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Learning from healthcare workers' experiences with personal protective equipment during the COVID-19 pandemic in Aotearoa/New Zealand: a thematic analysis and framework for future practice

Cervantée E K Wild [1,2] Hailey Wells,[1] Nicolene Coetzee,[1] Cameron C Grant [1,3] Trudy A Sullivan [4] José G B Derraik [1] Yvonne C Anderson [1]

ABSTRACT

Objectives Safety and welfare are critical as pandemic-related demands on the healthcare workforce continue. Access to personal protective equipment (PPE) has been a central concern of healthcare workers throughout the COVID-19 pandemic. Against the backdrop of an already strained healthcare system, our study aimed to explore the experiences of healthcare workers with PPE during the first COVID-19 surge (February–June 2020) in Aotearoa/ New Zealand (NZ). We also aimed to use these findings to present a strengths-based framework for supporting healthcare workers moving forward.

Design Web-based, anonymous survey including qualitative open-text questions. Questions were both closed and open text, and recruitment was multimodal. We undertook inductive thematic analysis of the dataset as a whole to explore prominent values related to healthcare workers' experiences.

Setting October–November 2020 in New Zealand.

Participants 1411 healthcare workers who used PPE during surge one of the COVID-19 pandemic.

Results We identified four interactive values as central to healthcare workers' experiences: transparency, trust, safety and respect. When healthcare workers cited positive experiences, trust and safety were perceived as present, with a sense of inclusion in the process of stock allocation and effective communication with managers. When trust was low, with concerns over personal safety, poor communication and lack of transparency resulted in perceived lack of respect and distress among respondents. Our proposed framework presents key recommendations to support the health workforce in terms of communication relating to PPE supply and distribution built on those four values.

Conclusions Healthcare worker experiences with PPE access has been likened to 'the canary in the coalmine' for existing health system challenges that have been exacerbated during the COVID-19 pandemic. The four key values identified could be used to improve healthcare worker experience in the future.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Transferability of the findings to countries with higher rates of COVID-19 than New Zealand is uncertain.

⇒ There was variability in the richness of responses across the dataset; the survey design meant that we could not probe for further explanation.

⇒ However, this was partially mitigated by the large sample size (n=1411 participants).

⇒ The collection of open-text comments alongside questions that were narrower in scope allowed for capture of important participant experience and prioritisation of healthcare workers' voices.

INTRODUCTION

The COVID-19 pandemic has placed a considerable amount of additional pressure on health systems worldwide. In Aotearoa/New Zealand (NZ), the first confirmed COVID-19 case was on 28 February 2020.[1] The country subsequently moved into a stringent[2] lockdown on 25 March with all non-essential businesses closed and workers staying home.[3] This approach resulted in the health system being able to manage the relatively limited number of cases; however, as in other countries, healthcare workers expressed concern that they did not have access to adequate personal protective equipment (PPE) to carry out their work safely.[4] Medical PPE is used to minimise risks to health and safety to healthcare workers and has previously been shown to be an effective form of infection prevention and control.[5 6] In NZ, concerns about PPE access were reviewed in a report

undertaken by the Office of the Auditor-General (OAG) into the way PPE was managed in NZ during the initial outbreak (surge 1: from 28 February 2020 to 8 June 2020[7]). Poor pandemic planning, mismanagement of PPE distribution and poor communication exacerbated existing complexity issues in the NZ health system.[8] PPE procurement in NZ has previously been the domain of the 20 individual district health boards (DHBs); however, the Ministry of Health has essentially centralised PPE supply following the OAG report.

Healthcare workers' safety and welfare were highlighted in media headlines in the early stages of the COVID-19 pandemic.[9] [10] In NZ, a cross-sectional survey of psychological outcomes and sources of stress in essential workers during the first COVID-19 surge found that healthcare workers were up to 71% more likely to experience moderate levels of anxiety compared with other essential workers.[11] Additionally, interview-based studies of healthcare workers in the UK,[12] and nurses in the USA,[13] have described anger, betrayal and feelings of being dispensable as they dealt with limited PPE supply while caring for patients. In NZ, the pandemic occurred at a time when there had already been signals that the health system was strained and in need of reform, with the NZ Government instigating a review of NZ health and disability services released in 2019.[14]

Prioritising healthcare workers' experience and finding solutions to ensure their safety and well-being are paramount in order to maximise workforce retention during a global pandemic and beyond. In general, qualitative analysis of surveys is often underused,[15] [16] perhaps owing to the perceived brevity of responses in mixed-methods surveys, or the lack of opportunity for respondents to provide detailed responses due to the survey design.[16] However, Braun[15] and colleagues noted that if surveys are well designed for the topic of interest, the resulting dataset is likely to be rich and complex when taken in its entirety. In this study, we report the findings from a nationwide survey in NZ that aimed to: first, understand the experiences of healthcare workers as they used PPE in their work during surge one of the COVID-19 pandemic, and second, propose a strengths-based framework using the themes identified for supporting healthcare workers moving forward.

