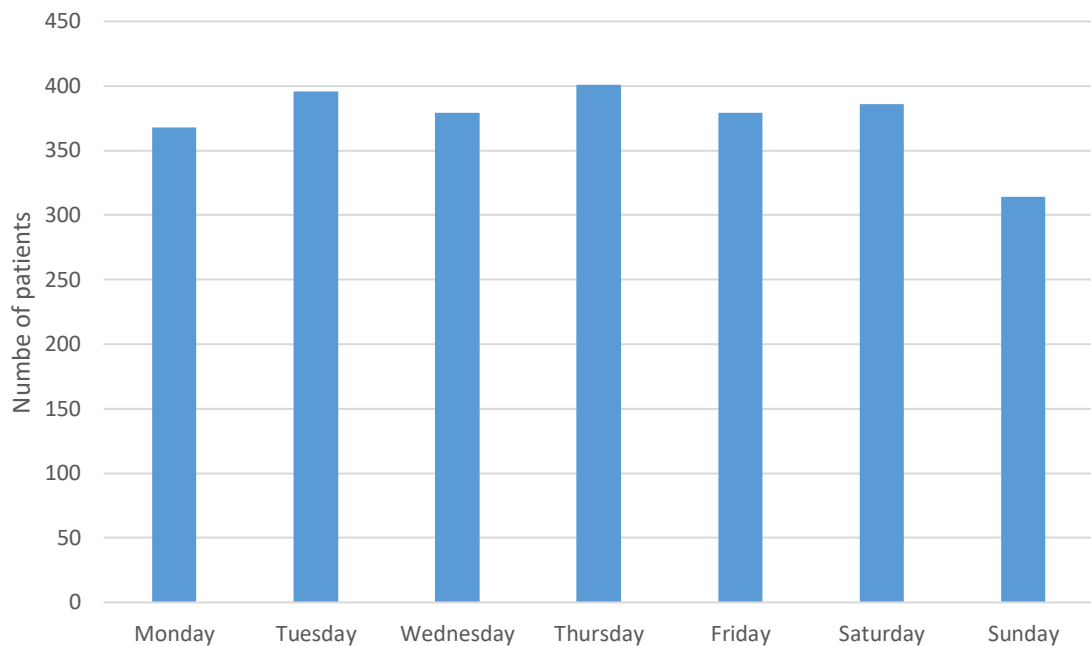
**Figure 50: ARC patients by triage scale from 2017 - 2021**

Figure 50 shows the triage scale breakdown for all patients who presented to the ED from aged residential care from 2017 to 2021. The outcomes of these patients are shown below, categorised into either admitted or discharged groups.



**Figure 51: Admission versus discharge outcome for ARC presentations 2017 - 2021**

Figure 51 shows the number of patients who presented to the ED from aged residential care and whether they were discharged home or admitted to hospital. The highest presentations from ARC were in 2019, with a mean of 0.6 patients a day presenting to the ED and being discharged home, in contrast on average in 2019, 1.2 patients presented to the ED from ARC and were admitted to hospital. The arrival of these patients by day of the week is shown in Figure 52.



**Figure 52: ARC patient presentations by day of the week from 2017 – 2021**

Figure 52 shows the number of presentations from aged residential care by their day of arrival from 2017 to 2021. Healthcare stakeholders had a perception that ARC patients often arrive on Friday afternoons. The only significant trend observed is that Sunday has a lower incidence of ARC patients arriving at the ED compared to the other days. The diagnoses of ARC patients who were discharged from the ED are shown in Table 8.

**Table 8: Top five diagnoses of ARC presentations who were discharged**

| Year        | Diagnoses   |
|-------------|---|
| 2017 - 2021 | Unspecified injury of head: 69<br>Other specified general symptoms and signs: 60<br>Chest pain, unspecified: 33<br>Mechanical complication of urinary (indwelling) catheter: 27<br>Syncope and collapse: 23 |

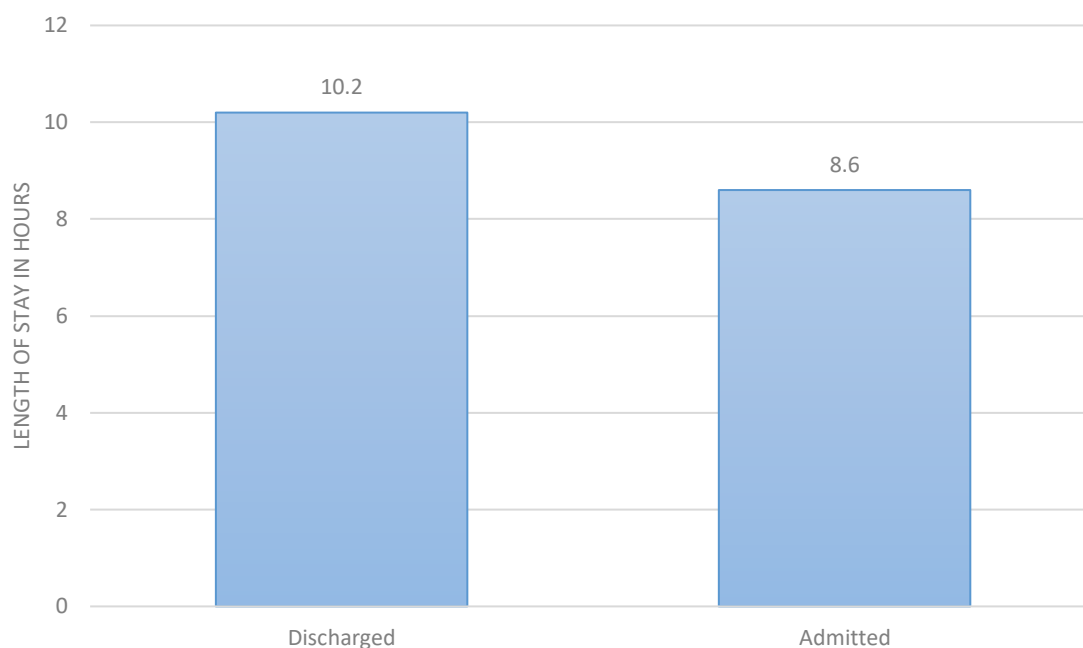
Note: These are discharge diagnoses and not presenting complaints.

These diagnoses were discussed in the subsequent focus group session, to gain perspectives from healthcare stakeholders on how these patients are managed. In contrast to Table 8, patients who were admitted to hospital who resided in ARC during these years are in Table 9.

**Table 9: Top five diagnoses of ARC presentations who were admitted**

| Year        | Diagnoses  |
|-------------|--|
| 2017 - 2021 | Fractured neck of femur: 138<br>Sepsis, unspecified: 118<br>Other specified general symptoms and signs: 116<br>Pneumonia: 89<br>Unknown and unspecified cause of morbidity: 48 |

These diagnoses differ from those of discharged ARC patients, except for ‘other specified general symptoms and signs.’ However, this category is broad, making it challenging to determine the specific illnesses associated with this classification. The mean LOS for patients in this group are shown in Figure 53, categorised into admitted and discharged groups.



**Figure 53: ARC patients' mean length of stay in the ED**

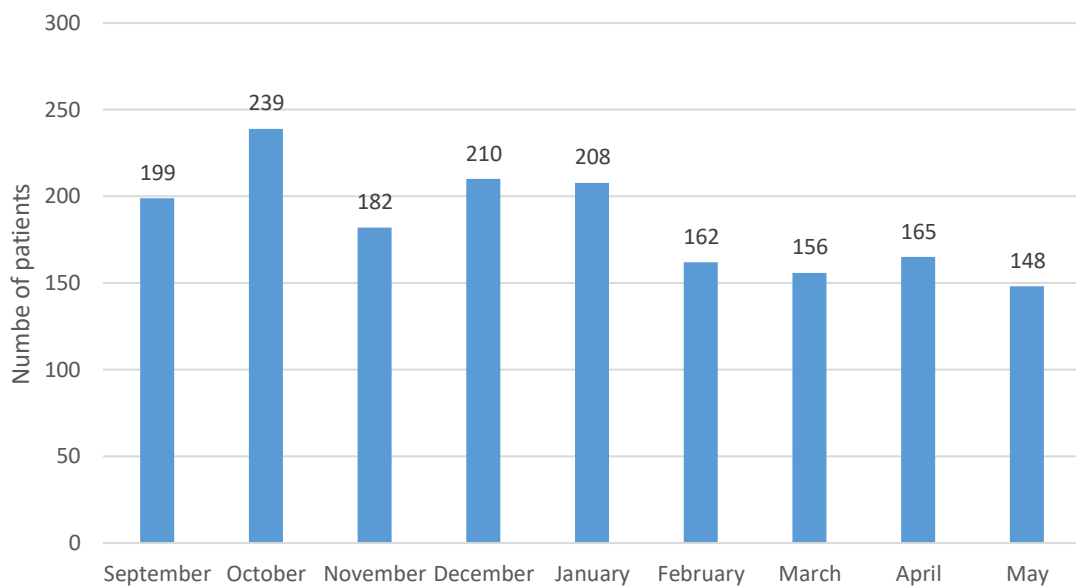
Figure 53 shows the mean length of stay (in hours) in the ED for patients who presented from aged residential care from 2017 - 2021. Although as shown previously the daily number of these patient presentations are low, these patients tend to spend an extended amount of time in the ED.

### 5.21.3 Summary

These data findings have provided evidence that although presentations from aged residential care make up less than one percent of total presentations to the ED, these patients spend an extended period in the ED, have a high hospital admission rate and tend to be of high-moderate acuity in terms of their triage category.

#### 5.21.4 Mental health presentations

The previous data that were available led to some difficulties when defining a presentation for a mental health issue. This area remained of interest in focus group two and therefore new data was obtained from 2021 to 2022 and the results are presented in Figure 54.

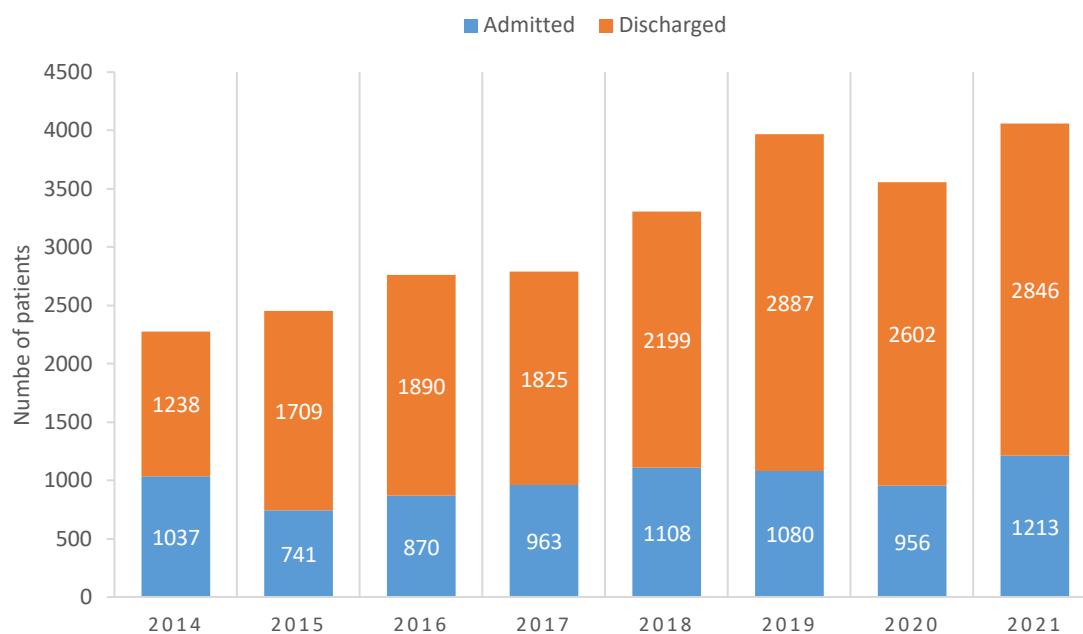


**Figure 54: Mental health presentations to the ED in 2021 - 2022**

Figure 54 includes any presentation to the ED where the person was referred to the 'Mental Health' team during their ED event. This graph shows these presentations by months from September 2021 to May 2022. These data indicate a decreasing trend in presentations for mental health services.

### 5.21.5 Chest pain presentations

There was a discussion on presenting complaints of chest pain and it was mentioned that a chest pain clinic located outside of the ED could be beneficial. Therefore, data has been examined in relation to chest pain presentations where no definitive cardiac diagnoses have been made.



**Figure 55:** 'Chest pain – unspecified' diagnoses

Figure 55 shows patients who presented to the ED and were discharged or admitted with a discharge diagnosis of 'chest pain – unspecified'. Focus group participants were also interested in the re-attendance of patients to the ED with chest pain, therefore these data were examined and are presented below.

### 5.21.6 Re-attendances

In 2021, there were 103 reattendances within 28 days of discharge after a diagnosis of unspecified chest pain where the patient was assessed again and diagnosed with unspecified chest pain and discharged home. These 103 reattendances were from 72 patients.

**Table 10: Rates of ‘chest pain – unspecified’ diagnoses**

| Description   | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|------|------|------|------|------|------|------|------|
| ‘Chest pain - unspecified’ percentage of total presentations for the year in ED | 3.5% | 3.5% | 3.8% | 3.6% | 3.9% | 4.4% | 4.3% | 5%   |
| Admission rate  | 46%  | 30%  | 32%  | 35%  | 34%  | 27%  | 27%  | 30%  |
| Discharge rate  | 54%  | 70%  | 68%  | 65%  | 66%  | 73%  | 73%  | 70%  |

Table 10 shows the percentage that patients diagnosed with ‘chest pain- unspecified’ contribute to the total presentations at the ED. This rate has increased over the last eight years. This table also includes the admission and discharge rates of patients who are diagnosed with unspecified chest pain. The triage score of these patients are shown in Figure 56.

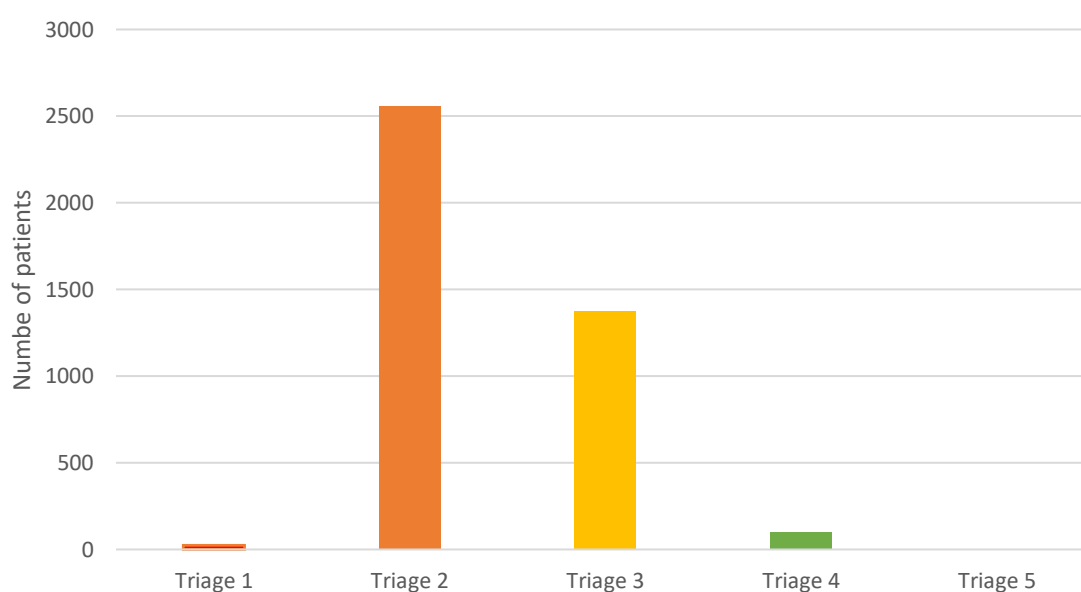
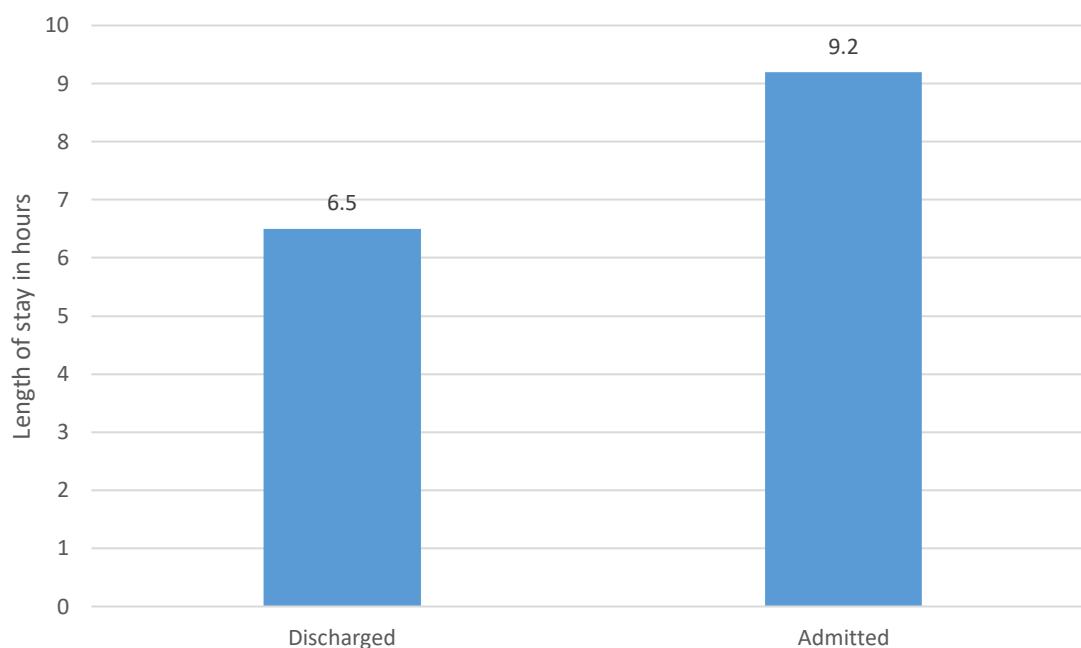
**Figure 56: ‘Chest pain - unspecified’ patients by triage scale in 2021**

Figure 56 illustrates the triage categories for patients diagnosed with ‘chest pain – unspecified.’ Most of these patients were classified as triage two upon arrival, likely indicating they were experiencing chest pain at the time. In contrast, patients classified as triage three likely reported

having had chest pain before arriving at the ED but were pain-free upon arrival, as this would be consistent with categorisation under the Australasian Triage Scale (ATS). The mean length of stay for these patients is shown in Figure 57.

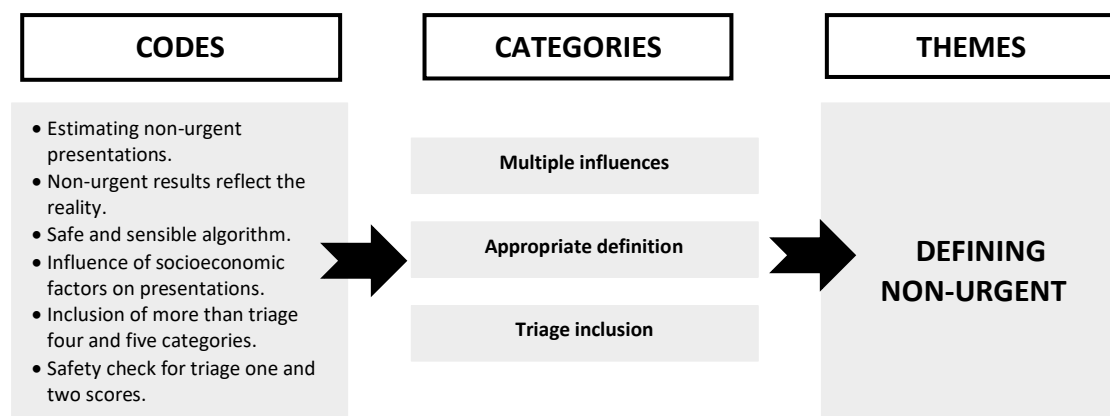


**Figure 57: 'Chest pain – unspecified' patients' mean LOS in the ED in 2021**

Figure 57 shows the mean length of stay in the ED for patients who were diagnosed with 'chest pain – unspecified' in the category of whether they were admitted or discharged in 2021. These patients spend an extended time in the ED.

This section explored the data in relation to patients who were seen in the ED and discharged or admitted with a diagnosis of 'chest pain – unspecified'. There is an increasing trend of patients with this diagnosis over the period examined. These patients are triaged as high – moderate acuity and spend an extended amount of time in the ED.

## 5.22 Theme two: Defining non-urgent



**Figure 58: Non-urgent theme from qualitative analysis**

The second focus group discussed defining non-urgent presentations to get an overview of what percentage of ED visits were non-urgent. The algorithm that was created by the research team was discussed along with the descriptive statistics of the patients who were allocated to the non-urgent group.

### 5.22.1 Safety check on non-urgent classification algorithm

There was a discussion in the second focus group on which triage scales should be included in the non-urgent classification algorithm with the suggestion that triage three patients may also be able to benefit from alternative services. The researcher therefore ran the non-urgent criteria without including the triage score (ATS) to see what percent of each triage level would be categorised as non-urgent and the results are shown in the Table 11.

**Table 11: Non-urgent categorisation safety check**

| Year | Triage 1          | Triage 2 | Triage 3    | Triage 4    | Triage 5    |
|------|-------------------|----------|-------------|-------------|-------------|
| 2021 | 1 patient (0.2%)  | 379 (2%) | 4,512 (10%) | 5,527 (31%) | 1,242 (63%) |
| 2020 | 0 patients (0%)   | 466 (3%) | 4,943 (11%) | 6,936 (34%) | 1,782 (60%) |
| 2019 | 0 patients (0%)   | 859 (5%) | 7,448 (16%) | 7,574 (34%) | 1,781 (61%) |
| 2018 | 3 patients (0.5%) | 810 (5%) | 7,919 (17%) | 6,671 (34%) | 1,563 (57%) |

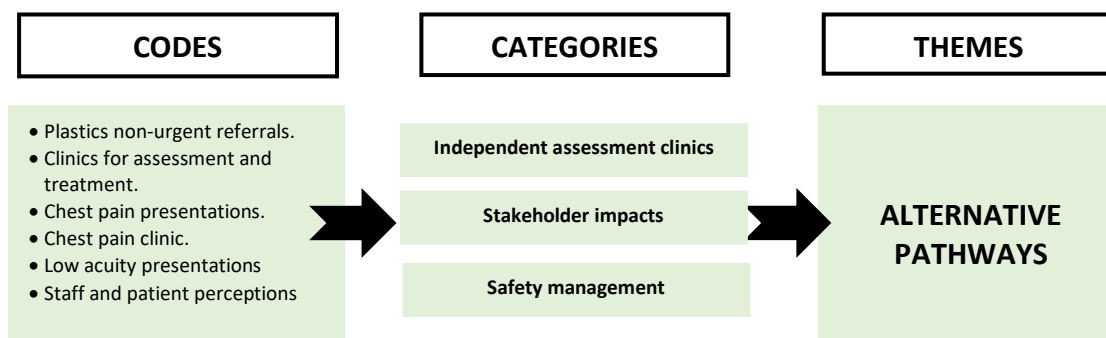
\*Note, triage scores use the ATS.

The percentages shown represent the proportion of patients within each triage score who were classified as non-urgent for that year when the triage score was excluded from the algorithm. For example, in 2021, two percent of triage 2 patients were categorised as non-urgent. It was reassuring to observe that minimal or no patients with a triage score of 1 were classified as non-urgent using the algorithm. The table highlights the expected trend of non-urgent presentations increasing with lower acuity (higher triage scores), as anticipated by the research team and healthcare stakeholders. This analysis was conducted as a safety check.

### **5.22.2 Feedback on ‘non-urgent ‘ algorithm from the prior focus group**

During the previous focus group session, several key points were highlighted regarding the analysis of the ‘non-urgent’ presentation category. There was concern that the current data potentially underestimated the true number of non-urgent presentations. Participants agreed on the importance of safe and sensible categorisation methods to accurately reflect the nature of non-urgent presentations in the ED. It was acknowledged that there is no universal definition for what constitutes a non-urgent presentation, leading to a discussion on the need to focus on this cohort and create pathways for assessing and treating non-urgent patients outside of the ED.

## 5.23 Theme three: Alternative pathways



**Figure 59: Alternative pathways theme from qualitative analysis**

This project is focussed on finding new ways of working and attempting to decrease the demand for the ED. The theme of alternative pathways has therefore been a focus area of discussion. The discussion in focus group two allowed alternative pathways to be prioritised with the development of two categories: future areas of focus and areas not of focus. These two categories key points are described below.

### 5.23.1 Non-urgent cohort pathway

There was a consensus that the algorithm made for ‘non-urgent’ presentations was appropriate. The data showed when using this algorithm that the ‘non-urgent’ cohort contributed to between eight and fourteen percent of all ED presentations. It was discussed that creating an intervention for this specific cohort could be beneficial in decreasing the demand of the ED and beneficial for the patients needing assessment and treatment.

### 5.23.2 Independent assessment clinics

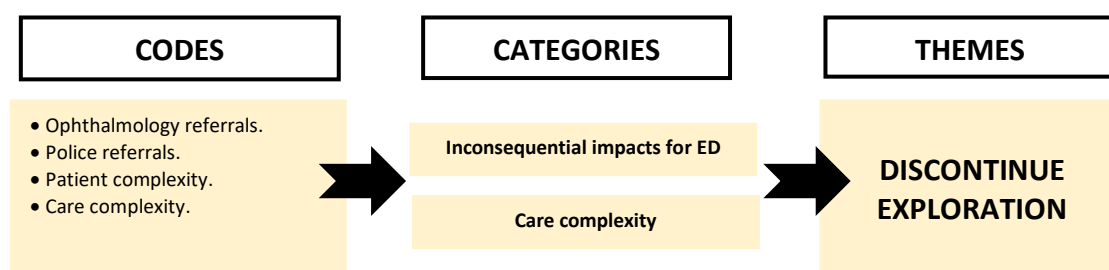
There was a discussion on referrals from general practitioners to speciality services such as the plastics non-burns speciality. The data discussed in focus group two provided evidence that the majority of these patients are of low acuity and have a high discharge rate. It was suggested by a clinician and supported by all other healthcare stakeholders in the focus group that these patients

could be seen in a clinic that is not located in the ED and therefore these patients would not be utilising the ED resources.

### 5.23.3 Primary care chest pain clinic

The large volume of patients who present with chest pain were also discussed and it was proposed that there was a possibility of creating a chest pain clinic within primary care services. This discussion led to new data analysis being completed as shown earlier under the theme 'refining data'.

## 5.24 Theme four: Discontinue exploration



**Figure 60: Discontinue exploration theme from qualitative analysis**

Certain patient groups in focus group two were found to have negligible data findings and therefore healthcare stakeholders reached a consensus that these patient cohorts would not be explored further within this research study. The numbers of ophthalmology referrals were low as shown in the previous report. These referrals were also discussed as being triaged in the ED and being assessed in the Ophthalmology clinic therefore having minimal impact on the demand of the ED. The majority of orthopaedic referrals are admitted to hospital as shown in the previous report. There was also a discussion around the orthopaedic referrals that are discharged needing orthopaedic and emergency medicine collaboration such as for procedural sedation and therefore the majority of this cohort is not perceived as being non-urgent. Lastly, there is no accurate way to decipher social presentations from the data collected in the ED without singularly assessing

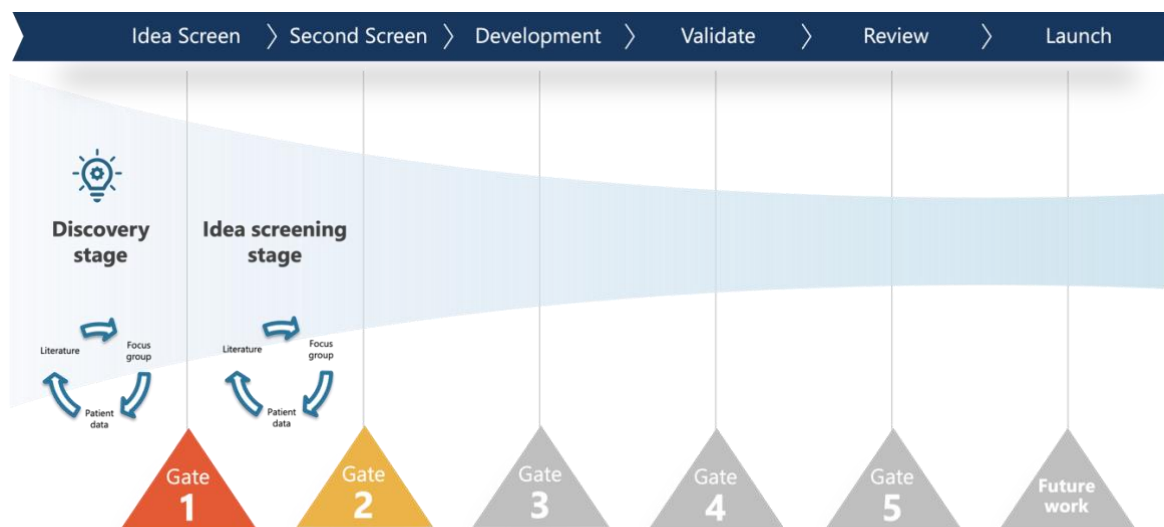
patient records which was out of scope for the timeframe of this research project. There was also a discussion around presentations that are deemed to be 'social attendances' where there is often an underlying medical illness which has caused the inability to cope and therefore should not be deemed as solely a social attendance.

### **5.25 Idea screening quantitative stage summary**

Overall, this data and analyses helped to clarify findings from the discovery stage and guide healthcare stakeholders in refining the patient cohort that will be the focus of this research project. This concludes the idea screening stage. The following section presents the stage-gate process, including the decision made at Gate Two.

## 5.26 Idea screening (stage two): Gate two decision

The idea screening stage was completed following the analysis of the second focus group discussion and the related patient data. The overview of the project to date is depicted below:



**Figure 61: Gate two decision**

The stage-gate process involves making a decision at each gate regarding the projects continuity. There are inputs, exit criteria and an output associated to each gate, with the relevant aspects for the idea screening stage shown in the table below:

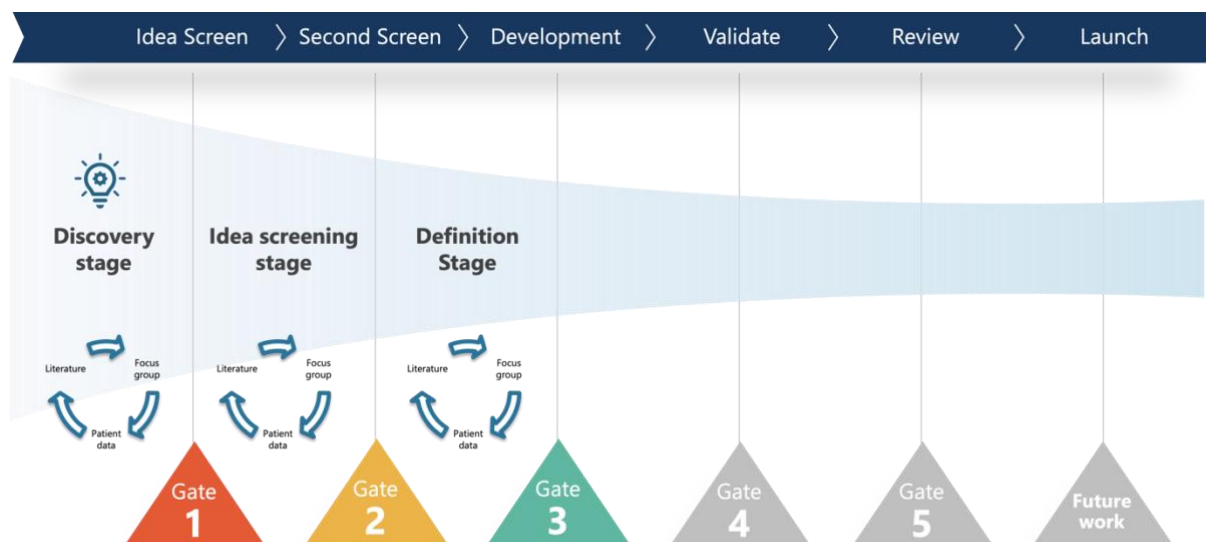
**Table 12: Gate two decision point**

| Gate two decision point:               |   |
|--|---|
| <b>Inputs:</b>                         | <ol style="list-style-type: none"> <li>3. Focus group two data collection and analysis report.</li> <li>4. Patient database review and analysis report.</li> </ol>  |
| <b>Exit Criteria:</b>                  | <ol style="list-style-type: none"> <li>3. Patient cohorts are refined based on the themes identified in the second focus group.</li> <li>4. Corresponding insights gleaned from refined patient data groups are considered adequate.</li> </ol> |
| <b>Output:</b><br>Go/Hold/Stop/Recycle | <ol style="list-style-type: none"> <li>2. <b>Go:</b><br/>The exit criteria for the idea screening stage were successfully met, the decision to advance to the next stage was made.</li> </ol>   |

## 5.27 Definition stage (stage three)

As the project passed through the idea screening stage and gate two, the definition stage began.

