National Vaccination Insights project

Childhood vaccination barriers in Australia and strategies to address them

Results from the first National Vaccination Insights project survey on childhood vaccination barriers and immunisation stakeholder strategy workshop

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A collaboration between

murdoch children's research institute

NCIRS National Centre for Immunisation Research and Surveillance Australia

THE UNIVERSITY OF SYDNEY

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About this report

This report — the first outcomes report from the National Vaccination Insights project — describes childhood vaccination barriers in Australia from the project's inaugural nationally representative survey of parents of children under 5 years of age; strategies to address identified barriers from the project's workshop with immunisation stakeholders; and proposed policy- and practice-related actions for consideration by the Commonwealth and state/territory governments and immunisation stakeholders.

In formulating these proposed actions, we drew on multiple data sources, including insights from the survey and stakeholder workshop, published literature, the core project team's experience and expertise in the social science of immunisation, and consultations with wider stakeholders including the Primary Health Network (PHN) Immunisation Support Program, the National Centre for Immunisation Research and Surveillance, and the Australian Government Department of Health, Disability and Ageing.

About the National Vaccination Insights project

The National Vaccination Insights project was established to deliver routinely collected systematic data and insights on vaccination barriers in different populations across Australia. This type of data is critical to inform strategies that improve vaccination uptake. The project uses various research methods, including nationally representative surveys using validated tools, in-depth qualitative interviews and stakeholder workshops. The project has so far collected data on vaccination barriers in two populations: parents of children aged under 5 years and adults. The strategic vision of the National Vaccination Insights project is to expand collection of this key data to include populations and vaccinations across the lifespan.

The project is a collaboration between the Murdoch Children's Research Institute, the National Centre for Immunisation Research and Surveillance, and the University of Sydney Social and Behavioural Insights in Immunisation research group.

The project is guided by a Stakeholder Advisory Group, comprising members with expertise from diverse areas, including immunisation policy, peak health professional and leadership bodies, peak health advocacy groups and community organisations, consumer advisory groups and the national health leadership body for Aboriginal and Torres Strait Islander peoples.

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Further acknowledgements

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Executive summary

Australians value childhood vaccination, but uptake is below national targets and declining post-COVID-19 pandemic, highlighting the need to investigate the barriers parents and caregivers experience relating to vaccine access and acceptance. The aim of the National Vaccination Insights project is to commence serial data collection on such barriers to vaccination to inform the selection and design of strategies to improve vaccination uptake.

This report — the first outcomes report from the project — describes findings from the project's inaugural national survey of parents of children under 5 years of age on access and acceptance barriers to vaccination and the project's immunisation stakeholder workshop on mapping strategies to identified barriers. This report also proposes policy- and practice-related actions for consideration by governments and other immunisation stakeholders to improve uptake of childhood vaccination in Australia.

(i) National survey of parents of children under 5 years of age on vaccination barriers

In March–April 2024, the National Vaccination Insights study team conducted the first nationally representative survey of 2,000 parents of children under 5 years of age. We measured access and acceptance barriers to vaccination from parents' perspectives using the Australian developed and validated Vaccine Barriers Assessment Tool (VBAT). We calculated prevalence of vaccination barriers in the whole sample and analysed associations between vaccination barriers and various characteristics, including child vaccination status (up-to-date, partially vaccinated and unvaccinated), parent location (regionality), parent experience of financial stress and number of children per family. We categorised vaccination barriers as either access (practical) barriers or acceptance barriers (how parents think and feel about vaccines and social influences), according to the domains in the WHO Behavioural and Social Drivers (BeSD) framework.

We found that:

- ***Parents of partially vaccinated children reported significant access barriers.***

Significantly more parents of partially vaccinated children reported access (practical) barriers than parents of up-to-date children. These included not prioritising vaccination over other things, difficulties getting a vaccination appointment, and costs associated with vaccination (see Figure 1).

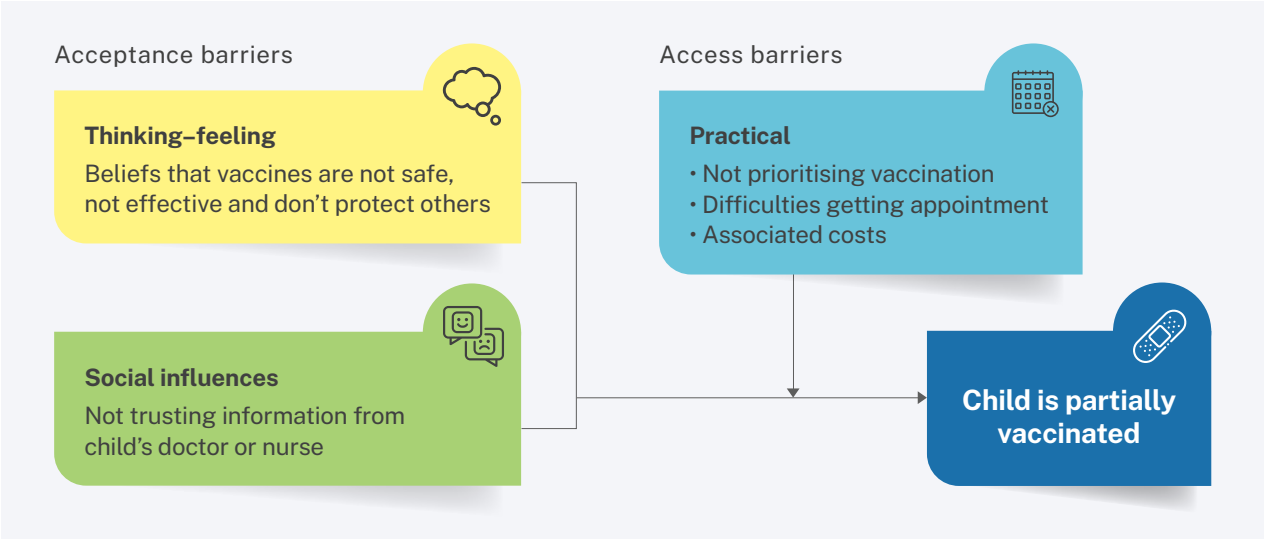

Figure 1. Access and acceptance barriers for parents of partially vaccinated children*

Note: Access and acceptance barriers identified in the National Vaccination Insights survey using the Vaccine Barriers Assessment Tool are further categorised into 'Thinking–feeling', 'Social influences' and 'Practical' using the Behavioural and Social Drivers of Vaccination Framework. Sources appear on the next page.

Sources: Kaufman J, Tuckerman J, Bonner C et al. Development and validation of the Vaccine Barriers Assessment Tool for identifying drivers of under-vaccination in children under five years in Australia. Human Vaccines & Immunotherapeutics 2024;20:2359623; and World Health Organization (WHO). Behavioural and social drivers of vaccination: tools and practical guidance for achieving high uptake. Geneva: WHO; 2022

Also, significantly more parents of partially vaccinated children reported acceptance (thinking–feeling and social influence) barriers than parents of up-to-date children. These included beliefs that vaccines are not safe, not effective and don't protect others, and not trusting the information about vaccination they receive from their child's doctor or nurse.

We also found that:

- ***Parents of unvaccinated children primarily reported significant acceptance barriers.***

In contrast to parents of partially vaccinated children, significantly more parents of unvaccinated children reported acceptance (thinking–feeling and social influence) barriers than parents of up-to-date children. Thinking–feeling barriers included not intending to vaccinate, not believing vaccines are safe and not feeling guilty if their unvaccinated child got a vaccine-preventable disease. Social influence barriers included people close to them not supporting vaccination.

Cost was a significant barrier for parents with multiple children

We also found that:

- ***Having multiple children, experiencing financial stress and where people lived amplified vaccination barriers.***

For example, cost was a significant vaccination barrier for parents with multiple children and parents experiencing financial stress, as well as for parents living in metropolitan-regional areas in Australia.

(ii) Immunisation stakeholder workshop on mapping strategies to identified barriers

To improve vaccination rates, alongside coverage data, strategies must be informed by behavioural and social insights and tailored to context. While evidence on effective strategies is available, the success of any new approaches is dependent on tailoring strategies to the identified population group and understanding their local needs and priorities.

To address specific challenges in the Australian context, in July 2024 we held an online, interactive workshop with the Stakeholder Advisory Group (SAG) to match evidence-based strategies to overcome barriers identified in our survey for parents of partially vaccinated children and explore how implementation of such strategies could occur at national and state/territory levels in Australia. The SAG selected parents of partially vaccinated children to focus on because these parents are known to be generally more open to strategies to encourage and assist them to fully vaccinate their child than refusing parents and, as such, seemed the logical group to explore first. Workshop participants were divided into three small groups representing different areas related to immunisation: community members, healthcare professionals and people working in immunisation policy.

Across the three groups, participants identified the concerning impacts of practical barriers to vaccination. To providers working in primary care, many of whom assumed the predominant barriers were around trust and vaccine acceptance, survey findings indicating parents had difficulties getting an appointment and experienced vaccination costs as barriers to completing their child's vaccination schedule were unexpected. As such, participants agreed it was important to better understand what underpinned these service access and cost issues reported by survey respondents via a qualitative interview-based study.

Participants suggested key strategies to address vaccination barriers for parents of partially vaccinated children (see Tables 1 and 2). Some suggestions extend beyond those barriers identified in the survey (which measures barriers from the parent's perspective), aiming to address known barriers at the provider and system level as well.

Table 1. Recommendations to make it easier for families to access vaccination and to build community trust in vaccination from community members including Aboriginal and Torres Strait Islander peoples (Group 1)

Selected strategy	How the strategy would look in practice	How to overcome implementation challenges
Strategies to address access (practical) barriers		More financial support for Aboriginal Community Controlled Health services Better training of community vaccine champions *'Champions or popular sporting players or people like that, people with lower health literacy may be more willing to listen and understand.'*
On-site vaccination in community settings	Offer in settings commonly attended (e.g. libraries, playgroups, sporting events) Combine education with vaccination, and offer tailored incentives *'How we can even have events like the healthy food, but also a bit of art, a bit of movement, dancing. We associate the immunisation with being healthy, being strong, being resilient, not like a thing that one must do.'*	
Strategies to address acceptance (social influence) barriers		
Tailored campaigns to inform/educate the public about vaccination, featuring vaccine champions and advocates	Trusted community champions and relatable 'deadly' cartoon-like characters to share positive vaccination stories	

Table 2. Recommendations to make it easier for primary care to prioritise and discuss childhood vaccinations from healthcare professionals (Group 2) and people working in immunisation policy (Group 3)

Selected strategy	How the strategy would look in practice	How to overcome implementation challenges
Strategies to address access (practical) barriers		Policies and funding for primary care need to change to enable prioritisation of childhood immunisation Streamline use of Australian Immunisation Register data to inform performance at service level Encourage GPs' sense of ownership of vaccination *'Policy people need to take some responsibility here with provider engagement. Losing providers is in part because we have made it incredibly complicated. I think it starts at a policy level and ends with education.'*
Provider performance assessment and feedback	Key performance indicators and financial incentives/payments, including specific Medicare items linked to vaccination at practice level, including for practice nurse administered vaccine	
Reminder for next dose/ recall for missed dose	Automated, personalised reminders utilising practice management software or via a system linked directly to AIR, such as Centrelink or Medicare	
Strategies to address acceptance (social influence) barriers		
Dialogue-based interventions, including one-to-one counselling to encourage vaccination	Vaccine education and communication training for healthcare professionals built into provider education *'Vaccination is completely about trust … Gaining that trust again through effective communication is key for us.'*	

Conclusions

In the setting of declining childhood vaccination coverage rates at all three age milestones (12 months, 2 and 5 years), this National Vaccination Insights project survey clearly shows that parents and carers of young children under 5 years of age in Australia experience multiple barriers to vaccinating their children, including costs associated with vaccination, difficulties getting vaccination appointments, not prioritising their child's vaccination over other things, and weakened trust and confidence in vaccines and vaccination information post-COVID-19 pandemic. These barriers differ for parents of partially vaccinated and unvaccinated children, with access and cost issues predominating for parents of partially vaccinated children.

These barriers require a multi-sectoral approach; no single strategy in isolation will have the desired impact to increase coverage rates. Strategies must improve access to vaccination by recognising and addressing practical and cost barriers for families, especially those experiencing financial hardship. Strategies must also work to improve acceptance of vaccination by acknowledging the impact of the COVID-19 pandemic and working to rebuild trust and confidence among parents and caregivers. Strategies must also support and build capacity among primary care providers (GPs, nurses and pharmacists).

We urge governments and immunisation stakeholders (e.g. peak health professional and funding bodies responsible for childhood vaccination policies and funding, primary health networks, etc.) to consider a set of actions that will make it easier for parents and carers to vaccinate their children, and that are in alignment with the National Immunisation Strategy (NIS). Drawing on multiple data sources, and in consultation with a wide range of experts and stakeholders (including the Primary Health Network (PHN) Immunisation Support Program, the National Centre for Immunisation Research and Surveillance, and the Australian Government Department of Health, Disability and Ageing), we have grouped actions for consideration into **four interrelated themes:**

We suggest these considerations be explored in more detail to better understand their contributions to childhood vaccination rates.

Next steps

This national survey, stakeholder workshop to map strategies to address identified barriers, and actions for consideration are the first steps in what we propose should be an iterative cycle to understand and track childhood vaccination barriers and inform strategies that increase uptake of childhood vaccines. The research team has also conducted in-depth qualitative interviews with parents of partially vaccinated children to gain a deeper understanding of survey findings, particularly around the barriers to service access and costs for families.

Going forward, collecting this critical data on vaccination barriers through quantitative and qualitative investigation, triangulation with coverage data, and consulting with vaccination stakeholders to identify strategies to address those barriers should be regular and ongoing activities. The broader strategic vision of the National Vaccination Insights project is to expand this essential data collection, analysis and consultation with stakeholders to support increased uptake of vaccines across the lifespan.

