MORPHOGENESIS AND MORPHOSTASIS:
What forms and maintains the safety norm?

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What Forms and Maintains the Current Safety Norm?

Carl Horsley

Lund 2021

Under the supervision of Johan Bergstrom Ph.D.

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Number of pages: 62
Illustrations: 2

Keywords
Safety science, sociology, healthcare.

Abstract

Progress in patient safety in healthcare has been frustratingly slow despite 20 years of intense effort. Recent literature suggests that current approaches inadequately address the complexity of healthcare, possibly explaining this lack of progress. What then sustains the current safety norm, sustaining a mismatched safety model in the face of challenge?

This research project explores this issue using interviews of healthcare safety practitioners in two New Zealand hospitals using semi-structured interviews. The critical-realist morphogenetic model of Archer was used to understand how the emergent structural, cultural, and agentic relations within the system create and maintain tendencies for action by agents within the healthcare system. This analysis helps to explore why attention is directed to certain approaches and solutions in safety work, while also highlighting what is left unexamined by current approaches.

This practical example of a critical-realism informed methodology demonstrates the potential this approach has for safety science. From this research it can be argued that this philosophy of science is well suited to examining issues such as the impacts of context, complexity, and emergence, as well as the role that individual agency has in creating safety. As such, it offers a potentially powerful new lens on the sociology of safety.

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Lund University, Lund 2021
Avdelningen för Riskhantering och samhällssäkerhet, Lunds tekniska högskola, Lunds universitet, Lund 2021.

Acknowledgements

This thesis represents the culmination of a two-year journey that has been incredibly rewarding, yet difficult. Who could have perceived at the start all the challenges that 2019-2021 would bring to studying on a course on the other side of the world? So much of what we took for granted has been upended, revealing the reality that the world is dynamic, uncertain, and complex. It could not have been a better background for the lessons we learnt in the course.

This thesis would not have been possible without the support of so many people whom I wish to acknowledge.

First and foremost, my thanks to all those who took part in the study. Your willingness to share the realities of work and your insights about the system are what has made this project possible.

Thanks also to my work whaanau in the Critical Care Complex, Middlemore Hospital, Auckland. This is a place full of brilliant people who have taught me so much about safety in the work that we do. Without the practical wisdom of Helmer Zjidel, Catherine Hocking, Pam Culverwell, Liz Bryce and Kylie Julian, my ideas for change would have remained just ideas.

To my colleagues at the New Zealand Health Quality Safety Commission whose humour, wisdom and support have meant so much as we try and find a uniquely Aotearoa way to apply resilient healthcare ideas.

My thanks also to the Resilient Healthcare Society, whose "short presentations followed by long conversations" showed me that there was another way to think about safety. In particular, to Erik Hollnagel, Siri Wiig, and the late Bob Wears for their support and guidance.

Studying safety science at Lund University has meant new friends from around the world and I could not have wished for a better class group to be a part of. The combination of academic challenge, humour, and mutual support made them all so much more than classmates.

To Anthony Smoker and my supervisor, Johan Bergstrom, my profound thanks for your guidance and support. You challenged me to push ideas further and yet I always felt as though you believed in what I was trying to do.

And finally, no journey is ever a solo one. The reality is that working full-time and studying meant no time for the most important people in my life. Without the unwavering support and love of my partner Philipa and my children, Nathan and Zoe, none of this would have been possible. I am grateful beyond words.

Riskhantering och samhällssäkerhet
Lunds tekniska högskola
Lunds universitet
Box 118
221 00 Lund

http://www.risk.lth.se

Telefon: 046 - 222 73 60

Division of Risk Management and Societal Safety
Faculty of Engineering
Lund University
P.O. Box 118
SE-221 00 Lund
Sweden

http://www.risk.lth.se

Telephone: +46 46 222 73 60

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1. INTRODUCTION

1.1 Still Not Safe

Twenty years ago, the publication "To Err Is Human" reported that up to 100 000 people died each year in the United States as a result of 'medical error' (Kohn, Corrigan, & Donaldson, 2000). The scale of this loss led to the 'patient safety movement', focused on reducing the harm to patients and families arising from healthcare (Wears & Sutcliffe, 2020). Patient safety incorporated the prevailing safety models of the time, especially Reason's work (Le Coze, 2013) with widespread recognition in healthcare of "error taxonomy" and the "Swiss Cheese Model" (Reason, 1990) as well as the need for a "culture of safety" (Reason, 1997).

However, these efforts often applied established safety approaches (Pronovost et al., 2006) without adequately understanding the underlying theory, or considering the impact of different contexts (Catchpole & Russ, 2015). Additionally, a focus on "quality improvement" meant safety was often conflated with reliability, leading to efforts aimed at reducing variability and ensuring compliance (Wears & Hunte, 2014). Not surprisingly, progress in improving patient safety has been disappointing (Vincent & Amalberti, 2016), coming nowhere near the hopes of a "50% reduction in five years" cited when these efforts began (Wears & Sutcliffe, 2020).

In the meantime, safety science has moved on, partially in recognition that prior models were a poor fit for the increasingly complex and interdependent world we experience (Dekker, Cilliers, & Hofmeyr, 2011; Hollnagel, 2011; Le Coze, 2013). Yet in healthcare only a few voices have been willing to challenge the status quo and call for new approaches that better match the dynamic, uncertain and complex nature of modern healthcare (Greenhalgh & Papoutsi, 2018; Hollnagel, Wears, & Braithwaite, 2015; Wears & Sutcliffe, 2020).

These calls have been particularly relevant with the SARS-CoV-2 pandemic highlighting the inadequacy of the old models of safety for this novel situation. In the face of uncertainty and urgency, frontline staff have had to rapidly reconfigure services in an attempt to prevent them being overwhelmed. This has required the collective action of many services working together to massively increase capacity and invent new ways to manage infection risks. Safety has therefore been related to how quickly and successfully the system is able to adapt, i.e. its *adaptive capacity* (Woods & Branlat, 2011).

Although the pandemic response is an extreme event, it highlights the dynamic nature of healthcare and how safety is constantly created through navigating changeable conditions. Given this, a key question is therefore, what maintains the bureaucratic approaches to safety despite their apparent mismatch to the realities of healthcare?

The catalyst for my research question was a paper by Wrigstad et al. (2017) which highlighted a shared safety norm across multiple accident investigations. Considering the discussions above, how was it that this shared norm came to be held across the entire system? What structural elements or shared meanings bound people into such a uniform view?

This is an important issue to understand, as any change to a social norm is likely to entail a degree of social risk and for change to spread, people will require *social reinforcement* that such a change is acceptable. If instead there are significant countering influences, these may act to resist change and reinforce the current state (Centola, 2018, p. 36). Making these influences visible is vital if we are to address them and change the current norm.

The aim of my thesis is therefore to explore the perceptions of New Zealand healthcare safety practitioners (HSPs) as a means of learning about the wider influences in the system. This group is of interest for several reasons:

1) These practitioners usually have a clinical background, meaning that they may potentially hold several differing perspectives on safety.

2) They represent the frontline face of safety efforts in many institutions, therefore impacting on the safety norms enacted in the clinical space.

3) The activities of HSPs provide insights into the overall priorities of the systems regarding safety.

4) The New Zealand healthcare context has universal no-fault insurance for accidents, including healthcare-related harm, in exchange for removing the right to sue.

By understanding the perspectives of HSPs and what influences they experience, I hope to make visible the wider structural elements that form and maintain the current approaches to safety, the 'safety norm'. By making these visible, it may be possible to explore how these structures came to be and what underlying drivers keep them in their current form.

1.2 Research Question

The research question that arises is therefore:

"What is it that sustains the current model of safety and its various expressions as the accepted norm?"

This central question can be augmented by related sub-questions that help identify the issues involved:

- How do HSPs acquire their understanding of their new role?
- What structural influences are apparent in this process?
- What does the activity of HSPs tell us about the model(s) of safety enacted by the wider system?
- To what extent can HSPs influence these structural elements?
- How do HSPs navigate any tensions between their current role and their previous clinical role?
- How did the current discourse on safety in NZ arise?

2. LITERATURE REVIEW

In seeking to answer these questions, it is important to be aware of the existing research related to this topic. This ensures the question has not already been addressed, as well as highlighting what existing knowledge may be relevant.

In this case the relevant literature is broad, covering the acquisition of social identity, the interplay of structure and agency, and the way in which sociotechnical structures are maintained or modified. These are issues at the heart of sociology and require a review of key concepts from the sociological literature rather than just the healthcare or safety science literature.

2.1 How Do Practitioners Learn About Safety?

Despite recent calls for the professionalisation of safety practitioners within healthcare (*The NHS Patient Safety Strategy*, 2019), staff involved often hold shared portfolios across quality improvement and safety. They predominantly come from a clinical background and transition to a safety role, rather than being generic safety professionals working in a healthcare setting. Interestingly, there is an absence of literature about the skills, roles, and practices of those involved in healthcare safety, although there is a wider literature on safety practitioners upon which we can draw.

One approach has been to examine the way in which groups acquire a shared meaning of 'safety'. Gherardi, Nicolini & Odella (1998) state that people do not learn about safety *per se* but rather that they learn collective practices and shared interpretations of meaning that develop in situated *communities of practice*. 'Safety' is instead a competence specific to that community of practice, explaining reported differences in the way people in various roles in an organisation interpret safety (Blazsin & Guldenmund, 2015; Gherardi et al., 1998). Entering a community of practice involves not only learning safety knowledge but also taking on a new professional identity and participating in the past and present practices of the community (Gherardi & Nicolini, 2000).

Further, it is at the boundaries between differing communities of practice that issues of power and influence are often revealed (Gherardi & Nicolini, 2000). Sitting in a 'meso' layer between clinicians and the wider system, HSPs are likely to interact with multiple other groups, each with their own representation of what safety is. These include management, regulators, clinicians, and the general public, all contributing different views and demands which must be navigated by HSPs (Provan, Dekker, & Rae, 2017, 2018). As such, the viewpoints of HSPs may reveal much about the tensions and influences on safety work within healthcare.

2.2 Exploring the Interplay of Structure and Agency

While the concept of 'communities of practice' offers one potential way to explore the research question, an alternative approach links this question to an issue at the heart of sociology: the relationship between the *agency* of people, individually or collectively, and the *social structures* which they inhabit. Various viewpoints on this relationship have been expressed in the differing views on safety seen in the literature.

Individualistic approaches to safety focusing on the actions of individuals were prominent in early safety efforts (Swuste, Gulijk, & Zwaard, 2010, p. 17) and can also be seen in *cognitivist* approaches such as "error taxonomy" (Reason, 1990, p. 207). These approaches position safety as wholly within the individual, either through their moral choices or cognitive failings.

By contrast, s*tructuralist* views posit that it is the configuration of structural conditions that *determine* function and human action (Giddens, 1984, p. 207). A form of structuralism is visible in Normal Accident Theory (Perrow, 1999) which sees safety as a structural issue of complexity and coupling, minimising the role of people within the system to effectively manage risk. Similarly, efforts to impose a normative 'safety culture'

(Guldenmund, 2000; Reason, 1997) may also be seen as structuralist, as they imply that behaviours change *deterministically* from the top down, rather than *emerging* from the collective actions of individuals (Silbey, 2009).

Using an altogether different approach, Berger & Luckmann (1966) advanced the view that rather than social structures existing 'out there', separate from social action, they too were *socially constructed*. Habitual actions become 'institutionalised', taking on the appearance of being external and objective, and these in turn act to socialise individuals, who internalise the social norms and knowledge (Alvesson & Sköldberg, 2009, p. 28). As such, *"people create their environment by making sense of it in particular ways"* (Le Coze, 2012, p. 1883). This view essentially banishes the structural, seeing it as being an illusory social construction without independent properties (Archer, 2010).

The relative contributions of the *determinism* of structure versus the *voluntarism* of agency, has been a central problem for sociology. Several differing approaches have tried to bridge this divide in a way that acknowledges that social structures are dependent on human action and do not exist in isolation from this (i.e. they should not be reified). Most prominently, Gidden's structuration theory (1984) avoids prioritising either structure or agency, seeing them not as two independent phenomenon but as a *recursive duality*, interrelated and inseparable as two different aspects of social practice. Structure in this setting refers to the resources and rules that agents call upon pre-consciously to inform their actions (Stones, 2001, p. 185). To date, structuration theory has had limited explicit use in safety science with only a few papers integrating this viewpoint (Furniss, Mayer, Franklin, & Blandford, 2019; Groves, Meisenbach, & Scott-Cawiezell, 2011; Hunte & Wears, 2013).

2.2.1 Effecting change in sociotechnical systems

Safety science has, albeit slowly, increasingly adopted a social constructionist view[1] (Le Coze, 2012), one that views people's actions as situated within a context of power, culture, technology and politics. This view is prominent in the High Reliability Organising literature (Rochlin, 1999) where safety is seen as arising from the agency of people to navigate dynamic conditions, changing the way they organise in order to meet the needs of the situation. It is also seen in how differing descriptions are possible about accidents (Dekker, 2006), as well as how these interpretations are influenced by issues of power and politics (Gephart, 1984). Likewise, it has moved discussions on 'safety culture' towards more *interpretivist* accounts of how culture emerges from the collective constructions of meaning by those within it (Silbey, 2009).

However, what remains unclear from all these accounts is how to exert influence within systems in the pursuit of improving safety, or indeed whether such influence is possible. For example, Gherardi & Nicolini (2000, p. 16) note that change imposed from 'outside' a community of practice risks being "received with suspicion or even outright rejection, as it fails to address the reality held by that community" (Blazsin & Guldenmund, 2015, p. 25). Rather, change is predominantly mediated through the collective and participatory behaviour of the community (Gherardi & Nicolini, 2000). This resistance to imposed change may partially explain why the structuralist approaches to safety in healthcare have had less impact than expected.

Social constructionist approaches to change may involve a process of "deconstruction followed by reconstruction" (Gergen, 2015, p. 26) . A common approach is to take a taken-for-granted truth and show that this way of viewing is not inevitable but, rather, is socially constructed. By problematising the issue, it creates the possibility of doing away with the current construction or at least transforming it (Alvesson & Sköldberg, 2009).

Other post-modern approaches such as Foucauldian discourse analysis examine the role of power in understanding how certain historical representations of meaning come to be, such as seen in Henriqson, Schuler, van Winsen, & Dekker (2014). By their nature, all these approaches challenge the idea that things

[1] Albeit a *weak* social constructionist view, one that acknowledges 'brute facts' outside of our socially constructed knowledge. This stands in contrast to *strong* versions of social constructionism which can be said to represent 'theories of reality' (Alvesson & Sköldberg, 2009)

need be how they are, highlighting the potential for change. Likewise, structuration theory highlights that while agents are habituated to certain practices, they can call on structures (resources and rules) to effect change in social practices at any time.

However, given this potential for agentic change of both meaning and practice, what is it that stabilises certain representations of safety in the face of changing discourses and a lack of progress in improving patient safety?

This question raises several issues that must be addressed when thinking about the approaches above as potential ways to answer the research question:

- The open, complex and diverse nature of the social world is poorly matched to modernist accounts of change (such as structuralism). Yet, these same features raise challenges to post-modern accounts where theory is seen as contestable and so difficult to test, that all accounts can be seen as equally valid (Pettersen, 2008, p. 29) . This potential for relativism leaves us with difficulties in how to progress knowledge (Sayer, 2000, p. 30).

- By treating structure and agency as two different aspects of social practice, structuration has been accused of "central conflation" (Archer, 1995, 2010) such that we are unable to examine the temporal interplay between them or understand their relative influence on the production and reproduction of society (Stones, 2001)[2].

- Material resources (and constraints) have an impact in determining which constructions are more likely or possible, i.e. not all constructions are equally likely. While these resources may have resulted from historical social constructions, they act as conditioning contexts on agents in the present (Sayer, 2000).

- By obscuring these potential mechanisms of stability and change, we may have few options to leverage the way a system functions (Pettersen, McDonald, & Engen, 2010).

