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Drivers of Vaccine Uptake for Aboriginal and Torres Strait Islander Children to Inform Tailored Strategies: A Qualitative Study Exploring Health Service Provider Perspective

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ABSTRACT

Objectives: To identify drivers of routine vaccination for Aboriginal and Torres Strait Islander children, from a health service provider perspective, to increase and maintain uptake.

Design: This qualitative study was designed, analysed and guided by Indigenous data sovereignty and governance principles. Data were analysed using inductive content analysis. Subcategories were refined using Miro (Miro Inc), an online collaboration platform. Aboriginal and Torres Strait Islander worldviews were privileged, with Aboriginal researchers leading data analysis in New South Wales (NSW) and contributing to analysis in the Northern Territory (NT).

Setting: The study was conducted in NSW and the NT, Australia, with health service providers from urban, rural and remote settings.

Participants: Individual and group interviews were undertaken in person or online between 2 May and 28 August 2024, with 18 health service provider participants in the Hunter New England Local Health District in NSW and 17 health service provider participants in the NT.

Results: We identified six key themes addressing drivers of vaccination for Aboriginal and Torres Strait Islander children for families (knowledge, attitudes and information sources; decision-making), health staff (workforce roles, responsibilities and relationships) and health services (improving access; health service operations; data for decision-making). Providers recommended strategies to improve uptake.

Conclusions: Health service providers in urban, rural and remote locations in Australia can provide valuable insights to inform tailored strategies to improve declining vaccine coverage for Aboriginal and Torres Strait Islander children, aligned with the priorities of the National Immunisation Strategy 2025–2030.

JEL Classification: Environment and public health, Health services administration, Indigenous health

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Plain Language Summary

The Known: Australian childhood vaccination coverage is declining annually, with lower coverage and increased disease risk among Aboriginal and Torres Strait Islander children.

The New: This study comprehensively explores the post-pandemic social and behavioural drivers of routine childhood vaccine uptake for Aboriginal and Torres Strait Islander families from the perspectives of urban, rural and remote health service providers in New South Wales and the Northern Territory. Strategies aligned with the National Immunisation Strategy 2025–2030 and are recommended to support families, health staff and health services.

The Implications: Targeted programs and initiatives should be co-designed with Aboriginal and Torres Strait Islander communities and informed by health service provider perspectives.

1 | Introduction

Childhood vaccines have made an enormous contribution to improved infant survival over the past 50 years, with an estimated 154 million deaths averted, mostly among children <5 years old [1]. However, the coronavirus disease 2019 (COVID-19) pandemic precipitated the biggest decline in routine childhood vaccine coverage globally in more than a decade, largely due to escalating misinformation and the erosion of public trust [2]. Fewer than 90% of Australian 2-year-olds were fully vaccinated in 2025—the lowest coverage in a decade and well below the 95% threshold needed to maintain herd immunity for measles. Coverage has declined each year for all age groups since 2020, with lower coverage observed among Aboriginal and Torres Strait Islander children [3]. In 2025, only 89.0% of Aboriginal and Torres Strait Islander 1-year-olds and 86.7% of 2-year-olds were fully vaccinated [3]. This progressive decline requires urgent action to ensure vaccine equity and protect Aboriginal and Torres Strait Islander children and their families from vaccine-preventable diseases.

The Australian Government made a strong commitment to halt this decline, prevent disease outbreaks and protect all Australians through the National Immunisation Strategy (NIS) 2025–2030, which was launched in June 2025. Aboriginal and Torres Strait Islander children experience a disproportionate burden of vaccine-preventable diseases [4] and the NIS prioritises improving vaccine coverage for these children as a key policy priority [5]. Recent qualitative interviews with Aboriginal and Torres Strait Islander families from urban Western Australia indicate support for childhood vaccination in the post-COVID-19 pandemic era, but barriers to uptake related mainly to access and ineffective reminder systems [6]. However, there are no contemporary data from other states and territories. Developing effective, feasible, culturally acceptable and community-led strategies to improve uptake requires an in-depth understanding of the

views and experiences of both Aboriginal and Torres Strait Islander families and their health service providers throughout Australia [7].

