

Understanding barriers to immunisation against vaccine-preventable diseases in Pacific people in New Zealand, Aotearoa: an integrative review

Vika Tafea^A RN, MHSc, Rebecca Mowat^{A,*}  RN, DHSc and Catherine Cook^A RN, PhD

For full list of author affiliations and declarations see end of paper

*Correspondence to:

Rebecca Mowat
School of Clinical Science, Nursing,
Auckland University of Technology,
90 Akoranga Drive, Northcote,
Auckland 0627, New Zealand
Email: Rebecca.marie.mowat@aut.ac.nz

Handling Editor:

Tim Stokes

Received: 13 October 2021

Accepted: 16 May 2022

Published: 10 June 2022

Cite this:

Tafea V et al.
Journal of Primary Health Care 2022;
14(2): 156–163.
doi:[10.1071/HC21129](https://doi.org/10.1071/HC21129)

© 2022 The Author(s) (or their employer(s)). Published by CSIRO Publishing on behalf of The Royal New Zealand College of General Practitioners.

This is an open access article distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License ([CC BY-NC-ND](https://creativecommons.org/licenses/by-nc-nd/4.0/))

OPEN ACCESS

ABSTRACT

Introduction. Pacific people have an increased risk of hospitalisation if barriers to immunisation against vaccine-preventable diseases are not reduced. This research sought to determine what is known about the barriers to immunisations in Pacific people living in New Zealand and identify ways to reduce these barriers and inform health care. **Aim.** To identify the barriers to immunisation for Pasifika and to identify ways to reduce these barriers and inform health care. **Methods.** An integrative review was undertaken with databases searched for articles published between February 2021 and May 2021. The review follows the five-stage process of problem formulation; literature search; evaluation of data; data analysis and interpretation; and presentation of the results through discussion. **Results.** Twelve studies were included. Three themes were identified: Deprivation, Health Literacy (which covered understanding the importance of immunisation programmes, attitudes and beliefs and communication), and access to health care (including communication accessibility to health professionals and physical access). **Discussion.** This review has identified that barriers such as level of deprivation strongly influences immunisation uptake in Pacific people. The significance of government-led initiatives was shown to improve the rates of immunisation of Pacific children. Pacific people's awareness of immunisation programmes and government campaigns are encouraged to incorporate ethnic-specific strategies in addressing barriers, such as bringing vaccinations to where Pacific people frequent, including churches, community hubs, and venues that parents can easily access.

Keywords: barriers, challenges, immunisations, New Zealand, Pacific people, Pacifica, vaccinations, vaccine-preventable diseases.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has demonstrated the consequences of a communicable disease outbreak in New Zealand.¹ COVID-19 has highlighted the need for priority care to New Zealand's most vulnerable populations, including indigenous Māori and Pacific people.² Pacific people currently make up 7% of New Zealand's population.³ Pacific people predominantly reside in urban areas, and the Auckland region is home to 66% of the Pacific population.⁴

COVID-19 highlights that Pacific people are disproportionately affected by communicable diseases, in volume and in morbidity. Previous epidemics in New Zealand, such as the Influenza A H1N1 virus in 2009⁵ and the 2019–20 measles epidemic,⁶ resulted in a disproportionate number of hospitalisations for Pacific people.

Geographically defined communities tend to share similar beliefs such as vaccine hesitancy.^{7–9} Socioeconomic factors in communities with high deprivation scores continue to undermine health interventions.^{10,11}

In New Zealand, there is limited research that examines barriers to immunisation for Pacific people. This review aimed to explore existing literature within a New Zealand

WHAT GAP THIS FILLS

What is already known: Pacific people are disproportionately affected by communicable diseases, both in volume and in severity.

What this study adds: Barriers to immunisation uptake are identified; therefore, solutions can be identified to address these barriers.

context between February 2011 and May 2021, to determine the barriers to immunisation that may inform health care for Pacific people.

Methods

This study used an integrative review approach and included experimental, non-experimental, and grey literature to gain a broad understanding of the barriers to immunisation for Pacific people living in New Zealand. The integrative literature review consists of a five-stage process: problem formulation; a literature search; evaluation of data; data analysis and interpretation; and synthesising results.¹²

Literature search strategy

The databases that were searched for existing literature on immunisation barriers in New Zealand comprised of CINAHL, Cochrane, Scopus, PubMed, and Google Scholar. Relevant articles from the latter source were checked for in Scopus to avoid predatory journals. A hand search of the reference lists from relevant articles provided further literature sources. Grey literature was sourced by scanning government departments such as the Ministry of Health for relevant initiatives for immunisations and Pacific people. Articles were chosen that met the inclusion criteria and were agreed upon between two authors (RM and VT).