METHODS

An anonymous, web-based cross-sectional survey was completed by healthcare workers in NZ who use medical PPE as part of their work (online supplemental file 1). The survey was developed by a multidisciplinary team including 'frontline' clinicians who used PPE in their work as well as non-clinicians. This was piloted among the research team, as well as among our wider colleagues and networks from a range of disciplines, though was not formally validated. The survey was undertaken in October–November 2020. Recruitment was multimodal, involving distribution through professional and representative organisation mailing lists, social and collegial networks, study advertisements on university and organisational websites, and word of mouth to maximise reach and potential response.[17]

In the survey, respondents were asked about their experience of PPE use and their demographic characteristics including age, gender, occupation, region and place of work. Survey questions included closed and open-text questions (extension, expansion and general open-text questions)[16] about respondents' experiences. PPE was described as equipment 'worn by a person to minimise risks to health and safety. PPE includes masks, eye protection, gloves, gowns, and in the event of aerosol-generating procedures, N95-type filtering face-piece respirators (FFRs)'. Ethnicity data were collected according to NZ Ministry of Health Ethnicity Data protocols, with participants able to select multiple ethnicities.[18] The survey was constructed using Qualtrics software (Qualtrics, Provo, Utah, USA) and beta-tested. All respondents provided informed consent electronically, as otherwise they were unable to proceed to the survey.

Inductive thematic analysis[19] of the qualitative dataset as a whole was undertaken to understand foregrounded issues in participants' experiences across the dataset. This approach was chosen due to its usefulness in understanding people's experiences, views and opinions and its suitability for working with a large qualitative dataset.[15] Following the six phases of reflexive thematic analysis outlined by Braun and Clarke,[19] Author 1 repeatedly reviewed the dataset as a whole to become familiar with the data before coding the full dataset. Coding was inductive, critically realist and both semantic and latent. Interconnecting ideas were then collapsed and worked into broader themes. Author 1, 3 and 7 then worked collaboratively to sense-check the generated ideas and to explore multiple interpretations of the data. Throughout the writing process, these themes underwent further review and refinement in conjunction with the wider research team. Using the findings from the thematic analysis, the team collaborated to develop a strengths-based framework of recommendations based on the testimony of the respondents.

Patient and public involvement (PPI)

Healthcare workers/clinicians ('PPI') were involved from study conception and throughout the research process. Clinicians internal and external to the research team were involved in peer reviewing the study design, survey questions and methods of recruitment. They evaluated the burden/time required to participate in the research and have been involved in study dissemination.

RESULTS

Overall, 1411 respondents completed the survey (80.6% female, 25.9% aged <35 years, 73.6% of NZ European

Table 1 Participant demographics*

Survey participants, n	1411
Gender, n (%)	
Female	1140 (81.6)
Ethnicity, n (%)†	
Māori	102 (7.6)
NZ European	995 (73.9)
Asian	190 (14.1)
Other	60 (4.5)
Age, n (%)	
<35 years	366 (25.9)
35–44 years	299 (21.2)
45–54 years	346 (24.5)
>55 years	400 (28.3)
Profession, n (%)	
Medical	269 (19.1)
Nursing	468 (33.2)
Dental	86 (6.1)
Allied health	486 (34.4)
Other health	102 (7.2)

*Comparative national health workforce data not available.
†Prioritised ethnicity output.[18]
‡'Other' ethnicity includes Pacific Peoples, and participants have been identified as such within the text.
NZ, New Zealand.

(NZE) ethnicity) (table 1). Respondents lived across NZ (76.1% in the North Island) (online supplemental file 2). Total numbers of responses varied across survey questions.

