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Exploring the impact of the COVID-19 pandemic on perceptions of national scheduled childhood vaccines among Māori and Pacific caregivers, whānau, and healthcare professionals in Aotearoa New Zealand

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ABSTRACT

In Aotearoa New Zealand, there has been a marked decrease in the uptake of routine childhood vaccinations since the onset of the COVID-19 pandemic, particularly among Māori and Pacific children. This Māori and Pacific-centered research used an interpretive description methodology. We undertook culturally informed interviews and discussions with Māori and Pacific caregivers ($n = 24$) and healthcare professionals ($n = 13$) to understand their perceptions of routine childhood vaccines. Data were analyzed using reflexive thematic analysis and privileged respective Māori and Pacific worldviews. Four themes were constructed. "*We go with the norm*" reflected how social norms, health personnel and institutions promoted (and sometimes coerced) participants' acceptance of routine vaccines before the pandemic. *"Everything became difficult"* explains how the pandemic added challenges to the daily struggles of whānau (extended family networks) and healthcare professionals. Participants noted how information sources influenced disease and vaccine perceptions and health behaviors. *"It needed to have an ethnic-specific approach"* highlighted the inappropriateness of Western-centric strategies that dominated during the initial pandemic response that did not meet the needs of Māori and Pacific communities. Participants advocated for whānau-centric vaccination efforts. *"People are now finding their voice"* expressed renewed agency among whānau about vaccination following the immense pressure to receive COVID-19 vaccines. The pandemic created an opportune time to support informed parental vaccine decision-making in a manner that enhances the mana (authority, control) of whānau. Māori and Pacific-led vaccination strategies should be embedded in immunization service delivery to improve uptake and immunization experiences for whānau.

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Introduction

The COVID-19 pandemic disrupted immunization services and vaccination campaigns globally, resulting in millions of children delaying or missing vaccine doses.[1–4] Fear of contracting COVID-19, restricted movements and closure of health services due to lockdowns, insufficient health personnel and personal protective equipment, and unclear guidance of safe vaccine administration in mass vaccination campaign environments were among the factors contributing to disrupted immunization services early in the pandemic response.[2,3,5] Amidst efforts to respond to the ongoing pandemic, immunization service providers worked to regain the momentum of immunization programs. However, millions of children worldwide are still missing out on age-appropriate immunizations to protect against vaccine-preventable diseases.[2,4]

Although touted as one of the most effective public health interventions,[6] routine childhood immunizations involve a complex interplay of factors that can explain why children are still missing out on vaccine doses since the onset of the pandemic.[5] Development of the 'new' COVID-19 vaccines was swiftly followed by widespread vaccine mis/dis-information about their safety and efficacy, exacerbating existing barriers to pediatric vaccine uptake by increasing parental vaccine hesitancy and risk perceptions.[7] A US study reported that one-third of parents' children missed a required vaccination during the pandemic, and only 65% planned to get their child vaccinated.[8] On the contrary, a Canadian study reported that the COVID-19 pandemic positively influenced parental vaccine confidence and acceptance of routine vaccines for their children.[9] Further, a Greek study reported a vaccine hesitancy rate of 8.9% among 1,095 parents toward routine childhood vaccines.[10] Notably, awareness, knowledge, and trust in authorities regarding the COVID-19 pandemic were strongly associated with being less hesitant about routine childhood vaccine decisions.[10]

In Aotearoa New Zealand (NZ),[a] a marked decrease in routine childhood immunization rates occurred during the COVID-19 pandemic, exacerbating existing immunization inequities by ethnicity and geographic region.[11] In NZ, children fully immunized at 24-months dropped from 92% pre-

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Table 1. Kaupapa Māori and Pacific practices and research protocols (from 24).

Kaupapa Māori Practices [20]	Talanoa Research Protocols (in the Tongan language) [22]
Aroha ki te tangata (show respect for participants) Kanohi kitea (the seen face, present yourself to participants, face-to-face) Titiro, whakarongo … kōrero (look, listen … speak with care) Manaaki ki te tangata (share and host people, be generous) Kia tupato (be cautious) Kaua e takahia te mana o te tangata (do not trample over the mana of people) Kia mahaki (do not flaunt your knowledge)	Faka'apa'apa (respectful, humble, considerate) Anga Lelei (tolerant, generous, kind, helpful, calm, dignified) Mateuteu (well prepared, hardworking, culturally versed, professional, responsive) Poto He Anga (knowing what to do and doing it well, cultured) 'Ofa Fe'unga (showing appropriate compassion empathy, aroha, love for the context)

**In te reo Māori and Tongan languages, respectively.*

pandemic (Jan-Mar 2020) to 83% toward the end of pandemic (Jan-Mar 2023), which was officially declared over by the World Health Organisation on 5 May 2023.[12] Over the same period, coverage among Indigenous tamariki Māori (Māori children) dropped from 87% to 69% and among Pacific children, from 95% to 81%.[12] Coverage at 6-months of age is an important marker for timely immunization receipt, which dropped from 79% to 68% for all children over the same period, faring even worse for tamariki Māori (from 65% to 48%) and Pacific children (from 76% to 60%).[12] With coverage rates well below the 92% national target for 24-month-olds, it is imperative to increase vaccine confidence and acceptance to protect against vaccine-preventable disease outbreaks. However, it is unclear how the COVID-19 pandemic and the health sector response and government influenced childhood vaccine uptake, particularly among Māori and Pacific families.

