








Respiratory research with Māori and Pacific children living in Aotearoa, New Zealand: a systematic review and narrative synthesis

Amio Matenga-Ikihele^{A,*} , Jacinta Fa'alili-Fidow^A , Dantzel Tiakia^A , Dudley Gentles^A , John Natua^B,
Gemma Malungahu^C , Bernadette Tatafu^A, Rudy Roodhouse-Hill^{A,D}, Ruby Tuesday^A , Maria Ngawati^E
and Mataroria Lyndon^F 

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

*Correspondence to:

Amio Matenga-Ikihele
Moana Connect, 141 Bader Drive, Mangere,
Auckland, New Zealand
Email: amio@moanaconnect.co.nz

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ABSTRACT

Introduction. Improving the respiratory health of Māori and Pacific children in Aotearoa, New Zealand is a priority. Respiratory studies over the past decade have continued to highlight the ongoing inequities among Māori and Pacific children. **Aim.** This systematic review aimed to explore the characteristics of respiratory research with Māori and Pacific children (0–14 years) living in New Zealand. Research objectives were to evaluate the types of study designs used, summarise participant demographics including ethnicity and evaluate whether culturally relevant frameworks were incorporated. **Methods.** Studies were located across four databases: Medline, EBSCOHost, Scopus and PubMed, from 2010 to 2022. To qualify, studies needed to include (1) Māori or (2) Pacific children aged (3) 0–14 years and (4) describe a respiratory research project conducted in New Zealand. A narrative synthesis of the studies meeting the inclusion criteria was performed. **Results.** Of the 539 studies identified, 29 met the inclusion criteria. Most studies were retrospective cohort studies with respiratory conditions focused mainly on asthma, group A streptococcus and lower respiratory tract infections. Four studies were qualitative, and only 2 of the 29 studies reported using a Kaupapa Māori framework. **Discussion.** Despite the increased attention to the respiratory health of Māori and Pacific children, there is a lack of research on the lived experiences of whānau and their children who endure these conditions. Few studies incorporated culturally relevant approaches. Further research that incorporates culturally responsive approaches is urgently needed to enhance our understanding of Māori and Pacific child respiratory health and to advance health equity.

Keywords: children, cultural frameworks, Māori health, Pacific health, respiratory conditions.

Introduction

Improving the respiratory health of Māori and Pacific children in New Zealand is a pressing priority due to persistent inequities within these population groups. Over the past decade, multiple studies have highlighted the ongoing challenges faced by Māori and Pacific children, including high rates of ambulatory sensitive hospitalisations related to respiratory conditions. These health disparities are exacerbated by social, economic and housing inequities, as well as barriers to accessing and utilising health care services.^{1–9} Despite a study by Schlichting *et al.*⁷ highlighting a notable 45% decrease in hospitalisations due to childhood asthma from 2010 to 2019, disparities persist in asthma prevalence, prescription practices and hospitalisations. This underscores the need for improved respiratory health management in New Zealand.⁷

To effectively advance the health and well-being of Māori and Pacific communities, it is crucial to understand and value their social and lived realities. The launch of the New Zealand Respiratory Strategy – Te Hā Ora, The Breath of Life – in 2015, aimed to reduce respiratory disease and eliminate health inequities, particularly among Māori, Pacific and low-income communities, and to establish a pathway for advocacy and research, promoting collaborative partnerships among health, housing, welfare, and education

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WHAT GAP THIS FILLS

What is already known: Respiratory conditions are a major public health concern in Aotearoa New Zealand, and are responsible for a large proportion of the morbidity and mortality experienced by Māori and Pacific children.

What this study adds: This paper provides an important overview of respiratory research that involve Māori and Pacific children living in Aotearoa New Zealand. It emphasises that more studies focusing on the needs of Māori and Pacific whānau and communities, and the use of culturally responsive approaches, are essential, ensuring that aspirations are whānau centred and tailored to their needs.

stakeholders.¹⁰ Furthermore, with the enactment of the Pae Ora (Healthy Futures) Act 2022 (NZ) the key objectives of Te Pae Tata (interim New Zealand Health plan) are to improve equitable health outcomes; embed Te Tiriti O Waitangi; implement a population health approach; and to ensure a sustainable and affordable health system.¹¹ An important key driver of these objectives is a commitment to health equity, which is essential to support good health and wellbeing for all New Zealanders, in particular for Māori and Pacific communities.¹¹ Several frameworks can facilitate this approach within health care, such as He Korowai Oranga: Māori Health Strategy,¹² Equity of Health Care for Māori. A Framework,¹³ Te Mana Ola: The Pacific Health Strategy¹⁴ and the All of Government Pacific Wellbeing Strategy.¹⁵ Incorporating Kaupapa Māori and Pacific approaches like talanoa and talanga can further reinforce culturally meaningful engagement and conversations based on respect, relationships, reciprocity and trust.^{16–18} Importantly, when research is undertaken where Māori have equal benefits and rights as non-Māori in accordance with Te Tiriti O Waitangi, all New Zealanders benefit from this.¹⁹

In light of the persistent respiratory health disparities among Māori and Pacific children in New Zealand, the aim of this systematic review is to explore the characteristics of respiratory research conducted within this population. By exploring the existing body of literature, this review seeks to identify opportunities for improving respiratory health outcomes.