An overview of the project to this stage is shown below:

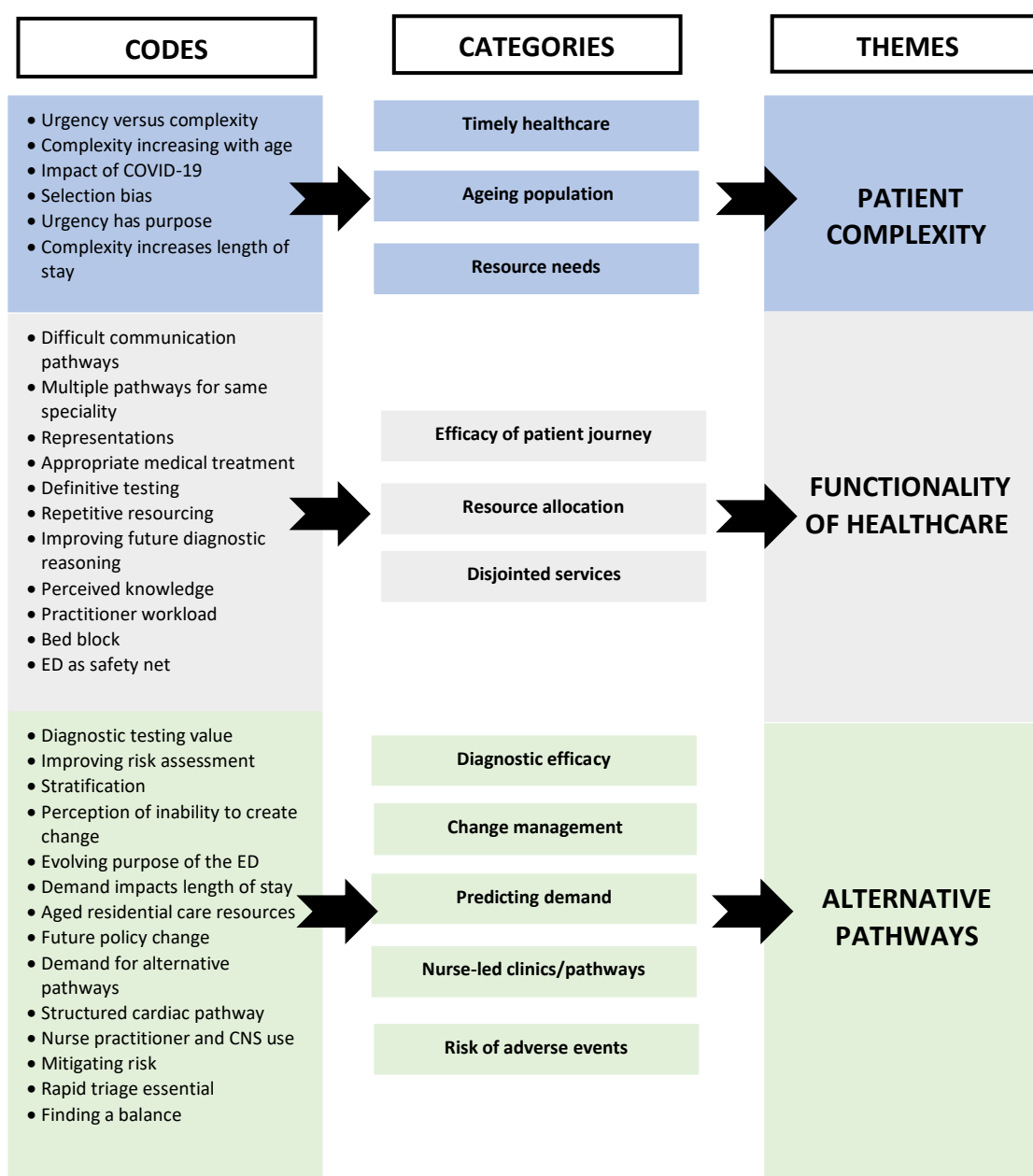


**Figure 62: Overview of the definition stage**

During the definition stage (stage three), a focus group session was conducted along with another review of patient data. The quantitative data report from the idea screening stage served as the basis for discussion during the third focus group session. This report facilitated a focused conversation on relevant patient data, allowing for an exploration of the reasons behind the data findings from the perspectives of healthcare stakeholders. Following this section, the thematic analysis findings of the qualitative definition stage are presented.

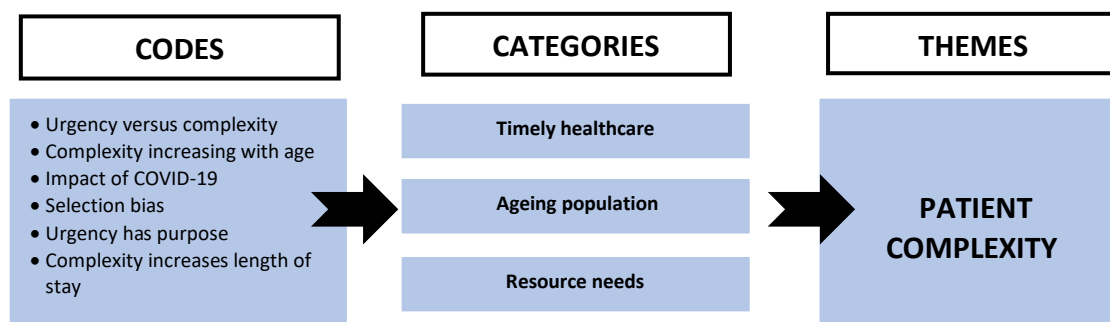
## Definition stage (stage three): Focus group three

The third focus group session utilised the idea screening stage quantitative patient database report as a discussion point. The focus group participants discussed aspects of the report but the prominent focus of the discussion was around the ‘big picture’ of healthcare and what impacts on the ability to create new interventions which are successful for patients and healthcare workers. The three main themes identified from focus group three were: (i) patient complexity, (ii) functionality of healthcare and (iii) alternative pathways. The codes, categories and themes identified from the analysis are shown below:



**Figure 63:** Focus group three qualitative analysis themes

## 5.28 Theme one: Patient complexity



**Figure 64:** Patient complexity theme

The theme, 'patient complexity' arose from six codes which were collapsed into three categories. Patient complexity included the discussions on the ageing population and urgency in healthcare. There was an interesting discussion on the difference between urgency and complexity and the impacts these two factors can have on the ED. One clinician discussed that at times people are sent to the ED because their conditions are too complex for a GP to address in the allocated 15 minute time slot. The perception from this clinician was that these people may be complex but they did not have an urgent condition that needed to be dealt with in the ED:

*This is part of the whole issue, there is a difference between urgency and complexity, but people get them mixed up at least in part because a GP's got 15 minutes and if you can't do it in 15 minutes and it still needs dealing with, there's an emergency. But these patients are complex. Every decade, you pick up another medical problem and you start on another medicine. And so by the time you get to 80, you've got eight other medical problems to think about as well as the issue that they've come in today with and figuring out what the bit is that you need to support out is incredibly complicated for the GP as well as it is for us.*

(Clinician 2)

All healthcare stakeholders in the focus group agreed with the above perspective. Another clinician spoke about how urgency requires prompt action and that patients with long lengths of stays in the ED do not necessarily have an urgent condition:

*Urgency moves if it's something clearly, that you need, you can do something about or need to do something about, like surgery, but it's these ones they've got um you know, obviously lower, they've got*

*higher complexities, but their urgency is lower that tend to stay in the ED longer. So you know, a note that extended length of stay in the ED is that complexity component rather than the urgency.*

(Clinician 1)

One clinician spoke about their perception of the ED being used inappropriately and how clinicians can find this frustrating:

*And that's where we are getting used to manage complexity rather than urgency and that just, you know, it's like taking your car into the local tractor repair guy and telling him that he's got the same tools he can do the same job cant he? And he's obviously gonna get cheesed off about it. And he'll talk about it for the next week because it's not what he's trained for and we're in the same boat here.*

(Clinician 2)

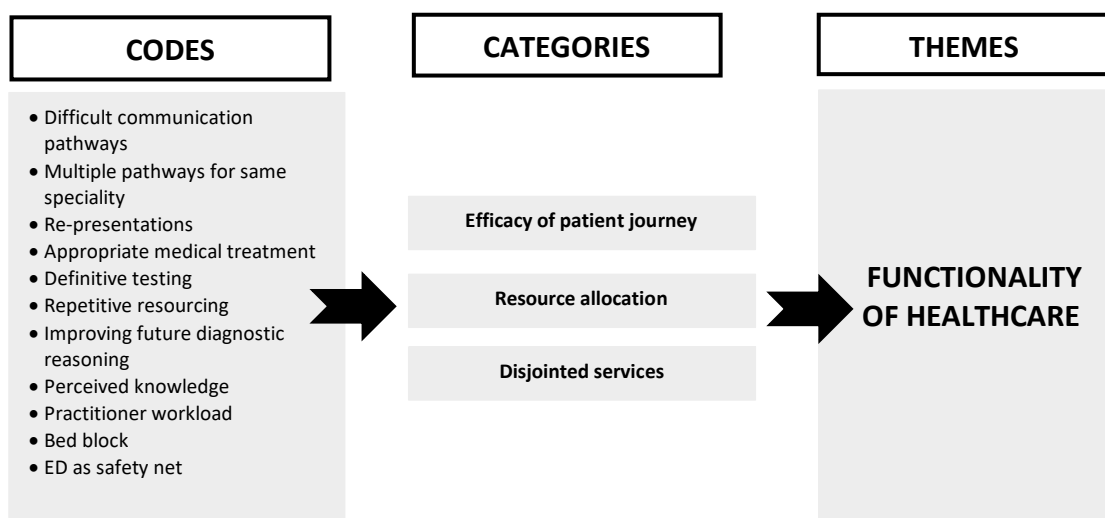
The ageing population was a key aspect when discussing complexity, with one clinician emphasising the primary role of the ED in managing life-threatening situations, such as myocardial infarctions (heart attacks), rather than focusing on whether patients have long-term conditions:

*My understanding of the data is that the admission rate based on your age just goes up constantly and once you get to around about 80, it's to 65 percent admission rate. I think that almost certainly relates simply to complexity. Because the problem we are stuck with in the ED is if you're on ten different medications and you've got five major chronic medical problems and you present with something like undiagnosed chest pain quite often we cannot get to the bottom of it. But the question in the ED is not do you have an ischemic heart disease? Because we know they're clogging their arteries. The question is, are you killing off heart muscle?*

(Clinician 1)

This clinician spoke about the complexities of diagnosing older people due to their co-occurring conditions and multiple medications within the ED after urgent conditions have been ruled out. Overall, it was evident that the ED clinicians believed urgency had a place in the ED. However, the fact a patient has a complex condition, or conditions does not mean they require emergency care.

## 5.29 Theme two: The functionality of healthcare



**Figure 65: Functionality of healthcare theme**

The theme ‘functionality of healthcare’ arose from eleven codes which were collapsed into three categories. There was a large discussion around the diagnostic value of current services and how utilising other diagnostic tests could aid in reducing future presentations to the ED for patients presenting for chest pain:

*I've worked in places where pretty much everyone came in with a presentation of unspecified chest pain would get an angio done within a specified time frame. With an angiogram, you can say to someone, if the angio is NAD they have one percent risk of a coronary outcome in the next 10 years. So you can basically for the next 10 years, you can tell them to go away. They might have pain but it's not their heart and you can stop worrying about it. What we tend to do here is send them off for an exercise tolerance test, which is probably about as useful as sending them down to the local dairy to buy an ice cream. It's got the same sort of predictive value and the same sort of usefulness in terms of the long-term outcome that makes us feel slightly better because we're doing something, but it's not actually that useful in terms of identifying what the cause of their pain is. We know that it misses at least as many people as it picks up and that's part of the story with this. It's a complete waste of time and you're no further down the diagnostic track until they get an angio you're stuck.*

(Clinician 2)

Two clinicians spoke about the efficacy of the patient journey and felt frustrated that patients had to reattend the ED multiple times for the same presenting complaint before any definitive testing would be completed:

*The re-presentation rate is the key bit of this that says if the healthcare system is functioning or not functioning, because you know, if I get chest pain, I rock into the ED, they do 2 troponins and they send me home. And then a week later, I get chest pain again. They were always told, go to the ED if you get chest pain... So, people rock in and out until they've got a clear diagnosis or a clear 'you don't have to worry about it'. And it's those representations that seem to be a lot of our bread and butter sometimes.*

(Clinician 2)

*Certainly, if it was me that had the chest pain, it's how many times do you have to present with the same thing before you get managed appropriately? Because if someone's, from what we see, people who sometimes present for 3-4 years until someone finally does the angio and it's only when they know what's wrong with them, that they stop presenting all the time.*

(Clinician 1)

*We still have to worry about chest pain and nobody's doing the definitive test to tell us whether we have to worry or not and there are some people they would be coming in, I would say on an average once every fortnight or so, they get two troponins then we send them home again and then they rinse and repeat a fortnight later.*

(Clinician 2)

These perspectives highlighted that clinicians viewed reattendance to the ED was an indicator of inefficiency within the healthcare system, suggesting that alternative services or diagnostic tools should be employed in these situations to prevent reattendance.

One manager spoke about the different functionalities of healthcare due to different funding streams. A prominent diagnosis for patients presenting from ARC facilities to the ED was complications with mechanical indwelling urinary catheters:

*That's interesting about the mechanical complication of urinary catheters, because if you're at home we might actually get a district nurse to go in to that group, but in aged residential care the district nurses don't go in.*

(Manager 1)

This clinician spoke about utilising nurses to assess and treat the problems in ARC rather than the patient being transported to hospital.

Another aspect of this theme includes the perception of disjointed services and the difficulty this creates with communication:

*Look, my impression of the mental health services standing from outside it, it looks like a monolith, but as soon as you dive in and we get into all sorts of trouble because child mental health goes to psychiatry if its non-Māori but if its Māori it goes to a Māori health provider that then picks up anyone who fits their criteria and the two services don't talk to each other. So we think we're talking to mental health, but we're not. We're talking to the wrong people. And adult health does this as well. There's consult liaison who will pick them up if they're going up to the acute medical unit. But there's another team who picks them up if that's the right time of day. And then there's the overnight person who comes on at 10:30pm and has to pick everything up and then the key workers as well if you get someone in and they are potentially going home, sometimes the psych team you ring you up and they say send them home and the key worker will see them in two hours.*

(Clinician 2)

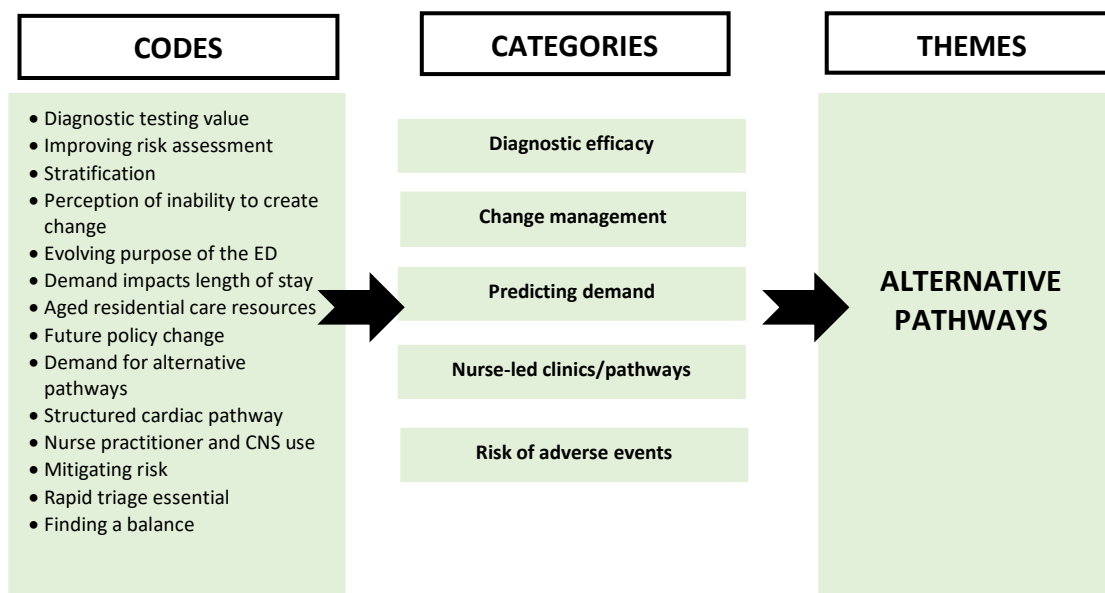
This clinician expressed frustration with the lack of a clear pathway for mental health services and the challenges of identifying the appropriate team to care for a patient. The ED was regarded as the safety net from all participants in the focus group session, a place where people go when there is nowhere else or when other services are having difficulty with meeting their demands:

*It is always 'don't worry, ED will cope with our overflow' and we've been doing it for far too long.*

(Manager 3)

It was evident that the focus group participants had concerns with the current functionality of healthcare and felt that new ways of working needed to be addressed.

### 5.30 Theme three: Alternative pathways



**Figure 66: Alternative pathways theme**

The theme of ‘alternative pathways’ arose from fourteen codes which were collapsed into five categories. The importance of understanding the accuracy or usefulness of pathways was discussed in relation to chest pain and exercise tolerance tests (ETT). One clinician perceived the ETT to be ineffectual in diagnosing heart disease for patients who have attended the ED for chest pain:

*We know that it (ETT) misses’ elderly and it misses woman, particularly so, around about 50 percent of females with the ischemic heart disease will get missed on an ETT. So, it really isn't a test that alters your pre-test probability enough to make it worthwhile doing, but it makes us feel like we're doing something and that's probably the only reason we actually go and do it. Call me cynical.*

(Clinician 2)

The efficacy of the ETT led into a conversation about utilising angiograms to enhance the way the ED can treat people faster if they have re-attendances for the same complaint:

*I've worked in one hospital in New Zealand a good while back now. And we had an ultra-keen cardiologist who was angio'ing everything and anything that moved. And it was really interesting the way that changed the cardiac work up because these people would come in and the first time they arrived, they would get angio'd. And then the next 15 times they arrived, they would come in and you say sorry, it's not your heart. Go home. And there was no need for two troponins. And there was no need for extended ED stays because you knew what, whether you had to worry about the problem that they presented with or not.*

(Clinician 1)

The clinician talked about the benefits for the ED after utilising diagnostic tests with higher sensitivity rates, however this clinician was also aware of the difficulties in finding the right balance when ordering diagnostic tests:

*I suspect, he was probably doing too many angios. But if you could draw a line somewhere between anyone with a heart and only the people that have proven themselves that they're having an active heart attack. And there is a line somewhere here where you need to be actively angioing people. And I don't think we found it yet.*

(Clinician 1)

While discussing chest pain presentations to the ED one clinician suggested the use of the nursing profession when assessing these patients:

*We've got very, very slick at 'this is chest pain these are the things to worry about and these are the tests that you have to do, the questions you have to ask'. I'm aware of some places where a nurse practitioner or clinical specialist nurse (CNS) does the cardiac work up because it's that structured and can be done that way if you've got the resources to put into it.*

(Manager 1)

A clinician discussed the risk or probability that a patient with chest pain is diagnosed with a Myocardial Infarction (MI):

*I think the data is something between 2 and 5 percent of them will be having an MI and that's when they get interesting from my perspective and we don't mind seeing them because every now and again you going to get one pop up that was worth picking up.*

(Clinician 2)

It is evident from this quote that the ED clinician views the diagnosis of an MI as needing the expertise of the emergency medicine team. It also notes the risk that patients with chest pain can be experiencing a heart attack.

When talking about risk and the role of the ED, one clinician shared their view that the ED is not only inappropriate for non-urgent patients to use but can also be detrimental for the patient:

*At the moment we are using EQ to drive these people to a more appropriate practitioner and I guess from my perspective I'm an emergency physician. I'm really good with emergencies. But the data out*

*there is that if you come to me with your hypertension, I'm more likely to kill you than I am to prolong your life. And this is where a lot of this work is coming from. That actually the ED is not just a bad place for you to be, because we don't want you here. But it's a bad place to be because we actually make your life expectancy shorter not longer if we treat the wrong thing. And so for these people, we're using EQ to drive the process where we can.*

(Clinician 1)

This quote highlights the importance of patients being cared for in an appropriate setting and by the most suitable practitioner to their needs. A manager spoke about the need to have alternative options available for non-urgent patients beyond the existing redirection pathway known as the Emergency Q (EQ) system. The EQ system operates by redirecting patients who arrive at the ED to a nearby urgent care clinic, rather than treating them within the ED itself, provided they meet specific criteria that indicate their condition is suitable for urgent care rather than emergency treatment:

*We can't let the EQ be our only option for these people and if it's an older patient with complex medical problems, yeah, we're not gonna send them down to urgent care, are we? So it's finding an alternative for those type of patients, isn't it? I think this is this is probably the bit where if we invest the energy in we would get a good return.*

(Manager 2)

There was a concern that identifying non-urgent patients would prolong the triage time and one clinician spoke about the importance of having a rapid triage system:

*One of the things that we really, really, really don't want to do is make the triage process so complicated that it takes too long for us to actually be able to do it properly.*

(Clinician 2)

*People waiting for an hour for triage is a great way of breaking your ED because you have to pull the people who are sick out of the queue - so you can't have a queue for triage. Again, one of the reasons our ED is a little bit broken at the moment is because we have a queue for triage on a regular basis, which means that people actually wait before we can figure out they shouldn't be waiting. That is just wrong.*

(Manager 4)

Overall, there were discussion points around the efficacy of diagnostic tests, new pathways which could be explored along with the importance of addressing risk and ensuring the triage system is not delayed within the theme of alternative pathways.

#### **5.30.1 Conclusion of the definition stage thematic analysis**

The analysis for focus group three concluded the prominent themes of (i) patient complexity, (ii) the functionality of healthcare and (iii) alternative pathways. The areas of interest from these themes are addressed in the third quantitative phase in the next section.

## **Definition stage: Quantitative analysis findings**

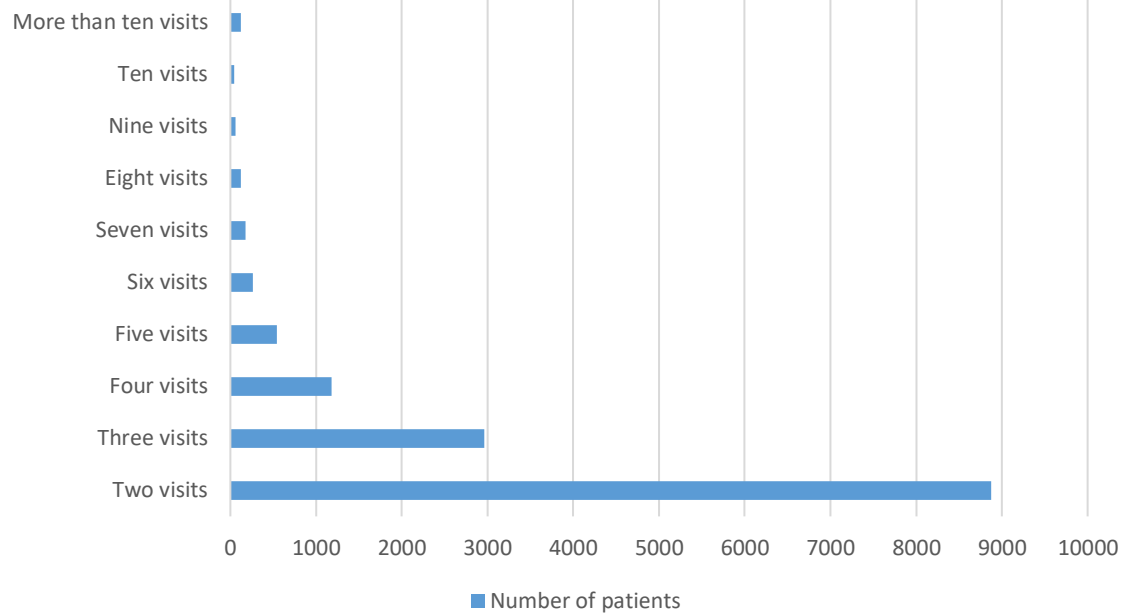
There was a discussion in the third focus group around the efficacy of a patient's healthcare journey and that using reattendances to the ED may be of interest. It was a perspective of focus group participants that if patients were returning to the ED for the same condition or frequently that it would be of interest to explore the details of these patients and see if there are issues that can be addressed. This next section therefore focuses on patients who have had more than one visit to the ED.

### **5.30.2 Re-presentation definition**

A re-presentation in this instance is defined as a return visit to the research hospitals ED within the same year. The breakdown of re-presentations are shown below.

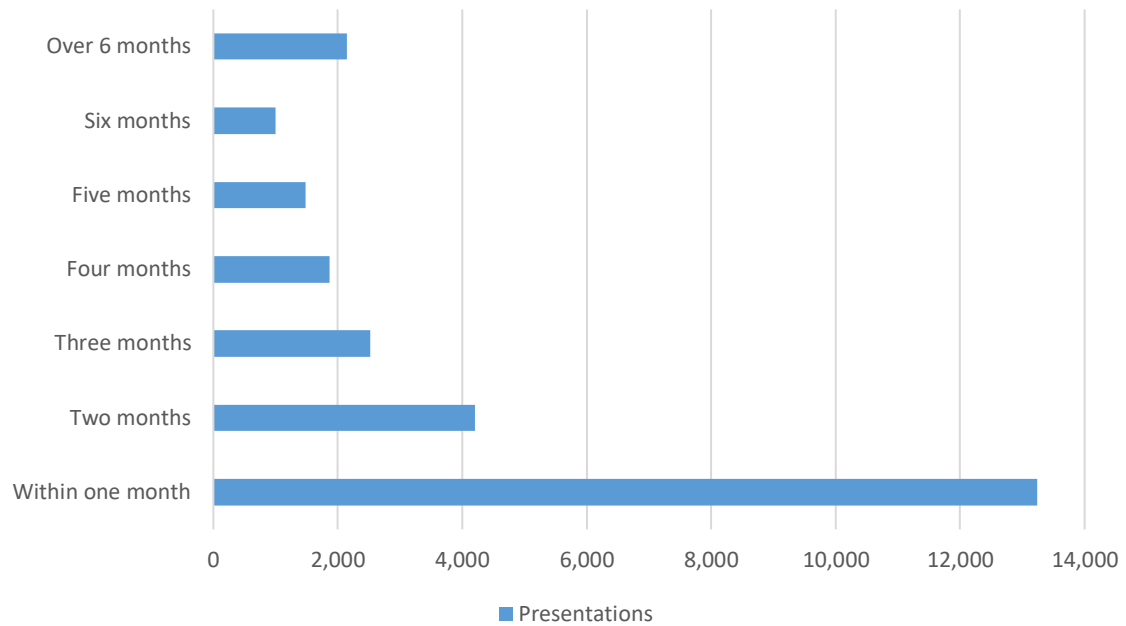
### **5.30.3 How many patients re-present to the ED?**

There were 39,943 patients (49.5% of presentations) who had one visit to the ED in the 2021 calendar year. This graph shows an overview of patients who presented to the ED more than once in a calendar year (January 2021 – December 2021).



**Figure 67: Patient visits to the ED in 2021**

There are a large number of patients who attend the ED more than once in a calendar year as shown in Figure 67. The majority of these patients present twice to the ED; however, some patients were shown to present more than ten times. The time-frames of these presentations of patients were examined and are shown below.



**Figure 68: The timeframe between patient re-presentations to the ED in 2021**

The majority of re-presentations happen within one month of a previous presentation (this includes all presentations i.e., people admitted to hospital or discharged from the ED). There is a trend in which patients reattendance tends to be closer in time to their previous presentations and it decreases accordingly as shown above. These findings were utilised and applied to the prospective patient group criteria which is described in the following section.

### 5.30.4 How to refine the target group?

The original criteria were developed based on focus group discussions and existing literature on non-urgent ED presentations. Between 6,500 and 10,000 presentations annually from 2014 to 2021 fell within this group, representing 8 to 14 percent of total ED visits. The researcher then introduced the criterion ‘not redirected to primary care,’ which eliminated thousands of presentations, narrowing the total to between 3,000 and 7,000 cases during the same period. To ensure the target group was manageable for a new, innovative pathway, further refinement was necessary. It was agreed that prospective criteria would be required to define the group in real-time without increasing triage time. The original criteria were adjusted, with all retrospective categories removed and patient reattendance was included, as the focus group had identified it as an indicator of healthcare system insufficiency. Table 13 compares the original criteria with the new prospective target group criteria.

**Table 13: Target group criteria**

| Original target group criteria  | Prospective target group criteria  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Self-referred</li> <li>2. Walk-in</li> <li>3. Triage 4 and 5</li> <li>4. Treatment time of 60 minutes or less<br/><i>(retrospective)</i></li> <li>5. Discharged home <i>(retrospective)</i> and,</li> <li>6. Not deceased during time in the ED<br/><i>(retrospective)</i></li> </ol> | <ol style="list-style-type: none"> <li>1. Self-referred</li> <li>2. Walk-in</li> <li>3. Triage 4 or 5</li> <li>4. Not redirected to primary care and,</li> <li>5. Current presentation is within 6 months of a previous ED visit.</li> </ol> |

### 5.30.5 Prospective criteria and priority patient group

The prospective criteria in Table 13 were used to identify the 'priority patient group', the following findings are from the quantitative analysis of this specific priority patient group. There were 2,798 presentations fitting the prospective target group criteria in 2021 (7.7 presentations a day). The data in the following tables is a review of patients' demographics who met the criteria in 2021. The data is shown by individual presentations and not by specific patients. Table 14 below displays the age breakdown of the presentations fitting the 'priority patient group' in age bands.

**Table 14: Age of 'priority patient group'**

| Age           | Number of presentations |
|---------------|-------------------------|
| 0-9 years     | 296 (11%)               |
| 10-19 years   | 228 (8%)                |
| 20-29 years   | 504 (18%)               |
| 30-39 years   | 433 (15%)               |
| 40-49 years   | 314 (11%)               |
| 50-59 years   | 339 (12%)               |
| 60-69 years   | 309 (11%)               |
| 70-79 years   | 219 (8%)                |
| 80-89 years   | 139 (5%)                |
| 90-99 years   | 16 (1%)                 |
| 100-109 years | 1 (0%)                  |

The majority of patients allocated to this criteria are between the ages of 20 and 69, with the highest percentage of patients being between 20 and 29 years of age. Healthcare stakeholders from the previous focus group discussed that younger patients tend to have fewer comorbidities and would likely fit into the 'non-urgent' category more often than older patients. They also noted that younger patients would likely be more receptive to a new pathway and have fewer complexities.

Therefore, it is reassuring that the categorisation above shows these results. In addition to age, ethnicity was also examined as a demographic. Table 15 shows the ethnicity breakdown of the presentations in the 'priority patient group'.

**Table 15: Ethnicity of presentations within the 'priority patient group'**

| Ethnicity                    | Number of presentations | Percentage of 'priority patient group' |
|------------------------------|-------------------------|--|
| African                      | 14                      | 1%                                     |
| Asian not further defined    | 8                       | 0%                                     |
| Chinese                      | 26                      | 1%                                     |
| Cook Island Māori            | 15                      | 1%                                     |
| European not further defined | 20                      | 1%                                     |
| Fijian                       | 21                      | 1%                                     |
| Indian                       | 90                      | 3%                                     |
| Latin American / Hispanic    | 11                      | 0%                                     |
| Middle Eastern               | 12                      | 0%                                     |
| Niuean                       | 1                       | 0%                                     |
| None Given                   | 15                      | 1%                                     |
| NZ European                  | 1,252                   | 45%                                    |
| NZ Māori                     | 983                     | 35%                                    |
| Other Asian                  | 30                      | 1%                                     |
| Other ethnicity              | 12                      | 0%                                     |
| Other European               | 203                     | 7%                                     |
| Other Pacific                | 2                       | 0%                                     |
| Pacific Island not defined   | 4                       | 0%                                     |
| Refused to answer            | 3                       | 0%                                     |
| Samoan                       | 29                      | 1%                                     |
| South East Asian             | 27                      | 1%                                     |
| Tongan                       | 20                      | 1%                                     |

The majority of patients in this group identified as either NZ European or NZ Māori. In addition to ethnicity, the domiciles of these patients were also examined. Table 16 below shows the Top 16 patients' domiciles at the time of their presentation, along with the corresponding index of deprivation for each domicile. As previously described, the NZ Index of Deprivation (NZ Dep) is an area-based measure of socioeconomic deprivation in NZ, derived from nine Census variables. NZ Deprivation is presented in deciles.

- Decile 1 represents areas with the least deprived scores
- Decile 10 represents areas with the most deprived scores

**Table 16: Top 16 domiciles of target intervention group**

| Domicile (NZ Dep level) | Number of presentations | Percentage of 'priority patient group' |
|-------------------------|-------------------------|--|
| Domicile A (Decile 8)   | 191                     | 7%                                     |
| Domicile B (Decile 9)   | 94                      | 3%                                     |
| Domicile I (Decile 9)   | 83                      | 3%                                     |
| Domicile C (Decile 10)  | 77                      | 3%                                     |
| Domicile J (Decile 9)   | 73                      | 3%                                     |
| Domicile E (Decile 7-8) | 70                      | 2%                                     |
| Domicile K (Decile 7)   | 67                      | 2%                                     |
| Domicile F (Decile 9)   | 62                      | 2%                                     |
| Domicile L (Decile 9)   | 61                      | 2%                                     |
| Domicile H (Decile 10)  | 60                      | 2%                                     |
| Domicile M (Decile 10)  | 55                      | 2%                                     |
| Domicile G (Decile 8)   | 49                      | 2%                                     |
| Domicile N (Decile 8)   | 48                      | 2%                                     |
| Domicile O (Decile 7)   | 46                      | 2%                                     |
| Domicile P (Decile 9)   | 44                      | 2%                                     |
| Domicile Q (Decile 10)  | 44                      | 2%                                     |

These domiciles are all located within areas that are classed as high deprivation areas as per the NZ Dep scale with a weighted average of 8.7. Table 17 shows the monthly breakdown of presentations which fit the priority patient group for 2021.

**Table 17: Month of arrival**

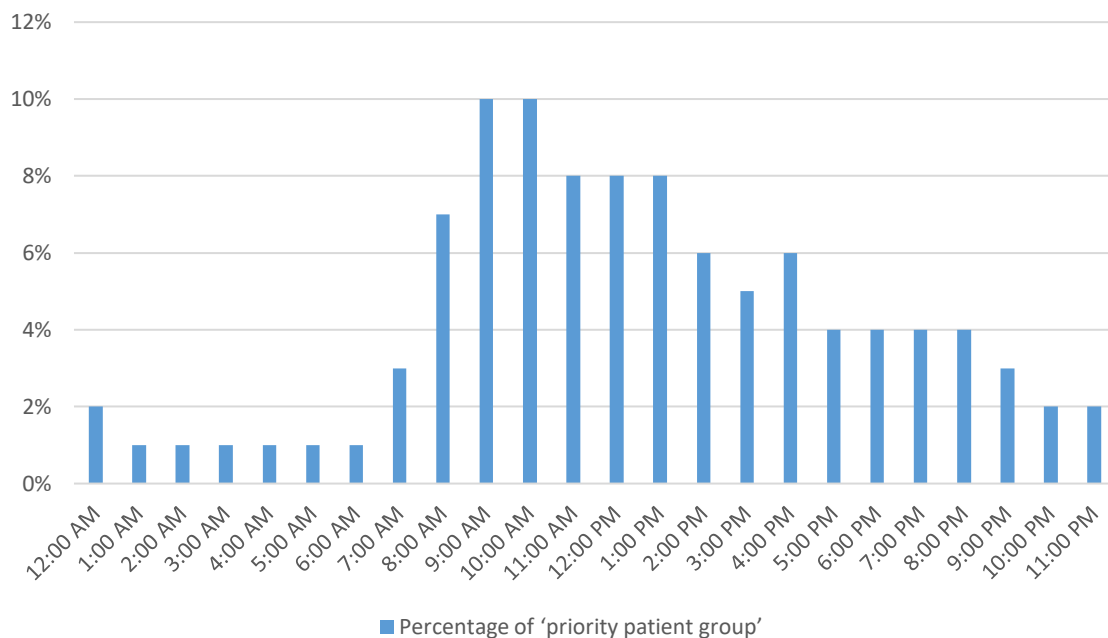
| Month of arrival | Number of patients | Percentage of 'priority patient group' |
|------------------|--------------------|--|
| Jan              | 168 (5.4 per day)  | 6%                                     |
| Feb              | 183 (6.5 per day)  | 6%                                     |
| Mar              | 244 (7.9 per day)  | 8%                                     |
| Apr              | 256 (8.5 per day)  | 9%                                     |
| May              | 203 (6.5 per day)  | 7%                                     |
| Jun              | 200 (6.7 per day)  | 7%                                     |
| Jul              | 267 (8.6 per day)  | 10%                                    |
| Aug              | 226 (7.3 per day)  | 8%                                     |
| Sep              | 243 (8.1 per day)  | 9%                                     |
| Oct              | 243 (7.8 per day)  | 9%                                     |
| Nov              | 255 (8.5 per day)  | 9%                                     |
| Dec              | 310 (10 a day)     | 11%                                    |

It is observed that the months with the highest number of presentations were July and December, with approximately 8 – 10 patients a day fitting the criteria. The day of arrival was also examined for this patient group. Table 18 below shows the day of arrival for the presentations meeting the priority patient group criteria.