The key search terms used were as follows:

- immuni?ation OR vaccin* OR anti-vaxx* OR vaccine-hesistan*
- barriers OR obstacles OR challenges OR limitations OR disparities OR difficulties OR uptake
- "Pacific islanders" OR Pacific OR Polynesian OR Pacific OR Pacifica OR Tonga OR Samoa OR

- Niue OR "Cook Islands" OR Kiribati
- "preventable-disease" OR "vaccine-preventable disease" OR VPD OR measles OR mumps OR
- rubella OR pertussis OR COVID-19 OR outbreak
- New Zealand OR Aotearoa OR NZ

Inclusion and exclusion criteria (Table 1) were used to screen relevant articles. Only data published in New Zealand were used to capture the unique experience of Pacific people living in New Zealand. Material from a 10-year period (May 2021–May 2011) were chosen to provide a contemporary overview.

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to record the number of articles found at each stage of the search strategy¹³ (Fig. 1).

Critical appraisal

The selected studies were analysed to ensure the quality was sufficient and to minimise bias. Two quality appraisal tools were applied to the 12 studies selected. Of the 12, eight were analysed using the Mixed Method Appraisal Tool (MMAT).¹⁴ The remaining studies, three reports, and one review, were analysed using the Joanna Briggs Institute Critical Appraisal Tools Checklist.¹⁵ To ensure rigour, a double appraisal analysis was undertaken by two independent reviewers (VT and RM); all articles and reports met 95% of the criteria.

Key articles were populated into the summary table that included the author, year, country, study design, sample size and main findings (Table 2, Supplementary File S1). Each article was read and reread. Emerging themes that formed a cluster of concepts that the authors identified as a barrier to immunisation were coded and grouped accordingly until there was a construction of themes based on reoccurring findings that identified barriers to immunisation.¹⁶ Themes that were identified as the main barriers to immunisation for Pacific people were agreed upon by discussion between the authors.

Results

Twelve studies were included in the review; nine articles, and three pieces of grey literature were eligible for analysis.

Table 1. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Pacific	Hawaiian and Pacific populations living outside New Zealand.
New Zealand	Studies older than 10 years.
Material from the past 10 years May 2021–May 2011	Material not in the scope of the research question – (What are the barriers to immunisation in Pacific people in New Zealand).
Vaccine-preventable diseases Covid-19	

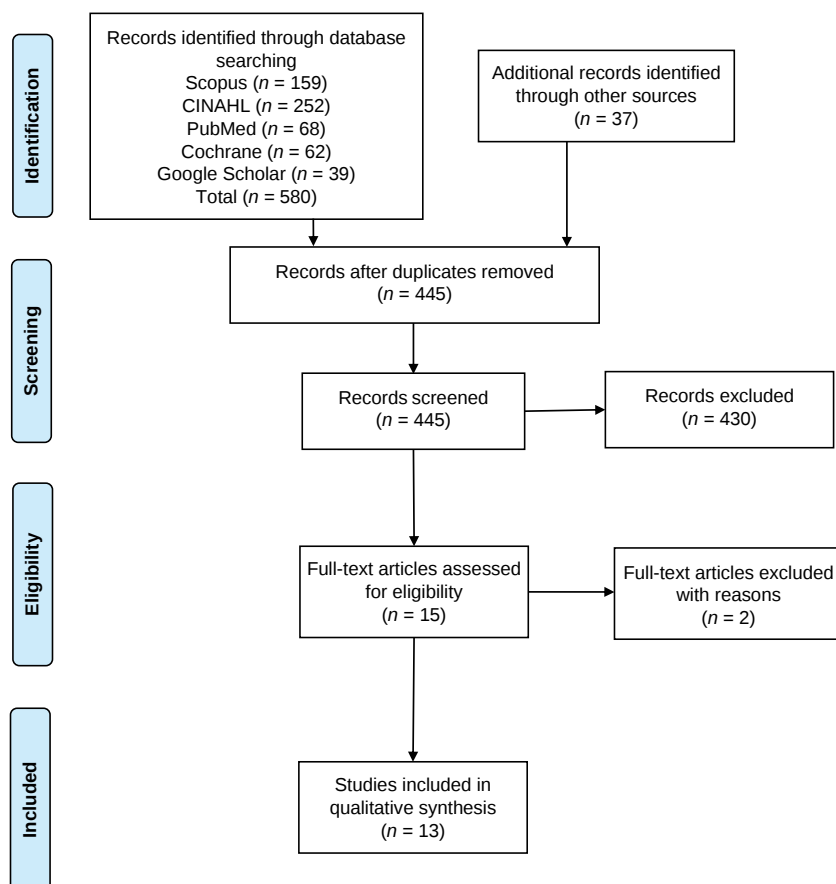


Fig. 1. PRISMA flow diagram.

Three themes were identified: deprivation, health literacy, and access to health care.