Methods

This systematic review was informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines.²⁰ A protocol for the study was written and agreed upon by all co-authors before commencing (available on request from the corresponding author).

Eligibility criteria

The search and screening process identified 29 eligible papers published between 2010 and 2022. Studies were eligible to be included if they investigated any respiratory condition among Māori and Pacific children aged 0–14 in New Zealand.

Search strategy

The initial search strategy was first carried out in June 2020 and repeated in December 2022. Databases searched included Medline, EBSCOHost, Scopus and PubMed. The search strategy used in Medline is provided in [Table 1](#). A combination of controlled vocabulary and Boolean-paired keywords were used, relating to (1) respiratory conditions, (2) Māori or (3) Pacific population group. The keywords, synonyms and various spellings were reviewed and agreed upon by all co-authors before commencement. The authors also conducted a hand search by examining the bibliographies of selected studies for other relevant citations.

Study selection

All articles were imported into RefWorks ProQuest software and duplicate records were removed. Studies were excluded if they were not in English, lacked full text or were conference abstracts, grey literature or not primary research. A search period of 12 years (2010–2022) was used. The quality of studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist, which evaluates the methodological quality of quantitative and qualitative studies.²¹ Multiple authors (A. M. I., D. T., D. G., J. N., B. T. and R. H.) independently reviewed the titles and abstracts of the articles for inclusion or exclusion, and further cross-checking and consensus among co-authors were conducted to make the final decisions.

Data extraction

Using the PRISMA checklist, data were extracted from eligible studies into an electronic spreadsheet. The study information extracted comprised authors, year of publication, location, study design, respiratory condition explored, study population (age, gender, ethnicity) and study findings ([Table 2](#)). A summary of the characteristics of the studies is also provided ([Table 3](#)).

Data synthesis

Four authors (A. M. I., D. T., J. N., D. G.) performed a narrative synthesis of the studies meeting the inclusion criteria. Due to the mix of study designs and research approaches, studies were grouped and summarised under six headings as follows: (1) study characteristics, (2) participants, (3) study design and elements, (4) methods for

Table 1. OVID medline search.

Search terms	
1	'Pacific Islanders'.mp.
2	Pacific.mp
3	'Pacific people'.mp
4	Pacific.mp.
5	Pasefika.mp.
6	'Pan Pacific'.mp
7	Pacifica.mp.
8	Polynesian.mp.
9	Micronesian.mp.
10	Melanesian.mp.
11	Samoan.mp
12	Tongan.mp.
13	'Cook Islanders'.mp.
14	Niuean.mp.
15	Tuvaluan.mp.
16	Tokelauan.mp.
17	Fijian.mp.
18	Kiribati*.mp.
19	'Native Hawaiian'.mp.
20	Tahitian.mp.
21	Palauan.mp.
22	Nauruan.mp.
23	Futunans.mp.
24	'Papua New Guinea'.mp.
25	'Solomon Islands'.mp.
26	Rotumans.mp.
27	Vanuatuan.mp.
28	'French Polynesia'.mp.
29	Maori.mp.
30	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29
31	Asthma
32	Asthmas.mp.
33	bronch*.mp.
34	'Upper respiratory tract infection'.mp
35	'Lower respiratory tract infection'.mp.
36	pneum*.mp.
37	nasoph*.mp.
38	sinus*.mp.

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Table 1. (Continued)

Search terms	
39	epiglot*.mp.
40	pharyng*.mp.
41	influenza.mp.
42	corona*.mp.
43	Covid.mp
44	laryng*.mp.
45	trach*.mp.
46	tonsil*.mp.
47	Tuberculosis/or tuberculosis.mp.
48	'Chronic obstructive pulmonary disease'.mp.
49	31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48
50	30 and 49
51	limit 51 to (English language and full text and humans and yr = '2010–Current')

recruitment or engagement, (5) cultural frameworks used and (6) outcomes.

Results

Out of the initial 539 articles retrieved from electronic database searches (93 from Medline, 151 from EBSCOHost, 279 from Scopus and 16 from PubMed), 518 records were screened by title and abstract after removing duplicates. From this screening, 461 articles were excluded. The full text of the remaining 57 studies was reviewed, focusing on respiratory conditions in Māori and Pacific children (aged 0–14 years) in New Zealand. After further review, 12 studies were excluded as they did not provide a sub-group analysis of ethnicity regarding the Māori and Pacific children. Twenty-nine studies met the inclusion criteria and are included in this review (Fig. 1). Five of these studies were published in New Zealand journals, such as the New Zealand Journal of Primary Healthcare^{22,23} and the New Zealand Medical Journal,^{24–26} while the remaining 24 were published in international, peer-reviewed journals. Refer to Table 3 for a summary of the characteristics of the included studies.