While both constructionist and structurationist approaches provide potentially powerful new ways of thinking about stability and change, they leave some issues at the heart of the research question unresolved.

2.2.2 Critical realism and analytic dualism

One of the striking issues in my exploration of this literature was the supposed contrast in the ontological and epistemological stances between the natural and social sciences (Flyvbjerg, 2001, p. 1). While the natural sciences are characterised by the search for 'universal laws' (Humean constant conjunctions), the social sciences have largely abandoned this aspiration in recognition of the contextual and transient nature of social phenomenon.

However, in my workplace of Intensive Care, my experience of the natural sciences is much more in line with the description of the social world. For example, while it is known that certain microbes may cause infections, the expression of disease is markedly different between patients. The response to infection ('sepsis') is the result of multiple cascading influences that arise from microbe-patient and patient-treatment interactions. While studies may tell us about the disease in populations, the individual expression in a patient is emergent and uncertain. Progress comes from understanding more of the underpinning mechanisms while acknowledging the fallibility this knowledge has for individual prediction.

Likewise, rather than pursuing absolute answers such as "Is drug A effective?", we ask questions that reflect the conditional and contingent nature of our interventions: "which patients? at what time in their disease course? how does the past health context impact this?". Thus, my experience is of a semi-open system, where context matters and where emergence is the norm, much like descriptions of social systems (Sayer, 2000, p. 3).

[2] This issue is addressed in structuration by the methodological technique of "bracketing".

It is therefore not surprising that I am drawn to a philosophical position that is consistent across both natural and social sciences, and that acknowledges the problems created by complex, open systems. Based on the writings of Roy Bhaskar (1975), critical realism (CR) is a movement in the philosophy of science that posits:

1) There is a world that exists independent of our thoughts about it (realist ontology).

2) There are intransitive and transitive dimensions of knowledge: while our theories about an object of study may change (transitive), the objects themselves do not (intransitive). This division allows for the social construction of knowledge but also means that the world should not be conflated with our experience of it[3] (epistemological pluralism).

3) In contrast to empirical realism's claims that 'what we can observe is all there is', Bhaskar describes three domains of reality:

   > "The Real": this consists of objects, structures, and their potential causal powers, i.e. capacities to act in certain ways. These exist regardless of our awareness of them and whether or not they are activated.
   >
   > "The Actual": refers to what happens when and if the causal powers are activated and produce change.
   >
   > "The Empirical": this refers to the domain of experience, i.e. what is observable. Observable effects may also be used to make a plausible case for the existence of unobservable entities by reflecting on 'what must be so for this to occur?'

   This description allows for the possibility that causal powers[4] remain either unactivated or unobservable, meaning that what we observe does not exhaust all the possible ways things might be.

4) The multiple, interacting causal powers means that the world is characterised by *emergence*. This is particularly relevant given the sensitivity and reflexivity of people in relation to their context, meaning that social phenomenon may be fleeting and regularities impossible to identify (Sayer, 2000, p. 13).

Critical realism can therefore be described as having a stratified realist ontology and a fallibilist, socially constructed epistemology. It assumes open systems and accepts that the outcomes of the activation of mechanisms are always dependent on context (Sayer, 2000, p. 23). It also allows for unactivated or unobservable causal powers as well as for the central role of emergence. These characteristics make it a potentially useful philosophical stance for the research question and should allay any concerns that it is 'positivism by stealth'.

While a full description of the implications of critical realism is beyond this introduction[5], critical realist ideas have been used to develop new approaches to the central question of sociology regarding the relationship between social structures and agentic actions:

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[3] What Bhaskar calls the "epistemic fallacy" (Bhaskar, 1975)

[4] Causality here is quite different to Humean ideas of "constant conjunctions", instead acknowledging that causal mechanisms may lead to different effects due to other interacting mechanisms and changes in conditions This model of cause is more appropriate for open systems such as seen in sociotechnical systems. For an excellent discussion on this topic, I recommend Maxwell's article (2004) on causal explanations.

[5] For a broader reading on critical realism, I recommend the book *Realism and Social Science* by Sayer (2000)

1) While social structures exist only through social action[6], they have causal powers and emergent properties that are distinct from the agentic actions that formed them and as such may be analysed separately (Sayer, 2000).

2) Social structures are inherited from agentic actions of the past and act 'as if real' based on their causal powers (ability to effect change) on agents in the present (Bhaskar, 1979).

3) Agents are not passive to this influence and have reflexivity and choice: "we are simultaneously free and constrained and we also have some awareness of it" (Archer, 1995, p. 2).

4) By treating structure and agency as *analytically* separate[7], it is possible to examine the relationship between structure and agency and identify causal powers which exert influence (Archer, 1995).

5) Analytical separation allows for the possibility of *emergence* from the interplay of structure and agency (Gorski, 2013).

These concepts were further developed into Archer's model of social and cultural *morphogenesis and morphostasis* as illustrated below (Figure 1.):

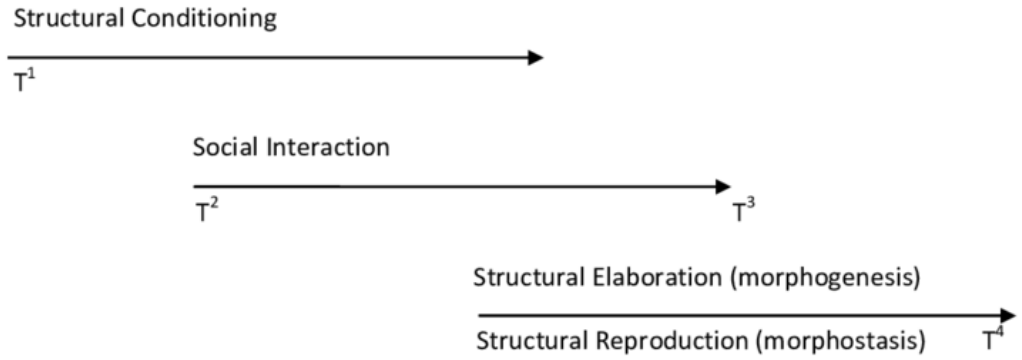

Figure 1. The Morphogenetic/static Cycle (Archer, 1995)

In this model (Archer, 1995), we see that:

1) structures constrain and condition agentic action
2) agents react, act, and interact through reflexivity and
3) structures are changed or maintained through structural elaboration or reproduction

A further important implication is that socio-material conditions cannot be reduced to the purely discursive (Reed, 2004). Rather, because the world comes 'previously structured' (Trigg, 2001, p. 235) actors face a set of institutionalised economic, political and cultural constraints that shape the *"conditions of possibility for sensemaking"* (Sims-Schouten & Riley, 2019). These constraints mean that not all discourses are equally available to actors (Fairclough, Jessop, & Sayer, 2002) and the social world cannot be seen as entirely discursive, as potentially implied in other post-modern approaches.

To date, safety science has had only limited engagement with CR ideas, with only Pettersen's work in the field of aircraft maintenance (Pettersen, 2008; Pettersen et al., 2010) explicitly acknowledging them.

[6] Critical realist approaches share the concern of Giddens that social structures should not be *reified* i.e., considered to exist independent of social action.

However, although Vaughan does not explicitly identify as such[8] (Vaughan, 2016), her work on the Challenger disaster (2016) could be described as critical realist given:

- her exploration of the inherited nature of social structures
- the treatment of those structures as having causal powers, analytically separate from the agency of individuals or groups, and
- her focus on the impact of non-discursive factors such as funding and physical location

In Vaughan's work we can perhaps see the potential explanatory role that a realist philosophy brings to understanding the emergent interplay of structure and agency in creating safety.

2.2.3 A way forward

This review has shown me that there is a large body of sociology literature that is highly relevant to answering my research question. Yet, these sociological approaches have not been widely applied in the safety science literature, despite their potential to progress the implementation of new models of safety. My hope is that this research project might contribute to enhancing our understanding of how safety norms are formed and stabilised, as well as how we might seek to change them in future.

[8] Somewhat predictably, given that critical realism remains relatively less well known in the U.S.

2.3 The New Zealand context

One of the key principles of realist informed research is that rather than a search for 'general laws', the focus is on understanding *local causality*. This acknowledges the contingent and contextual differences that exist in social systems and the way these impact on the activation of causal mechanisms. As such, it is important to provide some background to the New Zealand health system that enables us to see it as historically situated in a web of interrelated institutions, cultures, and practices, all of which impact on the system as experienced by HSPs.[9]

2.3.1 Ministry of Health

The Ministry of Health provides oversight of the healthcare sector, setting policy, providing funding, determining performance targets and standards. Responsibility for how best to arrange care to meet these central requirements within the budgetary constraints is devolved to the District Health Boards.

2.3.2 District Health Boards

District Health Boards (DHBs) are semi-autonomous, publicly funded health organisations within Auckland which are responsible for providing secondary and tertiary healthcare for around 550,000 people each. There are three DHBs within the Auckland area and this study was completed at the main hospitals for two of these DHBs: Auckland City Hospital and Middlemore Hospital.

The organisation of safety work within the two study DHBs is markedly different:

- Middlemore Hospital has Clinical Quality and Risk Manager (CQRM) roles which are part of each clinical directorate. The CQRMs are also part of an Adverse Events Operational Group which carries out reviews of adverse events. There is a Clinical Director of Patient Safety and Quality Assurance but no separate directorate and this is a non-executive role.
- Auckland City Hospital has a standalone Quality and Safety Directorate which employs Clinical Excellence Advisors (CEAs), who have oversight relationships with the Clinical Directorates. Some Clinical Directorates also have embedded quality and safety roles. There is an Adverse Events Review Committee which reviews serious incidents and includes senior medical and nursing staff. The Clinical Director of Quality and Safety is a member of the hospital executive team.

2.3.3 Accident Compensation Corporation

The Accident Compensation Corporation (ACC) was formed in 1974 to administer a public no-fault insurance scheme that covered accidental injuries, including harm associated with the provision of healthcare. This was expanded in 2010 to cover 'treatment injuries' without a need to show 'medical misadventure'. As part of the ACC reforms, the ability to seek redress through the tort system was removed (Bismark & Patterson, 2006).

2.3.4 Health and Disability Commissioner

The Health and Disability Commissioner (HDC) was established as an independent crown entity in 1995 as a counterbalance to the 'no-fault' system arising from ACC, to give patients and families a way of addressing episodes of perceived poor care. The HDC has the statutory responsibility for ensuring that the Code of Health Rights (*Code of Health and Disability Services Consumers' Rights*, 1996) is maintained. This predominantly involves dealing with complaints received about the care provided by healthcare practitioners and organisations, determining whether such care breached the Code. Of note, the HDC is legislatively focused on healthcare providers and organisations, with funding and governmental policy explicitly excluded from examination.

[9] Of note, a new round of structural healthcare reforms was announced in April 2021 which will lead to the abolition of District Health Boards and the formation of a single crown entity. The implications for the organisation of healthcare safety work remains unclear although there will inevitably be a period of uncertainty and upheaval within the NZ healthcare system.

2.3.5 Health Quality Safety Commission

The Health Quality and Safety Commission (HQSC) was formed in 2010 to support the healthcare sector in New Zealand by:

- providing advice to the Minister of Health on how quality and safety in health and disability support services may be improved.
- leading and coordinating improvements in safety and quality in health care
- identifying key health and safety indicators (such as events resulting in injury or death) to inform and monitor improvements in safety and quality
- reporting publicly on safety and quality, including performance against national indicators
- sharing knowledge about and advocating for safety and quality

Adverse Events Reviews

Carrying on from the 2001 Serious and Sentinel Event Healthcare Standard, and previous efforts to introduce root cause analysis (RCA) into healthcare in 2006/7, the HQSC introduced a standardised approach to triaging adverse events in 2011. This involved the use of the Severity Assessment Code (SAC) which assigned the response required of the DHBs based on the severity of harm associated with an event or the likelihood of recurrence. The likelihood criteria was removed in a 2017 revision of the SAC (see Appendix A).

The current SAC system classifies adverse events based on the degree of harm they have caused. SAC 1 (death or permanent severe loss of function) and SAC 2 (permanent major or temporary severe loss of function) events, as well as events on the 'Always Report and Review' (ARR) list must be reported to HQSC within 15 working days and a report on the subsequent investigation must be completed within 70 working days. These reports are aggregated into a national report to identify trends across the healthcare sector.

Less severe adverse events (SAC 3-4) do not require reporting and formal review and are usually dealt with at the clinical directorate level. Lower-level events may be reported to HQSC if they represent significant potential for learning.

The HQSC also supports quality and safety activities across the healthcare sector including training, quality improvement collaborations, conferences, health intelligence and national mortality review committees.

3. METHODOLOGY

It is important that any research project is clear on the underlying ontological, epistemological, and methodological assumptions in use and how these inform the methods used. These assumptions impact on every aspect of the research project and by making them visible, it enables the reader to understand the work better and enables me to reflect on the way they change my perspective.

3.1 Theoretical Underpinnings

For this research, I adopt a *critical realist* theoretical perspective based on the work of Bhaskar (1975), Archer (1995) and Sayer (2000) for the following reasons:

It is consistent with modern understandings of complexity, acknowledging the open and contextual nature of social systems.

It acknowledges a form of *ontological realism*, one that allows for the existence of discoverable tendencies and mechanisms that may be useful when thinking about how to effect change.

It treats structure and agency as *analytically separate* allowing for an examination of the interplay between them.

It allows for *epistemological relativism,* acknowledging that knowledge is socially constructed, and therefore allows an examination of the impact of various discourses on safety work in New Zealand healthcare.

It acknowledges the impact of extra-discursive or extra-semiotic influences within the system (Fairclough et al., 2002) such as resources and material properties.

It allows for *judgmental rationality*, seeing some descriptions and interpretations as more useful than others based on either being more coherent, less contradictory or having 'practical adequacy', i.e. the ability to explain more phenomena.

3.2 Reflexive Analysis

Reflexivity is an important part of research that allows the reader to understand the perspective that I bring, acknowledging that there is no 'view from nowhere' (Dekker, Nyce, van Winsen, & Henriqson, 2010). The experiences and relationships I bring to the research create a certain lens through which I view the world. Reflexivity is therefore about being honest with both the reader and myself about how my path has led to a certain situated view.

My aim in completing this research is to contribute to the ongoing discourse around safety, particularly in healthcare. This is largely driven by what I see as the gap between current safety approaches in healthcare which focus on retrospective judgment of clinical actions, and the realities of work in intensive care where safe outcomes are created despite the setting of uncertainty, time pressure and high stakes.

I began my training in medicine in 1991, just as the neoliberal reforms in New Zealand were under way. I witnessed the change from clinician-led to manager-led hospitals, the introduction of 'user-pays' approaches and the introduction of competition between hospitals as part of the marketisation of healthcare. Additionally, my education was reframed as being an individual good rather than a societal one, a clear change to the historical social contract.

An early interest in health economics and Evidence-Based Medicine (EBM) led me to write on the limitations of EBM as applied to the dynamic world of Emergency Medicine (Horsley, Kelly, & Epstein, 1999). The inherent tension between the positivist 'one true answer' of EBM (White & Willis, 2002), and

the realities of contingent and contextual answers to clinical questions has been an ongoing feature of my clinical life in Intensive Care Medicine[10].

I also need to acknowledge that beyond my current role as a researcher, I am a social agent embedded in the social structure of clinical and safety work in New Zealand and overseas. My views have been heavily influenced by being part of the Resilient Healthcare Society (previously Network), discussing safety with Erik Hollnagel and Bob Wears as well as many others. Being part of this group has been an important part of my self-identity over the last 6 years and has undoubtedly influenced my views on safety.

My prior expectations of the HSPs I interviewed were that they would be enculturated into certain views of safety and potentially not be aware of the realities of clinical work. I had also expected that the HDC would be a large driver of action through enforcing a bureaucratic 'policy as protection' approach.

Another concern was whether interviewees would try to say what they thought I wanted to hear, based on having attended my previous talks or knowing my involvement with HQSC in patient safety. Likewise, my clinical role as an ICU specialist (as well as my gender and age) creates a power dynamic that could change the interactions within interviews.