In this study, we explored health service provider perspectives on the drivers of under-vaccination for Aboriginal and Torres Strait Islander children in the Northern Territory and Hunter New England region of New South Wales to inform strategies to improve and maintain uptake, aligned with the NIS.

2 | Methods

2.1 | Setting and Population

This qualitative study involved interviews with health service providers and was undertaken in the NT and NSW. In NSW, the study was conducted on the unceded lands of the Awabakal, Biripi and Gomeroi Nations within the Hunter New England Local Health District (HNELHD). The HNELHD spans 131,785 km² with a population of more than 973,000 people, including almost 72,000 (approx. 7.4%) Aboriginal people [8]—the largest Aboriginal population in NSW. It includes urban, regional and rural towns and remote communities, reflecting a broad spectrum of healthcare delivery contexts.

In the NT, the study was conducted on the unceded lands of the Arrernte, Larakia, Tiwi and Kardu Diminin people. The NT spans 1.42 million km². More than 61,000 (26.2%) of the total NT population of 233,000 identify as Aboriginal and Torres Strait Islander [9], with most living in rural and remote areas and speaking one or more of the 100 traditional languages in this region [10].

Childhood vaccinations in both study settings are delivered in primary care clinics, government health centres and sometimes private medical clinics, primarily by child health nurses or midwives. Aboriginal and Torres Strait Islander staff administer childhood vaccines in some health services and jurisdictions, with training and when supported by state and local governance structures. We respectfully refer to Aboriginal and Torres Strait Islander staff to be inclusive of Aboriginal health practitioners, Aboriginal health workers, Aboriginal immunisation officers and other Aboriginal and Torres Strait Islander health staff.

2.2 | Research Team

This study was co-designed and undertaken by collaborating Aboriginal and non-Indigenous researchers. The data collection team, all experienced in applying community approaches and qualitative research methods, comprised: B.F.M., paediatrician and vaccine researcher; K.M., NT-based student; E.H., Gomeroi woman, project officer; K.K.C., Barkindji woman, Aboriginal immunisation manager; K.C., Euahlayi woman, Aboriginal program manager; K.T., Gomeroi woman, public health Aboriginal community and services engagement lead. The broader team contributed to study design, data analysis and interpretation of results and included: M.H., public health professor; C.K., research nurse; J.K., principal research fellow, social scientist;

M.H.D., paediatrician, vaccinologist; and D.N.D., public health physician and epidemiologist.

2.3 | Participants and Recruitment

Eligible participants worked in health services within the study regions and health services delivering childhood vaccines or administering immunisation programmes. They were purposively selected to represent Aboriginal community-controlled health organisations (ACCHOs) and government services in urban, rural and remote locations within each jurisdiction. Eligible staff involved in immunisation service delivery were identified by participating health services, provided with information about the study and invited to participate. Participants provided written informed consent.

2.4 | Data Collection

Individual and group interviews with health service providers were conducted face-to-face within the health service or online via Microsoft Teams [11] between 2 May and 28 August 2024. One or two female researchers conducted each interview, with up to three researchers present as observers. Participants were asked to identify their gender and professional experience—current role, current workplace and length of time working within HNELHD or the NT. Using a semi-structured interview guide, participants were asked to reflect on access and acceptance barriers to childhood vaccination for Aboriginal and Torres Strait Islander families with children aged under 5 years, and strategies that could be implemented to improve uptake (see interview guide in the [Supporting Information](#)). Interviews were audio recorded and transcribed using Microsoft Teams [11].

The same study design, methods and analyses were applied in NSW and the NT, but the involvement of Aboriginal researchers differed by site. In NSW, Aboriginal researchers led and implemented all stages of the research, including data collection, data analysis and interpretation of findings. In the NT, although the same study design was used, data collection was undertaken by combinations of non-Indigenous and Aboriginal researchers. In the NT, interview questions were led by one to two non-Indigenous researchers who were familiar with the local health context and observed by up to three Aboriginal researchers (pending availability) for cultural oversight and comparison between NT and NSW data. Aboriginal researchers provided cultural oversight and guidance throughout the research process. This included reviewing initial analyses with the non-Indigenous researchers, advising on culturally grounded interpretation, and confirming emerging themes to ensure they reflected Aboriginal perspectives, priorities and cultural integrity.