Previous literature has noted various barriers to immunization among Māori and Pacific communities prior to pandemic.[13–16] For instance, Māori māmā (mothers) reported mistrust in healthcare providers, which negatively influenced their health-seeking behaviors for their tamariki (children) and immunization experiences.[13,17] Pacific communities are diverse and comprise of many cultures and ethnic groups, including Samoan, Cook Islands Māori, Tongan, Niuean, Fijian, Tokelauan, Tuvaluan, and Kiribati. Among Pacific communities, the level of deprivation influenced immunization uptake, along with low health literacy and limited access to culturally appropriate health services.[14] Moreover, using data from the Growing Up in New Zealand birth cohort, Clark et al.[15] found ethnic differences in immunization uptake and that individual and household predictors of childhood immunization varied over the early years of a child's life course. The study emphasized the role healthcare professionals (HCPs) have as their encouragement of vaccines positively influenced child immunization uptake.[15]

Additional research is needed to understand the changing determinants of routine childhood vaccination in the context of the COVID-19 pandemic, particularly from the perspectives of parents and immunization providers, to inform the design and implementation of supplementary immunization programs to improve coverage rates equitably.[2,5,18] Qualitative research offers valuable insights to better understand the complex factors influencing vaccine decision-making and immunization experiences. However, to the authors' knowledge, no qualitative research has been conducted within this context to date in NZ. Therefore, in this study, we explored the perceptions of Māori and Pacific caregivers and HCPs about routine childhood vaccines throughout the COVID-19 pandemic and their suggestions for equitable immunization service delivery as we move beyond the pandemic.

Methodology and methods

This article presents the qualitative findings of a mixed methods study investigating the impact of the COVID-19 pandemic on routine childhood immunization coverage in NZ. We used Māori and Pacific-centered research,[19–22] and interpretive description methodology.[23] The team included Māori and Pacific research expertise which enabled culturally appropriate engagement and data generation with Māori and Pacific participants (Table 1).

Study location and participants

We recruited caregivers (parents and legal guardians) and whānau (extended family networks) who identified as Māori and Pacific and were over 18 years of age across Auckland, Hauraki and the Waikato districts of the North Island of NZ. Using professional and community networks, we also recruited HCPs who identified as Māori and Pacific and delivered childhood immunizations. We invited participants using purposive and snowball sampling.[24] Our sample size was guided by the interactive data generation methods used and employed method of reflexive thematic analysis.[24] Information power guided the adequacy of the sample size, determined by data quality and richness that yielded similar dialogue across participant data.[25]

Data generation

An advisory group informed the design, vetted the question guides (adding questions related to vaccination during pregnancy and improving question clarity), supported recruitment, reviewed preliminary findings, and assisted in disseminating the findings. The advisory group was comprised of experienced academics and practitioners with content and

methodological expertise in child health, immunizations, health service delivery, and Māori and Pacific health and well-being. We piloted indicative questions with four HCPs or caregivers of Māori and Pacific descent who were recruited through our community networks. This led to some adjustments to some questions. For instance, adapting the caregiver guide meant questions became touchstones that allowed unrestricted discussion and aligned with the Māori and Pacific research practices.

Based on participant preference and availability, we conducted in-person and online semi-structured interviews, wānanga (a traditional method of Māori deep discussion and reflection),[26] and Talanoa (a pan-Pacific process to build relationships, tell stories, and come to a shared understanding),[27] between November 2022 and May 2023. All those who expressed interest in participating went on to participate. Of the 37 participants we spoke to, in-person sessions were conducted with 29 participants and the remaining sessions were conducted online. Each session lasted approximately 20 minutes to 1.5 hours. Participants discussed factors influencing their vaccine decision-making before, during, and beyond the pandemic and their experiences accessing or delivering immunization services. Participants had the opportunity to suggest improvements to the immunization service. We also collected basic sociodemographic information from each participant. In appreciation of their time and for sharing their stories, we gave participants a supermarket voucher as a koha (a gift based on reciprocity).