Deprivation

Poor housing, overcrowding and deprivation were synonymously identified as barriers to the health of Pacific people in three primary research studies^{17–19} and three reports.^{20–22} Undoubtedly, housing hardship is a factor that negatively impacts the health and wellbeing in general of Pacific people, and living in homes that are damp and over-crowded influences general health and wellbeing.^{20,21} Overcrowding is linked to infectious disease spread, resulting in hospitalisation, and is considered a preventable situation in the Pacific population through immunisation.^{17–19,21} Hobbs *et al.*¹⁷ found that household crowding increases the risk of transmission of pertussis and meningococcus. These findings are echoed by Petousis-Harris *et al.*,¹⁸ who showed that Pacific children had the highest rates of initial all-cause pneumonia hospitalisation, especially those living in areas of higher socioeconomic deprivation. Pacific children had a four-fold risk of hospitalisation due to varicella compared to other ethnicities, with overcrowding, environmental and genetic factors identified as risk factors.¹⁹

Poverty was strongly associated with low immunisation uptake of Pacific people women during pregnancy²³ and is

linked to decreased childhood immunisation completion.^{17,24} Maternal vaccination for pertussis can help minimise hospitalisation risk of pertussis being spread to Pacific infants from high deprivation groups.²³ The study by Howe *et al.*²³ indicated that immunisation uptake only improved as the levels of deprivation decreased. Poverty was also positively linked to employment status, and that combined with low income were risk factors for infant hospitalisation due to vaccine-preventable diseases.¹⁷

Health literacy – understanding the importance of immunisation programmes

Non-achievement of childhood immunisation milestones is another barrier that impacts the numbers of Pacific children seen in hospitals with infectious diseases. For example, Hobbs *et al.*¹⁷ identified an association between Pacific ethnicity and delayed or incomplete immunisation at 9 months of age and infectious disease (ID) rates. Even with significant improvements in immunisation uptake since implementing the National Immunisation Register, both ethnicity and deprivation remained important determinants of low immunisation coverage.²⁴

Parents are challenged by the complexity of meeting immunisation schedules for children of different ages, especially families with many children. Often, commitments to

Table 2. Summary Table (Supplementary File S1).

Author (Year), Country	Study design	Participants	Aims and objectives
Petousis-Harris <i>et al.</i> (2019) ¹⁸ , New Zealand	Retrospective national cohort study	<i>n</i> = 344 020–375 720 NZ children aged <6 years between January 2006 and 31 December 2015	Aim: to evaluate the impact of the pneumococcal vaccine (PCV) programme on invasive pneumococcal disease (IPD), pneumonia and otitis media and explore the effect by ethnicity and deprivation.
Howe <i>et al.</i> (2020) ²³ , New Zealand	Retrospective cohort study	<i>n</i> = 323 622 Pregnant women from 2013 to 2018	Aim: to determine coverage of pertussis and influenza vaccinations given during pregnancy using maternity and immunisation data of NZ women from 2013 to 2018
Hobbs <i>et al.</i> (2017) ¹⁷ , New Zealand	Longitudinal study (Growing Up in New Zealand)	<i>n</i> = 6846 NZ children born in 2009–10	This study aimed at identifying risk factors for infectious disease hospitalisation, particularly differences in risk factors between ethnic groups
Mueller <i>et al.</i> (2012) ²⁴ , New Zealand	Cohort study	<i>n</i> = 187 533 children aged 12 months between 2007 and 2009 recorded in the National Immunisation Register (NIR)	The study aimed to investigate geographical distribution and variables associated with disparities in immunisation uptake in NZ
Charania <i>et al.</i> (2018) ²⁷ , New Zealand	Retrospective cohort study	Cohort A <i>n</i> = 75 375 (foreign-born migrants); Cohort B <i>n</i> = 50 136 (NZ-born migrant children); Cohort C <i>n</i> = 567 408 (NZ-born non-migrant children – 10.6% identify as Pacific)	The study explored vaccination rates among migrant and non-migrant children in New Zealand
Charania <i>et al.</i> (2020) ²⁵ , New Zealand	Retrospective cohort study	Cohort A <i>n</i> = 75 375 (foreign-born migrant children); Cohort B <i>n</i> = 50 136 (NZ born to migrants during study period); Cohort C <i>n</i> = 567 408 (non-migrant without recent history of migration – comparator group)	The study examined immunisation coverage and vaccine-preventable diseases (VPD) hospitalisations across three cohorts of NZ children aged <5 years from 2006 to 2015
Howell <i>et al.</i> (2019) ²⁸ , Australia, New Zealand, Pacific	Review	Western Pacific Region (according to World Health Organization)	The review focused on the challenges to eliminate Hepatitis B from Australia, NZ, and the Pacific island countries and territories (PICT)
Lee <i>et al.</i> (2020) ²⁶ , New Zealand	Longitudinal survey study	Data from New Zealand Attitudes and Values study from 2013 to 2017, <i>n</i> = 12 423; 11 912; 12 009; 10 254	The study aimed at examining the confidence in the safety of childhood vaccinations looking at demographic differences between distinct groups. To provide insight to assist in interventions of improving public vaccine confidence
Wen <i>et al.</i> (2015) ¹⁹ , New Zealand	Cases – questionnaire	<i>n</i> = 144 infants or children aged 0–14 years with varicella-related hospitalisation, meeting the case definition	This study looked at hospitalisation due to varicella – a vaccine-preventable disease
Ministry of Health (2020) ²⁰ , New Zealand	Report	Census data; A series of talanoa (discussions) from Pacific people across the New Zealand	This report is a guide for a health and disability system and government agencies to help support Pacific people improve health and wellbeing in achieving health equity
Statistics New Zealand and Ministry of Pacific Island Affairs (2011) ²¹ , New Zealand	Report	Census data of Pacific people in New Zealand (Statistics New Zealand)	The aim of the report is to inform understanding of how to improve health outcomes for Pacific people living in New Zealand
Walker <i>et al.</i> (2019) ²² , New Zealand	Evidence review	Integrative summary of national and international evidence	This review looked at improving childhood immunisation rates in New Zealand

