

Supplementary Material

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

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Supplementary File S1.

Author (Year), Country	Study Design	Participants	Results/ Findings
Petousis-Harris et al. (2019), New Zealand	Retrospective national cohort study	n=344,020 to 375,720 NZ children less than 6 years of age between January 2006 and 31 December 2015	Aim: to evaluate the impact of pneumococcal vaccine (PCV) programme on invasive pneumococcal disease (IPD), pneumonia and otitis media and explore the effect by ethnicity and deprivation. <ul style="list-style-type: none"> • Highest rates of pneumonia hospitalisations in Pacific children. • Poor housing and overcrowding contributing factors to high burden of infectious disease in Pacific and Māori people. • PCV childhood programme in 2008 resulted in 21 % decrease in hospitalisation rates for pneumonia, IPD and OM in Pacifica children • High rates of IPD hospitalization in Pacific children – second to Māori children.
Howe et al. (2020), New Zealand	Retrospective cohort study	n=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 <ul style="list-style-type: none"> • Increase in use of pharmacy for influenza vaccination. Māori and Pacific women were nearly half as likely to be immunised compared to NZ European or other ethnic groups. • Decreasing deprivation improves immunisation • Lack of awareness, safety concerns, doubts about effectiveness and disease risk are reasons for not receiving maternal vaccinations in Māori and Pacific ethnicities. Māori and Pacific women had lower rates of being vaccinated compared to • NZ European women of any level of deprivation. • In 2018, maternal influenza vaccine offered by pharmacies increased from 5 %to 9 percent.
Hobbs et al. (2017), New Zealand	Longitudinal study (Growing Up in New Zealand)	n=6846 NZ children born in 2009-2010	This study aimed at identifying risk factors for infectious disease hospitalisation particularly differences in risk factors between ethnic groups <ul style="list-style-type: none"> • Increased risk of hospitalisation for respiratory, gastrointestinal, and skin/ soft tissue infections in Pacific ethnicity. • Delayed immunisation in 33% of infants with Pacific mothers, low income, crowding increased risk of ID hospitalisation. • Greater deprivation linked to increased ID hospitalisation. • Pacific mother experience racism from healthcare workers discourage access to healthcare. • Specific cultural interventions to address modifiable risk factors experienced by Pacific mothers • Despite free access for children, adult family members with accumulated debt with their primary health providers may seek hospitalisation due to this financial barrier.
Mueller et al. (2012), New Zealand	Cohort study	n=187,533 children 12 months of age between 2007 and 2009 recorded in	The study aimed to investigate geographical distribution and variables associated with disparities in immunisation uptake in NZ <ul style="list-style-type: none"> • Significant improvement of immunisation uptake found since implementing NIR. • Pacific mean uptake of fully immunized children resulted in 82% which is below the national average of 85.4%. • The DHB population distribution by ethnic group or deprivation found Pacific children living in the most deprived areas.

		the National Immunisation Register (NIR)	<ul style="list-style-type: none"> • Areas of high deprivation was significantly accompanied by a decrease in immunisation uptake in Pacific people • Lack of funding considered a financial barrier, in 2007 to 2009 low immunisation coverage was experienced. • General practice recall and reminder services to monitor timely immunisation services resulted in low uptake.
Charania et al. (2018), New Zealand	retrospective cohort study	Cohort A n=75,375 (foreign-born migrants); Cohort B n=50,136 (NZ-born migrant children); Cohort C n=567,408 (NZ-born non-migrant children - 10.6 % identify as Pacific)	<p>The study explored vaccination rates among migrant and non-migrant children in New Zealand</p> <ul style="list-style-type: none"> • Pacific island children reported lower coverage than other ethnicities. In cohort A, children from Tokelau, Niue, Cook Islands had higher age-appropriate vaccination rates compared to other Pacific island ethnicities. • Partial or late vaccination in foreign-born migrant children were noted on refugee, Pacific and humanitarian visa schemes. • Foreign-born Pacific children appear more at risk of being under-immunised compared to other groups possibly due to lack of access and limited resources in the country of origin • Improving culturally appropriate services such as reducing the language barriers. A need for cultural and linguistic • Translating immunisation records from country of origin may not capture immunisation status of migrant children
Charania et al. (2020), New Zealand	retrospective cohort study	Cohort A n=75,375 (foreign-born migrant children); Cohort B n=50,136 (NZ born to migrants during study period); Cohort C n=567,408 (non-migrant without recent history of migration - comparator group)	<p>The study examined immunisation coverage and vaccine-preventable diseases (VPD) hospitalisations across three cohorts of NZ children under 5-years-old from 2006 to 2015</p> <ul style="list-style-type: none"> • Cohort C had higher rates and repeat hospitalisations compared to children in Cohorts A and B. Highest incidence of hospitalisation in Pacific children particularly of mothers arriving on Pacific visa schemes while Asian children less likely across ethnicities. • Foreign-born migrant children with parents on work, student and visitor visas showed the lowest rates of vaccine-preventable disease (VPD) hospitalisation. Possibly due to immigration screening requirements for entry into NZ. • Behaviours of the host country may impact the healthy migrant effect due to factors such as living and employment conditions
Howell et al. (2019), Australia, New Zealand, Pacific	Review	Western Pacific Region (according to World Health Organization).	<p>The review focused on the challenges to eliminate Hepatitis B from Australia, NZ, and the Pacific island countries and territories (PICT)</p> <ul style="list-style-type: none"> • Pacific people in NZ alongside Māori and Asian New Zealanders have higher HBV prevalence than European New Zealanders. • Geographical isolation, inadequate vaccine supply and cold chain systems, limited antenatal screening, births outside of health-care facilities, lack of medical skill identified as barriers in Pacific islands. Poor access to public health programmes.

