Emergency futures

An ethnographic design
exploration of a public health crisis

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Maria Białostocki

Victoria University of Wellington

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Abstract

Overcrowding in emergency departments is becoming a public health crisis in Aotearoa New Zealand. As demand for acute care continues to rise, and hospitals are running over capacity, emergency department patients requiring admission to hospital wards have nowhere to go. Healthcare workers are being forced to use unsafe interim solutions like corridor stays. Despite numerous attempts at intervention, the situation is not improving, posing serious risks to patient safety and staff wellbeing. This research explores, first, what we can learn from the voices of frontline healthcare workers when trying to understand the problem of emergency department overcrowding and, second, how design might enable us to imagine possible futures for emergency care as a way to reflect on the values and assumptions underpinning the current system. Through in-depth interviews and onsite observations, I discovered that the key challenges staff face relate back to the relationship with patients, staff, and the organisation. Moral distress, victimisation and scepticism towards change were the key themes constructed across these different levels. My research suggests that speculative design can offer a fresh approach for the healthcare sector to ask questions and open up space for thinking about how things could be radically different, as well as building new connections between the disciplines of healthcare and design.

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Motivation

I found my way from law to design school so I could think about the complex social challenges facing Aotearoa today. Working in litigation, I was used to being the ambulance at the bottom of the cliff when things had already broken. Design sounded like a way to start at the beginning and ask, “how can I make this better?” I have always been motivated by people. My decision to look into healthcare probably stems from my family’s background in medicine. The specific focus on emergency departments, on the other hand, was by chance. I had no idea there was a crisis when I started this research. Being a novice and outsider in this specialised space turned out to be an asset in some ways, as my approach was guided by genuine questions. My motivation for this research, and beyond, is this curiosity to never stop asking, looking, and most importantly, listening.

Contents

Abstract	1
Acknowledgements	2
Motivation	3
List of figures	5
Key terms	6
Introduction	9
Part one: Context	
Healthcare & wicked problems	
Chapter 1 Health	14
Emergency Departments & Healthcare System	
Chapter 2 Design	25
Things, Problems & Questions	
Part two: Research	
Ethnography	
Chapter 3 Research	32
How & Why I did Things	
Chapter 4 Findings	43
A Journey through the ED	
Part three: Design	
Speculative futures	
Chapter 5 Speculative Design	79
Emergency Care Futures	
Chapter 6 Discussion	91
So what?	
Conclusion	93
References	94
Appendices	105

List of figures

Figure 1	Patient Journey Map (Design for Health and Wellbeing Lab, 2016)
Figure 2	Patient Flow Board (Royal College of Art London, 2016)
Figure 3	Double Diamond (redrawn from Design Council, 2019)
Figure 4	Futures Cone (redrawn from Dunne & Raby, 2013)
Figure 5	NVivo code names
Figure 6	Thematic mind map
Figure 7	Sketch depicting departmental silos
Figure 8	Sketch of patients waiting to enter ED
Figure 9	Interview transcripts cut up and arranged thematically
Figure 10	Sketch of helicopter and ambulance arriving at ED
Figure 11	Entrance to the ED with Covid-19 shipping container
Figure 12	ED waiting room
Figure 13	Coloured chairs in empty ED waiting room
Figure 14	Patient journey map in ED waiting room
Figure 15	Snapshot of EDIS screen
Figure 16	ED CTA layout drawn from my observations
Figure 17	Snapshot of capacity at a glance screen
Figure 18	Sketch depicting patient ownership
Figure 19	First version of scenario matrix for ED futures
Figure 20	Students brainstorming during workshop
Figure 21	Brainstorming for Zoom calls scenario by design students
Figure 22	Brainstorming for retreat scenario by design students
Figure 23	Sketch of VR glasses for quick & dirty scenario by design students
Figure 24	Brainstorming for supermarket queue scenario by design students
Figure 25	Updated scenarios for emergency futures

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Key terms

I picked up a bit of jargon through talking to healthcare professionals for this research.

Any acronyms or specialised terms used in this portfolio are defined below.

ACEM	Australasian College of Emergency Medicine is the professional body responsible for training and supervising specialist emergency physicians in Australia and New Zealand.
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Access block	The situation when emergency department patients who have been admitted to hospital are unable to leave the department because of a lack of in-patient bed capacity.
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Acuity	The general level of patient illness, urgency for clinical intervention and intensity for resource use in the emergency department.
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Acute care	Any urgent or unplanned health care that a person receives for an illness or injury. Death or long-term disability can result if the person does not receive the care they need in a timely manner.
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Acute patient flow	The process that describes the movement of patients through the emergency department to either being discharged home or admitted to hospital.
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ACNM	The Associate Charge Nurse Manager is a senior nursing role in the emergency department who is responsible for managing the flow of patients into the department.
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Consultant	Title used for senior doctors, with a particular expertise or working in a specialist area of medicine. Other common titles include specialist, physician or Senior Medical Officer (SMO).
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Corridor stays	A common result of emergency department overcrowding where patients are kept waiting on trolleys in open corridors.
CTA	The Critical Treatment Area is the space within the emergency department where patients undergo assessment and treatment and is physically separated from the waiting room and EDOU .
EDIS	Emergency Department Information System is the main software used in the emergency department to record patient information, treatment plans and waiting times.
EDOU	The Emergency Department Observation unit is a type of short stay unit that is designed to facilitate streaming of patients by providing a designated space for observation for emergency department patients who are anticipated to be safe to discharge within six to eight hours.
Emergency department overcrowding	The situation where the emergency department function becomes impeded because the number of patients exceeds the physical and/or staffing capacity, whether the patients are waiting to be seen, undergoing assessment and treatment, or waiting for departure.
LOS	Length of stay is the total amount of time patients spend in the emergency department from arrival to either being discharged, admitted, or transferred to another hospital.
PFC	The Patient Flow Co-ordinator is a senior nursing role in the emergency department with primary responsibility for managing the flow of patients out of the department. This involves significant co-ordination with in-patient departments to find available hospital beds.
Registrar	Title used for intermediate level doctors with at least three years' experience post-graduation. Resident Medical Doctor (RMO) is the title that is used to refer to both house officers (junior doctors) and registrars.

Short stay unit	A separate unit in emergency departments that is designed for the short-term treatment, observation, assessment, and reassessment of patients following triage and assessment in the emergency department.
Streaming	A concept and process to ensure that patients are in a space that is configured, equipped, and staffed to best meet their needs at any particular point in their care journey in hospital.
Triage	The process whereby a healthcare professional (usually a registered nurse) assesses the urgency of a patient's condition in accordance with the ACEM triage scale, which ranges from category 1 (life threatening) to category 5 (non-urgent). The codes provide clinical guidance on the maximum amount of time in which patients should be seen.
Target	The Shorter Stays in Emergency Department Target was a health target introduced in 2009 that required 95 per cent of patients to be admitted, discharged, or transferred from the ED within six hours.
Undifferentiated patient	Patients arriving in the emergency department without any predetermined or suspected diagnosis or condition.
Waiting time	The amount of time a patient spends waiting to for assessment and treatment in the emergency department. Patients will usually wait in the emergency department waiting room for this period.

Introduction

The persistent problem of overcrowded emergency departments in New Zealand and worldwide is complex and multifaceted. Hospitals are over-capacity, meaning that emergency department patients requiring admission to hospital do not have access to hospital beds. Community and primary care facilities are under-resourced. An aging population is facing complex chronic health conditions requiring long-term treatments. Obesity, cancer, and heart disease continue to rise as well as mental health illnesses, loneliness, and social isolation. Unjust disparities in access to care and health outcomes for certain groups persist, especially for Māori. The emergency department, as a publicly funded service with an open-door policy, acts as a focal point and insight into many of these systemic problems.

New Zealand has tried to address the immediate consequences for emergency departments by focussing on reducing waiting times and length of stay for patients through more efficient processes. But sustainable and meaningful change to improve patient safety is challenging in complex systems like hospitals. The major health and disability system reforms on the horizon for New Zealand in 2021 provides an opportunity to rethink the approach to addressing overcrowding. My research advocates for starting with talking to the healthcare workers on the frontline. An overreliance on statistics and data risks overlooking the human element at the core. We are not dealing with factories or computers, but people caring for other people. After spending time in a tertiary hospital listening and observing to learn more about the problem, my research explores how design can be used as a vehicle for future making: to explore the world we want to build and which values we want to keep and re-think. In this sense design can be political; it is not just interested in tweaking the material world but also engaging with the beliefs and mindsets that ultimately shape that world.

From process to journey

From the outset, I want to clarify the distinction between the concepts of “patient flow” and the “patient journey”, and suggest that we move towards the latter when thinking about interventions to address overcrowding in emergency departments. The concept of patient flow is focussed on process efficiency and stems from lean methodology as it developed in the manufacturing context, most notably used by the Toyota Production System (Rutman et al., 2015). Although we have seen benefits of applying lean methodology to high level healthcare redesign (Joosten et al., 2009; NHS Confederation (Great Britain) et al., 2006), it does not necessarily support improvements to patient and staff experiences (Tlapa et al., 2020). Furthermore, as the “hospital without walls” is becoming a reality in the 21st century (Hawkes, 2013), and there is an increasing focus on patients having autonomy over their own health, we need to start thinking about care beyond the confines of institutional settings.

The concept of the patient journey has developed to place more of an emphasis on the perspective of patients and their experience of care delivery. It has primarily emerged out of the study of human factors and ergonomics to improve patient safety. The patient journey can be defined as “the spatio-temporal distribution of patients’ interactions with multiple care settings over time” (Carayon & Wooldrige, 2020, p. 279). It is a journey because it is spread across multiple settings and over time. It is from the patient’s perspective because they are the only constant in their care journey, with each provider only seeing a small section (Carayon et al., 2020).

The patient’s journey through the emergency department does not begin and end at the entrance and exit to the emergency department. It is only one interaction that is part of a broader care journey. There is a need to recognise and better understand the transitions between the different care settings to ensure seamless care for patients and minimise miscommunication, duplication, and errors.

I have used the terminology of acute patient flow in the findings section in Chapter 4 because this is how participants talked about it in the current structure. It is also the lens I used when I approached the problem initially. But I am suggesting a shift from focussing on patient flow to the patient journey, to move away from the dehumanised linear process model, and increase awareness of the holistic nature of healthcare. This shift mirrors my own experience throughout this research. I started out trying to map the emergency department processes in order to better communicate it and identify opportunities for design intervention. But the conversations I had with staff at the hospital required me to adopt a more nuanced and human-centred lens that focussed on experiences, communications, emotions, and relationships.

Aims & objectives

The question guiding my research was: what can we learn from the voices of frontline healthcare workers when trying to understand the “wicked problem” of emergency department overcrowding, and how might design enable us to imagine possible futures for emergency care? I had two broad aims. The first was to develop a deeper understanding of the problem. Too often we jump in with assumptions about what needs fixing, and press forward with solutions that do not work. A more in-depth understanding of the relevant issues was gained through reviewing the existing literature and conducting ethnographically informed interviews and observations in a tertiary hospital in New Zealand.

My second aim was to use insights gained from the first inquiry to explore possible futures for emergency departments. This was achieved by using a speculative design approach to develop scenarios for different future states and reflect on the values and assumptions that underpin the current system. As a playful and iterative method, these scenarios were developed in a collaborative student workshop and through feedback from healthcare participants.

Outline of chapters

This research portfolio is divided into six parts. The first chapter provides background context to the problem of emergency department overcrowding through an overview of the current crisis, the approaches to interventions to date, and the opportunity presented by the health and disability system reforms initiated in 2021. The second chapter introduces design as a unique vehicle for approaching wicked problems like emergency department overcrowding and suggests that speculative design may have a role to play in planning our future model of care delivery. Chapter 3 sets out the methodological approach for this research including selection of participants, data collection, analysis, and the trustworthiness criteria applied. The findings from the substantive data collection are set out in Chapter 4 which includes a summary of the key themes and an ethnographic account of the patient journey through my lens as the researcher. The possible futures of emergency care are explored in Chapter 5. A facilitated workshop with design students provided a platform to develop scenarios when different levels of waiting time and privacy are adjusted in the year 2050. Chapter 6 concludes with a discussion of the qualifications, improvements, extensions, implications and applications of the research.

Part 1 Context

Healthcare & Wicked Problems

Chapter 1

Health

Emergency Departments & Our Healthcare System

This chapter provides background context to the problem of emergency department (ED) overcrowding by providing an overview of the current crisis, the problem as described in the existing literature, and examples of interventions to date. It concludes by noting that the major health and disability system reforms initiated in April 2021 provide a unique opportunity for New Zealand to reconsider the crisis facing emergency departments by taking a whole system approach to understand the interconnected factors and start building a safer future together. The complexity and “wickedness” of the problem is calling for more than incremental and scattergun approaches to improvement initiatives.

1.1 Emergency departments in crisis

Emergency departments around the country are struggling to cope with demand. As Covid-19 restrictions ease and the winter flu season begins in April 2021, there has been renewed attention to and concern about the threats to patient safety posed by overcrowded EDs. The Australasian College of Emergency Medicine (**ACEM**) has warned that “failing to act now not only risks patient lives but threatens to create an entirely new public health crisis” (ACEM, 2021a). News reports quote emergency specialists who are worried patients will die waiting for treatment in ambulances or hospital corridors (Witton, 2021b). The controversial practice of ambulance ramping, where patients are held in an ambulance because the ED is full, is expected to rise significantly during the 2021 winter (Witton, 2021b). Further, nursing staff are worried about the number of patients waiting in ED corridors which are not designed to be used as a space for patient care (Witton, 2021a).

Hospitals are increasingly trying to divert patients away from the ED in all cases that are not genuine emergencies. Dunedin and Middlemore hospitals have made public requests for

the community to see their general practitioner (**GP**) for all non-life-threatening emergencies (“Dunedin Hospital in ‘code black’”, 2021; Forbes, 2020b). To encourage this, hospitals have started handing out vouchers to non-acute patients to attend private accident and emergency clinics to manage the demand. This practice has been strongly criticised since most of the patients causing overcrowding in the ED require admission to hospital (Forbes, 2020a). Furthermore, the New Zealand Nurses Organisation has said that “no member of the community should be denied care in the emergency department and patients must be given the opportunity for an informed choice without undue influences” (Forbes, 2020a, para. 4).

The current crisis is not a surprise for ED healthcare workers, with the president of ACEM Dr Bonning claiming: “this is not a post-pandemic blip, this is a gradual increase in workload that has hit the ceiling” (Witton, 2021b, para.9). In addition to threats to patient safety, there is serious concern about the wellbeing of hospital staff working in these conditions: “ED staff are being stretched to breaking point and are working in highly pressured environments, which are becoming unsafe for them and their patients” (“Expensive GP visits”, 2020, para. 12). Despite these concerns raised by ED staff, the Capital and Coast District Health Board (**DHB**) Director of Provider Services gave assurance that the health system was safe and work to improve patient flow was well underway (Witton & Meier, 2021).

1.2 What do we know about the problem?

The data clearly show the demand for emergency care continuing to rise. The latest statistics recorded over one million ED events in New Zealand during 2014/15, which is 3.6% higher than 2013/14 and 9.5% higher than 2010/11 (Ministry of Health [MOH], 2016). The international literature has linked the increased demand to several complex and interrelated factors, including a growing and aging population, the increasing incidence of chronic conditions, and the underfunding and inaccessibility of primary health services (Derlet & Richards, 2000; Elder et al., 2015).

As the demand for ED services increases, the number of patients presenting for treatment quickly exceeds the physical and staffing capacity of our hospitals which leads to overcrowding of the department (ACEM, 2021c). Overcrowding in the ED has serious consequences as patients are required to wait longer for triage, medical assessment, and treatment. The most significant contributor to ED overcrowding is widely accepted to be access block (ACEM, 2021b; Ardagh et al., 2011; Forero, 2008). This describes the situation when ED patients who have been admitted to hospital are unable to leave the ED because of a lack of in-patient bed capacity (ACEM, 2021b).

