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Paradoxes of pandemic infection control: Proximity, pace and care within and beyond SARS-CoV-2



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ABSTRACT

From the adoption of mask-wearing in public settings to the omnipresence of hand-sanitising, the SARS-CoV-2 pandemic has brought unprecedented cultural attention to infection prevention and control (IPC) in everyday life. At the same time, the pandemic threat has enlivened and unsettled hospital IPC processes, fracturing confidence, demanding new forms of evidence, and ultimately involving a rapid reassembling of what constitutes safe care. Here, drawing on semi-structured interviews with 63 frontline healthcare workers from two states in Australia, interviewed between September 2020 and March 2021, we illuminate some of the affective dimensions of IPC at a time of rapid change and evolving uncertainty. We track how a collective sense of risk and safety is relationally produced, redefining attitudes and practices around infective risk, and transforming accepted paradigms of care and self-protection. Drawing on Puig de la Bellacasa's formulation, we propose the notion of IPC as a multidimensional matter of care. Highlighting the complex negotiation of space and time in relation to infection control and care illustrates a series of paradoxes, the understanding of which helps illuminate not only how IPC works, in practice, but also what it *means* to those working on the frontline of the pandemic.

1. Introduction

The SARS-CoV-2 pandemic has resulted in over 6 million deaths worldwide (World Health Organization, 2022), re-shaped societies and economies, and altered interpersonal interactions in innumerable ways. Infection prevention and control (IPC) measures such as physical distancing, hand hygiene and mask-wearing have become commonplace and infused with moral and political meaning (Lupton et al., 2021). In September 2020, 95% of Australians reported washing or sanitising their hands regularly, 88% reported keeping physical distance from others, and 60% reported wearing a facemask¹ (ABS 2020). This is an

extraordinary change from pre-SARS-CoV-2 days, when even hand-washing was difficult to embed in people's personal and work routines (Grayson et al., 2018).

In healthcare settings, responding to SARS-CoV-2 has involved negotiating complex changes from routine IPC, with which staff are familiar, if not always compliant, to new SARS-CoV-2-appropriate IPC practices (Broom et al., 2022). These IPC practice changes took place within a fraught affective riskscape (Williams Veazey et al., 2021), demanding complex emotion management and new kinds of care practices (Dowrick et al., 2021). In the absence of publicly available national data on healthcare worker (HCW) infections in Australia (Quigley et al.,

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¹ Mask-wearing rates were 97% in Victoria and 78% in NSW, reflecting state-based variation in COVID-19 case numbers and public health regulations/messaging (ABS 2020).

2021), HCW safety became the subject of widespread public and professional dispute, across the editorial pages of newspapers and scientific journals, specialty bulletin boards, and social media (MacIntyre et al., 2020; McCauley, 2020). In contrast to the monitoring and auditing lens of much of the IPC literature (Brown et al., 2008), the diffused vulnerability of a global pandemic imbues IPC practices with a sense of personal, relational and embodied peril that alters the “affective atmosphere” (Anderson, 2009) and everyday experience of delivering healthcare.

To investigate the everyday lived experience of IPC during an unfolding pandemic, we conducted semi-structured interviews with 63 HCWs across two hospital sites in Queensland and New South Wales (NSW), between September 2020 and March 2021. Drawing on these firsthand accounts, this paper tracks the paradoxes, ambivalences and inequalities involved in providing hospital healthcare during a pandemic. Focusing on themes of vulnerability and relationality, we examine how dynamics of time and space play out in multiple and competing ways in pandemic healthcare. We build on recent scholarship on the ethics of proximity, distance, vulnerability and care in pandemic times (House & Hopkinson, 2021; Levine & Manderson, 2021; Long, 2020; Long et al., 2020; Trnka, 2021), examining how these concerns have played out in hospital settings. We then extend this consideration of proxemics (Levine & Manderson, 2021) by adding a temporal dynamic, namely, the ethics of speed in pandemic care. In our analysis of HCWs’ experiences, we first establish the diffusion of vulnerability and reconfiguring of responsibility (Broom et al., 2022) that shaped the affective atmosphere of the hospitals, before considering the spatial and temporal dynamics of providing hospital healthcare during an unfolding pandemic. We highlight how pandemic IPC practices are infused with emotion, ambivalence and paradox and argue for an understanding of IPC as a deeply relational and multidimensional matter of care (Puig de la Bellacasa, 2017).

2. Background

2.1. Australia's pandemic in space and time

Spatial distance and time(liness) have shaped the framing of the pandemic in Australia. Geographic isolation, history of policing borders, and distances between population centres fostered reliance on international and state border controls as defences against the pandemic threat (Wynn, 2021). Experiences of SARS-CoV-2 have varied widely between different Australian states and territories, in terms of case numbers, public health responses and healthcare governance (Bromfield & McConnell, 2020). During the study period, HCWs in NSW and Queensland observed their peers overseas, and in the state of Victoria which experienced a “second wave” of infections in June–October 2020 (Butt, 2020), with a mixture of fear, empathy and relief (Williams Veazey et al., 2021). By the end of our interviews, Queensland had seen 1368 cases and 6 deaths and NSW 5220 cases and 54 deaths, compared to Victoria’s 20,483 cases and 820 deaths (Department of Health, 2021a). Despite relatively low case numbers in both NSW and Queensland, healthcare systems and governance structures had been re-organised, staff extensively re-trained and redeployed, and patient treatments paused, halted or modified (Broom et al., 2022; Broom et al., 2020). The scene subsequently changed again due to sustained outbreaks in the latter half of 2021, relating to Delta and Omicron variants, which have seen infections rise substantially in most Australian states (Department of Health, 2021b); removal of many border restrictions; and the roll-out of COVID-19 vaccines.