Section 1.

Introduction: Routine monitoring of vaccination barriers is key to understanding under-vaccination

1.1 Australians value childhood vaccinations, but uptake is declining

As evidenced by increases in childhood vaccination coverage year on year prior to the start of the COVID-19 pandemic,[1] it is clear Australians value vaccination for young children. In 2020, vaccination coverage for children at various milestones, including by 5 years of age, nearly reached the national target of 95%.[2]

However, the COVID-19 pandemic negatively impacted uptake of childhood vaccines in Australia, with decreases in uptake between 2020 and 2022[1,3] (see Figure 2) that continued across 2023 despite removal of pandemic-related restrictions.[4] While coverage is still relatively high by global standards, this gradual decline in uptake of childhood vaccination in Australia is concerning and masks inequities among certain population groups who have lower uptake.

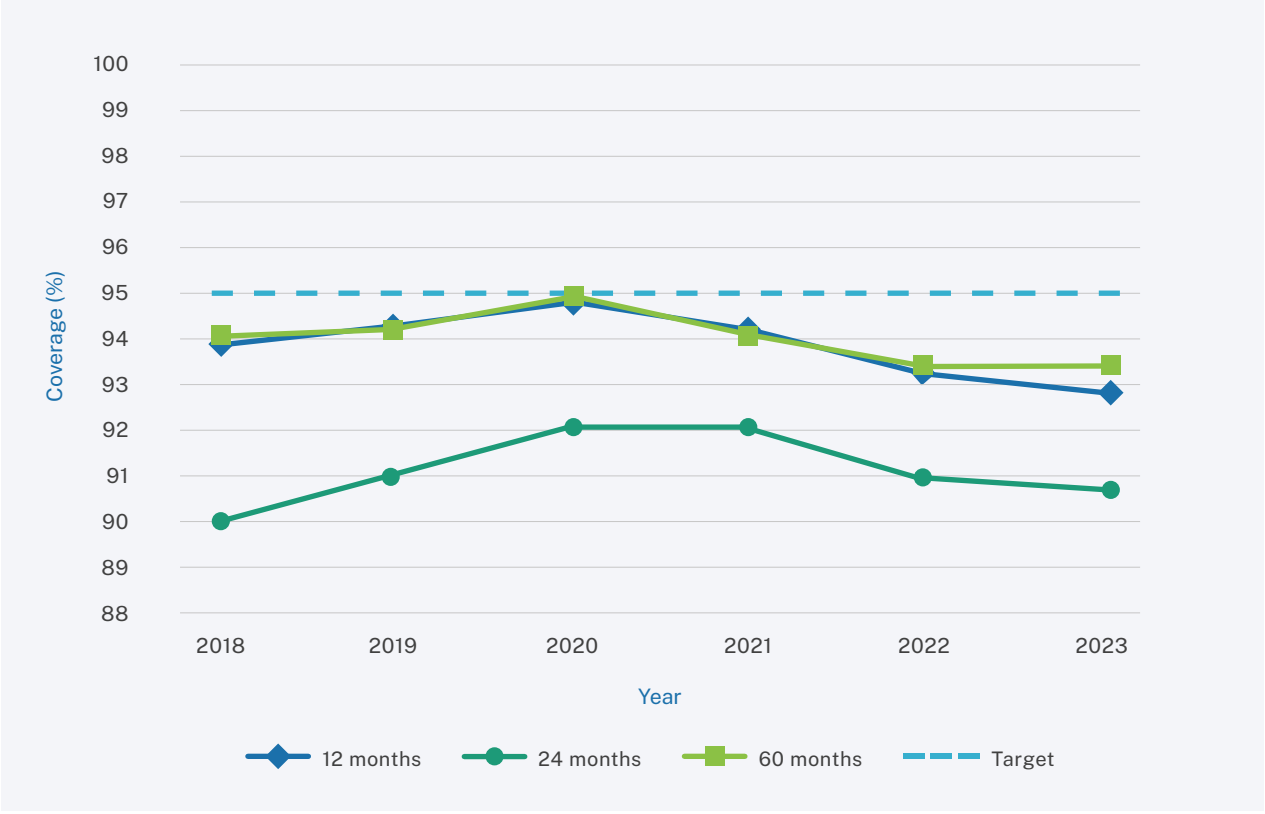

Figure 2. Trends in vaccination coverage in Australia in children at 1, 2 and 5 years of age: 2018–2023

Source: Hull BA, Hendry A, Dey J et al. Annual Immunisation Coverage Report 2022. Westmead, NSW: National Centre for Immunisation Research and Surveillance; 2023

Progressive declines in vaccine uptake in children, as well as in adolescents and adults, over the last five years are concerning and warrant investigation and action. Continuing to collect high-quality vaccination coverage data is critical; coverage data on its own, however, is an insufficient tool as it does not reveal why vaccine coverage is low. This requires exploring drivers of under-vaccination, which in turn helps in the design of evidence-based strategies to address gaps.

1.2 Diverse barriers drive under-vaccination

Barriers to vaccination drive suboptimal uptake of childhood vaccines.[5] Barriers can be broadly categorised as either access (practical) barriers or acceptance barriers (how parents think and feel about vaccines and social influences), according to the domains in the WHO Behavioural and Social Drivers (BeSD) framework (see Figure 3).[6]

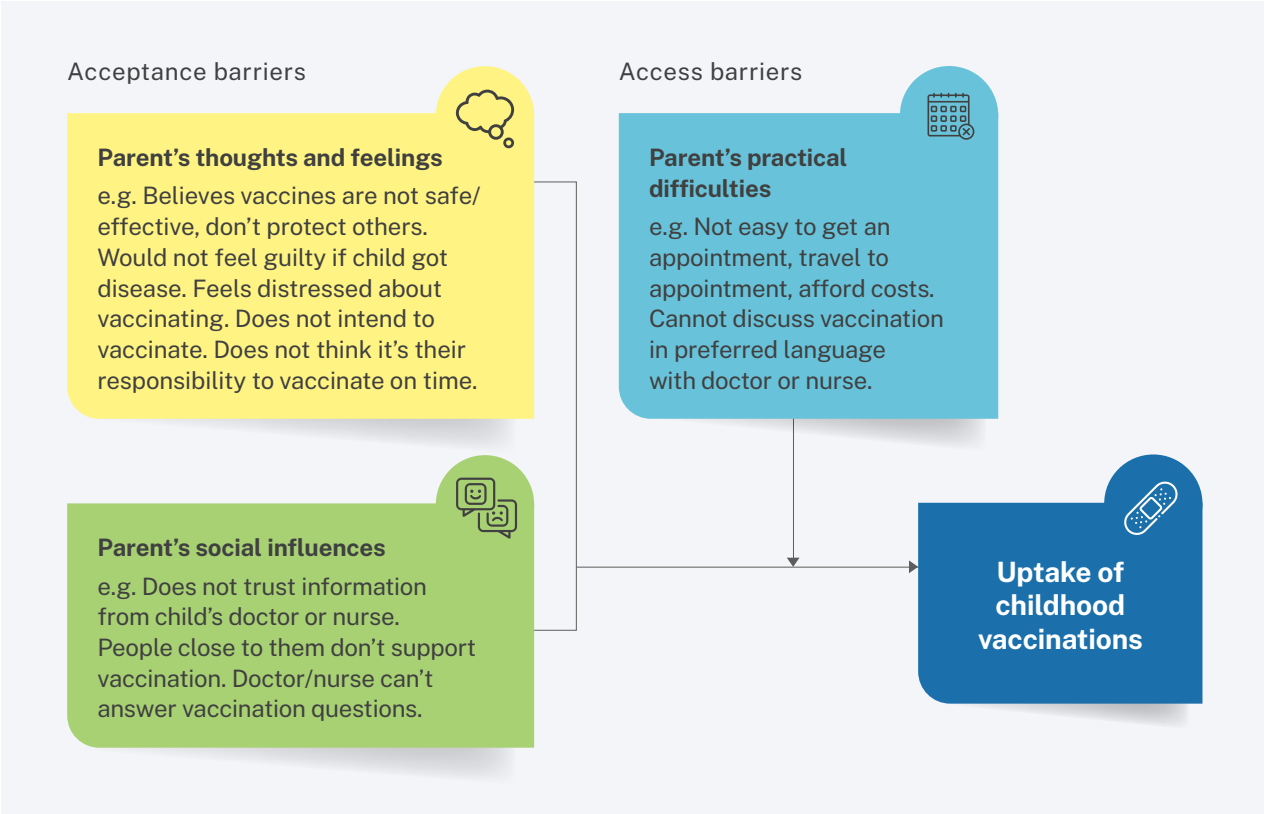

Figure 3. Access and acceptance barriers to childhood vaccination as measured by the Vaccine Barriers Assessment Tool (VBAT), arranged in categories informed by the WHO BeSD framework

Sources: Kaufman J, Tuckerman J, Bonner C et al. Development and validation of the Vaccine Barriers Assessment Tool for identifying drivers of under-vaccination in children under five years in Australia. Human Vaccines & Immunotherapeutics 2024;20:2359623; and World Health Organization (WHO). Behavioural and social drivers of vaccination: tools and practical guidance for achieving high uptake. Geneva: WHO; 2022

Access barriers are those barriers people face when trying to get vaccinated, such as difficulties accessing appointments and paying for transport to a clinic.[6]

Such practical factors have posed significant obstacles to vaccination in some communities prior to the COVID-19 pandemic. In regional New South Wales, for example, poor transportation, inflexible appointment times, high appointment costs and a lack of vaccination offered opportunistically at any health appointment were found to drive under-vaccination, despite parents supporting childhood vaccination.[7,8] Aboriginal and Torres Strait Islander people have been found to experience additional access barriers, such as unsafe cultural practices in medical services.[7,9]

During the COVID-19 pandemic in Australia, access barriers intensified due to lockdowns and other restrictive measures. Parents felt these practical barriers keenly, reporting difficulties getting face-to-face appointments with general practitioners (GPs) and delaying routine vaccinations to avoid face-to-face contact.[10] These barriers have been further compounded by financial hardship and the cost of living in Australia post-COVID-19. Similarly, healthcare providers reported reduced opportunities to offer opportunistic routine vaccination.[11]

During COVID-19 barriers intensified due to lockdowns and other restrictive measures.

Acceptance barriers comprise people's thoughts and feelings about vaccine safety and effectiveness, the severity and impact of vaccine-preventable diseases, and their motivation to vaccinate. Acceptance barriers also include social influences such as social norms about vaccination in different communities and regions and the receipt of information and recommendations from healthcare providers to be vaccinated.[6] Parents' negative thoughts and perceptions about childhood vaccination — that vaccines are unsafe, ineffective, may weaken children's immunity, and that children get too many vaccines too often — have been found to influence decisions to delay or decline vaccinations.[12,13,14] In terms of social influences, some parents have reported attributing their decision to decline vaccination for their child to lack of support from family, friends or influencers in their community, or historical mistrust in and dismissive vaccination encounters with healthcare providers.[15,16,17]

The COVID-19 pandemic amplified negative sentiments about childhood vaccines, and affected social influences related to vaccination.[10,18,19] Confidence in childhood vaccination decreased globally, including in Australia.[20] Compared to pre-pandemic years, more Australian parents expressed negative perceptions that vaccines cause autism, children receive too many vaccines and vaccine ingredients cause harm.[21] Parents' reports of negative vaccination experiences during this time — including negative experiences with COVID-19 vaccination and with healthcare providers — provide some explanation for increased hesitancy towards vaccines in general.[10]

1.3 Tracking vaccination barriers is key to informing strategies that improve uptake

Researchers, governments and the community have generated evidence on barriers to vaccination for Australian parents in the past through commissioned studies or funded research. However, a clear understanding of what is causing recent and ongoing declines in childhood vaccination rates at a national level is not currently available as these studies are usually conducted on a one-off basis, assess barriers incompletely or only in select populations or for select vaccines and have a long time lag from data collection to reporting. As such, the data is often out of date when it becomes available for use by governments and policymakers.

To build shared understanding on the drivers of under-vaccination, assessing and tracking a comprehensive range of access and acceptance barriers over time is essential. This approach is considered best practice by the World Health Organization (WHO)[6] and is endorsed by the WHO Strategic Advisory Group of Experts (SAGE) on Immunization.[22] Without this information, government and immunisation stakeholders risk developing and implementing ineffective policies and strategies.

Until now, there has been no national, systematic approach to identifying and tracking vaccination barriers in young children or other groups in Australia. The aim of this National Vaccination Insights project is to fill this gap by commencing regular data collection on barriers to vaccination, using robust, validated tools and methods, to inform the selection and design of strategies to improve vaccination uptake. It is essential that these data are serially collected and used alongside vaccine coverage data so we can accurately assess where the coverage gaps are, by key demographic variables, and what the social and behavioural drivers of vaccination are to guide cost-effective strategies in an increasingly resource-constrained policy environment. The broader strategic vision of the project is to collect data on vaccination barriers on an ongoing and regular basis, and to consistently consult with key stakeholders across the states and territories in Australia to identify evidence-based strategies to address those barriers, eventually expanding to include other populations and vaccines across the lifespan.

Section 2.

Survey of childhood vaccination barriers

Understanding why vaccine coverage is low requires measuring barriers to vaccination access and acceptance. In March–April 2024 we conducted the first nationally representative survey of parents of children <5 years of age to measure vaccination barriers from parents' perspectives.

2.1 Methods

We applied a cross-sectional survey design to assess 15 vaccination barriers in Australian children <5 years of age, using the Australian developed and validated Vaccine Barriers Assessment Tool (VBAT).[23] The VBAT is a comprehensive tool that draws on known drivers of vaccination to predict vaccine uptake, developed for use with parents of children <5 years of age (see Appendix A). We aimed to recruit a nationally representative sample of 2,000 participants from Australian online survey panel i-Link, employing a stratified random-sampling method to ensure the distribution of the invited sample reflected Australian Bureau of Statistics (ABS) Census 2021 data by Australian state or territory. Participants were adults ≥18 years of age, living in Australia, who could read and understand English, and who were the parent or carer of a child <5 years of age.