Auckland University of Technology Ethics Committee (22/266) granted ethical approval for the study. All participants received a participant information sheet (details about the study, benefits, and potential risks) to review before providing consent. We assigned study numbers to protect participants' privacy and de-identified and aggregated collected sociodemographic information. We securely stored data, only accessible by the research team. We matched Māori and Pacific researchers with participants to create a culturally comfortable environment for participants to share their stories. Research team members who collected data (DT, TBU, GD) identified ethnically as Māori and Pacific and spoke Māori, Cook Islands Māori, and Samoan languages. All data collection sessions were conducted in English with the odd words or phrases in the native language of the participants and facilitators. For Māori participants, sessions began with a karakia (blessing) and whanaungatanga (building relationships) between researchers and participants. Similarly, fa'aaloalo (respect) and tausiga (care) principles were adhered to throughout interactions with Pacific participants to develop and maintain positive relationships with participants during recruitment and data generation.

Data analysis

We recorded and transcribed all sessions and analyzed data using reflexive thematic analysis.[24,28–30] Transcriptions were checked for accuracy and quality. During this process, we used manual techniques and QSR NVivo® computer software (QSR International Pty Ltd., Doncaster, Victoria, Australia).

An interpretivist paradigm guided reflexive thematic analysis. Participants' language reflected their reality, thoughts, feelings, and behaviors.[24,31] Researchers independently reviewed and re-read each transcript and took notes. Māori and Pacific researchers read the respective Māori and Pacific participant transcripts to ensure cultural concordance in the data analysis. NC read all transcripts and provided insights throughout the analysis process. Systematic inductive coding at both the semantic and latent levels was undertaken, privileging the respective cultural worldviews and knowledge systems. The research team met regularly to discuss insights, the coding process, and collectively constructed candidate themes. The creation of candidate themes involved clustering codes and developing thematic tables as we revised and defined the themes.[31] Individually and as a team, we consistently reflected upon our positionality and how our backgrounds and values influenced our decisions.[32] Although we undertook coding within each dataset, commonalities existed across the datasets. The following section presents the themes, highlighting ethnic and cultural nuances where they existed. Published tools and recommendations for demonstrating quality reflexive thematic analysis guided our analysis.[33,34]

Findings

Thirty-seven participants included 12 Māori caregivers, 12 Pacific caregivers, and 13 HCPs. Three participants identified as being of both Māori and Pacific heritage. Most participants were between 30–39 years old and identified as female (Supplementary Table S1). Notably, almost all participants' children were either fully or partially immunized. The four themes, with names reflecting participants' voices, describe their perceptions and experiences about routine vaccines before, during, and beyond the pandemic. Participant quotes illustrate the themes and support our analysis.

Theme 1. "We go with the norm"

Participants generally expressed a high level of trust associated with routine childhood vaccinations. Moreover, participants believed routine childhood immunizations offered protective benefits to children. Parents wanted to immunize their children to 'protect them from diseases', 'keep them as healthy as possible', and 'avoid them getting sick'. They also believed immunizing their children helped protect elderly or vulnerable family members with preexisting health conditions. These perceptions contrasted with those related to COVID-19 vaccines, which were believed to be unproven and untrustworthy due to their rapid development.

> For me, I trust the childhood vaccines because they've been set in. Like a lot of them have been set in stone. (Pacific whānau, male)

Participants perceived routine childhood immunizations as something that 'everyone does' and sometimes as 'mandatory'. The routine immunization of children was a taken-for-granted social norm often passed down from parents, especially mothers. Many felt this intergenerational social norm of immunizing children was so ingrained that parents followed it unquestioningly without completely understanding. Some

caregivers noted that these norms stemmed from a lack of knowledge about vaccines, particularly those offered during pregnancy.

> Growing up, we didn't have the knowledge or the background on immunisation. Back in the day, it was, you have to do this, or you have to get it done. Our parents just did it because it was like me, they said the safety thing. (Pacific whānau, male)

However, some differences were apparent between Māori and Pacific whānau about the reasons for adhering to the social norm of vaccinating children. Some Māori whānau viewed the social norm as externally imposed pressure to conform, with the choice not always given about routine immunizations. Māori caregivers discussed this pressure with undertones of colonization and systemic racism, feeling coerced to vaccinate their children out of fear of being negatively judged by others or that daycare or other preschool facilities would exclude them. Wanting to avoid the associated feelings of guilt and shame underpinned the decision for some Māori whānau to vaccinate their children.

> And because they [vaccinator] were there [at my home], you kind of feel like you need to because they came to you. Yeah. Quite pushy, and no, they didn't really provide informed consent. (Māori whānau, female)

> I just followed, really, just because I just thought it was normal. It wasn't until you dive deeper into studying and then you understand a little bit more. But it just feels like it's this pressure on us to do it. And then it feels like there's always not a backlash but a consequence that we face if we don't. And then it just feels that you are excluded from things, which I definitely know that you are not. (Māori whānau, male)

On the other hand, Pacific whānau tended to emphasize trust in HCPs and respect for health experts who 'know what they're doing' as the reasons for adherence to the social norm of vaccinating children. These iterative and critical discussions within intergenerational families reflected the influence of Pacific cultural values of respect for and deference to elders, obedience to authority figures, and hierarchical structures.