Emergency department overcrowding has been a widespread and worsening problem in New Zealand for over two decades with serious consequences for access and quality of care for patients (Ardagh & Richardson, 2004). The anecdotal concerns within the medical professional resulted in the first official report from the Working Group for Achieving Quality in Emergency Departments to the Minister of Health in 2008 (**Working Group Report**) calling for change. The report provided a thorough overview of the problem and recommendations for improvement, including the introduction of national targets discussed at section 1.3 below.

The interrelated problems of long wait times, overcrowding and access block are not unique to New Zealand hospitals and have been recognised as a worldwide public health problem since the early 1990s (Di Somma et al., 2015; Elder et al., 2015). Several studies have reported on the adverse impact on patient safety, including an association with increased mortality in patients (Richardson, 2006; Sprivulis et al., 2006). Although these numbers provide hard evidence, the anecdotal stories from patients illustrate how tragic this reality is:

A 79-year-old male presented to an Emergency Department somewhere in Australia mid-afternoon. He had been referred to his general practitioner for his increasing breathlessness due to congestive cardiac failure. He spent two hours waiting on the ambulance trolley in a large area with many other patients. After two hours, he was moved to a monitored area on an ED trolley and was seen by an Emergency Doctor who agreed with the diagnosis. He was referred to the General Medicine Registrar (admitting doctor) for admission to a ward bed. It was six hours

before he was seen by the registrar, and in the meantime the patient had become more confused and agitated on the trolley. He had not received his usual evening medications and did not receive a meal. After the review, the staff heard a thud as the patient fell to the floor while trying to get over the trolley rails to go to the toilet. The patient landed on his side, causing a fracture of the neck of his femur. He was now referred to orthopaedics. As there were no beds in the hospital, the patient spent the night in the ED on the trolley, with increasing delirium. His cardiac failure worsened. He was taken to the operating theatre the next afternoon but did not survive the procedure. (Javidan et al., 2020, p. 31)

This story is from the report of the Emergency Department Crowding and Access Block Task Force in 2020, which provides a comprehensive overview of the challenges and insights from over 30 Emergency Medicine physicians across the world (Javidan et al., 2020). It is the first instance of an international collaboration on this scale and shows a growing commitment to understand and address the problem worldwide.

1.3 What strategies have we tried so far?

National health target

The primary response to the challenges facing EDs in New Zealand has been to focus on reducing wait times for ED patients through implementing performance targets. In 2009 the Government introduced the Shorter Stays in Emergency Department target (the **Target**) which required 95% patients to be admitted, discharged, or transferred from an ED within six hours (MOH, 2011). The Target was one of the recommendations from the Working Group's Report to enhance accountability of DHBs: "whole-of-system problems require whole-of-system solutions. Implementing such solutions requires engagement and co-ordination from the highest levels of the health system, including the Ministry and DHB CEOs" (p.20).

The Target has been acknowledged to have had a positive impact for EDs (Ardagh, 2017) although there are concerns about the unintended consequences of using such a blunt

measure. A national observational study of all DHBs found that ED and in-patient length of stay (LOS) had reduced following implementation of the Target, which freed up 145,000 beds across all DHBs in 2012 (Jones et al., 2017b). There was no evidence of increase in rates of admission to hospital and re-presentation to the ED within 48 hours. It also reported a reduction in mortality in ED patients, totalling 700 fewer deaths in 2012. A study published in the same year found that the introduction of the Target did not negatively impact on any measures of quality of care (Jones et al., 2017a).

A further study looked at data from four hospitals between 2006 to 2012. It also found that ED LOS had reduced at all sites following the introduction of the Target, although this reduction was confined to the period between mid-2009 and late 2010 (Tenbensen et al., 2017). The authors suggest that there are limits to possible improvements for patient flow within the current hospital settings. In particular, the increasing reliance on the use of short-stay units since 2011 indicates the Target was only being met if the time spent in these units was not considered (Tenbensen et al., 2017). The authors therefore question the value of time-based targets as a long-term approach given that the interventions and improvements that followed were the “low-hanging fruit”, so to speak, and the challenges facing ED demand remain. Concerns have also been raised about the Target leading to perverse incentives through DHBs “gaming” data to meet performance targets (Tenbensen et al., 2019) and a misdirected focus on the ED rather than the hospital and broader health system (Jones, 2011). This led to the incoming Coalition Government removing the public reporting requirement in 2018 while developing new measures to assess the delivery of emergency care (Clark, 2018).

Other initiatives

The introduction of the Target provided impetus for organisations to explore a range of methods to reduce patient wait times and consequently ED overcrowding. These initiatives have focussed on areas such as the effective use of space, process improvement, dedicated patient flow roles, and better communication between staff and with patients.

Space

The use of short stay, observation and assessment units is a common method to utilise limited hospital space more effectively. It is based on the concept of streaming, which is aimed at getting the patient to a place that is configured, equipped, and staffed to best meet their needs at that point in time (MOH, 2017). The use of dedicated units and proactive streaming aims to ensure there is no mixing of tasks between different specialties and a more efficient completion of tasks for each patient based on need. Units dedicated to assessment and planning have also become increasingly common and can be an effective decanter for an overcrowded ED. Having a more direct pathway for certain patients to bypass the ED waiting room and treatment space means patients can be referred directly to specialised medical and surgical assessment spaces. One example of this is the 24-bed Medical Assessment and Planning Unit (**MAPU**) that opened in Wellington Regional Hospital which has had a positive impact on reducing patients' average LOS (MOH, 2011). However, there have also been concerns that short stay units are being used to "stop the clock" to meet the Target without improving quality of care for patients (Tenbensel et al., 2017; 2019).

Processes

Other interventions have focussed on process improvement through introducing rapid assessment practices. This has been implemented through measures that involve a senior doctor at the patients' first point of contact to provide a rapid assessment and care plan. Referred to as a rapid assessment team (**RAT**), rapid assessment clinic (**RAC**) or physician-assisted triage (**PAT**), these approaches remove nurse-led triage and junior medical assessment from the process to increase efficiency and reduce delays for patients. A 2002 study in Christchurch Hospital's ED found the RAC reduced waiting time for patients to see a doctor for treatment and time in the department for lower triage categories (Ardagh et al., 2002). Although the study was limited from presenting generalisable substantive findings because of small numbers, there is also support for this practice in the international literature (Edwards, 2011; Elder et al. 2015; Ross, 2017).

Roles

The creation of dedicated resources with explicit responsibility for managing acute patient flow through and out of the ED is another approach that has been introduced in New Zealand. The Ministry of Health has recommended that having a senior nurse in a position to manage and co-ordinate patient flow in the department is critical (MOH, 2011). Dunedin Hospital Emergency Department's trial of a Patient Flow Co-ordinator role was viewed positively by the Associate Charge Nurse Manager (**ACNM**) as assisting with discharging of patients to in-patient wards and home (O'Gorman, 2019). The creation of dedicated resources also assists with the visibility and importance of acute patient flow for other departments and helps co-ordination between care teams.

Communication

A handful of interventions have recognised the importance of effective communication, with patients and between staff, to the challenges facing EDs. The visual language of design has played an important role in developing tools to facilitate communication in hospitals. An example is the collaborative project between Auckland DHB and Auckland University of Technology (**AUT**) that involved the co-design of a patient journey map to be displayed in the ED waiting room (Reay et al., 2017).

The research team recognised that long wait times in the ED can be frustrating for patients who do not have insight into the department's broader workload and complex processes for decision-making. In particular, high acuity patients arriving by ambulance or helicopter are not visible to waiting room patients who may form the incorrect conclusion that the department is quiet and that their wait is unjustified.

Figure 1 Patient Journey Map

Staff at the Auckland DHB predicated that a pathway map would provide patients with more clarity about the steps involved in the emergency care service and therefore help reduce anxiety, stress levels, and potentially violence (Lau et al., 2004; Reay et al., 2017). The Patient Journey Map (see Figure 1) simplifies the ED process into four key stages of arrival, assessment, care and outcome.

A similar overseas example was a collaboration between the Helen Hamlyn Centre for Design and the Royal College of Physicians of Edinburgh to improve acute patient flow across nine hospitals in the UK. Through focussing specifically on the discharge process, the research team identified poor communication to be the biggest challenge, both in terms of co-ordinating work between staff, and informing patients about their care journey (de Almeida & Matthews, 2016).

The project outcome was a Patient Flow Board (see Figure 2) that can be used to check progress and co-ordinate work across teams in the hospital. The Patient Flow Board also flags when certain tasks are due, like chasing up a medical examination or test results. Although the visualisation was not shared with patients at that point, the authors report that it was well received by hospital staff.

Figure 2 Patient Flow Board

These two examples indicate the potential for design to play an important role in improving communication in emergency care as well as leading the way in cross-disciplinary collaborations to tackle wicked problems (Reay et al., 2017).

1.4 Opportunity for systemic reform in New Zealand

Despite the numerous attempts at intervention, the problem of ED overcrowding persists. The barriers to implementing change in the healthcare context are well known to those working in patient safety and quality improvement. Research into the challenges of

implementing safety improvement initiatives in New Zealand hospitals highlights the importance of understanding cultural factors (Beaver, 2019). In addition to more dedicated resources and time to focus on improvement projects, staff need to be more empowered to take control of these projects within their localities. In relation to ED overcrowding specifically, clinical leaders have described the key barriers to change as not only insufficient resources, but also entrenched hospital culture and a lack of political will amongst staff (Rixon et al., 2020). These studies indicate the important role that frontline healthcare staff play in implementing and sustaining change initiatives. Resource constraints and underfunded hospitals are obvious, but a deeper understanding of the culture, relationships and perspective of those delivering care is needed. Literature focussing on staff perspectives and the culture in the ED is limited (Person et al., 2013) as is that on improving the working environment in the ED for staff (Johnston et al., 2016)

The wide-ranging Health and Disability System Review (Simpson, 2020a) provides a unique opportunity for New Zealand to gain a deeper understanding of the systemic causes and interconnected factors contributing to ED overcrowding through a whole system lens. One of the core themes of the recommendations for reform is to put people and communities at the centre of the system (Simpson, 2020a). The Review found the current healthcare model to be overly complex, fragmented and inefficient. This places significant stress on healthcare workers to deliver care to patients:

The people working in our hospitals, general practices, pharmacies, outpatient units, Māori and Pacific providers, care homes and officers are exceptionally hard working and dedicated – but aren't well enough supported by the settings and infrastructure of our health system. There are many examples of innovation and great practice, but often these are not recognised or struggle to spread across the system. (Department of Prime Minister and Cabinet [DPMC], 2021, p. 4)

The legal, structural and cultural changes to be implemented in the coming years are aimed at achieving more equitable outcomes for all New Zealanders and shifting the balance from treating illness to promoting health and wellbeing. This research provides a small

contribution to this ambitious redesign by reflecting the voices of the healthcare professionals working in EDs to understand their perspective before tackling the problem.

Chapter 2

Design

Things, Problems & Questions

2.1 An iterative and amorphous discipline

My research question seeks to gain insights from healthcare workers' experiences when designing the future of emergency care. But what does it mean to "design" a future? The term design has become ubiquitous in many different contexts to refer to the "formal imprint of discernible intent in an otherwise chaotic realm of phenomena" (Dutta, 2009, p. 164). Although this use risks the term losing any distinctive meaning, it is not far off Victor Papanek's concept of design as the "conscious and intuitive effort to impose meaningful order" (1972, p. 4). Herbert A. Simon also famously said, "everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (1988, p. 67). In this sense design is intrinsic to all human activity and can be used to *understand* as well as to *act*. The field and study of design as a distinct discipline has continued to evolve and expand over the past few decades, yet it remains a surprisingly flexible concept that resists reduction (Buchanan, 1992). Its appeal, to a large extent, lies in its ability to span disciplinary boundaries:

Design is about concepts, relationships, ideas and processes. It is also a collaborative venture which is supremely intradisciplinary in that it unites specialists in two- and three-dimensional communication, visual and material culture, and it is interdisciplinary in that it brings different professional domains together. (Julier, 2008, p. 49)

As specialisation of different fields of knowledge increases, design presents one way to resist this fragmentation and disconnection. Design gained attention and traction during the 20th century as a unique vehicle and mode for integrative thinking about "wicked

problems” in society. Horst Rittel developed this concept in the 1960s to refer to the “class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing” (Churchman, 1967, p. B-141). Almost all public policy issues are wicked in that they are never really solved, “only re-solved—over and over again” (Rittel & Webber, 1973, p.160). The problem of ED overcrowding is similar: it is complex, integrative, and influenced by environmental, social, economic, and cultural factors.

2.2 Human-centred design and healthcare

Human-centred design (HCD) is an umbrella term used to describe a broad range of approaches to problem solving that puts people at the centre, in terms of both the outcome and the process. This involves starting with a deeper understanding of peoples’ needs through user-derived insights rather than top-down hypothesis (Roberts et al., 2016). This is in line with a broader movement of using design more in socio-political contexts rather than blindly following commercial incentives from the traditional role of industrial design in society. The post-World War II consumerism boom led Papanek warning us that “there are professions more harmful than industrial design, but only a few of them” (1971, p. xi).

HCD is therefore being deployed in a range of contexts to use design as a vehicle for social change and innovation aimed at building a more equitable and inclusive society for all. The more specific disciplines within the HCD umbrella term, like inclusive, participatory, and co-design, place more of an emphasis on the method to ensure that we design *with* people, not *for* them. This illustrates a transfer of power and a democratisation of the processes used to build our society.

The stages of the HCD approach is visualised in the UK Design Council’s Double Diamond (see Figure 3). The problem space (first diamond) and the solution space (second diamond)

both utilise diverging and converging thinking to support exploration and refinement. The reality is not as tidy nor linear, of course, and many cycles through the different stages are expected to test assumptions and remain flexible as new insights are formed.

Figure 3 Double diamond framework (redrawn from UK Design Council)

HCD has started to gain attention in traditionally siloed and expert-driven disciplines like healthcare (see for example, Ku & Lupton, 2020). Policymakers and clinicians are seeing the potential for innovation in public health through applying the HCD principles of empathy, observation, ideation, prototyping, and experimentation (Chan, 2018). Persistent public health problems like inequity in access to care and the growing complexity of the system have led to the exploration of new ways to understand, work and implement change. The recognition that these problems are integrative and influenced by social, environmental, and behavioural factors means the traditional disciplines of medicine, epidemiology, and health management can talk across each other and fail to adopt holistic visions and approaches for the future (Chan, 2018).

One of the most extensive applications of HCD on a systemic level is the collaboration between the UK Department of Health and the UK Design Council to improve patient safety in hospitals. Major reports published in the UK (Department of Health, 2000) and in the USA (Kohn et al., 2000) drew attention to the significant impact medical errors continue to have on patient safety despite advances in technology and medicine. The Design Council undertook a scoping study to explore how the effective use of design can improve patient safety in a whole system context (Clarkson et al., 2004).

The report advocated for a shift in thinking about human error as individual deviations from best practice to systemic failures, which means there is the potential to effectively “design out” errors. This requires both a user-centred and systems-based approach to understanding the healthcare system and how patients and staff interact with it. The report concluded that there is no “quick fix” to the challenges facing patient safety but made several recommendations to form a strategy to develop the knowledge, systems, and processes to build the foundation for better design decision-making across the NHS (Department of Health, 2003).