In Australia, COVID-19 vaccines started to become available in February–March 2021, at the end of our interview phase, with frontline HCWs assigned first priority (Department of Health, 2021c). In March 2021, in response to questions about the apparently slow pace of the vaccine roll-out, Australian Prime Minister Scott Morrison famously

stated, “it’s not a race” (Morrison, 2021). For most of the data collection period, therefore, COVID-19 vaccinations were unavailable; part of a hopeful future (Williams Veazey et al., 2021) rather than a deployable means of protection. Non-pharmaceutical measures – including careful management of proximity and care – thus took centre stage in HCWs’ (and the general public’s) efforts to protect themselves and others from infection.

2.2. Infection prevention and control: risk, relation and care

IPC is based on the premise that many infections can be prevented by (technically) simple protective measures (Forder, 2002) like those deployed early in Australia’s pandemic experience. Yet even the basics of IPC run into trouble in the complexity of everyday healthcare settings (Hooker et al., 2020). Challenges endure around hand hygiene, effective use of personal protective equipment (PPE), environmental cleaning, and so forth, even in well-resourced countries (Brown et al., 2008; Hooker et al., 2020). Challenges such as the rise of antimicrobial resistance, and other structural weaknesses (i.e. sub-standard facilities, including in aged care contexts (see Gilbert & Lilly, 2021), have illustrated how IPC is inseparable from the context within which it is deployed. The SARS-CoV-2 pandemic thus offers a complex new set of conditions within which IPC practices, norms and responses have been carried out. Here, the issues of relationality, ethics and risk come to the fore, as we explain below, setting the stage for a complicated relationship between the legacies of existing IPC, and emerging knowledge, practices and affect in the midst of crisis.

The SARS-CoV-2 context has vividly illustrated the importance of *relationality* in determinations of risk and safety, including recognition of the moral underpinnings of in/formal care (Kittay, 1999), and the multiple and unevenly distributed obligations, which shape pandemic care. Common to sociology and moral philosophy, and emphasising the inherent interdependence of humanity in critical counterpoint to liberal individualist conceptions of the self (Brown, 2011), the concept of relationality and the forms of dependency therein have been central to feminist analyses of care and care work (Kittay, 1999). Viewed through a relational lens, human lives are affectively, socio-politically and environmentally enmeshed and thus structured by various interdependencies and vulnerabilities that are more or less salient in daily life (Butler, 2014). As Mackenzie et al. note, responses to vulnerability include moral obligations to protect and care for others, raising the question of *who* bears this obligation and what are its *limits* (2014: 13). The (unequal) distribution of this obligation and the resulting caring labour can render caregivers themselves more vulnerable (Kittay, 1999). Although ‘vulnerability’ has been deployed in social policy, research and medicine to emphasise deficiencies, weaknesses or stigma (Brown, 2011), we use the term in its relational sense to draw attention to the multiple ways risk, safety and care are dynamically produced in entangled networks of human and non-human actors (Puig de la Bellacasa, 2017). Drawing on Puig de la Bellacasa’s formulation, we propose the notion of IPC as a matter of care, which combines “an affective state, a material vital doing, and an ethico-political obligation” (2017, p.42). By focusing on HCWs’ experiences during the COVID-19 pandemic, we seek to untangle these three dimensions of care as they pertain to IPC, highlighting the shifting vulnerabilities and obligations through the frames of space and time.

2.3. COVID-19, proximity and pace in pandemic care

Repositioning infective risk as deeply relational raises questions of the *proximity* of those relations. Reducing spatial proximity between people with confirmed or suspected infections, and those they might infect, is a cornerstone of IPC. Choreographing such separation creates complex challenges during infectious disease outbreaks, demanding the reconfiguration of interpersonal relations, the use of material barriers such as masks, and spatial reorganisations (Brown & Marí Sáez 2021).

Empirical work in hospitals has described how pandemic IPC disrupts “the space and pace of care” and affects interactions between staff, patients and patients’ families (Dowrick et al., 2021). An ethics of care based on maintaining distance and physical barriers between some people – and enforcing proximity between others (e.g. in household-based lockdowns, see House & Hopkinson, 2021; Long et al., 2020) – may (re)produce new and existing forms of inequality and structural vulnerability (Team & Manderson, 2020). While governments have exhorted the public to “keep your distance” to “help stop the spread” and ensure people “stay healthy” (Department of Health, 2020), in health/care, proximity is central to the provision of effective treatment and to the interpersonal negotiation of care (Dowrick et al., 2021; Fietz et al., 2020; Levine & Manderson, 2021; Manderson & Levine, 2020).