meet the timely immunisation schedule are not followed, particularly when changes to the frequency of vaccinations are needed.²² Similar findings were also reflected in migrant children in New Zealand. This group also were reported as

having lower immunisation coverage at the appointed age milestones.²⁵

Further reasons for a decreased immunisation uptake were partially due to lack of government funding, which

impacts primary care practices' ability to recall patients and provide reminder services to parents.²⁴

Health literacy – attitudes and beliefs

The attitudes and beliefs held by communities often lead to hesitancy, which is a contributing barrier to immunisation. Understanding health concepts and having the capacity to use that information is key to health literacy. Vaccine sceptics in areas of high deprivation shared a distrust of vaccine safety. The longitudinal survey conducted by Lee and Sibley²⁶ in New Zealand found a correlation between Māori and Pacific people parents living in areas with high deprivation scores and lower vaccine confidence and decreased belief in vaccine safety. Inadequate healthcare access and not having a trusted relationship with health professionals often resulted in a lack of vaccine information shared and unaddressed doubts.²⁶ Therefore, these attitudes and beliefs can influence health-seeking behaviours towards immunisation.²⁶

Health literacy – communication

Poor communication between health professionals and Pacific people can lead to misunderstanding and, therefore, can impact families' health. Five of the studies identified communication as a barrier to health literacy.^{20–22,26,27} Language barriers predominantly reduced Pacific people utilising health services, including immunisation programmes. In the migrant study by Charania *et al.*²⁷ language barriers were strongly identified as an inequity that increased disengagement from immunisation programmes, due to difficulties communicating with healthcare providers. Limited access to culturally responsive healthcare means Pacific people do not access adequate information around vaccination.²⁶

Cultural inappropriateness was associated as a barrier due to health workers' communication styles. Culturally acceptable components in communication allow health information to be delivered more effectively, which may enhance responsiveness from Pacific people.^{20–22}

Access to health care

Although immunisation response rates were shown to be low in those living in deprivation, overall immunisation programmes and campaigns in New Zealand have resulted in a good response from Pacific people. Therefore, the lack of initiatives that target high-risk populations such as Pacific people is considered a barrier to immunisation. Successful programmes were identified in five studies.^{18–20,27,28} Examples of success were the Meningococcal Immunisation (MeNZB) vaccination campaign in 2004 and the human papillomavirus (HPV) vaccination programme in 2008.

Further findings by Statistics New Zealand and Ministry of Pacific Island Affairs²¹ demonstrate the success of school healthcare services, which showed a 97% immunisation

coverage for those aged 5 years in the Pacific people population, whereas the overall coverage was 86%. Similar success rates were reflected in introducing the pneumococcal conjugate vaccine (PCV) childhood programme in 2008. Petousis-Harris *et al.*¹⁸ reported a 21% decrease in hospitalisation rates for pneumonia in Pacific children after its introduction, compared to other ethnic groups. The PCV programme to immunise against invasive pneumococcal disease (IPD), and a common cause of pneumonia and otitis media, can reduce ethnic and socioeconomic disparities, as the programme has demonstrated effectiveness.¹⁸ The study by Wen *et al.*¹⁹ also inferred ethnic disparities in varicella hospitalisation numbers could be eliminated by introducing a varicella vaccine, as was demonstrated by the Australian national immunisation solution. The Australian initiative mentioned by Wen *et al.*¹⁹ showed that before the vaccine implementation, indigenous children had a higher varicella hospitalisation rate compared with non-indigenous children (incidence rate ratio (IRR): 1.9; 95% CI: 1.4–2.7); however, hospitalisations of indigenous children reached equivalence (IRR: 1.1; 95% CI: 0.7–1.6)²⁹ following the funding of one-dose varicella vaccination.

These programmes achieved increased vaccination coverage in populations that are disadvantaged compared to other ethnic groups.