2.3 Imagining futures through speculative design

My research builds on the underlying principles of HCD and then moves towards a more critical approach to design through speculative design. Speculative design is a form of “un-design” (Coombs et al., 2019) and is not as concerned with problem solving as other design approaches. The founders Dunne and Raby (2013) urge designers to instead redirect their energy to focussing on the “ideas and attitudes inside our heads that shape the world out there” (p. 2). This type of design:

[t]hrives on imagination and aims to open up new perspectives on what are sometimes called wicked problems, to create spaces for discussion and debate about alternative ways of being, and to inspire and encourage people’s imagination to flow freely. (Dunne & Raby, 2013, p 2)

One way to encourage imagination is to design aspects of alternative worlds to prompt speculation in the audience about how things could be different (Dunne & Raby, 2013). One of the primary ways speculative designers do this is through creating physical artefacts or props from a fictional world that provide a tangible vehicle for the viewer to explore ideas and beliefs. Other practitioners are beginning to use speculative design not only as an output but also as a method of research to ask questions and find new connections (Galloway & Caudwell, 2018). Used in this way, it offers a vehicle through which to ask questions and generate new connections at the start of a project.

I am using speculative design as more of a position than a precise methodology in this research. The aim is to open space for discussion about possible futures in emergency care and reflect on the assumptions that underpin our current healthcare model in order to create a vision about where we want to go. It is not about trying to predict the future, but rather to use fictional paradigms to spark debate about *possible* futures (Linehan et al., 2014). The idea that there are multiple possible futures that lie ahead of us is visually captured in the futures cone in Figure 4:

Figure 4 Futures cone (redrawn from Dunne & Raby 2013)

Whereas our usual foresight is within the narrowest cone representing “probable futures”, speculative design aims to move beyond this and into the broader cone representing “possible futures”. Anything further afield is the world of fantasy and science fiction, and not of interest to speculative designers. Finding these boundaries is a creative and collaborative process and the challenge is to debate where the preferable future (red cone) lies, which will change depending on perspectives.

Researchers are beginning to see the value of adopting speculative design approaches to the design of future healthcare services. For example, a recent study focusing on patients with Type 2 diabetes used a speculative design framework to develop an ethnographic research tool to gain insight into peoples’ experiences of their condition and consequent lifestyle through personal storytelling (Hoang et al., 2018). This research tool, called the “Fiction Probe”, is an A3 book with half-completed narratives and images for the patient to complete with their own responses and to visualise their health condition. The speculative storytelling method was used to help suspend disbelief and encourage patients to re-image what a future healthcare service might be. These visualisations, in turn, can provide inspiration for stakeholders involved in the design of future services for people with Type 2 diabetes.

Furthermore, two pilot projects in the UK (ProtoPolicy) and Malaysia (ImaginAging) used speculative design approaches to increase engagement between policy makers and citizens on the topic of aging (Tseklevs et al., 2019). The research team found that the design fictions created in the co-design workshops with senior citizens provoked creative thinking and built empathy between different groups. These examples provide encouragement that government and policymakers are open to exploring more creative methods to facilitate engagement and collaborate on designing the future of public services. I will build on these insights in the second part of my research in Chapter 5 by developing speculative scenarios for the future of emergency care.

Part 2 Research

Ethnography

Chapter 3

Research

How & Why I did Things

This chapter sets out the how and the why for my research approach, from the broad philosophical understanding of knowledge and meaning, to the more detailed decisions about collecting and interpreting the data. The question that guided my explorations was:

What can we learn from the voices of frontline healthcare workers when looking to understand the wicked problem of emergency department overcrowding, and how might design enable us to imagine possible futures for emergency care?

This question evolved many times over the 12 months of this research project. Each new discovery and piece of information made me revisit my assumptions and approach. One thing that did stay consistent throughout this project, though, was my commitment to hearing from people affected by the problem and capturing this in a meaningful way. The challenge was, therefore, to learn from other methodological approaches with the same aim and make intentional adaptations where needed.

3.1 Design (ethnography)

It is important to note that, although we are using ethnographic methods and techniques, we are not doing proper ethnography in its own right. Ethnography is a term that has had some use and abuse by designers over the past few years in the sense of ‘Yeah, we did some ethnography and then got on with the design work.’ Ethnography has a history, approach, and rigor that is much more loosely interpreted for design research, and when we borrow its methodology, we should be respectful of how and why it was developed in the first place—to understand and document the knowledge, relationships, and beliefs of social or cultural

groups, often through long-term participant observation of a year or more. (Polaine et al., 2013, p. 50)

My research drew from the relatively new field of design ethnography as the guiding methodological approach. This fits within the social constructionist paradigm where multiple realities are possible and meaning is socially constructed (Creswell, 2013).

Design researchers have increasingly borrowed (and adapted) methods developed from the field of anthropology to learn about people and how they live. As human-centred design became more prevalent in the 20th twentieth century, designers, engineers, and researchers started to change the way they work (Wasson, 2000). What now seems obvious was revolutionary: to design effective products and services that meet peoples' needs and aspirations, we first need to understand what people do and why.

The term ethnography is from the Greek word "*ethno*" meaning culture and "*grapho*" meaning writing and is therefore defined as the study and writing of culture (Ladner, 2014). As a qualitative social science practice, ethnography refers to both the research method and (written) output (Madden, 2010). Ethnographers are interested in understanding meaning by studying people in their natural environment and do so through onsite observations and in-depth interviews without asking participants to do anything they would not normally do. The researcher needs to build trust and rapport with participants to be invited into their world.

Although ethnography traditionally developed as long-term embedded observation within a community, the way designers are utilising the techniques today varies considerably in the context of private sector constraints. Some critics question whether design ethnography is truly ethnography (Button, 2000), but others are more positive about design ethnography maturing into an approach in its own right (Segelström & Holmlid, 2015). This can be seen through the development of artefacts like cultural probes, which although diverge from traditional ethnography, provide new ways to gain insights into peoples' everyday life that are less intrusive (Crabtree et al., 2003; Mattelmäki, 2006). Aware of the limitations and

adjustments I have made in my research, my methodological approach and techniques can be said to be *inspired* by ethnography.

The role of the researcher is central to the ethnographic approach of observation, recording, interpretation, and re-telling of the world being studied. I have taken care to make my position transparent and obvious throughout the study as a way to ensure reflexivity:

The terms reflexive, reflexivity, and reflexiveness have been used in a variety of disciplines to describe the capacity of language and thought - of any system of signification – to turn or bend back upon itself, to become an object to itself, and to refer to itself. (Babcock, 1980, p.4)

Rather than trying to mitigate or account for the personal biases I bring as the researcher, I have made them visible through my voice.

3.2 Participants & recruitment

The participants for this research were healthcare professionals working in a tertiary hospital in New Zealand. I adopted a purposeful snowball sampling approach to recruit staff. Mindful of the lack of clarity concerning the term “purposeful” in the literature on sampling strategies (Gentles et al., 2015), I am using the term in the context of this research to show that my purpose in finding participants was to identify hospital staff with some involvement or interest in acute patient flow. A snowball approach means that I gained access to most participants through talking to other participants (Noy, 2008). Although I had a research poster (Appendix C) that was displayed in the staff room and an email was circulated by the ED Team Administrator about my research, I did not have any success in recruiting participants through these methods. In hindsight, this is not surprising given the nature of the workload for ED staff and the importance of having some inside contact and recognition by the group.

The participants included three experienced nursing staff, four ED consultants, one medical consultant, two registrars from in-patient wards and one non-clinical staff working within the Integrated Operating Centre (IOC). All participants were provided with information about the research project and signed a consent form (Appendix B). This study was approved by the Victoria University of Wellington Human Ethics Committee (Appendix A) and was assessed to be out of scope for review by the Health and Disability Human Ethics Committee (Appendix A). Locality approval from the DHB was also obtained. Although this research was not designed to be analysed by ethnicity, any health research in Aotearoa must acknowledge the unique position of Māori in terms of inequitable access to care and health outcomes. These systemic failures place a responsibility on all health researchers to not only avoid contributing to the unjust differences in health outcomes, but to understand the cause and improve the future. The latest ED use statistics show that Māori have the second highest rate of ED use in 2014/15 (MOH, 2016). I consulted with the Research Advisory Group – Māori (**RAG-M**) at the DHB in the early stage of this research project, which provided an opportunity for me to critically reflect on the research design. The research plan was endorsed by RAG-M on 17 September 2020 (Appendix A).

3.3 Data collection

The two forms of data collection for the first stage of the project were shadowing observations and semi-structured interviews. The observations were completed at the early stages of the research to help familiarise myself with the clinical ED environment as well as build rapport with the staff. This involved shadowing a staff member for either the duration or a period of their clinical shift in the ED. I spent 15 hours in total shadowing three different staff members during different days of the week and times of the day to get an appreciation of the fluctuating demand. For safety and ethical reasons, I stayed within the staff write up area which is separated from the patient cubicles within the critical treatment area (**CTA**). I recorded handwritten notes of my observations and reflections during these periods and took photographs. The busy working nature of the ED, and awareness of my outsider status, meant that I was conscious of being respectful and not intrusive and did not take as many photographs as I had anticipated.

I conducted 11 interviews with staff, which I audio-recorded and later transcribed. Quotes from participants have been edited in line with the criteria for length, relevance, readability, comprehensibility and anonymity, while changing their meaning as little as possible (Emerson et al., 2011). The interviews were an hour long on average and covered a range of topics about the participants' involvement with acute patient flow in the hospital. I prepared an interview guide with questions that I loosely followed (Appendix B). I wanted the interviews to be more conversation-like and so departed from the guide when I found the participant was speaking freely about a topic. I asked open-ended questions and was guided by the participant's responses and demeanour. This flexibility to allow the conversation to flow in a way that felt natural is consistent with an ethnographically informed approach, as it opens space for the participants to tell their story (Celikoglu et al., 2017).

3.4 Data analysis

I used Braun and Clarke's reflexive thematic analysis (TA) (2006; 2012; 2019) as the framework to analyse and construct meaning from the data. TA is an umbrella term for several approaches to analysing qualitative data where the focus is on identifying patterns of shared meaning (called *themes*) across a dataset. Reflexive TA is the approach described by Braun and Clarke (2019) that is fully aligned with a qualitative paradigm and does not strive to meet any (post-)positivist measures for coding reliability. The foundation for the analysis is premised on the understanding that meaning is contextual and multiple realities are possible. Therefore, the researcher's subjectivity does not need to be erased or balanced by other measures, but rather should be made visible and intentionally used as a resource for interpretation (Braun & Clarke, 2013).

The "open, organic and iterative" coding process used in reflexive TA allowed me to experiment with different techniques to organise and visualise the data (Braun & Clarke, 2019, p. 848). The first step was importing the interview transcripts into the software program NVivo 12. This let me assign initial coding across the full dataset, which could then be structured within higher-level categories like "culture", "emotions", and "environment" (see Figure 5).

Figure 5 NVivo code names

The next step involved mapping these codes through more visual platforms to help identify relationships between them (for example, see Figure 6).

Figure 6 Thematic mind map

I also experimented with doodling some of the key moments and quotes that stood out to me from the data (see Figures 7 and 8). At the time I did not perceive this to be a particularly academic method for analysing the information, but it allowed a more open and free engagement with the content when writing felt too daunting. It also reflects some of the visual metaphors that participants use, for example, comparing access block to “constipation” (P3), describing the ED as a “battlefield” (P5), or referring to a patient being “flicked around like a tennis ball” between departments who do not want them (P12).

Figure 7 Sketch depicting departmental silos

Figure 8 Sketch of patients waiting to enter ED

The first written summary of my analysis resembled more what Braun and Clarke (2019) refer to as “domain summaries”, than fully developed themes. Although disheartened by what I perceived as my flawed approach, I later learnt that:

...it is difficult to determine themes as conceptually founded patterns at the start, because it requires depth of (close and critical) engagement to move beyond the surface or obvious content of the data and to identify implicitly or unexpected unifying patterns of meaning. (Braun & Clarke, 2019, p. 848)

The final step in my analysis phase involved printing out hard-copy versions of the interview transcripts, which I read again, cut up and physically moved around like pieces of a large jigsaw puzzle (see Figure 9). This served not only as a check on my analysis and interpretation of the data up to this point, but also a more visual and physical way of interacting with information beyond the confines of the digital screen.

Figure 9 Interview transcripts cut up and arranged thematically

3.5 Trustworthiness & fidelity

I was guided by Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability to measure the trustworthiness of my research. For credibility, I used data collection triangulation and peer debriefing (Nowell et al., 2017). The data collection phase involved secondary desktop research, multiple in-person observations, participant interviews, and reviewing policy documents provided by staff. The peer debriefing included numerous open discussions with my supervisors as well as with designers working on improving acute flow in another DHB. For transferability, I have provided thick descriptions of my research process and findings. This chapter on methodology provides a clearly documented record of my research process to assess its dependability. Finally, confirmability follows on from the previous three criteria being met and the explicit and consistent rationale for the underlying methodological approach.

In addition to trustworthiness as a measure for quality in qualitative research, fidelity is another concept I considered when thinking about the quality of this research project. Jackson (2017) explains how the “techniques of showing and knowing” in ethnographic writing:

have typically invoked notions of truth as a kind of fidelity: fidelity to the facts, fidelity to genre conventions and disciplinary boundaries, fidelity to the people whose lives we write about, fidelity to certain standards of logical rigor, scientific impartiality, or proper conduct. (p. 48)

This desire and challenge to do justice to the world I am writing about in this research was a constant struggle throughout the research process. It manifested through doubt, second-guessing, and a paralysing fear of committing any words to the page. This cautionary approach is not necessarily unwarranted, but when I allowed myself to work outside of the positivist confines of “facts” and “truth” I discovered a freedom through the art of storytelling. Although an art in the tradition of “make believe” it “often succeeds in making life more edifying and bearable than the ‘truest’ doctrine or most ‘proven’ fact” (Jackson, 2017, p. 48).

Chapter 4

Findings

A Journey Through the Emergency Department

The first part of my research question sought to gain a deeper understanding of the problem of ED overcrowding through talking to frontline healthcare workers about their experiences. The in-depth interviews and observations provided an avenue to listen and see what it is like for ED staff to work with these challenges on a day-to-day basis. The findings from this part of my research will be presented in two parts. The first part will provide an overview of the key themes and the second will elaborate on these through a narrative of the patient journey through my perspective as a researcher.

Figure 10 Sketch of ambulance and helicopter arriving at ED

5.1 Themes

The three key themes I constructed describe the relationship the ED staff have with:

- (1) patients
- (2) staff in other departments; and
- (3) the organisation.

These three levels represent essential components to understand and focus on when designing the future of emergency care. I emphasise that these themes have been “constructed” to remind the reader of my role in giving shape and meaning to the data as a researcher. Braun and Clarke (2013) draw an analogy with sculptors to explain how the choices made by the researcher will inevitably shape the data.

These themes are about the relationships that exist within and across the stages of the patient journey through the ED. Although I started this research on the premise that I was going to learn more about some technical process that could be studied, tinkered with, and ideally improved, what stood out to me most from my conversations with participants was the importance of the human relationships that enable the patients’ journey and the impact these can have on the healthcare workers’ mindset and wellbeing.

Theme One

We can’t do our jobs properly

The first theme is about the ED staffs’ relationship with patients. Although staff expressed deep understanding and empathy for patients and their circumstances, there was an overall feeling that, due to institutional and resource constraints outside of their control, they cannot do their jobs properly. This caused an uneasy tension for frontline staff who witness the challenging conditions in the ED daily and are therefore in a position of needing to apologise to patients for systemic failures: “**it’s exhausting to constantly by apologising for things that are out of your control and not actually your responsibility**” (P1).

There was a slight difference in how the nursing and medical staff talked about this experience. The nursing staff referred to the concept of care rationing. This describes the situation where nursing staff are required to ration their time and care on an individual patient level because of resource constraints (Kipiriri et al., 2009; Schubert et al., 2008). One of the participants explained this means that “you don’t get to do all the nice stuff, like getting them a blanket, getting them a cup of tea and sitting with the lonely, elderly person who has no family with them” (P1).