> That's a cultural thing, I believe. And in my experience, it really has been taught to us that we respect authority or we respect people and authority and not to question them. I guess in my experience, in our culture, when we were disciplined, it was the same thing that we were told what to do, and we naturally had to obey. (Pacific whānau, male)

Theme 2. "Everything became difficult"

With the onset of the COVID-19 pandemic, whānau spoke about additional challenges that amplified existing barriers to accessing routine childhood vaccines. For instance, whānau mentioned how booking a general health appointment was increasingly difficult because of limited appointment availability due to staff shortages and following mandated COVID-19 screening protocols. Whānau spoke of transportation challenging access to health services, exacerbated by geographical proximity to health services for whānau living in rural areas. Caregivers with multiple children to care for, particularly if they had a child with a disability, also found it harder to attend health appointments.

> That was the reason why we were late . . . the logistics of it. There's so many different things you have to consider. You've got children who are autistic, that means that they have different sensory needs and there's two of them . . . even when we were late, sometimes only five minutes or few minutes, they were really rude to me, kind of saying, "You've missed your appointment." And I remember one time I had to fight, I felt like I was fighting her [receptionist]. And she was like, "Okay, well you're just going to have to wait. I'll see if they've got another time opening up." So just even the people dealing with Pacific Māori families coming through to have a little bit more understanding and empathy. Just the way that they deal with us. (Māori and Pacific whānau, female)

> You really have to think about accessibility and how accessible it is. If you've got four kids and you are by yourself, how are you going to get your four-year-old to imms [immunisation appointment] if you have no petrol in the car. How far do you have to travel? What's that going to look like? Who's going to sit with the kids while you're in there? So, there's heaps of those types of barriers that. (Māori whānau, female)

Government and health sector communications added to these challenges by creating confusion among whānau about prioritizing routine childhood immunizations during the pandemic, as the message was to stay home to be safe. Because protecting whānau was paramount, the communications created uncertainty about what health services, including immunizations, were available, particularly during the lockdowns. Whānau spoke about the anxiety they experienced leaving their house to attend health appointments as they feared contracting COVID-19. In some cases, this led to delaying immunizations. Experiencing these challenges at the broader system level highlighted that whānau may intend to vaccinate their child(ren) but delay because of logistical constraints and unclear communications.

The influence of national and transnational media and social media platforms on vaccine decision-making was apparent. Whānau found the amount of information on vaccines overwhelming. The widespread mis/dis-information and conspiracy theories about COVID-19, and the newness of the COVID-19 vaccines affected their perceptions of vaccines in general. For some whānau, the inherent trust in routine childhood vaccines remained, but for others, a weariness developed.

> Well, particularly my Mum, well, I mean particularly with the COVID-19 vaccine . . . but she was saying that it's evil. So, you had that religious view on it. . . even though I don't think there was any religious expert to the vaccine, but there was that it managed to cross not just medical, but religious. . .I think it's a lot of misinformation, a lot of negative misinformation, negative experiences from whānau that I've seen. And parents' misinformation from other sources and it's usually sources and people they trust, whether that's a relative or Facebook where probably it's not the best place to get their source. (Pacific HCP, male)

> I think for children, I've always wanted to make sure our children were immunised. And maybe that's just because Mum was that way . . . But for my myself, I will say social media influence my views a little bit. It did make me feel more afraid or hesitant. (Māori and Pacific whānau, female)

Moreover, for both Māori and Pacific whānau, tensions within the wider community on natural versus acquired immunity were exemplified with the arrival of COVID-19 and associated government response measures. Many whānau members discussed their views on relying on natural health remedies, such

as rongoā (traditional Māori healing) which had a cultural and spiritual basis. A Māori HCP, also trained in rongoā, explained how rongoā supported personal beliefs on healthcare and vaccinations. However, this HCP suggested that there are some whānau who will choose traditional healing systems rather than vaccinations. The following quote from a Pacific whānau notes the importance of non-Western medicine and practices:

> Sometimes I feel a little bit like Western medicine and Western practices work in the Western world. And in the rest of the world, they have had their practices for decades, for centuries, and it's never been an issue. (Pacific whānau, female)

HCPs also spoke of facing immense challenges during the COVID-19 pandemic that impacted routine immunization service delivery. They echoed the struggles that whānau faced with attending immunization events during the pandemic, and they noticed a drop in routine vaccine uptake. HCPs noted how whānau were navigating through additional challenges to vaccinate their child. It was evident that for some, fear of the 'new' COVID-19 vaccines transferred to routine childhood vaccines. HCPs elaborated that the communications and importance of vaccinating the population against COVID-19 overshadowed routine childhood immunizations. As health personnel were diverted to COVID-19 vaccination campaigns, HCPs often spoke of feeling overwhelmed and overworked, and how this impacted the health of themselves and their whānau. In addition to challenges retaining nurses to deliver immunizations, they spoke of the high level of uncertainty they were operating within and a 'learn as you go' environment with guidelines constantly changing during the pandemic.