We collected data during March–April 2024 using i-Link's online survey platform. The survey was conducted in English and took participants approximately 12 minutes to complete. Participants answered multiple-choice socio-demographic questions, including a question about experiencing financial stress ('Since January 2023 did any of the following happen to you because of a shortage of money?' with response options 'Could not pay electricity, gas or telephone bills on time', 'Could not pay the mortgage or rent on time', 'Pawned or sold something', 'Went without meals', 'Was unable to heat home', 'Asked for financial help from friends or family', 'Asked for help from welfare/community organisations', 'None of these'). Participants who indicated two or more of the response options (not including 'None of these') were considered to have experienced financial stress. We asked participants about their youngest child's vaccination status ('Is your youngest child up to date with his/her vaccinations?' with response options 'Yes, completely up to date', 'No, but has had some' and 'No, hasn't had any'[**]). For vaccination barriers, we asked participants to respond to 15 statements about vaccinating their youngest child (e.g. 'It is easy to get an appointment when my child's vaccination is due' with response options 'strongly agree', 'slightly agree', 'slightly disagree', 'strongly disagree', and 'don't know/can't say'). In this survey, we also included questions about barriers to childhood flu vaccination; these are reported elsewhere.

For vaccination barriers, we asked participants to respond to 15 statements about vaccinating their youngest child.

Prior to analysis, we removed all respondent personal identifiers. We inverted statements and responses to a negative framing to highlight barriers ('It is not easy to get an appointment when my child's vaccination is due') and collapsed barrier responses to two categories: agree (including strongly and slightly agree) and disagree (including strongly and slightly disagree). We weighted the data by state/territory, regionality and parent age group using Australian Bureau of Statistics Census 2021 data.

For data analysis, we generated descriptive statistics of participant characteristics and calculated prevalence of vaccination barriers in the whole sample. We analysed the association between barriers and the youngest child's vaccination status. To measure these associations, we looked at the percentage of participants of a partially vaccinated child who reported a vaccination barrier and compared it to the percentage of participants of a fully vaccinated child who reported the same barrier, with the risk difference showing the difference in likelihood of reporting a barrier between these two groups. We compared parents of an unvaccinated child with parents of a fully vaccinated child in the same way. Lastly, we analysed the association between barriers (limited to the top seven barriers we found to be significantly

associated with partial vaccination) and parent's location (regionality) (comparing participants living in metropolitan-regional areas to rural-remote areas), parent's experience of financial stress (comparing participants experiencing and not experiencing financial stress), and number of children in the family (comparing participants with one child to participants with multiple children). We calculated proportions of participants reporting that vaccination barrier in each group and risk differences between groups.

When reporting results, and to facilitate selection of strategies in the next stage of the project (the strategies workshop described in Section 3 of this report), we sorted the 15 VBAT barriers into access (practical) barriers, and acceptance (thinking–feeling and social influence) barriers, informed by the Behavioural and Social Drivers (BeSD) of vaccine uptake framework (see Appendix B).[22,6] The BeSD framework was developed and validated by a World Health Organization global working group and shows broad categories of factors that can be measured to understand reasons for under-vaccination (see Figure 3, Section 1).

We obtained ethical approval for this study from the Sydney Children's Hospital Human Research Ethics Committee.

2.2 Findings

We describe participant characteristics using unweighted data. All subsequent analyses use weighted data.

2.2.1 Participant characteristics

Table 3 and Figure 4 show participant characteristics. Of the n = 2,000 participants, over half were women (54.6%), almost three-quarters were aged 30–39 (74.3%), and almost three-quarters were living in metropolitan areas (72.9%). Over three-quarters were based in the eastern states of New South Wales (30.6%), Victoria (25.9%) and Queensland (20.2%). Over half had either a bachelor's degree (44.0%) or a graduate degree (17.1%). Over half of participants were single parents (53.6%). Just over a half of participants had a youngest child either between 2 and <3 years of age (25.4%) or between 3 and <4 years of age (26.0%). Most participants' youngest child was fully vaccinated (93.5%).

Our sample had a small percentage of people identifying as Aboriginal and/or Torres Strait Islander (4.6%). A minority of participants spoke a language other than English at home (13.1%). More than one-third of our sample reported experiencing financial stress (36.3%).

Compared to the unweighted sample, our weighted sample had an increased percentage of parents living in metropolitan areas (an increase of 19.5 percentage points to 92.4%) and a decreased percentage of parents living in regional areas (a decrease of 12.6 percentage points to 4.8%).

Table 3. Participant characteristics

	Unweighted sample		Weighted sample
Sample characteristics	**n**	**%**	**%**
Gender			
Woman	1,091	54.5	52.3
Man	901	45.1	47.4
Non-binary	3	0.1	0.1
Prefer not to say	5	0.2	0.2
Age (years)			
18–24	32	1.6	1.3
25–29	153	7.6	6.8
30–34	742	37.1	38.1
35–39	743	37.1	37.6

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	Unweighted sample		Weighted sample
Sample characteristics	**n**	**%**	**%**
Age (years)			
45–49	29	1.5	1.4
50–54	7	0.4	0.3
55–59	3	0.1	0.1
Regionality			
Metropolitan	1,458	72.9	92.4
Regional	348	17.4	4.8
Rural	159	8.0	2.3
Remote	35	1.8	0.5
State or territory			
New South Wales	612	30.6	32.8
Victoria	517	25.9	27.3
Queensland	404	20.2	19.7
Western Australia	217	10.8	11.0
South Australia	154	7.7	6.6
Tasmania	47	2.4	0.4
Australian Capital Territory	36	1.8	2.0
Northern Territory	13	0.7	0.3
Aboriginal and Torres Strait Islander status			
Aboriginal	57	2.9	2.3
Torres Strait Islander	11	0.5	0.4
Both	23	1.1	0.8
Neither	1,909	95.5	96.5
Education			
Less than high school	13	0.7	0.6
High school or equivalent	324	16.2	14.3
Trade cert/apprenticeship	442	22.1	20.6
Bachelor's degree	879	44.0	46.3
Graduate degree	342	17.1	18.2
Language used at home			
English only	1,739	87.0	84.8
Other language	261	13.1	15.2
Number of children			
1	1,010	50.5	53.3
2	697	34.8	34.0
3+	293	14.6	12.8
Single parent or carer status			
Yes	1,072	53.6	55.8
No	928	46.4	44.2

	Unweighted sample		Weighted sample
Sample characteristics	**n**	**%**	**%**
Financial stress			
Yes	726	36.3	34.4
No	1,274	63.7	65.6
Youngest child's age			
<1 year	192	9.6	9.1
1–<2 years	359	17.9	17.1
2–<3 years	507	25.4	25.3
3–<4 years	519	25.9	25.9
4–<5 years	423	21.1	22.6
Youngest child's vaccination status			
Fully vaccinated	1,870	93.5	94.0
Partially vaccinated	97	4.9	4.5
Unvaccinated	33	1.7	1.5

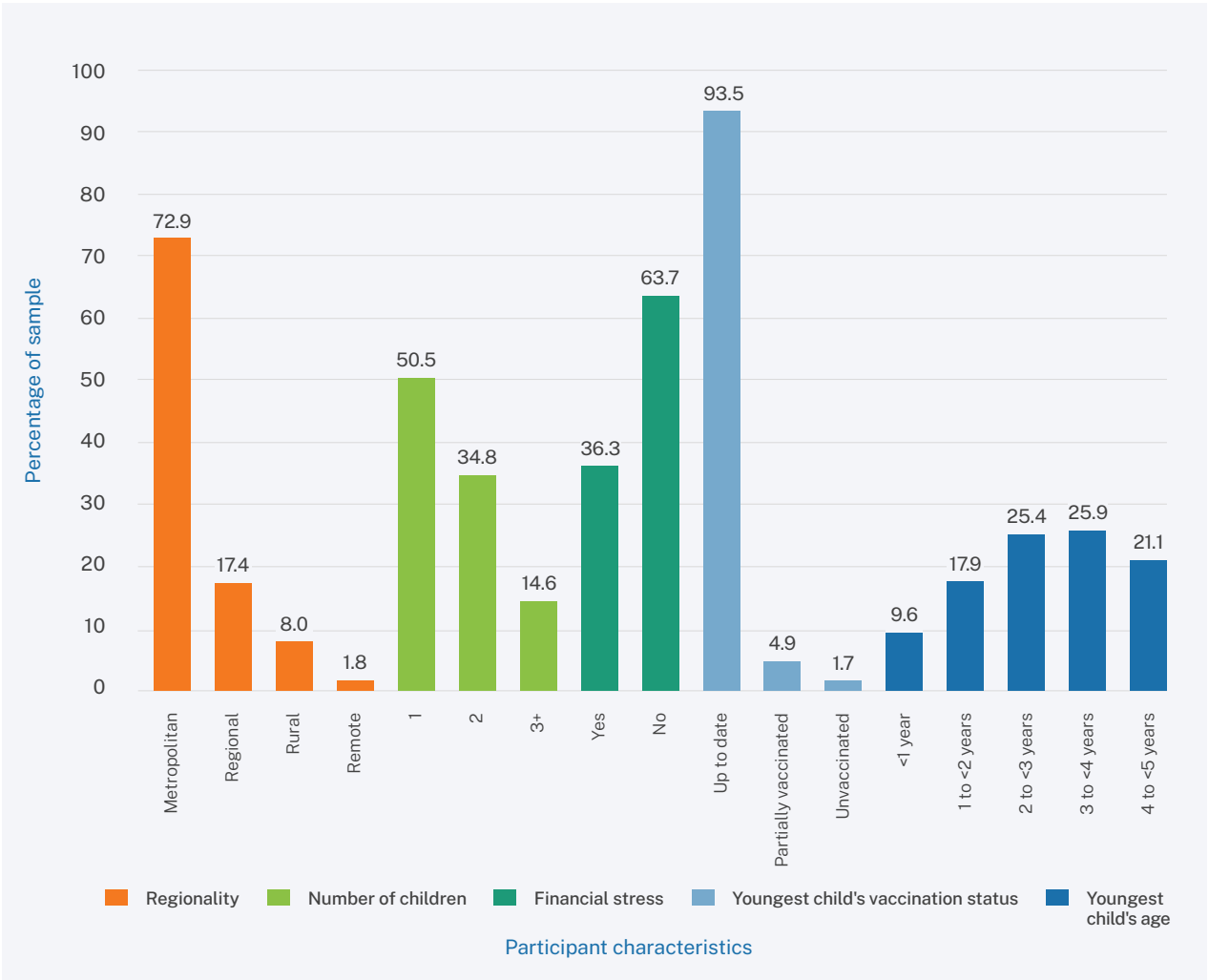

Figure 4. Participant characteristics

2.2.2 Prevalence of vaccination barriers in the whole sample

- More than 6 in 10 parents (60.2%) reported the acceptance (thinking–feeling) barrier that they feel distressed when thinking about vaccinating their child.
- More than 1 in 10 parents (11.0%) reported the access (practical) barrier that they cannot afford costs associated with vaccinating their child.
- A similar percentage (9.3%) reported the access (practical) barrier that it is not easy to get a vaccination appointment when their child's vaccination is due.

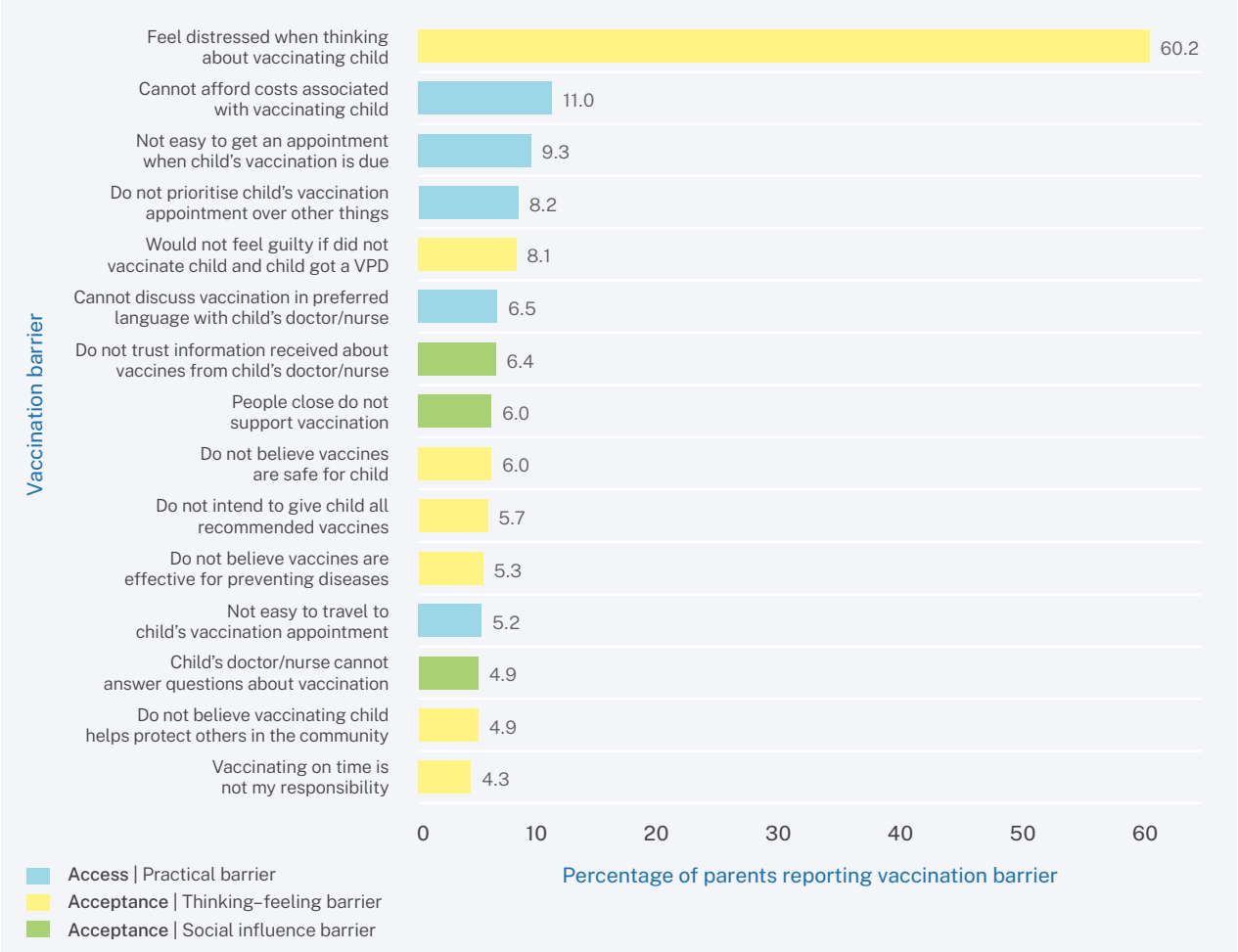

Figure 5. Prevalence of vaccination barriers reported by parents of children <5 years of age