2.5 | Data Analysis and Reporting

Data were analysed using inductive content analysis [12]. Two researchers initially reviewed audio recordings, transcripts and interview notes, and coded data into first-round content

categories for each interview. Using an iterative approach, the research team met regularly to review categories and refine these into more fine-grained subcategories using online whiteboard software Miro [13]. This article is written in accordance with the Consolidated Criteria for Reporting Qualitative Research checklist [14], the CREATE Quality Appraisal Tool [15] and the Consolidated Criteria for Strengthening Reporting of Health Research Involving Indigenous Peoples checklist [16]. Representatives from participating ACCHOs in the NT reviewed the manuscript before submission for publication.

2.6 | Indigenous Data Sovereignty and Governance

This study was designed, analysed and guided by Indigenous data sovereignty and governance principles [17, 18]. Aboriginal researchers co-developed the interview guide and the analysis approach, ensuring it reflected culturally safe and appropriate ways of understanding health service providers' views and experiences. The Aboriginal researchers guided non-Indigenous researchers on culturally informed methods, including the importance of strengths-based narrative framing. Inductive content analysis was conducted to ensure Aboriginal and Torres Strait Islander worldviews were privileged, with Aboriginal researchers leading the analysis of Hunter New England data and contributing to analysis of NT data. Although responsibility for data sits with the whole research team, Aboriginal researchers guided the use and interpretation of the findings. These approaches honour Indigenous data sovereignty principles.

2.7 | Ethics

This study was approved by the HNELHD Human Research Ethics Committee (2023/ETH02595), Aboriginal Health and Medical Research Council of NSW (2211/24) and the NT Health and Menzies School of Health Research Human Research Ethics Committee (HREC 2023-4756) including review by the Aboriginal Ethics Sub-Committee.

3 | Results

3.1 | Participants

Thirty-five health service providers from 14 health services were interviewed—18 participants from nine health services across 11 interviews in HNELHD, and 17 participants from five health services across 13 interviews in the NT. In some cases, participants from the same health service worked at geographically distinct sites (Table 1). The interviews were conducted between 2 May and 28 August 2024. Seven participants (20%) identified as Aboriginal or Torres Strait Islander—five from HNELHD and two from the NT. Participants worked in urban, rural and remote locations, employed by ACCHOs or government services. Many had over 10 years of experience in child health and/or immunisation (Table 1). Health service provider interviews continued until we had representation from health services in urban, rural and remote locations in both jurisdictions—HNELHD and the NT—and until data saturation was achieved.

TABLE 1 | Interview demographic details for participants.

Region	Sector		Roles	Aboriginal/ Torres Strait Islander		Gender	
	Government- funded health services	Aboriginal community- controlled health organisations		Yes	No	Male	Female
Northern Territory	4	13	Public health physician ×2 Registered nurse ×13 Midwife ×1 Manager ×1	2	15	1	16
Hunter New England Local Health District	8	10	Aboriginal health worker ×4 Registered nurse ×7 Midwife ×1 Clinical nurse coordinator ×3 Manager/coordinator ×3	5	13	1	17