Thematic analysis produced four main intersecting themes as respondents grappled with risk and decision-making in the context of compromised PPE supply during the COVID-19 pandemic. Taken together, these four interrelated values—trust, transparency, safety and respect—are essential for understanding healthcare workers' experiences and concerns during wave one of the COVID-19 pandemic, as summarised by the respondent below:

> The PPE issues experienced represented the overall dysfunction in the healthcare system, and in a way, has been the canary in the coalmine. It highlighted the negative impacts of managerialism within health […] This was extremely disappointing, given if healthcare workers became infected, so would managers. Trust is so critical in a pandemic, where healthcare and other frontline workers are putting their health and potentially lives on the line, and managers did not demonstrate caring and compassion overall nationally with this issue. #2012 (Consultant doctor, female, NZ European)

Transparency: 'Just be honest, upfront and consistent." (#782 – midwife, female, NZ European)

Open and clear communication and honesty around decision-making are critical for fostering a team culture within healthcare organisations. For most respondents, honesty about stock levels and plans to manage potential shortages was preferable to unfounded reassurances:

> Instead of a manager running around removing your PPE and locking it away, it would have been better to explain why there was a necessity to ration it out. #728 (Laboratory technician, female, NZ European)

> Communicate, and just not the decisions but the rationale that led to the decisions. #1161 (Nurse, female, NZ European)

However, a small portion of participants disagreed, reporting that communication of stock level information would create anxiety and that staff should trust that they had enough to keep them safe:

> I trust there will be enough. Best avoid creating anxiety. #1570 (General practitioner, female, NZ European)

Nevertheless, transparency was considered essential to understanding decision-making rationale, allaying staff concerns and preventing rumours:

> … the hospital propaganda machine has proven it cannot be trusted to give honest information to staff around supply of PPE. #922 (Anaesthetic technician, male, Māori)

> Be clear, as there were lots of rumours going around. At one stage, we were told ED [emergency department] had no PPE. It had actually been locked away as it was being stolen. #848 (Consultant doctor, female, NZ European)

This sentiment was echoed by those in PPE procurement, who felt that transparency would also help prevent potential mismanagement of PPE:

> More transparency around stock for those of us responsible for ordering. I had to lock away my supplies due to "misappropriation" as people panicked about unfounded shortages. #949 (Nurse, female, NZ European)

Trust: 'Trust is so critical in a pandemic' (#2012 – Consultant doctor, female, NZ European)

The need for transparency was closely related to notions of trust, or lack thereof, with appeals to '*trust your staff [enough] to be honest with them*' (*#391 – Social worker, female, NZ European*). Respondents' comments suggested that a lack of transparency from managers was an indication of employer distrust of employees to use that information in a responsible way:

> Respect their staff by communicating honestly regarding the situation. I felt information was issued on

a need-to-know basis. Management were [sic] intentionally withholding information or being economic with the truth, yet expecting us to be dealing with the risks despite not being fully informed. I think they were afraid of a mass revolt. #355 (Nurse, female, NZ European)

For respondents who reported positively on their employers' handling of PPE shortages, transparency also appeared to build trust and respect for management:

Personally, I think my employer handled the crisis and demand for PPE very well. We were all in uncharted territory and my employer kept us informed every step of the way. #911 (Nurse, male, NZ European)

Overall General Practice felt a lot safer with more quick (sic) uptake of PPE and no managerial obstruction to its use plus manager took responsibility for ordering and making sure we also had PPE available. We initially had low stock supplies but this was quickly addressed. #1121 (General practitioner, female, Māori)

Overall, transparency was considered to be '[…] a critical element of working together and building trust within the organisation. Otherwise, it is an "us and them" experience' (#2012):

Treating healthcare and other frontline workers as equals in this pandemic (and always), ensuring meaningful clinical governance. Providing updates as to how PPE stocks and potential shortages are being managed. Having visible updates of PPE stock levels. This will assist in building trust, and also highlights that healthcare worker safety is an important issue for managers. Also ensuring that issues around pandemic stock never happen again, many of us were aware of organisations not updating pandemic stock as they should have been, which negatively impacted on trust. #2012 (Consultant doctor, female, NZ European)

Reported incidents suggested that many healthcare workers felt that management did not trust them to use PPE appropriately, with gatekeeping leading healthcare workers feeling like they were not allowed PPE or that they did not deserve it.