Table 4. Percentage of parents reporting vaccination barriers, comparing all parents, parents with up-to-date children, parents with partially vaccinated children and parents with unvaccinated children

Vaccination barrier	% Reporting vaccination barrier			
	Parents with unvaccinated children	Parents with partially vaccinated children	Parents with up-to-date children	All parents
Do not intend to give child all recommended vaccines	48.8	10.8	4.8	5.7
Do not believe vaccines are safe for child	47.9	17.7	4.8	6
Would not feel guilty if did not vaccinate child and child got a VPD	46.7	16.0	7.1	8.1
Do not believe vaccinating child helps protect others in the community	39.7	14.0	3.9	4.9
Do not believe vaccines are effective for preventing diseases	39.8	14.3	4.4	5.3
Vaccinating on time is not my responsibility	12.8	10.4	3.9	4.3
Feel distressed when thinking about vaccinating child	65.4	55.4	60.3	60.2
Do not trust information received about vaccines from child's doctor/nurse	43.7	16.8	5.4	6.4
People close do not support vaccination	21.8	11.5	5.5	6
Child's doctor/nurse cannot answer questions about vaccination	20.2	10.8	4.4	4.9
Do not prioritise child's vaccination appointment over other things	47.6	23.9	6.9	8.2
Not easy to travel to child's vaccination appointment	12.1	8.9	4.9	5.2
Cannot afford costs associated with vaccinating child	16.5	20.5	10.4	11
Not easy to get an appointment when child's vaccination is due	14.2	24.8	8.5	9.3
Cannot discuss vaccination in preferred language with child's doctor/nurse	10.5	11.0	6.2	6.5

Access | Practical barrier **Acceptance** | Thinking–feeling barrier **Acceptance** | Social influence barrier

2.2.3 Vaccination barriers associated with partially vaccinating

Of the parents surveyed, 4.9% had a partially vaccinated child.

Significantly more parents of partially vaccinated children reported access (practical) barriers compared with parents of up-to-date children (see Figure 6, Table 5):

- More said they do not prioritise their child's vaccination appointments over other things (23.9% vs. 6.9%, a 17.1 percentage-point difference).
- More said it is not easy to get an appointment when their child's vaccination is due (24.8% vs. 8.5%, a 16.3 percentage-point difference).

Parents of partially vaccinated children also more frequently reported acceptance barriers (thinking–feeling and social influence) compared with parents of up-to-date children:

- More said they do not believe vaccines are safe for their child (17.7% vs. 4.8%, a 12.9 percentage-point difference).
- More said they do not trust the information they receive about vaccines from their child's doctor or nurse (16.8% vs. 5.4%, an 11.4 percentage-point difference

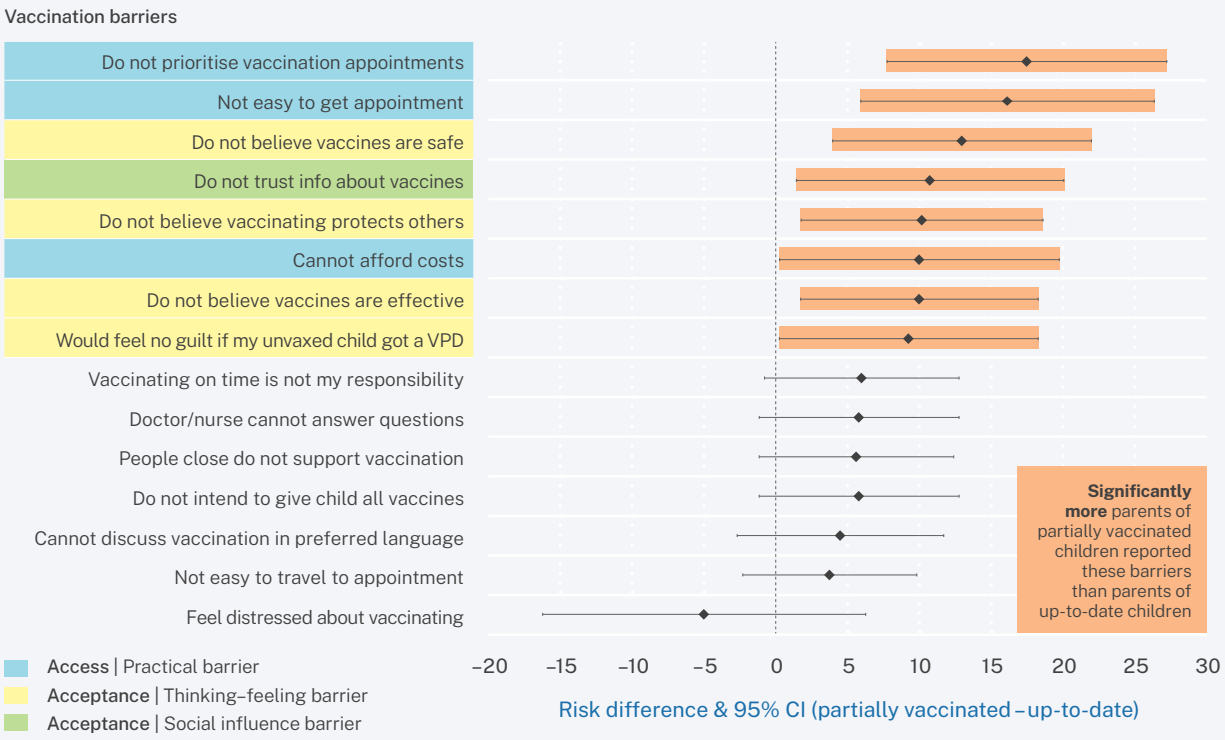

Figure 6. Differences in percentage of parents of partially vaccinated children reporting vaccination barriers, compared to parents of up-to-date children (risk difference)

Table 5. Differences in percentage of parents of partially vaccinated children reporting vaccination barriers compared to parents of up-to-date children (risk difference)

Vaccination barrier	% Reporting barrier			95% CI	
	Partially vaccinated	Up-to-date	RD~	Lower	Upper
Do not prioritise child's vaccination appointment over other things	(23.9%)	(6.9%)	17.1	7.2	26.9
Not easy to get an appointment when child's vaccination is due	(24.8%)	(8.5%)	16.3	6.3	26.3
Do not believe vaccinations are safe for child	(17.7%)	(4.8%)	12.9	4.3	21.4
Do not trust information received about vaccines from child's doctor/nurse	(16.8%)	(5.4%)	11.4	2.9	19.9
Do not believe vaccinating child helps protect others in the community	(14.0%)	(3.9%)	10.1	2.2	18
Cannot afford costs associated with vaccinating child	(20.5%)	(10.4%)	10.0	0.7	19.3
Do not believe vaccines are effective for preventing diseases	(14.3%)	(4.4%)	9.9	2.2	17.7
Would not feel guilty if did not vaccinate child and child got a VPD	(16.0%)	(7.1%)	8.9	0.2	17.6
Vaccinating on time is not my responsibility	(10.4%)	(3.9%)	6.5	–0.1	13.1
Child's doctor/nurse cannot answer questions about vaccination	(10.8%)	(4.4%)	6.4	–0.3	13.1
Do not intend to give child all recommended vaccines	(10.8%)	(4.8%)	6.0	–0.9	12.8
People close do not support vaccination	(11.5%)	(5.5%)	6.0	–0.8	12.8
Cannot discuss vaccination in preferred language with child's doctor/nurse	(11.0%)	(6.2%)	4.8	–2.3	11.9
Not easy to travel to child's vaccination appointment	(8.9%)	(4.9%)	4.0	–2.1	10.1
Feel distressed when thinking about vaccinating child	(55.4%)	(60.3%)	–4.9	–16.4	6.5

Access | Practical barrier Acceptance | Thinking–feeling barrier Acceptance | Social influence barrier

~Risk difference, i.e. percentage point difference between percentage of parents of partially vaccinated children reporting vaccination barrier, compared to percentage of parents of up-to-date children reporting barrier.

2.2.4 Vaccination barriers associated with not vaccinating

Of the parents surveyed, 1.7% had unvaccinated children.

Significantly more parents of unvaccinated children reported acceptance (thinking–feeling and social influences) barriers compared with parents of up-to-date children (see Figure 7, Table 6):

- More said they do not intend to give their child all the recommended vaccines (48.8% vs. 4.8%, a difference of 44.0 percentage points).
- More said they do not believe vaccines are safe for their child (47.9% vs. 4.8%, a difference of 43.2 percentage points).
- More said they would not feel guilty if their unvaccinated child got a vaccine-preventable disease (46.7% vs. 7.1%, a difference of 39.6 percentage points).
- More said they did not trust the information they receive about vaccines from their child's doctor or nurse (43.7% vs. 5.4%, a difference of 38.3 percentage points).

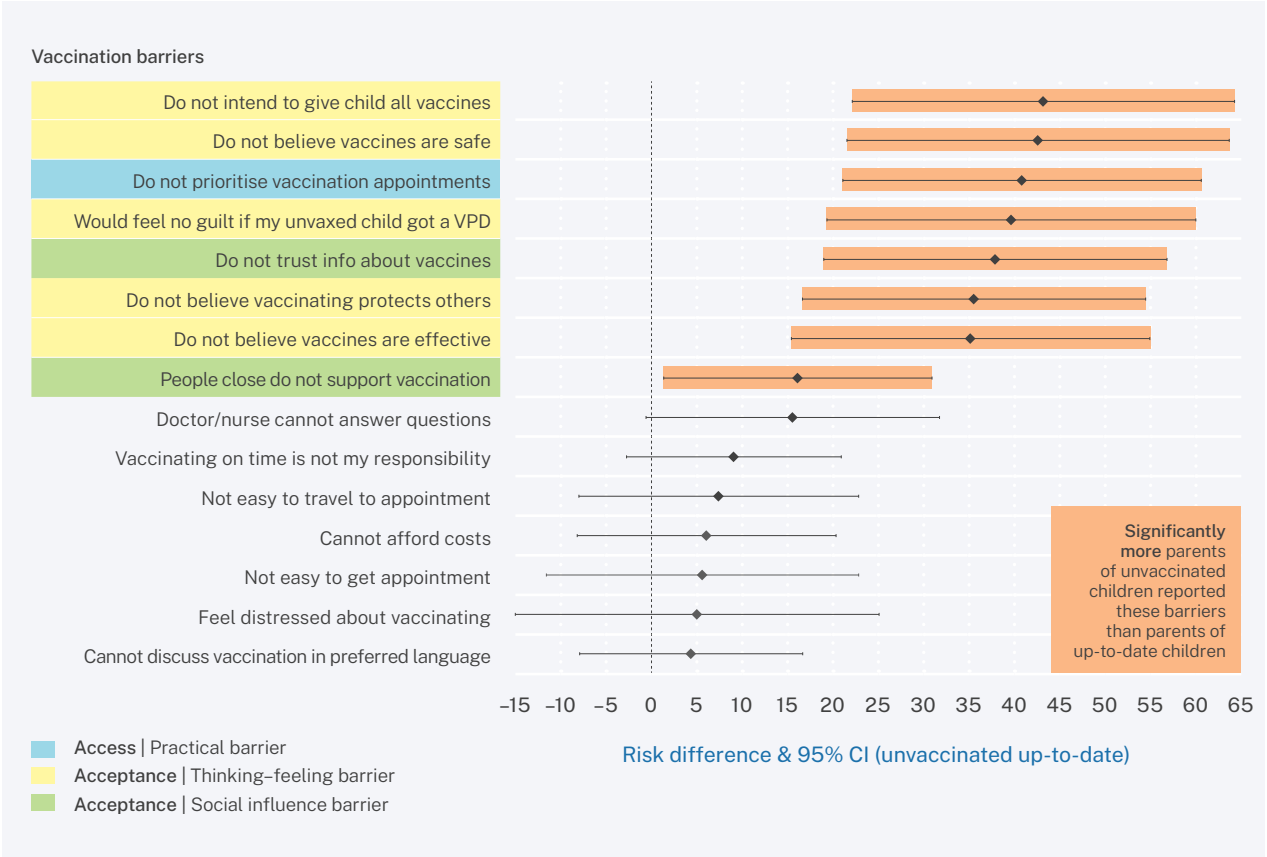

Figure 7. Differences in percentage of parents of unvaccinated children reporting vaccination barriers compared to parents of up-to-date children (risk difference)

Table 6. Differences in percentage of parents of unvaccinated children reporting vaccination barriers compared to parents of up-to-date children (risk difference)

	% Reporting barrier			95% CI	
Vaccination barrier	Unvaccinated	Up-to-date	RD~	Lower	Upper
Do not intend to give child all recommended vaccines	48.8	4.8	44.0	23.7	64.2
Do not believe vaccinations are safe for child	47.9	4.8	43.0	22.9	63.2
Do not prioritise child's vaccination appointment over other things	47.6	6.9	40.7	20.4	61.1
Would not feel guilty if did not vaccinate child and child got a VPD	46.7	7.1	39.6	19.7	59.5
Do not trust information received about vaccines from child's doctor/nurse	43.7	5.4	38.3	18.8	57.7
Do not believe vaccinating child helps protect others in the community	39.7	3.9	35.8	17.1	54.5
Do not believe vaccines are effective for preventing diseases	39.8	4.4	35.4	16.2	54.7
People close do not support vaccination	21.8	5.5	16.2	0.9	31.6
Child's doctor/nurse cannot answer questions about vaccination	20.2	4.4	15.8	−0.3	31.9
Vaccinating on time is not my responsibility	12.8	3.9	8.8	−3.4	21.1
Not easy to travel to child's vaccination appointment	12.1	4.9	7.2	−7.8	22.1
Cannot afford costs associated with vaccinating child	16.5	10.4	6.1	−9.0	21.2
Not easy to get an appointment when child's vaccination is due	14.2	8.5	5.7	−11.1	22.5
Feel distressed when thinking about vaccinating child	65.4	60.3	5.1	−14.5	24.7
Cannot discuss vaccination in preferred language with child's doctor/nurse	10.5	6.2	4.3	−8.3	16.9

Access | Practical barrier **Acceptance** | Thinking–feeling barrier **Acceptance** | Social influence barrier

~Risk difference, i.e. percentage point difference between percentage of parents of unvaccinated children reporting vaccination barrier, compared to percentage of parents of up-to-date children reporting barrier.