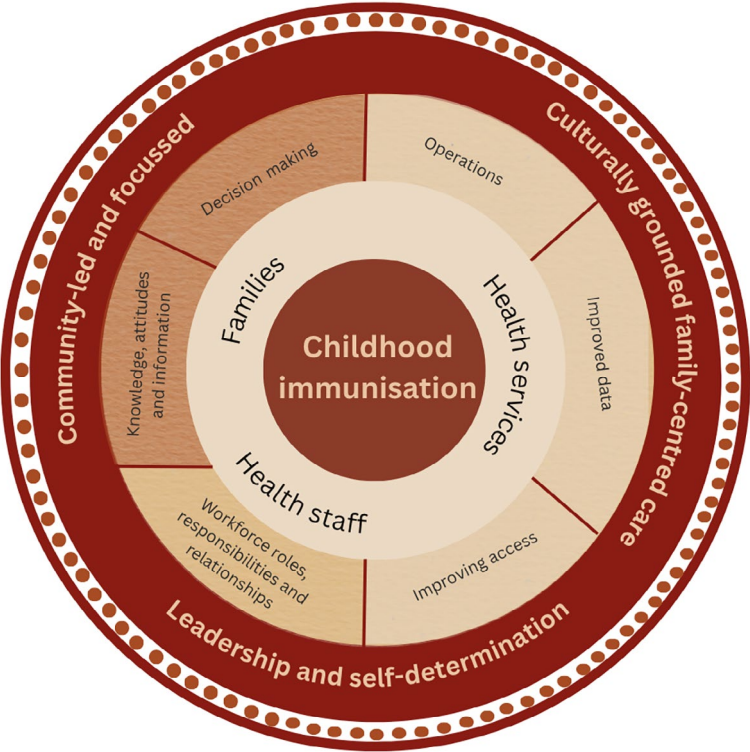


FIGURE 1 | Key themes influencing vaccination among Aboriginal and Torres Strait Islander children in the years following the COVID-19 pandemic as identified by health service providers.

3.2 | Themes

We identified six key themes addressing access and acceptance drivers of vaccination for Aboriginal and Torres Strait Islander children for families, health staff and health services (Figure 1). Drivers are linked to targeted strategies suggested by health service providers to support timely vaccination (Table 2).

3.2.1 | Theme 1—Families: Perceived Vaccine Knowledge, Attitudes and Information Sources

Providers in both settings, and from urban, rural and remote health services, reported broad acceptance of childhood vaccination among Aboriginal and Torres Strait Islander families, affirming that many families ‘understand vaccines are beneficial’

TABLE 2 | Key themes influencing vaccination among Aboriginal and Torres Strait Islander children in the years following the COVID-19 pandemic as identified by health service providers, and strategies to support timely and complete vaccination.

Identified themes	Key drivers	Suggested tailored strategies from providers	Target audience
1. Knowledge, attitudes and information sources (families)	Limited parental knowledge of vaccine-preventable diseases and how vaccines work, and parental concerns about the number of vaccines Trust in vaccines: impact of mandates, distrust of new vaccines for adults Vaccine resources too technical and not culturally appropriate	Yarning and culturally safe verbal communication using plain or local Aboriginal and Torres Strait Islander language, tailored to caregiver concerns Engage trusted community leaders and Elders (see below) Co-designed culturally appropriate resources	Parents/ caregivers
2. Decision making (families)	Limited engagement with health services Vaccination impacted by competing life priorities, family and cultural obligations Respected community leaders and family Elders are important for supporting uptake	Improve quality of culturally respectful health service engagement Involve extended family members in vaccine appointments/discussions Culturally responsive care and systems that support rescheduling appointments Vaccine champions programme focussed on community leaders and Elders to promote engagement, improve knowledge and increase trust in vaccines	Providers Parents/ caregivers
3. Health service workforce roles, responsibilities and relationships (health staff)	Government policies increased uptake but perceived as coercive, financial disadvantage Unskilled and under-experienced staff result in reduced family trust and confidence Embedding Aboriginal and Torres Strait Islander staff is essential to support families to navigate health systems, build rapport, understand Aboriginal and Torres Strait Islander perspectives, and to help non-Indigenous staff to navigate language and cultural differences High turnover of locum staff in remote areas impedes community relationships and trust	Tailor government strategies to promote immunisation equity without negative impacts Upskilling health service providers in vaccine knowledge, communication and delivery Health services should prioritise resources to support staff to get to know the community, invest in meaningful relationships, use plain language, listen to families and respect cultural differences Acknowledge, value and invest in Aboriginal and Torres Strait Islander workforce (nurses, midwives, Aboriginal health practitioners, Aboriginal health workers) and ensure culturally appropriate training, governance and workplace support Health services must invest in and prioritise cultural competence, respect and safety training for all staff Increase strategies to support remote workforce retention	Providers Clinic staff

(Continues)

TABLE 2 | (Continued)