With ongoing migration, more significant risks are expected. However, the catch-up immunisation service was found to improve the engagement of new migrant parents to New Zealand.²⁷ Universal vaccination programmes for hepatitis B vaccine and Global Vaccine Alliance-supported programmes for Pacific Island countries resulted in vaccination coverage of >80%, indicating access to adequate resources and programmes creates positive achievements towards immunisation in Pacific people.²⁸

Discussion

Although the topic of Pacific people and immunisations has received substantial media attention due to COVID-19,^{30–32} there is limited research investigating barriers for Pacific people around immunisations. Meeting age-appropriate immunisation targets allows for greater protection of Pacific people and the overall population of New Zealand.³³ The importance of this immunisation message may resonate more now with the COVID-19 pandemic, which has shown the devastating effects communicable diseases can have and the importance of immunisation. Abundant evidence demonstrates immunisations are a cost-effective, equitable and humane means of preventing disease, and healthcare professionals are at the forefront in facilitating immunisation programmes and delivering immunisations to the public.³⁴ Healthcare professionals who provide informed messages about immunisation safety and efficacy are essential. This review has identified that

multiple factors are interlinked: deprivation, low health literacy and inaccessible culturally responsive care.

Low health literacy underpinned poor uptake, whether due to limited understanding of the importance of immunisation programmes; attitudes and beliefs; or limited outreach from health agencies.^{17,20–27} Families without knowledge around immunisation programme availability were disadvantaged in receiving timely vaccinations.^{22,25,27} Despite interventions such as the New Zealand National Immunisation Register, which monitors immunisation records and achievements for all children, the findings suggest gaps in reaching immunisation goals.^{35,36} Pacific people's experiences of navigating changing immunisation updates and reporting to appropriate services were fundamental barriers to meeting the immunisation schedule.

Strategies implemented by the New Zealand government showed a positive response in immunisation uptake over several studies.^{18,19,21,27,28} Therefore, implementing ongoing programmes that provide easy access opportunities to have immunisations may help. Strategies include Pacific community hubs or offering mobile or in-home visits.

Further barriers in health literacy concerned attitudes that lead to vaccine hesitancy. Two studies from this review found that adults' concerns around vaccine safety and efficacy influenced the attitudes and beliefs as barriers to the uptake of immunisation.^{23,26} This theme is apparent across many studies exploring immunisations uptake.^{8,35,37} Healthcare professionals must take time, have empathy and skill to ascertain what factors underlie family decisions.

Barriers to immunisation due to health literacy about communication, language and cultural appropriateness were identified.^{20–22,26,27} Language barriers were strongly associated with engagement.²⁷ Cultural appropriateness also influences Pacific people's decisions to utilise immunisation services. These findings around communication barriers corroborate with the differences in cultural understanding and language experienced by Pacific people in seeking healthcare advice.^{7,38–40} Health professionals need to understand vaccine hesitancy in Pacific people to ensure information shared addresses people's concerns. Targeted, culturally responsive health care is required to address Pacific communities' concerns and beliefs, enabling useful vaccine discussions.⁴¹ These discussions allow healthcare professionals to 'unpack' misunderstandings. Healthcare messages should emphasise that immunisations are safe, lifesaving and that scheduling of immunisations is required to reach long-lasting immunity. A recent Ministry of Health (MOH) report about vaccine hesitancy and Pacific people identified that three categories of 'unvaccinated Pasifika' existed: the committed (28%); the undecided (31%); and the reluctant (19%). From the undecided and reluctant categories, analyses showed that these groups are likely to be younger, have less exposure to vaccines and have little knowledge about COVID-19 or do not see the relevance of immunisations.⁴² Prickett *et al.*⁴³ also identified that those who were hesitant

were most likely to be younger. The MOH report⁴² found that misinformation experienced by the Pacific community is present in dominant media sources, particularly social media, and that vaccine messages require more grass-roots discussion to reach communities. The report also recommends the need for Pacific people to promote the vaccine and tailored messages to those who are undecided and reluctant.

Low uptake is partly a reflection of the effective control of vaccine-preventable diseases. There is limited awareness of the risks of serious infectious diseases and the vital role of immunisation in protecting the public and individual health. Therefore, babies are being infected before they are old enough to be immunised because their communities are not immunised.²¹ However, COVID-19 has brought home the importance of vaccination, particularly to at-risk groups, and this is an excellent time for messaging about the significance of childhood vaccine schedules.⁴²

Significantly, the findings in this review indicate deprivation as an impediment to immunisation against vaccine-preventable diseases in Pacific people.^{17–24} Poor housing and overcrowding were major contributors to barriers to immunisation. Pacific people's housing was most likely to be in poor condition; damp and overcrowded, increasing hospitalisations. Disease transmission through overcrowding is an important reason that immunisation is imperative for Pacific communities.^{17–22} The impact of deprivation has been associated with poor health and education, resulting in lifelong consequences. Prickett *et al.*⁴³ found that although those who identified as Māori were more hesitant than other ethnicities, this factor did not correlate as strongly to hesitancy as other factors, such as having lower levels of educational attainment and being underrepresented among the highest income brackets. The authors suggest that Māori and Pacific subgroups need culturally aligned public health assistance so that uptake is achievable.⁴³