Finally, this research question arose from trying to understand why healthcare safety seems to have been stuck in a late 1990s approach, foregoing concepts such as emergence and complexity that seem well suited to the realities of healthcare. My hope is to understand how I might use this research to implement a more modern approach to safety in New Zealand healthcare.

3.3 Methods

My original methodological inspiration for the research question was *critical-realist critical discourse analysis* (Fairclough et al., 2002). This approach was appealing as it allows for ontological consistency and addresses the way in which inherited structures influence both agentic action and the selection of certain discourses.

This qualitative approach seeks to generate historical narratives that make visible the social structures that condition meaning making and agency. This necessarily includes the consideration of power, ideology and how socio-material conditions shape the discourses available. It also involves examining the complex, dynamic relationship between the socialising influences of structures and the collective agentic actions which transform or reinforce them.

However, the time constraints and potential breadth of discourses available has meant that I have had to limit my initial project. Therefore, the focus is on a critical realist examination of the structure-agency relationships of HSPs in two New Zealand hospitals, with only a limited examination of the influencing historical discourses.

Critical realism as a philosophical stance is *methodologically pluralistic,* i.e. it allows for many potential methodologies and methods including both quantitative and qualitative approaches. Additionally, rather than seeking to generate social laws, the aim is to understand *local causality* (Maxwell, 2012, p. 37). This means understanding what causal mechanisms lead to a safety norm situated in this particular context.

This research question requires an *intensive* approach (Sayer, 2000, p. 21) which seeks to produce a causal explanation of the production of the current safety norm, rather than an *extensive* approach which would aim to provide descriptive 'representative' generalisations (for example through survey data). As such, my research takes a qualitative approach, using interactive interviews to understand the relationships, functions and processes that impact on HSPs.

[10] The answer to any question posed to an intensive care specialist is always "It depends…"

3.3.1 Recruitment

All those working in identified safety practitioner roles at Auckland City Hospital and Middlemore Hospital were approached as potential participants. These were identified through contacts within the two DHBs but approached independently. An invitation to participate, together with an information sheet and consent form was forwarded to potential participants.

Additional efforts were made to ensure that participants represented a diverse set of viewpoints including from multiple hospital settings and a variety of cultural viewpoints. This was an important part of meeting the obligations arising from *Te Tiriti o Waitangi*, Aotearoa/New Zealand's founding document (Hudson & Russell, 2009).

Of the 35 potential HSPs invited by email, 16 agreed to participate. One HSP was recruited by a colleague following their interview, and a final HSP was approached directly as they had been identified by other interviewees as having enacted significant changes to their local safety system.

HSPs who accepted the invitation to participate were contacted and offered either virtual or in person interviews at a location and time that was convenient to them. The sites for the interviews were chosen to be quiet and private, ensuring that conversations remained confidential.

3.3.2 Interview questions

The interviews were semi-structured (see Appendix B) to ensure that key topics were covered reliably but still allowing for a wide ranging discussion between the researcher and the interviewee that responded to the issues raised in the conversation.

3.3.3 Recording, transcription and analysis software

All interviews were recorded using a UX560 Dictaphone (Sony Corp., Japan) with recordings transferred to an encrypted USB drive. Recorded interviews were transcribed using NVivo Transcription (QSR International) with manual fidelity checking and editing. Transcripts were imported directly into Nvivo for coding and ongoing analysis.

3.4 Ethical Considerations

3.4.1 Ethics review process

Prior to commencing the research, approval was sought from the Auckland Health Research Ethics Committee (AHREC) as it involved research carried out on and by staff members of two District Health Boards within Auckland (Auckland District Health Board, 2020). This process also included gaining locality approval for each hospital involved, as well as submission to the local Māori Research Review Committee. The requirements of AHREC were consistent with the Research Practice Guideline of Lund University regarding both the need for Ethical review and the requirements for informed consent (www.researchethics.lu.se).

AHREC approval was granted on 10 August 2020, valid for three years: Reference number: AH2889 (see Appendix C).

3.4.2 Data protection and privacy

Given the potentially sensitive nature of the work being discussed, a high degree of confidentiality was required. Numerical codes were assigned to each participant to maintain confidentiality. All recordings were stored securely and all identifying data was removed from the transcripts, such that no individual could be identified and linked to particular data. Data was stored on encrypted USB drives including scanned copies of any paper consent forms, which were destroyed. Transcription and analysis software was selected based on meeting data protection standards. All recordings were destroyed at the completion of the research project.

3.4.3 Voluntary participation and consent

Participation in the study was voluntary and consent was sought for participation, audio recording and the use and storage of data. Obtaining consent was viewed as an ongoing process of seeking and maintaining consent. For this project, this began with an educational session regarding the research and continued with an email invitation to participate that included a participant information sheet (see Appendix D) as well as a written consent form (see Appendix E). Additionally, consent was reconfirmed prior to commencing the interview.

Participants were informed that they were able to remove their consent and if done before 1st November 2020, their data would not be included in any analysis. No participants chose to withdraw consent.

Participants were also offered the option of receiving recordings and/or transcriptions of their interviews as well as the final report when completed.

3.4.4 Funding

The interviews and coding of the interviews were completed during my sabbatical as an employee of one of the DHBs involved in the research project. There were no additional sources of funding for the study beyond this.

3.4.5 Reimbursement

There were no financial or 'in kind' reimbursements or inducements offered to participants.

3.4.6 Conflicts of interest

This project work is in partial fulfilment of the requirements for the MSc in Human Factors and System Safety at Lund University.

I also hold several positions in the New Zealand health system that might influence the research and which I recognise have the potential for a perceived conflict of interest. These include being:

- a senior intensive care specialist at one of the study DHBs
- a member of a DHB safety governance committee and a safety advisor to departments at the other DHB
- a previous and current collaborator with participants on a variety of safety projects across both DHBs
- the Clinical Lead for Patient Safety for the HQSC
- a public advocate and speaker on Safety-II/Resilient Healthcare

The potential impact of these roles is two-fold: firstly, they risk creating the perception of power imbalance and secondly, that the 'insider' norms shared as a clinician could impact on my role as a researcher (Toy-Cronin, 2018). These issues were considered in all aspects of the research project including how staff were identified and approached, the consent process and the interviews themselves. As part of this process, I kept a journal outlining the issues that arose, what their perceived impacts were and how they were navigated (Gillam & Guillemin, 2019).

3.5 Analysis

Analysis of the interviews will cover four interrelated areas:

1) describing the way in which HSPs come to understand what the role involves
2) describing the context of HSP work, i.e. the realities of the wider healthcare system
3) analysing the way in which structure-agency relations constrain and condition HSP work
4) describing the unintended consequences of the safety system as described

The most analytically demanding of these is determining the structure-agency relationship in operation in this setting. While CR is methodologically pluralistic, guidance on CR based analytical methods have been comparatively lacking. The analysis approach used here is based on Fletcher (2017) as it is an interview-based study that has a clear description of a CR-informed analysis.

CR treats the world as 'theory-laden, but not theory-determined' and as such, the analysis approach relies on an overall abductive process, a going back and forward between local empiric findings and the relevant theories. For this project, I have used Archer's morphogenetic cycle (Archer, 1995) as the relevant theory to inform my analysis, as it represents the most prominent of the critical-realist informed approaches to the issue of 'structuration', exploring the emergent interplay between structure and agency

The CR analytic approach can therefore be broken down into three distinct phases:

3.5.1 The identification of demi-regularities

The initial stage is the search for 'demi-regularities' within the interview data. These are not Humean 'constant conjunctions' but rather tendencies that may provide clues to potential causal mechanisms in action. The aim is to provide thick descriptions of the "system as experienced" by HSPs.

Coding of interview text involved creating two kinds of codes: organisational and theoretic (Maxwell, 2012). Organisational codes were used to sort the empirical information that arose in the interviews, ensuring that subsequent analysis remained linked to interview data. Theoretic codes were derived from elements of the morphogenetic cycle, such as structural conditioning and agentic action. These latter codes reflected the theory informed view I was bringing to the analysis.

Second order analysis involved the reorganisation of individual organisational codes into conceptual themes. The aim was to ensure these represented the reported realities of HSPs, although reformulated at a higher level of abstraction.

3.5.2 Abduction

Abduction involves a theoretical redescription of the experiences of the interviewees using the relationships between structural conditioning and agentic action described in the morphogenetic cycle (Archer, 1995).

The focus is on understanding the way in which the unique historical, social, and political context of these HSPs acts to condition and constrain their agency. This influence arises from the particular structural, cultural and agentic internal relations that emerge and which are recognisable from their properties of pre-existence, durability, autonomy and causal efficacy (Parker, 2000, p. 79). These internal relations act to create situational logics, opportunity costs and power relations which then create non-deterministic tendencies for action by HSPs (see Figure 2 below).

Making these influences visible involves going back and forward between the segmented categories of coding and the contextual narratives within the interviews that help explain the relationships between them (Maxwell, 2012, p. 122). Additionally, because CR acknowledges that all knowledge is fallible, a particular focus is on examples that run counter to the theory in use.

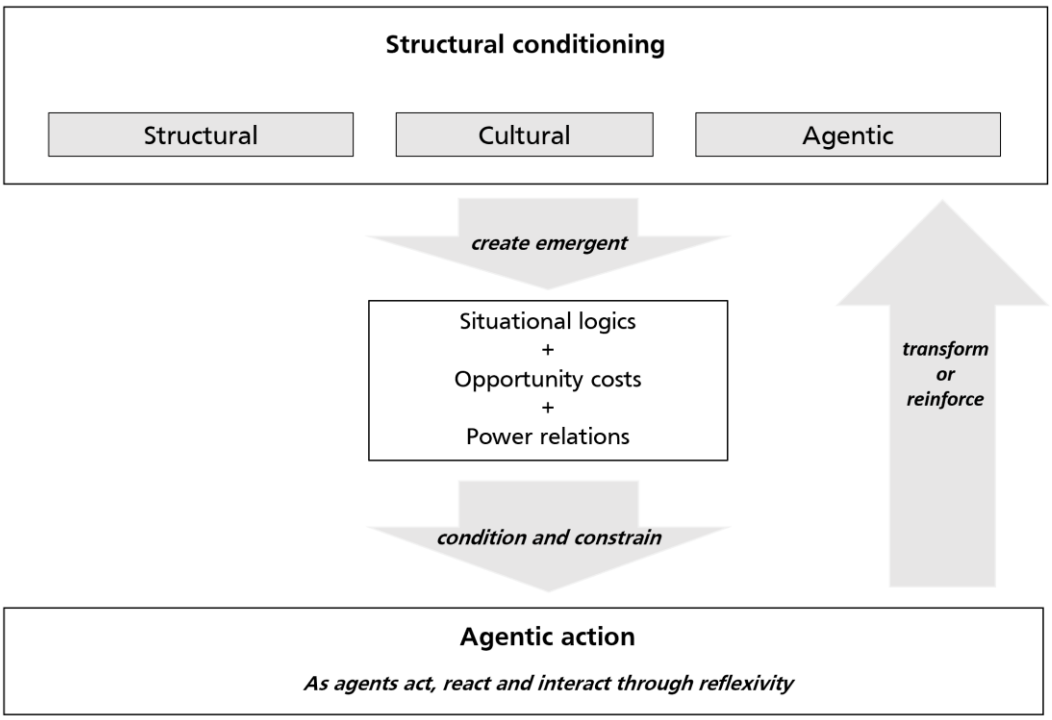

Figure 2. The relationship between structural conditioning and agentic action (based on Archer, 1995)

3.5.3 Retroduction

The final stage is that of *retroduction* which focuses on causal mechanisms and conditions. The aim is to consider 'what must be so' and to propose necessary social conditions that explain the local empiric findings. Given the emergent nature of the social world, the aim is to develop an understanding of the necessary conditions that led to these findings, in this context, at this time.

One of the key outcomes of successful retroduction is to modify, support or reject existing theories, in this case both the morphogenetic theory but also any underpinning enacted theories of the healthcare safety work.

3.5.4 Validity and reliability

Realist positions challenge ideas of validity and trustworthiness based solely on procedural criteria: *"Validity is a property of inferences. It is not a property of designs or methods, for the same designs may contribute to more or less valid inferences under different circumstances"* (Shadish, Cook, & Campbell, 2001, p. 34). It is not just how the data is generated but what the data allows the researcher to conclude (Maxwell, 2012, p. 212), and this depends on the interaction between the method and the particular research question and context. This may include (Maxwell, 2012, pp. 133-148):

> **Descriptive validity:** ensuring the factual accuracy of the accounts. This may include both what people say but also how they say it (e.g. stress and pitch) as well as ensuring that the research accounts do not omit the things held as important by those being interviewed.
>
> **Interpretative validity:** ensuring that the account represents the perspectives of participants rather than that of the researcher. This still requires a degree of interpretation and is therefore subject to concerns about reliability, i.e. that different researchers will interpret the accounts in different ways.

Theoretical validity: this refers to the account's validity as an explanation of some phenomena. It relies on the validity of the theoretical concepts themselves as well as any proposed relationships between them.

The aim is therefore to seek evidence to rule out plausible threats to the validity of the interpretations and conclusions drawn from the study. Evidence must be assessed through an understanding of the context and purpose it has, as well as the way it was generated (i.e. methodology).

In this study, I have attempted to identify and address validity threats through the following strategies, based on Maxwell (2013, pp. 243-245):

- The interview duration was long enough for discussions to move beyond the initial expressions of how the idealised system worked and to engage in discussions on the frustrations, contradictions, and limitations of the system, enabling a more nuanced view to be expressed over the course of the interview.
- Interviews were transcribed to enable the generation of 'rich data' (detailed and varied) allowing a nuanced description of what was going on from the perspective of those interviewed. However, only limited non-verbal information was included (such as laughter). Any quotes were checked to ensure that the contextual meaning of the quote was preserved.
- Discrepant or negative cases were intentionally sought to avoid confirmation bias regarding identified causal mechanisms. These were examined to understand what they revealed about any proposed findings or causal mechanisms, and how they might add to any explanations.
- Using two sites and a diverse range of interviewees (age, gender, role, and professional backgrounds) enabled a more extensive picture of the system through triangulation. However, time and resource constraints meant that other information sources (such as accident reports, HDC responses etc) were unable to be examined to increase the types of data used.
- The use of the two sites with differing structures allows for a comparison between them as well as being able to separate out which influences were local, and which were systemic influences (i.e. a shared influence across the DHBs)
- The initial descriptions and explanations were presented back to those being interviewed. These 'member checks' allow for a form of external review of the interpretative validity, although these are subject to their own limitations and problems (Maxwell, 2004, p. 259).

4. RESULTS

4.1 Interviews and Demographics

4.1.1 Interviews

A total of 18 interviews were conducted with a mean duration of 81 minutes (range 64 – 99 minutes). All interviews covered the original semi-structured questions but also covered many additional aspects of the safety system, led by the issues raised by the interviewees and their previous experiences.

4.1.2 Professional background

All of those interviewed came from a clinical background (described in Table 1 below), with nurses making up the bulk of those working in dedicated quality and safety roles. This is consistent with quality and safety work being a recognised career pathway for senior nurses and was reflected in descriptions of previous senior nursing roles held by interviewees.

Table 1. Professional Background of Interviewees

Professional Background	DHB1	DHB2	Total
Nursing	6	3	9
Medical	1	3	4
Allied Health	1	2	3
Other	1	1	2
Total	9	9	18

There was a notable difference between the two sites with DHB2 having more medical staff involved in quality and safety. This is likely to reflect the different structural arrangement of safety work between the two DHBS, with a separate directorate for Safety and Quality at DHB2, with medical staff in senior leadership roles as well as dedicated roles within the clinical directorates.

4.1.3 Roles and experience

The interviews captured a wide variety of roles and levels of experience regarding safety work. Some of those interviewed had been involved since the start of safety efforts in New Zealand, witnessing the changes in safety thinking and what was required from their roles over time. Others commenced their HSP work more recently, inheriting safety practices that were more established.