Identified themes	Key drivers	Suggested tailored strategies from providers	Target audience
4. Improving access to health services (health services)	Difficulty navigating the health system: complex, inflexible and culturally unsafe health services	Support families to navigate health systems—book next appointment before family leaves, schedule vaccination alongside routine child health checks, make contact with families between appointments, discuss vaccines during pregnancy	Providers Clinic staff Local council
	Inadequate recall systems, especially for transient families	Reminders/recall via text and in-person visits, phone calls to follow-up missed appointments, enter vaccine appointment details into 'baby books'	Parents/ caregivers
	Inadequate support for large families	Shorter/prioritised appointments for families with additional children, support childcare in waiting room with clinic staff, after hours and weekend clinics when other children can be cared for	
5. Reducing operation barriers when accessing immunisation services (health services)	High transport costs and private clinic consultation fees	Promote health services providing free vaccination and bulk billed appointments, support families with transport when needed	Providers Clinic staff
	Restricted clinic hours, appointment systems with long wait times	Flexible service delivery—drop-in service, after hours service, pop-up clinics, vaccine days, home visits	
	Inadequate time to discuss vaccination and address family concerns	Health services must allocate appropriate time for consultations, schedule vaccine information sessions that support culturally responsive engagement	
	(Northern Territory) Inability to discuss vaccination in the family's preferred language	Ensure access to interpreter services where appropriate and where requested; co-design vaccine education resources in Aboriginal and Torres Strait Islander languages appropriate to the region or health service	
	Systems issues: disrupted supply and stock delays, power outages disrupting cold-chain practices, limited information technology systems	Ensure adequate vaccine stock, delivery, storage and record-keeping systems	
6. Improved data for decision-making (health services)	Vaccine recall systems—poor communication and coordination between neighbouring health services, challenges ensuring continuity of care for transient families	Improve completeness, timeliness and transparency of Australian Immunisation Register data Support services to create accurate/workable databases to identify due and overdue children for use by all staff interacting with families	Providers Clinic staff
	No tools to routinely collect data on social and behavioural drivers of vaccination	Design/develop data collection tool and build health service capacity to measure barriers to uptake to design tailored strategies	

and 'know they're safe and necessary' (NT providers). Despite general acceptance of routine childhood vaccination, many providers expressed concern that families have limited knowledge about vaccine-preventable diseases, and little understanding about 'how vaccines work, why they work and why [they are] so important' (NT provider).

Some providers noted that parents expressed concern that there were 'too many needles' (NT provider) and were often 'more worried about the side effects [pain, fever] rather than the vaccine itself' (HNELHD provider).

In both settings, health service providers reported a shift in vaccine attitudes following the COVID-19 pandemic, with concern that people felt 'humbled' by the mandatory nature of COVID-19 vaccinations and were more distrusting of 'new vaccines like Japanese encephalitis virus vaccine' or 'booster doses' (NT providers) for the adult population. However, few providers felt this influenced families' childhood vaccination decisions.

Regarding sources of vaccine information, providers in all jurisdictions reported that posters, pamphlets, social media and automated pro-vaccine phone recordings played during call waiting, were often 'confusing', 'too wordy' and 'not easy to understand' (HNELHD provider). Providers expressed concern that some families 'don't understand the vaccine they are receiving and what the vaccine covers' (HNELHD provider). In the NT, the inability of providers to discuss vaccination in the family's preferred language was identified as a barrier to families' understanding of vaccines and uptake.

3.2.2 | Theme 2—Families: Factors Influencing Aboriginal and Torres Strait Islander Families' Decision Making Regarding Childhood Vaccination

Providers noted that families who do not vaccinate their children are often those that do not engage regularly with health services, making it 'difficult to know what they think [about vaccines] and why' (NT provider). Providers across both jurisdictions also observed that vaccination decisions can be shaped by non-health service factors, such as 'competing priorities in life for mums [meaning that] vaccinations are not always at the forefront of their mind' (NT provider). Providers noted other factors contributing to delayed vaccination including competing health priorities, work commitments and experiences of grief and loss in the community.

Extended family, particularly Aunts and Grandmothers, were noted to play a 'big role' (HNELHD provider) in supporting young families to attend vaccination appointments in both the NT and HNELHD. In some communities, respected community Elders shared their 'first-hand experience of diseases like measles and rubella' (NT provider) and encouraged uptake.

Providers felt that government policies (e.g., 'No Jab, No Pay') linking family assistance Centrelink payments and childcare attendance to vaccination status were a key motivator for some families. However, providers expressed mixed feelings about this policy, acknowledging that it improved vaccine uptake but

worrying about its coercive nature and real financial impact for families. As one provider said: 'there are big consequences for people not being vaccinated' (HNELHD provider).