We were told in isolation rooms (not covid, like diarrhoea and vomiting etc.) to go easy on the supply. Like we were wasting it in contagious gastro rooms. We seemed to be targeted a lot as people to blame. It was our fault the sanitizer went missing. Our fault supplies were so low. Like we were overusing it. Stock became harder to get for isolation rooms not on the covid ward. It was only after they accused us of stealing and misuse, I finally took a single spare surgical mask for my "emergency" work backpack with my own spare scrubs and own sanitizer, because everything

was vague and thinly veiled threats, we were getting low. #1309 (Nurse, female, Māori)

In this way, PPE was perceived as a mark of healthcare worker value for many respondents.

I don't understand how the lack of occupational health for ALL users has just been swept under the carpet - they lied, got away with it and now there will be no further discussion. I'm also frustrated that from the beginning they kept telling us we didn't need elements of PPE when we felt we did, zero consideration of staff mental health - that feeling protected is incredibly important for mental health - and it turns out we were in fact correct. #175 (Consultant doctor, female, NZ European)

These notions of trust appeared repeatedly throughout the survey data, in terms of both healthcare workers' experiences within their own organisations and, by extension, their trust in the government. This was closely intertwined with ideas about respect and safety, as evidenced in this respondent's final comment:

Final point, the frontline does not trust the DHB or the Government to keep them safe. #1055 (Infection control, male, NZ European)

Safety: 'We are not sacrificial lambs!' (#1680 – nurse, female, Asian)

Irrespective of actual access to PPE, respondents' comments signalled that healthcare worker safety was perceived to be compromised throughout surge one due to limited PPE. This was aligned with a sense that healthcare workers were compelled to work regardless of workplace conditions and that this was justified due to being frontline workers:

… everyone affected has the right to know if there is enough equipment available for them to do their job safely so they can make informed choices. #308 (Practice manager, female, Māori)

Fit testing of filtering facepiece respirators (FFRs) was highlighted by respondents as a key health and safety issue and essential for planning for a PPE supply that was appropriate for healthcare workers:

If DHBs don't actually know what their supply requirements are due to lack of fit testing all staff on each mask that may be used, then it will be impossible for the MOH (Ministry of Health) to plan. #2012 (Consultant doctor, female, NZ European)

The apparent lack of safety made respondents feel expendable, dispensable and, in some cases, shamed for asking for PPE:

Full PPE should be provided to the front-line healthcare workers. We put ourselves and our family at risk when working for the public during pandemic. Being

told off by your manager for wearing PPE is totally unacceptable. #1206 (Nurse, female, Asian)

Feeling unsafe was apparent across disciplines, which contributed to a sense of exclusion among some healthcare professionals who had difficulties accessing PPE, with some indication of differences between primary or community care, and secondary care:

Midwives and other community workers were begging for PPE, including gloves. We ran out the first week, bought my own, then had enough. Were told surgical mask was enough, when we knew it wasn't, and were told not to use a mask unless suspect, but saw workers overseas catching it from 'non-covid' patients. #1157 (Nurse, female, NZ European)

General Practice did not have clear, consistent communication from our PHO regarding PPE supply, delays in delivery and pressures on stock. We also had difficulty accessing hand sanitiser and waste collection for safe donning/doffing. This is despite being a testing clinic and seeing high numbers of symptomatic patients. We do not feel recognised or appreciated for the huge workload, financial pressures and clinical risk which has been placed on those General Practices screening, swabbing and managing patients during the CV-19 outbreak. #109 (General practitioner, female, Māori)

Respondents' comments highlighted that feeling safe and protected is closely tied with feeling valued and respected.

Respect: 'I felt abandoned, and like management did not care about our health or risk to our health, as frontline workers' (#2024 – consultant doctor, female, NZ European)

Lastly, respect was contingent on transparency, trust and safety.

Transparency is required by the DHB, to allow trust in those in management to us on the frontline. #2024 (Consultant doctor, female, NZ European)

Many comments showed that respondents felt overworked and disrespected as healthcare workers. There was a sense that some respondents did not feel that their organisation (or the government) prioritised their safety, which led to feeling devalued:

I felt as a nurse specialist completely overlooked in the first wave. We had no PPE, no instructions, no fit testing or keeping distance from others […]. It's a joke. My colleagues and I have experienced waves of anger and stress at how casually we were treated and have sought the help of professionals. It is an interesting phenomenon we are going through. We most certainly did not feel we were in a team of 5 million, in fact we felt used and disrespected. #1187 (Nurse, female, NZ European)