			<ul style="list-style-type: none"> • Estimated 25 %of Pacific Island countries living poverty. • Testing and surveillance strategies implemented in NZ to increase access to health. Community-based healthcare models through nurse-led models of care are aimed at improving engagement of populations at risk.
Lee et al. (2020), New Zealand	Longitudinal survey study	Data from New Zealand Attitudes and Values study from 2013 to 2017, n=12,423; 11,912; 12,009; 10,254.	<p>The study aimed 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.</p> <ul style="list-style-type: none"> • Former sceptics and vaccine sceptics were more likely to be female, Māori or Pacific, live in more deprived regions and have lower education in comparison to vaccine believers. • Vaccine believers compared to vaccine sceptics were less likely to be Māori, Pacific or Asian, male, live in less deprived regions and have higher education. • Low healthcare access, greater financial, transport and difficulty communicating due to language or cultural differences identified as barriers to healthcare. • No significant differences in comparison of ethnicity or deprivation level between vaccine sceptics and former sceptics. • Health professionals that showed cultural competence increased the likelihood of vaccine uptake. Trust in health professionals was an important factor regarding minimising concerns around safety and confidence in vaccine uptake.
Wen et al. (2015), New Zealand	Cases - questionnaire	n=144 infants or children 0-14 years with varicella-related hospitalisation, meeting the case definition	<p>This study looked at hospitalisation due to varicella - a vaccine-preventable disease</p> <ul style="list-style-type: none"> • Māori and Pacific children were three to four times more at risk of hospitalisation due to varicella. • Household crowding, economic deprivation, and environmental and genetic factors. • Almost 10 %of cases hospitalised with varicella required ICU admission. ongoing problems after discharge with almost • one-third of cases having permanent disability. • Varicella vaccine shown to eliminate hospitalisations by ethnic disparity as demonstrated in Australia national immunisation schedule.
Ministry of Health. (2020), New Zealand	Report	Census data; A series of talanoa (discussions) from Pacific people across the New Zealand	<p>This report is a guide for health and disability system and government agencies to help support Pacific people improve health and well-being in achieving health equity.</p> <ul style="list-style-type: none"> • Issues with access to healthcare such as understanding health jargon and communicating with health workers. • Concerns around cost for visiting doctors or medication. Prioritising work over making time for appointments as well as experiencing difficulty in making appropriate appointment times. barriers such as transportation often missed appointments. • Finances and housing hardships identified as a factor that negatively impacted health and well-being in • Pacific people living in New Zealand.
Statistics New Zealand and Ministry of Pacific Island Affairs. (2011), New Zealand	Report	Census data of Pacific people in New Zealand (Statistics New Zealand)	<p>The aim of the report is to inform understanding of how to improve health outcomes for Pacific people living in New Zealand</p> <ul style="list-style-type: none"> • From 2004, the MeNZB vaccination campaign achieved high vaccination coverage in Pacific people compared • to other ethnic groups. In 2007, nearly 100 %of Pacific people were enrolled in Primary Health Organisations (PHO's) • with 15 %enrolled with a Pacific PHO. • In 2010, 89 %of Pacific 2-year olds were fully immunised, compared with 87 %of European children of the same age • through the success of Primary prevention.

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Walker et al., (2019), NZ	Evidence Review		<p>This review looked at improving immunisation rates in New Zealand</p> <ul style="list-style-type: none"> • Challenges identified in the immunisation schedule for parents with large families and children of varying ages. • Often the complexity of meeting immunisation schedule that frequently changes is considered a barrier. • Timeliness of immunisation may be a barrier when the immunisation schedule is not followed. • The findings from Walker et al. (2019) identified Pacific children had good immunisation coverage comparable with NZ European and Asian children at eight months and 2 years of age. • From late 2013 to mid-2018, Pacific children reported the second highest rate of being fully immunised at 8 months of age.

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