3.2.3 | Theme 3—Health Staff: Workforce Roles, Responsibilities and Relationships

Providers identified the importance of skilled and experienced healthcare staff, saying 'the majority [of families] will come back for vaccination if they have had a good experience' (HNELHD provider).

Participants said Aboriginal and Torres Strait Islander staff play a central role in supporting families to navigate health systems, building rapport and understanding Aboriginal and Torres Strait Islander perspectives and needs in both HNELHD and the NT. For example, employing a female Aboriginal bus driver improved attendance as she would 'wait for all the children to get dressed rather than driving off because the family was not ready' (NT provider). Aboriginal and Torres Strait Islander staff also helped non-Indigenous staff to navigate language and cultural differences to better support families.

Providers in all locations said it was essential that non-Indigenous staff were 'culturally safe and culturally aware in their approach to clinical care' (HNELHD provider) and were able to 'listen to what they [families] have to say' (HNELHD provider).

Providers believed high turnover of locum health staff in remote areas post-pandemic contributed to decreasing vaccination coverage rates, especially in the NT. Providers considered that working in a remote location was advantageous, as they had a greater opportunity to know the community and increased autonomy to deliver holistic healthcare: '[urban settings are] not personable or caring, here we know people outside of work. Even though we are remote, the service is better' (HNELHD provider).

3.2.4 | Theme 4—Health Services: Improving Access for Families to Engage With Health Services

Providers acknowledged that families can have difficulty accessing health services and navigating appointment systems and health systems, which are often complex, inflexible and culturally unsafe. Restricted clinic hours (business hours only) and appointment-only systems with long wait times and short consultations, which reduced the opportunity for in-depth discussion, were identified as persistent barriers.

Access was particularly identified as a common challenge for families who are transient and move frequently between communities, and for large families, with it being 'hard to bring everyone to the clinic, or hard to organise care for five or six children, when only one child needs their vaccinations' (HNELHD provider).

While childhood vaccines are free, providers noted that there could be hidden costs associated with accessing the vaccination

process, such as transportation or private clinic consultation fees in urban settings.

3.2.5 | Theme 5—Health Services: Operation Barriers When Families Access Immunisation Services

Some health service providers actively work to support families in navigating the health system through culturally safe engagement, flexible service delivery and relationship-based approaches. Despite these efforts, operational barriers at the time of the consultation, including ‘time constraints and healthcare workers’ caseloads’, were noted to limit the opportunity for ‘in-depth discussion [of the] importance of childhood vaccinations and reasons behind getting it’ (NT provider).

Providers in smaller remote locations reported operational and system challenges, including supply management, vaccine stock delays, power outages disrupting cold-chain practices and limited information technology systems. For example, in the NT, one provider reported a young family having their Centrelink payments suspended because scheduled vaccines were not in stock, even though the child was otherwise up to date: ‘there’s nothing more frustrating than not having the stock on hand when we’ve got someone in front of us’ (NT provider).

3.2.6 | Theme 6—Health Services: Improving Data to Transform Health Service Design and Delivery

Providers in both settings recognised the Australian Immunisation Register (AIR) as the official national database but commonly used their own local databases to generate recall lists across urban, rural and remote health services: ‘if you’re not on my list, I don’t know you exist’ (NT provider). Many providers expressed frustration at the lack of coordination between neighbouring health services and the difficulty ensuring continuity of care for transient families, resulting in children ‘slipping through the cracks’ (NT provider).

No health services had the training or capacity to routinely collect data on vaccination barriers, including access issues and vaccine hesitancy. However, all providers believed this information would be helpful: ‘if we identified any barriers, we could look at how we could fix it’ (HNELHD provider). A culturally appropriate tool, that could be used to collect meaningful data without being burdensome on families or providers, would be welcomed.

4 | Discussion

Health service providers from urban, rural and remote settings in the HNELHD region of NSW and the NT identified key drivers influencing vaccination among Aboriginal and Torres Strait Islander children in the years following the COVID-19 pandemic. They identified health service operational and system challenges and suggested tailored strategies to improve timeliness and complete routine vaccination to reverse declining coverage (Table 2). The suggested strategies have been aligned with the identified priorities in the NIS [5].