The government has acknowledged the effects of deprivation and has utilised resources such as Ola Manuia Pacific Health and Wellbeing Action Plan 2020–25 to improve Pacific people's health.⁴³ Health professionals have an advocacy role concerning people's social circumstances that impact health; for example, asking patients about potential social challenges in a sensitive and culturally acceptable way and connecting patients with various support resources within and beyond the health system.^{44,45} Key health leadership interventions require addressing social determinants of health through funding, culturally informed initiatives, and Pacific health workforce development.¹¹

Systemic barriers that exist in healthcare access are closely linked to socioeconomic factors, living rurally, and parental difficulties in juggling families, work, and complex vaccine schedules. These contextual issues negatively impact coverage more than anti-vaccination views.²² As mentioned above, providing programmes by Pacific people within Pacific communities is a way of overcoming access

barriers. Accessible clinics led by healthcare professionals in collaboration with community leaders require networks with national bodies to avoid a piecemeal approach.⁴⁵ During the COVID-19 pandemic, Pacific church and health leaders sent strong messages regarding immunisation and role-modelled immunisations themselves. Opportunistic vaccinations offered to families when someone is admitted to hospital or when they present to primary care services should be normalised.³⁴

Strengths and limitations

This study has identified what some of the barriers are for Pacific people within a New Zealand context, prior to the peak of the COVID-19 pandemic. Foremost, Pacific people need to be resourced to lead culturally aligned education outreach to reduce the barriers against vaccine-preventable diseases for this population. Another strength of this study was the availability of quantitative data that explored successful programmes. This study followed a formal review process; the articles were reviewed using critical appraisal tools by two authors. At the time of this review, it was noted that there was no primary research that directly investigates health professionals' role in Pacific people's vaccine uptake, although many studies demonstrated the success of immunisation programmes for Pacific people. There were scarce qualitative studies around barriers to immunisation specific to Pacific people; therefore, this review has identified a gap in the research within the time frame of data collection.

Conclusion

Pacific people must be actively resourced to provide culturally meaningful and accessible vaccination programmes. Socioeconomic factors such as communities' deprivation levels are linked with poorer health literacy and access to healthcare services, including vaccinations. Low health literacy was a significant barrier to immunisation uptake for Pacific people. Barriers included communication related to language and cultural differences and physical inaccessibility.

Evidence demonstrates that government-led readily accessible vaccination initiatives through school services, and large-scale campaigns are successful in increasing immunisation uptake and reducing hospitalisation. Government initiatives such as Ola Manuia are needed to improve socioeconomic factors such as high levels of deprivation impacting health-seeking behaviour in Pacific communities.

Healthcare professionals can raise Pacific people's awareness of immunisation programmes and are encouraged to incorporate culturally competent strategies in addressing barriers faced by Pacific people. Evident during the COVID-19 pandemic, health professionals can bring immunisation messages and vaccinations to Pacific communities.

Supplementary material

Supplementary material is available [online](#).