Theme 3. "It needed to have an ethnic-specific approach"

HCPs tasked with rolling out COVID-19 vaccination initiatives for Māori and Pacific communities discussed numerous challenges and constraints of working within Western institutions. There were feelings of frustration with non-Māori and non-Pacific health leaders who took biomedical approaches to immunization service delivery and were perceived to lack a sense of urgency to address the needs of Māori and Pacific communities, especially early on during the pandemic response. Throughout the COVID-19 pandemic response, whānau spoke of feeling unheard and feeling more anxious in response to numerous negative interactions with health services. For some caregivers, past experiences of utilizing health services left them feeling racially profiled or discriminated against, which impacted their behaviors toward COVID-19 and routine vaccinations.

> I feel, from my knowledge and from my experience of being racially profiled or being judged or having … not issues, but putting people in positions of authority, trusting people with positions of authority and then not getting the respect that you deserve, you can see why our people would just avoid the whole situation. (Pacific whānau, female)

While caregivers' motivation to receive COVID-19 vaccination was for the benefit of their whānau, they noted some government health measures deterred them from being vaccinated. For example, mandating COVID-19 vaccination for workers across various sectors such as health and disability and education caused distrust among some whānau. Also, while some participants appreciated the incentives offered during COVID-19 vaccine rollouts, they were conflicted about the type of incentives available as their purpose were seen as bribes and raised concerns about informed consent.

> I think that was sad that they used that stuff to lure them in. Groceries, PlayStations, TVs. It's like, man, if the people want it, they'll get it. You're trying to keep them healthy, and then you're stuffing cash down their throat. It's sad … they use our people. (Pacific whānau, male)

> … the drives to get people to buy into that [COVID-19 vaccine]. But, were they fully informed or were they doing it because of these [incentives]? (Māori and Pacific HCP, female)

A positive aspect of engaging with whānau was that HCPs leveraged the opportunity to offer holistic support for whānau and vaccine information packs. Despite these efforts, HCPs spoke of losing community trust because the initial pandemic response and COVID-19 vaccine rollout did not reflect Māori and Pacific priorities and values, such as sense of family and community, interconnectedness, and holistic health and wellbeing.

> I think we lost huge amounts of trust. And it's only because everything that we actually were doing for our people was not being supported … originally, they [government] didn't support. (Māori HCP, female)

Many Māori and Pacific HCPs' sense of duty to respond to the needs of their communities meant that they took it upon themselves to develop, implement, and fund COVID-19 vaccination strategies (e.g., mobile vaccine services) before government funding was approved. When the government rolled out Māori and Pacific-specific initiatives, HCPs finally felt supported. They leveraged trusted community networks to deliver vaccinations in tailored ways to Māori and Pacific communities.

> It was a happy place for people to come, and they welcomed people to come. And so, when people came, it was a celebration. Even the workers, you see workers dancing, and we had music, and we just had a whole display of entertainment. And that's the kind of environment that everyone felt really drawn to … (Pacific HCP, female)

In essence, these Māori and Pacific-led strategies that were whānau-centric became pilot programs that the government subsequently funded. Thus, criticism of the health system's pandemic response centered on being reactive versus proactive and incongruent with Māori and Pacific cultural values and practices.

> Now, there's a lot of learnings with all of that help supporting COVID vaccination in the community. And one of the learnings that stood out is that it is challenging working in a Westernised system when, right at the beginning, we're trying to say Māori and Pacific need to be a priority. And often they go by, you may recall, but they started off with our elderly, they put restrictions. And we know there needs to be a system. However, the Westernised system and priorities are different to us. (Pacific HCP, female)

The government's (in)actions and inappropriate strategies during the COVID-19 pandemic response negatively affected perceptions and uptake of routine childhood immunizations. For instance, the once-trusted advice of HCPs in

a general sense no longer had the same level of acceptance among Pacific whānau. Whānau called for more avenues to discuss their concerns about vaccines and recommended applying lessons from the COVID-19 vaccine rollout involving whānau-centric approaches to routine childhood vaccines.