The nursing staff talked about the relationship between care rationing and poor staff morale, burnout, and high turnover in the ED: “it goes kind of against your ethics and morals as a nurse, because that’s why you became a nurse, to look after people” (P1).

Another participant further explained:

... people think that nurses get stressed and leave the ED because they had a child die or they dealt with a nasty cardiac arrest. It's not that. It's the frustration of not doing a good job for your patients. (P5)

Recent studies have found care rationing in nursing practice to be increasingly prevalent and posing serious threats not only to patient safety, but also to the professional health and philosophical base of nursing (Mandal et al., 2020).

The medical staff, on the other hand, talked about this experience in terms of not being available to “doctor” when the department is overcrowded. The ED doctors explained that they are often not able to do their core medical work and supervise junior doctors because they end up being pulled into various other dynamics and administrative tasks associated with poor patient flow. The examples discussed with me included negotiating with wards about bed availability, chasing in-patient registrars, and managing patient expectations. One ED doctor explained:

When its busy, the time when you really need to see your doctor to be doctoring, is the exact time when the senior doctor is doing almost no doctoring on some shifts, and its horrendously dangerous and very depressing. (P2)

It was acknowledged that many aspects of the job had changed in recent years and that it now involved “less medicine and more shuffling of cards” (P8). The senior doctors were resentful of this: “I didn’t train for 13 years to move beds around” (P2) and there was a sense that doctors should not have to “do flow”, so to speak. When the ED is overwhelmed with patients, the ED doctors are often prevented from doing their core medical work because of organisational inefficiencies and scarce resources, which leads to lower levels of job satisfaction for ED doctors. The level of interest and involvement in acute patient flow varied across different specialties and teams. Whereas the senior ED doctors were required to actively manage and improve flow in their department, other departments had less awareness and involvement in it.

Two related phenomena discussed in the literature are “moral distress” and “moral injury”. The concept of moral distress has been discussed in the nursing literature since the early 1980s and was first defined by Jameton (1984) as “when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action” (p. 6). Although there is debate about the conceptual clarity of the concept, it is underpinned by a fundamental ethical dilemma for health professionals that leads to negative emotions and implications for workforce retention.

Moral injury, on the other hand, evolved from the post-traumatic stress disorder context of war veterans who were described as carrying with them a kind of wound – a moral injury (Čartolovni et al., 2021). The concept has recently been recognised in broader circumstances including in the healthcare context. Dean et al. (2019) argue that doctors are not burning out but are suffering from moral injury. This is “the challenge of simultaneously knowing what care patients need but being unable to provide it due to constraints that are beyond your control” (Dean et al, 2019, p. 401). Furthermore, Čartolovni et al. (2021)

consider the Covid-19 crisis to be the right time to be elaborating on how moral injury fits with the perspectives of healthcare professionals and that this might help in establishing a more concise definition of moral distress.

My research does not seek to navigate through the differences between these concepts or try to label the experiences from the participants I spoke to as one or the other. But the stories I was told bear close resemblance to the underlying ethical dilemma that is caused when healthcare workers feel that they cannot take care of their patients because of external constraints, and the negative emotions that lead on from this dissonance.

Theme Two

We get treated like the annoying service of the hospital

The second theme is about the ED staffs' relationship with hospital staff in other departments which is characterised by feelings of victimisation and isolation. The ED feels victimised by the hospital because, although the problem of ED overcrowding and access block is a hospital-wide challenge, it still manifests in the ED space. The difficulty is that the ED staff have little to no control of the outflow of patients as it relies on other departments to have space available and accept patients into their wards. The other departments “**don't have to worry about it. It's not their problem, cos they can't see it. But it is our problem and it's what we see every day and it harks back to that issue of morale in ED staff**” (P1).

One of the participants further explained that ED overcrowding has:

...been touted as the Emergency Department's problem. Like [laughs] how is any of that our problem? It's the hospital's problem. It's actually the country's problem. It's the Ministry of Health's problem... Really what we're saying is that as a country we've decided we're not going to invest in this and therefore we are going to have to ration healthcare. But nobody says that. (P11)

There was a general sense in the ED that the in-patient departments in the hospital did not understand why acute patient flow was important: “I don’t know if they understand that the reason why we’re hassling them to try and get their patient... out of our space [is] because we’re worried about the patient in the waiting room” (P2). This leads to a sense of isolation where the ED staff feel like they are fighting the battle on their own. The notion of having to “hassle” other departments to move patients out of the ED is reflected in the current push/pull dynamic where patients need to be pushed up to the wards rather than being proactively pulled up when there is space available. This makes the ED feel like the “annoying service of the hospital” (P1) that is always trying to give the wards more work.

Although the pull approach is always better according to lean methodology, one of the in-patient doctors explained that the challenge is that departments do not want to pull in more work when they are already overworked: “if you’re sitting on a ward, why would you pull in more work? It’s sort of obvious. You’re pushing water uphill” (P9). The current system of needing to fight to get patients out of the ED makes the department feel like “second-best and second priority” (P1). This tension and struggle appeared to have a significant impact on the ED staff’s mindset. It even led to situations of distrust where one participant questioned whether beds were genuinely occupied sometimes in an in-patient ward or if the staff were just trying to manage their workload and have time for a lunch break, when the ED staff were drowning in work.

These challenges discussed by the ED staff can be understood within the context of the literature on departmental silos and care fragmentation. The concept of “silos” has been used in organisational management literature to describe inwardly focussed units leading to breakdowns in communication, co-operation and co-ordination between the units (Fenwick et al., 2009). This silo mentality can be divisive, creating communication barriers and disconnected ways of working (Fenwick et al., 2009). Departmental and professional silos are common in healthcare settings due to the highly specialised nature of the training and professional bodies. This occurs both between and within institutions (Mann, 2005). The most significant impact of silos in healthcare is that they lead to discontinuous and fragmented care for patients. A fragmented and overly complex system is one of the key

criticisms of New Zealand's current health model (Goodyear-Smith & Ashton, 2019; Simpson, 2020). One way to overcome this is to transition to a delivery system with the patient at the centre. This is referred to as "integrated" or "seamless" care, where the different healthcare players are able to act as a unified team (Parnaby & Towill, 2008).

The challenges posed to the working relationships across departments are in stark contrast to the internal relationships within the ED. The ED staff work in close proximity to each other, overhear clinical information and care plans and will be quick to step into someone else's role when needed without being asked. There is a strong sense of collegiality and being on the same team.

The sense of victimisation was confirmed by one of the participants when seeking feedback on my research findings. They explained that this is something they have noticed recently and is concerning because it is impacting negatively on aspects that they do have control over.

Theme Three

I gave up on that project

The third and final theme is about the ED staffs' relationship with the organisation. This is characterised by scepticism and a feeling of futility. In the current structure the DHB is accountable for meeting performance targets and therefore leads change initiatives in the hospital, but the frontline staff felt disconnected from the decisions and processes that occur at this management level. One participant was concerned that a new executive member did not understand the cause of ED overcrowding as at a recent meeting they made comments like "**we need to make sure that the people in ED are actually needing to be here**" (P5). Staff also had an underlying concern that the organisation is trying to hide the problem to a certain degree. This related to how data were recorded and presented about ED LOS: "**the hospital didn't like it so they told us to stop doing it, because it**

screwed up their numbers and made them a lot worse” (P1). This is similar to the “gaming behaviour” displayed by organisations as reported by Tenbensen et al. (2019).

The introduction of new initiatives to improve efficiency in the ED were seen as distracting from the bigger picture “because it allows management...or the hospital or the board or whoever it is, to feel like they are doing stuff” (P11). There was a feeling that higher level management and the Ministry of Health were “shielded” from the extent of the problem and what it looks like on a daily basis (P11). Whereas the organisation deals with data and targets, the frontline staff see the distress of patients who are not getting proper care.

This scepticism was also linked to an overall sense of futility about the attempts to improve the situation because there was a feeling that “nothing changes”. One participant explained: “we’ve tried everything, and you know, how is this going to be any different to every other thing we’ve done” (P1). Staff talked about giving up on projects because they couldn’t get traction and felt like no one cared. There was a view that the money spent on external consultants to improve acute patient flow was a waste: “it always feels like they swoop in, pick the low-hanging fruit, then disappear and still leave you with the biggest problem” (P3).

A clear example of this disconnect is the organisation’s current initiative to track and respond to overcrowding in the ED – the ED Escalation Plan. This is a model that assesses the ED’s capacity through a colour-coded tiered system. The tiers range from excess care capacity (purple) to critical care capacity deficit (red). Although not in the policy, a new category – “status grey” – had been created to indicate the most serious capacity deficit for the ED. The policy spells out certain triggers for moving between levels which are notified to senior management at the higher levels. The ED staff said that the department is constantly in status grey but no one responds or does anything about it. At times the ED is in status grey for a whole 24 hours but “the hospital has almost become numb to it” and “kind of ignores it now” (P1).

The creation of a system designed to signal when help is needed by the ED, but does not function as it should, leads to staff feeling like the organisation does not care and that there is no point to these projects. This is especially so since these initiatives often involve more work input from staff in terms of filling in forms and entering data: “it’s added more workload for us and probably added more resentment” (P11). Scepticisms and resistance to change has been recognised as a significant barrier to quality improvement in the healthcare context (Gollop, 2004). Change that requires people to think and behave differently is not straightforward and we need to take time to understand the perspectives of those on the frontline implementing the change.

5.2 A journey through the emergency department

One can show something, but one may not know anything with complete certainty. It is in this sense that the ethnographer is more like a witness than an analyst or activist. One testifies to things one does not necessarily know what to do about. But through one’s writing, the reader may be moved to see the world in a new way and to act differently within it (Jackson, 2017, p. 47).

With the key themes introduced, the next section is a story of my journey through the ED that weaves together my observations and conversations with hospital staff in a style that draws from ethnographic writing. I have drawn inspiration from a broad range of ethnographic writing styles to explore different ways of communicating qualitative research (Pandian & McLean, 2017). This style enables me to describe the environment and context in as much detail as possible (what has been called “thick description” by Geertz, 1973) to provide familiarity for the reader, as well as introduce storytelling as a way of communicating qualitative data.

Further, rather than just saying that I have been reflexive in my analysis, this approach allows me to provide constant written reminders of my own voice and presence in this environment. This is consistent with Braun and Clarke’s view of the researcher as a

“storyteller” who actively interprets and presents the data through their own subjective lens (2019, p. 848). The reader will see elements of the themes identified above play out through this narrative in the four core stages of:

- (1) Arriving at the ED
- (2) Waiting for assessment
- (3) Receiving care in the ED
- (4) Outcome for patient

1 Arriving at the Emergency Department

Introduction

From the ED’s perspective, the patient journey starts when the patient arrives at the department. Patients can be referred to the ED by a GP or they can simply walk in the door themselves if they believe they require hospital-level care. The more critical patients are likely to arrive by ambulance or even helicopter. Emergency departments in New Zealand are designed to provide resuscitation and stabilisation of critically unwell or injured patients (MOH, 2016). The departments are publicly funded and almost all of them are open 24 hours a day, seven days a week.

My observations: it is not straightforward

The process of getting myself to the front door of the ED was not straight forward. I had to jump through numerous bureaucratic hoops. I had been warned by several more experienced researchers that the hospital is not an easy place for outsiders to conduct research. The first stage was to establish a connection with someone on the inside. One of my supervisors introduced me to a senior doctor working in the ED so I could explore what opportunities there might be for my research.

Having the chance to meet with a senior doctor at the early stages provided a foundation to get the process going. After a couple more meetings I had established enough of a

connection and rapport with two key staff members who helped guide me through the lengthy approval process that followed. This involved getting Police vetting, Occupational Health Clearance, Locality Approval and Special Staff Status. I even had to get new blood tests in order to provide documented serological proof of immunity to measles. The correspondence with the hospital was difficult and involved talking to several different contact points. I sometimes received contradictory information about what I needed to do next. These barriers make it challenging for collaborative projects involving multi-disciplinary approaches – in this case, health, and design. This was reaffirmed by the participants' surprise that I was conducting this study as a design student. I think there is a lot of potential in New Zealand to open these disciplinary silos.

There are obvious limits to the observations I conducted that should be addressed up front. After spending a few hours in the ED, I could pick up my bag, return my visitor's sticker and go home. The experience of observing was not therefore fully immersive and in no way mirrored what anthropologists do when they go and live with a community for months or even years. Although "being with people by engaging in ethnographic participation is one of the more distinctive characteristics of being an ethnographic researcher" (Madden, 2010, p. 93), my chosen environment for study did not lend itself to active participation. The obvious health, safety and privacy risks within the ED meant that rather than trying to actively participate, I had to make my presence as unobtrusive as possible.

For my first observation, I arrived at the ED at 7:45am on a wet and grey Monday morning in December 2020. The nurse in the temporary shipping container, which had been set up as a Covid-19 screening station (see Figure 11), asked me if I was a patient or here to see someone. I had to explain that I was neither, and that I was here as a researcher. I was thankful the Covid-19 alert levels had remained low as this research would not have been possible a few months earlier. After answering standard screening questions about where I had been and who I had had contact with over the past two weeks, I was passed a visitor's sticker. The security guard walked me to the sliding doors and swiped me in. I reported to reception and confirmed I was here to shadow one of the ED staff members. I was asked to take a seat in the waiting room.

Figure 11 Entrance to the ED with Covid-19 shipping container

Figure 12 ED waiting room

The waiting room was almost empty this early in the morning. One elderly man was sitting in the front row of chairs on his own (see Figure 12). He was wearing pyjama pants and slippers. Another elderly couple sat a few rows back. The woman was resting her head on the man's shoulder. They looked tired. The only sound came from a cleaner who was making their way down the long hallway. They started vacuuming and the few people in the waiting room lifted their legs obligingly as they manoeuvred around them.

This was in stark contrast to my second observation that started at 3:00pm. This was also a Monday, but the waiting room was extremely busy and almost unrecognisable from the previous week. The chairs were almost full, people were standing by reception and congregating near the entrance to the CTA. There was a lot of chatter, movement, and beeping sounds. I felt overwhelmed. I was grateful to see the staff member I had texted earlier dash out to collect me from the waiting room and I followed them through to the CTA. There was no chair available for me like the previous time and I hovered around awkwardly for a while trying to stay out of everyone's way. In between making calls and rushing to different areas the participant said to me “our ED is always constipated” and that the “the waiting room looks like apocalypse” (P12).

Conversations: controlled chaos

The staff talked to me about the trends in patient arrival and numbers, which showed their insight and perspective on the broader socio-economic context. The key characteristic that came up was the fluctuating demand for ED services and the resulting challenges for the staffs' workload. The nature of a free, walk-in acute service means that patient numbers can vary drastically even within a few hours. This puts immense pressure on staff to meet the increased demand while still trying to get patients out of the ED and into the hospital.

The fluctuation was described as reasonably predictable by the staff. Mondays were acknowledged to be one of the busiest days for the ED, with patient numbers starting to surge late morning to midday. This was perceived to be due to a lack of primary health care services available over the weekend and a cultural attitude of “she'll be right” in New

Zealand (P3). Busy Mondays were seen to be an international phenomenon in EDs. One participant had a particular interest in analysing data of patient presentations to understand the underlying trends. They explained that the data show patterns based on the time of the day, week, and year and that the reasons go back to human behaviour and social norms. Despite the availability of these data, the participant explained, the hospital continues to be run based on a 9am to 5pm business model, with significantly fewer staff on weekends and at nights.