At times feel so tired and burnt out, I have contemplated quitting job and looking for another job with less hours. #1848 (General practitioner, female, Pacific Islander)

Divisions between clinical and management roles were stark, and relationships tended to be worsened by poor communication and 'gas lighting'. Some comments suggested that this might have been partially mitigated with more clinical representation on decision-making teams:

Respectful engagement rather than imperious rearguard autocracy. #2035 (consultant doctor, male, NZ European)

Our management seemed to think we were a joke with worrying about it, they never practiced safe practice at all and held meetings when not necessary, we work in a dental scene and never got given the correct mask, our gowns were also given away to hospital staff and we were given uncomfortable ones. #683 (Dental hygienist, female, Māori)

There was also a perception of devaluing of healthcare workers compared with non-healthcare workers. Respondent comments demonstrate a sense that either current evidence-based policy at the time was not adequate to protect healthcare workers, or that it was inconsistently implemented – both scenarios being innately tied with a perception of a lack of care for the health workforce.

Frontline staff felt expendable while the rest of the world were wearing masks both in public and in health care settings. #1181 (Nurse, female, NZ European)

Be open with staff. We are only allowed one surgical mask per shift, yet they were giving out free masks to the public at the front entrance. #1250 (Nurse, female, NZ European)

Regardless of whether it was deemed necessary in certain roles, for many healthcare workers, PPE became a symbolic marker of respect from their organisations, the public and the state.

Bringing together findings from respondents and the four inter-relating themes identified, table 2 presents the 'Nurture' framework as an approach for supporting health professionals during the COVID-19 pandemic (and beyond) and gives key recommendations for practice moving forward.

The Nurture framework, developed from the respondents' reported experiences, presents recommendations for practice to better support the health workforce, which are built on trust, transparency, safety and respect. While many district health boards have organisational values, these themes have been provided by healthcare workers themselves. When healthcare workers cited positive experiences, trust and safety were perceived as present, with a sense of inclusion in the process of stock allocation with managers and communication. When trust was low, with concerns over poor communication, and lack

Table 2 The nurture framework: an approach for supporting health professionals during the COVID-19 pandemic and beyond

Value	Supporting examples from respondent data	Recommendations for practice
Trust	'Transparency builds trust. The smoke and mirror tactic of large organisations builds fear and rebellion. It is also highly patronising. If you tell clinicians, you are in trouble and need help.... we will use innovative and out of the box thinking to help... if you treat us like mushrooms.... you will instantly lose our goodwill (clearly essential in this case), our trust.... And our respect' – #114 (Consultant doctor, gender not stated, NZ European). 'We have been continually be told not to use PPE unless absolutely necessary, each time the PPE has started to run low our practice/recommendations/criteria have changed to fit the availability of PPE. This had led to an absolute distrust that we are following the best clinical recommendations, instead prioritising reducing the hospitals costs' – #922 (Anaesthetic technician, male, Māori). 'Sharing that information makes me feel trust toward the organisation. Transparency and disclosure can create respect, and these form a team mentality' – #534 (Healthcare assistant, female, NZ European).	▶ Healthcare workers are included in decision-making processes. ▶ Clinical representation at an organisation's governance level. ▶ Close engagement with healthcare workers in times of PPE supply shortages. ▶ Working environment is collaborative rather than managerialist.
Transparency	'Transparency of information during stressful times provides great insight along with understanding. Withholding information provides insecurity/uncertainty and loss of confidence in leadership' – #1264 (Dental hygienist, female, Māori). 'Many of the communication issues were due to evolving understanding of proper use of PPE but there was a level of secretiveness and defensiveness when questions were asked that contributed to fear and rumour' – #1632 (Early career doctor, female, NZ European). 'Staff were advised about supply chain problems, but without the details, no one knew what to expect next. From an infection control perspective, this is a potential risk, because staff start to make decisions about what is best, and masks are seen worn inappropriately or put in pockets for re-use, as people become nervous that supplies will run out' – #1179 (Nurse, female, NZ European).	▶ Open communication with clear rationale for decision-making provided. ▶ Stock level information is accessible to healthcare workers. ▶ Honest communication about uncertainty. ▶ System failures are appropriately acknowledged rather than blaming individuals.
Safety	'100% adequate and appropriate provision of PPE gear [sic] needs to be provided otherwise I believe we should have the same rights as the general populace and be able to make decisions on our personal well-being not being compromised by a workplace environment' – #669 (Social worker, female, NZ European). 'Why were we so unprepared for a pandemic? Are we prepared for the next pandemic? The feeling amongst the nursing staff is that we were like cannon fodder. Pushed out into the front line without protection.(...) This placed staff in an unacceptable place and may have left our vulnerable patients without enough nurses to care for them. Terrified to be working if the next virus is stronger than COVID 19. Will resign in the short term before I put my health at risk' – #1181 (Nurse, female, NZ European). 'Feel that some professions did not have equal access to PPE and were told not to wear certain aspects of PPE despite have the clinical reasoning to be able to assess risk and what was required' – #349 (Physiotherapist, female, NZ European).	▶ Commitment towards appropriate occupational health and safety standards for all healthcare workers. ▶ Fit testing and checking of FFRs and appropriate PPE donning/doffing training regularly available as per approved safety standards. ▶ Welfare/well-being services readily available for healthcare workers requiring them. ▶ Safety is acknowledged as a *minimum* requirement for nurtured healthcare workers.