> And then, the model that we used for COVID, having ethnic-specific approach, and having our community leaders and church leaders drive it as well. Who are the influencers in our community? They're the ones that would support these childhood immunisations to become normal and urgent. (Pacific HCP, female)

Theme 4. "People are now finding their voice"

After the immense pressure to have the COVID-19 vaccines in which whānau lacked choice and autonomy, they discussed a renewed sense of agency and self-determination toward vaccine decision-making. The process involved whānau becoming more informed about vaccines and deciding whether to vaccinate was best for the health and wellbeing of their whānau. Becoming informed for many whānau involved intentionally taking time to go on their journey to find information about recommended vaccines via robust kōrero (discussions), media reports, independent website searches and social media posts. Whānau were particularly interested in understanding which diseases vaccines could protect against, the ingredients in vaccines, and possible side effects that could occur. Finding information resulted in gaining a wealth of knowledge to strengthen an informed decision, but not necessarily with input from HCPs. Given their experience with the COVID-19 vaccine rollout, whānau perceived that vaccine information from HCPs was biased or coercive as they shared messages supporting government initiatives. Thus, whānau were intent on their vaccine decisions informed by external sources perceived as unbiased.

Following the COVID-19 pandemic, a frequent comment was that whānau were more cautious, skeptical, and hesitant toward immunizations. Whānau asked more questions and felt more assertive in their agency to question the need for immunizations. While HCPs were happy to inform their visiting whānau of immunization information, HCPs were spending more time with whānau which had implications on their workloads. Despite these whakaaro (thoughts and discussions) and feelings, many whānau remained firm on their current and future decisions to receive routine vaccines for their children. However, the newfound knowledge caused others to question the need for nationally recommended vaccines. It strengthened their confidence to go against what was previously the norm for their whānau and instead choose alternative methods.

> So it'll be families coming in for the childhood imms, and then our normal education about what's being given today, the MMR or HPV, and explaining that. But then also with knowledge on wanting to know, "Okay, so what about the COVID?," on top of that. So, then you're spending maybe half an hour, 45 minutes before they actually come up with a decision. And then some families would actually pick and choose what they wanted, so they'd be like, "No, maybe we'll just do the MMR. I'll go back home, and think about the DTAP," or something else. (Pacific HCP, female)

> People are now finding their voice and they're going against the norms and the government recommendations and stuff. And now because they were forced to get COVID, they don't want to get any immunisations done. (Māori whānau, female)

Agency among whānau was also of utmost importance for HCPs, and although HCPs understood the importance of vaccinations, patients' mana (authority, control) was not to be compromised. For example, several HCPs understood that 'a no is a no' and clarified that they would not push a patient to be vaccinated.

> If people were anti, they were anti. It was bad enough being abused for other stuff. So, I actually said to the team, 'If they don't want it, they don't want it. Just let them know whenever they're ready, come back in. We're happy to have that conversation again.' So yeah, anybody that was anti, it was like, 'all good.' We didn't even give them any information. We just said, 'We're here once you are ready.' Because even giving that information, it's still like an insult. You're not respecting what they just want to say. (Pacific HCP, female)

> And so, I would explain to them, I said, 'You don't have to be here if you don't want to.' I said, 'I can only go ahead if you give me permission.' And then it's, 'Well, my job says I have to.' I said, 'But at the end of the day, it's your choice to be here'. (Māori HCP, female).

The educational aspect of becoming more informed highlighted the need for whānau to access unbiased vaccine information to support informed decision-making. For these whānau participants, this looked like advertisements on television and social media networks with well-known community leaders highlighting 'real' immunization information on the benefits, side effects, and risks of not vaccinating. Moreover, to genuinely support whānau with their decision-making, information tailored to the implications of delaying or refusing immunizations for their children and options if they missed immunization events, such as alternative or catch-up immunization schedules, must be provided.

To improve routine childhood immunization service delivery for Māori and Pacific communities, participants recommended that vaccines be more accessible, particularly for working whānau. Strategies like outreach and mobile vaccination services, community vaccination events, longer weekday and weekend clinic hours, and appropriate incentives (e.g., nappies, formula) would support uptake. In addition, having more Māori and Pacific HCPs represented among the health workforce would enable the implementation of strategies that reflect their communities' values, as this was an important learning from the COVID-19 pandemic response.

Discussion

This study explored how routine vaccine decision-making evolved throughout the COVID-19 pandemic from the perspectives of Māori and Pacific whānau and HCPs. The explicit focus of NZ's initial pandemic response on eliminating COVID-19 involved rapid implementation of control measures to break transmission patterns.[35] This elimination approach saw unprecedented nationwide lockdowns, extensive and systematic contact tracing and testing, and vaccine and mask mandates, to name a few.[35] While there were positive

aspects of this elimination approach regarding reducing cases, our study found the government and health sector's initial response to the pandemic was seen as reactive rather than proactively addressing the needs of Māori and Pacific communities. Moreover, participants perceived these responses as predominately guided by Western-centric knowledge, values, and processes that were incongruent with those among Māori and Pacific communities. In addition, boundaries of health service delivery during the pandemic were determined by District Health Boards which can be at odds of where whānau reside and seek care. The creation of Localities and updates to boundaries in recent legislation and health reforms in NZ will hopefully ensure communities have equitable access to healthcare.[36,37]