Another participant described the ED as “**controlled chaos**”, which captures this quality of drastic variations of patient presentations that is based on an underlying pattern (that we may or may not have knowledge, data on or understanding of). The sense of chaos is related to feelings of not having control over the environment and patient numbers with one participant noting: “**we will always continue to be overwhelmed by patients**” (P1). The ED does not have control over the inflow or outflow (to a large extent) of patients. The inflow is influenced by exertional socio-economic factors and there is a strong culture and understanding that patients cannot be diverted or turned away at reception.

The participants explained that they never turn patients away, even when it is a non-emergency, and that it was risky practice to do so: “**I’m not allowed to triage away. Our hospital doesn’t support triaging patients away**” (P6). Two participants referred to a Health and Disability Commissioner (HDC) investigation where a patient had died after being diverted to an after-hours clinic because the department was busy. This case was described as being very traumatic for the staff in the ED. The investigation that followed had resulted in an overly cautious approach by the department. One participant explained “**the problem is we’ve swung the pendulum completely to risk averse, where we don’t redivert or triage away anyone**” (P3).

During one of my observations when the ED was very busy, senior ED staff were discussing strategies to manage the high demand for the shift. One nurse asked if they should start giving out vouchers to a private after-hours urgent care facility for less urgent patients in the

waiting room, but the Clinical Director said it would not help the situation at this stage since most of the patients were requiring admission to hospital wards.

In addition to thinking about the patterns of arrival, staff also talked about the type of people using the ED. The staff felt there is a general misconception that patients misuse the ED. Although some patients were referred to as “frequent flyers” (P7) and others as not necessarily needing specialist treatment in an ED, participants were clear that these patients were not the majority and not the ones that contributed to the problem of overcrowding. One participant thought that from a strictly clinical perspective, there is a percentage of patients presenting to the ED who do not need the special skills and expertise of an ED. But the participant went on to explain that often the situation is much more complicated if we look at it from the patient’s point of view. For example, patients often struggle to get an appointment with their GP or cannot afford to take time off work to see a GP during business hours. These patients choose to come to the ED because it is a service that is on offer as part of our public health model. The participant noted that although patients get a good service once they are seen, they do pay with their time:

I sometimes get a little bit upset when we talk about ‘this patient shouldn’t be here.’ That patient has made a choice based on the options we, as a health system, have given them. (P3)

The participants also explained that these “GP-type patients” are not the cause of overcrowding in the ED because they are generally straightforward to deal with and can be sent home after treatment. The patients who are very unwell with complex medical conditions, on the other hand, who require admission to hospital, are the ones who contribute to access block in the ED.

Reflection

One of the key take-aways from the start of the ED journey was that we should question the assumptions we have about the role and function of the ED in our society and consider how

this compares to what is actually happening. From the patient's perspective, their care journey starts long before they present to the ED for treatment and staff were acutely aware of the economic, social, and cultural factors linked to ED presentations. The ED staff expressed their views about where the ED adds value to our current healthcare model. The ED doctors felt strongly that the value they add is resuscitating and stabilising critical and undifferentiated patients:

We add value in patients who are undifferentiated. That's what we do because we're also generalists. We add value in people who are really sick and people with major trauma because that's what we do, we resuscitate. (P3)

One participant talked about streaming the ED into two separate services – one for high acuity patients and another for everyone else. When talking about the "GP-type patients" in the ED waiting room, the participant said:

They might cause waiting room crowding...and add to the stress of the staff because they're like, 'oh my God, there's 30 people waiting', but actually if you look at the 30 people waiting with an experienced eye, you're like, well actually, only five of those people immediately matter. Everybody matters, right, and I'd like to see everybody straight away...the Emergency Department is an egalitarian, free place that's trained in dealing with everything and can deal with people in low socioeconomic groups – but only five matter and the other 30 are just causing stress because you don't know what's in there. (P 11)

To address the challenge of ED overcrowding, I suggest we need to start with a deeper understanding of the socio-economic role the ED currently plays in our society and reflect on the kind of public health model we want to be delivering to help people in emergencies. Given the lack of consensus about ED patient appropriateness (Richardson, 2010), we also need to think about how we want to define an emergency and what response, as a society, we want to provide.

2 Waiting for assessment

Introduction

The next stage in the patient's journey involves waiting. Once patients arrive at the ED and have registered their details with reception, the triage nurse will undertake a quick assessment to assign each patient a triage code. This triage code is a clinical tool for staff to establish the maximum waiting time for medical assessment and treatment of a patient. The triage nurse, who sits behind glass next to the reception area, will spend around two to five minutes assessing new patients: taking a quick history, asking questions, and recording their vital signs. New Zealand hospitals use the Australasian Triage Scale, which has five categories ranging from life threatening (category 1) to the least urgent (category 5). The triage codes provide clinical guidance on the maximum amount of time in which patients should be seen.

Figure 13 Coloured chairs in empty ED waiting room

My observations: it is frustrating

I usually arrived at the ED early on my observation days. This gave me a chance to spend some time in the ED waiting room. I would walk down the back of the room to find a seat, so I was not in anyone's way. I noticed several posters, signs and wayfinding material on the walls and floor. The messages were sometimes inconsistent. On the floor in front of the reception area were two coloured lines: a yellow one further back with white footprints and text "please wait here" and another red line a bit closer to the reception desk also with text "please wait here". I got lost many times over the few weeks I spent in the hospital for this project. I had to navigate to different areas for the interviews with participants, and the space often felt like a never-ending maze. Back in the waiting room, on the wall to my left was a patient journey map with the text "welcome to the emergency department" and happy looking animated faces walking through the stages of triage, registration, treatment, referral, and review (see Figure 14).

Figure 14 Patient journey map in ED waiting room

It is small and nowhere near as professional as the DHW Lab Patient Journey Map (Reay et al., 2017). I wondered if anyone looks at this. On the adjacent wall is a poster that reads, "please treat our staff with respect" and "aggression and violence is never ok". The waiting room seemed calm, but I knew that violence and aggression is a common problem in EDs in other countries (Lau et al., 2004) and my conversations with staff discussed below confirmed this is the same for New Zealand.

I was given a tip at the beginning of this research by a friend working in the hospital that coffee is the currency in the hospital and if I wanted to start on the right footing with the ED staff, I should show up with coffee. I took this on board and tried to bring a takeaway coffee for the participant I was shadowing each day. On the busy days they would only get to it once it had gone completely cold. They did not seem to mind.

The morning of the first observation was quiet, and the PFC walked me through the various systems and processes involved with acute patient flow. The first thing they showed me was the Emergency Department Information System (**EDIS**). This is a visual display of all the patients in the ED, whether in the waiting room or in the CTA, and keeps track of the how long they have been waiting (see Figure 15).

The triage codes and waiting times are colour coded. When the patient's LOS goes over six hours, the box turns red. A brief description of the patient's presenting problem is also entered – for example, "urinary problem" or "trauma", as well as the time of arrival so the waiting time can be tracked. All staff in the ED can log into this electronic system and see the patients waiting to be assessed, along with their vitals and triage code assigned. The EDIS screen will be open on most ED staff computers all the time. This is especially so for the staff in the roles of PFC and ACNM as their job is to ensure patients are moving through the ED at appropriate times. Patients do not have any visibility of these screen or an indication of how many other people are waiting to be seen and who may be higher on the urgency list than them.

Figure 15 Snapshot of EDIS screen

Conversations: waiting & chasing

Patients can wait for a very long time in the waiting room before being seen. When the ED is full and there is no room to see newly arrived patients, these patients must wait in the waiting room. A participant explained that the patients with triage codes 1 and 2 will always be brought directly into the department for assessment and treatment. This is often

patients who have arrived by helicopter or ambulance and are brought into the department through a separate entrance. But when the department is busy, patients with triage codes 3, 4 and 5 will stay waiting in the waiting room. The staff told me this is particularly concerning for patients in the code 3 category because their condition is time critical and although the guidelines say they should be seen within 30 minutes, they can sometimes be waiting for six hours in the waiting room. The ED doctors explained that one of the most serious consequences of overcrowding is that the ED is not able to see newly arrived undifferentiated patients. This is dangerous because some of these patients may need urgent treatment or may deteriorate in the waiting room if they are not seen:

So, then we start thinking, oh, geez, perhaps I'd better have a look at the triage notes and vital signs of people in the waiting room. Then we start getting sucked into oh man, this elderly person, they might be really sick or, gosh, this poor 90-year-old's been waiting five or six hours – they must be so uncomfortable, if not here with something really dangerous. We start trying to make clinical decisions on the basis of inadequate, incomplete information, and even go into the waiting room. (P2)

One of the frustrations the ED doctors talked about was that often they would find themselves available to see new patients but there was no room available to assess the patient: “because a lot of the time doctors are able to see patients – its the space to see them that is the delay” (P4). There is an expectation that patients will be assessed in a private space as the ED doctor may need to lift up their shirt to listen to their heart or examine their abdomen, for example. The expectation of privacy and physical constraints of the current ED space leads to situations where both the patient and staff are waiting, as the department continues to get busier and busier.

The staff acknowledged that the waiting process can be frustrating for patients as they do not know how long they will have to wait. It is difficult for staff to communicate this to patients at the outset and it becomes even harder once someone has already been waiting for several hours:

We know in reality that we would far rather be told why we are waiting for four hours and that we will be waiting for four hours, rather than sit there getting madder and madder and more angry about it. Unfortunately, that triage nurse is just so overwhelmed, they're just trying not to make eye contact with people, especially if they're more junior. They get quite frightened and they're just hoping that people just stay chill and just don't have an issue, but we know that they sometimes do. (P5)

Additionally, the patients in the waiting room can get a false impression that the department is quiet if the waiting room is quiet. But the department may be dealing with several serious cases that have arrived through the ambulance entrance that is not visible to the waiting room patients.

Staff told me it was common for patients to get very annoyed and upset if they have been waiting for a long time. Aggression from some patients is something they experienced on almost a daily basis:

Ninety-three or 95 percent of all ED staff in the previous year has either been verbally or physically abused, so it's extremely common. We also know that it's well under-reported. It probably occurs here on a daily basis. Staff, including myself, have been spat on, been kicked at, they've been punched at. The sad thing is, that's why it's under-reported, because that's just part of the job. But why should it be? Why should we accept that behaviour? (P3)

Staff were sympathetic to the situation patients were in, but also felt it should not be something they should put up with in their job:

Most people would take it as part of the job, but in no other segment of society would that be acceptable, except for maybe police work, and even then, it's not acceptable. For some reason, it seems to be accepted and tolerated here. (P8)

Although the triage system is meant to provide a guide for wait times, it is not communicated to patients and does not always provide an accurate measure for waiting times. One of the participants explained that they thought the triage system was “useless” because, first, the department cannot meet the time guidelines, and second, because the times are arbitrary and were devised years ago:

I’m not criticising...how people do it or triage – I’m criticising the system that we’re blindly following that’s been around for 20-something years and it’s way past its best before date. (P11)

In addition to the patients needing to wait long periods for assessment and treatment, the staff also talked to me about the periods when they must wait in their job. As discussed above, ED doctors are often waiting for a private space to see a patient. There are many other instances where staff need to wait, like waiting to get test results back for patients, waiting to hear back from a ward about the availability of beds to move a patient out of the ED, waiting for an in-patient registrar to assess a patient, and waiting for the cleaners to clean a bed for the next patient and an orderly to move a patient up to the ward. There are no feedback loops in place, so the ED staff need to follow up and constantly chase different people to keep the process moving:

It might be like the cleaning service – they’re great, but there’s only so many of them, and they get paid probably a minimum wage, and sometimes there’s only one cleaner for 300 and something beds in this hospital. It might take ages for a cleaning to happen, and then the Ward Co-ordinator’s busy, so she doesn’t necessarily pay attention to when the bed’s been cleaned, so I’m constantly chasing up. (P1)

In this cleaning example, the lack of feedback loop can lead to the situation where a bed has been cleaned and is ready for the next patient waiting for admission, but because everyone is so busy, no one tells the PFC in ED that the bed is ready. These small inefficiencies were predicted to add up to significant delays for patients waiting for admission to hospital.

The current process is also modelled on a linear model, meaning things need to progress sequentially, even when doing them simultaneously would be more efficient. A classic example is when the ED staff need to request a bed for a patient on one of the wards. The ED staff explained that in many cases, it is obvious that the patient will need to be admitted to hospital for further treatment, but the process requires the patient to be seen and admitted by an in-patient doctor before the bed request can be made on the system. “Early bed requests” is an initiative that was introduced to try to address the inefficiency of relying on sequential processes. This enables an ED doctor to request a bed for a patient on a ward, before they have been seen by that department, because the ED doctor can predict that that patient will need to be admitted and it is in that patient’s best interests to get them in the queue for a bed as quickly as possible. This initiative is limited by the fact that there are still not enough inpatient beds for patients requiring admission.

Reflection

The first realisation I had was that waiting happens throughout the entire ED journey, not only in this second stage, as it is generally represented in process and patient journey maps. It is also not just patients who wait, but staff too can spend long periods waiting for test results, to hear back from another doctor, or for a patient to be admitted and moved to a hospital bed. The experience of waiting can be incredibly frustrating.

Communication is central to this. It is about knowledge and having some sense of control about what is going to happen next. When people are kept in the dark and feel like the process is random, or they have been forgotten about, the experience of waiting can be very negative. This is especially so for ED patients, who are likely to be experiencing one of the worst days of their lives. One of the ED doctors talked about a recent experience where they had to go to hospital for surgery. They reflected on what it was like being on the other side as a patient, and said that “**you definitely feel disempowered, and to a degree, not helpless but certainly at the will of others**” (P8).

When thinking about the future of emergency care, the experience of waiting needs to be fully understood and carefully integrated into the process and patient journey. Can it be designed to be more deliberate? Is there a way to make the process more transparent so people know where they are in the queue? Can we give patients greater visibility and a sense of control over their care journey?

3 Receiving care in the emergency department

Introduction

The third step in the ED journey is when the patient gets through to the actual emergency department, the CTA, and undergoes assessment, tests, and medical treatment. At the site I studied, there are sliding doors separating this from the waiting room, which are locked and controlled by staff. The layout of the department can be seen in Figure 16. The ED staff are positioned in the centre with all the patient cubicles around the outside.

Observations: it is cramped

On my observation days, the staff I was shadowing would find a chair for me (or ask me to go and find one) and I would be tucked around the corner between the PFC and senior ED doctor on shift (see Figure 16). I would need to be careful to keep my chair within the yellow lines marked on the floor as the chair was a common tripping hazard for staff walking past. I felt like an outsider – a little uncomfortable and worried about getting in someone's way. The staff were friendly towards me and always intrigued when they heard that I was doing a research project on acute flow from a design perspective. A few would jokingly make comments like, "excellent, Maria is going to fix our flow for us!".

Figure 16 ED CTA layout drawn from my observations

I was struck by how much time all the staff spent in front of the computers which are positioned in the ED write up area in the centre of the department. I had had a perception of the nurses and doctors constantly being with patients doing “medical things”. But there is a significant number of administrative tasks for staff do in relation to each patient – writing up clinical notes, reading histories, requesting tests, and talking to GPs or staff in other parts of the hospital. I also noticed that the conversations with the ward staff and in-patient registrars can be tense when the ED is very busy. The PFC spends a significant amount of time trying to get hold of other people in the hospital in order to move patients out of the ED. They will often be multi-tasking by talking to someone in person, a phone squeezed between their head and shoulder, and typing notes on the computer.

On the busier days that I was in the department I was confronted by patients lining the hallways of the ED. When I would need to leave the confines of the staff area to go to the bathroom, I walked past patients lying on metal trolleys in the hallways, often wearing hospital pyjamas. It looked uncomfortable and undignified. I tried not to make eye-contact so as not to make the experience even more humiliating for them.