This paradox of proximity is mirrored in pandemic velocities where the imagined speed of viral transmission is pitted against the pace of scientific discovery, the promptness of public health measures, or the swift work of contact tracers. New viral variants were described as “moving at hyper-speed” by politicians, such as Victorian Premier Dan Andrews, justifying new public health measures and urging greater IPC compliance (Andrews, 2021). Governments and other institutions were encouraged to “go hard, go fast” (Gilbert & Lilly, 2021; Jamieson, 2020) in their responses to outbreaks. Yet this demand for dynamic action was often incompatible with the need for credibility based on rigorous evidence that necessarily develops at a slower pace (Parviainen et al., 2021). As with space and proximity, the meanings and conceptions of speed and time are also socially experienced, interpreted and co-constructed (Hasard, 1990; Wajcman, 2008). Thus, contrasting perceptions of pace can coexist in the same environment, with paradoxical impetuses. Norms around the proximity and pace of care, as well as the pace of administrative decisions that frame, inhibit or enable it, are disrupted by perceptions of risk (Baraitser & Salisburry, 2020). For example, slower care may be perceived as safer (because it allows for more infection prevention measures) but also as riskier (for the individual patient, who may have to wait longer for treatment). Delayed decision-making may result in safer care (because of increased knowledge or certainty) but present other risks for patients, staff and the community. As Baraitser and Salisburry (2020) argue, “delay holds within itself the possibility for care.” Actions that delay viral spread can be positioned as acts of care for HCWs and health systems, which will in turn preserve the care they provide. Yet delay – of treatment or public health measures – may also represent a lack of care, especially for the most vulnerable (Baraitser & Salisburry, 2020). Drawing on HCWs’ experiences of hospital IPC during the COVID-19 pandemic, we show how paradoxes of proximity and pace contribute to the relational coproduction of risk, safety and care under conditions of uncertainty, and their consequences for care now and into the future.

3. Methods

Interviews of hospital staff were conducted as part of a broader multi-methods qualitative study into HCWs’ experiences of IPC during the pandemic. Ethics approval was gained at both hospital sites. Interviews were conducted by two university-based social scientists with extensive experience in qualitative research (Authors LWVLWV and ABAB). Purposive sampling was undertaken to ensure participation from a broad range of specialties, roles, and experience (see Table 1). Investigators at each research site contacted directors of units involved in the COVID-19 response, via email, inviting their department’s involvement in the study. If they agreed, HCWs in these units were invited to participate.

A broad range of relevant specialties responded, including infectious diseases and IPC, emergency medicine, intensive care, anaesthetics, radiology, respiratory medicine, and public health. Participants included nurses, doctors, administrative staff, radiographers, social workers, educators, paramedics, cleaners, managers, physiotherapists and occupational therapists. Apart from an educator and one administrative officer, all had frequent contact with patients, in some cases alongside managerial responsibilities as noted in Table 1. Interviews

Table 1
Participants by site, role, and experience.

	Total	NSW	Queensland	>10 years’ experience	Managerial role
Doctors	20	7	13	19	9
Nurses	23	6	17	17	5
Allied Health	9	4	5	5	2
Non-clinical ^a	8	4	4	3	1
Other ^b	3	2	1	3	1
Total	63	23	40	47	18

^a Includes administrative officers, cleaners etc.

^b Includes ambulance staff, educators.

explored a range of issues, including everyday lived experiences of the pandemic; practices, policies and guidelines; processes of responsibility, accountability and decision-making; and the broader social significance of the pandemic.

Several participants described the period since January 2020 as a “rollercoaster”. As well as being an evocative metaphor for the turbulence of their experiences during the pandemic, the term serves as a reminder of the salience of temporality as a context for the production of qualitative data (Braun & Clarke, 2021; Sandelowski, 1999). Speed, change and adaptation have shaped the research project, from the rapid pace at which the project was conceived, designed and funded; followed by the decelerated tempo of research ethics and governance processes, despite aspirational declarations of ‘expedited’ review processes. Interviews were conducted via Zoom or telephone to overcome restrictions on travel and visitors in healthcare facilities, and to minimise disruption to participants. Interviews ranged between 20 and 91 minutes, were audio-recorded and transcribed verbatim.

The temporal context is particularly significant when undertaking research during and about a fluctuating phenomenon. Not only did later interviewees reflect on a longer period of working in a SARS-CoV-2 context, but each interview was also noticeably situated in a specific moment in the pandemic’s trajectory. For example, a participant interviewed in October 2020 mentioned a context of “zero community transmission” in Queensland, while an interviewee in December 2020 in NSW reflected on “what this new wave will mean and how we will face this.” These comments serve as important reminders that the narratives we hear are “stories from moments in time, moments in shifting life contexts” (Braun & Clarke, 2021, p. 27). In our analysis and writing, it has been important to remain sensitised to this temporal and spatial context, paying attention to the intersecting trajectories of the pandemic, the research and sociopolitical responses.