2.2.5 Vaccination barriers associated with financial stress

More than 1 in 3 (36.3%) parents in the total sample surveyed reported experiencing financial stress. Significantly more parents experiencing financial stress reported certain access (practical) and acceptance (thinking–feeling) barriers to childhood vaccination than parents not experiencing financial stress (see Figure 8, Table 7):

- More said they are not able to afford the costs associated with vaccination (16.4% vs. 8.1%, an 8.4 percentage-point difference).
- More said they do not believe vaccines are safe (8.0% vs. 4.9%, a 3.1 percentage-point difference).

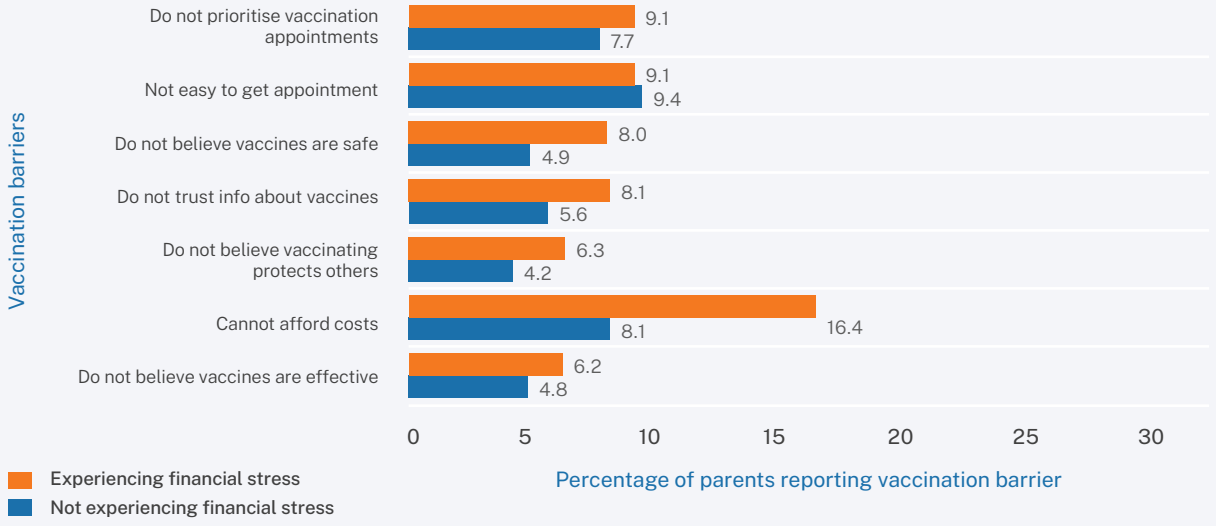

Figure 8. Percentage of parents reporting vaccination barriers^ comparing parents experiencing financial stress versus parents not experiencing financial stress

^ Includes the top seven vaccination barriers found to be significantly associated with partial vaccination (see 2.2.3)

Table 7. Difference in percentage (risk difference) of parents experiencing financial stress reporting vaccination barriers, compared to parents not experiencing financial stress

	% Reporting barrier			95% CI	
Vaccination barrier	Not experiencing financial stress	Experiencing financial stress	RD~	Lower	Upper
Do not prioritise child's vaccination appointment over other things	7.7	9.1	1.4	-1.5	4.3
Not easy to get an appointment when child's vaccination is due	9.4	9.1	-0.3	-3.3	2.6
Do not believe vaccinations are safe for child	4.9	8.0	3.1	0.5	5.6
Do not trust information received about vaccines from child's doctor/nurse	5.6	8.1	2.5	-0.1	5.1
Do not believe vaccinating child helps protect others in the community	4.2	6.3	2.1	-0.2	4.4
Cannot afford costs associated with vaccinating child	8.1	16.4	8.4	4.9	11.8
Do not believe vaccines are effective for preventing diseases	4.8	6.2	1.4	-1.0	3.7

Access | Practical barrier **Acceptance** | Thinking–feeling barrier **Acceptance** | Social influence barrier

~Risk difference, i.e. percentage point difference between percentage of parents experiencing financial stress reporting vaccination barrier, compared to percentage of parents not experiencing financial stress reporting barrier.

2.2.6 Vaccination barriers associated with geographic location (regionality)

- Significantly more parents living in metropolitan-regional areas said they experienced the access (practical) barrier of not being able to afford the costs associated with vaccinating their child compared to parents living in rural-remote areas (11.1% vs. 6.6%, a significant difference of 4.5 percentage points) (see Figure 9, Table 8).
- While not statistically significant, a higher percentage of parents living in rural-remote areas (10.9%) reported the access (practical) barrier that it is not easy to get an appointment when their child's vaccination is due compared to parents from metropolitan-regional areas (9.3%).

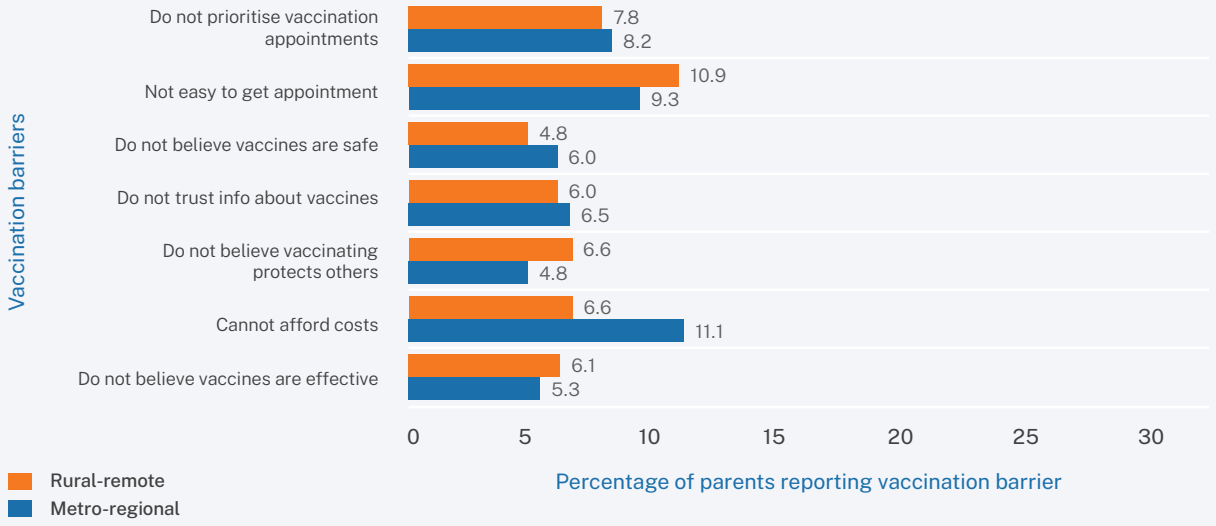

Figure 9. Percentage of parents reporting vaccination barriers^ comparing parents living in metropolitan-regional versus rural-remote areas

^ Includes the top seven vaccination barriers found to be significantly associated with partial vaccination (see 2.2.3)

Table 8. Difference in percentage (risk difference) of parents living in metropolitan-regional areas reporting vaccination barriers, compared to parents living in rural-remote areas

	% Reporting barrier			95% CI	
Vaccination barrier	Metro-regional	Rural-remote	RD~	Lower	Upper
Do not prioritise child's vaccination appointment over other things	8.2	7.8	−0.4	−4.4	3.6
Not easy to get an appointment when child's vaccination is due	9.3	10.9	1.6	−3.1	6.3
Do not believe vaccinations are safe for child	6.0	4.8	−1.2	−4.4	1.9
Do not trust information received about vaccines from child's doctor/nurse	6.5	6.0	−0.5	−4.0	3.1
Do not believe vaccinating child helps protect others in the community	4.8	6.6	1.8	−1.9	5.5
Cannot afford costs associated with vaccinating child	11.1	6.6	−4.5	−8.1	−0.8
Do not believe vaccines are effective for preventing diseases	5.3	6.1	0.8	−2.7	4.4

Access | Practical barrier **Acceptance** | Thinking–feeling barrier **Acceptance** | Social influence barrier

~Risk difference, i.e. percentage point difference between percentage of rural-remote parents reporting vaccination barrier, compared to percentage of metro-regional parents reporting barrier.

2.2.7 Vaccination barriers associated with number of children in the family

Almost half of parents (46.7%) surveyed had multiple children.

Significantly more parents with two and three or more children said they experienced almost all the seven access and acceptance barriers associated with partial vaccination compared to parents with one child (see Figure 10, Table 9).

The vaccination barriers most strongly associated with having multiple children were mostly related to access (practical). Significantly more parents of multiple children compared to parents with one child said:

- they did not prioritise their child's vaccination appointments over other things (11.9% for parents of two and three or more children vs. 5.0%, a difference of 6.9 percentage points)
- they could not afford the costs associated with vaccinating their child (13.4% for parents of two children vs. 8.7%, a difference of 4.7 percentage points; 14.1% for parents of three or more children vs. 8.7%, a difference of 5.4 percentage points).

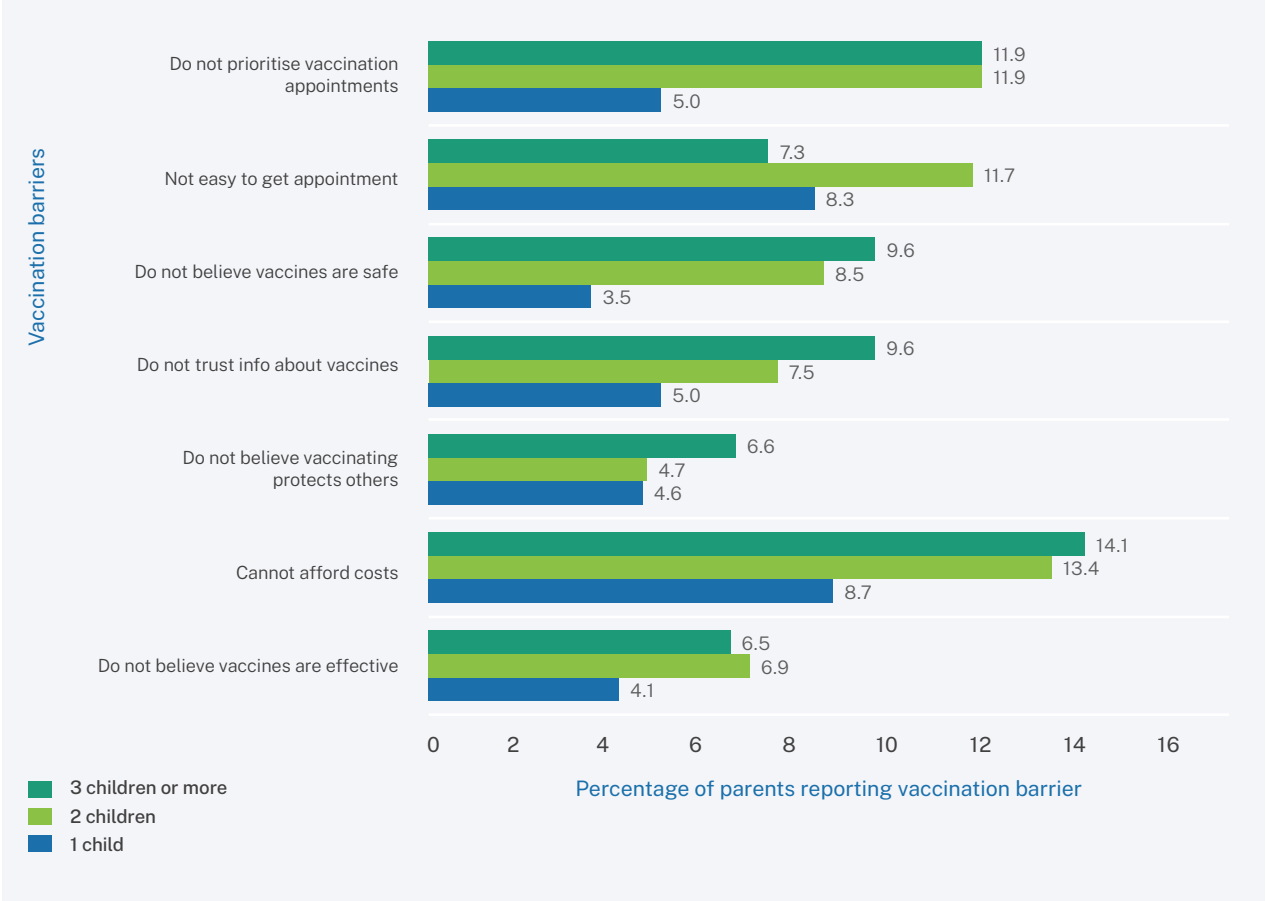

Figure 10. Percentage of parents reporting vaccination barriers^ comparing parents with one child versus parents with two and three children or more