I often heard patients complaining loudly and in physical discomfort. During one of my observations, a patient with dementia was constantly yelling “help” from the treatment room. When one of the ED staff realised this was an unfamiliar environment for me and that it may be concerning for an outsider, they reassured me that this patient had been looked after and was being checked on every few minutes. The families waiting with patients also voiced their frustrations at the long waits and lack of privacy. One elderly person walked up to the staff write up area requesting a copy of the code of rights and was very distressed at how long their partner had been waiting in a corridor. The ED staff calmly replied and apologised and told me afterwards that this was common.

Conversations: we have normalised the abnormal

The participants all acknowledged that the ED is frequently overcrowded with patients and that trying to manage this was a constant challenge for the department. The working

environment in the ED was described by staff as “chaotic” (P2), “mental”, and “like being in a battlefield” (P5). On the busy days, the department would see 50 to 70 more patients than the space can physically manage. Once the department gets this busy then everything becomes more chaotic. One participant described this as a “massive snowball effect” and explained that “as soon as we become dysfunctional, it gets even worse” (P2).

The participants told me that the ED was significantly too small for the demand. One participant explained that based on the number of ED presentations per year the ED should have 60 beds according to the ACEM recommendations, but the department only has 29 beds. Although staff clearly acknowledged the physical space of the ED was too small, there was consensus that the most significant cause of overcrowding in the department was access block and therefore bigger department would not be the answer in the current system.

One of the consequences of this poor outflow from the ED into the hospital is that some patients will be moved on to a trolley to wait in an ED corridor. The ED staff all acknowledged that corridor stays are undignified and unsafe for patients: “having anyone that's unwell in an open corridor is just tragic and it's wrong. A patient has no privacy. Lots of the time there's no dignity, cos it's often the elderly that ends up there” (P3).

Older patients end up in the corridor because they are less likely to complain. There was a sense that the ED had “normalised the abnormal” (P3) with corridor stays. Many participants expressed frustration at this aspect: “ED will cope; they’ve always coped! Historically we’ve overloaded so we’ll just keep being overloaded and it’s the status quo” (P6). One participant told me the reason they applied for the PFC role was because they were sick of looking after three or four corridor patients on a night shift: “this is absolutely appalling; this is not okay” (P5).

The ED staff felt that this normalisation was one of the biggest mistakes that the department had made. This contrasts with the in-patient wards that have a strict policy against corridor stays on their wards. There were divergent views about whether it was better to contain the risk of overflow and corridor stays in the ED, or if it would be safer to spread the risk

throughout the hospital – for example, if each speciality ward were prepared to take a few patients’ “over-census”. There was also a belief that having patients in corridors in speciality wards would mean beds would become available more quickly because “it looks awful, people are uncomfortable, there’s no privacy, nursing is very difficult” (P8) and this would put pressure on the wards to make decisions to get other patients out and free up space.

Reflection

ED staff deal with trauma and very sick people daily, but this is not what causes distress in healthcare workers. It is being faced with the daily reality that they cannot provide the level of care to patients that they need and want to. A helicopter arrived with three critical patients during one of my observations. The department ran more smoothly than I had ever seen during this period. A group of nursing staff who were not on shift and attending a training day jumped in without question. Communication was clear and effective. Everyone remained calm and undertook different tasks to keep the department moving. This situation is what the ED staff are trained to respond to. But seeing elderly patients on trolleys and constantly apologising to patients for the long wait and uncomfortable conditions in the corridor places an ethical burden on healthcare staff that seriously threatens their professional foundation. This is what leads to moral distress and burnout. How can we better support our healthcare staff? How can we alleviate the burden of an underfunded system to not weigh on the shoulders of individuals?

4 Outcome for the patient

Introduction

Once the patient has been assessed in the ED by an ED doctor, and in some cases an in-patient doctor as well, a decision will be made about whether that patient can be discharged to go home or if they need to be admitted to hospital for further treatment. The ED needs to contact the appropriate in-patient team, for example general medicine or

cardiology, to undertake a review and admit the patient to hospital. Once the patient has been reviewed by the in-patient doctor, they will become that department's patient, rather than an ED patient. But the patient will remain in the ED until a bed is available and cleaned on the in-patient ward and the patient can be transferred there by an orderly.

Observations: this is “your patient”

The outcome stage of the ED journey was slightly harder for me to observe. It involves the interface between the ED and the rest of the hospital, but the scope of my research meant that I was situated within the ED. The interactions between the ED staff and in-patient staff I observed were mostly through phone calls. Since it is the PFC's job to get patients out of the ED, they spend a significant amount of time trying to get in contact with in-patient registrars to either get updates on plans for a patient or to ask them to come and review a patient waiting in the ED. The PFC explained to me during my first observation that the hospital's standard operating requires in-patient wards to get back to the ED within 20 minutes of being contacted about bed availability. I was told this never happens. Most of the PFC's role is therefore “chasing” other staff in the hospital – they are always trying to get hold of someone, leaving messages and sending texts.

During one observation the PFC had a challenging interaction with one of the in-patient registrars. A plan had been made for two patients to be reviewed before they could be discharged and sent home, but they had been waiting for this review for the past six hours, taking up two spaces in the ED where newly arrived patients could have been seen. When the PFC spoke to the registrar, they said they needed to attend a departmental meeting first. At this point the PFC became very frustrated and the ED consultant got involved. The PFC explained this situation to me as the ED consultant needing to “pull rank” because of this constant push-back from the registrar. They said it is incredibly frustrating and wastes everybody's time.

Figure 17 Snapshot of Capacity at a Glance screen

I also attended two of the daily hospital wide “bed meetings” that commence at 9am. A room with four large projector screens is flooded with staff from various parts of the hospital – mostly nursing staff – to discuss current capacity issues and plans to reshuffle patients, either between wards or sometimes hospitals. There is one nurse who stands up and runs the meeting, while others chip in with requests, suggestions, or complaints. The environment felt a little like an auction with different departments bidding over the limited hospital resources. The Hospital Capacity at a Glance (CAG), which is projected on the screen at the front, shows the number of patients within the different departments (see Figure 17). The different colours represent the different specialties and patients who are in one department but “belong” to another, are called “boarders”.

Conversations: us vs them mentality

The staff talked about patient ownership where patients “belong” to certain departments within the hospital. When talking about the reasons for the ED being crowded and over capacity, a senior doctor explained that the ED is often required to nurse and care for patients that should be on the ward “they’re not really our patients, but they are our responsibility, because they’re in our physical space” (P2).

Figure 18 Sketch depicting patient ownership

An “ED patient”, on the other hand, is a patient who has presented to the ED directly (through a walk-in or ambulance/helicopter) and is undifferentiated. These patients are seen as distinct from those who have already been admitted to an in-patient department but may still be in the ED due to a lack of beds on the ward. The ED staff said they do not add much value to these patients but are still required to have oversight and respond if their situation deteriorates because of the long wait.

There was a lot of discussion about a push/pull dynamic between ED and the in-patient wards. The ED staff described feeling as though they were constantly pushing for the wards to take patients from the ED. Pulling, on the other hand, was described as the wards proactively pulling patients out of the ED when an appropriate empty space becomes available. One participant explained why pulling is so difficult to sustain in a system that is constantly under pressure:

If you look at lean methodology, pulling is always better, because you get the right patient in the right area as soon as possible. The problem is when you have a system that is constantly under pressure and they have no space to pull to, then the pull approach doesn't work anymore. Then even when you have availability, it still doesn't work because that's not our business-as-usual approach anymore. We've reverted to, oh, it's full, and so we're not pulling anymore. (P3)

The in-patient registrars talked about the challenges from their perspective. Although they acknowledged the need to assist the ED by actively pulling patients, they also needed to manage high workloads in their own departments which includes ward rounds, clinics, meetings and being in theatre for surgeries.

They are also physically removed from the ED and need to come down to see patients for review and admission. They told me about the difficulties they sometimes had when they came down to the ED to see a patient. For example, one participant said they often spend a lot of time trying to find the ED nurse looking after their patient to update them on the care plan. The whiteboard displaying the names of nurses assigned to each patient cubicle is not always up to date and people can still be hard to trace in the busy department. Another difficulty is the technology available for taking medical notes on. One of the in-patient registrars talked about the frustration of having to deal with the "computer on wheels" (P10) which often did not have power and could not be used. This means they needed to stay behind after the meeting with the senior doctor to type up the patient's notes, rather than doing this in the room simultaneously.

When talking about the problem of ED overcrowding and access block, the staff were clearly of the view that although it is a systemic, hospital wide concern, the problem manifests in the ED and so is still seen by some as an ED problem. Although there was recognition that the hospital has acknowledged this and the creation of a new hospital-wide Patient Flow Directorate is in line with this new approach, there was still a general feeling that this perspective has not shifted within all departments and staff in the hospital.

Although it was not discussed in detail during these interviews, staff referred to the discharge process as being overly complicated and time-consuming. A number of different services and professionals are involved with arranging a patient's discharge. There are also external socioeconomic factors that make it difficult for patients to leave the hospital:

...you don't unblock a flow by starting at the farthest point away from the blockage. You clear the blockage and things flow. So where is the blockage? Well, one of them certainly is exiting hospital, particularly transferring to other institutional care or people who need to go home. The hospital's an ultra-resourced environment; the community is generally poorly resourced. So it's a big step down in availability of resource. (P9)

The participants talked about the different initiatives that have been trialled by the hospital to improve flow and outcomes for patients. There was a general scepticism about the sustainability of any initiative. Although there is often enthusiasm at the start, staff thought it was necessary to have people continuing to champion and drive the change otherwise people go back to the old and easy way of doing things. Not everyone in the hospital had the same level of interest and engagement in patient flow initiatives. The ED staff said all of the improvement projects had been driven by them. The engagement with patient flow within the in-patient departments was seen to be personality dependent.

Reflection

The problem of ED overcrowding cannot be fixed in and by the ED. It is a system wide problem. Within the hospital, there is a need for better co-ordination and a common vision between departments. The high workloads and staffing constraints creates a turf mentality where staff just enter survival mode. The patient's journey moves across all of these services and needs to be unified to avoid disruptions and fragmentations in the care they receive. Emergency department capacity cannot be looked at in isolation from hospital capacity. If our hospitals are full, our EDs will not function either. Beyond the hospital, we need to understand the bigger picture involving primary care and social and economic factors related to health. Why are people staying in hospitals longer? What other support and services do we need to better help them take more control of their own healthcare journey? What can be done to create more unity between departments in hospitals?

Part 3 Design

Speculative futures

Chapter 5

Speculative Design

Emergency Futures

The interventions to improve ED overcrowding have failed to address the underlying causes and there is need to think differently but “the problem is” one participant told me “if you're in a system, and especially if you're in a system under pressure, it is very difficult to see an alternative way of doing things” (P3). Therefore, the second stage of this research sought to explore how design might enable us to imagine possible futures for emergency care as a vehicle for reflecting on our current values and assumptions and start a conversation about the future that we want.

I suggest that this is an important starting point before rushing to implement further changes. By using insights gained from my primary research in the hospital, the scenarios method provided a collaborative and creative way to explore alternative visions for the ED with designers and healthcare professionals. This chapter describes the process followed and outcomes from this second stage of my research.

5.1 Using scenarios as a strategic tool

Creating scenarios to explore possible futures has become a popular tool amongst futurists, strategists, and policymakers. Scenarios are stories that are built on “what if?” questions and explore different versions of the future. They are an effective method for strategic thinking because they assist in decision-making about where we want to go (Miller, 2006). They can also help to structure the discussion to see how different conditions might enable or hinder the delivery of certain policy objectives (UK Government Office for Science, 2017).

Projects like “SPREAD Sustainably Lifestyles 2050” have started to explore how scenarios can be used by designers to think about ambitious systems level change (Angheloiu et al., 2017). SPREAD investigated different pathways to 2050 and the role of users in enabling sustainable lifestyles in Europe through a two-day participatory workshop developing scenarios. The authors argue that “design can lead the effort to change society by imagining provocative artifacts, new interactions and tools for change” and that this “shift in mindset” is key to changing behaviours and attitudes for systemic transitions (Angheloiu et al., 2017, p. S3214).

5.2 Emergency futures in 2050

I developed four speculative scenarios that depicted the state of emergency care in the year 2050 (see Figure 19). These were created by using two key concepts that came through strongly in several research findings discussed in Chapter 4: waiting time and privacy. I plotted these along two axes to create a “quattro stagioni” in Figure 19 below. This is a framework that combines two extreme states to create four different realities (Jonas, 2001).

The x-axis depicts two extremes for time spent waiting in the ED which is a common characteristic of our current emergency care model. Patients wait to enter the ED, they wait for treatment once in the ED, and they wait to leave the ED through admission to hospital or discharged home. Resource and staffing constraints and inefficient processes mean hospital staff also spend considerable time waiting – for test results, for in-patient reviews and for rooms to become available for assessments. Finally, waiting time has also become a blunt performance measure for hospitals through the introduction of the Target, although as the research discussed in Chapter 1 reveals, meeting the Target does not necessarily mean better care for patients.

Figure 19 First version of scenario matrix for ED futures

The y-axis depicts two extremes involving privacy, which is another feature that poses challenges in the current model. There is an underlying right for everyone to have their privacy respected under the Code of Consumers' Rights (HDC Act 1994). But due to limited physical space in the hospital, privacy is not always possible and leads to undignified interim solutions like corridor stays. The expectation of privacy for medical care and spatial constraints can also lead to frustrating situations where an ED doctor is available to see a patient, but there is no assessment room to do so. The ED waiting room is open and public and not seen as an appropriate space for a physical assessment. The need for privacy also needs to be balanced with the ability for ED staff to have easy oversight of patients to monitor their status.

5.3 Workshop with design students

The four scenarios for the future of emergency care were explored in a workshop with 19 third-year students enrolled in the Bachelor of Design Innovation at Victoria University of Wellington. An amendment to the original ethics application was made and approved for this workshop and written consent was obtained from all participants (Appendix E). I provided a brief background to the research project and the problem of ED overcrowding before the workshop activities were introduced.

The students were divided into four groups, and each assigned a scenario for the future of emergency care (See Figure 20). Limited information about each scenario was provided to the groups (see Appendix E) along with the provocative names: "zoom call", "quick & dirty", "the retreat" and "supermarket queue". The groups were asked to brainstorm all of the words, ideas and images that came to mind creating more detail for the future they were imagining. They were then asked to design an artefact that they would be likely to find in their future scenario and think about how people would interact with it.

Figure 20 Students brainstorming during workshop

Zoom call

The “zoom call” scenario was a future where emergency care is quick and very private and reflected a society that values efficiency, individuality, protections and control. The participants imagined the state of the world to be technology based where emergency care consultation and assessment could be provided remotely in the first instance. The lack of physicality was seen as the key challenge to overcome, and the group therefore came up with a tooth implant that would do readings of key vital signs and provide automatic updates to the patient and doctor. The group thought this would ensure honesty so people cannot trick the system. The main benefits included better support for self-management and access to 24-hour care through a worldwide connection of emergency specialists. This would take pressure off the physical ED, which would be reserved for trauma and life-threatening illnesses only. The main risk that was identified was data breaches and hijacking.

Figure 21 Brainstorming for Zoom call scenario by design students

The retreat (MIQ)

The “retreat” scenario involved long waits for emergency care, but it was very private once the patients get there. This society values work and lifestyle flexibility, health and wellbeing, privatisation, and not compromising. This group imagined a luxury space that provided good care in a nice and confidential setting. The group talked about using a robot at the entrance to scan people wanting to enter to make sure they have a proper illness or injury, and to allow the health professionals to focus on providing care rather than administrative tasks. The artefact the group designed was a tablet that could be used by patients in the queue to chat with the health professionals and request things like water and food. The main problem identified was that it would not be big enough for everyone and people could die waiting (see Figure 22). This scenario was the most dystopian of the four, as it was the only one depicting death. In this future society has agreed to sacrifice some people for the hope or promise of a small selection getting the best treatment.