In this project, we sought an in-depth understanding of HCWs’ experiences. We aimed to look beyond IPC policies and procedures, to examine the lived experience, the “back stage”, of IPC in an unfolding pandemic. Drawing on interpretive traditions within qualitative research, we viewed participants’ accounts as attempts to construct meaning and practices in a changing and uncertain context. Authors LWV, AB and KK led the analysis of the data, reading and re-reading transcripts, looking for patterns, constellations and contradictions. We took a developmental approach, using later interviews to expand, challenge or compare with the tentative knowledge generated in earlier interviews, considering the shifting context in which both interviews and analysis took place. We sought to retain the complexity of participants’ responses, documenting conflicts and contradictions within the data as well as coherent themes and recurring ideas. The final step involved revisiting the literature and seeking out additional conceptual tools that could help make sense of the patterns that had emerged from the data (Ezzy, 2002). Our analysis focuses on the shifting spatiotemporal landscape of IPC during an unfolding pandemic, highlighting areas of conflict and paradox, particularly around relationships between risk, proximity, pace and care.

4. Findings

4.1. Relationalities of vulnerability and risk

Although IPC practices have long been embedded in the everyday lives of HCWs, participants emphasised how the pandemic brought intense and rapid cultural change. For example, in non-pandemic times, the vulnerability at the centre of IPC strategies is seen to inhere primarily in patients' bodies, with concerns about hospital-acquired infections or antimicrobial resistance focusing on risks to patients, except in limited circumstances where the risk to staff is deemed particularly high (see e.g. [Beekmann & Henderson, 2005](#)). IPC literature frequently positions patient safety as the core outcome, with HCW infection/colonisation positioned as "additional negative outcomes" ([Sax et al., 2007](#): 11), if mentioned at all. In such accounts, the patient is positioned as the vulnerable object of HCWs' protective practices. In practice, the locus of vulnerability may be more complex: patients may be both "victim and vector" ([Battin, Francis, Jacobson, & Smith, 2009](#)); HCWs' self-protective practices (e.g. glove use) may (unintentionally) compromise patient safety ([Jain et al., 2017](#)); and outbreaks of infectious diseases may intensify HCWs' fears of infection, particularly in the uncertain context of novel diseases (e.g. AIDS, Ebola, and now COVID-19; see [Broom & Broom, 2017](#); [Horsman & Sheeran, 1995](#)).

In our study, participants articulated how SARS-CoV-2 radically redistributed the locus of vulnerability between patients, staff, their families, the institution and community. This shifting and diffused sense of vulnerability resulted in widespread anxiety and fear. Participants from infectious disease and IPC specialties, and managers across all areas, described how managing colleagues' fear of infection and/or anticipation of overwhelming case numbers became a significant part of their increased workload:

It was the constant reassuring of staff that took the time as well. [...] Often, it was just a half an hour of sitting down and reassuring someone that there were people to support them and that they wouldn't be left on their own. But it was also trying to think out of the box about, if we did have up to 45, 50 ventilated patients, how could we as nurses manage that? (Senior ICU nurse, Queensland)

Even staff experienced in managing infectious diseases expressed an increased sense of vulnerability, noting that COVID-19 had exposed deficiencies in their IPC practice, e.g. "donning and doffing" PPE, and heightened awareness of the relations of care among patients, staff, the physical environment and the wider community:

This is the first time I'd ever felt unsure of my own safety, except when we were preparing for Ebola. It added another dimension to the care that you hadn't had to consider well, I should have considered before, but never had. It made me more aware of keeping other people safe too. We were keeping ourselves safe, but we were also having to make sure we kept other people safe as well. So it was an added responsibility. (Infectious Diseases nurse, Queensland)

In speaking of "added responsibility", this nurse articulates how the pandemic context illuminated the ethico-political dimension of IPC as a matter of care for self and others. A strongly felt obligation to "keep other people safe" in the context of evidentiary uncertainty drew patients, colleagues, family and friends into the sphere of IPC.

Participants frequently expressed paradoxical statements about the degree to which they felt at risk and a risk ([Willis & Smallwood, 2021](#)) to their networks of care within and beyond the hospital. Fears of succumbing to infection, becoming seriously ill or dying were commonplace, often based on what they observed happening to peers overseas ([Williams Veazey et al., 2021](#)). However, many participants expressed a sense that although unlikely to become ill themselves, they might become a vector of transmission to their family:

I wasn't worried about my personal risk; I was more worried about my partner and my family. So, I don't ever think I concerned myself because I believe in the PPE, I believe I was doing everything correctly. I didn't fear for myself, but my partner is older than me and he has a respiratory problem [...]. So my risk was to bring it home to him. [...] Through the high five/six weeks, I had no physical contact with my daughter or my granddaughter. That was tough. [...] And then I didn't really see any of my friends for a couple of months possibly, really. They stayed clear of me as well, which I had no problem with. (Social worker, Queensland)

Participants carefully managed physical proximity within their networks of caring relationships across both their professional and personal lives. Many discussed measures to protect others, for example, wearing scrubs, changing clothes and showering before coming into contact with their family, avoiding contact with family and friends from different households, and planning how they might completely isolate even from partners and young children, if the pandemic worsened. While the social worker quoted above confirmed that their separation from family and friends was "strictly [...] because I worked in the COVID wards", this contrasted with other participants' statements that they felt at greater risk outside the hospital:

I felt that if I was using PPE responsibly, that I was safe. And, to be honest, in a way, I got to a point where I felt safer at work than I did in the community, because I had PPE and I had an abundance of hand sanitiser, I had people around me that were super hypervigilant. So it was like this weird thing where I was like, "At least I know these people have my back." (Emergency nurse, NSW)

Another respondent:

I still think I'm safer at work than I am if I go to [the supermarket]. [...] Because I feel like everyone at work knows what needs to be done to keep everybody safe. Whereas I think that we have people in the community that just have no idea. (Administrative officer, Queensland)

Participants' sense of safety was tempered by their awareness of the relationality and thus precarity of IPC:

We're only as safe as a clinician making a good call in the front door. We're only as safe as the person who breaches PPE. (Senior Respiratory/Infectious Diseases nurse, Queensland)

The hospital is thus positioned as a risky space due to the (potential) presence of COVID-positive patients, deficiencies in IPC practice, and incomplete knowledge about the new virus. At the same time, it is a space of relative safety co-produced by the available resources, IPC practices, and the knowledge and vigilance of colleagues. IPC – as a matter of intercollegial care – involves attention, knowledge, action and obligation (see [Puig de la Bellacase 2017](#)).

The production of the hospital as a space of risk and/or safety also involves actors beyond frontline staff, for example, hospital executives and state/federal governments. Participants expressed broadly positive views of the measures taken by the Queensland, NSW and federal Australian governments, recognising that border closures and lockdowns had avoided the health system overload and loss of life they had seen in reports from overseas:

I think the government's done a pretty good job. Looking at what's happened in other countries, there's been America and places like that where the response just hasn't been quick enough and they've lost the race pretty quickly. (IPC nurse, Queensland)

Participants' reflections on health service management responses were more mixed and often emotionally charged, expressing frustration with changing guidelines, powerlessness in the face of altered decision-making processes, and anger at leaders who seemed unresponsive, distant or unprepared ([Broom et al., 2022](#)). By contrast, leaders deemed

“prepared” and “present” were highly valued and contributed to a sense of safety through mutual care and responsibility:

I feel very lucky to be in this organisation, because I honestly feel that, particularly our direct management in our department, they have really protected us and they have been very, very good to us in terms of making sure we are prepared. (ICU nurse, Queensland)

Above we see articulations of the ways in which HCWs' sense of vulnerability and risk was enmeshed in their relationships within and beyond the hospital. Pandemic narratives highlight the shifting relationality of IPC, demonstrating how safety, risk and vulnerability are co-produced by interdependent bodies, microbes, material objects and the environment, complicating accounts of IPC that centre on individual HCWs' actions (and individual patient vulnerabilities) (Hooker et al., 2020 20:4). Conceptualising IPC as a matter of care, and as a deeply relational practice, provides an alternative to the monitoring and auditing lens of much of the IPC literature (Brown et al., 2008). The unsettling of the collective sense of risk and safety brought by SARS-CoV-2 may outlast the current pandemic, with important implications for enduring notions of vulnerability and responsibility.

4.2. Paradoxes of proximity, risk and care

Managing the proximity of staff, patients and visitors has been critical to the protective strategies enacted by healthcare institutions, but it has also unravelled particular roles and forms of care, many of which require the physical proximity that has been positioned as risky. In our study, navigations of proximity, risk and care had different meanings and impacts across HCWs. For example, people who were unable to maintain distance perceived themselves as at greater risk, including nurses working in COVID-19 wards, and emergency and ICU departments; anaesthetists; and radiologists working in emergency and ICU settings (see Buising et al., 2021.) For these participants, proximity was central to their role in the provision of care, and there was little opportunity to delegate to someone else:

The doctors ordered video phones to go into the negative pressure rooms so that they could remain outside the room and converse with the patient via video from there. So, that basically left the only person having contact with the patient as the nurse. [...] And the nurses were taking the meal trays in and the catering staff were staying outside. The only thing the nurses weren't doing is emptying the rubbish bins. [...] So, it was primarily the nurse that was in direct contact. So we kind of felt a little bit like cannon fodder [...] It was almost the feeling like, “Well, you're disposable, you're not as important.” (Senior Respiratory/Infectious Diseases nurse, Queensland)

Nursing care cannot be done at a distance and because of their unavoidable proximity to patients, nurses were also asked to take on tasks for other staff, as in the excerpt above, who would thus be able to remain outside the ‘risky’ space of the patient's room. Allied health staff articulated the logic of taking a “minimalist approach” to avoid entering patients' rooms:

So probably the first level was, can the nursing staff who were already in contact with the patient, can they do our role? [...] If you didn't have to go in, don't go in. (Occupational therapist, Queensland)

Cleaners, whose presence in patient rooms was also unavoidable, reported being told to spend no longer than 15 minutes cleaning the rooms of COVID-19 patients (the length of time designated as relatively low-risk). In order to meet this target and minimise exposure, cleaners requested nurses assist with some cleaning tasks: “If the nurses were in there [ICU rooms] I couldn't understand why they couldn't wipe things all down.” (Cleaning team leader, NSW).