Continued

Table 2 Continued

Value	Supporting examples from respondent data	Recommendations for practice
Respect	'They were inconsistent about the need for PPE and cagey about their policy and uncaring regarding whether I got the plague or not' #375 (Consultant doctor, male, Māori). 'The organisation developed an Incident Management Team (IMT) which did a very poor job of communicating who the members were and their roles. The lead clinician sent condescending emails to staff concerns and there was poor communication to frontline staff. The members of the IMT lacked an understanding of the issues faced and we were left to develop our own protocols which the IMT subsequently challenged until they were shown our rationale. This was despite many repeated attempts in engaging them while developing our protocols' – #1328 (Consultant doctor, male, Asian). 'Why is it that supermarket workers had access to PPE, and were allowed to wear PPE during the first wave, and we (frontline health workers) weren't? Why did hairdressers get access to PPE when ours was kept under lock and key? Sure, the(organisation*) was going by MoH (Ministry of Health) / WHO (World Health Organization) "guidelines", but why do other professions care more about their staff than(organisation*)? And why is it okay?' – #86 (Nurse, female, Asian).	▶ Equity between healthcare professions in terms of access to PPE is ensured. ▶ Healthcare workers' concerns are listened to and responded to meaningfully. ▶ Care and compassion are demonstrated rather than defensiveness. ▶ Healthcare workers are treated as equals within organisations.

*The organisation's name was omitted to ensure anonymity.
FFRs, filtering facepiece respirators; NZ, New Zealand.

of transparency in decision-making, this resulted in a perceived lack of respect, distress among respondents and sense of unsafety.

DISCUSSION

Our study reports challenging and fraught experiences of healthcare workers in the face of limited PPE access during the pandemic. Their experiences suggest a widespread sense of disrespect and gaslighting that threatened healthcare worker safety at a critical time and suggest that the way PPE was managed was suboptimal on the part of some organisations. Our qualitative findings provide greater context for healthcare workers' experiences with PPE during the pandemic, with presence or lack thereof of four key values (transparency, trust, safety and respect) underpinning their experiences. The open-text comments throughout the survey demonstrated the dilemmas healthcare workers faced as they grappled with risk and decision-making in the context of threatened PPE supply in the pandemic[20 21] and corroborate the concerns around PPE mismanagement by organisations and government from the OAG report.[8]

For many healthcare workers, it appears that communication relating to PPE and its supply represented 'the canary in the coalmine' for wider healthcare system challenges. These difficulties surrounding PPE supply and access have occurred against the backdrop of calls for healthcare reform, among a workforce already under stress, burnt out, under-resourced and facing increasing workplace demands.[14] As a result, the strain and complexity of urgently managing PPE logistics and supply at the commencement were unsurprising. Many of the reported findings relate to wider health systems issues identified in the Health and Disability System Review and the need to support the workforce to keep New Zealanders well.[14] Reports of bullying and toxic workplace culture have been highlighted within district health boards across NZ prior to the pandemic, and respondents reflected that some of these issues have not been resolved despite some regional health boards working towards addressing them with antibullying programmes.[22–25] These challenges appear to have been both illuminated and exacerbated by the pandemic and its associated PPE access and supply issues; the 'Nurture' framework provides several recommendations for change, such as a commitment towards appropriate occupational health and safety standards for all healthcare workers, and inclusion of healthcare workers in decision-making processes with clinical representation at organisational governance level.