**Table 18: Day of arrival**

| Day of arrival | Number of patients | Percentage of 'priority patient group' |
|----------------|--------------------|--|
| Monday         | 417                | 15%                                    |
| Tuesday        | 471                | 17%                                    |
| Wednesday      | 435                | 16%                                    |
| Thursday       | 390                | 14%                                    |
| Friday         | 422                | 15%                                    |
| Saturday       | 316                | 11%                                    |
| Sunday         | 347                | 12%                                    |

The weekdays with the highest number of visits meeting the criteria were Tuesday and Wednesday, with the weekends having the least amount of patients. Figure 69 below displays the time of arrival for presentations which fit the 'priority patient group' criteria.

**Figure 69: Time of arrival for the 'priority patient group' shown in percentages in 2021**

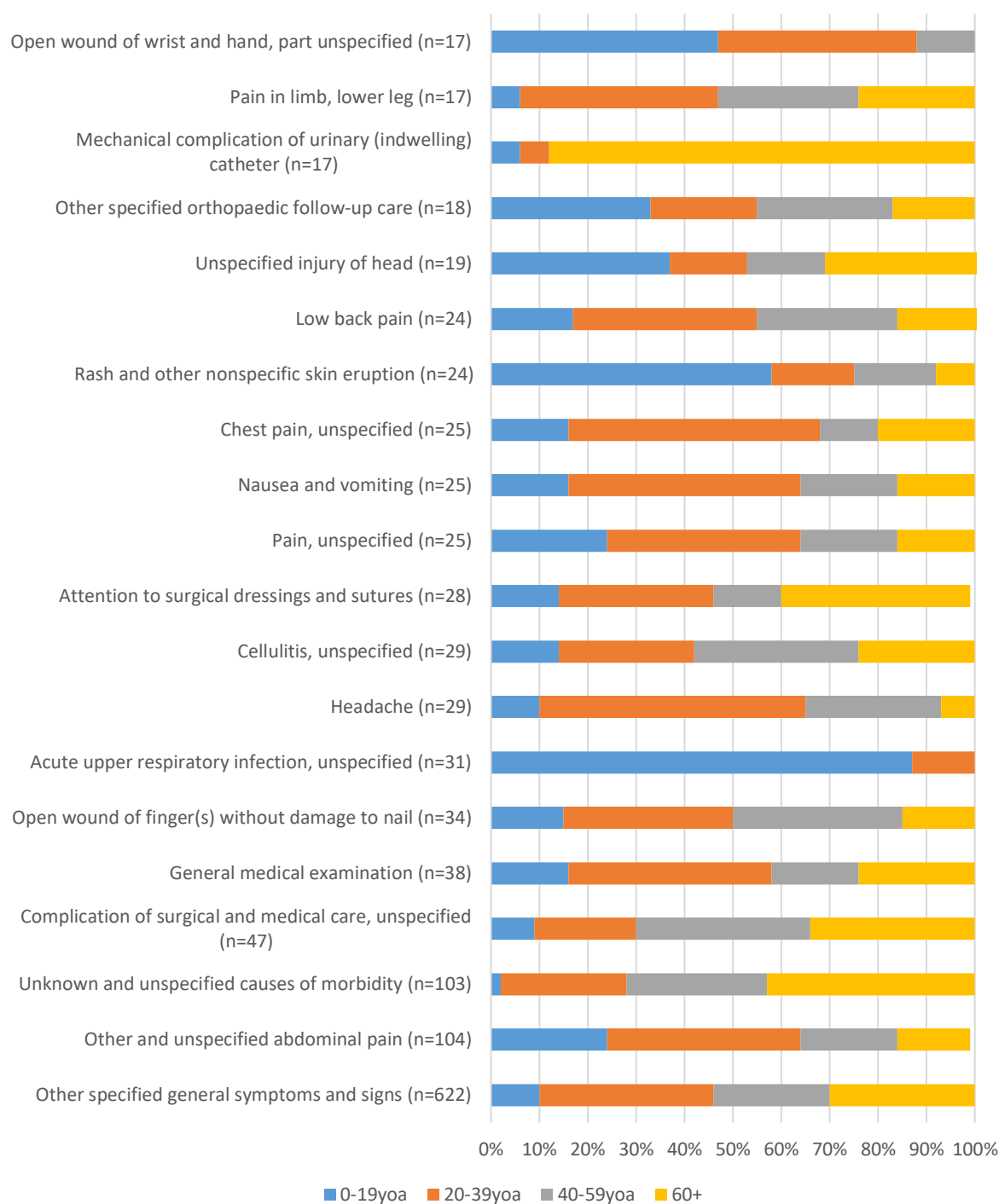
The peak times for this group appear to be between 08:00hrs and 16:00hrs; this information will be taken into account when establishing business hours for the new pathway. The mean length of stay for this group in the ED was calculated as 4.5 hours in 2021. The diagnoses of this group were also analysed and are presented below.

#### **5.30.6 Top ten diagnoses of the 'priority patient group'**

1. Other specified general symptoms and signs
2. Other and unspecified abdominal pain
3. Unknown and unspecified causes of morbidity
4. Complication of surgical and medical care, unspecified
5. General medical examination
6. Open wound of finger(s) without damage to nail
7. Acute upper respiratory infection, unspecified
8. Headache
9. Cellulitis, unspecified
10. Attention to surgical dressings and sutures

Healthcare stakeholders reviewed these diagnoses during the next stage to provide their insights on the treatments these patients might need and the most effective ways to address the needs of this 'priority patient group.'

These diagnoses were examined in more detail and categorised into age bands. The following figure shows the age breakdown of the top diagnoses for presentations coded as 'priority patient group' in four different age bands.



**Figure 70: Age distribution of diagnoses for the 'priority patient group'**

Figure 70 highlights the age-band distribution of the top diagnoses within this group in 2021. Clear patterns emerge among these diagnoses: the majority of patients with a 'mechanical complication of urinary catheter' are over 60 years old, while 'acute upper respiratory tract infection' is most

common in individuals under 19. Cases of ‘open wound of wrist and hand’ are predominantly seen in those up to 39 years old. In contrast, diagnoses such as ‘low back pain,’ ‘pain unspecified’ and ‘general medical exam’ are distributed more evenly across age groups. The following section focuses on patients who were categorised into the ‘priority patient group’ criteria, but left the ED before they were seen and assessed by a healthcare professional.

### **5.30.7 Failed to wait for assessment / ‘Did not wait’**

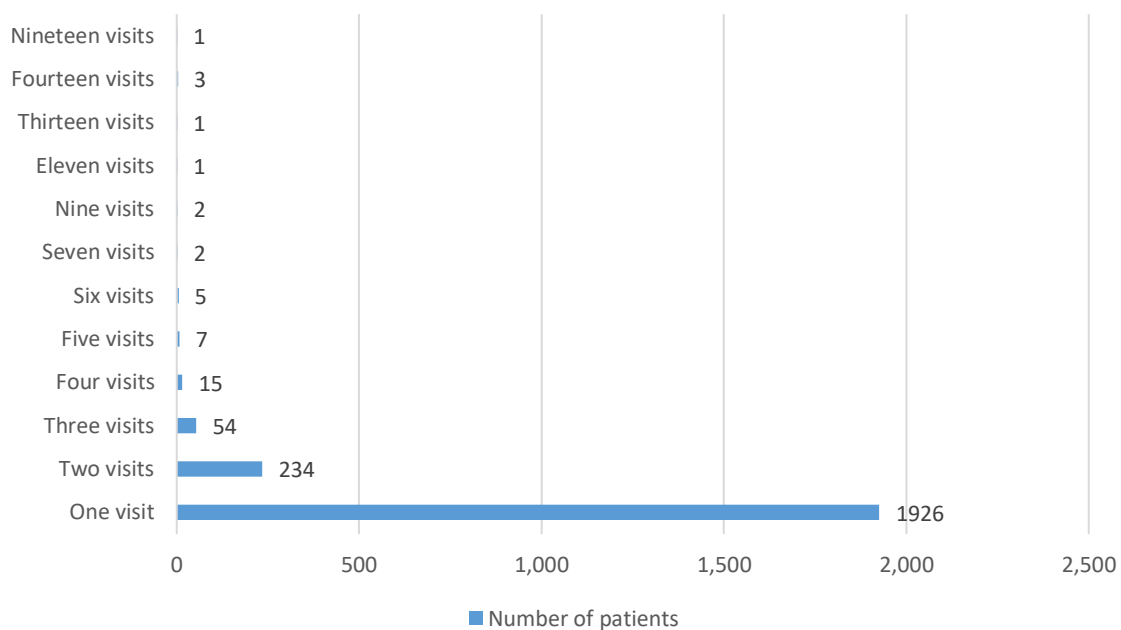
There were 287 presentations (from 244 patients) in the ‘priority patient group’ where patients failed to wait for assessment and left the ED in 2021. These presentations made up 10.3 percent of the total presentations within the target group. Below is a snapshot of this specific patient group:

1. The mean length of stay in the ED for these patients was 3.6 hours. Cumulatively, this equates to a mean of 1,033 hours or 43 days, which is a significant amount of time for these patients to spend in the ED to subsequently leave without being assessed or treated.
2. Of the 244 patients who did not wait for assessment, 133 identified as female and 111 identified as male.
3. Of the 244 patients that did not wait for assessment 101 patients identified as NZ European (41%) and 113 patients identified as NZ Māori (46%).

Notably, nearly half of the patients (46%) identified as NZ Māori, highlighting a significant representation of this group among those who did not wait for assessment. Within the priority population, 11.5 percent of the 983 NZ Māori patients left without being seen, compared to 8.1 percent of the 1,252 NZ European patients. These findings were addressed in the next stage, prompting discussions on equity in healthcare.

### 5.30.8 Specific re-presentations within the ‘priority patient group’

This graph shows the number of times patients were allocated to the ‘priority patient group’ in the 2021 year. Overall, there were 2,251 patients who made up the 2,798 presentations. One patient met the ‘priority patient group’ criteria nineteen times in 2021.



**Figure 71: Reattendances to the ‘priority patient group’**

Figure 71 illustrates that one patient was identified by the criteria 19 times in one year and there were three patients who met the criteria 14 times. However, the majority of patients met the criteria once.

### **5.31 Checking retrospective data**

1. There were 593 patients who were classed as admitted from the 'priority patient group'.
2. On examination, 24 of these patients were seen in a clinic and therefore were referrals to specialities and were incorrectly categorised within the data available as these patients should not be described as 'self-referred'. There were also 10 other admissions that had referrals to specialities or follow up appointments with specialities.
3. 164 patients were classed as admitted but had no ward allocated to their data.
4. 118 patients were admitted to a short stay acute medical unit
5. All other patients had wards allocated to their data.
6. 12 patients were admitted to the mental health centre
7. No patients in the 'priority patient group' were inputted as deceased during their presentation.

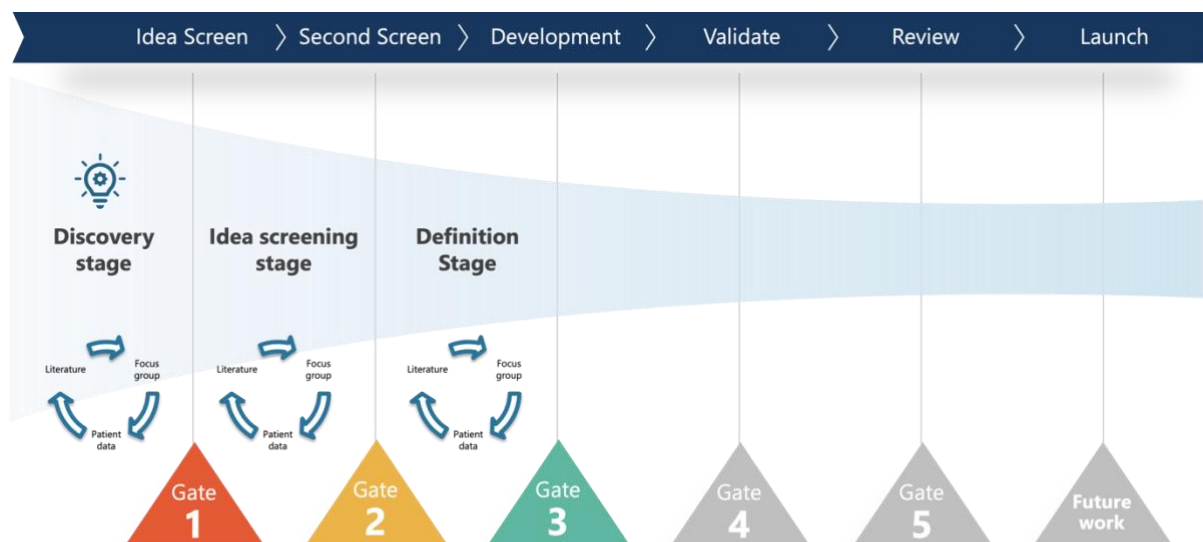
These findings were addressed in the next stage in focus group four.

### **5.32 Definition stage conclusion**

In the definition stage, the focus was to analyse patient complexities, such as repeated visits to the ED, evaluating the functionality of the healthcare system and working to identify a patient population for which an alternative pathway could be developed. This concludes the definition stage. The following section presents the stage-gate process, including the decision made at Gate Three.

### 5.33 Definition stage: Gate three decision

The definition stage was concluded once the focus group discussion was completed and analysed, along with the review of the associated patient data.



**Figure 72: Gate three decision**

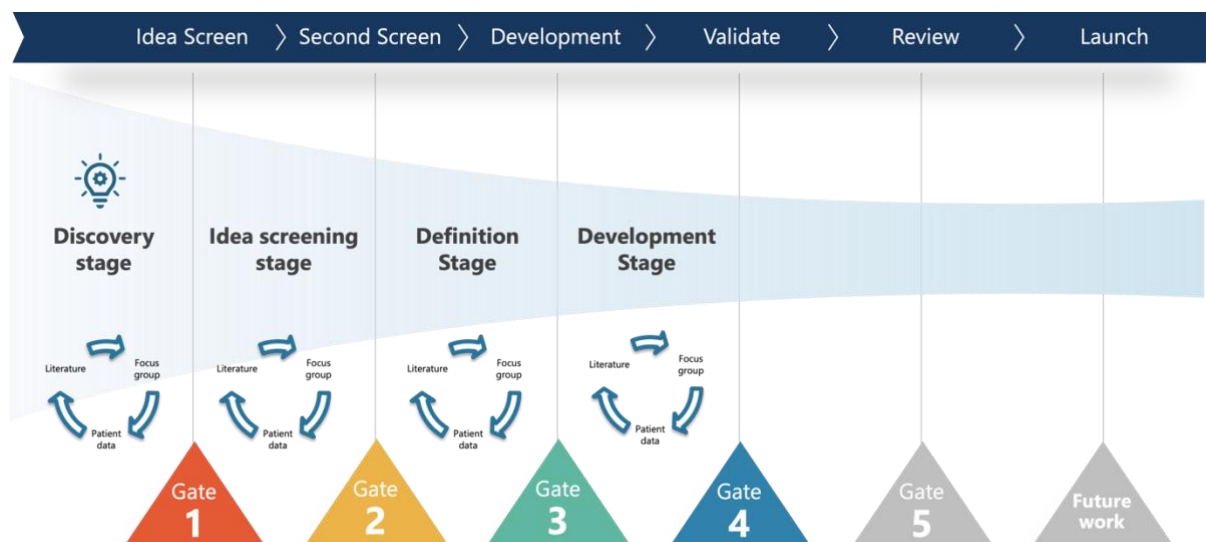
The stage-gate process involves making a decision at each gate on the continuity of the project. There are inputs, exit criteria and an output associated to each gate, with the relevant aspects for the definition stage shown in Table 19.

**Table 19: Gate three decision point**

| Gate one decision point:               |   |
|--|---|
| <b>Inputs:</b>                         | <ol style="list-style-type: none"> <li>1. Focus group three data collection and analysis report.</li> <li>2. Patient database review and analysis report.</li> </ol>                      |
| <b>Exit Criterion:</b>                 | <ol style="list-style-type: none"> <li>1. Prospective patient criteria defined based on the focus group and patient data findings.</li> </ol>   |
| <b>Output:</b><br>Go/Hold/Stop/Recycle | <ol style="list-style-type: none"> <li>1. <b>Go:</b><br/>The exit criterion for the definition stage was successfully met, the decision to advance to the next stage was made.</li> </ol> |

### 5.34 Development stage (stage four)

During the development stage, a focus group session was conducted along with a review of relevant evidence-based literature.

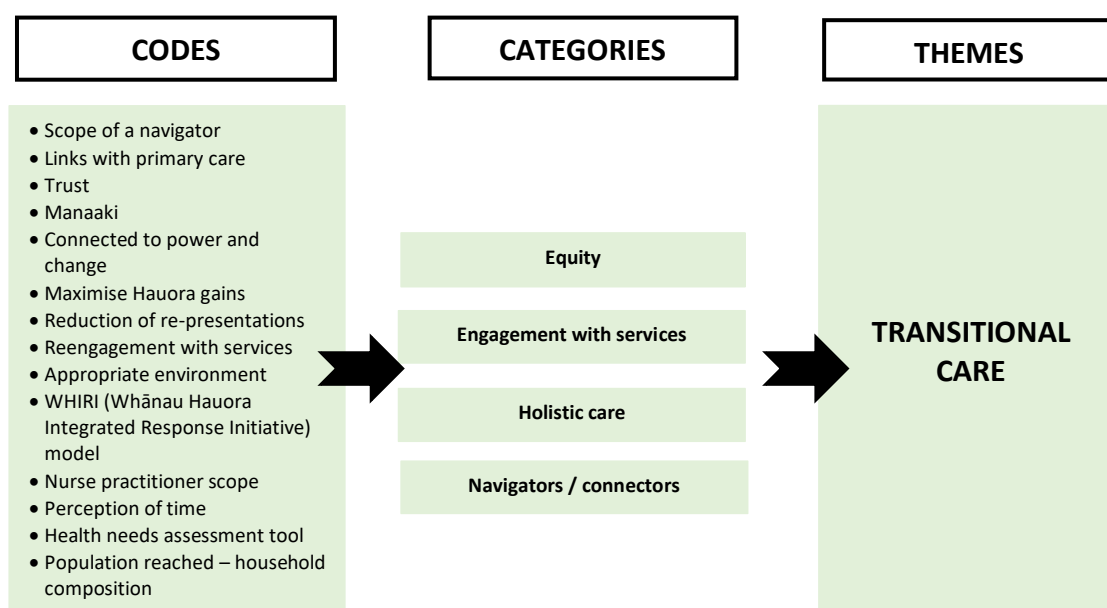


**Figure 73: Overview of the development stage**

The quantitative data report from the definition stage formed the foundation for discussion during the fourth focus group session. This report enabled a targeted conversation about pertinent patient data, allowing healthcare stakeholders to explore potential solutions for this patient group. Subsequently, the thematic analysis findings from the development stage are presented.

## Development stage: Focus group four

The following section includes the analysis and theme from the completion of focus group four. This focus group discussed the definition stages quantitative findings and began to focus on a solution-based approach for the patient data that was discussed. There was one prominent theme that was identified from the thematic analysis and this was transitional care.



**Figure 74: Focus group four thematic analysis theme construction**

### 5.35 Theme: Transitional care

The theme, 'transitional care' arose from fourteen codes which were collapsed into four categories. The most prominent theme of focus group four was transitional care. The focus group participants discussed how the target group may benefit from being better connected with other services outside of the ED. There was a discussion on how transitional care could be implemented:

*There could be a variety of things, we want someone to stay involved with that specialist input to make sure they actually understood the specialist input and they did follow up and they went to their GP or they did take what they were given to take and stuff like that. So what type of role would we see that type of person being?*

(Manager 1)

*You know, it's probably like a, it's almost like a navigator, like the intervention is like a navigation function, isn't it? So we did work like that in Canterbury after the earthquake. They worked in primary care and they actually booked these people in and followed them up, because the services were there but they often didn't get there you know. They called them primary care connectors.*

(Clinician 2)

The idea of a person helping the target patient group navigate healthcare services was supported by all focus group participants with one manager of the opinion patient navigators could have the ability to decrease reattendance at the ED:

*And it would then tackle a persons compliance going forwards so they weren't gonna become a repeat presenter. So that would align with from an equity perspective as well. So, if we did call them, I don't know, connectors, but we initially based them in ED and then actually with a view to move out.*

(Manager 2)

The focus group agreed patient navigators could be a solution for the priority patient group and there was a discussion around who would fill the role of a patient navigator:

*You're talking about navigation. You don't need health professionals. If it's kaitiaki, you know, supporting and navigating. It's people who are connected into the system and have some sort of coordination response. So if you think about our kaitiaki, they are not clinicians. Yeah, but they work alongside clinicians to better coordinate and navigate care when in the hospital.*

(Manager 1)

This focus group participant spoke about their perspective that the navigator role would not need to be filled by a health professional but instead someone who had knowledge of the healthcare system and could work alongside patients and healthcare professionals. Another focus group member spoke about their experience with navigators in a different healthcare context:

*These navigators can do so much. And I'm constantly fighting to increase the scope that navigators can do. They can do an awful lot and that the nurse just can't do from a time perspective. Yeah. And if you had a really good health needs assessment tool, you can pack a lot into there and sort of whole lot of stuff out.*

(Manager 3)

This quote describes the time-constraints that can be experienced in the healthcare setting by nurses and that having another person in a role where they can complete a health needs assessment and support the patient may be beneficial. Another healthcare stakeholder spoke about the role patient navigators have had in another setting with promoting transitional care and increasing patients' engagement with primary care services:

*What we found was you know, for whanau that are not engaged or disengaged or have had poor health experiences. Once we've reengaged them into the health services and we've gathered that trust then actually, we kind of help them to their first planned care appointment and then they kind of continue on their pathway and end up going to these subsequent appointments knowing that there's somebody there to contact if they need to. But you know, I just I can't speak highly enough of the trust and the engagement and the support.*

(Manager 2)

Another focus group member spoke about the importance of guiding patients and not just redirecting them to other services:

*And it might take a few goes before we actually get them into primary care and in a structured way where they feel you know, it's not just a hand off to primary care and so may need to guide them and shepherd alongside them through a nursing workforce to help them do that. Because we operate in a space where there is non-attendance and non-engagement with health services, there is the element of trust and support to guide them (patients).*

(Clinician 1)

One focus group participant spoke about their initial reluctance about the role of patient navigators due to a perceived power indifference and what steps would need to be in place to ensure the role was successful:

*So previously I've been really reluctant. I didn't like that navigation model because it's like if you, it was always like oh, you know, two powerless birds, you know, how can a navigator help if the problem is racism and lack of power sharing, how are you gonna get, you know a Māori whanau member, essentially a navigators like that whanau member again. It's just kind of useless, but that's where a model comes in, because that navigator is connected to power and change, they need protection and support to make those changes.*

(Manager 4)

Once the initial conversation on using patient navigators was agreed on the discussion moved to a more systems-based approach on what a pathway with patient navigators would look like and where they would be located. One focus group participant spoke about the ED environment and how it can be a busy place which may not be conducive to all patients' needs:

*When we talked about the attrition rates or people leaving and you know sometimes it is just that manaaki and really, when we think about it, our ED environments, are not always conducive, people are rushed, people are busy. And so there isn't always an ability to just spend time and be present with whanau or to listen to and alleviate what's actually going on for whanau at that particular time.*

(Manager 2)

Another focus group participant spoke about the ED environment and that having a separate clinic may be better in providing holistic care:

*I guess when you come to an ED environment, you're coming for one thing, but if you've got comorbidities that are impacting on that one thing, I would say that if you had that offshoot of that has stepped down clinic, for example or a different stream that somebody would be able to look into those comorbidities to ensure that that's not impacting on their representation back to ED all the time.*

(Clinician 2)

A focus group participant had a concern that if the new pathway was to care for these patients within the ED it may be difficult to change the way they are cared for:

*I think we would have to take them out of the ED.. Because when you're in the ED, they will tell you they will go ED speed just like the thought of putting in a GP into ED. The GP will end up going ED speed and it's a different speed. GPs are used to doing 15 minutes. And this is a group*

*that is going to need a little bit more than that. And we just don't have the physical space in the ED. And we don't want them developing those bad habits either.*

(Clinician 1)

After discussing the idea of holding a clinic off-site that has a more a conducive environment for the priority patient group, there was an idea that this clinic could be run by a NP:

*I think it could be a service that is set up with nurse practitioners, their scope of practice means that they lead a team, their concentrated level of knowledge but with prescribing as well would be great and then that would reduce your resource on and your costs for the GP workforce or for that particular workforce coming up.*

(Manager 2)

There was also a discussion around linking in multi-disciplinary teams with NPs and patient navigators:

*The other group of workforce who we could look at is allied health and looking at alternative support in the home and connecting them up with community NGO's and you know MSD kind of stuff, social determinants that impact on people's health and well-being.*  
(Definitions: NGOs – non-government organisations, MSD – ministry of social development).

(Manager 1)

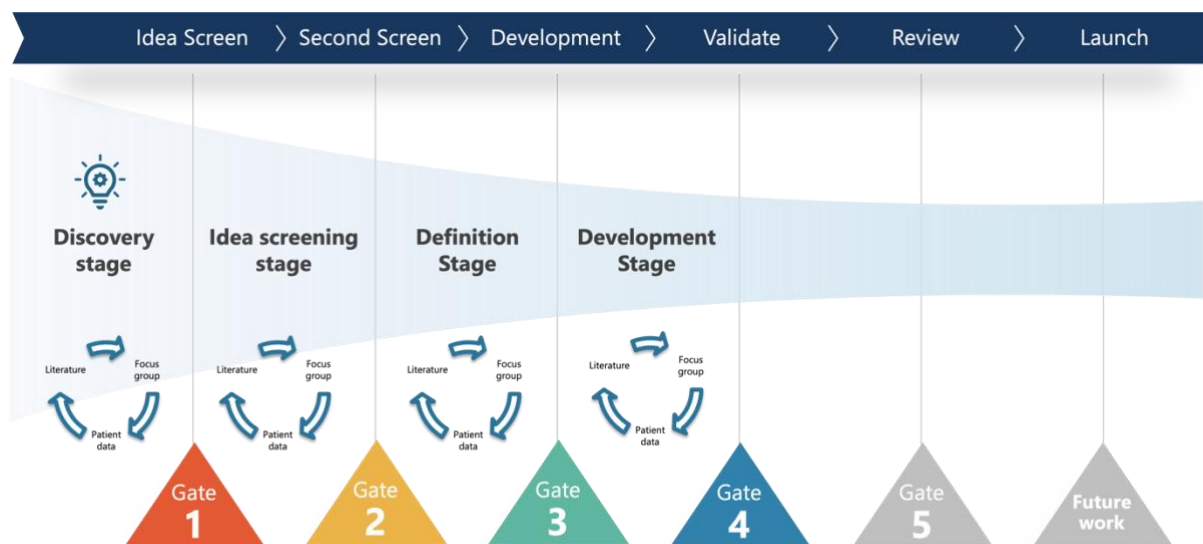
Overall, the focus group participants collaborated effectively to explore alternative approaches to caring for the priority patient group. It was concluded that a NP-led clinic, located off-site from the ED and supported by a patient navigator, could be a valuable service. There was particular interest in understanding the role of patient navigators in healthcare and the benefits identified in previous research. To explore this further, a rapid literature review on patient navigators was conducted, as detailed in the next section.

## **Secondary research methods: relevant literature**

Following the thematic analysis of the previous focus group, it became clear that healthcare stakeholders were interested in a pathway incorporating a patient navigator. To explore this further, a rapid literature review was conducted to examine the use of patient navigators in healthcare and their associated outcomes. Three randomised controlled trials were identified, all conducted in the United States, which assessed the impact of patient navigators on ED use. However, no randomised controlled trials matching this description were found in Australasia. The findings from this literature review are included in Appendix 7 and were presented during the focus group session in the validation stage.

### 5.36 Development stage: Gate four decision

The development stage concluded with the analysis of the focus group discussion and the completion of the associated rapid literature review. An overview of the project to this point is depicted below:



**Figure 75: Gate four decision**

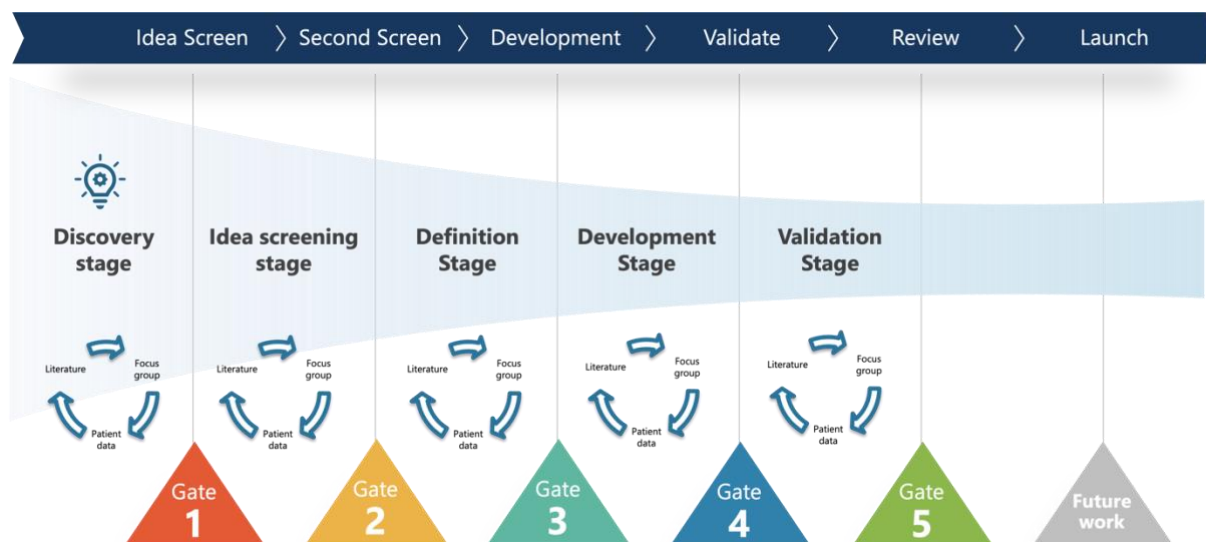
The stage-gate process involves making a decision at each gate on the continuity of the project. There are inputs, exit criteria and an output associated to each gate, with the relevant aspects for the development stage shown in the table below:

**Table 20: Gate four decision point**

| Gate four decision point:              |  |
|--|--|
| <b>Inputs:</b>                         | <ol style="list-style-type: none"> <li>1. Focus group four data collection and analysis report.</li> <li>2. A rapid literature review on patient navigators.</li> </ol>                    |
| <b>Exit Criterion:</b>                 | <ol style="list-style-type: none"> <li>1. A concept for the patient pathway is developed using the findings from the focus group session and current research evidence.</li> </ol>         |
| <b>Output:</b><br>Go/Hold/Stop/Recycle | <ol style="list-style-type: none"> <li>3. <b>Go:</b><br/>The exit criterion for the development stage was successfully met, the decision to advance to the next stage was made.</li> </ol> |

### 5.37 Validation stage (stage five)

The validation stage included completing a focus group session and a proposal for a new pathway which includes key patient data. The validation stage is the last stage completed in this research study. The figure below depicts an overview of the project thus far:

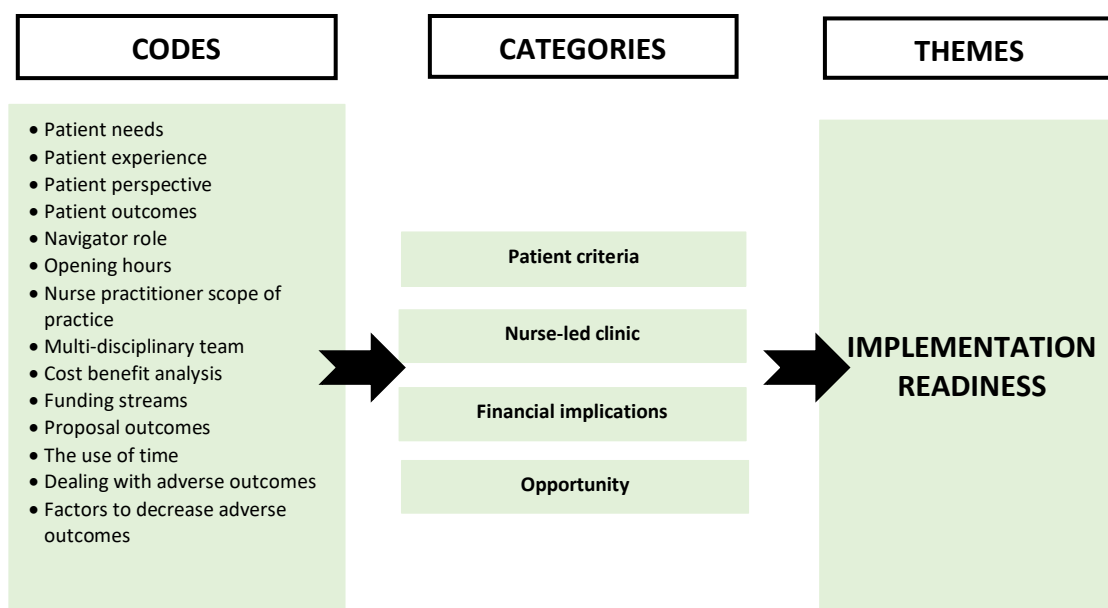


**Figure 76: Overview of validation stage**

The evidence tables summarising research on patient navigators were used as a discussion point during the fifth focus group session. This document, included as Appendix 7, informed discussions on the design of the new pathway. The outcomes of these discussions are detailed in the next section.

## Validation stage: Focus group five

The fifth focus group discussed the role of the patient navigator after the focus group participants had read the literature overview which contained evidence from previous research studies. The discussion then focused on the logistics of creating a new pathway for patients. There was one main theme that was concluded from the analysis of this focus group and that was ‘implementation readiness’.



**Figure 77: Focus group five thematic analysis theme construction**

## 5.38 Theme: Implementation readiness

The theme, 'implementation readiness' arose from fourteen codes which were collapsed into four categories. After discussing the current literature on the use of patient navigators the focus group participants were all in agreement that this role should be included within the new pathway. The conversation then focused on the readiness of a new pathway to be implemented. The first agenda was to confirm if the group was in agreement on the patient inclusion criteria for the new pathway.