While hospital-based HCWs have been positioned as “on the frontline” (see e.g. Hoernke et al., 2021) of the pandemic, evidently some are

more frontline than others, with less ability to protect themselves via spatial separation. In some cases, nurses reported resisting pressure from colleagues to take on additional duties:

The pathology people, they'd come around and go, “Oh, can one of the nurses take their bloods?” It's like, “Well, no. No, we can't. That's your job.” And you'd get people that would not go in, they just would not go into the rooms. (Respiratory/Infectious Diseases nurse, Queensland)

Witnessing colleagues exercise degrees of autonomy and self-protection not available to themselves could be dispiriting, disrupting the solidarity of collective vulnerability to risk, and highlighting hierarchies and power asymmetries:

“There's nothing more demoralising than watching two doctors argue outside the double doors [about] who was going to come in when you'd been the one in there for hours.” (Respiratory/Infectious Diseases nurse, Queensland)

Viewed relationally, and situating the ethics of risk/exposure within roles and responsibilities, these experiences point to the ways in which the safety of some HCWs rests on the increased vulnerability of others. Indeed, these nurses' accounts trouble the more positive narratives of solidarity and mutual obligation presented in the previous section. Reconceptualising IPC as a matter of care (in all its dimensions) could present a means of extending how IPC is understood, recalibrating the ethico-political considerations that drive IPC practices and decision-making.

While proximity can be seen as risky, it is essential for effective clinical and social care and thus critical for avoiding other kinds of risk. While the intimate bodily care performed by nurses was positioned as unavoidable, even if potentially risky, other forms of care involved more complex negotiations of risk and care. For example, spatial separation measures created barriers to monitoring the condition of patients. As one Queensland paediatrician articulated:

As soon as you think that they may have COVID, the door gets closed and there's no ability to really monitor them closely. I mean, you could argue, yes, just stay in your PPE and stay in the room, but we don't have the resources for that. And so it's a barrier to go in and eyeball somebody in a very timely manner. Because as soon as you have to put your stuff on, you're kind of going, “Well, I'll wait. I'll do that at the end of the ward round because it's going to slow me down,” or whatever, and that's not good for our patients.

This constellation of distance and delay is also salient in the context of spatial reorganisations to enable isolation of patients, or the separation of patients designated as possible COVID-19 cases from other patients. For example, opening new wards to increase distancing between patients, moving patients into single rooms, or adding doors. In the following excerpt, an emergency physician in Queensland describes the fluctuating risk considerations during a spatial reorganisation for an anticipated influx of COVID-positive patients, which had not eventuated:

Quite sick people were put into an area where they were much less visible and then the consultant, who previously would have walked in, had a look and a chat themselves [...] didn't go in at all, and just waited for the resident to come out after an hour-and-a-half to tell them the patient's sick. And so, there was definitely clinical risk in the new areas that we commissioned. Necessary clinical risk because they then reduced the risk of transmission to other patients and to staff, but it certainly made things less clinically safe for that subgroup.

This paradox of distance as a signifier of safety/responsible care – and, simultaneously as a potential source of risk or even neglect – resonates with disability scholars' responses to pandemic health measures emphasising distance/separation. Arguing that such measures are based on an illusory “ideal of autonomy” (Fietz et al., 2020; see also Kochhar, 2020), disability scholars note that both pre-existing trends towards

individualised care structures (Carey, 2020) and the re-organisation/withdrawal of care services in response to COVID-19 (Fietz et al., 2020) place disabled people – and those who care for them – at risk of infection, neglect and death (Rotarou et al., 2021). Similarly, reviews of outbreaks in residential aged care note the importance of the built environment in facilitating separation between residents (and between staff) to avoid transmission of the virus, and the potential for IPC measures to lead to isolation and neglect (Gilbert & Lilly, 2021). If separation is deemed safer (for staff and patients) from an IPC perspective, but proximity facilitates faster, more responsive, more humane, care, which type of care should take precedent?

Our participants' accounts illustrate that their assessments of risk and safety were dynamic, shifting in relation to the broader spatiotemporal context of the pandemic. For the emergency physician cited above, for example, witnessing the rise and fall of case numbers elsewhere brought an acute awareness that being located in a "very low COVID risk area" was a precarious and likely temporary position. The choreography of care during a fluctuating infectious disease pandemic is complex, and the tensions between the risks and benefits of proximity and distance are difficult to resolve. Care is not synonymous with physical closeness; "it can be about the right distance" (Puig de la Bellacasa, 2017, p. 5). Distance, as a tool of IPC, not only inhibits touch as a mode of care (Dowrick et al., 2021), it also inhibits attention and thus timely treatment.

4.3. "There's no emergency in a pandemic": contestations of speed and safety

Across the uncertain trajectory of the pandemic, participants spoke of the pressure to "get up to speed" with new knowledge, changed practices and procedures. "The pace of change of information" was described by one doctor as "the single biggest challenge". He described writing a procedure and finding "by the time I'd finished writing it that night, it would have changed again." Participants spoke of their simultaneous hunger for updated information, and fatigue with rapid changes of processes. Decision-making and governance structures were established or adjusted to enable swift decision-making, and then, during what would prove to be temporary hiatuses in case numbers, slower, more bureaucratic decision-making was perceived to return.