Table 2. Roles and Experience of Interviewees

Roles	DHB1	DHB2	Years of Experience Mean (Range)
Clinical Directorate HSPs	3	4	7 (2-12)
CQRMs	5		9.5 (1-20)
CEAs		2	13 (3-23)
Quality & Safety Management		2	6.5 (2-11)
Other roles	2		9.5 (5-14)
Total	9	9	8 (1-23)

4.2 The Socialisation of Health Safety Practitioners

This initial section explores the way in which HSPs came to be socialised into their new safety specific roles. It allows us to examine how it differs from descriptions in other industries (Provan et al., 2017, 2018) as well as comparing it to the ideas of Gherardi & Nicolini (2000) on communities of practice.

4.2.1 'The baggage we bring'

The HSPs' previous professional backgrounds provided a pre-existing *clinical* community of practice with its own shared meaning of safety. The interviews described how the model of safety they learnt in clinical practice was based on deontological ethics, the duty of care to an individual patient that arises from the professional relationship.

> *'You know, as clinicians, it's been drummed into us since, you know, 18 years-old that safety is number one. You know, first do no harm… Because that is-- that is the underpinning principle for every clinician, right?'* (INT1)

Two of the interviewees also described significant safety incidents which they had been involved in during their previous clinical practice. They outlined how these had impacted on them at the time and how the events had informed their future safety work.

Several HSPs also described the blame-centred approach to safety they experienced in training, even describing the way they in turn adopted this as they moved into leadership roles, replicating the behaviours they had seen modelled.

> *'I trained in the 70s... under hard charge nurses that if you didn't do the right thing, you got yelled at from one end of the ward to the other, so you never did it again. So, you learnt.'* (INT11)

While this experience of blame was limited, other examples highlighted how they came to understand what it meant to live up to this duty of care. These descriptions of early career learning often focused on safety as being about compliance with written policies or procedures.

> *'So, I guess… when I graduated or even as a student, you kind of learn right from the outset around safety. We've gotten policies, procedures, guidelines in place that we refer to. We have people in specific roles that provide us with, you know, those mechanisms to be able to practice safely… and in turn, it means keeping our patients safe.'* (INT14)

Additionally, the clinical training descriptions focused on individual skills or knowledge, without necessarily considering the way in which the system impacted on the delivery of care. Good care was seen as a professional, and hence individual, responsibility. These cases provided an interesting starting point in understanding the way in which HSPs' understanding of safety changed as they transitioned into their safety roles.

4.2.2 Muddling along

It was apparent from many of the descriptions that HSP work was often poorly delineated and the expectations of what the role entailed were not immediately clear to them when they started. There was often a significant time period required to understand what the job involved and how to complete the safety related tasks required of the role.

> *'... it was learned over time, and it was just about what felt right for me personally. There was never... I think hospitals over time just expect you to investigate. There wasn't always the right way or that I was aware of, you know, they expected you to investigate the incident and make sure it never happened again. That was all they expected. How you did that and how you managed that was how you did it.'* (INT9)

In the interviews, there was a sense that the HSP role was predominantly defined by the tasks required to be completed, rather than as a practice to be learnt. This may reflect that HSP roles are relatively new in

healthcare, with few established practices or, alternately, that HSP work remains necessarily underspecified and highly differentiated with staff responding to local demands.

4.2.3 Training for safety

None of the HSPs reported having dedicated safety science or human factors qualifications. Additionally, there was no set curriculum for becoming an HSP, with interviewees acquiring exposure to a variety of training sources over time.

> *'So probably the first year I didn't really have anything formal and then I started moving and realizing what was around, and being a bit more assertive about what was needed.'* (INT4)

For several of the HSPs, the introduction of the Serious and Sentinel Events standard in 2001 and the subsequent training on Root Cause Analysis in the mid-2000s, (provided by Communio, a private contractor) represented the first formal safety science education for HSPs working at that time. This training introduced people to thinking about the impact of the system for the first time.

> *'Communio, and subsequently HQSC when they ran programs, there was a lot more discussion about... what is actually the cause of an event and what are the barriers too. So, there was a lot of teaching around systems and processes and barriers and forced, um... solutions with... forcing functions, that sort of thing. So... so I think that we... our minds were expanded about, or our concepts were expanded so that we... had a broader understanding. And I think that influenced the way-- it changed the way we did the reviews.'* (INT17)

The HQSC continued to provide training on accident investigations and ran several safety related programmes. Many of the HSPs had been involved in this training, although some felt it was overly simplistic for the realities of their work.

Interestingly, a variety of other sources of training were referred to as 'safety-related' including health management, project management and quality improvement courses and qualifications (such as Lean Six Sigma). The extent of safety science knowledge contained within these courses was unclear, but participant descriptions included references to quality improvement methodologies and root cause analysis.

4.2.4 A community of practice

Some of those who had been involved early on as safety and quality initiatives were introduced into healthcare had minimal support at first. However, over time HSPs developed a sense of belonging to a collective group, one which helped them learn the requirements of the role. HSPs also learnt what made these practices more effective, emulating the approaches they found most useful.

> *'You learn, you learn from being involved with reviews and talking to other people who've actually done them well. But there wasn't really one course or one bit of training, which was particularly useful, it was more an iterative process over four or five years.'* (INT8)

Additionally, the community of practice of HSPs was influenced by their previous clinical backgrounds as well as their ongoing relations with clinical staff. Rather than seeing staff as the 'object' of safety efforts, HSPs were also learning about different clinical contexts and the realities of work.

> *'And yeah, I was learning from these people, and I was also... and then also learning from... well... forming my views, I suppose, from what I experienced in my interactions with clinical people.'* (INT17)

This community of practice had previously extended beyond the individual DHBs, with an annual national conference providing a forum to share practices. This sense of community was lost when the conference was discontinued a few years prior. This loss was clearly felt by several of those interviewed, who described a lack of opportunities to acquire and share safety related knowledge since that time.

4.2 Section summary

The interviews did not identify a strong community of practice which socialised HSPs into long-established practices, such as described by Gherardi & Nicolini (2000). Rather, HSPs were socialised into their roles through the demands of the various safety-related activities required by the DHBs and other external agencies. The interviews identified a wide variety of sources of learning that helped shape the individual approaches HSP took to meeting these requirements.

All the HSPs interviewed were either former or current health practitioners, who subsequently acquired safety related knowledge and practices. This stands in contrast to other industries which may have multiple practitioner pathways, including generic safety practitioners who enter into a particular practice setting and develop the required knowledge of the context (Provan et al., 2018).

4.3 Shaping the Conditions of Action

This chapter focuses on building an understanding of how the structural, cultural, and agentic relations present within the HSPs' work context come together to create particular situational logics, opportunity costs and power relations. Understanding these relations helps to formulate potential explanations of how the current safety norm has arisen and been stabilised.

4.3.1 The context of HSP work

The interviews identified several major themes that described the structural context of HSP work, providing a rich description of the 'system as experienced' by HSPs.

4.3.1.1 A stretched system

A recurring theme in the interviews related to the reality of the healthcare context in which safety work is done. There were many descriptions of the pressured nature of providing care within the DHBs and the impact this has on both staff and patients. Financial and resource constraints were ubiquitous issues and HSPs who had been in the roles for longer periods described seeing progressively increasing demands alongside significant financial restraints that limited the ability of the system to respond.

> *'But now every dollar counts. You know, every dollar has to be put to the right use. And the constraints of the facility, staffing and money is just, has become the biggest stress. The whole place has changed.'* (INT4)

This production pressure was seen in multiple descriptions of the hospital operating like a factory, focused on maximising production. This included descriptions of operating theatres under constant pressure and wards running over capacity. This focus on 'production' in an increasingly tightly coupled system led to managerial pressure being applied on staff to keep the system flowing, as in the following description of the need to discharge patients from wards to create space to admit from the Emergency Department (ED).

> *'You've got your leader here who gets it from up here. You know, patient flow, get those patients out of there, we need to decant ED, there's-- So, then it's hurry up and, you know, get those patients out of here. You know, what's the holdup?'* (INT14)

HSPs described the risks that arose in the system as clinical staff struggled to meet these increasing demands. This included a wide range of examples ranging from the risks created from patients arriving in overloaded wards through to examples about the increasing pressures on outpatient waitlists.

> *'We have more patients than what we... we have more patients than what fit the criteria to go out there, so we've had to move our criteria... constantly. And now we seem to have lost control of our criteria because we are pushing the boundaries.'* (INT11)

There was also a recognition that not only was demand increasing, but that there was inherent unpredictability in the timing of the demand. This created issues regarding how best to meet these peaks of demand and whether this was, in fact, possible.

Further, interviewees reported that both the needs of the patient and the care system itself had become more complex. These new demands required many services to work together, increasing coupling whereby one part of the system was highly dependent on another, as in the following example related to care pathways for cancer.

> *'So, it's really to understand how each system is connected by the cancer pathway. If you don't get the imaging done on time, how it impacts everything else. For us, okay, we didn't do the imaging but the risk of not getting imaging done is just one part of a wider risk of the whole oncology treatment side of things being out of kilter.'* (INT12)

Descriptions of escalating demands and limited resources were linked with reports of clinical staff having to make trade-off decisions, deploying scarce resources where they would have the most impact.

> *'So, we'll have to stretch from somewhere else and put them here. So, we will spread the butter thinner.'* (INT12)

Interviewees described how the need to keep the system flowing and deal with unanticipated issues often came at the cost of patient-centred care. These descriptions were consistent with Efficiency-Thoroughness trade-offs in action (Hollnagel, 2009) as staff balanced the need for quality care with the operational demands of the system leading to the need for workarounds.

> *'But it is an ongoing challenge and I think that's why I, um-- people, you know, when-- they will take shortcuts when they need to, um, not because they're actually trying to take a shortcut, but they're actually trying to actually meet the needs of as many patients actually as they can, and actually they think, you know, they actually-- ah, genuinely actually aiming to do the right thing, um, to, yeah, for all their patients.'* (INT15)

Overall, the picture of the DHBs was one of systems under immense pressure where production demands created dynamic risks as clinical staff sought to balance the needs of individual patients with the overall patient care needs of the wider system. HSPs seemed to have a firm grasp of these realities and the risks to safety that they created.

4.3.1.2 Bureaucratic safety

When describing the practices that defined their work, the interviewees generated many examples of safety-related bureaucratic activities. These included both the activities by which they monitored the control of risks and safety on the clinical floor, as well as the way in which their own work was made visible and verifiable to others.

There were recurring descriptions of the proceduralised nature of clinical work, including the ubiquitous use of written policies and practice guidelines, the training of clinical staff to ensure standardised competencies, and the frequent auditing of clinical processes.

HSP work was similarly bureaucratic with a wide array of activities including incident reporting systems, complaints management systems, document control systems, risk registers and 'safety dashboards'. The overarching theme was of a highly bureaucratic system of formalised information flows, defined roles and standardised processes.

There were many examples given of how this proceduralisation added to organisational safety whether by enabling the escalation of risks through the organisation, by ensuring a more structured approach to investigations, or by providing protection for both the organisation and its employees.

'So, it's there as, sort of, the protection of employees from an organisation point of view that, you know, they they've put those down because that's what you've—that's-- to keep your employees safe, this is what you need to follow. And then from an employee's point of view, that you're working within the constraints of the organisation. So that was always my thoughts as to why we have them.' (INT3)

However, the interviews also revealed that many HSPs questioned the value of these bureaucratic activities in improving the quality of clinical care within the system. The safety activities instead risked being focused on 'ticking the boxes' rather than supporting safer care.

'And that's... and it is-- that was sort of what we sort of grappled with is how do you... get staff to focus on their sort of assessment of that individual? What's going on for this individual versus they're overwhelmed with actually we've got to do a falls risk assessment, a pressure injury assessment, and care plan. We've got to update that each day. And it's a tick box versus- a task versus actually a patient in front of you.' (INT15)

The interviews explored the perceptions of HSPs about several routine bureaucratic safety procedures and highlighted that assumptions about the effectiveness of these might be misplaced, as described below.

Example 1: Bureaucratic safety and the normalisation of deviance

The risk register involves collating reported risks and assessing their likelihood and potential impact. Risks are then prioritised with formal decisions about whether to accept or mitigate the risk. The interviews highlighted two different functions of the risk register:

1) making problems visible and escalating them
2) documenting risk to protect staff from future critique

HSPs gave varying descriptions of the balance of these two functions, with some seeing it as a purely bureaucratic exercise whereas others were more optimistic about the role it had for both escalation and protection:

'It's a bit of a formalization so that we acknowledge to our frontline staff that, you know, we support you, we acknowledge this issue, we're protecting you. And we also want to feed this up transparently to the powers that be, to-- to have this conversation, you know. That-- that we're-- we don't throw staff members under the bus when it's a systemic sort of issue.' (INT1)

The cost implications of mitigation efforts were mentioned frequently as an influence on decision making. Several accounts described situations where risks that had been accepted through the risk register process later resulted in harm, such as the following example of serious harm arising from long outpatient review times.

'And then, so there was quite a deep dive into "How the hell can this happen? How did we not know?". And I thought, it's been on a risk register since 2009, which it has. And every month I updated it. To the point where they've got all these archived updates.' (INT11)

The decision to accept the risk was often revised once a serious incident occurred, however such an event did not necessarily provoke wider reflection on the risk register process itself. Indeed, the processes by which risk was assessed and accepted were similar to the descriptions of "normalisation of deviance" from Vaughan (2016), whereby the formal bureaucratic process provides false reassurance that the risk is quantified and manageable.

'Yeah, I think- I think people have a false sense of security. We've put it on the risk register—It's on the risk register, it's been... it's been acknowledged.' (INT13)

The safety system also created a trade-off for HSPs between efficiently meeting the bureaucratic needs for timely 'procedural closure' versus giving the attention and resources required for deeper learning about issues.

> *'I think some directorates, you know, they just want to get it signed off because they have, you know, their managers are managed above saying "This is overdue, this is overdue, you need-- you know, you need to look at it. You need to sign it off, you need to close it". Because they in turn have got pressure from people up above that they've got open and overdue incidents.'* (INT13)

This combination of a bureaucratic approach to safety and the need for procedural closure often led to 'bureaucratic entrepreneurialism', whereby the solution to any safety issue was more bureaucracy. This often came in the form of additional procedures, increased documentation demands, or further auditing. The cumulative impact of these was increasingly burdensome to clinical staff.

> *'You know, all the way along we had these things way back when with Lean thinking and production-based models. We had the productive ward, we had 'Releasing Time to Care'. So, trying to give nurses more time to provide care. I actually think that really what we were looking at and what we've been doing more and more of is releasing time to measure or releasing time to audit. So, any free time is taken up by auditing and measuring the care that we provide, rather than actually working out what it is we need to do to provide better care.'* (INT7)

It was also notable that HSPs felt that the demands of external agencies often inadvertently reinforced this bureaucratic approach. For example, HDC enquiries often focused entirely on the adequacy of bureaucratic controls and required organisations to rewrite or add procedural requirements for staff, despite HSPs recognising these as particularly weak systems interventions.

Another example given was how the HQSC requirements for the timeliness of submitting Reportable Event Briefs (REBs) often became the de facto goal of the adverse events process, rather than being focused on the quality of the learning generated.

> *'A bit like the adverse event review reports, which HQSC says you must generate, we don't care if you follow up and find out what recommendations are enacted or not. But we must have an REB A and an REB B by 15 and 90 days and then you're sweet.'* (INT3)

Likewise, work undertaken to meet HQSC determined safety measures focused on activities being completed, regardless of whether such interventions were likely to influence safety, as seen in the following discussion relating to the falls prevention programme.

> *'…it was driven by the system more than it was driven by the desire or the need to provide better care. And part of that is that the measures, the HQSC safety marker measures aren't about the quality of the implementation plan. It's just, have you done one? It's not, 'is it a good one?' Is it—It's not-- Is it one that meets the actual needs of that patient? It's 'have you done an implementation plan?' You could be doing completely the wrong thing, but you've checked yes, so you're doing something.'* (INT7)

The cumulative impression from the interviews was of a bureaucratic system designed *at all levels* to seek comfort and assurance that safety was being managed effectively, rather than a system for making visible and learning about the dynamic risks that threaten safe, high quality care.