### 5.38.1 Patient criteria

One participant acknowledge that creating a criteria that includes every patient who could benefit from the service is difficult and spoke about using clinical decision making to also include patients:

*I don't think we're going to get a perfect formula and there's going to be in the criteria of four and fives (triage score) that you're gonna get some nuances that as a clinician, I'd go, OK, actually, let's bring them across and you've gotta allow the clinicians to actually pull them across. You have to look at it because if we get too tight on our criteria and start to narrow it down even more, I think we'll lose people.*

(Clinician 1)

Another participant agreed and felt letting clinicians use their expertise to assess patients' eligibility rather than changing the criteria to include more patients would be responsible:

*There's always the opportunity if we did run something for clinicians to kind of pull people in patients that they think would benefit from the service rather than just changing the criteria.*

(Clinician 2)

There was also an agreement that the current criteria included patients who can be assessed and managed in a nurse-led clinic:

*And we currently have an ED system where we have a nurse practitioners, clinical nurse specialist within the ED and prior to probably COVID to be fair the nurse practitioners were looking at the lower acuity patients, triage scores and mixture of DRG's and case weights of patients through the consult area.*

(Manager 1)

It was also discussed that using reattendance in the criteria can capture patients who need assistance with navigating primary care:

*I think we looked at probably at least five or six patients in a day and they are patients with repetitive or representations to the ED. That may or may not have a good engagement with primary care.*

(Manager 2)

Once it was established that the focus group agreed on the current patient criteria the conversation moved onto how these patients would be cared for.

### 5.38.2 Nurse-led clinic

There was a consensus from the focus group that patients should be cared for using a nurse-led model outside of the ED with the added role of a patient navigator:

*We're looking at particularly a non-urgent, non-emergent, cohort of patients that go across to an area outside of the ED, preferably to be initially on site, to be assessed and have a treatment plan organised. We apply the filter, we then update a CNS or NP, it's a clinic but kind of off to the side and then we'd have the patient navigators as a mobile team.*

(Manager 2)

The clinic being outside of the ED was thought to be a better environment for patients and staff when working with low acuity concerns:

*We wanted to take a different feel both in the environment but also the way that the staff responded in a different space than the ED.*

(Manager 3)

One participant spoke about the benefits of the nurse-led model and giving patients more time to discuss their concerns:

*And where we could actually spend a bit more time I suppose doing those assessments from a, a truly nurse practitioner, nurse perspective.*

(Manager 2)

Another participant spoke about the benefits of having the clinic outside of the ED but also still on-site at the hospital:

*So this would be a nurse led, allied health contributing service on site, but outside of the ED, which has initially good connection with the ED if something where to go wrong it would be easy to return someone back to the ED and then eventually over time progressing that into primary care.*

(Manager 4)

There was an agreement with initially starting the clinic on-site from a safety-net perspective:

*We could build into the proposal that there's a safety net. Yeah, so that rather than our end with nurse prescriber, there's actually a built-in site in there and if so, they can actually filter it back if the algorithm is wrong and it will be wrong, it can't be right all the time.*

(Manager 2)

One participant thought it was essential that interventions were primary care driven, as the goal of the project was to reduce ED attendance and support patients to engage with primary care:

*All of the interventions have to be primary care driven because and therefore it is us supporting primary care. Otherwise, they will just use us, we will be the victim of our own success and they'll keep on coming back. The trick would be that the team will have to embed them back into primary care. The right solution is not long term with this service, they need to go back to primary care.*

(Manager 1)

This perspective highlights the importance of integration and the objective of transitional care. The clinic's goal was discussed as providing assessment and treatment for patients who present to the ED while facilitating their engagement with primary care, ultimately reducing their reliance on the ED for low-acuity concerns. There was a consensus from all participants that the clinic needs to be open seven days a week after reviewing the times of presentations in Figure 69:

*It needs to be seven days a week (for the service). Monday to Sunday and an 08:00am to 08:00pm service.*

(Manager 1)

After discussing the functionality of the nurse practitioner clinic, the next agenda item concerned the financial aspects of the new pathway.

### 5.38.3 Financial implications

The current cost of patients being seen in the ED was discussed and how a new clinic would compare financially:

*Looking at ED triage costs. If it's just ED in isolation, it's \$261 and \$522 for triage five and four. But then when you add in average laboratory, radiology, other and blood test, that's where the figure goes to. So the cost of them being seen across the road or down the road or round the corner in a clinic is gonna be significantly less.*

(Manager 1)

Another participant discussed the impacts on the ED if patients are treated elsewhere:

*The cost per patient is only one small part of it, isn't it? Because if that patient is spending four and a half hours in ED, that's blocking a bed, that's impacting on flow into the hospital, it's impacting on the waiting room. The costs are really significant.*

(Manager 3)

One participant discussed the impact on throughput with the new pathway, but also had the opinion that in reality it would not be cost saving:

*There is the impact on throughput, capacity and resources because it's not as if the hospitals probably gonna save any money. It's just things that you know as you say, frees up capacity for other to speed up the throughput. Whether there are actually any hard savings here? I mean there are on paper no doubt about that, but practically, in reality, there's probably, it ain't gonna change the amount of money being spent.*

(Manager 4)

Another participant discussed the on-going benefits of having a clinic which promotes transitional care and the impact this has on patients' health and therefore the health system:

*If you're looking at the cost benefit analysis, I mean it's management of comorbidities, it's reduction in planned care, less bed days with acuity, it's all those re-presentation sort of things as well, if you're looking at it from an organisation perspective, you know there is a cost benefit there.*

(Manager 1)

When discussing the cost-benefit aspect of the new pathway there was a discussion on the funding streams that could be used:

*The funding of this is quite complex because these patients are already funded, partly funded through primary care through capitation. A whole heap of them have long term conditions and they therefore can access additional funding through primary care.*

(Manager 1)

One manager highlighted the importance of understanding the financial implications of the service from a patient perspective. This participant thought it was essential that patients would not have to pay for the service as this can be why they present to the ED (free service):

*If we could match something so they don't actually have to worry about that taking the card or having cash on them to pay to see our clinicians. And then we're just left with the social determinants. How do they get here? How do they get home? How do they get any prescriptions? The cost of getting people to hospital like vouchers and stuff like that, petrol vouchers just to get them to their appointments. You know it's around looking for other ways to support them because it is a stress to them.*

(Manager 2)

The focus group overall agreed patients should not have to pay for the new service and this conversation continued next to address the pathway from a patient's perspective.

#### **5.38.4 Patient perspective**

One participant raised the notion of patient incentivisation:

*Just thinking about how do we incentivise people to do this? How do we actually get them thinking that this is great, this is a much better option for me. You know what I'm saying? I'm saying that, you know, often we think too much from supply side, service provision and don't think enough about the demand side from the actual patient themselves. So how do we actually go about achieving that?*

(Clinician 2)

This opinion was met by another participant who felt the decreased waiting time and increased time with a healthcare professional would be incentivising:

*It's really important that we frame it in the sense that this is not about 'bum on seats' and because if we're looking at five or six people a day, that's quite a long period of time that a clinician is spending time with them. And if you think of primary care has 15 minutes slots a day and emergency care, you're waiting up to five to six hours to be seen.*

(Manager 1)

After discussing the patient perspective, the focus group continued to address the patient navigator role along with the proposed outcomes of the pathway.

### 5.38.5 An opportunity and a challenge

One participant made a comment about the new pathway:

*We have an opportunity. You know what? Both an opportunity and a challenge.*

(Manager 4)

There was a large discussion on who would fill the role of the patient navigator and whether or not they had to be a healthcare professional. When the focus group participants had been addressing equity in their conversations a suggestion was made to use a service known as Te Kōhao Health for navigation:

*Because if you use someone like Te Kōhao Health, it's a culturally appropriate service. They'll see it as an opportunity to increase their enrolled population as well by getting that population signed up. And you need that living well, coach style CBT approach from your connector.*

(Manager 2)

One participant who specialised in Māori health also spoke about the benefits of utilising a health needs assessment to ensure holistic care for patients:

*This could make a really big impact on all of our Māori public health priorities. If we got the health need assessment, you know, which has it all in there. Like, you know, cancer screening, immunisations, smoking. I think it is about the focused approach that the service will provide for patients and whanau and in a more holistic way.*

(Manager 1)

The focus group participants agreed that a patient navigator with these qualities would be beneficial for this patient group and the clinic proposal. The focus group concluded with an emphasis on the proposed or expected outcomes of this proposal:

*We need to be really careful about the outcomes that we're seeking because an outcome needs to be, engaged and enrolled in primary care. If they are enrolled and engaged and they're getting high quality primary care services. They won't be coming back to ED.*

(Clinician 2)

It was agreed that a proposal should be developed for a nurse-led clinic, staffed by nurse practitioners and located near the ED to provide a safety net. Healthcare stakeholders emphasised the importance of operating the service seven days a week and including a patient navigator role to support patients in transitioning to ongoing care with primary care practices. The next section outlines the proposal for this service.

## **Validating the new tailored care pathway**

The objective of this study was to identify a cohort of non-urgent patients and develop a new care pathway for this group by utilising the stage-gate process. This section therefore presents the new tailored care pathway, providing an outline of how it would function in practice. Firstly, an overview of the most recent data available was completed along with a safety check of the priority patient group criteria and then the proposed pathway is outlined.

### **5.39 Priority patient group**

There were 2,798 presentations meeting the criteria in 2021 from 2,251 unique patients. Most eligible patients received a triage score of four, representing 87 percent (2,346 patients), while 13 percent (361 patients) had a triage score of five in 2021. The majority of patients in this group identified as NZ European (45%) or NZ Māori (35%) in 2021. The majority of patients in 2021 were between 20 and 69 years of age and they also lived in areas of high socioeconomic deprivation. The highest rates of these patients arriving at the ED occurred between 08:00hrs and 16:00hrs. This provides an overview of the patient group, with these demographic findings discussed in greater detail in relation to current literature in Part 1 of the discussion chapter of this thesis.

#### **5.39.1 Safety check of eligibility criteria**

A retrospective data review was conducted as a safety check, focusing on presentations from 2021 to ensure accuracy in categorising non-urgent cases as seen in the definition stage. The review initially identified 593 patients classified as admitted to hospital under the priority group non-urgent criteria. Among these, 24 patients had been assessed in a clinic and referred to specialist services, which meant they were incorrectly listed as 'self-referred' in the dataset. Another 10 patients were also referrals to specialist services, while 164 patients were marked as admitted but lacked ward allocation details, making it unclear whether they were in fact admitted to hospital. Additionally,

118 patients in this group had an inpatient length of stay (LOS) of zero to one day. Stakeholders believed this finding indicated that a new service offering discharge support could potentially prevent all, or a significant proportion, of these short-stay admissions by providing a more comprehensive wrap-around service. After adjusting for these discrepancies, 281 patients were likely misclassified as non-urgent, suggesting an estimated categorisation error rate of around 10 percent. Importantly, no patients in the non-urgent group were recorded as deceased during their ED presentations. A similar review of 2022 data found a comparable error rate of approximately 10 percent.

The retrospective analysis, based solely on data entry without clinical assessment, likely contains some categorisation errors. Stakeholders acknowledged the difficulty of achieving flawless criteria, noting that clinical nuances often make it impossible to attain 100 percent accuracy. Nevertheless, they discussed these findings and proposed an added safeguard: once identified by the criteria, patients could undergo a rapid review by a Nurse Practitioner (NP). This assessment would act as a safety net, ensuring that only suitable cases proceed along the designated pathway. Stakeholders also noted that overly refining the criteria could risk excluding patients who might benefit from the service, they therefore recommended maintaining the current criteria but supplementing it with a NP review before assigning patients to the new pathway as a way to decrease potential risk.

#### **5.40 A new tailored care pathway: the CATCH team**

The newly proposed pathway has been named the Coordination, Assessment, Treatment, Community Hauora (CATCH) team by the researcher. The CATCH team aims to support patients who meet the priority patient group criteria by helping them navigate healthcare services, ensuring that their health needs are managed in a smooth, transitional manner.

The CATCH service will operate as a NP-led clinic, based adjacent to the ED at the hospital site. Patients presenting at the ED will be assessed by the triage nurse, who will enter their information into a system supported by a computer algorithm identifying those who meet the CATCH criteria. Selected patients' triage information will be reviewed by a NP and if deemed appropriate, the patient will be directed to the CATCH clinic, where they will undergo assessment, diagnosis and treatment by the NP team. Patients will also have medications prescribed by NPs if necessary as this is within their scope of practice (Nursing Council of New Zealand, 2017). Patients will then be assessed by patient navigators to determine if they have additional care needs and the navigator will work to decrease barriers to healthcare for these patients (Chan et al., 2023; Chen et al., 2024). The navigators in this proposal are non-health professionals, trained to support patient access to services, working directly with patients to facilitate healthcare navigation.

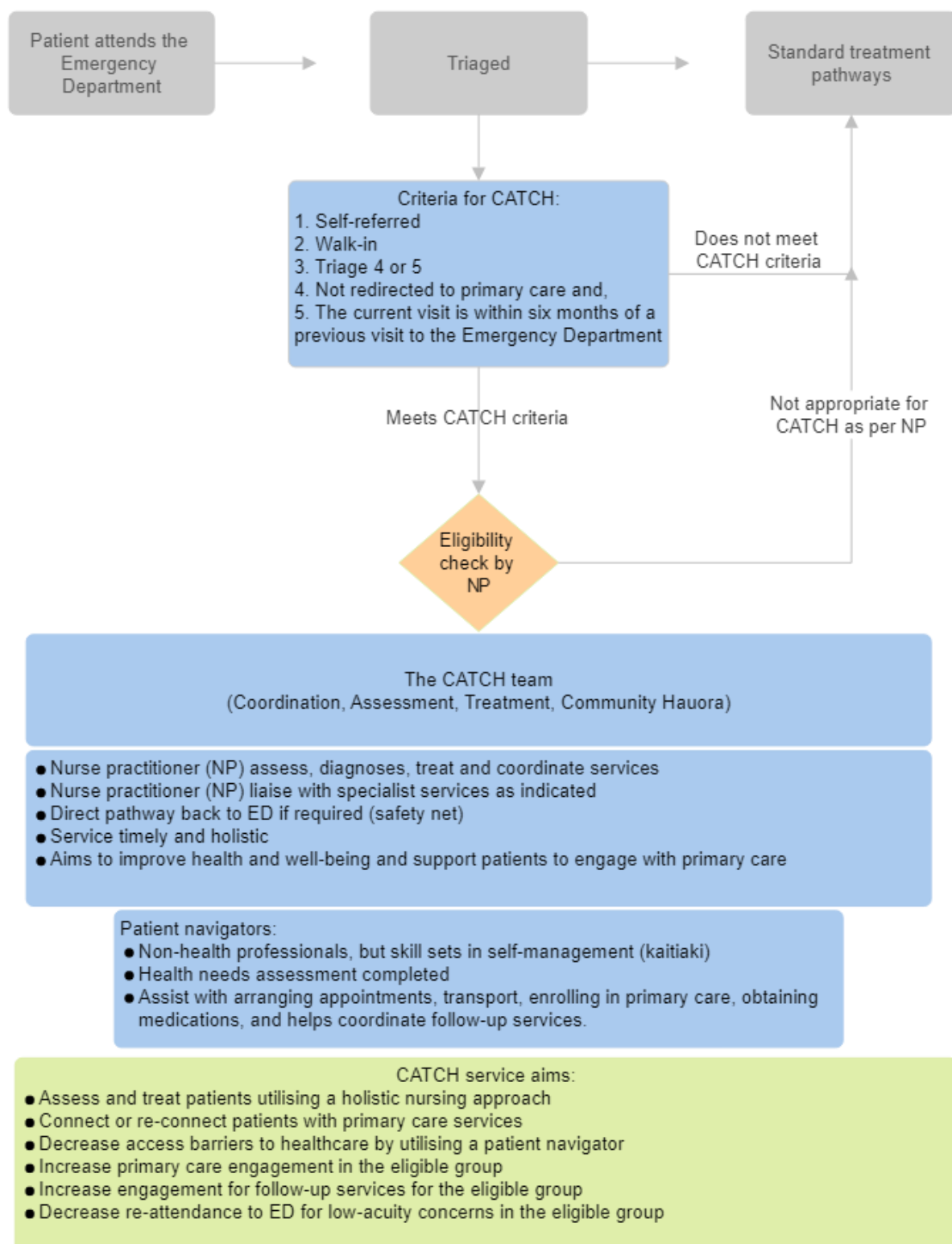
The CATCH service has the following objectives:

1. Utilise a holistic nursing approach to assess and treat patients through nurse practitioners;
2. Connect or re-connect patients with primary care services;
3. Decrease access barriers to healthcare by engaging a patient navigator;
4. Increase primary care engagement among the priority patient group; and
5. Decrease re-attendance to the ED for non-urgent concerns in the priority patient group.

Operating seven days a week from 08:00hrs to 20:00hrs, the CATCH clinic will be located outside the ED to reduce ED resource use while remaining close enough to ensure easy access and act as a safety-net if a patient requires further urgent care. Patients will be escorted to the clinic by a healthcare assistant (HCA), NP, or patient navigator. Upon arrival, the NP will assess and treat the patient. After completing the consultation, the NP will collaborate with the patient navigator to address further needs and hand over care. The patient navigator will then conduct a comprehensive health needs assessment in collaboration with the patient and their whānau if

appropriate, co-designing a care plan tailored to the patient's needs. The navigator will assist patients with arranging appointments, organising transport, enrolling in primary care if necessary, obtaining medications and coordinating follow-up appointments. When beneficial, the patient navigator may accompany patients to appointments, ensuring continuity of care and a better understanding of their conditions.

The patient navigator will follow up with patients two weeks after their session, or following scheduled appointments, to ensure their needs are being met. If further support is needed, patients will continue with navigation services; otherwise, they will be discharged from the service once their needs are met. Patients that present to the ED after-hours and meet the criteria will have a follow-up phone call with a patient navigator, these patients would have been assessed and treated for their concern within standard ED treatment pathways due to the clinic's opening times and therefore will not require NP services. This service will incorporate kaitiaki (guardians) as patient navigators, who will receive training to build a strong understanding of available services, a key element for success in this role. The proposed service is expected to educate and encourage patients to engage with appropriate services tailored to their needs. By implementing this service, the aim is to alleviate some of the pressures on the ED, enhance patient outcomes, reduce inequalities and promote healthcare integration. An overview of the CATCH team process is shown in the Figure 78.



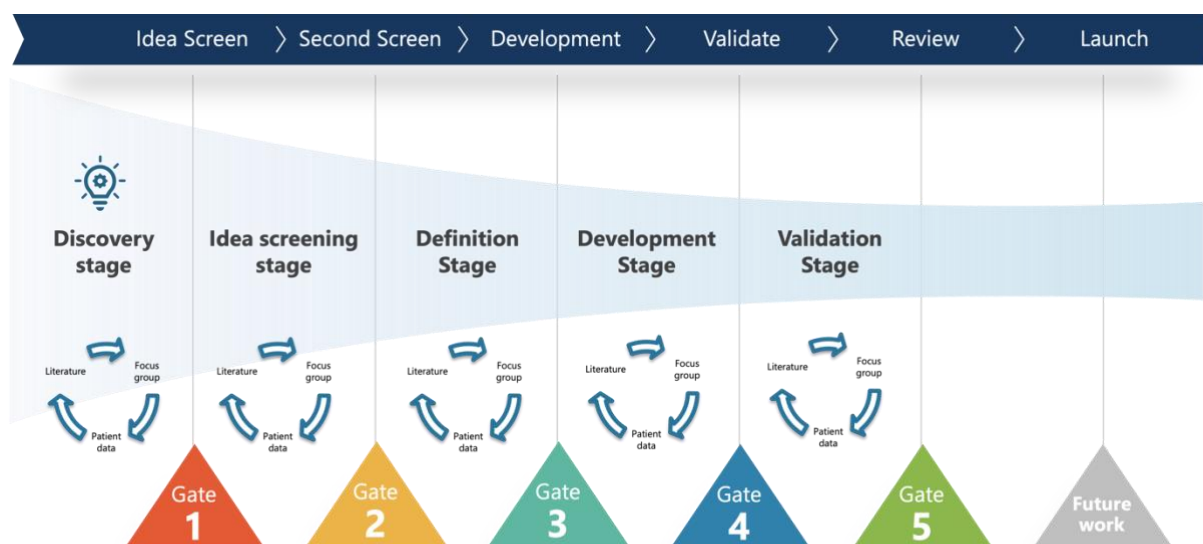
**Figure 78: A flowchart of the CATCH service**

Figure 78 provides an overview of the patient journey, starting from their arrival at the ED. It illustrates the journey if patients meet the CATCH criteria and if they do not. If a patient does not

meet the CATCH criteria they continue on the standard ED treatment pathway. If patients are eligible for CATCH this figure shows an overview of the CATCH team and what the patient can expect from this service. This pathway was reviewed by all healthcare stakeholders from the focus group session and it was concluded that the pathway was validated. This concluded the validation stage, the overview and outcome decision is displayed next.

## 5.41 Validation stage: Gate five decision

The validation stage was concluded once the focus group discussion was completed and analysed and the proposal for the new pathway for the selected patient group was created.



**Figure 79: Gate five decision**

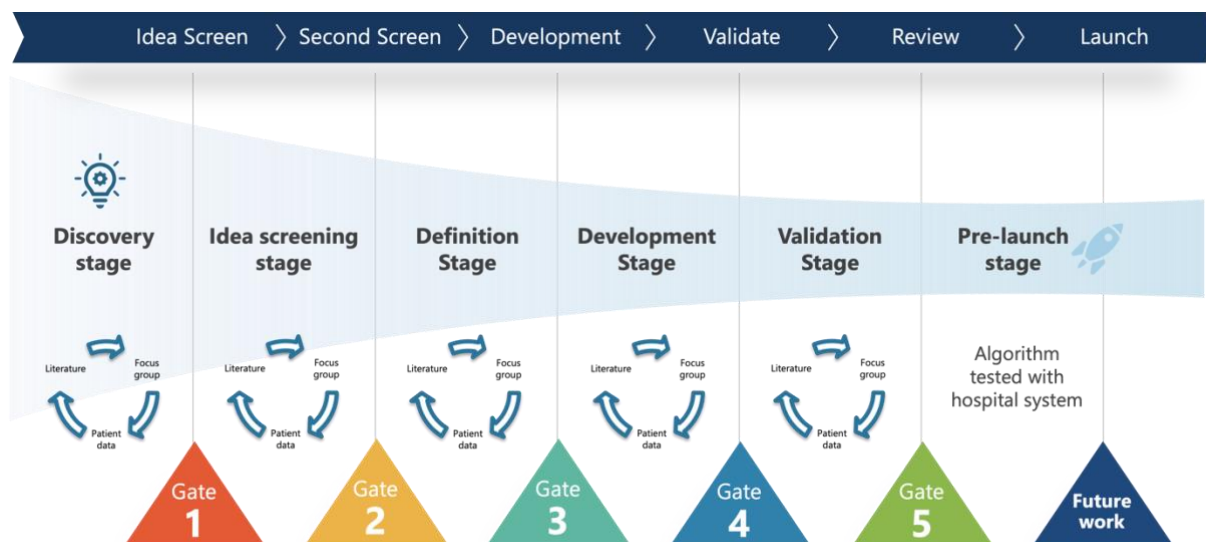
The stage-gate process involves making a decision at each gate on the continuity of the project. There are inputs, exit criteria and an output associated to each gate, with the relevant aspects for the validation stage shown in the table below:

**Table 21: Gate five decision point**

| Gate five decision point:              |   |
|--|---|
| <b>Inputs:</b>                         | <ol style="list-style-type: none"> <li>1. Focus group data collection and analysis report.</li> <li>2. Patient pathway proposal.</li> </ol>   |
| <b>Exit Criterion:</b>                 | <ol style="list-style-type: none"> <li>1. Patient pathway validated</li> </ol>  |
| <b>Output:</b><br>Go/Hold/Stop/Recycle | <ol style="list-style-type: none"> <li>1. <b>Go:</b><br/>The exit criterion for the validation stage was successfully met, the decision to advance to the next stage was made.</li> </ol> |

## 5.42 Pre-launch stage (future work)

The pre-launch stage of this project involves testing the patient criteria algorithm within the research hospital's database systems. Below is an overview of the whole project to this point:



**Figure 80: Overview of the pre-launch stage**

The pre-launch stage of the stage-gate process for this project falls outside the scope of this study. The information and proposal for the patient pathway developed in this research have been left with the healthcare stakeholders. The computer engineering team has commenced testing the algorithm and is integrating machine learning into the system. This testing phase is beyond the scope of this study.

## 5.43 Findings summary

The analysis of both qualitative and quantitative data was conducted to establish specific patient criteria, which were then used to develop a new interventional pathway for this patient group. The discussion chapter will address the research questions and examine the patient pathway in relation to current literature, with the aim of fostering positive change in NZ's healthcare system.

## **Chapter VI: Discussion**

### **6.1 Introduction**

The increasing demand for the Emergency Department (ED) has become a significant concern within contemporary healthcare systems, reflecting changing demographic trends in population health, service accessibility and patient behaviour. The aim of this study was to critically explore the phenomenon of non-urgent presentations, a growing issue that contributes to overcrowding, resource strain and compromised patient care within EDs. This study also aimed to develop a tailored care pathway for this population in collaboration with health care professionals who have expertise in the management of an ED located in New Zealand (NZ).

The following discussion chapter is divided into three parts. Part 1 summarises the answers to the three research questions: (i) From the perspective of the healthcare stakeholder group, what are the characteristics of patients attending the ED who could have improved outcomes with alternative pathways; (ii) Among patients attending the ED, which group is prioritised by the healthcare stakeholder group for requiring an alternative care pathway; (iii) What alternative approach, informed by both evidence and views of the research stakeholder group, could be implemented to improve the outcomes of this patient group?

Part 1 aims to combine the study findings with broader research to address the research questions and build an understanding of healthcare stakeholders' perspectives on non-urgent ED presentations and alternative management strategies. The theoretical contribution of this research study is presented in Part 2 and Part 3 considers limitations and the implications of this study with suggestions for future research endeavours.

## **Part 1: Research questions**

A mixed-methods approach was employed to gather insights from healthcare stakeholders with expertise in managing the ED at the research hospital, alongside data obtained from a patient management database system to analyse non-urgent presentations to the ED. This methodology was implemented to ensure a thorough exploration of themes, utilising triangulation of qualitative and quantitative data to enhance the credibility of the findings. In this section, the results from the five qualitative focus group discussions and the quantitative analysis of patient data will be integrated to address the research questions, along with current research literature.

### **6.2 From the perspective of the Emergency Department healthcare stakeholder group, what are the characteristics of patients attending the Emergency Department who could have improved outcomes with alternative pathways?**

The core role of EDs is to treat patients with life-threatening illnesses or injuries. However, many patients who present to the ED do not require urgent medical intervention. The demand for ED services has been rising in NZ and globally, driven by population growth and shifting demographic trends (Ministry of Health, 2016). At the research hospital, presentations to the ED rose from 65,570 in 2014 to 80,759 in 2021, a 23 percent increase. The escalating demand for ED services raised concerns among healthcare stakeholders, who recognised the need to investigate whether alternative approaches could be employed to help alleviate some of the demands for the ED. This research question therefore aimed to determine whether the healthcare stakeholder group perceived certain patient populations who use the ED as not needing emergency care and whether alternative care pathways could result in better outcomes for these patients.

The initial focus group discussion highlighted the stakeholder belief that a significant proportion of ED presentations involve patients who could be managed elsewhere, with a range of characteristics discussed. Stakeholders showed a strong interest in the functionality of the ED and were eager to explore and discuss how certain patient groups contribute to unnecessary workload, as well as potential alternative management strategies for these patients. The focus of this research question was to identify a cohort of patients who could benefit from an alternative care pathway and was structured as a process of elimination, utilising healthcare stakeholders' perspectives and patient data to evaluate whether specific patient populations merit the implementation of such an approach. Initially, the discussion centred on combining insights from healthcare stakeholders and patient data in the process of eliminating patient characteristics. As potential patient cohorts for the alternative pathway were identified, relevant research literature was incorporated to strengthen the findings and provide supporting rationale.

The pathway through which patients arrive at the ED emerged as a key consideration among healthcare stakeholders, with a particular focus on patients referred by their general practitioners (GP). Stakeholders expressed concerns that GP-referred patients, as well as those awaiting specialist assessment, often use ED resources unnecessarily and could be managed more appropriately in clinic settings. They suggested that speciality services at times utilise the ED as a 'de facto clinic', which not only strains ED resources but also subjects patients to potentially prolonged waits in the busy ED environment. The data analysis on GP-referred patients indicated that this group contributed to only two percent of total ED visits. These patients predominantly had low-acuity Australasian Triage Scales (ATS) (levels 3 and 4), were discharged without admission and had an average stay of four hours in the ED. Stakeholders believed that some GPs refer patients to the ED either to seek a second opinion or due to time constraints within GP appointments. While several studies have examined healthcare professional referrals to EDs and found non-urgent presentations linked to such referrals, non-urgent cases are typically defined as

being self-referred (Masso et al., 2007; Schütze et al., 2019). For example, Unwin et al. (2016) and Afilalo et al. (2004) found that 25 percent and 20 percent of non-urgent cases, respectively, were referrals from healthcare professionals. This literature supports the perspectives of the healthcare stakeholders in this study. However, given the low volume of GP-referred cases to the emergency medicine team identified in the patient data analysis, stakeholders decided that this subset was too small to justify further investigation.

The researcher also examined data on patients referred to other speciality services, such as orthopaedics, ophthalmology, ear, nose and throat (ENT) and plastics surgery. The findings indicated that most of these presentations were similarly low-acuity cases (ATS levels 3, 4 and 5), with the majority discharged from the ED, except for patients under the orthopaedic team. Upon reviewing these data, the stakeholder group agreed that low-acuity presentations and high discharge rates across speciality services supported the notion that many of these patients could be managed in clinic settings outside the ED, as they did not require hospital admission. However, the overall numbers were not substantial enough to be the focus of this study. An exception was identified in referrals to orthopaedic services. The majority of orthopaedic patients required hospital admission for further treatment and one emergency clinician noted that orthopaedic cases often require collaboration with emergency medicine, particularly for procedures such as fracture relocation under sedation. Overall, the stakeholder group concluded that while many speciality referrals could potentially be managed outside the ED, referrals to orthopaedic services warranted continued care in the ED setting. Nevertheless, they ultimately determined that the numbers were too limited to be a central focus of this study.

The researcher examined patients who were redirected from the ED i.e., those who are assessed by a triage nurse and then directed to an urgent care centre, rather than receiving treatment in the ED. In discussing these findings, stakeholders agreed that the current redirection process was

effective and preferred not to modify it. Redirection pathways are well established in EDs and have been shown to improve ED performance indicators, aligning with stakeholders' perceptions in this study (Anne-Laure et al., 2024). Stakeholders instead suggested focusing on additional methods to reduce ED demand rather than interfering with a system already considered successful. However, concerns were raised about the long-term suitability of this redirection approach, as patients sent to urgent care centres lack continuity of care or follow-up. It was also noted that there were a higher number of redirections occurring on the weekends. Stakeholders believed this was due to a lack of primary health care services available at these times and suggested that this concept should be discussed when exploring new pathways for non-urgent patients as access on every day of the week is essential. Stakeholders acknowledged that developing an alternative pathway could better address these patients' ongoing healthcare needs in the future.

Mental health presentations were a key topic of discussion at the first focus group session when discussing risk aversion. Clinicians noted that, while mental health patients sometimes present to the ED requiring emergency medical intervention such as in cases of drug overdose that necessitate clinical investigations and management, many of these visits do not require emergency medicine input and instead need specialist mental health care. Mental health professionals do not operate from the ED, so they must be called in, which stakeholders believed resulted in patients experiencing mental distress and they considered the ED a suboptimal environment for these patients' needs. The findings were presented at the second focus group, where stakeholders informed the researcher that separate work was already underway to address the needs of mental health patients. Consequently, the stakeholders suggested that this research study focus on other patient populations that might benefit from alternative pathways, as mental health presentations were being addressed through parallel initiatives.

The characteristic of age was also discussed by the healthcare stakeholders. Healthcare stakeholders perceived that many parents bring their children to the ED primarily out of caution, even when emergency care may not be strictly necessary. Additional studies support these perceptions, indicating that parents often choose nearby EDs for convenience and due to limited access to primary care services (Benahmed et al., 2012; Guckert et al., 2022). Guckert et al. (2022) argued that parents see EDs as better equipped to quickly diagnose and manage their child's health, reducing parental anxiety. This perception of urgency and the drive to alleviate worry appear especially influential in paediatric cases, where parents may feel an added pressure to ensure timely, high-quality care. Stakeholders in this study also noted that children often remain in the ED longer than adults, as additional observation is frequently sought to ensure their safety. McHale et al. (2013) suggest that parental decisions to visit the ED stem from a belief that it offers the safest and most appropriate care. The findings showed that children account for around 20 percent of all ED presentations at the research hospital, underscoring their significant impact on ED capacity and workload. Stakeholders therefore advocated for the inclusion of children in any new patient pathway, as they constitute a large portion of ED visits and could benefit from more efficient, targeted care options.

When discussing risk aversion in the ED, the stakeholders also spoke about patients who are brought into the ED under police custody as they believed this patient population was increasing in prevalence. The number of patients brought to the ED by police increased significantly and healthcare stakeholders noted that this increase could be attributed to a recent policy change, implemented after a death in custody, which encourages police officers to bring individuals in custody to the ED as a precaution. Stakeholders acknowledged that while the actual number of presentations from police custody was low, these cases tend to stand out due to the behavioural challenges they often present in the ED environment. Stakeholders believed this heightened awareness may create a bias among ED staff, who may perceive these cases as more frequent or

impactful than they actually are. Given the low volume of such presentations, stakeholders concluded that patients brought in by police custody should not be a focal point of this study.

The topic of patients presenting to the ED with chest pain was also discussed in terms of risk aversion, proving to be a controversial issue within the stakeholder group due to the associated clinical risks. One clinician highlighted the high volume of patients presenting with chest pain, pointing out that only two percent of these cases actually result in a diagnosis of acute myocardial infarction. This clinician expressed frustration with the current management of these patients, noting that some individuals return weekly with the same symptoms, undergo an electrocardiogram and blood test and are then discharged, only to return with similar complaints. However, this perspective was met with caution by other healthcare stakeholders, who emphasised the importance of rapid emergency care for chest pain patients, given the potentially life-threatening nature of myocardial infarctions. Although only a small percentage of chest pain cases result in acute cardiac events, the group largely agreed that the risk involved in missing one of these cases was too high. This view is supported by the literature with Schütze et al. (2019) specifically excluding patients with chest pain from their non-urgent presentation criteria due to the risk of myocardial infarction. Consequently, chest pain presentations were excluded as an area of interest.

There was a perception among healthcare stakeholders that patients from Aged Residential Care (ARC) facilities should ideally be treated within their homes rather than in the ED, as they often do not require emergency medical services. However, upon reviewing the data, stakeholders held differing views. Some stakeholders believed that ARC patients frequently presented to the ED without needing emergency care and accounted for a significant number of presentations. Others felt that, although these patients prompted substantial discussion within the ED, the issue was more about the discourse surrounding them than the actual number of cases, with one stakeholder referring to it as "noise". However, upon investigation, the actual numbers of patients attending

from ARC were low, although patients were typically of moderate to high acuity, with the majority assigned triage levels of two or three and were frequently admitted to the hospital.