In the midst of these competing urgencies, the relationship between speed, care and risk, presents some interesting paradoxes. Just as proximity may be paradoxically both safer and riskier in a pandemic context, rapidity and delay intersect in complex ways for both staff and patients. Reorganisation of space, systems and processes in response to a novel threat must be swift, as indeed must testing, diagnosis and treatment, but self-protection measures require slow and careful steps. In the context of diffused vulnerability, speed of care and speed of change became a signifier of the time and pace of safety.

Interviewing participants from different specialty groups revealed differing norms around pace, which were frequently contested. People trained in emergency medicine expressed a desire for swift decision-making, sometimes at odds with other specialties or managers:

The pace of decision-making was notably something that was quite frustrating for ED because ED makes decisions on a minute-to-minute basis and the answer is, "Tell me the information and I'll tell you the answer." The executive do not make decisions in that sort of pace. ID and public health rarely make decisions at pace. (Emergency physician, Queensland).

This participant's perception was confirmed by a NSW infectious diseases doctor who emphasised the importance of a slower tempo:

This is just Infection Control 101: you don't rush things in Infection Control, and you need to make sure that things are properly set up before they're activated. So, that should always have happened, including going around and checking all the signages, making sure all the appropriate PPE was there. [...] Things need to take time because things can look like

they're fine until you actually go through and work in them. We know that. It all seemed to be very quickly rushed through.

From this perspective, a slower tempo increases safety through improved scrutiny. On the other hand, the same participant expressed frustration at some colleagues' preference for delaying care to enable greater certainty about a patient's COVID-19 status:

There's been lots of other things actually which have been frustrating, just about care and delaying of care for a lot of people. I mean, I've found that a bit problematic. So some of it being people having investigations done, and some specialists, like radiology, placing higher demands on having negative test results, when really they need to be thinking about the actual risk. I mean, I've found that difficult, because that certainly delays the patient journey and delays often reaching the correct diagnosis or starting the correct management.

As this physician's account suggests, delaying care for the certainty of test results was often a moment of concern and inter-professional tension. Other participants noted similar concerns:

We would delay putting them on nebulizers until such a time where their COVID swab was negative or until we had a senior consultant make that decision. [...] we were there to witness treatment that was potentially poorer because we waited for the COVID swab and COVID trumps everything. (Respiratory/Infectious Diseases nurse, Queensland)

While some healthcare settings had close links to pathology services, and thus access to rapid testing, HCWs elsewhere had longer to wait, prompting negotiations around whether to accept increased risk or delay treatment. Meanwhile, patients still needed nursing care. From the perspective of the nurse, therefore, "waiting" did not entail passivity or absence of action. Indeed, nursing practices may be intensified during such waiting periods by the need for full protective practices and PPE, and the decision by non-nursing staff to abstain from proximate care until the patient's COVID status is confirmed:

Thankfully the swab results come back really quickly now, so we may have only been nursing them for a couple of hours on the ward doing COVID precautions (Respiratory/Infectious Diseases nurse, Queensland)

We were keen to quickly get back results so we could stop using and wasting [resources] where not necessary (ICU nurse, NSW)

The inclination to hurry was counteracted by the phrase "there's no emergency in a pandemic", which was cited by numerous participants, across both research sites, as a guiding principle and indicator of significant cultural change. One participant referred to it as a "mantra"; others noted the phrase had been introduced by senior colleagues, or enshrined in visual reminders:

We were always encouraged to never rush into a room. There's a sign out there saying 'There is no emergency in a pandemic'. We had to make sure that we were safe before we went in, which really went against the grain a lot. I had trouble making sure that I did it slowly, and the patient's in there going, "Help," and you can't just go, "I'm coming." You have to make yourself safe first, and that was really hard to do. [...] You were having to put yourself first. Your safety of yourself first, and that was something that was difficult. [...] I felt fearful for the patient because it took too long. The process was pretty long. (Respiratory/Infectious Diseases nurse, Queensland)

The phrase encapsulates the complex relationship between a desire for speed and aversion to risk and, incorporated in it, the sometimes competing priorities of staff and patient safety. A NSW anaesthetist described "reassuring people that if you have a disseminated pandemic, you're the valuable asset, not the patient, and essentially, you do what you can with what you have". This paradigm shift rests on a relational and future-oriented ethics of care, where the professional obligation to care

includes an element of self-protection, on its own merits and as a means of ensuring future ability to care for others (Jeffrey, 2020). As noted by participants above, this paradigm shift involved overcoming years of embodied practice. However, the guidelines around this change were interpreted by participants as acts of care by their organisation:

For years it's drilled into you that time on the chest is what saves lives [...] but now there is no CPR until the patient has a face covering, you stop CPR when inserting an advanced airway, things that completely go against all of those really ingrained processes [...] But at the same time, I understand that the organisation is looking out for us. For years we've said Ambulance doesn't necessarily look out for its staff but by introducing these changes, that's not for the patient's wellbeing, it's actually for our wellbeing. And trying to comprehend that, it's a challenge. (Paramedic, NSW).