^ Includes the top seven vaccination barriers found to be significantly associated with partial vaccination (see 2.2.3)

Table 9. Difference in percentage (risk difference) of parents with one child reporting vaccination barriers, compared to parents with multiple children

Vaccination barrier	% Reporting barrier			95% CI		% Reporting barrier		95% CI	
	1 child	2 children	RD~	Lower	Upper	3 children or more	RD~	Lower	Upper
Do not prioritise child's vaccination appointment over other things	5.0	11.9	6.9	3.8	10.1	11.9	6.9	2.5	11.4
Not easy to get an appointment when child's vaccination is due	8.3	11.7	3.4	0.1	6.7	7.3	−0.9	−4.7	2.9
Do not believe vaccinations are safe for child	3.5	8.5	4.9	2.3	7.6	9.6	6.1	2.2	10.0
Do not trust information received about vaccines from child's doctor/nurse	5.0	7.5	2.5	−0.2	5.1	9.6	4.5	0.5	8.6
Do not believe vaccinating child helps protect others in the community	4.6	4.7	0.2	−2.1	2.4	6.6	2.0	−1.4	5.4
Cannot afford costs associated with vaccinating child	8.7	13.4	4.7	1.3	8.2	14.1	5.4	0.5	10.4
Do not believe vaccines are effective for preventing diseases	4.1	6.9	2.8	0.3	5.3	6.5	2.5	−0.9	5.8

Access | Practical barrier **Acceptance** | Thinking–feeling barrier **Acceptance** | Social influence barrier

~Risk difference, i.e. percentage point difference between percentage of parents with two or three children reporting vaccination barrier, compared to percentage of parents with one child reporting vaccination barrier.

Section 3.

Immunisation stakeholder workshop on mapping strategies to identified barriers

To improve vaccination rates, strategies must be informed by behavioural and social insights on drivers of under-vaccination, alongside coverage data. While evidence on effective strategies is available, the success of any approach is dependent on tailoring strategies to the identified population group and understanding local context, needs and priorities.

To address specific challenges in the Australian context, in July 2024 we held an online, interactive workshop with the National Vaccination Insights project Stakeholder Advisory Group (SAG). The purpose was to map evidence-based strategies to barriers identified in our survey for parents of partially vaccinated children and explore how implementation of such strategies could occur at national and state/territory levels in Australia.

The SAG selected parents of partially vaccinated children to focus on because these parents are known to be generally more open to strategies that encourage and assist them to fully vaccinate their child than refusing parents and, as such, seemed the logical group to explore first.

Workshop participants were divided into three small groups representing different areas related to immunisation: community members including Aboriginal and Torres Strait Islander peoples (Group 1), healthcare professionals (Group 2) and people working in immunisation policy (Group 3).

3.1 Methods

A week prior to the workshop participants received pre-reading materials about survey findings and existing evidence on strategies to address vaccination barriers[6,24] and some questions to consider for discussion.

During the workshop, presentations on survey findings and existing evidence on strategies to address vaccination barriers were followed by an interactive session of small group discussions. Below, we present a summary of findings from these discussions. Each discussion included SAG participants who represented different areas related to immunisation: community members (Group 1), healthcare professionals (Group 2) and people who work in policy (Group 3). Participants in each group were asked to select priority vaccination barriers and three to four key corresponding strategies to overcome these barriers, then discuss how selected strategies could look in practice, potential challenges to implementation and suggestions for how to overcome these.

Detailed methods are described in Appendix F.

3.2 Detailed findings

3.2.1 Perspectives from participants who represented community members (Group 1)

Participants in Group 1 identified the following priority vaccination barriers and corresponding strategies to overcome them.

Vaccination barrier	Strategy
Access (practical) barriers Difficult to travel to vaccination appointment Cannot afford costs associated with vaccination	**1.** On-site vaccination provided in community settings
Acceptance (social influence) barrier Low trust in vaccination information from child's doctor or nurse	**2.***** Tailored campaigns to inform or educate the public about vaccination, featuring vaccine champions and advocates

Strategy 1. On-site vaccination provided in community settings

Participants proposed that on-site vaccination that brings **vaccination free of charge** to **locations in the community, where people normally congregate and feel safe**, can help to address many practical barriers to vaccination and may be particularly helpful to families living in rural and remote areas, without own transport, who are socially isolated, and First Nations families.

Ideas for how this strategy could look in practice

Participants proposed to offer on-site vaccination **during community, health-oriented and/or sporting events** (e.g. swimming carnivals, marathons, football events); **in public places accessible to parents and carers of young children and at schools**, and to **accompany them by incentives tailored to local needs,** such as food (e.g. barbeque or a healthy food spread) and clothing (e.g. T-shirts, shawls, baby vests with logos). Vaccination could be offered in vaccine van/mobile vaccination.

Additional ideas for First Nations families included using vans painted by local First Nations artists; framing vaccination messages from a strength-based perspective and vaccination events as celebrations of health, strength and family. Healthy foods, arts and crafts and storytelling (cultural ways of conveying messages) should be offered as part of vaccination events in the community.

'Storytelling, incorporating the health of the child and what we're trying to achieve as a community by immunising our children.'

'I just love the idea of celebrating it. How we can even have events like the food, healthy food, but also a bit of art, a bit of movement, dancing. We associate the immunisation with being healthy, being strong, being resilient, not like a thing that one must do.'

*** Group combined two of the evidence-based strategy areas: campaigns and champions

Suggestions to overcome potential challenges with strategy implementation

Participants noted that Aboriginal Community Controlled Health Services (ACCHSs) — organisations that deliver many of the on-site vaccination clinics and other forms of vaccination outreach — need to be supported with continuous funding at the Commonwealth, state and territory levels. Participants emphasised that expanding the scope of practice for Aboriginal Health Workers and Aboriginal Health Practitioners and allowing them to deliver vaccinations in community settings would be another important way to support ACCHSs.

Participants also advised that vaccination champions and healthcare providers delivering education and vaccination at on-site events should be supported by training to build skills and confidence in having supportive vaccination conversations.

Strategy 2. Tailored campaigns featuring vaccine champions and advocates

Participants suggested campaigns that are **tailored to different audiences, featuring community vaccine champions**, can help build confidence and trust in vaccines and vaccination.

Ideas for how this strategy could look in practice

Participants proposed that **daytime events** with dress up, educational activities, posters and books about immunisation could be organised in childcare centres, public libraries, and other places frequented by mothers and carers of young children.

Messages should focus on the 'Three Ws' — *Why (fully vaccinate?), when (to vaccinate the child?) and where (to vaccinate the child?)* — which are all related to the benefits of full immunisation and what may happen when the child is not fully immunised. Participants proposed that campaigns **should feature stories by community vaccine champions,** who are people known and trusted in the community and relatable to the community.

> **'In all our communication strategies, we have to just be plainer and target audiences in a way that they understand … champions of popular sporting players and people like that, people with lower health literacy may be more willing to listen and understand.'**

> **'Real faces, real words that aren't polished … Not having a superstar, but having real people who can talk through their eyes and their ears about why it's important.'**

Additional ideas for First Nations families included creating strength-based cartoon-like 'deadly characters': both male (men's business) and female (women's business) with whom children could identify.

> **'Creating deadly characters like strength-based characters, male and female characters of strength because we got to look at woman's business and man's business and having those two characters that kids can identify and maybe proud to be vaccinated.'**

Suggestions to overcome potential challenges with strategy implementation

Participants advised that it is **essential to have a community steering group for the campaigns** in addition to other stakeholders (e.g. behavioural science, research, communications agencies, etc.). Participants also discussed that with limited funding, decisions on which audience/community to focus on for the campaign should be informed by data on vaccination rates and burden of vaccine-preventable diseases.

3.2.2 Perspectives from participants who represented healthcare providers (Group 2)

Participants in Group 2 identified the following priority vaccination barriers and corresponding strategies to overcome them.

Vaccination barrier	Strategy
Access (practical) barriers Difficult to get a vaccination appointment	**1.** Default appointments **2.** Provider performance assessment and feedback (note: this strategy addressed broader issues at provider and system levels)
Acceptance (thinking–feeling) barrier Would not feel guilty if did not vaccinate the child and they got a vaccine-preventable disease	**3.** Vaccine champions and advocates **4.** Dialogue-based interventions, including one-to-one counselling to encourage vaccination

Strategy 1. Default appointments

Participants discussed that default appointments automate scheduling vaccinations, make it easier for busy families to remember about vaccinations and may help to normalise vaccination. Default appointments may also facilitate continuity of care with one provider.

'It's a way to almost automate the next schedule … It normalises that this is part of what is routine activity. It also, if it's a default appointment, it's bringing people back to the same providers. I believe could help with trust aspect.'

'How to make it so simple that it actually decreases work rather than just adds another electronic input into your busy parental life.'

Ideas for how this strategy could look in practice

Participants discussed that if the time offered for the vaccination appointment is not suitable for the parent, they should be able to easily change the time by clicking on the link in the text message rather than needing to call the clinic to reschedule.

Suggestions to overcome potential challenges with strategy implementation

Participants advised that default appointments need to be well thought through to ensure they contribute to better workflow for the practice and scheduling for parents, rather than disrupting a busy practice workflow. Participants added that communities should be consulted on the actual design of the default appointments, to help ensure that the format and content of the messages work for them.

Strategy 2. Provider performance assessment and feedback

Participants discussed that receiving a report on how the practice is doing on meeting vaccination targets (timely, local coverage data), and seeing vaccination rates in their patient groups, can be an effective strategy.

> **'This has been shown to be very effective when practices get feedback monthly on how they're going with numbers of vaccines delivered, which providers doing the most.'**

Ideas for how this strategy could look in practice

Participants suggested it may be helpful to have Key Performance Indicators (KPIs)/payments, including specific Medicare items linked to vaccination at practice level, which may act as an added motivator for providers to monitor patients' vaccination status, offer vaccinations opportunistically and strongly recommend them.

Suggestions to overcome potential challenges with strategy implementation

Participants noted that current lack of provider performance and feedback and lack of related KPIs linked to vaccination at practice level are part of a larger issue of general practices not being incentivised to offer vaccinations. Within the fee-for-service model in general practices, practices are not encouraged to prioritise preventative health, offer vaccination consultations and monitor vaccination rates. Participants suggested that relevant changes were required at the policy and fiscal level to make it easier for primary care to prioritise childhood vaccination.

> **'Policy people need to take some responsibility here with provider engagement – losing providers is in part because we have made it incredibly complicated. I think it starts at a policy level and ends with education.'**

Strategy 3. Vaccine champions and advocates

Participants suggested there was lack of understanding in the community of what vaccine-preventable diseases look like. This may be contributing to a lack of a sense of urgency in timely vaccination of children with all recommended childhood vaccines. Participants suggested that community vaccine champions are best placed to understand the community's perceptions of vaccination and vaccine-preventable diseases, and how to convey messages to support timely, complete childhood vaccination in communities.

> **'To get the community back on board in a post-COVID environment, we need to normalise things and normalising things is actually having conversations with community about what actually is important and why we do it. We need a strong community voice that's coming from the non-health sector.'**

Suggestions to overcome potential challenges with strategy implementation

Participants acknowledged that vaccine champions need to be adequately trained and supported in their role.

> **'I think it's also more important where you have specific cultural groups and First Nations groups where this is very much a community-led strategy. It builds trust, but these leaders need to be really empowered and given skills in our experience where we've done this.'**

Strategy 4. Dialogue-based interventions, including one-to-one counselling to encourage vaccination

Participants discussed that supportive vaccination conversations with patients may not be happening across many health settings due to providers' lack of knowledge about childhood vaccines and skills in having vaccination conversations (in particular among newly graduated doctors).

This may be contributing to parental negative perceptions of vaccinations and a lack of a sense of urgency to vaccinate the child on time.

Participants proposed that training on the above should be implemented across the health sector.

3.2.3 Perspectives from participants who worked in policy (Group 3)

Participants in Group 3 identified the following priority vaccination barriers and corresponding strategies to overcome them.

Vaccination barrier	Strategy
Access (practical) barriers Difficult to get a vaccination appointment	**1.** Reminder for next dose/recall for missed dose **2.** Provider performance assessment and feedback (note: this strategy addressed broader issues at provider and system levels)
Acceptance (social influence) barrier Low trust in vaccination information from child's doctor or nurse	**3.** Dialogue-based interventions, including one-to-one counselling to encourage vaccination **4.** Enable easy access to vaccination information and counselling outside of scheduled appointments (note: this is a new strategy)

Strategy 1. Reminder for next dose/recall for missed dose

Participants discussed that receiving a personalised reminder about vaccination is a known effective strategy to increase vaccination.

Ideas for how this strategy could look in practice

Participants discussed that receiving a personalised reminder about upcoming vaccination makes it easier for families to remember and prioritise vaccination appointments for their children.

Participants commented that having a national app that sends reminders about upcoming childhood vaccines to parents who are registered with Medicare would be another way to automate the reminder system.

Suggestions to overcome potential challenges with strategy implementation

> **'Vaccination, it's never an emergency. They [healthcare professionals] should be supported to building routine appointments well ahead of time … so that they're not forgetting to book, so vaccination being a bit more of a default in the plan, the healthcare plan.'**

Participants advised that **further funding** is needed to understand how to develop best model(s) to automate the reminder/recall system.