Figure 22 Brainstorming for retreat scenario by design students

Quick & dirty (bus to work)

The “quick & dirty” scenario involved emergency care that is quick but out in the open. The society in this future values efficiency, sharing, openness, and community. This group came up with several imaginative options. These included an emergency bus service – a normal commuter bus that has been converted into a mobile ED where people can hop on to receive quick care and then off again after. Another idea was virtual reality glasses where people could connect with a virtual doctor for an assessment (see Figure 23). They said this was “privacy in public”. The group also talked about a “chicken pox coach” – although not a well-formed concept, they joked that it captured the idea that people with the same infectious diseases can be together to keep each other company. The key element to the concepts this group came up with was that a lack of privacy meant openness and that this contained possibilities for more empathy towards each other: if we are all open about these things, then there is nothing to be ashamed of. This group appeared to have the most fun coming up with ideas for their scenario and seemed to have the least restraints about being plausible.

Figure 23 Sketch of VR glasses by design students

Supermarket queue (airport lounge)

The “supermarket queue” scenario involved a long wait for emergency care which is out in the open. This group took inspiration from an airport waiting area and had the idea of a big screen in the waiting room that lists all the patients waiting to be seen, with their medical condition displayed as well. All patients would be given a wristband that would beep when it was their turn to be seen (see Figure 24). The group explained this would mean that other people would be more understanding if someone is seen before them because they can see how urgent their condition is. Like the previous group, this group also talked about this openness as increasing empathy in people.

Figure 24 Brainstorming for supermarket queue scenario by design students

Figure 25 Updated scenarios for emergency futures

5.4 Feedback from healthcare workers

I revisited the scenarios following the student workshop with more detail about the state of each future with ideas from the students, and also amended the names to resemble more familiar environments like the zoom call. The updated scenario matrix (see Figure 25) was shared with the healthcare participants to seek their feedback with the following prompting questions:

- (1) Where do you think we are heading according to our current trajectory? Is one of the quadrants more likely than another?
- (2) What do these futures say about our values? Are there values we should hold onto, or ones that should change?
- (3) Which scenario do you think is the scariest?
- (4) Can you imagine any other alternative futures?

I received detailed responses from four of the participants I reached out to and provide a summary of their thoughts below.

Our current trajectory

The participants thought the Zoom scenario was the most likely way forward and that this was already happening, for example, through trials of phone consultations for rural patients. Some participants thought that the major shift towards telehealth during the Covid-19 lockdown period in New Zealand (Imlach et al., 2020) has not been consistently sustained. Although participants thought this shift was positive, the limitations were also noted, including the value of physical examination for accuracy and face-to-face interactions for job satisfaction.

Our values

The participants thought that privacy is so paramount in our current system that it was hard to imagine a future where this is not the case. It was suggested that this might change with

different generations, and the increasing use of social media today may mean that options like the airport lounge are not as surprising. One participant expressed their preference for futures that incorporate more openness and togetherness but acknowledged there may be reluctance from some groups for this, especially where there are risks posed by hackers misusing information.

Where do we want to go?

The mobile emergency bus idea was well received by participants, especially if it was targeted at more deprived neighbourhoods to try address health inequities. The participants wanted to see more automated and less invasive options for monitoring patient vital signs. The participants thought the zoom scenario was also potentially the scariest if it meant the majority of healthcare moved to that format. One participant said it would be “soul destroying” (P11) as a clinician if it meant there was no person-to-person contact. The MIQ scenario was described as “so lonely” and also not feasible from a public funding perspective. Overall, the participants wanted to see the future of emergency care involving more ownership by clinicians, better integration, and a technology that enhances rather than hinders care.

Reflection

There was strong engagement by both the design students and healthcare participants in discussing the future scenarios. The physical and collaborative setting of the design workshop created a “convivial space” (Bates, 2018) and lead to enthusiastic chatter and ideas floating around. If time permitted, I would have done the same with the healthcare participants, rather than getting written feedback. Bringing these two disciplines together into the same room would provide an opportunity to test different ways of approaching and thinking about these problems and ideally open space for new ways forward.

Chapter 6

Discussion

So what?

This chapter provides a brief discussion of the qualifications, improvements, extensions, implications and applications, of my research.

Qualifications

When I began this research journey, I did not appreciate how significant and complex the problem of ED overcrowding would be. Defining the boundaries for my research was challenging and the areas excluded are by no means irrelevant. The most significant qualification is that my primary research does not include the patient voice and perspective. It goes without saying that a human-centred design approach to understanding and improving the patient journey must include this, and even start from it. Practical constraints led me to focussing on the people delivering the care, with the understanding that further inquiries involving patients will be necessary.

Improvements

In hindsight, I can see that more time dedicated to making the scenarios come “alive” could have improved the second part of my research to encourage more intimate engagement by design and healthcare participants. The point of difference brought by speculative design is the creation of imaginary worlds through props and stories to help transport people there from their current reality. Creating a few low-fidelity props to interact with may have encouraged even more imaginative thinking and is something I would explore next time.

Extensions

The research could be extended by developing more opportunities for collaborative discussion between the different stakeholders including patients, whānau, caregivers, Māori health services, healthcare workers, management, and policymakers. Although I was able to engage with two different disciplinary approaches to the problem, they were still done separately. The next step would be to try and bring them together to start a conversation.

Implications

Through my explorations I realised that human interactions, relationships and emotions were essential to any attempt at improving ED overcrowding. An efficiently designed process still needs to be implemented on a daily basis by people. This research builds on the findings in the literature about the challenges of implementing change in hospitals and that there has been a lack of in-depth engagement with frontline staff about their experiences (Beaver, 2019; Johnston et al., 2016; Person et al., 2013; Rixon et al., 2020). There is a need to understand these underlying cultural factors before rushing to implementing new interventions. It also builds on the call to move towards more holistic concepts of healthcare through using the concept of the patient journey (Crayon et al., 2020).

Applications

The hospital staff I spoke with provided a dire outlook on the current state of our EDs. In addition to threatening patient safety, the wellbeing and ethical foundation of healthcare workers is at risk. The flipside of the distress, victimisation, and scepticism uncovered reveals a foundation of empathy, teamwork, and a desire for change. These findings are applicable to the design of our future healthcare model as they capture the perspectives of some of the frontline healthcare workers. If New Zealand is serious about radical change to address systemic problems in the current system, these voices need to be heard and should be part of the conversation about redesigning healthcare in New Zealand.

Conclusion

The complexity and pervasiveness of ED overcrowding demands new ways to approach and think about the problem. The voices of frontline healthcare workers taught me to look beyond individual, linear, and tidy steps in a process map or policy. The level of abstraction required for process and systemic thinking and intervention can risk losing touch with the humanness at the centre. I found that the moral distress, victimisation and scepticism underlying foundational relationships in the hospital is the outcome of a system that is failing to support people. Underneath these we can also discover strong cultural enablers including empathy, team mentality and a desire for change. These discoveries led me to asking more questions (to answer next time, or by someone else):

- What role do we want the ED to play in our society?
- How can we enable patients to take more control of their own care journey?
- How can we better support healthcare staff and create more unity between departments in the hospital?
- Can we rethink the experience of waiting in the ED? Is there a way to make it more deliberate and transparent for patients?
- How can we alleviate the burden of an underfunded system to not weigh on the shoulders of the frontline healthcare workers?

I think there is great potential for design to be utilised as a vehicle for future making and creating space for critical reflection and debate. Approaches like speculative design can help us to move beyond the confines of the material world and spark ideas about how things could be. Through this process we may find we are able to revisit the underpinning values, beliefs and ideas that shape our world. In this case, it served to question the expectation of privacy – what does this mean, and do we want to protect this at all costs? Once we realise that we are in control of this, the possibilities for change will open up.

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Appendices

Appendix A: Ethics approval for healthcare participants

VUW Human Ethics Approval
HDC Out of Scope
RAG-M endorsement for research

Appendix B: Interview and observation guides for healthcare participants

Information and consent forms for health professionals
Observation protocol
Interview guide

Appendix C: Posters for healthcare participants

Recruitment and notice of research posters

Appendix D: Ethics approval for design participants

VUW Ethics Approval Amendment

Appendix E: Workshop material for design participants

Information and consent forms for design students
Workshop material

Appendix F: Copyright permission

Auckland University of Technology
Auckland District Health Board
Royal College of Art

Appendix A

Ethics approval for healthcare participants

VICTORIA UNIVERSITY OF
WELLINGTON
TE HERENGA WAKA

Phone 0-4-463 6028
Email judith.loveridge@vuw.ac.nz

TO	Maria Bialostocki
FROM	Associate Professor Judith Loveridge, Convenor, Human Ethics Committee
DATE	13 November 2020
PAGES	1
SUBJECT	Ethics Approval Number: 28914 Title: Acute patient flow: insights from a design perspective

Thank you for your application for ethical approval, which has now been considered by the Human Ethics Committee.

Your application has been approved from the above date and this approval is valid for three years. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Kind regards,

Judith Loveridge

Convenor, Victoria University of Wellington Human Ethics Committee

4 September 2020

Ms Maria Bialostocki
Victoria University of Wellington
bialosmari@myvuw.ac.nz

Dear Ms Bialostocki

Study title: Acute patient flow: insights from a design perspective

Thank you for contacting the Ethics team regarding whether your research proposal was in scope for HDEC review on 14 August 2020. The Secretariat has assessed the information provided in your proposal and supporting documents against the Standard Operating Procedures.

Your study will not require submission to HDEC as, on the basis of the information you have submitted, it does not appear to be within the scope of HDEC review. This scope is described in section three of the Standard Operating Procedures for Health and Disability Ethics Committees.

An observational study requires HDEC review only if the study involves more than minimal risk (that is, potential participants could reasonably be expected to regard the probability and magnitude of possible harms resulting from their participation in the study to be greater than those encountered in those aspects of their everyday life that relate to the study).

For the avoidance of doubt, an observational study always involves more than minimal risk if it involves one or more of the following:

- one or more participants who will not have given informed consent to participate, or
- one or more participants who are vulnerable (that is, who have restricted capability to make independent decisions about their participation in the study), or
- standard treatment being withheld from one or more participants, or
- the storage, preservation or use of identifiable human tissue without consent, or
- the disclosure of identifiable health information without authorisation.

The Secretariat stresses that locality approval must be sought (from the hospital) in order to ensure no identifiable patient information is able to be accessed without permissions, even accidentally by the researcher. This would be considered a breach of privacy

If you consider that our advice on your project being out of scope is incorrect please contact us as soon as possible giving reasons for this.

This letter does not constitute ethical approval or endorsement for the activity described in your application, but may be used as evidence that HDEC review is not required for it.

Please note, your locality may have additional ethical review policies, please check with your locality. If your study involves a DHB, you must contact the DHB's research office before you begin. If your study involves a university or polytechnic, you must contact its institutional ethics committee before you begin. We recommend you contact Auckland District Health Board's ethic committee(s) for guidance.

Please don't hesitate to contact us for further information.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Courtney Parnell', with a long horizontal flourish extending to the right.

Courtney Parnell
Assistant Advisor
Health and Disability Ethics Committees
hdec@mh.govt.nz

Māori Partnership Board, [REDACTED]

RESEARCH ADVISORY GROUP MĀORI (RAG-M)

17 September 2020

Maria Bialostocki
School of Design Innovation
Vivian Street
Victoria University of Wellington
Wellington

Tēnā koe

Re: RAG-M #782 - Acute Patient Flow: Insights from a Design Perspective

Thank you for your application. RAG-M is very happy with your submission and advises that:

☒ Your application has been endorsed

We note your query regarding attending the Tikanga Māori Research Specific training. Please contact [tikanga@\[REDACTED\]](mailto:tikanga@[REDACTED]) for training dates and further information.

RAG-M wishes you all the very best with your study and looks forward to receiving a copy of the study summary report.

Ngā mihi nui

Jack Rikihana
Chairperson

Appendix B

Interview and observation guides for healthcare participants

PARTICIPANT INFORMATION FORM

Project: Acute Patient Flow: Insights from a Design Perspective

Researcher: Maria Bialostocki

Department: School of Design Innovation

Ethics: Approved by VUW Human Ethics Committee on 13 November 2020 (# 28914)

I am a master's student at the School of Design Innovation at Victoria University of Wellington. As part of this degree I am undertaking a self-directed research project. This project will study the experience of healthcare professionals with acute patient flow in the Emergency Department (ED) at [REDACTED]. The aim of this study is to explore how design research and practice could bring a fresh perspective in terms of understanding and communicating the current process – including both the successes and challenges. This research project has received approval from the Victoria University of Wellington Human Ethics Committee.

I am asking healthcare professionals with experience working in the ED to participate in this study. Participation will involve being shadowed at work during a shift and/or being interviewed. You can decide whether you would like to take part in either one of these or both. The observation will be for a period of time during your shift, and I would like to cover a range of different times in the ED to get a sense of how things change when it is busy and quiet. You will be able to opt out of the observation at any point if it becomes inconvenient. Further information is set out in the Observation Protocol attached. The interview will focus on your experiences with acute patient flow and your views about what does and does not work well at present. The interview will take about 45 minutes and will be audio recorded and later transcribed. I may ask some participants for a follow up interview or arrange a focus group session towards the end of the project for feedback on any design concepts developed.

Information gathered from the observations and responses provided in the interviews will form the basis of my research project and will be put into a written report on a confidential basis. This means that it will not be possible for you to be identified personally. All of the material collected from the interviews and observations will be kept confidential and no other person other than myself, my supervisors and the transcriber (who will be required to sign a confidentiality form) will see the interview transcripts. The thesis will be submitted for marking to the School of Design Innovation and deposited in the University Library. It is also intended that one or more articles will be submitted for publication in scholarly journals or at academic conferences. Interview recordings and transcripts will be destroyed two years after the end of the project. The interview transcripts, summaries and any recordings will be kept securely and destroyed on 13 August 2021.

You may withdraw from the study by contacting me at any time before 11 January 2021. If you withdraw, the information you provided will be destroyed or returned to you.

If you have any further questions or would like to receive further information about this project, please contact me at bialosmari@myvuw.ac.nz or my supervisors Dr Gillian McCarthy, at the School of Design Innovation at Victoria University of Wellington (04) 463 9548, gillian.mccarthy@vuw.ac.nz, and Dr Brian Robinson, at the Graduate School of Nursing, Midwifery and Health 04 463 6155, brian.robinson@vuw.ac.nz.

Your time and input is much appreciated – ngā mihi.

Maria

CONSENT TO PARTICIPATE IN RESEARCH

Project: Acute Patient Flow: Insights from a Design Perspective

Researcher: Maria Bialostocki

Department: School of Design Innovation

Ethics: Approved by VUW Human Ethics Committee on 13 November 2020 (# 28914)

I have been provided with and understood an explanation of this research project. I have had an opportunity to ask questions and have had them answered to my satisfaction. ☐

I agree to take part in an audio recorded interview. ☐

I agree to take part in the observation phase of the project. ☐

I understand that:

I may withdraw from this study at any point before 11 January 2021 and any information that I have provided will be returned to me or destroyed. ☐

The identifiable information I have provided will be destroyed on 13 August 2021. ☐

Any information I provide, observation notes and recordings will be kept confidential to the researcher, supervisors and the transcriber. ☐

The findings may be used for a master's thesis, academic publications and presented at conferences. ☐

My name will not be used in reports and utmost care will be taken not to disclose any information that would identify me, although I understand that my identity could be obvious to others working in the [REDACTED] due to my position. ☐

Please tick the boxes below that apply:

I would like a summary of the results of the research when it is completed ☐

I would like to receive a summary of my interview once it has been transcribed ☐

Signed: _____

Name of participant: _____

Date: _____

Email: _____

Please note this consent form will be securely held for a minimum of five years before being destroyed.