In giving permission to provide *slower care*, although deeply uncomfortable for staff trained to respond quickly and selflessly, healthcare organisations demonstrate care for their staff and strategic thinking to enable the continuing delivery of healthcare. Staff are encouraged to see themselves not in a dualistic hierarchy of importance with the patient but rather as a node in a network of care delivery and IPC. Significantly, slower care for self-protection appeared to apply across all specialties and roles, in contrast to separation measures for self-protection, which applied unevenly across roles and specialties and left some groups feeling uncared for, or “like cannon fodder”.

In the pandemic context, speed and safety exist in dynamic tension. Rapidity may be deemed responsive or risky; likewise delay or deceleration may represent safety to some and abandonment to others (Baraitser & Salisbury, 2020). From the vantage point of 2022, the phrase “there's no emergency in a pandemic” brings to mind two contradictory declarations by public figures. Namely, Australian Prime Minister Morrison's “it's not a race” defence of the pace of Australia's vaccine roll-out, and New Zealand Prime Minister Ardern's “go hard, go early” justification of her government's pandemic response (Jamieson, 2020). HCWs in this study were urged to see IPC practices, which might delay or disrupt proximate care, as acts of care in which they enacted their ethico-political obligations to themselves, their families and colleagues. In turn, HCWs interpreted this guidance as itself an act of care towards them by the institution. In each, the complex relations of care, and the paradoxes of space and time, proximity and pace, vulnerability and dependence, safety and risk, are thoroughly entwined.

5. Discussion

Examining the interplay and paradoxical relations of space, time, risk and care in the experiences of Australian HCWs during the SARS-CoV-2 pandemic highlights how new pathogens unsettle and reconstruct practices around infective risk and transform accepted paradigms of care and self-protection. HCWs' deeply ingrained, embodied care practices have been reconfigured as they carefully manage proximity and distance, acceleration and delay, across networks of relations, interactions and practices within and beyond the hospital. The pandemic has amplified HCWs' sense of their own vulnerability to infection, and highlighted the (uneven) distribution of vulnerability across patients, HCWs, their networks of family and friends, healthcare institutions and the wider community.

Individual and collective understandings of risk and safety are relationally produced. This work reminds us of the need to attend to the non-human agency of microbes, in this case the virus, as well as the materiality of personal protective equipment, in reconfiguring matters of care (Puig de la Bellacasa, 2017). The relationality across humans, microbes, bodies, protective equipment and institutional contexts in IPC is exacerbated by the situational context of the pandemic, but is fundamental to IPC practices, even in non-pandemic times. It is not so much a case of governing effective IPC; rather, how IPC is made effective *in relation*. For example, the expansion of the nursing role, as an unintended result of IPC

guidelines to limit staff exposure, highlights how the safety of some staff rests on an increased risk to others. This also raises important questions about the ethico-political obligations to care. Who, in pandemic healthcare, bears the obligation to *care in close proximity*, and who can delegate this obligation to others? Who is rendered more vulnerable by the unequal distribution of this moral obligation and the resulting caring labour (Mackenzie et al., 2014; Kittay, 1999)? As so poignantly illustrated in our findings, the expansion of the nursing role to protect other staff in pandemic conditions (see also Ness et al., 2021) is worthy of further examination from a healthcare ethics perspective, in particular, inter-professional solidarity and professional obligations to care (Jeffrey, 2020). This tension between solidarity and safety in IPC practice warrants further attention.

The experience of the SARS-CoV-2 pandemic has highlighted the importance of conceptualising IPC as a relational, ethically complex and affective practice in which the infectivity of the pathogen is but one thread of the interwoven fabric of concern. One route to untangling some of the paradoxes of risk and care in a context of radical uncertainty is to conceptualise IPC as a multidimensional, deeply relational matter of care. From the networked diffusion of vulnerability to the paradoxes of proximity and pace that HCWs have experienced during the pandemic, these findings add complexity to conceptions of IPC positioning patients as subjects and vectors of infection, and monitoring individual HCWs' practices of prevention and control.

Looking to the future, participants talked about an enduring wariness in relation to proximity to patients with infectious diseases and an unsettling of presumptions of safety and certainty in the hospital environment. This has implications for IPC practices and communication, and for care within and beyond the hospital. Fields such as public health, infectious diseases and IPC have been pushed into the spotlight during the SARS-CoV-2 pandemic but it remains to be seen whether this attention will translate into enduring change, improved practice or enhanced pandemic preparedness. Participants expressed the hope that decision-making would be quicker in a future pandemic as a result of the SARS-CoV-2 experience, but also noted signs that as organisations emerged from the initial crisis stage, bureaucracy and budget constraints were already slowing the pace of everyday decision-making. Illustrating, as we have here, the relationality of IPC, reveals the need for HCWs, managers, institutions, governments, and the community to treat IPC as a matter of care, one that is rife with affective and ethical dynamics, both now and into the post-pandemic future that will hopefully soon come to pass.

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Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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