4.3.1.3 Fragmentation and difference

The interviews described a safety system that was fragmented both structurally and in the way that information flowed within the organisation.

At the macro-level, there were a multitude of institutions involved in the oversight of healthcare, each of which attended to certain issues e.g., the HQSC aggregates national adverse events reports, WorkSafe regulates and oversees occupational health and safety, the HDC examines complaints from patients and families, and the professional councils oversee practitioner competencies. Rather than a single system, the

healthcare operates as a web of interconnected relationships between different organisations and interest groups.

Likewise, the DHB cannot be thought of as a single entity, but rather as a collection of differentiated sub-systems, each with differing priorities and work cultures. These theoretically work together to deliver patient care across system boundaries, often involving multiple services both within the hospital and the community. This fragmentation acted as a barrier to identifying and learning from incidents that touched on many services.

> *'Particularly in our directorate it was challenging because a patient is never admitted into clinical support, it is admitted into medicine or surgery or whatever. And quite a few times we were completely lost in the system because a radiology event could be happening on a medical ward and that'll go to medicine.'* (INT12)

Further fragmentation occurs in the way safety-relevant departments are organised within the DHBs. At one DHB adverse events, patient complaints, occupational health and safety, quality improvement and risk all sat under a single division, in the hopes of facilitating organisational learning.

> *'So, we have quite a big role in, because we own the incident management module and the risk module, in understanding the collective-- what the organization thinks and then how we share it back out and learn, how we enable that learning.'* (INT18)

No such grouping was present in the other DHB, with these services falling under a variety of reporting and managerial structures although informally connected through a web of interpersonal relationships.

The interviews also highlighted the fragmented streams of safety-related information that exist within the organisation, each of which has a particular audience and focus. These have an impact on the flow of information and shape the ability of others within the DHB to 'put the pieces together'. One example given of this issue was the departmental mortality and morbidity (M+M) reviews. These are clinically focused reviews of cases, but which may not always link to the formal safety reporting systems or focus on the implications for the wider system.

> *'So, we had a couple of real classics where people-- departments had discussed stuff at M+M meetings and then a letter's arrived from HDC, and you read the letter from something that's not gone right. And you go, holy crap, I can see where this is going. And yet you find out that it's been, um, that a group of people has discussed it in an M+M meeting and that's where it's staying. No actions, no learning, no "Oh, there's risk here of other things happening. What about the family?".'* (INT1)

The categorisation of safety data created further fragmentation by treating categories such as falls or medication errors as standalone issues to be monitored and managed independently. Therefore, while a cluster of falls may generate a deeper examination of systems issues on a ward, a cluster of single events from different categories would not generate the same response. This structuring of information into categories inadvertently risks concealing underlying risks within the system.

Finally, the interviews reported an 'informal safety system' involving staff troubleshooting issues without highlighting them to HSPs, or informally escalating problems via email or 'corridor conversations'. Yet this large body of 'soft intelligence' (Martin, McKee, & Dixon-Woods, 2015) about the realities of everyday work was only variably captured by the formal safety systems.

> *'I think the informal part is the real iceberg, right. Like, because everybody does workarounds, you know, everybody's busy, everybody's stressed. There's all sorts of little safety mechanisms informally out there to keep the hospital running. And it's—it's amazing that more of that has—hasn't fallen over, to be honest. Because we only see the stuff that actually comes to light when it's-- when it's serious, when it's frequent, when it's... causing issues.'* (INT1)

4.3.1.4 The many audiences of safety

The interviews revealed the many and varied audiences for safety work, each of which place specific and differing demands on HSPs. These differing audiences include external agencies (e.g. HQSC and HDC), different groups within the DHBs (e.g. clinical directorates and executive managers) in addition to patients and their families.

There were markedly different needs for these audiences, ranging from determining blameworthiness (HDC) through to learning about the system (DHBs) or making sense of a potentially life-changing event (patients and families). However, the various recipients of HSP work were not given equal attention, reflecting differences in the power relations with the DHBs, as seen in the following description of the differences in how complaints were handled depending on the involvement of the HDC.

> *'They are treated somewhat differently. Theoretically, it's the same process, but the responses will be somewhat different. Certainly, with an HDC (complaint), it's more of a formal, structured response that we provide to the HDC or to the patient but with an awareness that it's being viewed by the HDC… As opposed to a complaint from a family that's come to us via our feedback system. The response will be a lot different. It'll be a lot different. It'll certainly be of a lesser detail. It'll be more generic in its terms. We will always at the end say, "look, if you're not happy, this can go-- you can send this to HDC", which very rarely happens. But it's more of a... sort of an acknowledgement of the incident, generally. A--a bit of an explanation and an apology forms that kind of format.'* (INT 3)

The interviews discussed how HSP work was calibrated to the specific requirements of the audience in both style and substance. Most of those interviewed felt that the HDC carried the most organisational risk for the DHB with reports written with this in mind.

The tensions these differing needs create was also evident in discussions about writing adverse events reports. These reports required sign-off at multiple levels by, for example, the clinical service, the directorate, and the adverse event committee, before being presented to families. As such, they became political documents that required agreement from all those involved.

> *'When you've got three [senior medical officers] from different specialties, all with a differing view on this incident, how do you write the report diplomatically to get all the outcomes and everybody's happy to sign off on?'* (INT1)

Additionally, the language used in the reports was often crafted for patients and families, yet mindful of the potential involvement of the HDC at some stage in future. Some interviewees felt the need for non-technical writing prevented more nuanced discussions that may have helped system learning.

> *'And then we have a desire also to make sure that the report is understandable to the family. And so, we've got a process currently where the report is, um... someone reads the report to turn it into plain English and often something is lost in that.'* (INT17)

These multiple internal and external audiences of safety work require HSPs to respond flexibly, navigating the varied needs and political sensitivities of each situation. In this way, these audiences shape the work of HSPs by influencing what they prioritise and structuring the way they respond to issues.

4.3.1 Summary

These descriptions highlight the perceptions of a system under strain, with multiple time pressures and trade-offs required at all levels. Additionally, the varied contexts and fragmented information streams create challenges in putting together a cohesive understanding of the safety state. Despite this reality, safety is predominantly managed through an extensive bureaucratic system of controls and activities, and HSPs must complete an array of activities, while still trying to meet the varied needs of all those who impacted by safety issues.

4.3.2 Cultural structuring

Cultural propositions can be thought of as pre-existing 'taken for granted' assumptions, in this case about safety, that exert *causal influence*. They become structural when then they "exercise objective constraint independently of what people actually believe" (Parker, 2000, p. 81). That is, they are not dependent on persuading people to believe them to exert influence. However, as always, people may choose to act in ways that run counter to these propositions, for example introducing new safety activities with different underlying assumptions (see Example 3 below).

4.3.2.1 'No harm, no foul' – the focus on outcome

The interviews highlighted that the current safety system prioritises resources and investigative efforts based on the degree of harm. This outcome-focused proposition is inherent within the Severity Assessment Code (SAC) system from the HQSC (see Appendix A) and has associated requirements for the categorisation, reporting and investigation of adverse events resulting in patient harm[11].

While in theory all incidents receive some form of investigation, the limited resources and reporting requirements of the SAC system mean that resources are directed to the most severe harm incidents.

> *'It's mandated by HQSC at the moment to report, um, because we can't report every-- we can't investigate everything. So, the way we're investigating the most severe of incidents is mandated by HQSC.'* (INT13)

Events categorised as SAC 1 or 2 received extensive investigations using tools such as *root cause analysis* and were reported to committees comprised of senior healthcare staff. The priority given to more severe harm events also meant such events resulted in immediate notification of the executive leadership team once reported.

The flip side of this outcome-based prioritisation is that events categorised with lower SAC scores received less attention. These tended to be investigated at the clinical service level with local solutions implemented. Several of the interviews highlighted the potential for learning within these cases but these were only examined in depth if there were repeated instances or if a later event resulted in a higher level of harm. The following example references an investigation into a SAC 2 case where there had been many similar lower-level events in the preceding years.

> *'I said there's a systemic problem here. Now you're only thinking we've got one, because he said "Oh, we've got this one, I want to see how many others are". So, I did a report and we had about 30 and he said, "Oh, I didn't realize, I hadn't looked at them because they're SAC threes".'* (INT13)

The prioritisation based on harm was also evident in several narratives where recurring lower-level events were identified as having a common systemic risk. In one example, funding for a solution was declined until the identified risk later actualised as a death at another DHB. The funding for the solution was approved later that same day, suggesting that what was an acceptable risk prior to the incident became an unacceptable risk following it.

4.3.2.2 'If you can't measure it, you can't manage it' – the primacy of metrics.

A second theme in the interviews was that *only what is measurable is meaningful*. While clearly related to the bureaucratic activities described above, quantification had independent causal powers as a cultural proposition in that it shaped the way HSPs assigned meaning to issues including: What counts as data? How big a problem is this? How will we know we have fixed the problem? These issues and the need for quantification are also at the heart of quality improvement processes frequently used by HSPs in responding to safety issues (as discussed in Example 2 below).

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[11] Although the SAC system was introduced through agentic action, it has subsequently become a structural element as it has acquired independent causal properties by prescribing both *what* events to pay attention to and *how* to examine them.

Throughout the interviews, quantification was described as a key activity used in detecting, monitoring and improving issues within the services. Metrics were used as the primary means to understand 'how safe is the organisation?'.

Example 2: Falls - Rituals and residua

Falls by patients within hospitals remains a persisting safety issue in healthcare despite sustained attention. Previous approaches included Quality Improvement (QI) methodologies which educated staff on the need for change, then worked with staff to embed a risk assessment tool and guidance on interventions to manage the falls risk. Completion of the tool and putting in place the required interventions became the process measure for monitoring improvement.

After an initial reduction in the incidence of falls, further progress has stalled. Post-falls reviews often identified inadequate documentation on the tool or a failure to put in place interventions. The interviews revealed the frustration of a failure to make progress and felt the reviews had become an assessment of compliance rather than progressing understanding.

What started out as tools to support staff to navigate risk eventually became 'bureaucratic residua' where the completion of documentation became a proxy for safety.

> *'The nurses that were doing it for the first six months to a year were the people that were doing the paper record anyway. So, they knew the reason behind it, and they knew what they were doing, and they knew how to do it. But then with turnover, after about six months to a year, you've got a whole new workforce that's never done the paper version of it, and now is just doing the electronic version of it. And what we're seeing is that to some extent, the actual documentation is driving practice rather than the other way around.'* (INT7)

In exploring why this occurred, the interviews revealed that often QI programmes were highly focused on a particular problem but once this was completed, the attention moved on to another issue.

> *'I guess to me, is it safety or is it just to be safe is, you can't put-- you can't spray and walk away. You can't put something in and go tick, done, move on. Because that's not how it works, because the system is constantly changing.'* (INT9)

A more recent review involved an HSP directly observed clinical work and the way in which staff used the falls tools. This found issues regarding competing clinical demands and trade-offs, tools that were poorly matched to workflows, and faulty assumptions about the effectiveness or availability of interventions. An example of this was the use of 'watches', staff who remain with individual high-risk patients to prevent them falling.

> *'But it wasn't until I heard what she had observed, and how people... Like watches. One watch looking after three patients, this one wants to go to the toilet and the others aren't being watched and they would get up and wander off type thing. I'm thinking that's ridiculous. So how we think it works and how it actually works are two totally different things.'* (INT11)

This provides an illustration about how both the QI process and the review process carry assumptions that impact both the type of data generated as well as the meaning ascribed to them. These assumptions risk creating distortions that prevent deeper learning about the realities and tensions in the system,

Auditing was described as a prime way of ensuring that recommendations arising from safety events resolved identified issues. This requirement created a focus on identifying *measurable* processes or outcomes as part of any recommendations, despite an acknowledgement that important issues, such as 'workplace culture', may not be easy to measure. As such, those aspects which are harder to measure remain relatively invisible to the wider system.

Many interviewees expressed concern regarding whether metrics represented clinically relevant outcomes or if they enabled any additional understanding of how to resolve safety related issues.

> *'So, you-- basically many of the things were meaningless because you didn't really have a level of understanding as to what actually drives, you know, those measures... And with the vast majority of it, at least my way of viewing it, having really no relevance to what the patient experiences or what service we provide.'* (INT16)

Finally, the interviews discussed how measurement and audit often reinforced a *normative* approach that means differences in context or individual patient needs remain invisible. Even those who expressed strong support for the use of audit acknowledged that it should be a stimulus for deeper examination. Without this, the risk is that the data becomes an end in itself, with a focus on improving the numbers rather than what they represent.

> *'But when it gets to the reporting levels higher up, to those process measures, to the numbers that-- the numbers for falls specifically that go to the HQSC data, that's driven by those numbers and keeping them down. We don't-- because again, quite a lot happens. We lose the individual stories behind them.'* (INT7)

4.3.2 Summary

The interviews highlighted the way in which a focus on outcomes and quantification influenced the meaning which HSPs assigned to different events. The system prioritised attention to adverse events with the worst outcome, implying that these were the events with the greatest learning potential. Likewise, the systemic prioritisation of metrics created distortions in what HSPs considered as data and shaped the types of solutions they looked to implement.

4.3.3 The structured agent

Conditioned and conditioning influences also exist in how roles and relationships within organisations act to influence individual agency (Parker, 2000, pp. 82-84). As Archer describes (1995, pp. 287-289), these arise as people within organisations simultaneously act as:

1. *corporate agents:* occupying institutional roles (with the powers and relationships of that role)
2. *social actors:* occupying social roles (how HSPs personify their role)
3. *persons:* with pre-social tendencies and differences (the sense of self we bring)

The combination of these elements helps to explain the differentiated opportunity costs and situational logics faced by HSPs as they exert their agency within their organisation.

In the interviews, these issues were visible in the discussions about how HSP roles were structured within the different organisations, either embedded within the clinical directorates or within a central quality and safety directorate. In either configuration, the different relationships HSPs had with their assigned clinical directorates created perceived differences about the ability to influence change, due to the clinical directorates holding the resources required to address safety issues, such as finance, staffing and the ability to rearrange work. As such, HSPs were dependent on the support and engagement of the clinical directorates to effect change.

> *'We make it visible. And it's very much then the view is, is that it's basically a service decision as to how they then deal with that.'* (INT16)

It was also apparent that interviewees' professional identity as an HSP was held to varying degrees, depending on the role they held within the organisation. Those embedded within clinical directorates generally held their clinical identity as primary, whereas the CEAs working in a dedicated Quality and Safety Unit held their HSP identity as primary. Therefore, how safety work is organised within DHBs is likely to impact on both HSP professional identity and potentially the relationships with the clinical directorates.

It was also notable that the self-descriptions of interviewees varied when describing different phases of their careers.

> *'And I have to say, though, I suppose, unfortunately, I have to say that it probably doesn't... it doesn't worry me as much as it used to because I can't do anything about it. And so, I've had to, you know, say, well, I can only just do this. I can't do anything else.'* (INT 17)

These themes were most prominent in those who had held HSP roles the longest, as they described how their roles had been repeatedly reconfigured in terms of role power and organisational relations. They also portrayed a sense of cynicism that had developed about their ability to make meaningful change in the system. Rather than having a fixed sense of professional self, HSPs may have a dynamic view of their professional self and the social role they inhabit within the organisation.

4.3.3 Summary

The interviews revealed differences in how HSP roles were arranged in the organisations, the differentiated powers those roles held, and the variable quality of the relationships HSPs had with individual clinical directorates. Given that the clinical directorates held the resources needed to respond to safety issues, these differences impacted on HSP perceptions of their ability to effect change. Additionally, these perceptions were not fixed but varied over time, reflecting different clinical directorate relationships and the changing degree of agency felt by HSPs over their career.