Historic knowledge from previous pandemics and public health emergencies signaled that Māori and Pacific communities were marginalized population sub-groups predicted to be disproportionately impacted during the COVID-19 pandemic.[38,39] As seen during previous pandemics, our study noted how existing challenges Māori and Pacific whānau experienced when accessing care, including routine immunizations, were amplified during the COVID-19 pandemic. As such, there have been international calls for meaningful engagement of Indigenous and ethnic minority communities and their leadership in planning efforts.[38–48] The COVID-19 pandemic saw numerous examples of successfully implementing Indigenous-specific strategies to protect their communities.[42–46] Moreover, noting the importance of the collective worldview among Pacific communities, the COVID-19 pandemic demonstrated how Pacific nurses utilized their cultural values, knowledge, and language to protect their communities.[39,47] However, previous literature notes a lack of government support for Māori and Pacific-led strategies during the COVID-19 pandemic even though these strategies reflected their respective cultural values.[39,45,49] Indeed, in our study, HCPs discussed their frustration with a lack of urgency to protect Māori and Pacific communities, particularly during the initial pandemic response phase. Our study found that the government's reactive and culturally incongruent initial pandemic response had considerable negative implications for meeting the needs of Māori and Pacific communities. Notably, it contributed to losing trust amongst these communities in vaccines and HCPs, which subsequently affected the routine immunization program.

Our study highlighted the vital importance of tino rangatiratanga (self-determination, independence, autonomy) and mana motuhake (Māori right to self-management) among Māori and Pacific communities, particularly in vaccine decision-making. A Māori whakataukī (proverb) "Ka mua, ka muri" means "walking backwards into the future". Our participants shared how, in the past, social norms primarily influenced vaccinating their whānau. Colonization's impacts affected whānau Māori conforming to the norm, while Pacific whānau conforming related more to trust in HCPs' recommendations. The control measures enforced during the pandemic response (e.g., lockdowns, mandates) substantially limited people's sense of autonomy and agency, echoing participants' examples of having their vaccine decision-making power removed or feeling coerced into vaccinating their children. While the COVID-19 vaccine mandates likely contributed to the high vaccination rates in NZ,[50] our results demonstrated that the lack of choice had detrimental effects on participants' tino rangatiratanga. Our study showed that the vaccine discourse landscape substantially changed during the pandemic as whānau became more aware of what protection vaccines can offer and that it was their decision to get vaccinated (i.e., voluntary). As whānau began to exert their renewed sense of agency, some questioned the need for vaccines. In a way, this can be viewed positively as whānau are resisting being coerced by social pressures to vaccinate. However, as there is a downside that Māori and Pacific whānau may decide not to vaccinate their children and thus be susceptible to vaccine-preventable diseases, avenues to support informed vaccine decision-making in a culturally-appropriate manner is imperative.

Central to Māori understandings of hauora (health and wellbeing) are mana (authority, control) and kaitiakitanga (guardianship). Over the past 40 years, a mana-enhancing paradigm has substantially developed with application to various disciplines, including social work, health, and education.[51] Research has noted how HCP recommendations can influence vaccine decisions[15,52] and how the COVID-19 pandemic can provide an opportune time for immunization providers to support informed vaccine decision-making among parents.[9] As such, there is the opportunity for HCPs to engage in respectful and mana-enhancing discussions with whānau about vaccines and support intergenerational conversations for collective decision-making. For whānau who had negative experiences with the health system, being treated with care, understanding, and empathy was implored particularly for non-Māori and non-Pacific HCPs. One of the key ingredients to ensuring mana-enhancing treatment of Māori and Pacific whānau is the notion that one should not trample on the mana of another.[20,22] To ensure mana-enhancing practice for Māori and Pacific whānau, the government and health providers should consider increased time allocation to HCPs who administer childhood vaccinations to allow for information sharing with whānau.

This study highlighted the role of health information sharing online and in-person among Māori and Pacific communities. Participants spoke about their difficulties navigating the abundant and ever-changing information available during the pandemic. With the development of information and communications technology, online health information seeking behavior has increased with notable facilitators and barriers.[53] Of interest to this study are barriers related to limited internet accessibility as Māori and Pacific peoples experience inequity from digital exclusion in NZ and abundant misinformation available online related to vaccines.[54,55] The term 'infodemic' was increasingly used during the COVID-19 pandemic and refers to the overabundance of information shared through multiple platforms that is either false, misleading, or accurate, but makes it hard for people to discern which sources are trustworthy and reliable.[56] Importantly, within health systems, infodemics can lead to increased vaccine hesitancy and conspiracy beliefs.[57] Our study highlighted that some whānau perceived that vaccine information provided by

HCPs was biased and coercive. Thus, to make informed decisions, many whānau are looking to the media, internet, and social media platforms for health information on vaccines, which they perceive to be unbiased. Unfortunately, this means potential exposure to mis/dis-information that can contribute to vaccine hesitancy and the declining uptake of routine immunizations.