Notably, ARC patients had prolonged stays in the ED. This prolonged duration supported the perception that ARC patients are highly visible within the ED due to their extended stays rather than a high volume of presentations. These perceptions and data findings are supported by Street et al. (2012) who conducted a retrospective cohort study examining all emergency presentations for ARC patients at an Australian hospital in 2009. Street et al. (2012) concluded that the 4,637 emergency visits from ARC patients in their study accounted for 3.4 percent of all ED visits that year. They found the average length of stay in the ED was 7.9 hours, with 84 percent of ARC patients remaining in the ED for more than four hours. Notably, only 59 presentations in the Street et al. (2012) study were classified as non-urgent, which was less than 1.5 percent of the study population. These findings support the limited ability to class ARC visits as non-urgent and also support the findings that patients from ARC spend an increased amount of time within the ED. The majority of the stakeholder group decided after reflecting on the findings from the patient data that this population was unlikely to fit the characteristics of patients needed for this study and therefore no further ARC data was sought.

In examining specific patient populations, it became apparent that patient numbers were often either too limited to justify creating a new care pathway, or the populations under consideration were more complex than initially perceived, not aligning with non-urgent patient characteristics as healthcare stakeholders had anticipated. Consequently, the researcher broadened the focus beyond the initially identified characteristics, as the previously defined groups were found to hold limited value for further investigation. When exploring the motivations driving patients to use the ED for non-urgent complaints, stakeholders raised concerns that many patients were disengaged from primary healthcare services due to the high costs associated with GP visits and urgent care, often

feeling they had no viable alternative. They also highlighted issues of healthcare equity, noting that some individuals faced greater levels of social deprivation, which impacted their access to and use of health services. Furthermore, stakeholders perceived that the ED frequently serves patients with complex conditions with multiple comorbidities rather than urgent needs. They expressed the view that such patients might be better managed by GPs or NPs in primary care, who are more equipped to handle long-term health conditions and also provide continuity of care.

However, stakeholders noted that GPs often struggle to manage complex cases within the standard 15-minute appointment slots, leading to referrals to the ED for reasons of complexity and time constraints rather than urgency. Stakeholders also discussed the varying perceptions among patients regarding what constitutes an emergency, noting that patients often have differing views on the severity of their conditions. One clinician highlighted the significant disparity between medical professionals' definitions of emergencies and patients' perceptions. It was noted that educational background and personal experiences influence these perceptions, leading some patients to seek ED care for conditions they perceive as urgent, even if they are not clinically so. This aligns with findings from multiple studies that explored patients presenting to the ED with non-urgent conditions. The primary characteristic identified by patients was their perceived need for care. For instance, Masso et al. (2007) found that 67 percent of participants believed their conditions required immediate attention and were too urgent to wait for a GP appointment. Similarly, Akbulut et al. (2008) reported that 66 percent of patients classified as non-urgent still perceived their needs as urgent. Other studies, including those by Afilalo et al. (2004), Unwin et al. (2020) and Al-Raddadi et al. (2020), echoed these findings, indicating that patients often overestimate the urgency of their situations. Matifary et al. (2021) concluded that individuals without medical training struggle to accurately assess the urgency of their conditions. Thus, these perspectives of patients and results from the current literature support the perceptions of the healthcare stakeholders from the focus group sessions.

Stakeholders highlighted that the reasons patients present to the ED are multifactorial and consequently, the researcher focussed more on identifying the broad characteristics of patient visits that could help define a non-urgent cohort through specific criteria. The first characteristic identified was the triage score, previously discussed in the context of examining specific patient populations, as stakeholders believed it could be useful in assessing whether ED utilisation was necessary. The role and perceptions surrounding triage scores are discussed next.

The research hospital uses the Australian Triage Scale (ATS) in its ED to prioritise care based on acuity. The ATS includes five levels, with triage one being the highest acuity requiring immediate intervention and triage five allowing up to 120 minutes of wait time before treatment (Australasian College for Emergency Medicine, 2013; Ministry of Health, 2016). Stakeholder discussions focused on whether the triage system accurately reflected how long patients could safely wait for care. A clinician expressed concern that increasing demand often means many patients are not seen within their recommended triage timeframes. As a result, patients initially triaged as two or three might retrospectively fall into lower acuity categories due to prolonged waiting. This led stakeholders to critically evaluate the reliability of triage scores as indicators of urgency. While triage scores four and five generally reflect low acuity cases, they acknowledged that some patients initially assigned lower scores may require hospitalisation or further assessment. This issue arose from the brief nature of triage assessments, which often do not capture the full extent of a patient's condition.

Literature supported these concerns, with five studies using triage scores to define non-urgent presentations, revealing significant variation in non-urgent rates based on the triage levels applied. For example, Afilalo et al. (2004) found 25 percent of ED visits were non-urgent based on Canadian Triage and Acuity Scale (CTAS) level five alone, but this excluded triage one patients. Other studies reported rates ranging from 50.3 percent (Jimenez et al., 2021) to 78.5 percent for non-urgent presentations, depending on whether both triage four and five were included (Al-

Raddadi et al., 2020). Studies relying solely on triage scores for defining non-urgent presentations, such as those by Unwin et al. (2016) and Unwin et al. (2020), estimated that 54.1 percent to 56.5 percent of visits were non-urgent. However, these figures may overestimate non-urgent cases. For instance, Duwalage et al. (2021) noted that using only triage scores four and five would misclassify 26 to 40 percent of patients as non-urgent in their study. Furthermore, Al-Raddadi et al. (2020) found that 15.3 percent of patients triaged as non-urgent were later admitted to hospital, suggesting that these patients required hospital-level care. The literature, therefore, aligns with the perceptions of the healthcare stakeholders in this study, indicating that triage scores serve as a scale of urgency but do not adequately reflect the severity or complexity of a patient's condition. Consequently, stakeholders concluded that while triage scores are a useful tool, they are not a definitive basis for defining a non-urgent presentation. They emphasised that additional factors must be taken into account to accurately assess the urgency and complexity of each case. The stakeholder group acknowledged that a more comprehensive approach, integrating triage scores of four and five with other patient characteristics, would be more effective in identifying genuinely non-urgent cases.

Another characteristic frequently associated with non-urgent cases was the manner in which patients arrived at the ED. Stakeholders discussed that patients who self-referred to the ED (those arriving without a prior referral from a healthcare professional) and 'walk-in' patients (those who arrived independently rather than by ambulance and had not been evaluated by paramedics) were more likely to present with non-urgent conditions. These groups exclude patients who had already been assessed by a healthcare professional and been advised to seek care within the ED. While stakeholders acknowledged that not all patients referred to the ED by another service or transported by ambulance necessarily required emergency services, they believed these patients were more likely to require ED-level care than those who self-referred or walked in. Consequently, stakeholders recommended that 'self-referred' and 'walk-in' status be included as criteria when assessing cases with ATS levels of four and five to better identify potentially non-urgent

presentations. This approach also underscored the importance of utilising easily identifiable characteristics at the time of presentation, as these factors are routinely recorded within the patient management database, streamlining the identification of non-urgent cases.

The preceding approach discussed by healthcare stakeholders was similar to the Australasian College for Emergency Medicine (ACEM) method, which has been explored in several studies (Duwalage et al., 2021; Nagree et al., 2013; Toloo et al., 2020). The ACEM method aims to identify patients attending the ED who could be managed in general practice. It classifies patients as suitable for primary care if they are self-referred, did not arrive by ambulance and had a medical consultation lasting less than one hour (Duwalage et al., 2021; Nagree et al., 2013; Toloo et al., 2020). Although this method incorporates patient presentation factors, it has been critiqued for excluding discharge destination as a criterion (Duwalage et al., 2021). As a result, patients with brief consultation times, such as urgent trauma cases requiring emergency surgery, may be incorrectly classified as appropriate for primary care. Duwalage et al. (2021) observed that using the ACEM method alone misclassified six percent of patients as general practice suitable, despite these patients ultimately being admitted, transferred to another hospital, or dying. In response, they developed a modified version of the ACEM method, adding 'not admitted, not transferred and did not die' as additional criteria. Applying this modified ACEM method to data from four hospitals in Queensland, Australia, they identified the following percentages of primary care-type presentations over a six-year period: 33 percent at one site, 19 percent at another, 17 percent at a third and seven percent at the fourth. These rates are substantially lower than those reported in studies relying solely on triage scores to identify non-urgent cases.

As an additional safety measure, the researcher utilised the findings from the literature above and stipulated that patients in the non-urgent cohort of this study did not die during their ED visit, were not transferred to another hospital, were treated in less than 60 minutes and were not admitted

to the hospital. Patients requiring hospital admission are assessed as needing secondary level care and therefore would not align with the study's aim of identifying candidates suitable for a new care pathway. This same rationale applied to patients with treatment durations exceeding one hour, as these cases were also deemed unlikely to be non-urgent in nature. Following this, the researcher examined the data for patients who met all specified criteria. The findings from this analysis are discussed in the subsequent section, which presents the 'ED Outcome Model' formulated in the findings chapter of this thesis. This model, created based on criteria established by the stakeholder focus group and relevant literature, categorised non-urgent presentations into a distinct cohort. A second cohort included patients admitted to the hospital, while a third encompassed those who did not fit the criteria for either non-urgent presentations or hospital admissions, thus indicating a need for ED treatment.

The following criteria were used to define the non-urgent cohort, with patients classified as non-urgent if they met all of the following criteria: (i) Self-referred; (ii) Walk-in; (iii) Treatment duration of less than 60 minutes; (iv) Not admitted to the hospital; (v) Did not die during their ED visit; (vi) Not transferred to another hospital; and (vii) ATS of 4 or 5. An overview of this patient cohort from 2014 to 2021 showed that non-urgent presentations accounted for between 8.4 percent and a peak of 14.8 percent of all ED presentations at the research hospital. These findings indicate that non-urgent presentations significantly contribute to the overall demand for the ED. The non-urgent presentation rates in this study's analysis were comparable to those reported by Duwalage et al. (2021) which ranged from seven to 33 percent across various sites. The literature on non-urgent presentation rates is highly variable; for instance, Durand et al. (2011) conducted a systematic review revealing rates between five and 90 percent across different studies. It is reassuring that the non-urgent rates in this study closely align with those in Duwalage et al. (2021), as the researcher employed a criteria framework closely resembling theirs and their study was completed in Australia, which has a healthcare system comparable to NZ.

A study by Schütze et al. (2019) also aligns closely with the criteria used to explore patient data in this study. In their research, Schütze et al. (2019) had an advisory panel including doctors, nurses, GPs, research fellows and an ED research professor who developed a coding framework to identify non-urgent ED presentations. This framework included patients who were triage four or five, arrived without emergency services (ambulance, helicopter, or police), were self-referred, had a new episode of care, were not expected to be admitted, had no trauma code and did not present with any of the 21 specified conditions (e.g., chest pain, assault). Testing this code on data from December 2016 to February 2017, they found a high sensitivity of 99.9 percent in identifying patients requiring hospital admission, prioritising risk aversion over specificity. Their non-urgent presentation rate of 29 percent was consistent across multiple hospitals from 2011 to 2016, slightly higher than the findings from this study but validating the similarity of the criteria used. The literature reviewing non-urgent criteria supports the researchers data, combining these findings with the stakeholder insights works to strengthen the findings of this study's criteria.

The researcher completed an analysis of the days of the week which revealed that non-urgent presentations were higher on weekends. Stakeholders attributed this trend to the limited availability of alternative healthcare services during weekends, noting that the ED often serves as a safety-net and is sometimes perceived by patients as the only accessible source of care. This trend is supported by literature showing that non-urgent cases rise on weekends and "after hours". Studies by Unwin et al. (2016), Duwalage et al. (2021) and O'Keeffe et al. (2018) show that non-urgent presentations are significantly more common during "after-hours" times (typically defined as outside of 08:00–17:00 on weekdays and on weekends). Unwin et al. (2016) found that two-thirds of non-urgent cases occurred after hours, while Duwalage et al. (2021) observed 57 to 76 percent of such cases during hours when GP services were closed. This pattern is further emphasised

during public holidays, when non-urgent ED visits increase (Duwalage et al., 2021; McHale et al., 2013).

Studies indicate that patients often try to access primary care before resorting to the ED. Unwin et al. (2016) found that 40 percent of non-urgent patients in their study had attempted to contact primary care services prior to attending the ED, which suggests that patients turn to the ED when they feel no other options are available. Patient perspectives further highlight various factors driving non-urgent ED visits, such as the perception that the ED offers superior services, specialists and equipment (Al-Raddadi et al., 2020; Diserens et al., 2015). Other reasons include the ED's ease of access, familiarity and perceived reliability (Afilalo et al., 2004; Diserens et al., 2015). Some patients also reported limited knowledge of alternative emergency services or how to access after-hours care (Masso et al., 2007; Matifary et al., 2021). In summary, both stakeholder observations and patient perspectives indicate that non-urgent ED presentations are influenced by multiple factors, including the limited availability of primary care services after hours and on weekends, financial considerations and patient perceptions about the reliability and accessibility of ED care.

The researcher's analysis of non-urgent ED presentations from 2014 to 2021 revealed a notable age-related trend: younger patients, particularly those aged 20-29, had the highest rates of non-urgent ED visits. This age group consistently demonstrated the greatest proportion of non-urgent cases, accounting for 25 percent of such presentations in 2015 and reaching 27 percent in 2020. Stakeholders responded positively to this trend, noting that younger patients typically present with fewer comorbidities and simpler care requirements than older patients. They felt reassured that non-urgent visits were less frequent among older people, a trend that, from their perspective, was preferable for overall patient safety. Stakeholders emphasised that older patients often have more complex health needs and a higher prevalence of long-term conditions, which require a more

specialised level of care. This trend aligns with findings from studies such as McHale et al. (2013) and O’Keeffe et al. (2018), which report similarly high rates of non-urgent ED presentations among younger patients and a significant reduction in these rates among older populations.

McHale et al. (2013), in particular, found that non-urgent presentations were most common in early childhood, peaking in young adulthood and declining steadily from age 27 onward. For instance, patients aged 16 years and younger had a non-urgent attendance rate of 15.04 per 100 ED visits, compared to only 2.43 per 100 among patients aged 85 and older. O’Keeffe et al. (2018) reported similar findings, with significantly higher odds of non-urgent attendance among younger adults aged 16 to 44, compared to those aged 45 to 64 and those aged 65 and older. These age-related trends are consistent across multiple international studies, with similar patterns observed in Australia (Duwalage et al., 2021; Unwin et al., 2020; Unwin et al., 2016), the United States (Chen et al., 2015; Uscher-Pines et al., 2013) Switzerland (Clément et al., 2010; Diserens et al., 2015) and Canada (Afilalo et al., 2004). Stakeholders also identified possible reasons for higher non-urgent presentation rates among younger individuals, noting that limited knowledge of appropriate ED use, difficulties in accessing primary care and cost barriers might lead young adults and parents of young children to rely on the ED for non-urgent issues. Duwalage et al. (2021) and McHale et al. (2013) echoed this perspective, suggesting that younger patients may turn to the ED due to a lack of awareness about alternative services, lower patience in accessing care and perceptions of ED as a safer or more reliable option.

In contrast, stakeholders observed that older patients are less likely to make non-urgent ED visits, a trend they associated with the greater complexity and higher acuity of health issues that tend to develop with age. Older people are often managing multiple long-term conditions, which stakeholders felt makes it less likely for them to present to the ED for non-urgent issues. This view is supported by literature indicating that multimorbidity increases with age and complicates

clinical care, especially as the population continues to age (Lowthian et al., 2011; Ministry of Health, 2021; World Health Organization, 2021). Research by Stanley et al. (2018) also supports this perspective, revealing that over one-quarter of the NZ population experiences multimorbidity, with prevalence rates significantly higher among older people. Overall, these findings validate the stakeholder perceptions and the data findings concerning the age of non-urgent presentations.

The researcher also reviewed the diagnoses of patients classified within this group. The primary diagnoses included general symptoms and signs, abdominal pain and sprains and strains. The healthcare stakeholder group confirmed that these diagnoses were generally non-specific and not indicative of high-acuity conditions, posing no significant safety concerns. However, the broad nature of these diagnoses limited their usefulness for identifying specific reasons behind non-urgent ED visits.

The researcher analysed the domiciles of patients in the non-urgent cohort, as previous focus groups identified equity as a potential factor influencing non-urgent ED visits. Using the New Zealand Deprivation Index, the researcher discovered that the top three domiciles of non-urgent patients consistently came from high-deprivation areas (Atkinson et al., 2019), with presentation rates ranging from 13 percent to 30 percent. In contrast, one of the least deprived areas in the region showed non-urgent presentation rates of only 5 to 11 percent. Healthcare stakeholders felt these findings reinforced the notion that patients from more deprived areas are more likely to seek ED care for non-urgent issues, highlighting the significance of equity in this context. This trend aligns with existing literature, indicating that patients from high-deprivation areas frequently utilise ED services for non-urgent concerns. Research indicates that socioeconomic deprivation has been linked to an increased risk of hospital admission (Ministry of Health, 2021) and has been identified as a factor influencing non-urgent ED presentations. In their study, McHale et al. (2013) investigated deprivation levels among their participants and discovered that individuals residing in

the most deprived areas exhibited the highest rates of both urgent and non-urgent ED presentations. Unwin et al. (2020) revealed that patients from the most deprived areas were 4.5 times more likely to make non-urgent presentations compared to their counterparts from less deprived regions. They noted a lack of larger primary care facilities equipped with pathology and radiology services in these deprived communities, suggesting significant disparities in access to healthcare resources.

Moreover, the examination of deprivation has been connected to the financial implications of accessing healthcare services. In NZ, ED services are free for citizens and residents, while primary healthcare incurs costs for the patient (Ministry of Health, 2016). Stakeholders believed this situation may lead patients to use the ED for non-urgent services to avoid the financial burden associated with primary healthcare. Masso et al. (2007) conducted a study exploring why patients attend the ED for non-urgent conditions and found significant differences between the perspectives of healthcare professionals and patients. While healthcare professionals attributed non-urgent presentations primarily to cost, patients did not rank cost among their top reasons for using the ED. Similarly, Unwin et al. (2016) reported that patients did not consider cost a major factor in their decision-making. These findings from the literature are similar with the views expressed by stakeholders in this study; however, patient perspective was not gathered in this study but it is of interest that the patients views conflicted with healthcare professional views in the Masso et al. (2007) study. Healthcare stakeholders emphasised the importance of applying an equity lens when developing a new pathway in the next section of this study, given the findings on non-urgent presentations and high deprivation levels.

A discussion took place with healthcare stakeholders on the safety of the non-urgent criteria. Healthcare stakeholders were interested to see what the breakdown of patients would be if they met all the criteria apart from an ATS score. Consequently, the researcher ran the non-urgent

criteria without including ATS scores to determine the percentage of each triage level categorised as non-urgent. Findings displayed a trend of increasing non-urgent presentations as acuity decreases, which aligns with the healthcare stakeholder expectations and served as a safety check. Based on these findings, healthcare stakeholders decided to continue to focus on ATS four and five patients, as these categories had the highest percentages of non-urgent classifications when ATS score was excluded from the criteria and decreased the risk associated with higher acuity ATS scores.

Stakeholders were satisfied with the working criteria of the non-urgent group used in this research study analysis, considering it both safe and sensible. They felt that the data analysis supported their perspectives regarding characteristics of patients with non-urgent presentations. However, after examining the initial non-urgent cohort, stakeholders expressed concerns about the retrospective nature of this criteria going forward. They emphasised the necessity of using prospective criteria if the findings were to be applied in real-time within the ED to identify patients effectively. This was deemed essential to ensure appropriate alternative treatment for these patients. Additionally, stakeholders indicated that the current cohort of between 6,769 and 10,469 annual presentations was too large to serve as the primary focus of this research study. As a result, they suggested reframing the criteria to be more specific. This shift led to the formulation of the next research question, which is answered next.

### **6.3 Among patients attending the Emergency Department, which group is prioritised by the healthcare stakeholder group for requiring an alternative care pathway?**

The research question aimed to develop criteria for a patient group that would serve as the foundation for a new pathway created by the healthcare stakeholders involved in this study. As previously discussed, the first research question established criteria for identifying non-urgent presentations in the ED. Stakeholders considered these criteria to be safe and sensible and the patient characteristics in the literature on non-urgent presentations closely aligned with the findings in this study, lending further support to the results. However, by the end of the discussion regarding this patient group, stakeholders highlighted areas for improvement in the criteria to enhance its applicability within this study.

The primary concern raised by stakeholders was that the initial patient population was too large for this study and stakeholders believed a more targeted approach was needed to reduce the group size and focus on a priority population for this research. Additionally, stakeholders expressed the need for criteria that could be applied in real-time, as many of the initial criteria used retrospective indicators, such as treatment time, admission, death, or transfer to another hospital. Furthermore, stakeholders recommended excluding redirected patients from the criteria, as they felt the current redirection process in their ED was effective and wanted to focus on a different patient population. Therefore, the researcher sought to develop revised non-urgent patient criteria for this research question, with the aim of identifying a smaller, more specific population that excluded redirected patients and relied solely on prospective criteria.

When looking into more specific criteria, the healthcare stakeholders discussed the effectiveness of a patient's healthcare journey, noting that reattendances to the ED might provide valuable

insights. Stakeholders suggested that patients returning to the ED for the same condition or attending frequently might warrant closer examination to identify potential issues that could be addressed. Healthcare stakeholders believed that reattendance to the ED was a sign of a health system that was not functioning effectively for patients. This view is supported by existing literature, which describes the reasons for frequent ED visits as multifactorial. Factors contributing to these visits include low-income status, lack of a primary care provider, familiarity with the ED and the presence of long-term conditions (Seaberg et al., 2017). Consequently, stakeholders were interested in focusing on patients who had more than one visit to the ED within the same year. In this study, a reattendance is defined as a return visit to the research hospital's ED within the same calendar year. Of the total ED presentations in 2021, 39,943 patients (49.5%) visited the ED only once. The remaining 40,816 presentations were from patients who visited the ED multiple times. The majority of the reattending patients visited the ED twice, although some presented over ten times. The intervals between these presentations were examined, with the results detailed below.

Most reattendances occurred within one month of a previous visit (including all presentations, whether the patient was admitted to hospital or discharged from the ED). There is a clear trend where reattendance is more likely to happen closer to the previous presentation, gradually decreasing over time. Specifically, the findings demonstrate that a substantial number of patients return to the ED within the same year, often within a short period after their previous visit. Stakeholders expressed concern about this trend and suggested that reattendance should be included in the new non-urgent criteria. They felt that patients who return to the ED may not be receiving appropriate management. They suggested that patients who reattend the ED place additional demand on services and that an alternative pathway could be beneficial for this group. It is important to note that this initial analysis of reattendance data includes all ED reattendances and not exclusively non-urgent ones, as the non-urgent reattendance analysis was completed after reattendance was added as a priority criterion.

Healthcare stakeholders emphasised the importance of using simplified criteria for this project to avoid increasing triage times within the ED. One clinician highlighted the need to avoid over-complicating the triage process, noting that extended wait times for triage can pose a significant safety risk. The clinician explained that delays in triage can result in patients waiting without a timely assessment, even if their condition requires immediate attention. For example, a patient might wait 10 minutes to be triaged, only to then be classified as needing immediate care. In such cases, the delay in triage itself can pose serious risks which the clinician described as a potential way to "break the ED". This opinion is supported by the Australasian College for Emergency Medicine (2013) who suggest triage is the first point of contact when a patient arrives at the ED and should happen instantly to enhance patient safety. Healthcare stakeholders noted that in some cases, there are already delays for patients to be triaged due to high demand for their department and they did not want to exacerbate this by adding more to the triage assessment. Consequently, the research team focused on criteria that were already gathered by the triage nurse or accessed via the ED computer database system. Stakeholders recommended continuing to include self-referred and walk-in patients, as they felt that prior data findings and the literature reviewed supported these characteristics as having higher rates of non-urgent presentations.

Following these discussions, the researcher revised the criteria by removing all retrospective categories, as agreed with healthcare stakeholders. The researcher also excluded patients eligible for redirection and introduced prospective criteria deemed beneficial for the target patient cohort, including reattendance. The revised prospective criteria are as follows: (i) Self-referred; (ii) Walk-in; (iii) Triage 4 or 5; (iv) Not redirected to urgent care; and (v) Current presentation is within six months of a previous ED visit.

The researcher applied these criteria to the patient database, a process that involved categorising data to identify whether patients had attended the ED within the previous six months. The

researcher then examined patient demographics associated with this priority non-urgent group. In 2021, 2,798 presentations met the criteria above, averaging 7.7 presentations per day. The stakeholder group expressed satisfaction with these patient numbers, as they had previously emphasised the importance of a service that could accommodate approximately five to six patients per day. They believed that this level of engagement would allow for a more meaningful interaction between healthcare providers and patients, ultimately leading to improved outcomes. By focusing on a smaller patient cohort, the stakeholders believed the service would enable clinicians to dedicate more time and attention to each individual, ensuring that their unique needs are thoroughly assessed and addressed.

The majority of patients meeting the priority non-urgent criteria were aged between 20 and 69, with the highest proportion aged 20 to 29. This distribution is consistent with the age breakdown of the previous non-urgent criteria, which healthcare stakeholders found reassuring, as younger patients generally have fewer comorbidities and are more likely to fit the 'non-urgent' category than older people. Stakeholders also noted that younger patients are more likely to be receptive to a new pathway and present with fewer complexities. The literature further supports that non-urgent presentations are predominantly within younger populations, as previously discussed (McHale et al., 2013; O’Keeffe et al., 2018). These results affirm the suitability of the new categorisation.

In addition to age, the researcher also examined domiciles. The researcher analysed patients' domiciles and the corresponding index of deprivation for those areas. The top 16 domiciles where these patients resided fell between deciles 7 and 10, indicating that the majority of this patient population resides in high-deprivation areas. These findings align with the literature and previous non-urgent coding, with studies showing that non-urgent presentations are more frequent among patients living in the most deprived areas (McHale et al., 2013) and Unwin et al. (2020) reporting that patients in these areas are 4.5 times more likely to present with non-urgent complaints.

The researcher analysed the day of arrival for these presentations, as healthcare stakeholders believed it was important to identify any significant patterns when considering this patient group for a new service. They felt this data would be valuable for planning the new pathway. The analysis showed that the highest number of visits meeting the criteria occurred on Tuesdays (17%) and Wednesdays (16%), while weekends had the fewest (11-12%). Peak hours for this group were between 08:00hrs and 16:00hrs and the average length of stay for this group in the ED was 4.5 hours. These findings contrast with the previous non-urgent criteria and conflict with current literature, where studies by Unwin et al. (2016), Duwalage et al. (2021) and O’Keeffe et al. (2018) show that non-urgent presentations are significantly more common during "after-hours" times (typically defined as outside of 08:00–17:00 on weekdays and on weekends); however these studies did not include reattendance in their criteria. Stakeholders suggested that the conflict of findings may be due to the inclusion of reattendance data, with patients possibly perceiving their previous care in the ED as satisfactory and therefore choosing to return, even when other services were available. These opinions from healthcare stakeholders are supported by the literature where patients have attended the ED for non-urgent concerns due to the perception it is a superior service (Al-Raddadi et al., 2020), the ease of access and also due to the familiarity of the ED (Masso et al., 2007; Matifary et al., 2021).

The primary diagnoses for this group included a range of general and specific conditions. Healthcare stakeholders reviewed these diagnoses and considered them appropriate for non-urgent presentations, as they are unlikely to require ED intervention. This opinion regarding these diagnoses is supported by the literature as none of these diagnoses are in the exclusion criteria for non-urgent patients reflected by Schütze et al. (2019).

The majority of patients in this group identified as NZ European (45%) or NZ Māori (35%). This distribution does not accurately reflect NZ’s overall population, as the 2023 census indicates that

Māori comprise 17.8 percent and NZ European 67.8 percent of the population (Stats NZ, 2023). Stakeholders noted that these figures highlight the inequities in health outcomes for NZ Māori, a topic that will be explored further in the section regarding the new patient pathway and how stakeholders believe equity can be improved. Within the priority patient group, 287 presentations (10.3%) involved patients who left the ED without being assessed. In terms of ethnicity, 101 identified as NZ European (41%) and 113 as NZ Māori (46%). This distribution reveals a significant discrepancy compared to national ethnicity demographics, suggesting a need to address equity concerns. When stakeholders discussed attrition rates and the phenomenon of patients leaving the ED, they highlighted the cultural concept of *manaaki*. They acknowledged that the ED environment is often not conducive to providing the necessary support, as staff are frequently rushed and busy. They believed this fast-paced atmosphere can hinder the ability to spend quality time with *whānau* and to listen to their concerns, which is essential for understanding and addressing their needs at that moment. Stakeholders suggested these findings be re-reviewed when developing a pathway for this patient population.

Stakeholders acknowledged the challenges of developing flawless criteria, recognising that clinical nuances often make it impossible to achieve 100 percent accuracy. However, they discussed the implications of these findings and proposed that once patients are identified by the system, a NP could conduct a rapid review of the triage information. This added layer of assessment would serve as a safety net, ensuring that only appropriate cases proceed along the designated pathway. Additionally, stakeholders expressed that further refining the criteria could excessively limit the patient population, potentially excluding individuals who would benefit from appropriate care. They agreed it would be more advantageous to retain the current criteria, complemented by an added clinical assessment before patients are allocated to the new pathway intervention.

In response to the research question, the research team have identified the patient group prioritised for this study based on the prospective criteria discussed above. These patients will be identified and their triage assessments will be reviewed by a NP to determine their eligibility for the new service. The details of the newly formulated patient pathway for this group will be discussed in the following section.

#### **6.4 What alternative approach, informed by both evidence and views of the healthcare stakeholder group, could be implemented to improve the outcomes of this patient group?**

The objective of this research question was to develop an innovative approach for the identified patient group in this study. This initiative arose from concerns regarding the increasing demand for EDs, which leads to issues such as overcrowding, access block, prolonged waiting times, stress among healthcare professionals and negative patient outcomes (Australasian College for Emergency Medicine, 2019; Richardson, 2006; Sprivulis et al., 2006). At the outset of this study, the researcher aimed to define a cohort of non-urgent patients that could be targeted for an alternative care pathway. This patient group has been previously identified and will be referred to as the 'priority patient group' in this discussion.

When discussing alternative care options for the priority patient group, healthcare stakeholders highlighted the potential role of Nurse Practitioners (NPs) in enhancing care delivery for this population. They viewed NPs' ability to practise independently as a crucial asset, enabling them to manage patient care effectively in this context. One stakeholder emphasised that NPs could relieve pressure on EDs by providing timely, appropriate care, reducing the need for ED visits. This aligns with literature from the Nursing Council of New Zealand (2017), which underscores the importance of NPs in enhancing health outcomes and addressing health inequities through their

broad scope of practice, including the authority to order tests, prescribe medications and manage admissions and discharges. The concept of a NP-led service featured prominently in stakeholder discussions, especially in relation to fostering collaborative partnerships with community services. Stakeholders believed this integrated approach would provide continuity of care for patients with complex needs. For instance, they suggested that a primary NP could coordinate with community teams to ensure robust follow-up care, which was seen as essential for improving patient outcomes. This aligns with evidence in the literature showing that NPs are well-positioned to lead holistic models of care, especially in addressing comorbidities (Nursing Council of New Zealand, 2017) that may complicate primary health issues and lead to repeat ED visits. Stakeholders also noted that NPs' specialised knowledge and prescribing authority could help alleviate demand for general practitioners, while their expertise in patient assessment would support the identification and selection of patients suitable for the alternative care pathway. This aligns with the Nursing Council of New Zealand (2017) position on the NP role, which highlights NPs' capacity to work autonomously and collaboratively within multidisciplinary teams to deliver comprehensive, patient-centred care across various healthcare settings.

Stakeholders also acknowledged the existing models in which NPs and Clinical Nurse Specialists (CNS) are already integrated into the ED of the research hospital. They observed that NPs and CNS within this setting were already effectively managing lower-acuity patients, which allowed for comprehensive assessments and care tailored to specific patient needs. The literature supports this view with research indicating that NP-led emergency care delivery positively influences patient satisfaction, resource utilisation, length of stay in the ED, rates of return visits and overall patient and system outcomes (Wilbeck et al., 2023). The perspectives shared by healthcare stakeholders and evidence from the literature underscore the transformative potential of NPs in healthcare delivery. The capacity of NPs to assess, treat, prescribe, provide holistic care, leadership and effectively collaborate with community services makes them well positioned to support a more

efficient, patient-centred healthcare pathway for the priority patient group in this study (Defibaugh, 2018). NPs can also collaborate with patient navigators to enhance care delivery whose role is discussed next.

Patient navigation was the most prominent concept discussed by healthcare stakeholders when considering an alternative pathway for the priority patient group. Patient navigation is a model of care developed in response to the need for guidance and support to help patients navigate health and social care systems, ensuring they meet their healthcare needs (Calhoun & Esparza, 2017; Freeman, 2013). It is an evidence-based approach designed to reduce fragmentation within healthcare services and improve patients access to care. Patient navigation is built on the foundation of the empowerment theory, which emphasises the importance of enabling patients to take control of their health and wellbeing. Built on principles of self-determination, self-efficacy, participation and social change, the empowerment theory acknowledges that patients thrive when equipped with the knowledge, skills and confidence to navigate complex systems and advocate for their needs (Timothy et al., 2024; Yue et al., 2024). The empowerment theory addresses socioeconomic disparities and systemic inequalities which may impact patients' abilities to access care. Access to healthcare is multifactorial and Levesque et al. (2013) suggests that access to healthcare services is the result of an interaction between factors related to individual characteristics (e.g. place of residence, economic resources, social status) and service characteristics (e.g. availability, location and cost). It can be challenging to navigate the complexities of healthcare access for patients and therefore being assisted in navigating this system, especially in times of illness can be beneficial.

Patient navigation is facilitated by patient navigators, individuals trained to help patients overcome barriers to care and navigate the healthcare system effectively and efficiently (Chen et al., 2024; Ranaghan et al., 2016). Retrospective studies of the Freeman (2013) programme showed significant

outcomes, with early-stage breast cancer diagnoses and treatments increasing and the five-year survival rate among minority women rising from 39 percent to 70 percent (Freeman, 2013). The patient data analysis highlighted significant barriers to care within the priority patient group, including higher levels of deprivation, leading stakeholders to believe that this population would greatly benefit from patient navigation support as it was developed to aid minority patients and remove barriers to care.