4.3 Section summary

This section has explored the way in which the current safety system creates certain structural, cultural, and agentic internal relations that form the context for HSP work. While these are commonalities identified in the interviews, it must be remembered that individual HSPs will experience them differently due to the unique, emergent combination of these influences that they face.

It is important to remember that the way the system is currently structured is inherited from the past, reflecting an ongoing cycle of stabilisation and change. This means that current configuration is not fixed in time but is subject to change through the action of people as social agents.

An example of this is how the introduction of the SAC system impacted on the structural, cultural, and agentic properties through not only changing the work activities required, but also through introducing a new cultural proposition and changing the relationship between HSPs and the clinical directorates. This example shows how agentic action is constantly creating the conditions for future work.

4.4 How Structure-Agency Relationships Impact on HSP Work

The next section makes visible the way in which these structural, cultural and agentic factors act together to create differentiated situational logics, power relations and opportunity costs for HSPs. It is important to restate that these create *tendencies* for action but do not *determine* action, however, it may help to explain how the current approaches to safety work are stabilised.

4.4.1 Strategic guidance by situational logics

The structural and cultural relations outlined above can interact emergently to generate a range of situations that HSPs must navigate. These may include, for example, mandatory requirements, competing demands, goal conflicts and opportunities. As such, HSPs faced a range of issues which may be either in conflict or alignment, and which can be necessary or contingent. These combinations of characteristics give rise to 'situational logics'[12] that provide strategic guidance for HSPs in how they navigate their work and create 'general tendencies' for action.

This can be seen in the HSPs' descriptions of what they decided to report, how they classified adverse events, which events they investigated, the tools they use to understand events, the solutions they implemented, and the way in which they judged the success of any such interventions. Each interviewee experienced slightly different strategic guidance based on their role and relationships within their organisation.

4.4.2 Power relations and exchange transactions

The HSPs also exist in a web of power relations which guide their actions and prioritise certain events over others. This is seen in how complaints are treated differently if lodged by a patient/family compared to how such a complaint would be prioritised if arriving through the HDC or in a letter via the CEO.

> *'And as they're dealt with differently. For example, an HDC complaint would take priority over... and even though you've got your timeframes for responses and so forth, um... an HDC complaint would trump just the same person sort of complaining off their own back. Like, if they came directly to us and complained.'* (INT10)

Likewise, because HSPs require the support and resources for addressing safety concerns, both the reports about adverse events and the proposed solutions must be financially and politically acceptable to the Clinical Directorates and senior managers.

Even the simple task of assigning SAC scores was subject to negotiation, with assessments of harm and causality being variably interpreted. These categorisations had large implications for the attention and resources given to them, highlighting that even this simple act had political underpinnings.

4.4.3 Opportunity costs and trade-offs

The stretched nature of the system means that, just like clinical staff, HSPs face mismatches between the limited resources available, particularly time, and the various demands they face.

> *'And they've promised the family that they'd have everything done within six weeks—it's not going to happen, and I'm not prepared to rush a review for six weeks for HDC and the family, I'd rather do a robust review because it's going to, you know, this will probably go in the media and, you know, I want to do a robust review and do it thoroughly and leave no stone unturned. But not just to rush it through.'* (INT13)

HSPS must therefore make efficiency-thoroughness trade-offs (Hollnagel, 2009), choosing where to direct their attention. They tend to prioritise those actions which most effectively meet the bureaucratic demands for procedural closure, in particular prioritising SAC 1 & 2 and Always Report and Review cases, as well as HDC cases.

[12] Archer describes four situational logics: compromise, elimination, protection and opportunism (Parker, 2000)

Therefore, while HSPs might choose to take a new approach to safety, this comes at an opportunity cost as the existing requirements still need to be completed and at some point may generate managerial attention if delayed. As such, acting in ways that are different to the current norm are always possible but HSPs face differentiated opportunity costs in doing so.

4.4.4 The differentiated constraint on agency

One of the key features of any realist examination is that agency is "dependent on structurally conditioning factors that differentially distribute the capacity to influence outcomes" (Parker, 2000, p. 85). In other words, although agency is available to every HSP, structural influences make influencing change easier or harder. For example, while many of the interviewees expressed frustrations with the current safety system, there were markedly varied views held on their individual ability to effect change.

With an understanding of the situational logics, power relationships and opportunity costs highlighted above, it becomes easier to understand the way in which these differences arise.

4.4.4.1 Inability to effect change:

For some HSPs, the bureaucratic and production demands create significant opportunity costs for change and mean that even when people are exposed to new discourses, they feel unable to act on them. In the following excerpt, the HSP had attended talks by Erik Hollnagel and discussed the impact on their work.

> *INT17: 'And so, um... I came-- came away from both of those talks with a new way of looking at things. But in fact, my practice hasn't changed at all.'*
>
> *Interviewer: 'Why's that?'*
>
> *INT 17: 'So, I think it's the tyranny of the work. I think it's being like "I've got this caseload that I have to get through". And, um... and it's, and perhaps also, it's not-- it doesn't-- in some way it doesn't get embedded in my daily practice or in the practice of the team and so is not reinforced. And I forget.'*

This interchange highlights the reality that being exposed to new discourses alone is not enough to lead to change. Without identifying and addressing the structural constraints faced by HSPs, they may face ongoing challenges to implementing new practices.

An inability to effect changes negatively impacted the perceptions HSPs held about their own degree of agency, with several of those interviewed noting a sense of passivity and frustration that arose when change was not seen as possible.

> *'And you've the other people who want-- who would love to see things change but don't feel that they can, or they lose hope and just think "I'll just come and do my job and go home".'* (INT 10)

4.4.4.2 Change at the local level

Some interviewees felt that agentic action at the departmental or directorate level was distinctly possible. These descriptions were more common in those embedded within clinical units or holding dual clinical and HSP roles. This potentially reflects their closer relationships with the services, as well as their more granular understanding of how their agency might be applied to effect change.

> *'I think that I understand the system well enough to be able to drive change for... erm... to propagate safer systems and patient safety, yes. But that's because I've been immersed in the system for a long time. And so... to understand how to how to push buttons, how to get... the change that you want to see.'* (INT8)

Both role power and the relationships with the clinical areas appeared to be key enablers of change. This may reflect the reality that resources were held by the clinical services and that HSPs' agency was implemented indirectly using alliance building and engagement with those services.

4.4.4.3 Change at the systemic level

Almost all those interviewed felt that their agency was limited to the departmental or directorate level. The ability to implement changes at the DHB or national level was much more difficult. A few exceptions to this arose with those HSPs who had both significant role power within the DHBs in addition to high degrees of reflexivity about wanting to implement change. However, even with strong organisational support, change was seen as incremental and resource dependent.

> *'And, um, there's a limited resource... okay, no, there has been a limited resource to get enough, um... people, time, bandwidth to make a shift away from that, in a wholesale way… And so, it's like turning an ocean liner around, it's not like turning a speedboat around.'* (INT18)

In addition to these differentiated constraints on individual agency, the pre-existing requirements of external agencies, such as the HQSC, imposed an opportunity cost on institutional efforts to change their approach to safety work, as seen in the example below.

Example 3: Just Culture and structural constraint

This constraint was visible in the implementation of a commercial Just Culture programme (Just Culture Company, Florida, USA) that was introduced into the DHB by its Chief Quality, Safety & Risk Officer. This programme breaks with a focus on outcomes to instead examine the intent and 'riskiness' of employee behaviours.

However, during the rollout of this programme, it was highlighted that the DHB was still obliged to report and investigate incidents based on outcomes as defined by the SAC score.

> *'It's going to be interesting. We're just starting to roll the just culture program out and I'm one of the facilitators. And I know when I do my, you know, when I facilitate, people are going to say, well, why do you we review SAC one or twos when that's outcome based? You know, it's an outcome based, whereas you're telling me now that someone who maybe went and caused a car accident and killed someone, isn't as much danger as someone who drinks and drives the whole time and are high on drugs and never causes a car accident.'* (INT13)

The SAC system therefore acts as a potential barrier to change by creating competing cultural propositions regarding safety investigations, as well as increasing the workload for staff. Agentic actions for change, even though well supported by the DHB, may therefore face structural and cultural constraints that act as countering influences.

4.4 Section summary

These examples illustrate that although agency is always available to HSPs and institutions, their unique emergent social context creates differences in their relative power relations, the opportunity costs they face and the situational logics which drive actions. These conditioning and constraining elements help to explain both the stability of the current safety structures as well as why agentic transformation of these elements may be more feasible for some HSPs compared to others.

4.5 What Remains Unseen?

One of the important elements of any critical research is to understand the unintended consequences of the system as investigated, especially as it relates to issues of power. Structural and cultural conditioning lead us to focus on certain events and ascribe meaning in certain ways, leaving other aspects invisible. This section aims to highlight the problems that remain unaddressed by the current system, as described in the interviews.

4.5.1 Not meeting the needs of families.

There was almost universal agreement in the interviews that the current safety system did not reliably met the needs of the patients and families of those harmed. When harm occurred, the focus was on the meeting the procedural requirements rather necessarily understanding what the individual needs of the family were:

> *'We take too long. We don't communicate with them, and we don't communicate with them early enough or regularly enough. We've started to, in some cases, we've offered the report to them for errors of fact, you know, looks-- and in some cases but I don't think we're doing it consistently enough. We-- in some cases we're saying, we'd-- as you know we're doing this review, we'd like to hear your story and then include that.'* (INT17)

Issues of poor communication after an adverse event were also commonly reported and described as inflicting additional harm on families. This included not only the processes within the DHBs but also to those of HDC, ACC and the coronial services, where decision delays and poor communication created frustration for families.

This brings us to a central issue regarding power: *who gets to decide what is meant by safety*? As discussed above, the SAC system codifies both what and how we should pay attention to regarding safety. By doing so, it inadvertently defines what *not* to pay attention, prioritising a certain view at the expense of other potential definitions (Bowker & Star, 1999, p. 320).

Yet many interviews expressed how harm defined by patients was quite different to that expressed in the SAC definitions, such as this discussion from a Māori perspective of what made care 'safe':

> *'I guess it's… not understand or attempt to understand who we are as a person, who we are as people. What's important to us? What's important to us right now? And... and, um, I guess it's being part of-- being feeling listened to and being given the opportunity to be part of what, um... is it the plan of care-- the plan of care... and having input into that. Being able to ask the questions, being given the time to make those-- Just be part of the decision making and not having someone come over us and, you know, and if we want our whānau at the bedside and part of that decision making, that that's-- we're enabled to do that.'* (INT14)

The issue of what we do and do not consider harm was further illustrated by the description of a case where a patient left the Emergency Department due to feeling judged and disrespected. In addition to ongoing distrust in the health system, her wound went on to require skin grafting due to delayed closure and subsequent infection. This harm remained invisible to the formal safety system, although it would have been considered a significant adverse event if, for example, it arose from a pressure injury in hospital.

4.5.2 The invisibility of everyday work

As described earlier, the realities of clinical work are of constant production pressures, inadequate resources, and the need for staff to make trade-offs to keep patients safe. However, many interviews highlighted that the data generated by the safety systems did not reliably represent this reality, or the impact it was having on staff.

One interview gave an example of how the everyday messiness of clinical work was not apparent in the reports on medication errors which tended to focus on issues like compliance with best practice:

> *'And what was identified out of that was this harebrain of chaos that was not being replicated by the data that we were getting.'* (INT5)

In exploring why these realities were relatively absent from adverse event reports, it became clear that all those interviewed understood the messiness of everyday work, reflecting their clinical backgrounds. However, the retrospective reviews used to examine cases often focused on deviations from prescribed procedure, ignoring the question of whether such rules were followable at the time. This mismatch was invisible, with staff unwilling to talk openly about the realities of work.

> *'I just don't think there's enough people out there who've got enough passion to speak up and say, "Look, this isn't working, you know, it's written in the policy and procedure. We know we don't follow it because it's just not practical or we don't see the point of it". But rather than actually do anything about it, they just carry on doing whatever they normally do.'* (INT10)

The interviews also described the impact that the current production demands place on frontline staff, noting the impact it had both on staff wellbeing as well as on the provision of patient-centred care. The sustained mismatch between the demands on the system and the resources available to deal with them created a situation where staff were forced to make trade-offs:

> *'They-- they-- they do what they do on the front lines very well with stretched resources, with stress, burnout, all that sort of stuff. I think they cope phenomenally well'* (INT1)

This production pressure was reported as a constant presence for staff, even when they may be emotionally affected by an event, such as in the following description of an operating theatre team dealing with the impact of a traumatic clinical event where a patient died.

> *'We don't want to see any tears-- so we don't want to see any tears. That might be—that'd be terrible. And yeah, and that's—that's what, that's what staff were saying, that they, um, they felt the organization they just had to kick-- they just had to keep going, it was like a factory.'* (INT17)

This invisibility of the realities of everyday work is important in how it shapes the problems identified and therefore the solutions implemented by HSPs. Unless the reports reflect the constraints and demands faced by frontline staff, the focus will fall on identified deviations from prescribed work leading to standardised solutions such as training, increased proceduralisation and audit. It also means that the dynamic nature of work goes unseen, leaving in place presumptions about the effectiveness of solutions, without an awareness of how risk is increasing or the unintended impacts on clinical practice.

This shows how assumptions about how safety is created become embedded in the tools and methods we use, which in turn shape not only what we find and fix (Lundberg, Rollenhagen, & Hollnagel, 2009) but also inadvertently act to reinforce the original assumptions, sustaining them in the face of ineffectiveness to make progress.

> *'But we would have spent the last six, seven years investigating SAC one or two falls coming up with the same recommendations: Teach the nurses, you know, um, promote the interventions, look at the watches, how we manage those, you know, and the same recommendations year after year after year going "Not working are they?".'* (INT9)

4.5.3 The missing levels

As discussed above, the current social structures not only condition *what* we pay attention to but also *how* we pay attention to identified issues. The interviews identified that the focus of investigation generally remained at the clinical and directorate level. Beyond this level it was often felt that there was political risk meaning that managerial decision making and issues such as funding and government policy remained unexamined.

> *'You can't—there's a certain there's a certain altitude you can go to and then you can go no further. You certainly can't say, "Well, this is all because the CEO didn't decide to invest X number of health bucks in... promulgating a just culture in the organization". You certainly couldn't have ever said that.'* (INT8)

This did not appear to be based on any overt feedback but instead reflected the reality that such levels of the system were beyond the ability of an HSP to influence, and hence it was "not worth going there".

> *'And why? Why? Why wouldn't we do that? I suppose the whole purpose is to make improvements. So therefore you-- I guess actually, I hadn't really thought about it, I guess it's a bias of it because you're only gonna look for stuff that you have some control over. There are certain things you'll escalate, go actually, I can't control that. But again, there's still a threshold. Cause you're not... is it burnt out? I don't know. What's the point of escalating it when you know they're not going to change? You know that, you know, that system's highly unlikely to ever change.'* (INT9)

However, higher level drivers of the system clearly have an influence on the safety of the system. By not making these influences visible, their contribution remains hidden and the focus is instead diverted to the more superficial "symptoms" of system dysfunction (Hollnagel, 1993).

This focus on the clinical frontline is reinforced through the HDC's focus on the obligations of providers to "provide services of an appropriate standard" ("Health and Disability Commissioner Act," 1994, s20), excluding the role of resourcing and policy in shaping the delivery of care. Likewise, the nursing and medical councils' disciplinary processes focus on the individual professional, without a necessary understanding of practitioners as situated in a wider sociotechnical system that shapes practice.

Thus, limits of "what we can influence", together with issues of power, politics and legislation act to create a bias within the system to focusing on the frontline providers and practitioners, leaving the influence of the wider system unexamined.

4.5 Section summary

The current approaches to safety direct attention and action in certain directions but these tendencies create unintended consequences. The bureaucratic prioritisation of metrics and procedural closure mean that the unmet needs and stories of harmed patients and families remain invisible. Likewise, the formal safety systems are poorly matched to capturing and supporting the complex and dynamic risks of everyday clinical work. Finally, the power relationships and legislative framing of safety work drive attention to the actions of the frontline, leaving unexplored the wider influence of funding models, political decision-making and the underpinning safety model.