4.1 | NIS Priority Area 1: Immunisation Equity for Aboriginal and Torres Strait Islander People

Partnering with Aboriginal and Torres Strait Islander communities to understand barriers to childhood vaccination and co-design implementation strategies to improve access is critical [5]. When enabled, supported and resourced, Aboriginal and Torres Strait Islander peoples can lead solutions that improve vaccination rates. Key strategies include assisting families to navigate the health system, using reminders and recall, offering childcare and appointment flexibility, and promoting bulk billing. While they require policy change and additional resourcing, many of these community-responsive approaches were evidenced in HNELHD when activation of the Aboriginal Vaccination Steering Committee resulted in high COVID-19 vaccine uptake [5, 19].

4.2 | NIS Priority Area 2: Build Trust, Understanding and Acceptance of Immunisation in Communities

Engaging respected Elders and community leaders to advocate for vaccination as vaccine champions builds trust and understanding within communities [7, 20]. Vaccine champions who share their community’s culture and values can act as powerful vaccine advocates to complement messaging provided by health providers, combat misinformation and support vaccine acceptance. These approaches were used extensively during the COVID-19 pandemic and have shown improvements in trust in vaccines and healthcare providers, knowledge, communication skills and intention to vaccinate in diverse cultural groups [7, 20, 21].

4.3 | NIS Priority Area 3: Use Data More Effectively to Target Immunisation Strategies and Monitor Performance

Providers indicated that improving completeness, timeliness and availability of AIR data at the local level and automated identification of children due or overdue for vaccination would support vaccine delivery. Improving data sharing between health services, especially for families who move frequently between communities, was a priority for participants and could be supported through local community dashboards with both coverage and social and behavioural data. Developing innovative SMS recall systems to support families who move frequently for cultural reasons may increase vaccine uptake [22, 23].

Tracking local community sentiment and routinely collecting data on vaccination barriers for Aboriginal and Torres Strait Islander families could strengthen the design, delivery and evaluation of immunisation strategies [24]. The Vaccine Barriers Assessment Tool assesses parental access and acceptance barriers to childhood vaccination for children under 5 years old; it is now used for national surveillance in Australia and has been adapted for Māori children in New Zealand [25]. Adapting, adequately resourcing and routinely applying this tool with Aboriginal and Torres Strait Islander communities and health

services could help track social and behavioural insights and inform investment in effective strategies [5].

4.4 | NIS Priority Area 4: Strengthen the Immunisation Workforce

Providers recognised Aboriginal and Torres Strait Islander workforce expertise, including health and cultural knowledge, community connection and rapport, shared language and shared understanding of community circumstances and priorities. Improving provision of flexible, targeted, culturally appropriate immunisation training for providers, improved governance structures and assisting health services to train and employ more Aboriginal and Torres Strait Islander staff would considerably strengthen the local immunisation workforce [5]. Employing Aboriginal staff to engage with families before scheduled immunisations (pre-call strategy) reversed the gap in vaccine coverage between Aboriginal and Torres Strait Islander and non-Indigenous children in HNELHD in the pre-pandemic era [26]. In addition, developing, implementing and resourcing a nationally standardised accreditation framework enabling Aboriginal and Torres Strait Islander staff to administer childhood vaccines across all Australian jurisdictions is needed.

Participants also emphasised the importance of upskilling and retaining quality health service providers, ensuring non-Indigenous staff receive training and support to offer evidence-informed and culturally safe care [5], and providing paid employment opportunities for community vaccine champions (non-health staff).

4.5 | NIS Priority Areas 5 and 6: The Role of Government Regulation and Incentives

Some providers reflected on the role of government incentives, like Centrelink payments, in influencing Aboriginal and Torres Strait Islander families' vaccination decisions. While these may encourage uptake, they fail to address deeper issues of access, cultural safety, trust and engagement with the health system. As noted, such programmes can feel punitive to communities already experiencing systemic disadvantage [27], despite positively influencing vaccine uptake by individuals. Identifying and addressing unintended negative consequences from mandatory vaccination policies that can compound disadvantage should be considered by government [28, 29].