Our study highlights widespread concerns regarding PPE supply, also reported by healthcare workers elsewhere. A recent study of PPE experiences in the UK identified concern among healthcare workers when official guidance appeared to downgrade the level of PPE required in certain areas,[12] especially as this appeared to be governed by supply issues rather than level of risk. In NZ, the OAG report noted that there was public confusion about 'who

should have access to PPE and in what circumstances' and concern from healthcare workers that current guidelines were insufficient for preventing transmission among them.[8] Our survey supports this finding and demonstrates there was concern from some respondents for whom certain types of PPE were deemed unnecessary, and further in-depth exploration of the differences in experiences between primary and secondary care may be warranted. Additionally, it was clear that the vagaries as to which professions and areas of care are supplied from central MOH and/or regional DHB stocks, coupled with the perceived disparities between different professions, added to distress levels. The Ministry of Health has updated its communications regarding this to improve clarity.[26]

Our survey shows that debates around who 'requires' PPE can easily become who 'deserves' PPE, which does not foster goodwill among healthcare workers and different professional groups within health. This reflects what has been found in the UK among healthcare workers outside of secondary care settings who felt inadequately protected.[12] For many respondents, it appeared that PPE access—and subsequently, perceived safety—had become a symbol of the value and worth placed on healthcare workers by their employers and wider society. Previous research has demonstrated that a lack of perceived safety can increase the risk of depression, anxiety and post-traumatic stress disorder[27]; furthermore, access to PPE and training can mitigate these adverse psychological outcomes.[28] Pandemic circumstances require the availability and willingness of healthcare workers to continue in their work, but this relies on the provision of and training in PPE use to minimise exposure risk.[4] It is therefore vital that healthcare workers are supported and nurtured in their roles to be able to deliver care safely. In terms of wider restructure, it is important to acknowledge that no amount of health systems reform will be successful in supporting healthcare workers unless workplace culture is improved. It is proposed that application of the Nurture Framework we present will assist managers in prioritising health professionals' welfare and well-being as health system reform evolves, enabling a supportive partnership between managers and clinicians.

Limitations of this study include that not all the qualitative survey data were rich or nuanced; there were thin responses across the dataset. However, this was mitigated, at least in part, by our large sample size, which included a large number of respondents across NZ. The collection of open-text comments,[16] alongside questions that were narrower in scope, was also a strength as it enabled capture of important information and prioritisation of healthcare workers' voices. This enabled the research team to make use of a large, rich qualitative dataset to complement the quantitative data previously analysed.[15] In this analysis, we were unable to identify considerable differences across ethnicity between participant experiences. While this may speak to the apparent universalism of these values that characterised participant experiences, we acknowledge

the reasonably low numbers of Māori participants that may have affected interpretation of our results. The transferability of the findings to countries who undertook different strategies in their response to COVID-19 is uncertain; however, we contend that these four values would be relevant to healthcare contexts worldwide.

In conclusion, this survey shows that trust, respect, transparency and safety are key factors to consider when working with healthcare workers around PPE supply and usage and indeed more broadly with respect to health system issues in general. Experiences of PPE use could be described as 'the canary in the coalmine' of current health system challenges and provide opportune insights into supporting the healthcare workforce moving forward through the COVID-19 pandemic and beyond. It is critical that a commitment to genuine partnership between managers and clinicians is made, in order to achieve a supportive workplace environment, and to enable the delivery of high-quality healthcare.

Author affiliations
[1]Department of Paediatrics: Child and Youth Health, Faculty of Medical and Health Sciences, The University of Auckland, Auckland, New Zealand
[2]Nuffield Department of Primary Care Health Sciences, University of Oxford, Oxford, UK
[3]Department of General Paediatrics, Starship Children's Health, Auckland, New Zealand
[4]Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand

Author note Until July 2022, District Health Boards were responsible for providing or funding the provision of health services in their district in New Zealand. This responsibility has since been taken over by Te Whatu Ora (Health New Zealand) and Te Aka Whai Ora (the Māori Health Authority).

ORCID iDs
Cervantée E K Wild http://orcid.org/0000-0001-5377-6222
Cameron C Grant http://orcid.org/0000-0002-4032-7230
Trudy A Sullivan http://orcid.org/0000-0001-8452-2591
José G B Derraik http://orcid.org/0000-0003-1226-1956
Yvonne C Anderson http://orcid.org/0000-0003-2054-338X

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