Patient navigators core duties include patient advocacy, care coordination, education and emotional support (Calhoun & Esparza, 2017). They advocate for patient preferences, facilitate communication with healthcare providers and help patients understand their rights. Navigators also coordinate care by scheduling appointments, arranging transportation and ensuring adherence to treatment plans. Additionally, they educate patients on medical conditions and treatments, provide emotional support and connect patients to community resources that address social determinants of health, such as financial aid and housing (Chan et al., 2023; Chen et al., 2024; Ranaghan et al., 2016). Stakeholders in this study advocated for the expansion of patient navigation roles, viewing them as essential for improving continuity of care, reducing repeat visits to EDs and addressing broader equity issues within the healthcare system.

The healthcare stakeholders spoke about the Canterbury earthquakes in NZ and how the navigator role became critical. In this context, patient navigators worked within primary care settings to follow up with patients, helping them access available services. Healthcare stakeholders believed these navigators played an instrumental role in addressing patient non-compliance and reducing repeat ED visits by ensuring patients accessed necessary care services. This approach aligns closely with health equity principles, as it seeks to prevent repeat visits and establish continuity of care, especially for those who might otherwise lack consistent access to healthcare. The roles of patient navigators vary depending on the programme, their work experience and qualifications. Freeman

(2013) noted that the diversity of tasks within patient navigation allows navigators to come from a range of backgrounds, including non-professionals such as laypersons and health professionals like nurses, NPs and social workers. This flexibility has led to the involvement of various trained individuals in patient navigation services, with the role continually evolving (Chen et al., 2024). The views of stakeholders in this study aligned with the literature on the use of patient navigators from various backgrounds. For example, some stakeholders highlighted the success of kaitiaki - culturally aligned navigators who collaborate with clinicians to support Māori patients. Though not health professionals, kaitiaki are seen as well-integrated within the healthcare system, working closely with clinicians to help patients understand and manage their health needs. Stakeholders believed this culturally sensitive approach builds trust within Māori communities, fostering engagement with healthcare services and supporting better health outcomes and treatment adherence. This model was particularly relevant given that 35 percent of the priority patient group identified as NZ Māori, underscoring the importance of culturally responsive care in improving health equity within the priority patient group.

Healthcare stakeholders emphasised that establishing trust is essential for effective patient navigation, especially for those with past negative healthcare experiences. One stakeholder explained that patient navigators can reconnect disengaged patients by building a foundation of trust, which encourages sustained healthcare involvement. They felt that navigators, by guiding patients to initial primary care appointments, could gradually foster patients' confidence in navigating healthcare independently. This supportive role addresses non-engagement and non-attendance, as navigators initially accompany patients to appointments and assist with system navigation until patients feel confident to proceed on their own. This approach was deemed particularly important due to the high attrition rates observed within the priority patient group. The data highlighted a significant ethnic disparity compared to national NZ demographics, raising equity concerns, as NZ Māori were disproportionately represented in these findings (Stats NZ,

2023). The high proportion of Māori in this group emphasised the need for a more culturally responsive approach. Stakeholders highlighted the importance of manaaki, or compassionate care. They believed that involving kaitiaki (guardians) could encourage engagement, helping patients feel respected and supported, thus improving their healthcare outcomes. This culturally sensitive approach was viewed by healthcare stakeholders as key to fostering connection and ensuring patients continue to seek care when needed. This perspective aligns with Wilson et al. (2021), who describe a Māori-centred model of care that incorporates whakawhanaungatanga (relationship-building) and tikanga (cultural protocols) guided by cultural values of aroha (compassion), manaakitanga (kindness and hospitality), mauri (life force) and wairua (spiritual wellbeing).

In addition to fostering cultural alignment, healthcare stakeholders viewed patient navigators as having the ability to alleviate some of the time pressures faced by healthcare providers. They felt navigators are equipped to handle tasks that nurses may lack time to address, especially when using a robust health needs assessment tool. By assessing patients' needs holistically, stakeholders believed navigators can provide a comprehensive approach that addresses a range of health issues beyond acute concerns, such as cancer screening, immunisations and smoking cessation. This breadth of care enables navigators to engage patients fully, helping them feel supported and connected within the healthcare system. However, the navigation model is not without challenges. Some stakeholders expressed initial reluctance toward navigation due to concerns about the lack of power-sharing and the risk of reinforcing existing healthcare inequities if using kaitiaki. Without sufficient authority or institutional backing, stakeholders expressed concern that navigators may struggle to advocate effectively for patients in situations where discrimination or systemic barriers persist. For the navigation model to succeed, it requires a robust support structure, enabling navigators to enact meaningful change and advocate for patients effectively. Healthcare stakeholders believed that when integrated with culturally appropriate services, such as Te Kōhao Health, navigators can contribute to positive health outcomes by connecting patients with relevant

services and facilitating enrolment in primary care. Overall, the healthcare stakeholder views on patient navigators were supported by the literature with evidence showing that patient navigators can enhance patient care along with patient satisfaction (Chen et al., 2024; McBrien et al., 2018).

The researcher explored the literature to examine if patient navigators had been used in similar patient populations to that of the priority patient group. It was clear healthcare stakeholders were passionate about moving forward with a patient navigator concept and therefore a rapid review of the literature was completed and then reviewed by the stakeholder team. There were limited studies of high value evidence retrieved, with the researcher finding only three randomised controlled trials (RCT) that specifically looked at patients who had reattended the ED frequently. The priority patient group are all individuals who have been to the ED within the last six months and therefore are classed as reattenders, in some cases, some of these patients had multiple reattendances to the ED with one patient fitting the priority group criteria nineteen times during one year. The researcher therefore believed these research studies were relevant to this study's population and were reviewed. An overview of these studies will be discussed here as they are of importance to the final decision by healthcare stakeholders and the formulation of the pathway for this research study.

Seaberg et al. (2017) conducted the largest RCT involving 282 frequent ED users ('super-utilisers' with five or more annual visits) in a high-volume urban ED. The study evaluated whether patient navigators, trained in community resources, social services and medical referrals, could reduce ED visits and associated costs. Patients were monitored for 12 months post-intervention, with 148 in the treatment group and 134 in the control group. Key findings showed that the treatment group had significantly higher primary care engagement (6.42 visits vs. 4.07,  $p=0.0013$ ) and a greater reduction in ED visits (13.2% vs. 4.3%,  $p<0.0001$ ). ED-related costs also dropped more significantly in the treatment group (26.6% vs. 17.5%). However, patient satisfaction did not differ

between groups (median score of 2.00,  $p=0.57$ ). While the study suggests patient navigation effectively reduces ED reliance and costs, limitations include potential recall bias in primary care attendance reporting (Seaberg et al., 2017).

Kelley et al. (2020) conducted a RCT at a large urban academic hospital to assess the impact of patient navigation on ED use, hospitalisations and costs for frequent ED users. The intervention involved patient and nurse navigators providing 12 months of support, including coordination of primary care appointments, specialist referrals and addressing social needs. A total of 100 patients were randomly assigned to either a navigation group ( $n=49$ ) or a control group ( $n=51$ ). Key findings showed that navigation patients had fewer ED visits (3.96 vs. 5.90,  $p=0.01$ ) and hospitalisations (1.0 fewer,  $p=0.001$ ), but the reduction in ED visits was not statistically significant. The navigation group also saw a \$10,202 reduction in hospital costs per patient, though this was not significant ( $p=0.10$ ). Limitations included a small sample size and potential selection bias, as over half of approached patients declined participation. Overall, the study suggests that patient navigation can reduce ED visits and hospitalisations, with potential economic benefits (Kelley et al., 2020).

Lin et al. (2017) conducted a RCT to assess the impact of navigation services on care coordination and ED visits for frequent ED users. The intervention involved navigators and an ED-based clinical team who created interdisciplinary care plans for high-utilisation patients. The study included 72 participants, randomly assigned to either an intervention or control group. Results showed a 35 percent reduction in ED visits ( $p=0.10$ ) and a 31 percent decrease in hospital admissions ( $p=0.20$ ) in the intervention group, though these reductions were not statistically significant. Additionally, ED-related costs were 15 percent lower and inpatient costs decreased by eight percent in the intervention group. Although the small sample size limited statistical significance, the findings suggest the potential for navigation services to reduce healthcare reliance

and costs for frequent ED users. The study highlights the value of community health workers and interdisciplinary care in improving outcomes for high-utilisation patients (Lin et al., 2017).

Collectively, these studies suggest that patient navigation holds promise in reducing ED visits and healthcare costs while improving care continuity and primary care engagement among frequent ED users. By addressing the social determinants of health and ensuring continuity of care, navigators can help reduce unnecessary ED visits, freeing resources for acute emergencies. However, generalisability is limited by the small sample sizes, single-centre designs and potential biases from patient selection and self-reported data. The literature reviewed here aligns with healthcare stakeholder perspectives that navigation services are critical in healthcare delivery for repeat ED users, particularly for underserved populations. Stakeholders suggested that patient navigators could assist in re-engaging disconnected patients, establishing trust and addressing barriers such as transportation and healthcare access, a theme echoed by the reviewed studies. Stakeholders in this study also highlighted the potential of patient navigation to improve engagement, which aligns with Seaberg et al. (2017) findings of increased primary care visits among navigated patients. Kelley et al. (2020) further supports this, showing a notable reduction in ED visits for patients with navigation support, an outcome stakeholders identified as crucial for alleviating ED demand. Additionally, this parallels Lin et al. (2017) findings, where navigators helped reduce ED visits and hospital admissions.

One qualitative study was reviewed in regard to the priority patient group and patient navigation. The focus on cultural competence, highlighted by stakeholders as essential in NZ for Māori and underserved communities, reflects the broader need to tailor navigation services to meet specific population needs. Wilkinson et al. (2022) conducted a qualitative study in NZ to explore patient experiences with health and social care navigation support for long-term conditions. Nine former clients, including some of NZ's most vulnerable populations, were interviewed, revealing a central

theme of restored personal identity and a sense of belonging (wairua and tūrangawaewae in Māori). Participants expressed that navigation services affirmed their sense of self and wellbeing, fostering self-determination and improved health outcomes. Although focused outside ED settings, the study highlights the positive impact of navigation services on vulnerable individuals in NZ, therefore it is included here due to the demographic characteristics of the priority patient group. Overall, these studies support the role of patient navigators in bridging healthcare gaps, improving primary care continuity and reducing ED dependency. Healthcare stakeholders were reassured when they reviewed the RCTs within the focus group and it was decided that the patient navigation model would be used for this priority patient group going forward.

Once it was established that NPs and patient navigators were going to be utilised in the new alternative care pathway for the priority patient group, the discussion moved on to what this would look like and what setting would be best for this pathway. Healthcare stakeholders highlighted the need for assessing and treating the priority patient group in a clinic located on the hospital site, but distinctly separate from the ED. This model recognises that non-urgent, non-emergent patients often require a different pace and depth of care than what is typically delivered in the ED, where the focus is on rapid, acute response (Ministry of Health, 2016). Stakeholders believed establishing a clinic adjacent to but outside the ED was essential to providing these patients with the necessary time, attention and resources, ultimately aiming to better integrate them into primary care and reduce repeat ED visits. One primary consideration from stakeholders was the operational tempo of the ED, which is inherently fast-paced and task-driven. Stakeholders expressed that in such an environment, NPs and patient navigators may struggle to deliver the more comprehensive assessments and care planning that this priority patient group requires. The ED's rapid throughput may lead to what one stakeholder described as "ED speed", where clinicians are pressured to make swift decisions, often at the expense of deeper engagement with patients. They believed this tempo is incompatible with the needs of the priority patient group who may require more time and

connection. Stakeholders instead proposed establishing a clinic outside of the ED, where these patients can receive thorough, unrushed care without the physical or procedural constraints of the ED.

Stakeholders proposed the clinic would be led by NPs and supported patient navigators, with the initial goal of maintaining strong connectivity with the ED. This connectivity would allow for an easy transfer of patients back to the ED if urgent needs arise, thereby providing a built-in safety net. As the clinic grows, stakeholders envision it gradually evolving into a primary care setting, thus facilitating the continuity of care essential for long-term patient wellbeing. This clinic-based model would offer a distinct environment and experience from the ED. Stakeholders expressed a desire for the clinic to differ not only in pace but also in atmosphere, fostering a sense of calm and focus on patient-centred care. This alternative space would allow NPs to approach patients in a more relaxed manner, fostering engagement and building trust in a way that can be difficult within the high-stakes, high-pressure ED. To accommodate patient needs effectively, stakeholders stipulated the clinic should operate seven days a week from 08:00hrs to 20:00hrs, ensuring availability outside of regular business hours and encapsulating the highest volumes of these patients as shown in the patient data analysis.

An important aspect of this proposed clinic model is its focus on fostering patient engagement with primary care. Stakeholders believe that when patients are effectively engaged and enrolled in high-quality primary care, they are less likely to return to the ED for non-urgent issues, which is supported by the literature previously discussed (Seaberg et al., 2017). The clinic's approach would involve not only treatment but also a comprehensive assessment of patients' ongoing healthcare needs, with an emphasis on creating treatment plans and connecting patients with primary care services via patient navigators. By ensuring that patients leave the clinic with a plan in place for primary care follow-up, stakeholders anticipate a reduction in repeated ED visits for non-emergent

issues. Stakeholders suggested navigators would ensure that patients are enrolled in primary care and assist with coordination to minimise barriers to accessing these services. This model emphasises continuity and consistency, building a bridge from acute care to sustained, long-term health management (Chen et al., 2024).

Healthcare stakeholders highlighted the ongoing benefits of a clinic that supports transitional care, which has substantial positive effects on patients' health and, consequently, on the health system overall. One stakeholder noted that from a cost-benefit perspective, the clinic's focus on managing comorbidities, reducing the need for unplanned care and decreasing ED visits days, presents a financial advantage for healthcare organisations by reducing readmission rates and the demand for resources. There was also discussion around removing financial barriers for patients, such as the worry about paying for services. Instead, stakeholders believed the focus should be on addressing social determinants of health, such as transportation to and from appointments, with suggestions including providing petrol vouchers or other transportation assistance to reduce the stress on patients. Ultimately, stakeholders concluded that to address equity concerns, particularly for patients from high-deprivation areas, this clinic service should be free to ensure these patients can access care without financial barriers.

Ultimately, stakeholders underscore the importance of intended outcomes for the new pathway. Stakeholders believe successful outcomes would entail not only the assessment and treatment of non-urgent conditions but also the establishment of patients within primary care networks where they can receive continuous support. This focus on primary care enrolment and engagement reflects a commitment to creating a healthcare system that prioritises preventive care and reduces the strain on emergency services. In conclusion, the establishment of an on-site but separate clinic adjacent to the ED offers a targeted solution for managing non-urgent patients in a way that aligns with their specific healthcare needs. This model, driven by a slower, more deliberate pace, an

integrated safety net and a focus on primary care engagement, aims to improve patient outcomes while reducing unnecessary ED utilisation. By investing in a clinic run by NPs that supports continuity of care and integrates patients into primary healthcare by utilising patient navigators, stakeholders hope to foster a more equitable and efficient healthcare system that better serves the priority patient group.

In response to the research question, the new pathway for the priority patient group would involve a structured care process: patients presenting at the ED would be identified based on non-urgent criteria and then assessed by a NP, who would address their presenting concerns in the clinic setting. A patient navigator would subsequently evaluate the patient's ongoing needs, working collaboratively with them to enhance their care following the clinic visit. An overview of this pathway is shown in the figure over-page.

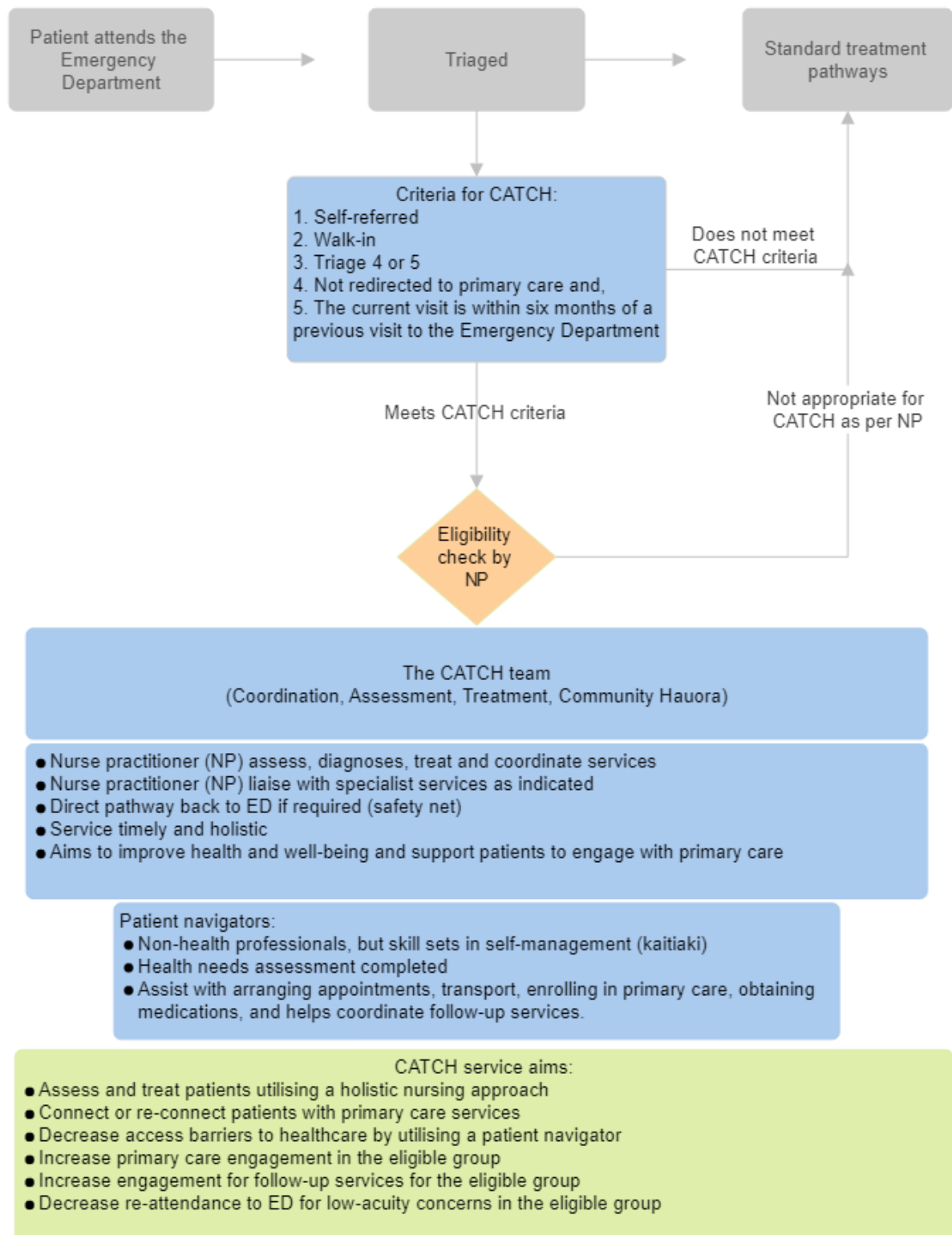


Figure 81: The CATCH pathway

Figure 81 provides an overview of the patient journey, starting from their arrival at the ED. It illustrates the journey if patients meet the CATCH criteria and if they do not. If a patient does not meet the CATCH criteria they continue on the standard ED treatment pathway. If patients are eligible for CATCH this figure shows an overview of the CATCH team and what the patient can expect from this service. This figure displays the conclusion to this research question, where the CATCH team pathway is the alternative pathway that has been formulated for the priority patient group.

## **6.5 Summary of Part 1 discussion**

This concludes Part 1 of the discussion which addresses the research questions by integrating perspectives from healthcare stakeholders, findings from patient data and insights from current research literature. A set of prospective criteria was developed, accompanied by a novel approach to care tailored to this patient group. Part 2 of the discussion explores the theoretical contributions of this research, along with its limitations, conclusions and potential directions for future study.

## Part 2: Theoretical contributions

*Research means that you don't know, but you are willing to find out.*

Charles F Kettering (1876 – 1958)

### 6.6 Introduction

This section of the discussion chapter focuses on the theoretical contributions and the new knowledge gained from this research study. It begins by discussing the novel approach of using the stage-gate process within healthcare research. By employing the structured, phased approach of the stage-gate process this research study was able to successfully develop a new healthcare pathway for non-urgent patients presenting to the ED. This demonstrates the stage-gate processes potential to be used for and to enhance future healthcare research. This discussion explores how the stage-gate process facilitated evidence-based decision-making by integrating healthcare stakeholders' perspectives, relevant literature and patient data at each stage of development.

Additionally, this section explores how the foundations of the new pathway of the Coordination, Assessment, Treatment, Community Hauora (CATCH) model formulated in this research study differs from conventional ED models. By addressing the limitations of the conventional ED model for non-urgent patients, the CATCH pathway prioritises empowerment, patient-centred care, continuity of care and cultural sensitivity. This novel approach, grounded in evidence from the literature, healthcare stakeholder collaboration and patient data, offers a transformative solution to the unique challenges faced by non-urgent patients, positioning it as a more effective alternative to the traditional ED framework for these patients.

## **6.7 The stage-gate process in healthcare – a novel approach**

The stage-gate process, developed by Dr. Robert Cooper in 1983, emerged as a transformative framework for managing innovation. Dr. Cooper, an expert in innovation management, significantly advanced understanding of the challenges organisations face in bringing new ideas to fruition. His observations identified recurring issues such as poor decision-making, lack of structure and high failure rates in product launches. To address these challenges, Dr. Cooper introduced the stage-gate process as a structured methodology for guiding innovative projects from inception to completion. This approach, first published in 1986, provided a framework for assessing progress, making informed decisions and allocating resources effectively. Over the decades, it has gained global recognition as a best-practice tool for product development and project management (Cooper, 1990, 2008).

While the stage-gate process has been adapted for various industries, its foundational principles remain consistent: structured decision-making, risk management and iterative improvement (Cooper, 2022). The process consists of stages (workstations) where work is performed and gates (decision points) that determine whether a project advances, pauses, or is revised. Typically, it involves four to seven stages, depending on the project scope. These stages progress from discovery, idea screening, definition, development, validation and launch, with each phase comprising specific activities that must be completed before reaching the subsequent gate. The gates serve as quality control points where deliverables from each stage are evaluated against pre-established criteria by gatekeepers, who are typically senior, multidisciplinary stakeholders. Gatekeepers assess whether a project should proceed, require refinement, or be terminated. This structured evaluation ensures resources are allocated effectively, reducing risks of pursuing non-viable initiatives. Despite its disciplined approach, the stage-gate model is flexible, allowing for adjustments in response to new information or changing circumstances. This adaptability has contributed to its enduring relevance across industries (Cooper, 2008).

Despite its success, the stage-gate process has faced criticism, particularly regarding ineffective gates. Cooper (2008) noted that gates are sometimes misused as mere milestones or project updates rather than critical decision points. In such cases, projects may bypass necessary scrutiny, resulting in a "one-gate, five-stage" tunnel rather than a rigorous "five-gate, five-stage" funnel. To address this, Cooper advocates for gates to function as genuine decision points, supported by gatekeepers with authority to commit resources. By maintaining the integrity of gates and ensuring appropriate resource allocation, organisations can maximise the system's effectiveness. One of the stage-gate process's key strengths lies in its adaptability. Although it provides a structured framework, it allows project teams discretion over activities, enabling tailoring to specific needs. This flexibility makes the stage-gate model particularly suitable for dynamic environments, where conditions and information are subject to change (Cooper, 2022). In the context of this research, the healthcare system's evolving demands made the stage-gate framework an ideal choice for managing this research project effectively while accommodating new information and evidence.

This discussion examines the application of the stage-gate process within healthcare research, a domain that traditionally operates outside the typical realm of product development and project management (Cooper, 2008). While the framework has been extensively used to manage innovation in business contexts, its systematic and iterative approach presents substantial opportunities for addressing the unique challenges of healthcare research. These challenges include constrained resources, high stakes, regulatory complexities and the need for evidence-based, iterative decision-making (Polit & Beck, 2021). The stage-gate process, with its phased structure and decision points, aligns well with the needs of healthcare research by enabling the systematic progression of projects (Cooper, 2008). Each stage incorporates predefined objectives, deliverables and review processes, fostering accountability and transparency. These attributes are particularly critical in healthcare research, where resource allocation must be efficient, risks carefully managed and decisions firmly grounded in evidence (Polit & Beck, 2021). By breaking projects

into manageable stages, researchers can assess progress at regular intervals, facilitating adjustments based on emerging data or changes in priorities. This adaptability reduces the risk of pursuing impractical or misaligned initiatives and ensures that research efforts remain focused on delivering tangible, real-world benefits (Cooper, 2008).

An essential advantage of the stage-gate process in healthcare research lies in its capacity for iterative evaluation. The inclusion of gates allows for the incorporation of new evidence or stakeholder input, enhancing the project's responsiveness (Cooper, 2008). This iterative nature is particularly valuable in the dynamic landscape of healthcare, where evidence and priorities often evolve rapidly. By reassessing the project's viability at each gate, researchers can ensure alignment with patient needs, organisational objectives and broader healthcare priorities. The effectiveness of the stage-gate approach is exemplified in this research study, which successfully applied the framework to develop a novel non-urgent patient pathway. By systematically advancing through each stage, the researcher integrated perspectives from healthcare stakeholders, analysed patient data and reviewed relevant literature, ensuring a robust evidence base for decision-making. This adherence to evidence-based practice not only strengthened the project's credibility but also ensured that the final outcomes were both practical and patient-centred. Moreover, the collaborative nature of the process by engaging stakeholders at various stages, promoted shared ownership and enriched the project with diverse insights. This underscores the stage-gate process's potential to bridge gaps between research, clinical practice and policy development, making it a valuable tool for healthcare innovation.

The stage-gate process represents a promising framework for healthcare research. Its emphasis on systematic progression, evidence-based decision-making and iterative evaluation offers a robust mechanism for navigating the complexities of the field. As demonstrated by this study, the application of this process can lead to the development of impactful, well-aligned healthcare

solutions that address real-world needs. By leveraging its principles, healthcare researchers have the potential to enhance the rigour, efficiency and relevance of their work, ultimately contributing to improved patient outcomes and system performance.

The integration of evidence-based practice (EBP) principles into the stage-gate process was also used in this research study. EBP, the cornerstone of modern healthcare, combines the best available research evidence with clinical expertise and patient values to inform decision-making. This integration ensures that interventions are effective, efficient and patient-centred (Craig & Dowding, 2020). Within this research, EBP principles were embedded at each stage of the stage-gate process. Perspectives from healthcare stakeholders, patient data and research literature were synthesised to inform decisions and address the research questions. Although direct patient experiences were not captured, patient data provided valuable insights into patient needs and outcomes. This approach bridged the gap between evidence and practice, ensuring the research remained grounded in real-world considerations. The resulting model, which combined the stage-gate framework with EBP, shows the ability of these methodologies to be used together. By aligning structured progression in the stage-gate process with robust evidence, this model highlights a pathway for advancing healthcare research that is adaptable, systematic and patient-centred.

The following figure illustrates the integration of healthcare stakeholders' perspectives, patient data findings and research literature as the foundation of evidence-based practice in this study. This combination was systematically applied throughout each stage of the stage-gate process, from the discovery stage to the validation stage.

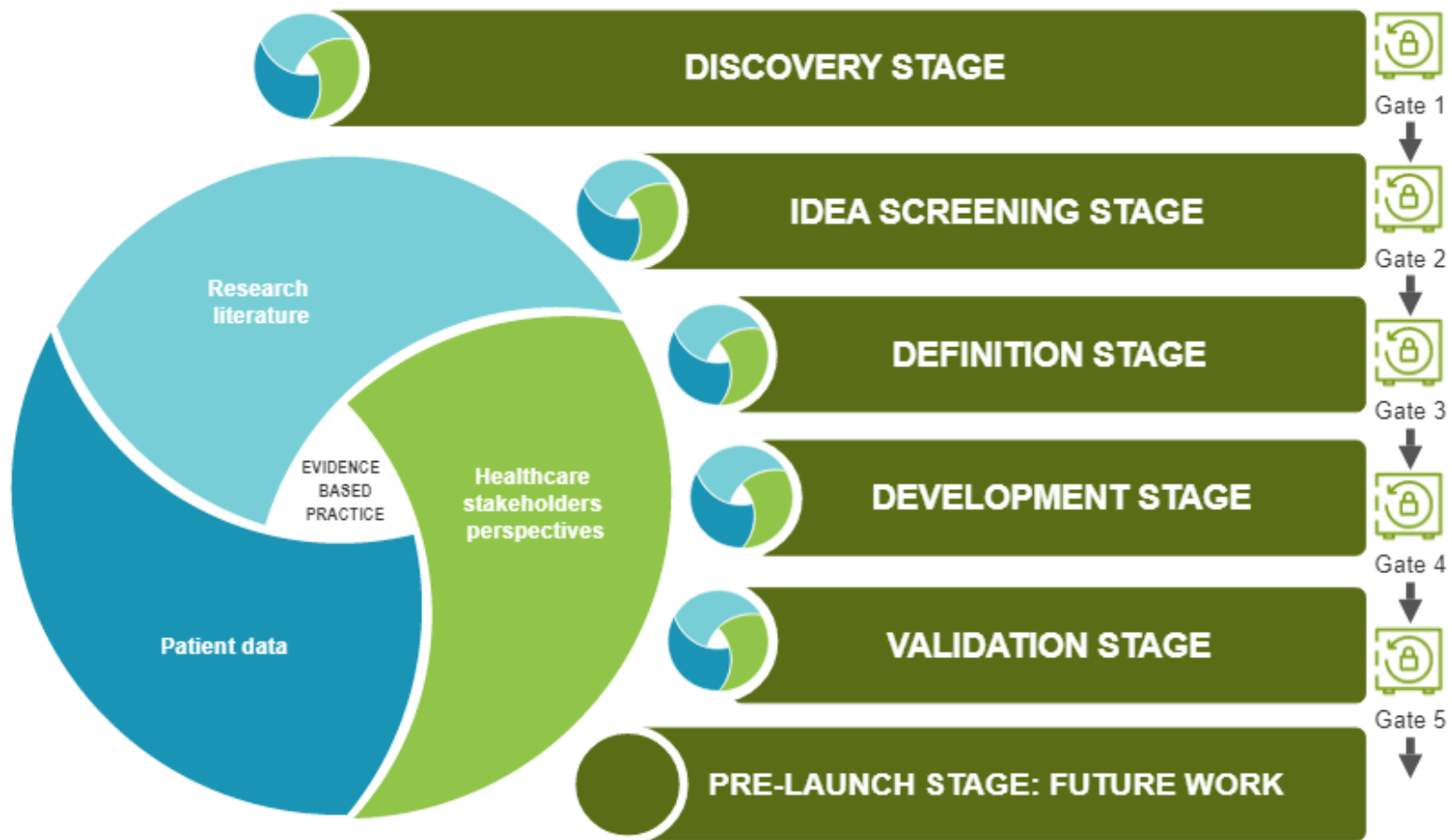


Figure 82: Integration of the stage-gate process and evidence-based practice

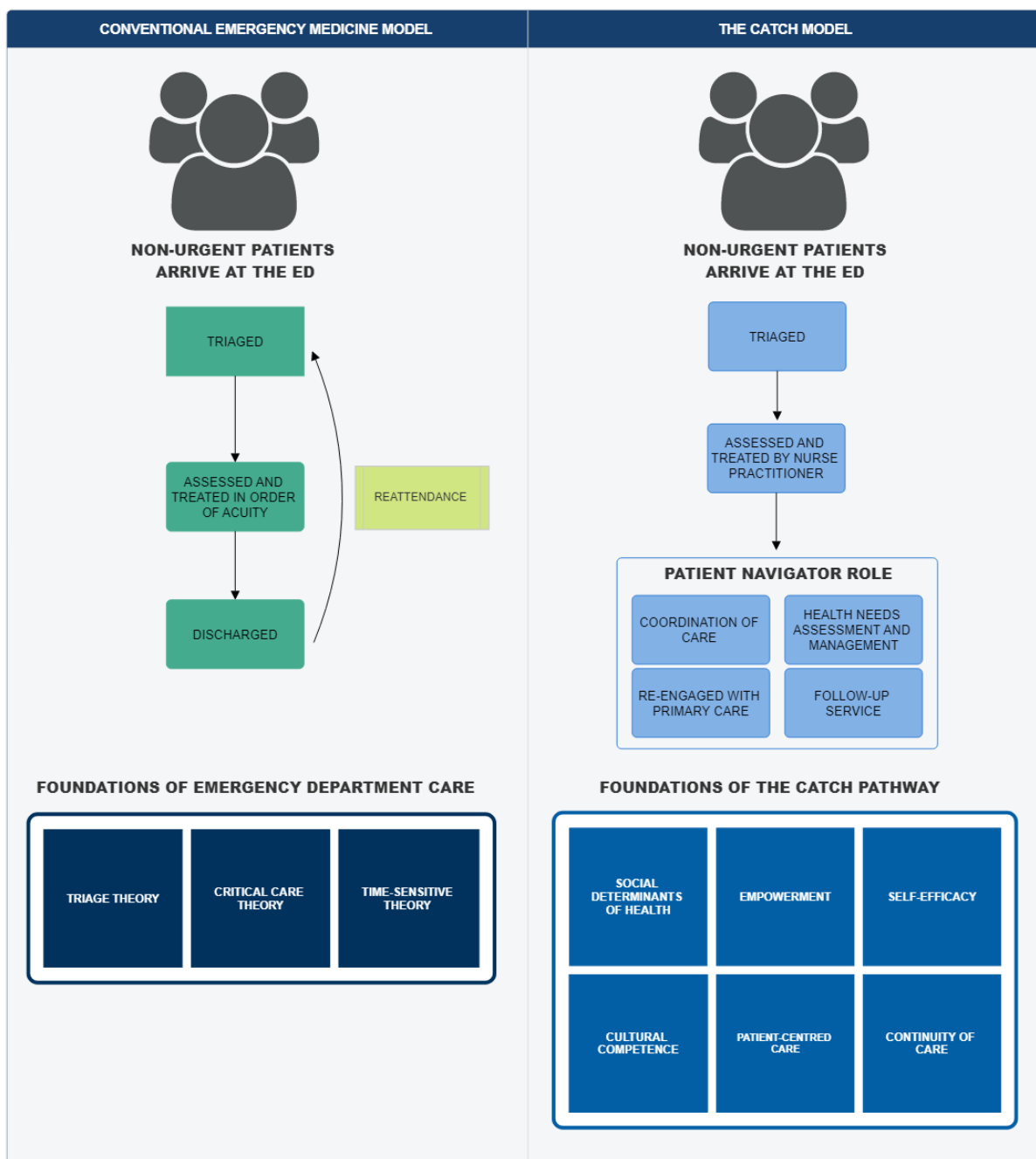
By employing this iterative approach, the study ensured that viability was rigorously assessed and strengthened at every phase of the process. The stage-gate process, with its structured yet flexible approach, offers a valuable framework for managing innovation across diverse contexts (Cooper, 2008). Its application in healthcare research represents a novel contribution, demonstrating its potential to address the unique challenges of this field. By combining the framework with evidence-based practice, this study illustrates a methodology that supports iterative development, efficient resource use and patient-centred decision-making. As healthcare systems continue to evolve, integrating structured methodologies like the stage-gate process has the ability to drive innovation and improve outcomes.