Participant Information

I would be grateful if you would please consider taking a moment to complete the questions below as this will assist my analysis of the findings from the interviews.

1. What is your profession?

2. How long have you worked in the [REDACTED] Emergency Department?

3. What gender do you identify with?

Female ☐

Male ☐

Other ☐ Please specify _____

4. Which ethnic group do you belong to? Mark the space or spaces which apply to you.

New Zealand European ☐

Māori ☐

Samoan ☐

Cook Islands Māori ☐

Tongan ☐

Niuean ☐

Chinese ☐

Indian ☐

Other ☐ _____ (Please state: e.g. Dutch, Japanese, Tokelauan)

OBSERVATION PROTOCOL

Researcher:	Maria Bialostocki
Department:	School of Design Innovation
Project:	Acute Patient Flow: Insights from a Design Perspective
Supervisors:	Dr Gillian McCarthy Dr Brian Robinson
Ethics application number:	28914

Observation

This research project will be guided by the qualitative methodology referred to as a case study. Case studies are focussed on capturing the complexity of the object of study and making use of naturally occurring sources of knowledge, such as observations of interactions that occur in the physical space. The intent will be to obtain a detailed and in-depth appreciation of how acute patient flow functions in the Emergency Department, from the perspective of clinicians.

Participant observation will involve shadowing clinical staff for a set period during their rostered shift in the Emergency Department at [REDACTED]. The observations will focus on the tasks, activities and processes undertaken by the clinical staff in relation to acute patient flow. For example, where does the triage process take place, who does the clinician need to communicate with, how does this communication take place (e.g. phone, pager, text), where are clinical notes recorded and how are patients moved from one area to the next. Although information regarding confidential patient information may be overheard, this will not be recorded as it is not the focus of the study. Patients will simply be referred to as “patient” in all observation notes to maintain confidentiality. The researcher may ask the participant clinician some questions to clarify processes, if the timing is appropriate and there is no risk to the patients. Respect for the patients will be of utmost importance at all times.

Consent

The participants will be provided with the **Information Sheet** and **Consent Form** to review and sign before commencing the observation. Patients will not be asked to provide formal written consent since the object of study involves the clinical processes for managing acute patient flow, and will not involve confidential patient information. However, the researcher will be guided by the clinicians, and if at any point a patient is uncomfortable with the researcher being present, the researcher will not observe the interaction.

Recording

The researcher will take free form notes during the observations, when appropriate to do so, being mindful of not making patients feel uncomfortable. Patients will not be identified by

name and will be referred to as “patient” in all note recordings. Participants will be identified by their title only and not their name.

The following notes will be completed at the end of each observation by the researcher:

Observation notes (to be completed for each observation)	
Date:	
Location:	
Start time:	
End time:	
Who was present:	

PARTICIPANT INTERVIEW GUIDE

Acute Patient Flow: Insights From a Design Perspective

Participant:

Date & Time:

Checklist before starting

- Thank you
- Information and consent forms
- The idea is for this to be really natural and conversation like. I've got a few general headings and themes that I'd like to hear your perspective on, but I am not going to be prescriptive with my questions.
- Clarify, happy for me to audio record
- Water, tea/coffee
- Any questions before starting recording?

Introductory questions

- Profession, training, role, number of years worked
- And your current role?
- Key daily tasks
- Clinical/admin split
- How does a busy shift compare to a quiet one?
- Who are the key people to talk to for this research?

Acute flow – current process

Can you start by giving me a brief overview of how acute flow is currently managed in [REDACTED] ED?

Probes

- *What are the key stages in the process from presenting to ED to admission or discharge?*
- *What resources are dedicated to flow? Is it part of everyone's responsibility/tasks?*
- *Can you tell me about the hospital bed meeting?*

Improving flow

Can you tell me about some initiatives that have been implemented or trialled that are focussed on improving flow?

Probes

- *What was the impact of the shorter-stays target?*
- *What about the [REDACTED] ?*

- *Have they been accepted and implemented? Biggest barrier for new interventions?*
- *Planning units?*
 - *MAPU, SAPU...*
- *EDOU*
 - *16 beds?*
 - *What is it used for? How effective is it?*
 - *Who has oversight of this area?*
- *Rapid assessment?*

Overcrowding and access block

Can you tell me what happens when the ED becomes overcrowded?

Probes

- *How often is the ED overcrowded?*
- *How does ED manage this usually? (E.g. vouchers to After Hours)*
- *What do you think is the biggest contributor?*
- *Can you tell me about corridor stays?*
- *Any other impacts of ED overcrowding?*
- *What is the impact on patient safety? How is it mitigated?*

Burnout, turnover and staff morale

Do you see the impact of overcrowding on staff morale in the ED?

Probes

- *Is there a high turnover rate for nurses?*
- *Any discussion of “moral injury”?*
- *What is the sentiment in ED about access block?*

Systems to support flow

Can you tell me about the technology, systems and applications that are used in ED to assist with flow?

Probes

- *How many?*
 1. *EDIS*
 2. *Hospital Capacity at a Glance*
 3. *In Department Delay Reason – can you tell me about this? When was it initiated and what is it used for now?*
 4. *ED Status Codes (yellow, orange, red, grey)*
 5. *Qlik – data*
 6. *Trend Care*
 7. *Citrix*
 8. *Our Patients Today*

9. *Bureau Staff Request*
10. *Smart Page - orderly / cleaning request*
11. *MAP (medical application portal)*
12. *SSEP Compliance Decision Support Tool*

- *What are they all used for?*
- *Are they all necessary? Any doubling up?*
- *Used consistently between staff?*
- *Which ones do you like? Which ones are easy to use?*
- *What changes would make your life easier?*

Inpatient departments

What is the relationship like between ED and the other departments in the hospital?

Probes

- *What is the communication like with other inpatient specialties?*
- *Are there competing priorities?*
- *Is ED overcrowding considered an ED specific issue, or seen as hospital wide problem in terms of capacity?*
- *Do departments have visibility of EDs workload and patients waiting?*

Where to next?

Probes

- *What do you think is the most important thing for the hospital to focus on?*
- *Where do you think further resources are needed?*
- *Do you think more dedicated flow roles are needed?*
- *What would make your role easier?*

Appendix C

Posters for healthcare participants

Working with acute patient flow?

Hello. My name is Maria.

I am a master's student at the School of Design Innovation. If you work in the Emergency Department, I would love to talk to you about acute patient flow. The aim is to explore your day to day experience in order to design a visualisation of the current process. For further information about the project and how you can help, please email me at:

bialosmari@myvuw.ac.nz or
you can scan the QR code.

TE HERENGA WAKA
WELLINGTON
VICTORIA UNIVERSITY OF WELLINGTON

Research on acute patient flow

Hi, I'm Maria.
You might see
me around the
ED today

I am doing a study on acute patient flow and will be shadowing staff to get an understanding of how the ED works. I won't be recording any names or personal information. If you have any questions you can talk to the Charge Nurse or email me at bialosmari@myvuw.ac.nz.

Thank you for
accommodating me!

TE HERENGA WAKA
WELLINGTON
VICTORIA UNIVERSITY OF WELLINGTON

Appendix D

Ethics approval for design participants

Subject: Human Ethics Application Approved as a Category A 0000028914 Vs 1 Automated Email
Date: Friday, 30 April 2021 at 10:03:45 AM New Zealand Standard Time
From: researchmaster-help@vuw.ac.nz
To: Brian Robinson, gillian.mccarthy@vuw.ac.nz, Maria Bialostocki, Maria.Bialostocki@gmail.com
CC: hec@vuw.ac.nz

Kia ora Maria,

Application ID: 0000028914 Vs 1
Title: Acute patient flow: insights from a design perspective
Primary investigator: Maria Bialostocki

Thank you for your application for human ethics approval. Your project, as described in the application, is approved as of today. Your approval applies for three years from the date of this email.

If you would like to receive a formal letter, please contact the Research Office at hec@vuw.ac.nz. If you need to make changes to your project, you will need to apply for an amendment to this application.

Best wishes with the research.

Ngā mihi,
the Research Office

Appendix E

Workshop material for design participants

Re-imagining Emergency Care: A Speculative Design Workshop

INFORMATION SHEET FOR [REDACTED] STUDENTS

You are invited to take part in this research. Please read this information before deciding whether or not to take part. If you decide to participate, thank you. If you decide not to participate, thank you for considering this request. Your participation or non-participation will have no bearing whatsoever on your academic performance for [REDACTED].

Who am I?

My name is Maria Bialostocki and I am a Masters student in the MDI programme at Victoria University of Wellington. This research project is work towards my research portfolio for DSDN 593.

What is the aim of the project?

This project is focussed on the problem of overcrowding in emergency departments (**EDs**) which leads to not only a frustrating experience for patients but also poorer clinical outcomes. Despite a number of interventions and projects focussed on reducing the wait times and streamlining the process of moving patients through the ED, the situation is not improving. In fact, recent stories in the news suggest that hospitals around the country are struggling to cope with demand. The focus of my research was to understand the issue from the perspective of the staff working in ED to ensure that future initiatives are focussed on the right problems. Your participation will support this research by exploring how a speculative design approach can open up possibilities for different futures and therefore a space for debate about our values, beliefs and assumptions. This research has been approved by the Victoria University of Wellington Human Ethics Committee (ref: 28914).

How can you help?

You have been invited to participate because you are enrolled in [REDACTED]. If you agree to take part you will be part of a workshop that will take place during the scheduled tutorial time at 1:40pm on **Monday 3 May 2021**. The workshop will involve brainstorming ideas and drawing objects and interactions within a future scenario. All the required materials will be supplied and the activities will be done in groups. The workshop will not be audio-recorded; however, I may take some handwritten notes and photographs of the activities. You can withdraw from the workshop any time before the workshop commences. You can also withdraw

while the workshop 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.

What will happen to the information you give?

A description of student work and methods used for its development will form the basis of a section of my research project and will be put into a written report on an anonymous basis. Images of the work and drawings produced during the workshop may also be included in the report. It will not be possible for you to be identified personally, though it will be made clear that the work was completed by students rather than myself. The research portfolio will be submitted for marking to the School of Design Innovation and deposited in the University Library. It is intended that one or more articles will be submitted for publication in scholarly journals and at conferences.

If you accept this invitation, what are your rights as a research participant?

You do not have to accept this invitation if you don't want to. If you do decide to participate, you have the right to:

- withdraw from the workshop while it is taking part however it will not be possible to withdraw the information you have provided up to that point;
- ask any questions about the study at any time;
- be able to read any reports of this research by emailing the researcher to request a copy.

If you have any questions or problems, who can you contact?

Feel free to contact me (Maria) at bialosmari@myvuw.ac.nz or my supervisors Dr Gillian McCarthy, at the School of Design Innovation at Victoria University of Wellington (04) 463 9548, gillian.mccarthy@vuw.ac.nz, and Dr Brian Robinson, at the School of Nursing, Midwifery, and Health Practice 04 886 5612, brian.robinson@vuw.ac.nz.

Human Ethics Committee information

If you have any concerns about the ethical conduct of the research you may contact the Victoria University of Wellington HEC Convenor: Associate Professor Judith Loveridge. Email hec@vuw.ac.nz or telephone +64-4-463 6028.

Re-imagining Emergency Care: A Speculative Design Workshop

CONSENT TO PARTICIPATE IN WORKSHOP

This consent form will be held for minimum of five years.

I have read the Information Sheet and the project has been explained to me. My questions have been answered to my satisfaction. I understand that I can ask further questions at any time.

I agree to take part in a student workshop.

I understand that:

- I can withdraw from the workshop while it is in progress however it will not be possible to withdraw the information I have provided up to that point as it will be part of a discussion with other participants
- Images of my work (including drawings and objects) may be used in any reports on this research (including for the research portfolio, conferences and journal publications).
- My participation or non-participation will have no bearing whatsoever in the assessment of my academic performance for [REDACTED] or any other papers at Victoria University.
- I will not receive any money for taking part in this research.

I would like to receive a summary of the results of the research when it is completed:

☐

Signature of participant: _____

Name of participant: _____

Date: _____

Email: _____

Scenario One

Zoom call

Emergency care is quick and very private.

Social values

- Efficiency
- Individuality
- Protections
- Control

But:

- At what cost?
- Is anyone excluded?

Utopia and dystopia?

Scenario Two Quick & Dirty

Emergency care is quick but out in the open.

Social values

- Efficiency
- Communal
- Sharing
- Openness

But:

- At what cost?
- Does anyone gain from our information?
- Risks?

Utopia and dystopia?

Scenario Three

The retreat

There is a long wait for emergency care, but it is very private.

Social values

- Work and lifestyle flexibility
- Health and wellbeing
- Privatisation
- Don't compromise

But:

- At what cost?
- Is anyone excluded?

Utopia and dystopia?

Scenario Four Supermarket queue

There is a long wait for emergency care, and it is out in the open.

Social values

- Two birds one stone
- Mindfulness
- Don't spend more money on healthcare

But:

- What is the impact?
- Equality?

Utopia and dystopia?

Appendix F

Copyright permission

Tēnā koutou

I am a research student in the School of Design Innovation at Victoria University of Wellington. I am completing the Master of Design Innovation through a self-directed research portfolio on acute patient flow and emergency department overcrowding in New Zealand.

I am seeking permission to utilise the following copyright material in my research portfolio for the purposes of examination and subsequent deposit in Victoria's publicly available digital repository, ResearchArchive:

- Patient Journey Map <https://www.dhwlab.com/patient-journey-map>

If you are happy to grant permission, please sign the authority at the bottom of this letter and return a copy to me. You may also add specific instructions regarding the attribution statement that I will include in my research portfolio, and any additional terms and conditions that you require.

If you wish to discuss the matter further, please contact me at bialosmari@myvuw.ac.nz or by phone on 0212108585.

Thank you for your consideration of this request.

Yours sincerely

Maria

Permission

I, as Copyright Owner (or the person with authority to sign on behalf of the Copyright Owner) of the material described above, grant permission for Maria Bialostocki to copy the material as requested for the stated purposes, with no further action required.

Signed: Date: 24 June 2021

Dr Rosanne Ellis, Assoc PUC Research Engagement + Management
Attribution statement

Please note any specific instructions you would like included in my acknowledgement of Copyright Ownership:

Terms and conditions

Please note any terms and conditions of the permission:

Tēnā koutou

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Yours sincerely

Maria

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Signed: Date: ...21/ June 21/...

Attribution statement

Please note any specific instructions you would like included in my acknowledgement of Copyright Ownership:

Terms and conditions

Please note any terms and conditions of the permission:

Tēnā koutou

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I am seeking permission to utilise the following copyright material in my research portfolio for the purposes of examination and subsequent deposit in Victoria's publicly available digital repository, ResearchArchive:

- [Patient Flow: Improving Acute Medical Units](#)

If you are happy to grant permission, please sign the authority at the bottom of this letter and return a copy to me. You may also add specific instructions regarding the attribution statement that I will include in my research portfolio, and any additional terms and conditions that you require.

If you wish to discuss the matter further, please contact me at bialosmari@myvuw.ac.nz or by phone on +64 21 210 8585.

Thank you for your consideration of this request.

Yours sincerely

Maria

Permission

I, as Copyright Owner (or the person with authority to sign on behalf of the Copyright Owner) of the material described above, grant permission for Maria Bialostocki to copy the material as requested for the stated purposes, with no further action required.

Signed: Date: ...1 July 2021.....

Name: Jonathan West
Attribution statement

Please note any specific instructions you would like included in my acknowledgement of Copyright Ownership: Project was led by Laís de Almeida and Gianpaolo Fusari

Terms and conditions

Please note any terms and conditions of the permission: Please let me have a copy of the final work, thanks.