5. DISCUSSION

5.1 The Shaping of the Safety Norm

We see from the interviews that although the experiences of HSPs are differentiated, there are elements that are consistent across their narratives. These represent the structural, cultural, and agentic properties of the current system that act as a reinforcing web of influences to explain the 'system as experienced' by HSPs. These act by shaping how HSPs *pay attention to certain problems in certain ways with certain solutions, while leaving them blind to all that they are missing.*

As one example of this, the HQSC SAC system for adverse events was described as having a major role in channelling focus onto those events with the worst outcome. While intuitively logical, this prioritisation reflects underlying assumptions of *proportionality* and *linearity*, whereby the worst outcomes arise from the biggest failures and therefore offer the most learning (Dekker, 2011). This stands at odds with an understanding of healthcare as an "error-prone activity" (Paget, 2004) where clinicians must navigate dynamic and uncertain risks to create safety (Dekker et al., 2011; Hollnagel et al., 2015).

However, this mandatory, externally imposed requirement has acquired emergent causal power in that it now exerts an influence on the behaviour of agents, causing them to focus on certain events (based on outcome), in certain ways (mandatory root cause analysis until 2017) and with certain acceptable responses (often in the form of quality improvement projects). In this way it has become a cultural object that influences the entire safety system. What is less obvious is that through categorising 'what to pay attention to', the SAC system inadvertently determines what to ignore, leaving these issues invisible (Bowker & Star, 1999). As such, the very system introduced to aid system learning and improve patient safety, may inadvertently act both as a constraint to learning about the whole system, and also fail to meet the needs of harmed patients and their families.

While the discussion above might imply a certain 'structural determinism' (with the usual caveat that 'agency is always as option'), the SAC system is also an example that highlights the role that agentic action has in transforming the system. The SAC system was introduced as an intentional change by a particular group at a particular time with a particular purpose, and therefore represents a transforming agentic action. More importantly, as discussed above, this historical agentic action created the new structural, cultural and agentic internal relations that have become the context of current HSP agentic action.

This capacity for agentic transformation is, however, not equally available to all. The interplay between the structural, cultural and agentic factors *differentially* constrains or conditions the ability of agents to transform the social structures they inhabit. There are differentiated opportunity costs and power relationships which make change easier or harder for different HSPs. This stands in contrast with structuration theory (Giddens, 1984) which implies that any agent is potentially able to transform practices at any time.

Rather than an imposed safety norm that arises from a central training programme or a binding community of practice, we can instead see how the current safety norm is the emergent product of the historical agentic actions of the past, which act to create the structural relations which condition and constrain the actions of HSPs in the present.

5.2 The Search for 'Necessary Conditions'

A final step of any critical realist analysis is to look for the 'necessary contextual conditions' that may explain how the current safety structures have come to be. This retroductive process aims to propose potential underlying influences that might not otherwise be visible, including to those interviewed. These are not to

be taken as 'true' but rather they are potential explanatory mechanisms that can be replaced should other explanations prove more useful.

5.2.1 The deontological nature of healthcare

One of the common themes throughout the interviews was the harm done to patients and families as well as the impact that patient harm events had on the staff involved. This may relate to an issue in healthcare which may not be present in other safety critical industries.

The primary aim of healthcare is to care for those who seek treatment, to return them to a state of wellbeing. As such, healthcare-related harm breaches this fundamental duty of care held by healthcare professionals. Delivering safe care is seen as a core professional responsibility, drummed into staff as they are being trained.

> *'You come out feeling really, really nervous because now you've got this overwhelming sense of responsibility and you- you don't want to kill anybody.'* (INT14)

Likewise, healthcare has a long history of concerns with 'negligence' and the failure of healthcare professionals to take reasonable steps to prevent loss or injury to a patient (Price, 2010). This is reinforced in New Zealand by the HDC Code of Rights (*Code of Health and Disability Services Consumers' Rights*, 1996) which guarantees that care should be delivered with "reasonable care and skill" and "in a manner that minimises the potential harm to, and optimises the quality of life of, that consumer". Patient harm calls into question whether these rights have been met and a complaint is therefore grounds for review by the HDC.

Taken together, this historical and legislative focus on the professional duty of care is in tension with a systems approach which situates healthcare practitioners as part of a complex adaptive socio-technical system. A 'duty of care' lens anchors any examination close to those directly involved in meeting that duty, i.e. healthcare professionals and organisations, rather than considering all levels of the system and how these interact in ways that may increase risk (Rasmussen, 1997).

While the aim of any safety system should be to maximise learning, the 'duty of care' focus may drive the system to prioritise those cases where the harm is highest and therefore the presumed breach of this professional duty is greatest. Additionally, this may partly explain why patients and families remain relatively excluded from the process, as the system focuses on accounting for professional failing, rather than seeking to co-produce an explanation of how such harm came to be by examining the interactions of the wider system.

The final way in which this duty creates 'necessary conditions' for explanation is with regard to the relative paucity of safety professionals within healthcare as compared with other high risk industries (Provan et al., 2017). A lack of safety science training and academic qualifications for HSPs is at odds with the pervasive view of safety as a fundamental prerequisite for healthcare professionals as expressed by 'first do no harm'. When safety is seen as 'what we all do' in providing care, it inadvertently undermines the idea of HSPs as 'knowledge workers' with a specific knowledge base and skillset to be acquired, such as one might acquire in specialised clinical training.

Reframing this duty of care as a 'whole of system' responsibility might enable better engagement with the specialised knowledge of safety-related professionals that could more fully address the impacts of the wider system on individual care.

5.2.2 The long shadow of neoliberalism

One of the strong themes in the interviews related to the production pressures and resource limitations experienced by both the clinical services and the HSPs. These were a major driver of trade-offs, especially in determining which safety issues would be prioritised and focused on. The overwhelming impression was of a system constantly struggling to meet the demands placed upon it.

The background to these pressures may lie in the health reforms of the mid-1990s. At this time, neoliberal reforms were enacted to introduce the economic principles of the market, including competition and a focus on productive efficiency (Kelsey, 1997, p. 195). While some of the more radical aspects of these reforms have since been removed, there remains a strong focus on the pursuit of productivity within the health system, despite an expressed focus on delivering 'patient centred care'. The interviews contained discussions about the safety risks created by target-based approaches, such as the 6-hour waiting time target for the Emergency Department, as well as descriptions of the increasing pressures to meet elective targets in the face of increasing complexity and acute surgical demands.

The associated introduction of *New Public Management* can also be seen in a focus on input and output control, the growth of hands-on management, a focus on cost containment of clinical services, and the organisational distancing from policy makers such as the Ministry of Health (Osborne, 2006). This last issue is particularly relevant with safety work representing a form of *responsibilisation* (Gray, 2009), whereby DHBs are given the responsibility of making various trade-offs based on the funding and policy prioritisations determined by the Ministry, shifting the political consequences of adverse events should they occur (Gauld, 2009, p. 213). Yet again, power and safety are intertwined in determining where to focus safety efforts (Dekker & Nyce, 2014; Rolston, 2010).

Neoliberalism has also been associated with bureaucratic approaches to safety (Dekker, 2014) which focus on centrally-determined bureaucratic controls and the rise of audits as "rituals of verification" (Power, 1997). These were both prominent features within the interviews and highlight the ongoing influence that the neoliberal reforms have had on both healthcare and safety management.

5.2 Section summary

It is possible to see how the focus on 'duty of care' acts as a specific characteristic of healthcare safety work, one which aligns with the *responsibilising* tendencies of neoliberalism. Together they may create conditions where the focus on clinicians and providers becomes seen as both appropriate and acceptable, despite the obvious impacts that the wider regulatory, financial, and political systems have on the ability to deliver safe care.

5.3 Emancipatory Critique

Any critical research has emancipatory potential by revealing the negative consequences of the current approaches and creating an obligation to effect change. An understanding of how social structures condition action allows us to identify potential leverage points within the system to effect change. This may include such actions as:

- Engaging with the HSP community of practice to update their understanding of safety science.
- Enhancing the agency of HSPs through increased resources, role-power or alliances with clinical areas, as well as aligning production concerns with safety efforts through human factors approaches (CIEHF, 2020).
- Changing from an approach that prioritises activity based on outcomes (such as SAC) to instead using a system that prioritises activity based on learning potential and the identification of underlying system influences. This may involve introducing new tools such as AcciMap (Svedung & Rasmussen, 2002) or changing the focus to understanding the work-as-done by frontline staff (Braithwaite, Wears, & Hollnagel, 2017).

Engaging with the implications of seeing healthcare as a complex adaptive system is also likely to change many aspects of HSP work including adverse event investigation, quality improvement and governance. These changes may fundamentally challenge many of the assumptions that drive current approaches. As such, it is likely that there will be political consequences to such change, and it will be important to manage the varied expectations and needs of all those impacted. However, without these changes, progress of healthcare safety is likely to remain slow and fragile.

5.4 Implications for safety science

Critical realism represents a philosophical frame and methodology that seem well suited to understanding modern complex systems. In particular, it allows for the open nature of systems and is grounded in the emergent outcomes that arise from multiple interacting causal mechanisms, differentially activated based on context. Rather than developing universal 'safety laws', it instead focuses safety science on understanding the conditions that impact the way local causal mechanisms are activated and how they interact to give emergent outcomes.

The 'post-structurationist' stance of Archer also allows for a different lens on the interplay of structural and agentic actions, adding to previous work on historical discourse (Henriqson et al., 2014) and the constructed nature of social reality (Le Coze, 2012). The morphogenetic approach enables us to understand both how specific historical agentic actions lead to structural elaboration, as well how various structural elements, including resources, condition and constrain such actions.

For example, this approach may allow an exploration of the mechanism of influence that exists between the layers of Rasmussen's sociotechnical system (Rasmussen, 1997). His model is highly compatible with the layered nature of reality described in critical realism, where each layer of the system has emergent structural properties and causal powers that differ from the layer below. By understanding the causal powers that arise in each layer, we may be able to look at how these condition the actions possible in the layer below.

Critical realist informed sociological theories are potentially useful to underpin modern safety science approaches such as resilience engineering. While structuration theory has been examined by Hunte & Wears (2013), a critical realist informed approach might allow for further exploration of how historic agentic actions and structural relations constrain and condition the resilient performance of systems.

A critical realist approach would also encourage discussion about the conditions and contexts where resilient performance enhances safety, and where it may create new risks or harms. This approach would be helpful in developing guidance on how to build 'whole of system' resilience, as opposed to approaches which risk promoting 'adaptive coping'. This is seen, for example, when the entire resilience of the system is loaded onto frontline clinical staff who remain unsupported by the wider work system (Amalberti & Vincent, 2020).

Most importantly, it would allow for a more nuanced exploration of safety interventions that moves beyond normative ideas of building "safety culture" (Reason, 1997) or creating "high reliability organising" (Weick, Sutcliffe, & Obstfeld, 1999) to instead examine "what works, for whom, in what respects, to what extent, in what contexts, and how?" (Pawson & Tilley, 1997). This enhanced understanding of the influence of context and conditions would represent a significant step forward for safety science and allow a more coherent integration of the various streams of safety work to date.

5.5 Reflexivity on the Research Process

The process of qualitative research using interviews was an experience of research quite different to my biomedical background. Discovering a joy for sociological theories was like finding myself in a strange land and realising it was my home all along.

However, the techniques of social research remain new to me and somewhat challenging. For example, while the interviews were coded, I found that the process of fragmentation and categorisation often left more out than it revealed. Coding was useful for tracking the information but was not a replacement for repeatedly listening to the interviews in their entirety. I found a notebook invaluable for capturing insights and unanticipated connections.

I had expected that my current safety-related roles and previously expressed views would impact on the interviews. To some extent this was true, with many of the interviewees implying that the descriptions they gave might be at odds with my personal views of 'how things should be'. These were identified at the time,

and it was re-emphasised that the project was about understanding the system as experienced by HSPs. Interestingly, the single interviewee who extensively described their plans to move to a 'Safety II approach' was unaware of my role in the HQSC or my prior advocacy for these approaches.

The interviews also challenged some of the previously identified assumptions I brought to the research project, as well as revealing some I had not even considered. My previously held assumption was that the HDC was the prime driver of the bureaucratic approaches I had witnessed in safety work prior to this project. Although the HDC did indeed require bureaucratic activities such as rewriting policy and audits, a far larger influence on the system was exerted by the HQSC SAC system. This externally imposed approach to the prioritisation and investigation of incidents was a central factor in the shared safety norm held across the two DHBs.

Another surprise was how mismatched my preconceptions of HSPs were to reality. I had presumed they applied safety and QI tools relatively unthinkingly, with little insight into the assumptions inherent within them or the issues these created. Instead, the interviews revealed a group who held nuanced, although variable, views on the limitations and mismatches that arose from the current safety approaches. There was also significant empathy for both the experiences of harmed patients and families, as well as the challenges faced by frontline clinical staff.

Hearing the rich stories from the interviews has shown me the many roles that HSPs have within the safety system and led me to consider what a potentially more realistic HSP role description might look like.

Table 3. The Many Roles of Healthcare Safety Practitioners

Helping the system learn about itself	- Making visible the realities of Work-as-Done - Understanding the unintended consequences of productive pressure - Looking for underlying patterns across multiple classes of events
Navigating trade-offs	- Navigating the competing demands of the system: Efficiency vs thoroughness Safety vs financial constraint Standardisation vs individualisation
Dealing with fragmentation and difference	- Acting as a "bridge" between different parts of the system - Understanding the impacts of context and difference - Designing solutions that support staff to provide "good quality care" (Wiig et al., 2020)
Negotiating power	- Building relationships and alliances - Finding ways to meet and co-opt power - Using role power to effect change in the system
Meeting the wider system needs	- Responding to the various demands of the many audiences of healthcare safety work - Using reports to make the realities of work visible - Designing measurement tools which help drive *understanding*
Understanding and repairing harm	- Engaging with multiple views to understand what safety and harm mean to different groups - Meeting the needs of all those who have been harmed, including staff

While this focus on HSP roles is not central to the current research question, the findings here add to the previous descriptions of Provan, Dekker & Rae (2017, 2018) about safety practitioner work in other industries.

5.6 Limitations

Qualitative research is inherently subjective in how a researcher decides what to include, what to leave out and the way in which certain narratives are chosen over others. As such, the findings within this research represent my personal construction of the meaning contained within the data. As acknowledged earlier, I bring pre-existing assumptions and viewpoints that invariably shape what I see.

Additionally, the interviews represent only two DHBs and gather the perspectives of a limited range of people involved in healthcare safety. Their interviews also represent a 'view from somewhere', and should not be seen as providing ready access to some 'truth'. Others, such as regulators, managerial staff or frontline clinicians may have provided widely divergent views on the safety norm in action.

However, as stated earlier, critical realism accepts a fallibilist view of knowledge, positing that we can make rational judgments about the usefulness of different propositions based on their explanatory usefulness. On these grounds, the current work provides potential explanations for the stability of the approaches to safety in the face of the aforementioned failures to make progress in improving patient safety.

Finally, these explanations refer to the local conditions that shape the safety norm. They are situated in the unique place, time, and context in which they have been explored and as such, these findings cannot simply be extrapolated to other settings without consideration of contextual differences.

6. CONCLUSION AND FUTURE DIRECTION

The goal of this research project was to understand how the current safety norm in the New Zealand healthcare system was formed and maintained. This issue is of particular relevance given the difficulties faced over many years in improving patient safety worldwide, despite intensive efforts.

The HSPs' descriptions of the health system painted a vivid picture of a bureaucratic, fragmented healthcare system under constant strain, where both clinicians and the HSPs themselves struggled to meet the various demands imposed upon them. Additionally, this approach to safety shaped what HSPs were required to focus on, inadvertently creating a system that did not meet the needs of patients or families, and which was also blind to the realities of everyday work and the influence that the wider system had on providing safe care.

By understanding these realities of HSPs' work, we can therefore see why their actions seem situationally logical and understand why they *pay attention to certain things in certain ways with certain solutions*. Through this exploration, the activities, outcomes and unintended consequences of the system became clearer.