## **6.8 Theories underpinning the CATCH model**

EDs are the frontline of healthcare, designed to address acute and life-threatening conditions with speed and precision. However, the growing prevalence of non-urgent patients presenting to EDs has revealed the limitations of the conventional model, which prioritises critical care and operates on principles embedded in triage theory and time-sensitive interventions (Australasian College for Emergency Medicine, 2013). In contrast, the CATCH (Coordination, Assessment, Treatment, Community Hauora) model developed in this research study offers a NP-led service in combination with patient navigators specifically designed to address the unique needs of non-urgent patients. By incorporating patient navigators and focusing on a more supported, wrap-around model of care, the CATCH model provides an innovative solution to the challenges faced by non-urgent ED patients.

This discussion examines the theoretical differences between the conventional ED model and the CATCH approach, demonstrating why the latter is better positioned to empower non-urgent patients, improve outcomes and address systemic inefficiencies in healthcare delivery. The figure

below displays the differences between the foundations of the conventional ED method and the CATCH model formulated from this research study.



**Figure 83: The foundations of non-urgent patient pathways**

The conventional ED model is built on three foundational theories: triage theory, critical care theory and time-sensitive theory. Triage theory is the cornerstone of ED operations, prioritising

patients based on the urgency of their medical needs. The goal is to ensure that patients with life-threatening conditions receive immediate attention, while those with less urgent needs are treated in order of decreasing acuity (Australasian College for Emergency Medicine, 2013). This system works well for managing acute crises but inherently disadvantages non-urgent patients, who are often left waiting for extended periods or receive minimal attention (Unwin et al., 2016). Furthermore, the critical care foundation of the ED emphasises rapid stabilisation and treatment of acute conditions, with the focus on time-sensitive interventions rather than long-term care planning (Ministry of Health, 2016). While this model is essential for high-acuity patients, it falls short in addressing the complex needs of non-urgent patients, particularly those who return to the ED (Uscher-Pines et al., 2013).

In contrast, the CATCH model operates on a fundamentally different foundation of care. It prioritises empowerment, continuity and vertical equity, providing a holistic approach tailored to the unique challenges faced by non-urgent patients. NPs, at the helm of the CATCH team, bring advanced clinical expertise and the capacity to deliver both acute and chronic care (Defibaugh, 2018), while patient navigators ensure that patients are supported beyond the immediate ED encounter. This wrap-around care model seeks to address not just the presenting medical issue but also the underlying social and systemic factors contributing to non-urgent ED visits (Kelley et al., 2020). A central tenet of the CATCH approach is the emphasis on patient empowerment and self-efficacy. Empowerment theory acknowledges that patients thrive if they are equipped with the knowledge, skills and confidence to navigate complex systems and advocate for their needs. The empowerment theory underpins patient navigator strategies to address inequities and power balances in healthcare which are often experienced by patients (Timothy et al., 2024; Yue et al., 2024). By educating patients about their conditions and providing them with tools to navigate the healthcare system, the CATCH team aims to foster confidence and autonomy. This empowerment

aims to reduce patient dependency on ED services and enable patients to take a more active role in their own health management, leading to better long-term outcomes.

Another key strength of the CATCH model is its focus on continuity and coordination of care. Unlike the episodic nature of conventional ED treatment, which often addresses immediate symptoms without follow-up, the CATCH team provides a seamless care pathway. Patient navigators play a critical role in ensuring that non-urgent patients are connected to appropriate services, whether it be primary care providers, community health programs, or social support networks. This continuity not only improves patient outcomes but also addresses unmanaged chronic conditions or unmet social needs (Chen et al., 2024). By bridging the gaps between acute care and ongoing support, the CATCH model transforms what is often a fragmented healthcare experience into a cohesive and patient-centred journey. The principle of vertical equity further distinguishes the CATCH model from the conventional ED approach. Vertical equity is the concept that unequal needs require unequal care, meaning that patients with more complex challenges should receive tailored interventions (Ministry of Health, 2018a). In the ED, triage-based prioritisation focuses solely on the acuity of the immediate medical condition, often overlooking the broader, chronic issues that drive non-urgent patients to seek care. The researcher found that the priority patient group in this research study experienced high levels of socio-economic deprivation giving evidence to health inequalities for this patient group. The CATCH team, on the other hand, recognises that these patients often face significant barriers to accessing traditional healthcare services, such as transportation issues, socioeconomic instability, or a lack of health literacy. By providing targeted, individualised support, the CATCH model addresses these disparities and ensures that care is proportional to the patient's overall needs.

The CATCH model's focus on empowerment, continuity and equity also positions it as a more effective solution for alleviating ED overcrowding. Non-urgent patients contribute to congestion

in EDs, which can strain resources and delay care for high-acuity cases. The conventional ED model, with its episodic and reactive nature, often fails to break this cycle, as non-urgent patients receive limited intervention before being discharged back into the same circumstances that prompted their visit (Durand et al., 2011). In contrast, the CATCH team not only addresses the immediate issue but also works to prevent future visits by tackling the underlying causes of ED reliance. This proactive approach not only benefits the non-urgent patients themselves but also improves the efficiency and effectiveness of the ED.

The patient-centred focus of the CATCH model aims to build trust and enhance satisfaction among non-urgent patients. Traditional ED environments, characterised by their fast-paced and high-pressure dynamics, often leave non-urgent patients feeling neglected or undervalued (Unwin et al., 2016). In contrast, the CATCH team provides personalised care and actively involves patients in their treatment, creating a more compassionate and supportive experience along with being in a more appropriate environment. A key strength of the CATCH model is its incorporation of kaitiaki, who foster cultural competence. The priority patient group included a disproportionately high number of individuals identifying as Māori compared to national demographic statistics. Kaitiaki serve as patient navigators, playing a crucial role in encouraging engagement by ensuring patients feel respected and supported, thereby improving healthcare outcomes. This culturally sensitive approach aligns with Wilson et al. (2021), who advocate for a Māori-centred model of care emphasising whakawhanaungatanga (relationship-building) and tikanga (cultural protocols). Guided by core Māori values such as aroha (compassion) and manaakitanga (hospitality) the CATCH model is deeply rooted in cultural sensitivity.

In conclusion, the CATCH team represents a transformative approach to the care of non-urgent ED patients, offering a stark contrast to the conventional model grounded in triage theory and critical care principles. By focusing on empowerment, continuity of care and vertical equity, the

CATCH model provides a more holistic and patient-centred alternative that is better suited to the unique needs of non-urgent patients. It aims to address the systemic factors driving non-urgent ED visits, empower patients to take control of their health and reduce the strain on ED resources. As healthcare systems continue to grapple with the challenges of increasing demand and limited resources, the CATCH model offers a compelling blueprint for improving care for non-urgent patients while potentially enhancing the overall efficiency and effectiveness of emergency services.

## **6.9 Summary of Part 2 discussion**

This concludes Part 2 of the discussion, which highlighted the theoretical contributions of the study. It covered the innovative application of a stage-gate process to healthcare and compared the foundational theories underpinning the conventional ED model with the CATCH model introduced in this research.

## **Part 3: Limitations, conclusions and future research**

*One raindrop raises the sea.*

James Gurney (1999)

### **6.10 Introduction**

The limitations that impacted the study's outcomes will be discussed first, followed by the implications for practice and the study's conclusions. Finally, areas for future research that build upon this work will be identified, providing a close to the thesis.

### **6.11 Limitations**

This study has several limitations that influence both the scope and applicability of its findings. Firstly, conducting the research within a single-centre hospital presents limitations for generalisation. The specific demographics of this hospital's patient population may not represent other hospitals within NZ, particularly those in regions with different socioeconomic, cultural, or age compositions. As a result, the findings may not be broadly applicable across the country and are even less likely to translate effectively to international contexts with distinct demographic profiles. This geographic and demographic specificity limits the extent to which the outcomes can inform policy or practice beyond similar settings, reducing their potential impact on a wider scale. However, despite these limitations, the research could still be valuable for hospitals with comparable patient populations, where it could inform practice in similar healthcare settings or inspire pilot programs in diverse regions to test the applicability of the findings.

A potential source of bias arises from the researcher's background as an ED registered nurse, which introduces the possibility of unconscious bias in data collection, interpretation and analysis. The researcher's familiarity with ED protocols, typical patient cases and treatment processes could lead to assumptions or expectations that influence how data is perceived and evaluated. Although the

researcher did not work within the research hospital's ED, thereby experiencing different local policies, the overall structure, environment and principles of emergency care were similar, which may still impact objectivity and introduce bias. This limitation could lead to findings that reflect the researcher's interpretation rather than an entirely neutral analysis, potentially impacting the study's reliability (Moule, 2017). However, checks were conducted by the healthcare stakeholders using the stage-gate process and also by the researcher's supervisors.

The reliance on the hospital's patient management system for data accuracy introduces further limitations. While this system is widely used for record-keeping, it is subject to errors, missing data and occasional discrepancies. During the data review process, some fields were found to contain incomplete information, suggesting that certain patient details may not have been accurately or consistently recorded. This limitation is particularly pertinent for a study that depends on detailed patient data to identify patterns and draw meaningful conclusions about non-urgent ED presentations. Missing or inaccurate data may obscure important trends, limit the reliability of findings and restrict the ability to form robust recommendations. However, the findings of this research study were consistent with existing published research.

An additional limitation is the lack of patient perspectives included in the study. Incorporating patient viewpoints is often valuable, particularly in research related to non-urgent ED presentations, as it helps capture the reasoning behind patients' decisions to seek ED care (Bornais et al., 2020). However, previous research has shown that patients often perceive their conditions as urgent, even when medical assessments categorise them as non-urgent (Unwin et al., 2016). For this study, the focus was placed on healthcare stakeholders to bring a system-wide perspective, allowing for an innovative approach to pathway development by relying on experts who understand both clinical and logistical needs in the ED. This aligns with the principle of anticipating needs, based on the expertise of healthcare providers. However, the study may have benefitted from

incorporating patient feedback to enrich the understanding of patient motivations, despite it being outside the study's timeframe and scope.

Finally, the study did not include the implementation phase of the proposed CATCH policy. This limitation arose due to the scope and time constraints of the research, preventing the practical application and assessment of the proposed pathway in real-world conditions. Implementing and evaluating the policy in practice would have provided valuable insights into its effectiveness, feasibility and areas needing refinement. Without this implementation phase, the study's findings remain theoretical and cannot confirm how the CATCH pathway would perform in an actual setting, limiting its immediate applicability and relevance for practitioners and policymakers.

This study also faces limitations due to selection bias, as healthcare stakeholders were purposefully sampled. Purposeful sampling is a non-random approach often used to ensure that participants have the relevant expertise to provide meaningful insights. While this sampling method was necessary to gather input from knowledgeable healthcare stakeholders (individuals with experience and understanding of ED operations, patient flow and the wider health system) it also introduces the risk of selection bias (Moule, 2017). By specifically selecting participants based on their roles and expertise, the study may have unintentionally limited the diversity of perspectives, particularly in terms of representing a broader range of frontline staff or healthcare professionals from different departments. Those included in the study may share similar viewpoints shaped by their professional positions and experiences, potentially overlooking alternative insights from staff not directly involved in ED management, such as general practitioners or community health workers who also interact with non-urgent patient cases. Furthermore, because stakeholders were aware of the study's aim to develop a tailored pathway for non-urgent ED cases, their responses may have been influenced by a desire to align with the project's objectives. This could result in feedback that is supportive of the CATCH pathway model without necessarily reflecting all potential limitations

or challenges. This purposeful sampling may therefore have limited the breadth of feedback on the proposal, potentially affecting the comprehensiveness and balance of the study's findings. These limitations highlight areas for caution in interpreting the study's findings and underscore the need for further research to address these gaps.

## **6.12 Implications for policy and practice**

The conclusions drawn from this research have informed a pathway that can be translated into actionable policy and practice recommendations. The CATCH team's proposal has previously been discussed and its anticipated outcomes for policy and practice have been outlined. While the research has already addressed the proposal and aims of the CATCH service, the researcher will now discuss the feasibility and limitations of implementing this proposal in real-world practice. The researcher believes that the CATCH service is highly feasible, as it was designed with the practical constraints of real-world healthcare in mind. To facilitate its implementation, the researcher developed a prospective criterion to identify patients at triage, rather than relying on the retrospective criteria initially formulated.

A key consideration is the financial viability of the CATCH service within the government-funded healthcare system. A cost-benefit analysis would be essential to demonstrate the proposal's efficacy as a business case. Ideally, as suggested by healthcare stakeholders and research literature, this service would reduce non-urgent reattendance at EDs, eventually yielding cost savings. However, one stakeholder noted that while financial savings might not be immediate, the service could free up ED capacity, thus improving throughput and patient outcomes in the ED. Randomised controlled trials by Kelley et al. (2020), Seaberg et al. (2017) and Lin et al. (2017) have shown ED and hospital cost savings within their patient navigator programmes, along with decreased ED use, which is reassuring from a financial standpoint for the CATCH proposal.

Patient uptake and acceptance of the CATCH service are also crucial. It is possible some patients may prefer to continue seeking care directly from the ED. Kelley et al. (2020) had 114 patients decline to participate in a research project with patient navigators, with 21 percent expressing they did not need navigation services and 18 percent expressing a lack of interest. Although this was part of a research study, whereby patients may have been more reluctant to partake, it highlights that the CATCH service would need to appeal to patients for successful uptake. The researcher believes that incorporating cultural considerations, such as involving kaitiaki (guardians), could help build patient trust and increase acceptance of the service, thereby mitigating this factor.

From a safety perspective, the researcher has addressed potential risks in the CATCH proposal by requiring that patients identified by the non-urgent criteria algorithm undergo an eligibility check by a NP. This decision was informed by the safety review, which revealed that approximately 10 percent of the study population had been admitted to hospital. Involving a NP adds a layer of clinical safety, ensuring that only appropriate patients are directed to the CATCH clinic. Additionally, healthcare stakeholders recommended that the clinic operate onsite at the hospital, facilitating the transfer of patients back to the ED if necessary. The researcher believes these safety measures significantly reduce risks to patients, enhancing the feasibility of the proposal's implementation.

A clear policy would also be needed to specify the training requirements for patient navigators employed within the CATCH service. For example, in Seaberg et al. (2017) study, patient navigators received training in hospital case management to understand community-based social and medical services and referral systems. Kelley et al. (2020) included a two-day training program that equipped patient navigators to identify and eliminate barriers to care and support patients effectively within their RCT. Within the CATCH service, navigators would similarly need to be trained in health needs assessment frameworks, which are critical for identifying areas where

patients require additional support. In conclusion, the researcher believes the CATCH service presents a promising approach to managing non-urgent ED visits, with potential benefits for patient outcomes, ED capacity and overall healthcare system efficiency. While financial, patient engagement and safety considerations must be carefully addressed, the proposal has been thoughtfully designed to address these challenges. By implementing robust training programs for patient navigators, incorporating cultural sensitivities and establishing clear pathways for patient care, the CATCH service is well-positioned for real-world success.

### **6.13 Study conclusions**

This study was initiated in response to growing concerns over the increasing demands on EDs due to population growth and demographic shifts. NZ's EDs are experiencing demand levels similar to those in other developed nations, driven by an ageing population, long-term health conditions and overall population growth (Ministry of Health, 2016). EDs worldwide face intense pressures, aggravated by rising patient volumes, high acuity cases, non-urgent visits and limited resources. When acute demand is poorly managed or healthcare supply cannot meet demand, patient safety is put at risk. This imbalance of supply and demand in EDs is linked to overcrowding, access block, longer wait times, decreased job satisfaction among healthcare workers, reduced quality of care and higher patient mortality rates (Australasian College for Emergency Medicine, 2019; Richardson, 2006; Sprivulis et al., 2006). These issues highlighted the need for innovative strategies that improve ED efficiency while enhancing patient outcomes and experiences. Consequently, this study aimed to identify new methods of managing ED demand that would improve both patient safety and ED outcomes.

This research focused specifically on non-urgent ED presentations, as there is no universally accepted definition of what constitutes a non-urgent presentation (Durand et al., 2011). The researcher conducted a mixed-methods study to establish criteria for non-urgent presentations,

using qualitative input from healthcare stakeholders and quantitative data from a patient database that included ED visits to the research hospital. Following a stage-gate framework, the ultimate goal was to develop a new patient pathway to meet the healthcare needs of identified patients outside the ED. The first three stages of the stage-gate process were employed to develop criteria for a priority patient group by integrating perspectives from healthcare stakeholders, patient data and relevant literature. The researcher defined patients in the priority non-urgent group as those meeting all five of the following criteria: self-referred, walk-in, ATS level 4 or 5, not redirected to urgent care and presenting within six months of a previous ED visit. The researcher then analysed the demographics of this group over previous years using patient database records. In the development and validation stage, the researcher combined healthcare stakeholders' insights, patient data and research to design a viable patient pathway for this group with their demographics in mind.

The proposed pathway involved using NPs to assess and treat patients, supported by patient navigators to enhance care, reduce barriers and address equity concerns (Chan et al., 2023). The findings indicated that the priority group often came from high socio-economic deprivation zones and exhibited high attrition rates. These elements informed a proposal for a new pathway, the Coordination, Assessment, Treatment and Community Hauora (CATCH) team, with practical implications examined. The theoretical contributions of this research study were discussed, examining the use of the stage-gate process within healthcare research and also reviewing the theoretical foundations of the conventional ED model (triage theory, critical care theory) with the CATCH model (empowerment, patient-centred care). The study concluded with an assessment of its limitations. Overall, this research has successfully addressed the research questions through a mixed-methods approach within a stage-gate framework and has created a pathway for the identified patients in the priority non-urgent group.

Building on these findings, this research highlights an urgent imperative for transformation within the New Zealand healthcare system, one that extends beyond traditional integrated care models. While integration focuses on aligning services across sectors, the lived experiences and individual needs of patients are often overlooked. The adoption of person-centric care models places individuals and their whānau at the heart of healthcare delivery, ensuring that care is tailored to their unique contexts, values, and preferences. Such a model not only fosters empowerment and engagement but also addresses the broader social determinants of health that often drive non-urgent ED presentations, especially in populations experiencing socio-economic deprivation.

Furthermore, this study demonstrates how a navigated continuity of care model can effectively bridge the gap between acute and primary care settings. Transitions between these care environments are often fragmented, leading to repeated ED visits and unmet health needs. By incorporating patient navigators alongside clinical teams such as nurse practitioners, the proposed CATCH pathway facilitates smoother, more coordinated care journeys. This approach ensures that patients receive timely, appropriate services in the community, reducing reliance on the ED and enhancing overall system efficiency. It also reinforces equity by proactively addressing barriers to access and supporting vulnerable populations through sustained engagement.

The implications of this research are far-reaching: by reimagining care through a person-centred, navigated framework, healthcare systems can respond more effectively to rising demand, reduce unnecessary acute care utilisation, and ultimately improve patient safety and experience. Embracing this transformation is essential to building a resilient and sustainable healthcare system, one that values people over processes and fosters meaningful connections between all levels of care. The CATCH model offers a practical blueprint for such innovation, signalling a critical step towards healthcare that is equitable, responsive, and centred on the needs of the communities it serves.

## 6.14 Future research

Implementing and reviewing the success of the proposed CATCH pathway in a real-world setting is essential to evaluate its impact on patient outcomes and ED efficiency. Testing the proposed CATCH policy in practice in the form of a randomised controlled trial (RCT) will help determine its viability and adaptability, providing valuable insights for further refinement and optimisation. Future studies could also expand on this research by involving multiple hospital sites and applying the priority non-urgent criteria to additional hospital databases. By examining patient demographics across diverse sites, researchers could gain a deeper understanding of the pathway's applicability and effectiveness for various patient populations. This multi-site approach would also help identify the pathway's vulnerability to local differences, offering critical information for scaling the CATCH pathway more broadly.

Conducting RCTs within a NZ context, with patient navigators, could provide robust evidence of the pathway's impact on health outcomes and patient experiences. Such trials would offer insights into the effectiveness of patient navigation for non-urgent cases in NZ's unique healthcare environment. Further research should also focus on optimising navigator training and exploring strategies to scale navigation programmes across varied patient populations. Additionally, investigating the long-term cost-effectiveness of these interventions would be valuable, as it would help inform resource allocation decisions and ensure the sustainability of navigation support for non-urgent ED patients, as previous cost evaluations have been short-term (Lin et al., 2017; Seaberg et al., 2017).

Integrating patient perspectives is vital in future studies to ensure the pathway meets patient needs and preferences effectively. Gathering qualitative data from patients can help refine the pathway's structure, enhance patient satisfaction and address any unmet needs that could hinder its success. Along with incorporating patient perspectives, expanding the stakeholder group to include a

broader array of healthcare professionals from diverse settings would enrich the understanding of non-urgent ED cases. In particular, incorporating insights from community-based providers and using random sampling within certain stakeholder categories could mitigate selection bias and present a fuller picture of the CATCH pathway's feasibility and potential impact. Finally, the complexity of defining non-urgent presentations highlights the need for further research to establish a universal definition. Addressing this gap would facilitate clearer identification and management of non-urgent cases across healthcare systems, supporting more targeted interventions for ED efficiency and patient care quality.

The stage-gate process, a well-established project management tool typically employed in product development, was innovatively adapted in this research study for application in health research, leading to the creation of a new patient pathway. This approach demonstrated alignment with evidence-based practice and proved effective in its implementation. Given its success, the stage-gate process holds significant potential for future healthcare research. In conclusion, this study opens the door to numerous opportunities for further exploration and innovation in the healthcare field.

## Appendices

### Appendix 1: Massey University ethics approval



7/12/2021

Dear: Amber Marshall

**Re: Ethics Application - NOR 21/77 - Exploring acute demand: an investigation into the management of patients presenting to the Emergency Department.**

Thank you for the above application that was considered by the Massey University Human Ethics Committee:

**Human Ethics Northern Committee** at their meeting held on **Thursday, 25 November 2021**

On behalf of the Committee I am pleased to advise you that the ethics of your application are approved.

Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely



Professor Craig Johnson  
Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Research Ethics Office, Research and Enterprise  
Massey University, Private Bag 11 222, Palmerston North, 4442, New Zealand T 06 951 6841; 06 95106840  
E [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz); [animaethics@massey.ac.nz](mailto:animaethics@massey.ac.nz); [gte@massey.ac.nz](mailto:gte@massey.ac.nz)

## Appendix 2: Māori consultation endorsement



### Te Puna Oranga Māori Research Review Committee

12 October 2021

**Re: Māori Consultation for 'Exploring acute demand: an investigation into the management of patients presenting to the Emergency Department'**

**Name of Applicant: Amber Marshall**

Tēnā Koe Amber,

*Thank you for submitting the above research proposal to the Waikato DHB Te Puna Oranga Māori Research Review Committee for Māori consultation. The research application has been reviewed in order to support and prompt the researcher to think about how this research will improve health outcomes and eliminate inequity for Māori living within the Waikato DHB region.*

1. The Committee acknowledges the researchers for collecting ethnicity data as part of a demographic background of the participant to improve data collection for Māori in order to improve Māori health outcomes and reduce inequity for Māori.
2. The Committee encourages the research team to actively recruit equal numbers of Māori and Non-Māori. Any Research that involves Māori participation would require sufficient face to face time for fully informed consent to occur. Inclusion of the whānau of the Māori participant should be encouraged to support the continued engagement of the Maori participant in the research process.
3. The Committee encourages all research that involves participation of individuals, especially Māori participants to fully inform them regarding the detail of tissue collection. One consent form for the current use of Tissue. One consent form for the future use of tissue (this should be clear to the participant).
4. Studies using retrospective data must respect Maori data as outlined in Te Mana Raraunga: **5.1 Respect**. *The collection, use and interpretation of data shall uphold the dignity of Māori communities, groups and individuals. Data analysis that stigmatises or blames Māori can result in collective and individual harm and should be actively avoided.*  
  
Reference: Te Mana Raraunga: Principles of Māori Data Sovereignty. Brief #1 | October 2018  
<https://static1.squarespace.com/static/58e9b10f9de4bb8d1fb5ebbc/v/5bda208b4ae237cd89ee16e9/1541021836126/TMR+Māori+Data+Sovereignty+Principles+Oct+2018.pdf> (Accessed August 2019)
5. If cultural issues arise for the Māori participant during any research, they will inform the research team during the study that an issue has occurred. Cultural issues may not be obvious to the participant or the researcher prior to commencement of the research.
6. The Committee encourages the research team to continue to consult with Te Puna Oranga, Māori Health service at any time, should they have any further queries.
7. Feedback regarding this research is appreciated and can be shared back to the Kaunihera Kaumatua via Te Puna Oranga Māori Health Service

The Committee endorses this research proposal with the consideration of the above cultural recommendations where appropriate and requests the researcher to collect ethnicity data for all study participants seen at Waikato DHB for our own internal records. We would encourage you to include Māori participants in the focus groups.

Dr Nina Scott  
Te Puna Oranga-Maori Health Service

## Appendix 3: Research hospital approval



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23 September 2021

Mrs Amber Marshall  
Massey University



Dear Amber,

**Research Project (our ref RD021104)**

Thank you for providing information on your proposed research project **"Exploring acute demand: an investigation into the management of patients presenting to the Emergency Department"**.

I confirm that your study has been registered at Waikato District Health Board and has been approved in principle by the relevant staff. Final sign-off will be contingent upon you gaining approval from Massey University, and ethics approval if required.

Yours sincerely,

A handwritten signature in black ink, appearing to read "S. Brodnax".

Sarah Brodnax  
**Coordinator - Governance  
Quality & Patient Safety**

## Appendix 4: Participant information sheet



The School of Nursing  
Gate 1 Albany Expressway (SH17)  
Massey University  
Albany  
Auckland  
0632  
New Zealand

### ***Exploring acute demand: an investigation into the management of patients presenting to the Emergency Department.***

#### **PARTICIPANT INFORMATION SHEET FOR FOCUS GROUP SESSION**

**Researchers:** Amber Marshall (Primary Investigator) and Nicolette Sheridan (Supervisor).

You are being invited to participate in this research study. In order to provide adequate information to help you decide whether to take part or not, this information sheet will explain the research and what participation in this study involves. Please take the time to read this carefully prior to your decision to take part.

#### **Researcher introduction**

This research will be conducted by myself (Amber Marshall, Primary Investigator) under the supervision of Professor Nicolette Sheridan who is the Primary Supervisor. My clinical background is in Emergency Nursing and this mixed methods research study is being conducted in fulfilment of the requirements for the degree of Doctor of Philosophy in Nursing.

#### **What is the study and what is the purpose of it?**

This study aims to explore the acute demand of the Emergency Department, specifically exploring the management of patients with minor to moderate acute conditions. We are interested in gathering your perspectives on patients who attend the Emergency Department who may not benefit from an Emergency Department setting. Furthermore, this study also aims to explore any positive factors along with gaps in our overall healthcare system for these patients from your perspective of a healthcare professional. This is the first phase of this research study. The final phase of this research will include developing and implementing an intervention which aims to improve access to healthcare for patients with minor to moderate acute conditions.

#### **Who is invited to participate in this study?**

You have received this participant information sheet as you have been identified as a key healthcare stakeholder in relation to the management of the Emergency Department at Waikato District Health Board. Your knowledge and expertise in relation to patients with minor to moderate acute conditions presenting to the Emergency Department is sought for this research.

**What happens if you decide to take part?**

If you choose to participate in this study, please contact Amber Marshall (Primary Investigator) and a date and time convenient for all interested participants will be made. The study will be set out in the form of a focus group discussion with 6 – 10 other health care professionals from the selected group. This number of participants allows the group to be small enough to ensure all participants views are heard and large enough to gather a diverse range of data. There will be written consent forms to read and sign at the beginning of the focus group session. The focus group session will be led by the Primary Investigator, who will use a predesigned question template to guide the group discussion.

There will be up to five separate focus group sessions, these will all be separated by time to allow the Primary Investigator to analyse data from the previous focus group. This will enable further focus groups to explore concepts which have come from that analysis. Each focus group should take no longer than one hour of your time. The researcher will email participants and a convenient time will be established for all involved to complete the subsequent focus groups.

Audio recording is essential for data collection and will be carried out for the entire duration of the focus group discussion. You may refuse to answer any questions and are free to leave the group discussion without having to give a reason at any time. However, because of the nature of the group situation, the recording device cannot be turned off during the discussion. You can withdraw from the focus group at any time before the focus group begins. You can also withdraw while the focus group is in progress. However, it will not be possible to withdraw the information you have provided up to that point as it will be part of a discussion with other participants. After completion of the study a summary of the findings will be emailed to you.

There are no known risks involved in this study. However, there is the possibility that you may find topics arise that you feel are sensitive, or that you wish to discuss further, please contact the Employee Assistance Programme (EAP) on 0800 EAPNOW for confidential professional assistance.

**How will information be stored and destroyed?**

The consent forms and any other hardcopy data will be stored securely in locked filing cabinets at Massey University. The consent forms will be stored separately to maintain confidentiality. Similarly, audio recordings will be stored on a password-protected computer. The transcriptions of the focus group session will also be stored securely and only accessible by the research team. Consent forms, electronic data, and any hardcopy documents utilised will be kept for seven years, before being shredded (or in the case of electronic copies, destroyed securely) at Massey University.

**If you participate, what are your rights?**

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used; and

- be given access to a summary of the project findings when it is concluded.

Should you have any questions or concerns relating to your rights as a participant in this study, feel free to contact the researchers directly. If you would prefer to contact someone outside of the research team, you may contact an Independent Health and Disability Advocate.

Phone: 0800 555 050 or email: [advocacy@hdc.org.nz](mailto:advocacy@hdc.org.nz)

#### **Confidentiality**

There are limits on confidentiality as there are no formal sanctions on other group participants from disclosing your involvement, identity or what you say to others in the focus group. However, the consent form requests that all participants maintain confidentiality of the discussions held at the focus group session. All information obtained for the study will remain strictly confidential and no identifiable information will be used in the study report.

#### **Need more information?**

Please do not hesitate to contact the researchers if you have any questions or wish to know more about this study.

**Primary Investigator:** Amber Marshall, Massey University PhD student.

Phone: +64 [REDACTED]. Email: [REDACTED]

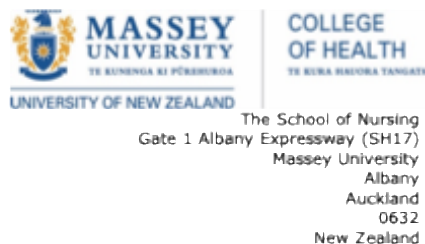
**Supervisor & Head of School:** Professor Nicolette Sheridan, School of Nursing, Massey University.

Phone: +64 92136346 Email: [n.sheridan@massey.ac.nz](mailto:n.sheridan@massey.ac.nz)

#### **Committee Approval Statement:**

*This project has been reviewed and approved by the Massey University Human Ethics Committee: Northern, Application NOR 21/77. If you have any concerns about the conduct of this research, please contact A/Prof Fiona Te Momo, Chair, Massey University Human Ethics Committee: Northern, telephone 09 414 0800, x 43347, email [humanethicsnorth@massey.ac.nz](mailto:humanethicsnorth@massey.ac.nz)*

## Appendix 5: Consent form



***Exploring acute demand: an investigation into the management of patients presenting to the Emergency Department.***

**FOCUS GROUP PARTICIPANT CONSENT FORM**

I have read, and I understand the Information Sheet attached as Appendix I. I have had the details of the study explained to me, my questions have been answered to my satisfaction, and I understand that I may ask further questions at any time. I have been given sufficient time to consider whether to participate in this study and I understand participation is voluntary and that I may withdraw from the study at any time.

1. I understand that I have an obligation to respect the privacy of the other members of the group by not disclosing any personal information that they share during our discussion.
2. I understand that all the information I provide will be kept confidential to the extent permitted by law, and the names of all people in the study will be kept confidential by the researcher.

*Note: There are limits on confidentiality as there are no formal sanctions on other group participants from disclosing your involvement, identity or what you say to others in the focus group. There are risks in taking part in focus group research and taking part assumes that you are willing to assume those risks.*

3. I agree to participate in the focus group under the conditions set out in the Information Sheet attached as Appendix I.

**Declaration by Participant:**

I \_\_\_\_\_ hereby consent to take part in this study.  
[print full name]

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## Appendix 6: Focus group guide

### Semi-structured focus group guide:

#### Introduction

Primary investigator introduces self and gives thanks for those attending. Randomised self-introduction of all participants. Consent form process (participants read and sign if willing to participate). Primary Investigator will establish ground rules:

- *The information shared in this meeting is confidential. You should not discuss the opinions and comments made by other focus group participants with anybody outside this room.*
- *You do not need to agree with others, but you should listen respectfully as others share their views.*
- *We would like to hear a wide range of opinions: please speak up on whether you agree or disagree.*
- *There are no right, or wrong answers, every person's experience and opinions are important.*
- *The meeting is audio recorded, therefore, please one person speak at a time.*

#### Session

The primary investigator will give an overview of the research study and then move into questions. Questions may include:

1. Can you tell me what the characteristics of patients that should be using the Emergency Department are?
2. Can you tell me what the characteristics of patients that shouldn't be using the Emergency Department are?
3. What are the characteristics of presentations that may be able to be diverted from the Emergency Department?
4. What are the alternative services available for presentations with these characteristics?
5. What are new interventions that could be established to aid access to healthcare for these patient presentations?
6. Has anything been trialled in the past that has been effective?
7. Has anything been trialled in the past that has not been effective?

#### Conclusion

Primary Investigator facilitates ending focus group, gives thanks to all participants.

## Appendix 7: Rapid literature review- patient navigators

### Literature review summary – rapid review for focus group session

#### Article one

**Title:** Patient Navigation for Patients Frequently Visiting the Emergency Department: A Randomized, Controlled Trial.

**Date:** 2017

**Author:** Seaberg et al

**Type:** Randomised controlled trial

**Study population:** 282 patients with five or more ED visits per year receiving standard care or a patient navigation intervention.

**Findings:** Comparing pre-enrolment and post-enrolment years to control, the patient navigation programme resulted in:

- Reduced ED and hospital costs (27% vs. 18% decrease)
- Decreased ED use (13% vs. 4% decrease)
- Increased primary care utilisation (6.42 vs. 4.07 visits per patient increase)

Patient surveys found no significant impact on patient satisfaction.

#### Article two

**Title:** Patient navigation to reduce emergency department utilization among Medicaid insured, frequent ED users: a randomized controlled trial.

**Date:** 2020

**Author:** Kelley et al

**Type:** Randomised controlled trial

**Study population:** Adults who visited the ED between 4 and 18 times in the prior year including the current visit. 49 patients in the intervention group, 51 in usual care/control.

**Findings:**

- Reduced ED visits (1.4 fewer ED visits per patient in the navigation group ( $p=0.01$ ))
- Decreased hospitalisations (1 fewer hospitalisations per patient in navigation group ( $p=0.001$ ))
- Cost savings but these were not statistically significant.

#### Article three

**Title:** ED-Based Care Coordination Reduces Costs for Frequent ED Users

**Date:** 2017

**Author:** Lin et al

**Type:** Randomised controlled trial

**Study population:** 72 frequent ED users, 36 receiving standard care and 36 receiving the patient navigation intervention.