Implications for policy and practice

As we look beyond the COVID-19 pandemic, it is essential that immunization services better address barriers to vaccine access among Māori and Pacific communities, as these can be exacerbated during a public health emergency.[13,14] In particular, participants suggested that more support is needed to enable working parents to access vaccines (e.g., longer clinic opening hours and weekend hours). Importantly, while government strategies may reflect an intention to prioritize and address the needs of Māori and Pacific communities, in practice, the government's response was perceived by some participants as delayed in delivering cultural-specific vaccine efforts. HCPs discussed that only when they were given ownership to direct the COVID-19 vaccine rollout could they effectively reach Māori and Pacific communities. In other words, community mobilization and self-responsibility must lie with, by, and for Māori and Pacific to deliver culturally relevant and appropriate health initiatives, demonstrating a strengths-based approach at scale. Māori and Pacific-led strategies must be embedded in routine immunization service delivery to support uptake and improve community trust in the health system. As whānau regain a sense of autonomy over their vaccination decisions, mechanisms are needed to cultivate more agency in the vaccine decision-making process. For instance, some participants suggested that trusted community leaders can share immunization information.

Moreover, to support HCPs to engage in vaccine discussions, mechanisms could include longer consultation times to answer questions and additional informational brochures that outline the risks and benefits of (non-)vaccination. Participants noted the amount of attention given to the COVID-19 vaccines via numerous outlets. They suggested that other avenues also be leveraged to disseminate information about routine immunizations (e.g., advertisements on television and social media). Offering longer consultation times and additional vaccine education would have both financial and personnel resource implications to the public healthcare system. As whānau are actively looking for immunization information and are influenced by mis/dis-information on national and transnational platforms, literature recommends that government and health agencies continue to publish credible information, monitor and debunk vaccine mis/dis-information, and engage social media companies to share correct information.[58] Also, it is vital that HCPs and the health sector more broadly regains credibility as trusted sources of unbiased health information among Māori and Pacific whānau. Overall, these findings support partnering with Māori and Pacific communities to collaboratively inform local and national guidelines on routine immunizations during future public health emergencies.

Strengths and limitations

This study presents timely and novel findings about how the COVID-19 pandemic and associated government and health system responses influenced the perceptions of routine immunizations among Māori and Pacific whānau and HCPs. While this qualitative study provides valuable insights, it did not intend to produce results that would be generalizable on a statistical basis or address all the avenues in which the COVID-19 pandemic has impacted routine immunizations. We have detailed descriptions of our research decisions and findings to enable transferability (case-to-case generalization) to other settings.[59] A limitation is that our study cannot reflect the diversity present among Pacific Peoples who represent many different nations and have differing worldviews. We also note that male Māori whānau and HCPs are underrepresented in our study despite our best efforts. However, our participants echoed previous literature noting the importance of the mother's role in vaccine decision-making.[60] While we aimed to recruit participants with varying views on vaccines, all the participants reported that their children were either fully or partially vaccinated, inferring a level of engagement with immunizations and services. Future research would benefit from exploring perceptions among those who have decided not to vaccinate their child(ren) and are not engaged with immunization service delivery.

Conclusion

Insufficient engagement with Māori and Pacific communities and lack of support for Māori and Pacific-led strategies during the COVID-19 pandemic appears to contribute to a loss of community trust in routine immunizations. The implemented measures, such as vaccine mandates, limited the agency of whānau to decide how best to protect themselves. Moving beyond the pandemic, Māori and Pacific whānau exert their tino rangatiratanga by becoming more informed about vaccines from sources they perceive to be trustworthy. To improve uptake and positive immunization experiences, mechanisms are needed to support mana-enhancing vaccine-decision making among caregivers and to embed Māori and Pacific-led vaccination strategies in mainstream service delivery.

Note

[a] Please refer to Supplementary Table 2 for a full list of Māori and Pacific terms and an English interpretation.

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NC, LI, GD, GP, and DW conceptualized the study and applied for funding. DT, TBU, and GD conducted data generation and analysis with input from NC, LI, GP, and DW. NC, DT, TBU, and LI co-wrote the manuscript draft with intellectual information from all authors. All authors read and approved the final manuscript.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to privacy and ethical reasons. The collected data is of a sensitive and personal nature, and was collected from participants on the basis that strict confidentiality would be maintained. Data can be available from the corresponding author on reasonable request and will require completion of relevant confidentiality agreements.

Ethical approval and consent to participate

Auckland University of Technology Ethics Committee (22/266) granted ethical approval for this study. All participants provided informed written consent prior to participation.

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