Strategy 2. Provider performance assessment and feedback

Participants discussed that some providers may not be aware of vaccination gaps within their area/patient group. They suggested that provider performance assessment and feedback could help to ensure that providers are more motivated to opportunistically offer vaccinations to patients, and are incentivised for having patients up to date on their vaccinations.

Suggestions to overcome potential challenges with strategy implementation

Participants noted that it is currently unclear how jurisdictions can use Australian Immunisation Register (AIR) data to inform/drive performance review, and recommended clarifying the above.

> **'We would love to put heat maps online to inform providers, public, et cetera, but we've really been a bit hamstrung by mixed interpretation of the AIR Act.'**

Strategy 3. Dialogue-based interventions, including one-to-one counselling to encourage vaccination

To help parents regain trust in vaccination information from their child's doctor or nurse, participants proposed that healthcare workforce needs to communicate better about vaccines and vaccination, using motivational and dialogue-based approaches. Participants noted that the COVID-19 pandemic has had negative impacts on people's perceptions of vaccinations, including routine childhood vaccination, and that a two-way dialogue in which parents' perspectives are respected may help to mediate these impacts.

> **'Vaccination is completely about trust. Vaccination is different from every other medication in that you're asking a parent to give something to their child when, for all intents and purposes, there's nothing actually wrong with the child. Gaining that trust again through effective communication is key for us.'**

Ideas for how this strategy could look in practice

Many healthcare professionals, however, lack skills and confidence in this area and would benefit from dedicated training. Participants proposed to inbuild this type of training into healthcare professionals' curriculum, via revisiting and suggesting changes in the National Education Framework for Immunisation, by supporting communication training using the Royal Australian College of General Practitioners Continuing Professional Development (CPD) program, and by having healthcare professional vaccination 'champions' in facilities to provide mentorship to other staff.

Suggestions to overcome potential challenges with strategy implementation

Participants discussed several unsupportive fiscal policies in primary care, including the closure of child and family health clinics, reduced funding for preventative health consultations within the fee-for-service model in Australia, and the move away from practice incentive payments. Participants noted that as a result of those unsupportive fiscal policies, vaccination consultations are often not prioritised in primary care.

Participants stressed that **unless primary care is supported by policies and funding that welcome and encourage longer vaccination consultations, few will be motivated to apply the newly acquired dialogue-based approaches in practice.**

> **'If there's not funding attached, even for a GP to be able to have these conversations with the parents where the parents are not out of pocket, it's going to be really hard to implement them as a strategy, even though they're really important.'**

Strategy 4. Enable easy access to vaccination information and counselling outside of scheduled appointments

Finally, participants indicated it was important to better support parents and carers with information about vaccines and vaccination by making these available free of charge and accessible in parents' own time.

> **'Provide a space where parents can, or caregivers or people can just ask a healthcare professional without that burden of having to make an appointment to do something where they can get that advice specific to their child or their need.'**

Ideas for how this strategy could look in practice

To enable the above, participants proposed that governments facilitate access to the National Immunisation Information Line[25] for parents with vaccination questions seeking tailored advice. They noted that such a centralised information vaccination service was provided temporarily during the COVID-19 pandemic. We note that such a hotline exists and has been in place for several years;[25] therefore the recommendation may be greater awareness of the hotline.

Section 4.

Discussion

A multi-level, multi-faceted approach to increase childhood vaccination rates

In Australia, we need a multi-level, multi-faceted approach to increase childhood vaccination rates. In the setting of declining childhood vaccination coverage rates at all three age milestones (12 months, 2 and 5 years), this National Vaccination Insights project survey clearly shows that parents and carers of young children under 5 years of age in Australia experience multiple barriers to vaccinating their children, including costs associated with vaccination, difficulties getting vaccination appointments, not prioritising their child's vaccination over other things, and weakened trust and confidence in vaccines and vaccination information post-COVID-19 pandemic. These barriers differed for parents of partially vaccinated and unvaccinated children, with access and cost issues predominating for parents of partially vaccinated children.

These barriers require a multi-sectoral approach; no single strategy in isolation will have the desired impact to increase coverage rates. Strategies must improve access to vaccination by recognising and addressing practical and cost barriers for families, especially those experiencing financial hardship. Strategies must also work to improve acceptance of vaccination by acknowledging the impact of the COVID-19 pandemic and working to rebuild trust and confidence among parents and caregivers. Strategies must also support and build capacity among primary care providers (GPs, nurses and pharmacists).

We urge governments and immunisation stakeholders (e.g. peak health professional and funding bodies responsible for childhood vaccination policies and funding, Primary Health Networks, etc.) to consider a set of actions that will make it easier for parents and carers to vaccinate their children, and that are in alignment with the National Immunisation Strategy (NIS). Drawing on multiple data sources, and in consultation with a wide range of experts and stakeholders including the Primary Health Network (PHN) Immunisation Support Program, the National Centre for Immunisation Research and Surveillance, and the Australian Government Department of Health, Disability and Ageing we have grouped actions for consideration into **four interrelated themes** (see Figure 11).

We suggest these considerations be explored in more detail to better understand their contributions to childhood vaccination rates.

Figure 11. Four interrelated themes outlining actions for consideration

Theme 1. Improve access to vaccination

The national survey clearly showed that access barriers to childhood vaccination are real and are driving under-vaccination.
Specifically, we found that:

- Significantly more parents of partially vaccinated children reported access (practical) barriers than parents of up-to-date children. This included not prioritising vaccination over other things, not being able to easily get a vaccination appointment, and (perhaps surprisingly, given childhood vaccines in Australia are free) not being able to afford costs associated with vaccinating.
- Financial stress and caring for multiple children amplified these practical barriers, suggesting that vaccinating children on time may be particularly difficult for parents and carers who experience disadvantage and lack of support.

Governments and immunisation stakeholders should consider:

- **removing cost barriers** associated with childhood vaccinations, such as co-payments for consultations, but also costs related to transport to/from services in regional and remote areas, by offering transport assistance
- **reviewing the effectiveness of different models of service delivery and implementing more effective models**, including GPs, pharmacies, nurse-led clinics, family and child health clinics, community outreach clinics, mobile clinics and pop-up clinics at community events, to consider the best (mix of) models to support access
- **making vaccination services and appointments more accessible in general practice** to families by encouraging general practices to see new patients for immunisation consultations; extending vaccination clinic times to after-hours and during weekends; offering drop-in vaccination appointments; supporting funding for nurse-led clinics in general practice
- **funding community clinics that offer a nurse-led clinic**, and identifying existing successful models for wider implementation that incorporates rotating locations in regions, varying hours and days, drop-in appointments, a published yearly schedule of clinic days and times, and availability of child and family nurses on site to support developmental checks
- **improving accessibility for families less connected with health services**, by offering vaccination free of charge in community settings where people normally congregate and feel safe (community and sporting events, libraries, parks) and offering it alongside tailored incentives (including foods, clothing, cultural events)
- **implementing the recommendations from the Expert Advisory Panel report to the Australian Government regarding the Review of General Practice Incentives**;[26] the recommendations of the report focus on simplifying payment structures, supporting quality care, the introduction of an independent pricing authority and the introduction of a 10-year transition to a new payment model
- **updating current Practice Incentive Program Quality Practice Measures**[26] to ensure they are current and in line with government immunisation priorities
- **reviewing the Primary Health Networks performance and quality framework**[27] to consider whether the PHN Program indicators are in line with government priorities for immunisation.

Theme 2. Support provider education and advocacy

The national survey clearly showed that acceptance issues, such as parents' lack of trust in healthcare professionals, is driving under-vaccination. Specifically, we found that:

Significantly more parents of partially vaccinated and unvaccinated children do not trust the information they receive about vaccination from their child's doctor or nurse compared to parents of up-to-date children.

Governments and immunisation stakeholders should consider:

- **providing funding via Medicare items and other mechanisms, to support providers with paid time for vaccination counselling**,[28] informed by review of the approach implemented during the COVID-19 pandemic of funding longer vaccine consultations via the Medicare Benefits Scheme, where charging a gap fee was not allowed,[29] to determine the transferability to all vaccination appointments
- including **training to support skills and confidence** to have supportive vaccination conversations (e.g. **Sharing Knowledge About**

Immunisation) in healthcare professionals' education/professional development programs, such as the Royal Australian College of General Practitioners Continuing Professional Development program

- **having regular forums to enable providers to ask questions** about childhood immunisation from a range of experts.

Theme 3. Support parent knowledge and confidence

The national survey clearly showed that acceptance barriers, such as not believing that childhood vaccines are safe, effective or help protect others, contribute to parents partially vaccinating their children.

Governments and immunisation stakeholders should consider:

- **engaging the community in designing vaccination messages** that convey the benefits of childhood vaccination for the family and the community
- **improving awareness of and access to the existing National Immunisation Information Line**,[25] where the community can ask questions about childhood immunisation
- **sharing messages via vaccine champions and using channels that are tailored to community needs**. This may include videos, ads and presentations in the media, at community events and in public spaces. This may benefit communities who do not use traditional written resources. These are parents and carers who speak languages other than English at home, Aboriginal and Torres Strait Islander peoples, people who may not have access to the internet, those living in more regional and rural areas, and those who may not be well-connected to services. Vaccine champions, however, need to be supported with ongoing training (see Theme 2)
- providing access to a **vaccination reminder app for parents** to inform about the immunisation schedule, receive timely reminders and be able to easily access reliable information about vaccines
- **introducing a centralised vaccination reminder system to send automated and personalised reminders before vaccines are due and when overdue**, to enable the utilisation of practice management software or a system linked directly to the AIR, such as Centrelink or Medicare, to allow notifications of vaccines due, rather than just overdue, at no cost to the immunisation provider delivering these notifications
- **providing vaccination training and education about immunisation for community members** who are interested in becoming vaccine advocates and champions (e.g. the Vaccine Champions Program[30]).

Theme 4. Facilitate providers' access to immunisation data

While access to accurate and timely immunisation data was not a barrier measured in our survey, a lack of access to such data was highlighted by the SAG in the strategy workshop as an important barrier to vaccination uptake at the provider/system level. Access to accurate and timely immunisation data enables immunisation providers and stakeholders to identify areas with low vaccination coverage, monitor the effectiveness of strategies and target areas of concern.

Governments and immunisation stakeholders should consider:

- **providing real-time vaccination data** via dashboard on vaccination coverage, vaccination barriers, etc., that can be easily accessed by providers and stakeholders who are supporting the delivery of vaccination
- **changing the *Australian Immunisation Register Act 2015*[31] to enable better sharing of immunisation data** at the practice level, to inform provider performance and feedback (i.e. inform practices of vaccination gaps among their patients, and to monitor progress)
- evaluating the current AIR vaccination provider reports to determine their usefulness and identify areas for improvement.

Next steps

This national survey, stakeholder workshop to map strategies to address identified barriers, and actions for consideration are the first steps in what we propose should be an iterative cycle to understand and track vaccination barriers and inform targeted, data-driven strategies that increase uptake of childhood vaccines.

The research team also conducted in-depth qualitative interviews with parents of partially vaccinated children to gain a deeper understanding of the childhood vaccination barriers described in this report – particularly the barriers relating to service access and costs for families. These interviews have confirmed and further unpacked the barriers described in this report. Parents also suggested helpful strategies, many of which are in line with the ones proposed in this report.

Going forward, collecting this critical data on vaccination barriers through quantitative and qualitative investigation, triangulation with coverage data, and consulting with vaccination stakeholders to identify strategies to address those barriers should be regular and ongoing activities.

The broader strategic vision of the National Vaccination Insights project is to expand this essential data collection, analysis and consultation with stakeholders to include populations and vaccination across the lifespan, including in Aboriginal and Torres Strait Islander peoples, adolescents, pregnant women and older adults.

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Appendices

Appendix A. About the Australian Vaccine Barriers Assessment Tool (VBAT)

The Vaccine Barriers Assessment Tool (VBAT) draws on known drivers of vaccination to predict vaccine uptake. VBAT consists of (1) a short form or VBAT-SF (6-items) for rapid and cost-effective deployment and (2) a long form or VBAT-LF for more comprehensive diagnosis of behavioural barriers.

The VBAT tool was developed in Australia, using the COM-B framework to ensure all behavioural determinants of vaccine uptake are covered. VBAT has been supported by an NHMRC grant and developed through a comprehensive item selection and psychometric validation process over the last four years (2018–2022).