**Findings:** Intervention consisted of a community health worker coordinating post-discharge support and a clinical team developing an acute care plan across a seven-month pilot period. Compared to the control group, patients randomized to the intervention group experienced:

- Reduced ED costs (15%)
- Reduced inpatient costs (8%)
- Reduced ED visits (35%)
- Reduced admissions through the ED (31%)

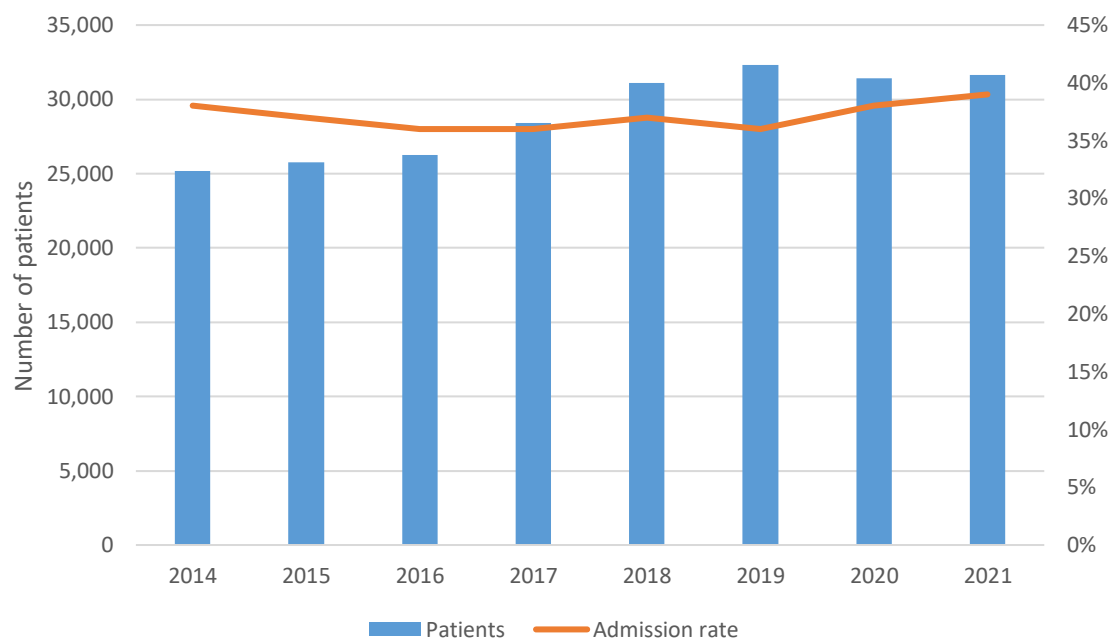
These findings were not statistically significant.

## Appendix 8: ED outcome model - additional data analysis

This appendix includes the data for patients who were admitted or classed as the “ED Treatment” group from the ED outcome model in the findings chapter of this thesis on page 153.

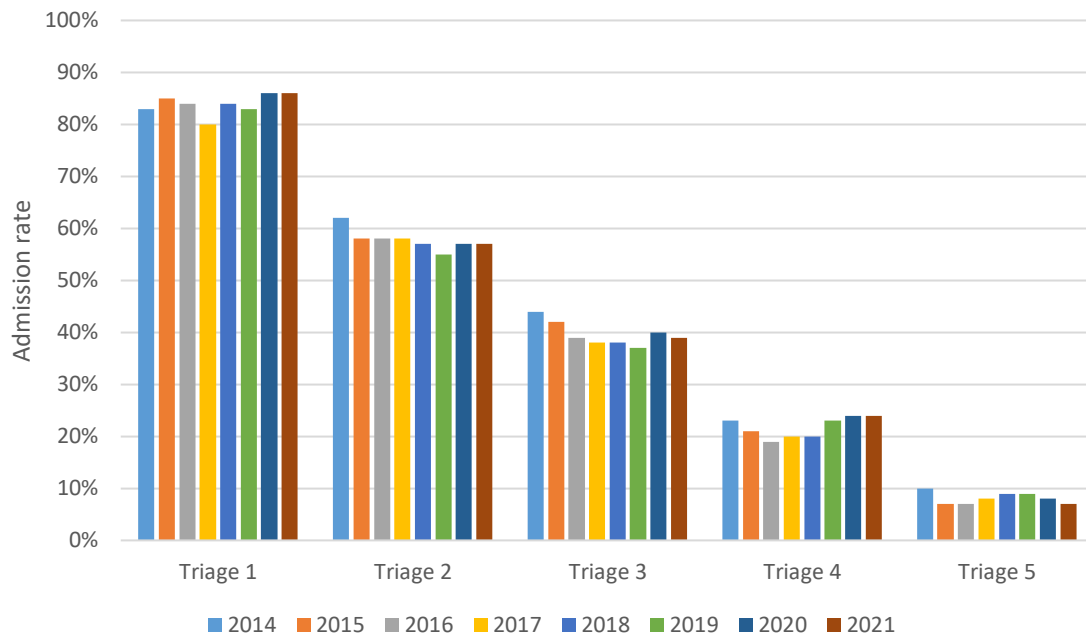
### Admitted patients

Patients were coded as **admitted** if they had a discharge destination of: Hospital Admission, ED Mental health centre, Acute Hospital, ED Other Hospital Same DHB or Other Hospital.



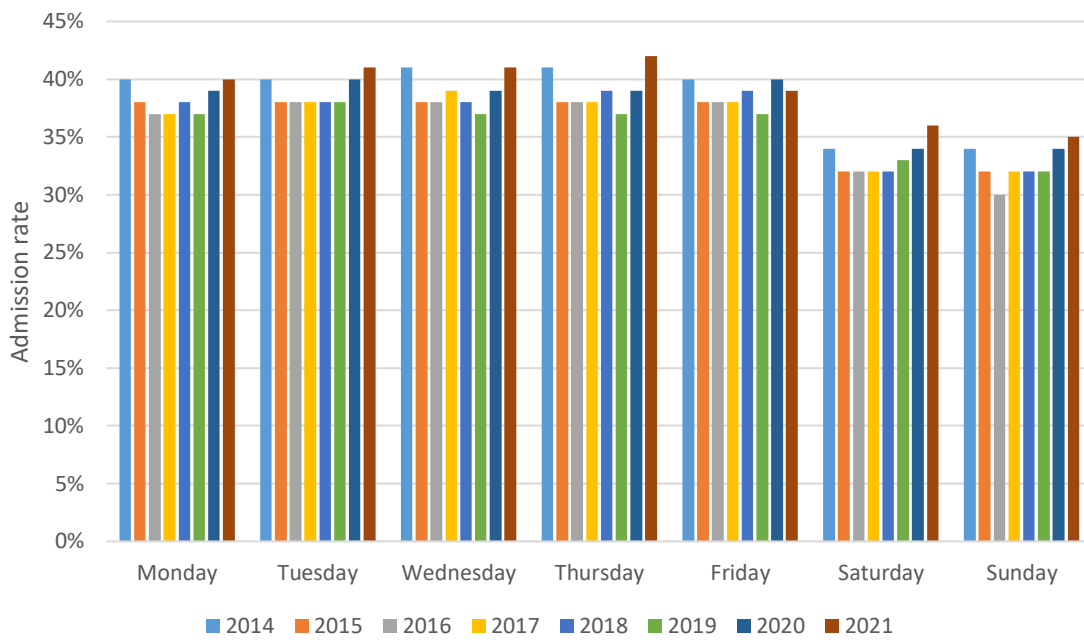
**Figure 84: Total number of admitted patients by year**

Figure 84 illustrates the number of patients admitted to hospital following their time in the ED over the eight-year period. The trendline indicates the admission rate as a percentage for each year. The admission rate appears stable during the last four years of the research period. The triage scales allocated to patients who were admitted to hospital are presented next.



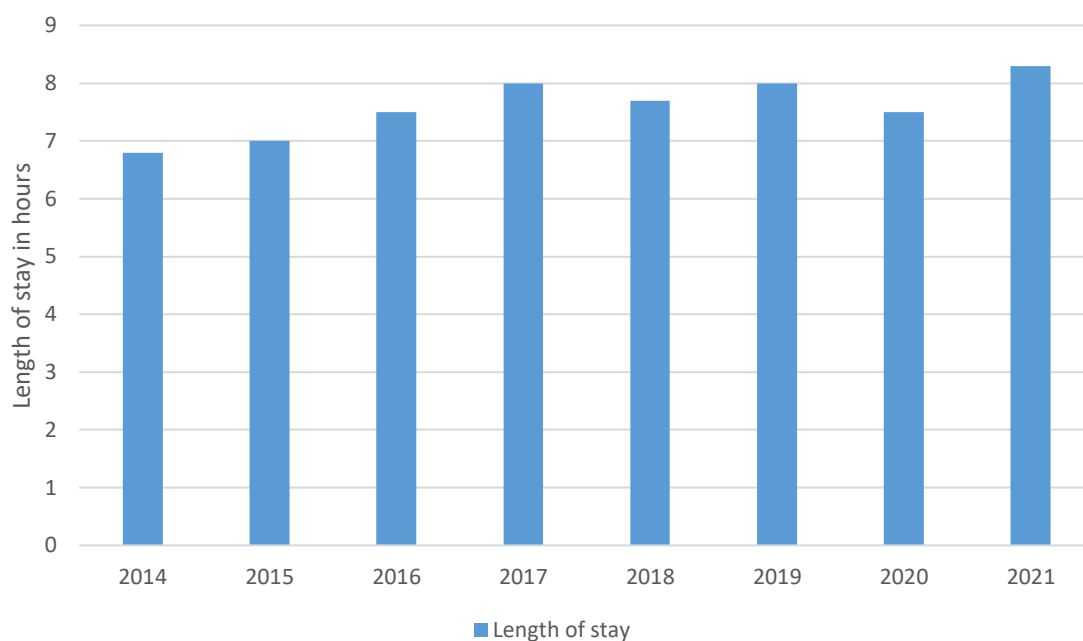
**Figure 85: Admission rate by triage scale**

Figure 85 shows the admission rate of patients by their triage score over the eight-year period. For example, in 2014, 83 percent of all Triage 1 patients were admitted to hospital. The admission rates by the day of the week were also reviewed and are shown below.



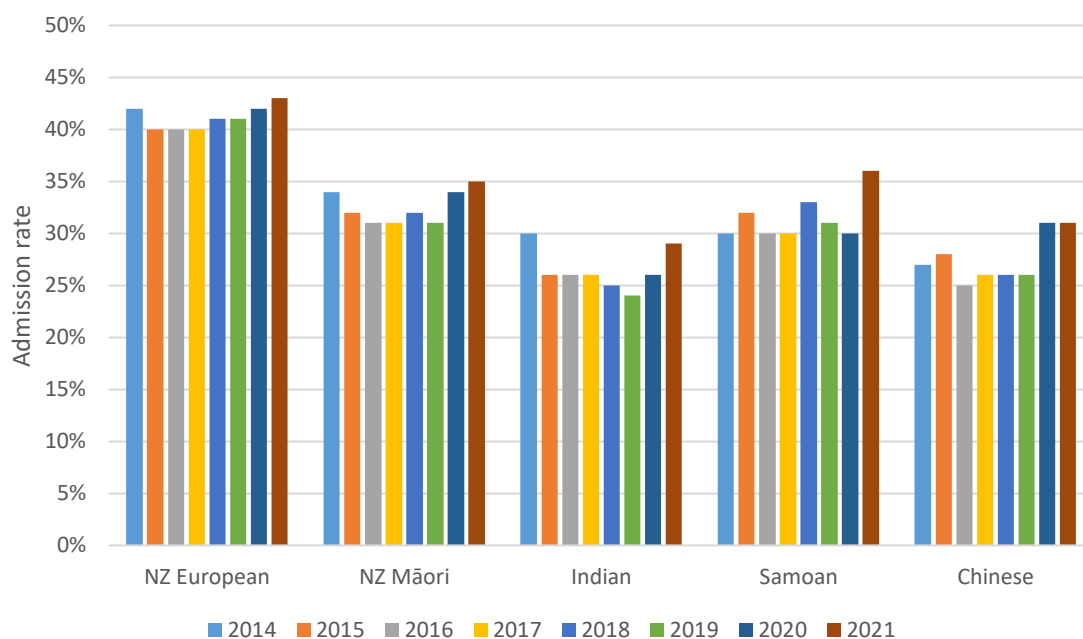
**Figure 86: Admission rate by the day of the week**

Figure 86 shows the admission rates of patients by day of the week. For example, in 2014, 40 percent of patients who arrived on Mondays were admitted to hospital. The mean length of stay of patients who are admitted to hospital from the ED are shown next.



**Figure 87: Admitted patients’ mean length of stay in ED**

Figure 87 displays the mean length of stay for patients admitted to hospital from the ED. It is evident that these patients spend a significantly longer period of time in the ED when compared to the 'non-urgent' patient cohort examined earlier. The ethnicity breakdown of patients who were admitted to hospital was also examined and this is shown below.



**Figure 88: Admission rates by ethnicity**

Figure 88 shows the admission rates of patients by ethnicity. For example, in 2014, 42 percent of patients who identified as NZ European were admitted to hospital. The diagnoses of patients admitted to hospital were also reviewed with findings shown in Table 22.

**Table 22: Top three diagnoses of admitted patients by year**

| Year | Diagnoses  |
|------|--|
| 2014 | Other and unspecified abdominal pain: 1,818 patients<br>Chest pain, unspecified: 1,037 patients<br>Other specified general symptoms and signs: 709 patients              |
| 2015 | Other and unspecified abdominal pain: 1,847 patients<br>Other specified general symptoms and signs: 926 patients<br>Chest pain, unspecified: 741 patients                |
| 2016 | Other and unspecified abdominal pain: 1,968 patients<br>Other specified general symptoms and signs: 1,088 patients<br>Chest pain, unspecified: 870 patients              |
| 2017 | Other and unspecified abdominal pain: 1,804 patients<br>Other specified general symptoms and signs: 1,322 patients<br>Chest pain, unspecified: 963 patients              |
| 2018 | Other and unspecified abdominal pain: 2,644 patients<br>Other specified general symptoms and signs: 1,628 patients<br>Chest pain, unspecified: 1,108 patients            |
| 2019 | Other and unspecified abdominal pain: 3,632 patients<br>Other specified general symptoms and signs: 2,352 patients<br>Chest pain, unspecified: 1,080 patients            |
| 2020 | Other and unspecified abdominal pain: 3,961 patients<br>Other specified general symptoms and signs: 2,587 patients<br>Unknown and unspecified causes of morbidity: 1,193 |
| 2021 | Other and unspecified abdominal pain: 3,591 patients<br>Other specified general symptoms and signs: 2,581 patients<br>Chest pain, unspecified: 1,213                     |

It is evident there is a large proportion of patients admitted to hospital for abdominal and chest pain. These findings will be discussed with the healthcare stakeholders at the next focus group session. The domiciles of these patient were also examined and are shown in Table 23.

**Table 23: Top three domiciles of admitted patients by year**

| Year | Domiciles   |
|------|---|
| 2014 | <p>Domicile A: 29% admission rate (n=735)</p> <p>Domicile F: 35% admission rate (n=496)</p> <p>Domicile G: 40% admission rate (n=459)</p> <p><b>Comparison:</b> Domicile D admission rate 44% (n=618)</p> |
| 2015 | <p>Domicile A: 26% admission rate (n=762)</p> <p>Domicile G: 39% admission rate (n=477)</p> <p>Domicile F: 30% admission rate (n=462)</p> <p><b>Comparison:</b> Domicile D admission rate 42% (n=583)</p> |
| 2016 | <p>Domicile A: 26% admission rate (n=846)</p> <p>Domicile F: 32% admission rate (n=535)</p> <p>Domicile G: 39% admission rate (n=491)</p> <p><b>Comparison:</b> Domicile D admission rate 41% (n=555)</p> |
| 2017 | <p>Domicile A: 25% admission rate (n=786)</p> <p>Domicile F: 30% admission rate (n=582)</p> <p>Domicile H: 30% admission rate (n=512)</p> <p><b>Comparison:</b> Domicile D admission rate 46% (n=686)</p> |
| 2018 | <p>Domicile A: 27% admission rate (n=826)</p> <p>Domicile F: 31% admission rate (n=646)</p> <p>Domicile G: 37% admission rate (n=537)</p> <p><b>Comparison:</b> Domicile D admission rate 46% (n=731)</p> |
| 2019 | <p>Domicile A: 25% admission rate (n=823)</p> <p>Domicile G: 38% admission rate (n=610)</p> <p>Domicile F: 31% admission rate (n=603)</p> <p><b>Comparison:</b> Domicile D admission rate 45% (n=725)</p> |
| 2020 | <p>Domicile A: 24% admission rate (n=833)</p> <p>Domicile F: 32% admission rate (n=570)</p> <p>Domicile I: 36% admission rate (n=539)</p> <p><b>Comparison:</b> Domicile D admission rate 46% (n=742)</p> |

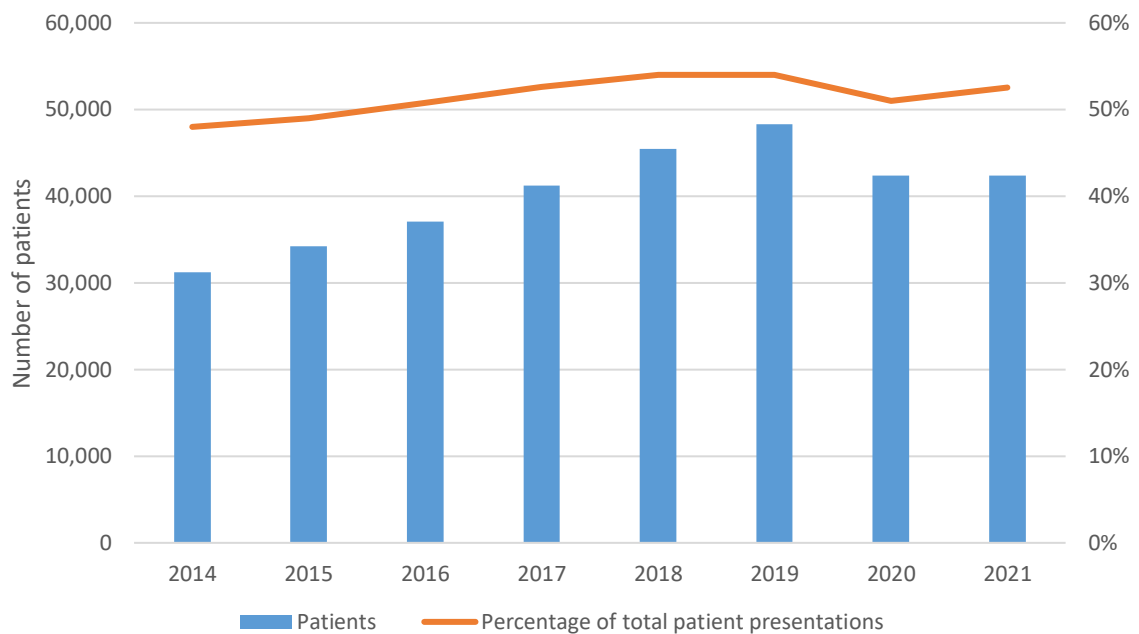
|      |  |
|------|--|
| 2021 | Domicile A: 27% admission rate (n=931)<br>Domicile G: 40% admission rate (n=570)<br>Domicile F: 35% admission rate (n=560)<br><b>Comparison:</b> Domicile D admission rate 43% (n=618) |
|------|--|

The top three domiciles for each year in Table 23 were linked to high deprivation zones. As previously noted, the research team used Domicile D, one of the least deprived areas in the region, as a comparison zone. It is observed from the data that Domicile D had higher admission rates over the years compared to domiciles with higher deprivation levels.

Patients who have been admitted to hospital, along with patients who are classified as ‘non-urgent’ and do not necessarily require emergency medicine services, have been examined above. There is one final cohort of patients included in this model: those who require emergency medicine services but are not admitted to hospital. The data for these patients is presented in the section below.

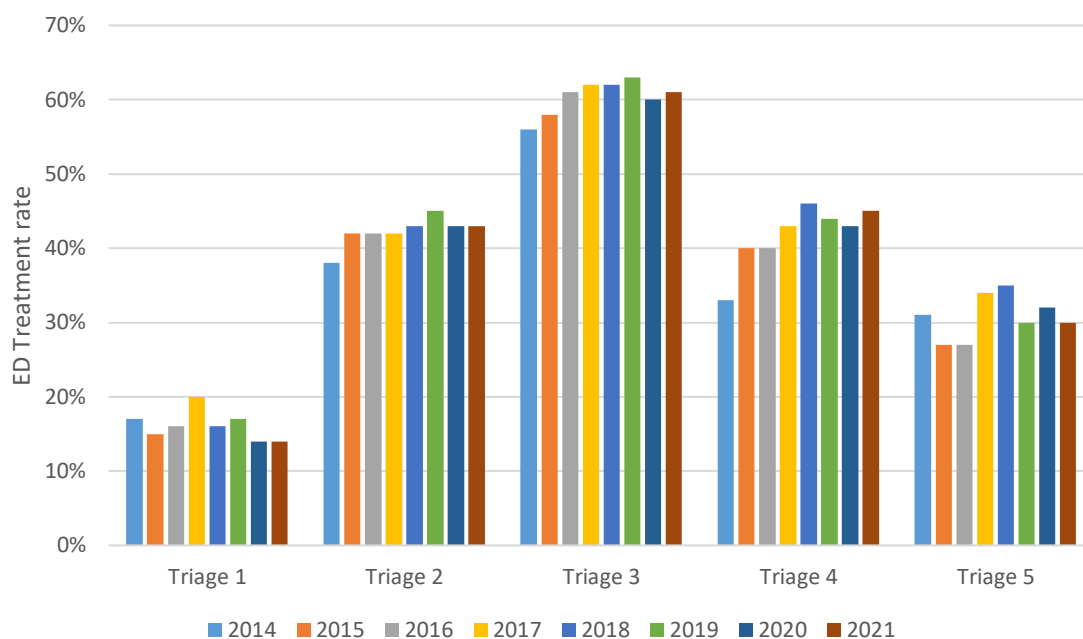
**Patients needing ED treatment**

Patients were coded as needing ED treatment within this model if they were not classified as non-urgent and were not admitted to hospital. The overview of these patient presentations are shown in Figure 83 below.



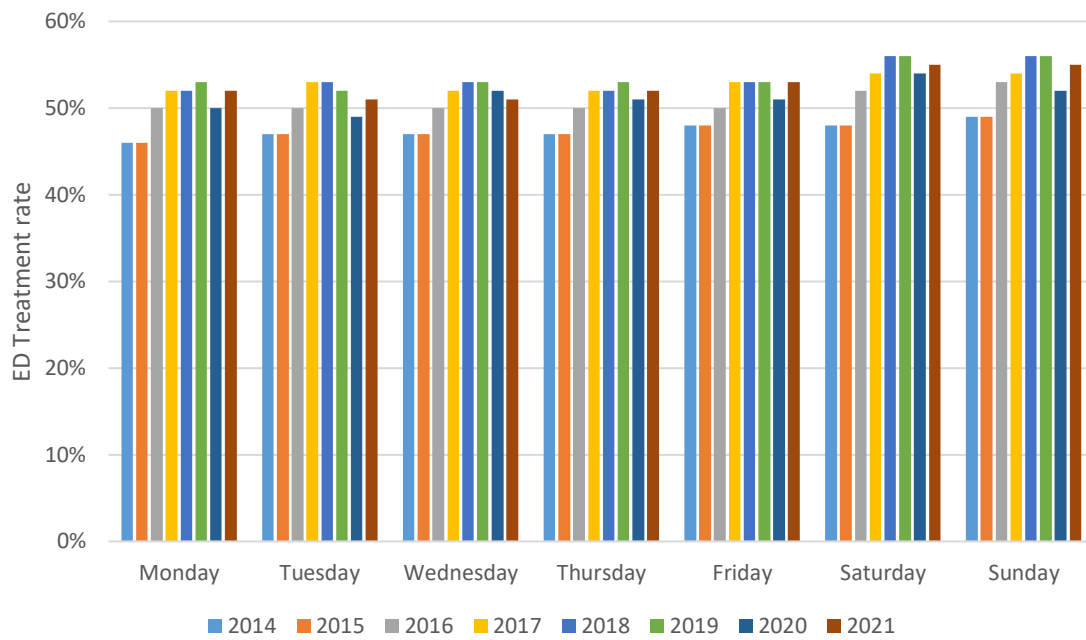
**Figure 89: Total number of “ED Treatment” patients by year**

Figure 89 shows the number of patients who were coded as needing ‘ED Treatment’ using the coding system over an eight-year period. The percentage of total patient presentations the ‘ED Treatment’ group make up has not changed significantly over the eight-year period. The triage scales of these patients are shown in Figure 84.



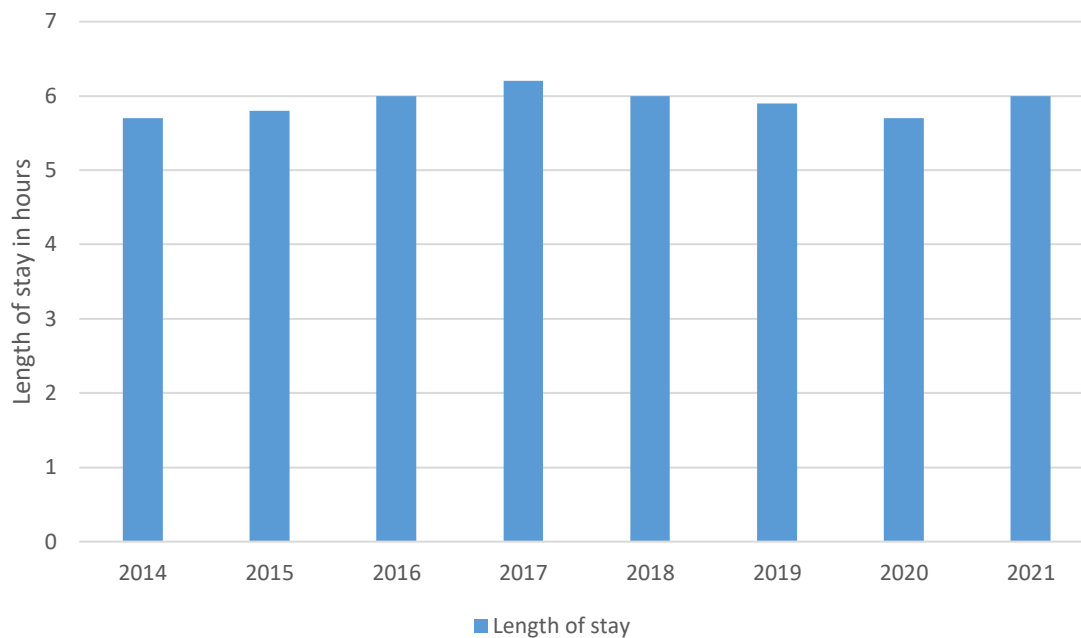
**Figure 90: ED Treatment rate by triage scale**

Figure 90 shows the ‘ED Treatment’ rate by triage scale. For example, in 2014, 17 percent of triage one patients were coded as needing ED Treatment, 38 percent of triage two patients were coded as needing ED Treatment and so on. The presentation rates by day of the week were also examined and are shown in Figure 91.



**Figure 91: ED Treatment rate by the day of the week**

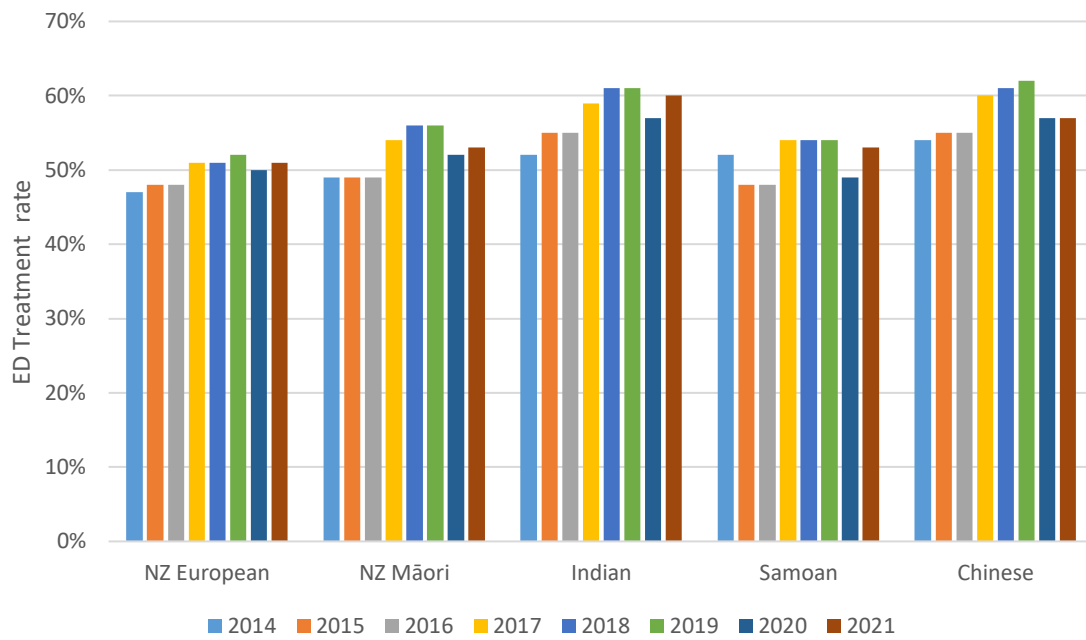
Figure 91 shows the ED Treatment rate by the day of the week. There are no significant trends found when reviewing these data. The mean LOS has been examined for this cohort and the results are shown in Figure 86.



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**Figure 92: ED Treatment patients' mean length of stay in ED**

Figure 92 illustrates the mean length of stay in the ED for patients categorised as needing 'ED Treatment'. These results are similar to those of patients admitted to hospital, as shown in the previous section and differ from patients classified as 'non-urgent' in this model. It appears that patients requiring ED treatment and those admitted to hospital have a longer mean length of stay compared to 'non-urgent' patients, who typically have a mean length of stay of two to three hours. The ethnicity breakdown of the 'ED Treatment' group is shown in Figure 93.



**Figure 93: ED Treatment rates by ethnicity**

Figure 93 shows the ‘ED Treatment’ rate by ethnicity. For example, in 2014, 47 percent of all NZ European presentations were classed as needing ‘ED Treatment’. The diagnoses of this group are displayed in Table 24.

**Table 24: Top three diagnoses of ED Treatment patients by year**

| Year | Diagnoses   |
|------|---|
| 2014 | Other specified general symptoms and signs: 2,299 patients<br>Other and unspecified abdominal pain: 2,167 patients<br>Chest pain, unspecified: 1,202 patients |
| 2015 | Other specified general symptoms and signs: 2,963 patients<br>Other and unspecified abdominal pain: 2,489 patients<br>Chest pain, unspecified: 1,657 patients |
| 2016 | Other specified general symptoms and signs: 3,191 patients<br>Other and unspecified abdominal pain: 2,984 patients<br>Chest pain, unspecified: 1,834 patients |
| 2017 | Other specified general symptoms and signs: 3,414 patients<br>Other and unspecified abdominal pain: 3,105 patients<br>Chest pain, unspecified: 1,780 patients |
| 2018 | Other and unspecified abdominal pain: 3,313 patients<br>Other specified general symptoms and signs: 2,966 patients<br>Chest pain, unspecified: 2,150 patients |
| 2019 | Other and unspecified abdominal pain: 4,236 patients<br>Other specified general symptoms and signs: 3,283 patients<br>Chest pain, unspecified: 2,661 patients |
| 2020 | Other specified general symptoms and signs: 4,538 patients<br>Other and unspecified abdominal pain: 2,804 patients<br>Chest pain, unspecified: 2,567 patients |
| 2021 | Other specified general symptoms and signs: 4,279 patients<br>Chest pain, unspecified: 2,821 patients<br>Other and unspecified abdominal pain: 2,683 patients |

These diagnoses are similar to those seen in patients who were admitted to hospital, including abdominal and chest pain. The domiciles of the 'ED Treatment' group were also examined and are shown in Table 25.

**Table 25: Top three domiciles of ED Treatment patients by year**

| Year | Domiciles  |
|------|--|
| 2014 | Domicile A: 52% ED Treatment rate (n=1,320)<br>Domicile E: 54% ED Treatment rate (n=757)<br>Domicile H: 53% ED Treatment rate (n=742)<br><b>Comparison:</b> Domicile D 43% ED Treatment rate (n=536)     |
| 2015 | Domicile A: 53% ED Treatment rate (n=1,572)<br>Domicile B: 52% ED Treatment rate (n=862)<br>Domicile C: 53% ED Treatment rate (n=810)<br><b>Comparison:</b> Domicile D 49% ED Treatment rate (n=631)     |
| 2016 | Domicile A: 55% ED Treatment rate (n=1,814)<br>Domicile B: 57% ED Treatment rate (n=888)<br>Domicile F: 53% ED Treatment rate (n=888)<br><b>Comparison:</b> Domicile D 51% ED Treatment rate (n=701)     |
| 2017 | Domicile A: 58% ED Treatment rate (n=1,832)<br>Domicile F: 57% ED Treatment rate (n=1,083)<br>Domicile B: 58% ED Treatment rate (n=965)<br><b>Comparison:</b> Domicile D 47% ED Treatment rate (n=702)   |
| 2018 | Domicile A: 59% ED Treatment rate (n=1,819)<br>Domicile B: 61% ED Treatment rate (n=1,089)<br>Domicile F: 58% ED Treatment rate (n=1,187)<br><b>Comparison:</b> Domicile D 49% ED Treatment rate (n=783) |
| 2019 | Domicile A: 60% ED Treatment rate (n=2,018)<br>Domicile F: 57% ED Treatment rate (n=1,099)<br>Domicile B: 56% ED Treatment rate (n=1,093)<br><b>Comparison:</b> Domicile D 47% ED Treatment rate (n=750) |
| 2020 | Domicile A: 59% ED Treatment rate (n=2,101)<br>Domicile B: 55% ED Treatment rate (n=934)<br>Domicile F: 55% ED Treatment rate (n=997)<br><b>Comparison:</b> Domicile D 49% ED Treatment rate (n=791)     |

|      |  |
|------|--|
| 2021 | Domicile A: 59% ED Treatment rate (n=2,043)<br>Domicile B: 57% ED Treatment rate (n=907)<br>Domicile F: 56% ED Treatment rate (n=902)<br><b>Comparison:</b> Domicile D 52% ED Treatment rate (n=751) |
|------|--|

The top three domiciles for each year in the table above were linked to high deprivation zones. As previously discussed, the research team used Domicile D, one of the least deprived areas in the region, as a comparison zone. It was observed that the ED treatment rates did not differ as significantly as the non-urgent presentation rates and admission rates across areas with varying deprivation levels. This concludes the data analysis for admitted patients and ‘ED Treatment’ patients as per the ED outcome model in the discovery stage of this research study.

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