What also became clear is how the current system conditions and constrains the ability of those within it to effect change. Despite HSPs being aware of many of the problems in the system, they faced differentiated constraints to their ability to influence the current state, based on the unique opportunity costs and power relations they faced.

Finally, the retroductive analysis of the interviews suggested two potential stabilising influences that might otherwise be hidden. The combination of the deontological 'duty of care' experienced by health professionals and the impacts of the neoliberal health reforms act as two potential 'necessary conditions' for the research findings, acting together to maintain the current system.

This understanding of the way in which a safety norm arises and is maintained in the face of challenge leads to several potential future directions for research. First among these would be an examination of the historical structures and agentic actions that have shaped the structural conditions of today. This would include:

- Understanding the discourse and events surrounding the formation of external institutions such as the HDC, ACC and HQSC and how these starting conditions have influenced these institutions over time.
- Identifying how the international discourses around healthcare safety have influenced the introduction of certain safety tools and approaches in the New Zealand context.
- Exploring the healthcare reforms of the 1990s and how these have shaped health policy since that time.

This further exploration would allow further understanding of the identified 'necessary conditions' and accept, modify, or even reject them in the face of other potential explanations for the findings of this research. Additionally, by carrying out similar studies of other industries or healthcare settings, we may be able to understand more about how different conditions activate social causal mechanisms.

Finally, this research engages with a new philosophical stance, one well-aligned to an emergentist, systems-oriented view of safety. It brings both the ability to examine situated structure-agency interactions as well as the identification of potential explanatory mechanisms. By understanding the interplay between the structural and the agentic, we may develop our general understanding of how the structural conditions, agency, discourses, and resource allocations come together emergently to influence safety. Most importantly, it may suggest new leverage points for change, offering hope for progress in improving patient safety at last.

Our patients, their families and all those who care for them are waiting.

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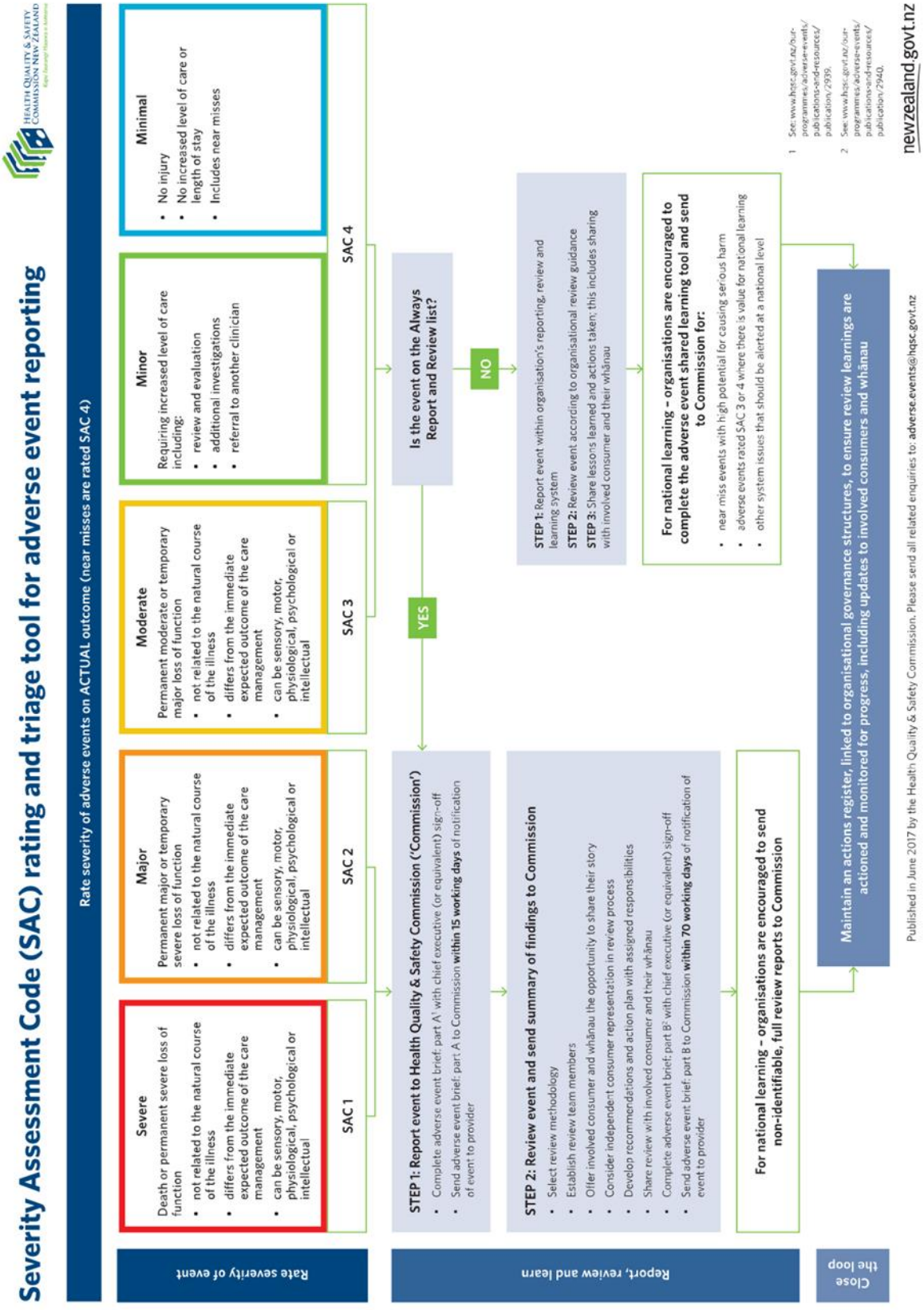
8. APPENDICES

Appendix A: Severity Assessment Code (SAC) 2018-19



Appendix B: Semi-structured interview guide

Interview Guide – suggested topics to cover

Morphogenesis and morphostasis – what forms and maintains the current safety norm?

The interviews are semi structured in that there will be opening questions and general points that should be explored over the course of the interview. However, the interviews should be seen as a dialogue between the researcher and the participant, allowing for flexibility to explore and refine the understanding of any issues raised.

There are four main areas to be covered in the interviews:

- *The Situated Practitioner*: Understanding the interviewee's path to the safety practitioner role, how they are situated within their organisation and the resources available to them.
    - Can you tell me a bit about how you came to your current role? (clinical background?)
    - What made you want to take on this role?
    - Where does your role sit within the organisation?
    - Roughly how much of your time is devoted to safety activities?

- *Socialisation*: Discussing how interviewees transitioned from a clinical to a safety practitioner role. What understandings and practices did they take on and how did this occur?
    - How did you come to learn about being a safety practitioner involved?
    - Did you go to any training courses or did you learn from others in your hospital?
    - Has your understanding of these practices changed over time? How did that happen?

- *Institutional demands*: Exploring the requirements that practitioners must meet as part of their role. Understanding to what extent the role involves meeting bureaucratic demands as opposed to other safety activities such as reflexive work with clinical staff
    - Tell me about the kinds of work you do (e.g. safety related activities)
    - How do you decide when to investigate an issue and what determines how you do this?
    - Who is the main audience for your reports?
    - How does the intended audience change the way your approach? (e.g. HDC vs internal)
    - What are the most frustrating aspects of your work? What things do you most enjoy?

- *Conflict and Agency*: Making visible any tensions or conflicts, particularly with the clinical area, that arise from current safety practices. How do practitioners navigate these tensions and how does the practitioner's own background impact on this? To what extent do they have an ability to modify the local approaches to safety work (agency)?
    - Do you notice any difference between the way you used to see safety in your previous role and the way you see it now?
    - Does this create any tensions or issues for you in your safety work?
    - How do you navigate these tensions (if present)?
    - Do you feel you are able to try new approaches to doing things? What enables you to do this? What prevents you from doing this?

Appendix C: AHREC Approval Letter

AUCKLAND HEALTH RESEARCH ETHICS COMMITTEE (AHREC)

10/08/2020

Dr Carl Horsley

Re: Application for Ethics Approval (Our Ref. AH2889): Approved with Comment

The Committee considered the application for ethics approval for your study entitled "**Morphogenesis and morphostasis: what forms and maintains the current safety norm?**". We are pleased to inform you that ethics approval has been granted with the following comment(s) or required minor changes:

1. When you are seeking participants as experts, rather than focusing on their personal or health information, you may wish to consider giving you participants an option to be identified or not (explained in the PIS and included in the Consent Form). The consent to being identified might depend on knowledge of what information provided by the participant is to be included in any report. If you decide to make this change, please provide the modifications as an amendment to the application.

2. Whether or not you give an option to be identified (rather than promising confidentiality) given that your participants are a small group of specialists, there is a possibility that they might be identifiable from reported comments. This should be explained in the PIS and noted as understood in the Consent form.

The expiry date for this approval is **10/08/2023**.

Final report: In order that up-to-date records are maintained, you must notify the Committee once your project is completed and submit a final report.

Amendments to the approved project: Should you need to make any changes to the approved project, please follow the steps below:

- Send a request to the AHREC Administrators to unlock the application form (using the Notification tab in the Ethics RM form).
- Make all changes to the relevant sections of the application form and attach revised documents (as appropriate).
- Change the Application Type to "Amendment request" in Section L.
- Add a summary of the changes requested in the text box.
- Submit the amendment request (PI/Supervisors only to submit the form).

If the project changes significantly, you are required to submit a new application.

Funded projects: If you received funding for this project, please provide this approval letter to your local Faculty Research Project Coordinator (RPC) or Research Project Manager (RPM) so that the approval can be notified via a Service Request to the Research Operations Centre (ROC) for activation of the grant.

The Chair and the members of AHREC would be happy to discuss general matters relating to ethics approvals. If you wish to do so, please contact the AHREC Ethics Administrators at ahrec@auckland.ac.nz in the first instance.

Additional information:

- Do not forget to fill in the 'approval wording' on the PISs, CFs and/or advertisements, using the date of this approval and the reference number, before you use the documents or send them out to your participants.

All communications with the AHREC regarding this application should indicate this reference number: **AH2889**.

AHREC Administrators

Auckland Health Research Ethics Committee

Appendix D: Participation Information Sheet

Counties Manukau Health
Private Bag 93311
Otahuhu
Auckland 1640
New Zealand

Participant Information Sheet

"Morphogenesis and morphostasis: what forms and maintains the current safety norm?"

Project Leader	Carl Horsley
Address	Critical Care Complex, Middlemore Hospital, Otahuhu, New Zealand
Contact phone number	0212249294

INTRODUCTION/ KUPU ARATAKI

You are invited to take part in a project about understanding the experiences of healthcare safety practitioners. This project will look at how they acquire their understanding of safety practices and the realities of everyday work in healthcare safety.

Please take your time to think about and decide whether you wish to take part in the project. You may wish to discuss your participation in the project with family / whanau and take any time you need to do this. Taking part is completely voluntary and there are no consequences for choosing not to participate.

Who am I?

My name is Carl Horsley and I work as an intensive care specialist at Middlemore Hospital. I am also completing a MSc in Human Factors and System Safety at Lund University, Sweden. This research project is work towards my thesis.

Why we are doing the study

Over the last 20 years, there have been extensive efforts to improve the safety of those receiving healthcare. However, progress has been disappointing, with little change in the overall rates of harm. Recent safety science literature suggests that previous approaches may be poorly matched to the complex and dynamic realities of everyday healthcare, potentially explaining this lack of progress.

This project is trying to identify the influences that shape and maintain the current approach to safety. This might include how people come to learn about safety or the types of practices mandated by organisations. These influences may therefore act either to reinforce the status quo or to implement change. Making these influences visible and understanding how they arose is the primary aim of this research.

What your participation will involve

You have been invited to participate because you are identified as working in a healthcare safety practitioner role within either Counties Manukau Health or Auckland DHB. Your insights and experiences will help to answer the research question.

If you agree to take part, I will interview you at a place of your choosing, either in person or via Zoom. I will ask you questions about how you came to learn about safety practices, as well as the activities and realities of everyday work as a safety practitioner.

The interview will take around 60-90 minutes. I will record the interview (audio only) with your permission and write it up later. You can choose to not answer any question or stop the interview at any time, without giving a reason. You can withdraw from the study by contacting me at any time before 1st November 2020. If you withdraw, the information you provided will be destroyed or returned to you.

You can also request to receive a copy of the interview recording or transcription and will have a chance to review and edit these (for up to 7 days).

There is no payment or other direct benefit for participating but the project will inform future work to improve healthcare safety in Aotearoa. It is not anticipated that any costs will be incurred by participants.

General Information

You may have a friend, family, or whanau support to help you understand the risks or benefits of this study and any other explanation you may require prior to deciding whether to participate or not. A friend, family or whanau support can accompany you during the interview.

What will happen at the end of the study?

The findings of the project will initially be written up as my Masters thesis but may also be used for academic publications or presentations. No individual will be identified and there will be no reference to you or your name in any publications.

A summary of the outcomes of this project can be made available to you. Please indicate on the consent form that you would like to receive a copy of the recordings, transcript or the results the project.

At the end of this project, the recordings of the interviews will be destroyed. The consents, research notes and transcripts will be securely stored for a further five years.

Confidentiality

This research is confidential. This means that the researcher will be aware of your identity but the research data will be combined and your identity will not be revealed in any reports, presentations, or public documentation. Only myself, the transcriber (who will be required to sign a confidentiality agreement) and my supervisor will read the notes or transcripts of the interview.

Whom should I contact if I have further questions?

If you have any questions, please contact:

Researcher:	Carl Horsley	Ph. 021 22 49294	or	email chorsley@middlemore.co.nz
Supervisor:	Johan Bergstrom			email johan.bergstrom@tfhs.lu

If you require Māori cultural support, talk to your whānau in the first instance. Alternatively, you may contact Delanie Nepia or Teei Kaiaruna via 09 276 0000 at CMH or for ADHB please call the administrator for He Kamaka Waiora (Māori Health Team) on 09 486 8324 ext 2324.

If you have any questions or complaints about the study, you may contact the Mana Whenua Maaori Research Review Committee at CMH via the Research Office by calling 021 574 4928.

For concerns of an ethical nature, you can contact the Chair of the Auckland Health Research Ethics Committee at ahrec@auckland.ac.nz or at 09 373 7599 or at Auckland Health Research Ethics Committee, The University of Auckland, Private Bag 92019, Auckland 1142.

Thank you, tēnā koe, for making the time to read about, and for considering taking part in this project.

Approved by Auckland Health Research Ethics Committee on 10/08/2020 for three years. Reference number AH2889

Appendix E: Consent Form

Counties Manukau
Health
Private Bag 93311
Otahuhu
Auckland 1640

Consent Form

"Morphogenesis & morphostasis: What forms and maintains the current safety norm?"

- I have read the Participant 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 have had time to consider whether to take part in this project. I have had the opportunity to use family / whanau support or a friend to help me ask questions and understand the project.
- I agree to take part in an audio recorded interview.

I understand that:

- I understand that taking part in this project is voluntary and that I can stop taking part at any time.
- I understand that my participation in this project is confidential. My name will not be used in reports and utmost care will be taken not to disclose any information that would identify me.
- I understand that I am free to withdraw my participation at any time, and to withdraw any data traceable to me up to 1st November 2020
- I know who to contact if I have questions about the project, wish to receive support or make a complaint

• I would like a copy of the recording of my interview:	Yes ☐	No ☐
• I would like a copy of the transcript of my interview:	Yes ☐	No ☐
• I would like to receive a copy of the final report and have added my email address below.	Yes ☐	No ☐

I, _____ (*full name*) hereby consent to take part in this study

Signature: Date:

Email address for recording or transcription link to be sent to:

Researcher: Carl Horsley
Contact phone number for researcher: 021 22 49294
Signature: Date:

Approved by the Auckland Health Research Ethics Committee on 10/08/2020 for three years. Reference number AH2889.
What forms and maintains the current safety norm?
Participant Information Sheet and Consent Form *Version 1, 30/07/20*