The VBAT development process included:

1. Identifying all potential drivers to under-vaccination with routine childhood vaccines *(global systematic review)*
2. Drafting items to assess each driver of under-vaccination *(expert consensus)*
3. Refining wording of items and responses *(cognitive interviews in Australia and New Zealand)*
4. Measuring reliability and predictive validity *(comparison with AIR data)*
5. Selecting items for long and short forms *(expert consensus)*
6. Applying, adapting and further validating VBAT

VBAT has several potential uses, including:

- for population-level surveillance (VBAT-SF)
- for surveillance at a state and/or regional level to evaluate immunisation programs (VBAT-SF)
- for use by local program delivery teams (VBAT-LF)
- for use by clinicians with individual parents to improve vaccination uptake (VBAT-LF)

VBAT tool questions (long form)

1. *It is easy to get an appointment when my child's vaccination is due.*
2. *It is easy for me to travel to my child's vaccination appointment.*
3. *I believe vaccines are effective for preventing diseases.*
4. *I believe vaccinating my child helps protect others in the community.*
5. *I believe vaccines are safe for my child.*
6. *I would feel guilty if I did not vaccinate my child and they got a vaccine-preventable disease.*
7. *I feel distressed when I think about vaccinating my child.*
8. *I can afford any costs associated with vaccinating my child.*
9. *I can discuss vaccination in my preferred language with my child's doctor or nurse.*
10. *I intend to give my child all the recommended vaccines.*
11. *It is my responsibility to make sure my child is vaccinated on time.*
12. *I prioritise my child's vaccination appointments over other things.*
13. *People close to me support vaccination.*
14. *My child's doctor or nurse can answer my questions about vaccination.*
15. *I trust the information I receive about vaccines from my child's doctor or nurse.*

Appendix B. Vaccine Barriers Assessment Tool (VBAT) barriers sorted into categories

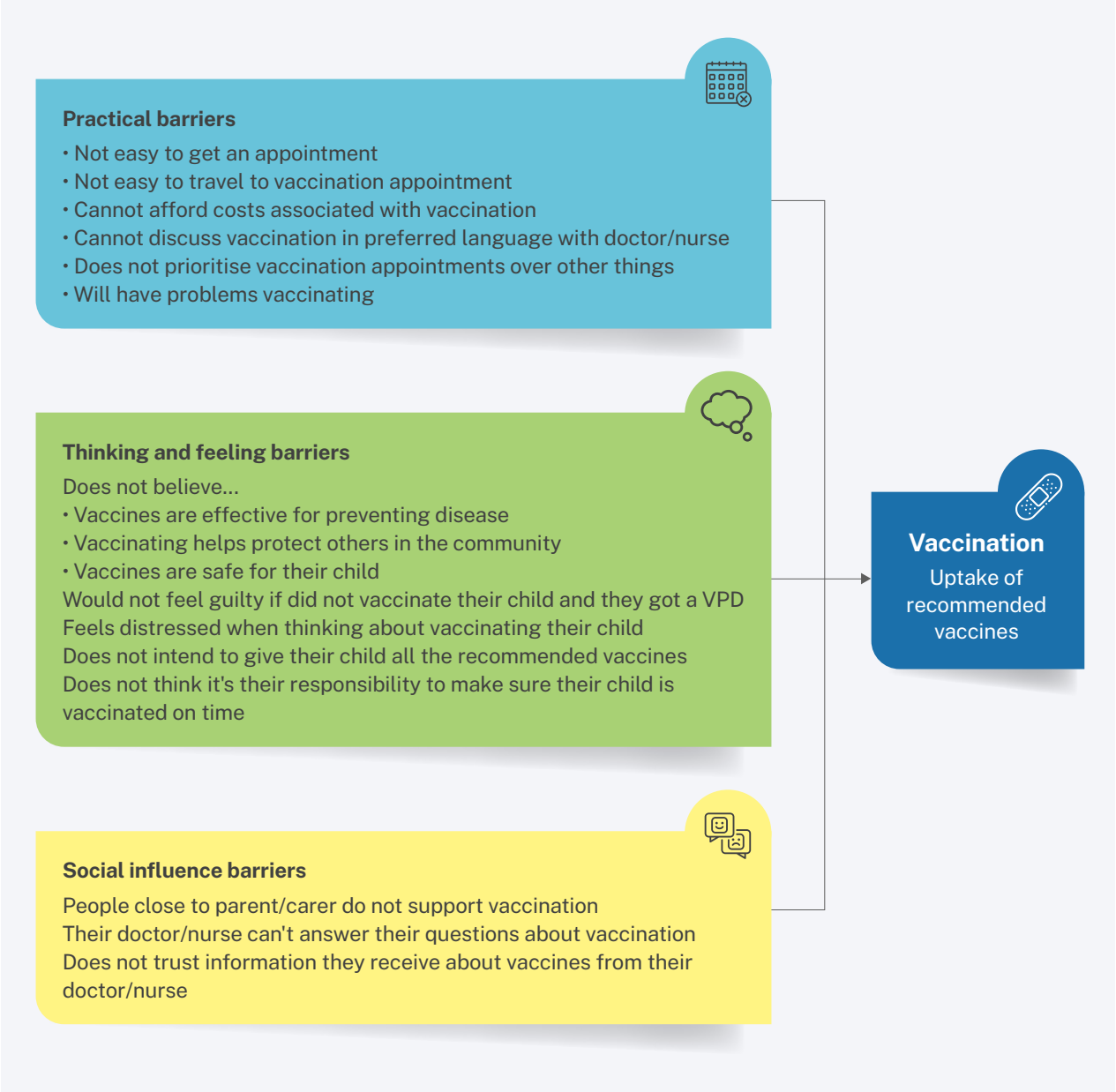
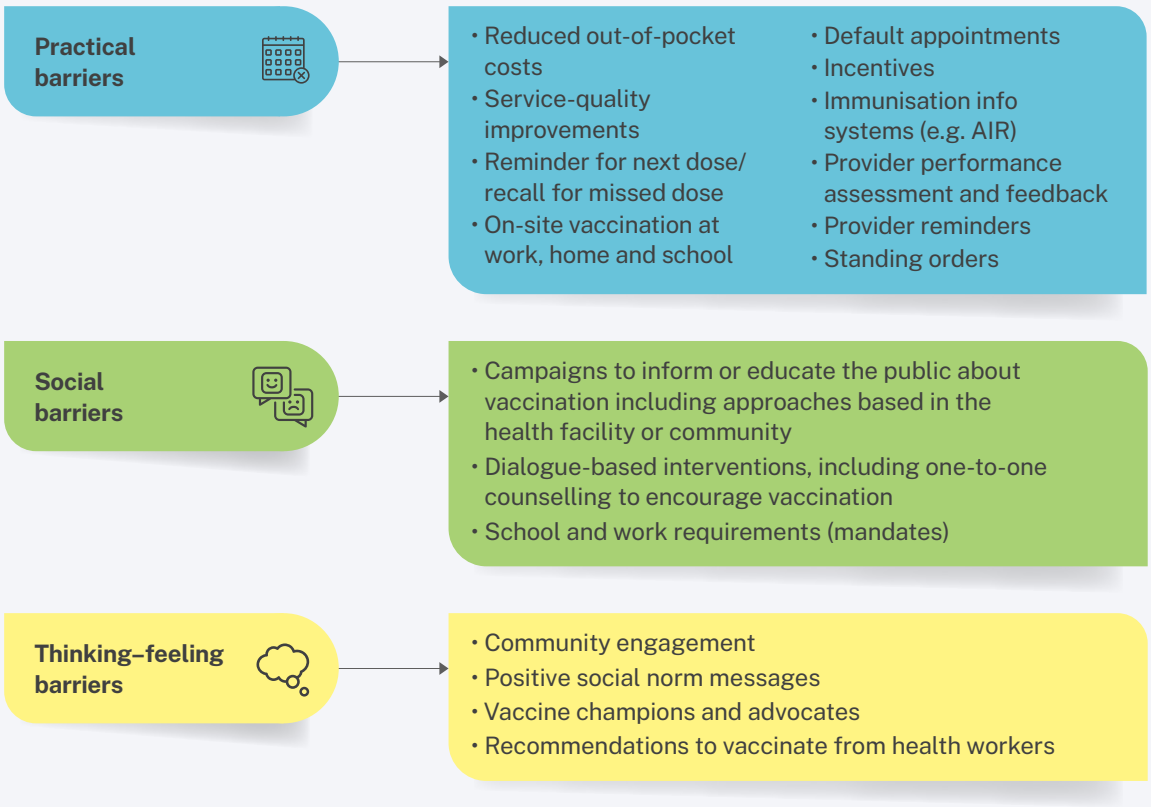


Figure A1. VBAT barriers sorted into categories, informed by the Behavioural and Social Drivers (BeSD) of vaccine uptake framework

Appendix C. Strategies to address different categories of vaccination barriers

List of strategies shown to address key barriers and increase vaccination



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Appendix D. Short descriptions of strategies* to address vaccination barriers

Reduced out-of-pocket costs	Service quality improvements
This strategy reduces patients' direct or indirect out-of-pocket costs to make vaccinations more affordable.	This strategy uses multiple activities to improve the quality of health services, such as strengthening supply chains; training health workers; engaging communities; and evaluating services.
Reminder for next dose/recall for missed dose	**On-site vaccination**
Reminders tell an individual they are due for a vaccine soon. Recalls prompt individuals to get a missed vaccine.	Vaccination is given on the site where people are located. For example, workplace, school, home visiting or remote area vaccination delivery.
Default appointments	**Incentives**
Default appointments present vaccination as the preselected option so that vaccination is automatically scheduled unless people opt out.	Vaccine incentives are financial, nonfinancial, or service-related rewards given to patients for keeping appointments, receiving vaccines, or producing documentation of vaccination status.

Immunisation information systems (e.g. AIR) Provider performance assessment and feedback	Provider performance assessment and feedback
Immunisation information systems are digital databases that record immunisation doses given to people in a certain area. Such systems can create or support other strategies such a s patient reminders and recalls.	This strategy assesses providers' delivery of one or more vaccinations to a patient population and presents them with feedback on their performance.
Provider reminders	**Standing orders**
Provider reminders let healthcare providers know when patients are due for specific vaccinations.	Standing orders authorise healthcare providers to assess a patient's immunisation status and administer vaccinations without a doctor's involvement each time.

Campaigns to inform or educate the public	Dialogue-based strategies
Campaigns are coordinated efforts that use multiple strategies (e.g. disseminating accurate information or addressing misconceptions) and channels to inform and educate communities on vaccines and vaccine preventable diseases.	Dialogue-based strategies involve two people sharing information through conversation. They often involve communication techniques designed to facilitate decision making and/or change behaviour.
Vaccination requirements (mandates)	
A vaccine mandate is a policy that requires vaccination with consequences for non-vaccination in the absence of a medical exemption.	

* Intervention briefs developed for WHO by Tinessia A, Wiley K and Leask J from the University of Sydney SABII research group; dated 5 March 2024

Community engagement	Positive social norm messages
Community engagement involves developing relationships between stakeholders so they can work together to address health issues and promote wellbeing.	Positive social norm messages imply what should and should not be done in relation to vaccination. They may positively influence people's vaccination behaviours.
Vaccine champions and advocates	**Health workers recommending vaccination**
Vaccine champions are people within a community who advocate for vaccinations, e.g. a trusted member of the community, a religious leader or a local health worker.	A health worker recommendation is an endorsement or advice given to a patient, advising them to receive a specific vaccination.

Sources: Community Preventive Services Task Force. The community guide: increasing appropriate vaccination. Atlanta, GA: Centers for Disease Control and Prevention; 2021

Appendix E. Questions for stakeholders to consider when selecting and contextualising strategies to address vaccination barriers

Q1. Which barriers shown in the survey resonate with you most? (e.g. You have observed; you were surprised by; you think are particularly important to address; etc.)

Q2. In your opinion, which 3–4 strategies are particularly important/appropriate in your context?

Q3. [From the list of selected strategies] What could each strategy look like in your context?

Q4. Working with the list of selected strategies, what would help you make those strategies happen (i.e. be implemented)? Think of contextual factors (e.g. policies, funding, staffing, etc.) and other factors.

Q5. What makes it difficult to implement those selected strategies? Think of contextual factors.

Q6. What needs to change to enable it to happen (i.e. for the selected 3–4 strategies to be implemented)?

Appendix F. Detailed strategy workshop methods

On 26 July 2024, the core research team for the project, with assistance from the NCIRS Education Officer and Marketing and Communications teams, conducted an online, three-hour long facilitated workshop with the Stakeholder Advisory Group (SAG).

Before the workshop

- A week prior to the workshop the core team for the project emailed pre-reading to the SAG, with the aim of facilitating discussion on the day. Pre-reading included:
- an overview of key barriers to vaccination reported by survey participants who partially vaccinated their children with scheduled childhood vaccines – grouped into practical, thinking–feeling and social influences (see Appendix B)
- a list of strategies with promising global evidence of increasing vaccination rates,** grouped into the same three groupings as the barriers (see Appendix C), together with short descriptions of each strategy (see Appendix D)
- six questions for the SAG to consider when selecting and contextualising strategies to address vaccination barriers (see Appendix E)
- a summary plan for disseminating findings and recommendations from the study.

During the workshop

The workshop was structured into six sessions chaired by the core research member and facilitated by content experts, and was accompanied by a PowerPoint presentation that included the content of the pre-reading. Data were captured through audio recording and note-taking.

The sessions were as follows:

- **Session 1.** Introduction, aims (10 mins)
- **Session 2.** Presentation of key survey findings (20 mins)
- **Session 3.** Presentation of evidence-based strategies by groups of barriers (20 mins)
- **Session 4.** Interactive, small group discussions to help with selecting and contextualising the most appropriate strategies (60 mins) – more information below
- **Session 5.** Brief summary of small group discussions and plenary discussion on how to disseminate findings and recommendations to enable change (45 mins)
- **Session 6.** Wrap-up, next steps and quick evaluation (10 mins)

More information about Session 4

For Session 4, SAG members were divided into three groups by sector (approximately 3–5 participants in each group), with the aims of facilitating discussions and generating sector-specific insights.

These groups were:

1. community members (including Aboriginal and Torres Strait Islander peoples; community members familiar with lived experience in regional and rural Australia; consumer advocates)
2. healthcare providers (e.g. representatives of general practice and pharmacy; representatives of nurses were not present at the meeting)
3. people working in policy (e.g. representatives of the Commonwealth and Jurisdictional Immunisation Coordinators).

** World Health Organization (WHO). Behavioural and social drivers of vaccination: tools and practical guidance for achieving high uptake. Geneva: WHO; 2022; and Community Preventive Services Task Force. The community guide: increasing appropriate vaccination. Atlanta, GA: Centers for Disease Control and Prevention; 2021

Small group discussions involved participants reflecting on the five questions included in the pre-reading. First, participants reflected on key barriers shown in the survey, then proposed which three strategies from the long list of evidence-based strategies were most appropriate to focus on, and then collaboratively reflected on how those strategies would look in practice and how to address barriers to implementation.

After the workshop

After the workshop the audio data were transcribed and analysed thematically with further input from the SAG.

Thematic analysis was an iterative process. It involved one member of the core research team, skilled in qualitative data analysis, reading and rereading transcripts, identifying similar concepts and grouping those into categories illustrated by key de-identified quotes from a range of participants. That member prepared analysis summaries which were first checked for accuracy by all facilitators, and subsequently discussed with the core research team. The whole team agreed on key categories, and collaboratively identified key themes.