4.6 | Strengths and Limitations

Leadership by Aboriginal researchers ensured culturally safe and appropriate ways of understanding health service providers' views and experiences. Participants included government services and ACCHOs from urban, rural and remote locations with considerable experience working with Aboriginal and Torres Strait Islander families.

Our research supports the results of recent post-COVID-19 pandemic studies from WA, which found that Aboriginal families in urban areas reported limited knowledge of additional vaccines

recommended for Aboriginal and/or Torres Strait Islander children under the NIS [6], and identified a range of systemic barriers. These barriers included a lack of awareness of the vaccine schedule, difficult access to vaccination services, a shortage in a workforce able to have meaningful conversations with vaccine-hesitant parents, ineffective reminder systems and the rapid spread of misinformation for both Aboriginal and Torres Strait Islander and non-Indigenous children living in country WA [30]. Our call for better access to vaccine clinics, vaccine reminder systems, improved transport, co-designed and culturally appropriate resources, enhanced cultural awareness for non-Indigenous staff and strengthened capacity for the Aboriginal and Torres Strait Islander workforce further supports recommendations from WA [6, 30, 31], as well as the multi-sectorial, multi-component approach used and recommended by the current National Vaccination Insights project [32]. Similar priorities have also been identified in Aotearoa New Zealand, where inaccessible health services, skill shortages, the need to prioritise communication and engagement, and the need for health services to be built on cultural safety and trust have been shown to support improved vaccine uptake among young Maori and Pacific children [33].

For this study, participating health service providers were nominated by the health service manager or research manager. Although only five participants in HNELHD and two participants in the NT identified as Aboriginal and/or Torres Strait Islander (Table 1), this reflects the broader makeup of the immunisation workforce, particularly in the NT where training, recruitment and retention of Aboriginal and Torres Strait Islander health staff have declined in recent years [34]. These findings support calls to value and invest in the Aboriginal and Torres Strait Islander workforce, including nurses, midwives, Aboriginal health practitioners and Aboriginal health workers, and to ensure culturally appropriate training, governance and workplace support. The views and experiences shared by participants may not be representative of all health service providers.

The insights gathered reflect the perspectives of health service providers, rather than those of health service recipients. While these perspectives provide valuable professional and operational insights into vaccination strategies, they may not fully capture the lived experiences, preferences or barriers faced by Aboriginal and Torres Strait Islander families. Complementary research engaging directly with families has been undertaken in parallel and will be presented in a separate publication.

5 | Conclusion

This study, co-designed and undertaken through collaboration between Aboriginal and non-Indigenous researchers, provides the first comprehensive understanding of health service provider perspectives of the drivers influencing childhood vaccine uptake for Aboriginal and Torres Strait Islander families since the COVID-19 pandemic response. Given declines in coverage, Aboriginal and Torres Strait Islander children remain a priority population. Strategies to improve and maintain uptake need to be informed by social and behavioural understandings, alongside coverage data, to inform co-designed approaches to support families and health staff and strengthen health services.

Author Contributions

Bianca F. Middleton: conceptualisation, project administration, data curation, formal analysis, funding acquisition, writing – original draft. **Kristy Crooks:** conceptualisation, data curation, formal analysis, validation, writing – review and editing. **Kylie Taylor:** project administration, data curation, formal analysis, validation and writing – review and editing. **Elizabeth Harwood:** project administration, data curation, formal analysis, validation and writing – review and editing. **Katrina K. Clark:** data curation, formal analysis, validation and writing – review and editing. **Caitlin Kent:** formal analysis and writing – review and editing. **Kelly McCrory:** data curation and writing – review and editing. **Marita Hefler:** methodology, supervision and writing – review and editing. **Jessica Kaufman:** methodology, formal analysis, supervision and writing – review and editing. **David N. Durrheim:** conceptualisation, supervision and writing – review and editing. **Margie H. Danchin:** conceptualisation, supervision and writing – review and editing.

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Consent

We confirm that all participating health service providers have provided written informed consent to participate in this study and for their responses to be analysed and published.

Conflicts of Interest

Bianca F. Middleton is an Associate Editor at the *Medical Journal of Australia*. They had no role in the editorial appraisal or decision making for this manuscript.

Data Availability Statement

The data for this study will not be shared as we do not have permission from the participants or ethics approval to do so.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** mja270233-sup-0001-supinfo.pdf.