References

- 1 Jefferies S, French N, Gilkison C, et al. COVID-19 in New Zealand and the impact of the national response: a descriptive epidemiological study. *Lancet Public Health* 2020; 5(11): e612–23. doi:10.1016/S2468-2667(20)30225-5
- 2 Ministry of Health. COVID-19: Advice for higher risk people. 2020. Available at <https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-information-specific-audiences/covid-19-advice-higher-risk-people>
- 3 Statistics New Zealand. National ethnic population projections: 2018(base)–2043. 2021. Available at <https://www.stats.govt.nz/information-releases/national-ethnic-population-projections-2018-base-2043>
- 4 Statistics New Zealand. Pacific peoples ethnic group. 2021. Available at <https://www.stats.govt.nz/tools/2018-census-ethnic-group-summaries/pacific-peoples>
- 5 Verrall A, Norton K, Rooker S, et al. Hospitalizations for pandemic (H1N1) 2009 among Maori and Pacific Islanders, New Zealand. *J Emerg Infect Dis* 2010; 16(1): 100–2. doi:10.3201/eid1601.090994
- 6 Turner N. A measles epidemic in New Zealand: why did this occur and how can we prevent it occurring again? *N Z Med J* 2019; 132(1504): 8–12.
- 7 Berry NJ, Danchin M, Trevana L, et al. Sharing knowledge about immunisation: an exploration of parents' communication needs to inform development of a clinical communication support intervention. *Vaccine* 2018; 36(44): 6480–90. doi:10.1016/j.vaccine.2017.10.077
- 8 Dube E, Gagnon D, MacDonald N, et al. Underlying factors impacting vaccine hesitancy in high income countries: a review of qualitative studies. *Expert Rev Vaccines* 2018; 17(11): 989–1004. doi:10.1080/14760584.2018.1541406
- 9 Scott N, Gabriel S, Sheppard V, et al. Responding to a measles outbreak in a Pacific island community in western Sydney: community interviews led to church-based immunization clinics. *Western Pac Surveill Response J* 2015; 6(2): 51–7. doi:10.5365/wpsar.2014.5.3.004
- 10 Atkinson J, Salmond C, Crampton P. NZDep2018 Index of Deprivation. Final Research Report. 2019. Available at <https://www.otago.ac.nz/wellington/otago730394.pdf> [Accessed December 2020]
- 11 Frieden TR. A framework for public health action: the health impact pyramid. *Am J Public Health* 2010; 100(4): 590–5. doi:10.2105/AJPH.2009.185652
- 12 Whittemore R, Knafl K. The integrative review: updated methodology. *J Adv Nurs* 2005; 52(5): 546–53. doi:10.1111/j.1365-2648.2005.03621.x
- 13 Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *J Clin Epidemiol* 2021; 134: 178–89. doi:10.1016/j.jclinepi.2021.03.001
- 14 Hong QN, Gonzalez-Reyes A, Pluye P. Improving the usefulness of a tool for appraising the quality of qualitative, quantitative and mixed methods studies, the Mixed Methods Appraisal Tool (MMAT). *J Eval Clin Pract* 2018; 24(3): 459–67. doi:10.1111/jep.12884
- 15 Joanna Briggs Institute. Critical appraisal tools. 2017. Available at <https://jbi.global/critical-appraisal-tools>
- 16 Braun V, Clarke V, Hayfield N, et al. Thematic Analysis. In: Liamputtong P, editor. *Handbook of Research Methods in Health Social Sciences*. Singapore: Springer Singapore; 2019. pp. 843–60.
- 17 Hobbs MR, Morton SMB, Atatoa-Carr P, et al. Ethnic disparities in infectious disease hospitalisations in the first year of life in New Zealand. *J Paediatr Child Health* 2017; 53(3): 223–31. doi:10.1111/jpc.13377
- 18 Petousis-Harris H, Howe AS, Paynter J, et al. Pneumococcal conjugate vaccines turning the tide on inequity: a retrospective cohort study of New Zealand children born 2006–2015. *Clin Infect Dis* 2019; 68(5): 818–26. doi:10.1093/cid/ciy570
- 19 Wen SC, Best E, Walls T, et al. Prospective surveillance of hospitalisations associated with varicella in New Zealand children. *J Paediatr Child Health* 2015; 51(11): 1078–83. doi:10.1111/jpc.12937

- 20 Ministry of Health. Ola Manuia: Pacific health and wellbeing action plan 2020–2025. 2020. Available at <https://www.health.govt.nz/publication/ola-manuia-pacific-health-and-wellbeing-action-plan-2020-2025>
- 21 Statistics New Zealand, Ministry of Pacific Island Affairs. Health and Pacific peoples in New Zealand. 2011. Available at <https://www.stats.govt.nz/assets/Uploads/Reports/Health-and-Pacific-Peoples-in-New-Zealand/Health-and-Pacific-Peoples-in-New-Zealand-October-2011.pdf>
- 22 Walker L, Ward E, Gambitsis D. Improving New Zealand's childhood immunisation rates. 2019. Available at <https://www.health.govt.nz/system/files/documents/publications/improving-new-zealands-childhood-immunisation-rates-sep19.pdf>
- 23 Howe AS, Pointon L, Gauld N, *et al.* Pertussis and influenza immunisation coverage of pregnant women in New Zealand. *Vaccine* 2020; 38(43): 6766–76. doi:10.1016/j.vaccine.2020.08.030
- 24 Mueller S, Exeter DJ, Petousis-Harris H, *et al.* Measuring disparities in immunisation coverage among children in New Zealand. *Health Place* 2012; 18(6): 1217. doi:10.1016/j.healthplace.2012.08.003
- 25 Charania NA, Paynter J, Lee AC, *et al.* Vaccine-preventable disease-associated hospitalisations among migrant and non-migrant children in New Zealand. *J Immigr Minor Health* 2020; 22(2): 223–31. doi:10.1007/s10903-019-00888-4
- 26 Lee CH, Sibley CG. Attitudes toward vaccinations are becoming more polarized in New Zealand: findings from a longitudinal survey. *EClinicalMedicine* 2020; 23: 100387. doi:10.1016/j.eclinm.2020.100387
- 27 Charania NA, Paynter J, Lee AC, *et al.* Exploring immunisation inequities among migrant and refugee children in New Zealand. *Hum Vaccin Immunother* 2018; 14(12): 3026–3. doi:10.1080/21645515.2018.1496769
- 28 Howell J, Pedrana A, Cowie BC, *et al.* Aiming for the elimination of viral hepatitis in Australia, New Zealand, and the Pacific Islands and Territories: where are we now and barriers to meeting World Health Organization targets by 2030. *J Gastroenterol Hepatol* 2019; 34(1): 40–8. doi:10.1111/jgh.14457
- 29 Heywood AE, Wang H, Macartney KK, *et al.* Varicella and herpes zoster hospitalizations before and after implementation of one-dose varicella vaccination in Australia: an ecological study. *Bull World Health Organ* 2014; 92: 593–604. doi:10.2471/BLT.13.132142
- 30 Clent D. Covid-19: Maori and Pacific people more likely to be hospitalised - and younger. *Stuff*, 9 July 2021. <https://www.stuff.co.nz/national/health/coronavirus/125678618/covid19-mori-and-pacific-people-more-likely-to-be-hospitalised--and-younger>
- 31 Foon E. Battle to spread truth about Covid-19 vaccine in Pacific communities. *Radio New Zealand*, 20 March 2021. <https://www.rnz.co.nz/news/national/438769/battle-to-spread-truth-about-covid-19-vaccine-in-pacific-communities>
- 32 Triponel TR. Covid 19 coronavirus: Maori and Pacific people most vulnerable, but hesitant in getting vaccine. *New Zealand Herald*, 19 February 2021. <https://www.nzherald.co.nz/kahu/covid-19-coronavirus-maori-and-pasifika-most-vulnerable-but-hesitant-in-getting-vaccine/OMLFFXN555LO3VG6YIRKBHYEXA/>
- 33 Harrower J, King R, Jackson C. Pacific demographic profile: Census 2013 Auckland usual residents. 2015. Available at <https://www.ccdhb.org.nz/news-publications/publications-and-consultation-documents/pacific-population-health-profile/web-pp-pacific-health-profile.pdf>
- 34 New Zealand Nurses Organisation. New Zealand Nurses Organisation submission to the Health Services Select Committee on the inquiry into how to improve completion rates of childhood immunisation. 2010. Available at <https://www.nzno.org.nz/resources/submissions/pgrid/4734/pageid/2/pid/4734/mcat/4735/acat/1/ev/1/artdate/year/2010>
- 35 Kilham HA, Leask J. The Royal Australian College of Physicians immunisation position statement. *J Paediatr Child Health* 2013; 49(6): 427–31. doi:10.1111/jpc.12230
- 36 Ministry of Health. 'Ala mo'ui progress report: Child health November 2018. Wellington: Ministry of Health; 2018. Available at <https://www.health.govt.nz/publication/ala-moui-progress-report-pacific-child-health>
- 37 Lee CHJ, Duck IM, Sibley CG. Personality and demographic correlates of New Zealanders' confidence in the safety of childhood vaccinations. *Vaccine* 2017; 35(45): 6089–95. doi:10.1016/j.vaccine.2017.09.061
- 38 Cho D, Ramondetta L, Garcini L, *et al.* HPV vaccination among racial/ethnic minority college students: current status and future direction. *J Natl Med Assoc* 2020; 112: 639–49. doi:10.1016/j.jnma.2020.06.005
- 39 Lee CHJ, Sibley CG. Ethnic disparities in vaccine safety attitudes and perceptions of family doctors/general practitioners. *Vaccine* 2020; 38(45): 7024–32. doi:10.1016/j.vaccine.2020.09.030
- 40 Pritchard EN, Jutel A, Tollaffield S. Positive provider interventions for enhancing influenza vaccination uptake among Pacific Peoples in New Zealand. *N Z Med J* 2011; 124(1346): 75–82.
- 41 Desmond N, Grant CC, Goodyear-Smith F, *et al.* Nurses make a difference in immunisation service delivery. *Aust J Adv Nurs* 2011; 28(4): 28–35.
- 42 Ministry of Health. Attitudes towards COVID-19 vaccination amongst Pacific peoples. Ministry of Health; 2021. Available at <https://www.health.govt.nz/about-ministry/information-releases/general-information-releases/attitudes-towards-covid-19-vaccination-amongst-pacific-peoples>
- 43 Prickett KC, Habibi H, Carr PA. COVID-19 vaccine hesitancy and acceptance in a cohort of diverse New Zealanders. *Lancet Reg Health West Pac* 2021; 14: 100241. doi:10.1016/j.lanwpc.2021.100241
- 44 Ryan D, Grey C, Mischewski B, Tofa Saili. A review of evidence about health equity for Pacific Peoples in New Zealand. 2019. Available at <https://www.nzdoctor.co.nz/sites/default/files/2019-09/Tofa%20Saili%20A%20review%20of%20evidence%20about%20health%20equity%20for%20Pacific%20Peoples%20in%20New%20Zealand.pdf>
- 45 Andermann A. Taking action on the social determinants of health in clinical practice: a framework for health professionals. *CMAJ* 2016; 188(17–18): E474–83. doi:10.1503/cmaj.160177

Data availability. The data that support this study are available in the article and accompanying online supplementary material.

Conflicts of interest. The authors declare that they have no conflicts of interest.

Declaration of funding. This study did not receive any specific funding.

Author affiliation

^ASchool of Clinical Science, Nursing, Auckland University of Technology, 90 Akoranga Drive, Northcote, Auckland 0627, New Zealand.