Study characteristics

Eight studies were based in New Zealand with no specified region. Eleven studies were based in Auckland, with six located explicitly in South Auckland.^{27–32} Two studies were conducted across multiple regions of New Zealand; the first was co-located across Porirua, Hutt Valley,

Table 2. Characteristics of included studies.

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
Bibby <i>et al.</i> (2015), ²⁴ New Zealand	To investigate hospital admissions for non-cystic fibrosis bronchiectasis and to describe their distribution and annual cost in New Zealand.	Bronchiectasis	Retrospective cohort study 4 years	No cultural approach mentioned	Mixed	<i>n</i> = 5519 Age: 0→90 years Gender: n/a Ethnicity: Māori (26%); Pacific (20%); European/ Other (53%)	Reported hospital admissions for bronchiectasis were concentrated in socioeconomically disadvantaged young and elderly Māori and Pacific peoples; are more common in winter and spring and incur a high annual cost.
Byrnes <i>et al.</i> (2020), ³² New Zealand	To reduce intermediate respiratory morbidity with a community intervention programme at the time of discharge.	Lower respiratory tract infection (LRTI)	Randomised control trial	No cultural approach mentioned	Mixed	<i>n</i> = 400 Age: <2 years Gender: Female (43%), Male (57%) Ethnicity: Māori (26%); Pacific (62%) NZ European (9%), Other (3%)	Despite consistent monitoring at community clinics, treatment for respiratory symptoms, promotion of health-resilient behaviours, and referrals for environmental issues, there was no difference between intervention and control children in the high prevalence of respiratory morbidity 2 years after the initial admission.
Crengle <i>et al.</i> (2011), ²⁵ New Zealand	To describe the pharmacological management of children's asthma and to assess whether there were ethnic differences in pharmacological management.	Asthma	Cross sectional study 23 months	No cultural approach mentioned	Mixed	<i>n</i> = 583 Age: 2–14 years Gender: Female (45%), Male (55%) Ethnicity: Māori (38%); Pacific (30%) European/ Other (32%)	The proportion of children with asthma who were receiving beta agonists and inhaled corticosteroids (ICS) were higher than that previously reported in New Zealand and the reported use of anticholinergics was low. Other findings show there is still room for further improvements to be made, particularly with respect to

(Continued on next page)

Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
							the use of inhaled corticosteroids among children who experience significant morbidity, the use of nebulisers, and the use of spacer devices.
Doyle <i>et al.</i> (2018), ⁴⁴ Porirua	To examine effectiveness of oral probiotic <i>Streptococcus salivarius</i> K12 in preventing group A streptococcus (GAS) pharyngitis in 5–14-year-old children at high risk of acute rheumatic fever (ARF).	Acute rheumatic fever (ARF)	Nonrandomised study 1 year	No cultural approach mentioned	Mixed	<i>n</i> = 1314 Age: <6 (25.9%), 7–9 (40.4%), >10 (33.7) Gender: Males (49%) Ethnicity: Māori (33%); Pacific (55%); NZ European (6%); Asian (5%); Middle Eastern / Latin American / African (MELAA) (2%)	Reported <i>S. salivarius</i> K12 had modest nonsignificant effects on culture-positive sore throats when given at school, during the school day. The trial also reported the routine use of the probiotic in the prevention of pharyngitis associated with GAS detection was not supported.
Free <i>et al.</i> (2010), ³³ Porirua, Hutt Valley, Christchurch, Dunedin/Bluff	To determine whether more effective home heating affects school absence for children with asthma.	Asthma	Randomised control trial 1 year	No cultural approach mentioned.	Mixed	<i>n</i> = 269 (Intervention Group 134/Control Group = 135) Age: 6–12 years Gender: Males (59%) Ethnicity: Māori (32%); PI (22%); NZ European (67%); Other (9.3%)	Reported when compared with the control group, children in households receiving the intervention experienced on average 21% fewer days of absence after allowing for the effects of other factors. More effective, non-indoor polluting heating reduces school absence for asthmatic children.
Gill <i>et al.</i> (2012), ³⁷ Dunedin	To Identify the prevalence of sleep disordered breathing (SDB) symptoms in a community sample of New Zealand 3-year-olds. To examine sleep, demographic, health,	Sleep disordered breathing (SDB, snoring)	Cross sectional study 1 year	No cultural approach mentioned	Mixed	<i>n</i> = 823 Age: 3 years Gender: Male (53%); Female (47%)	Reported the factors associated with habitual snoring among New Zealand pre-schoolers include male gender, Māori ethnicity and poorer deprivation

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
	environmental, familial, perinatal, and behavioural adjustment factors associated with habitual snoring.					Ethnicity: Māori (11%); Pacific (2%); NZ Euro (83%); Other (4%)	neighbourhood, as well as a variety of other environmental and health factors.
Gillies <i>et al.</i> (2013), ⁵⁰ New Zealand	To measure recommended treatment and outcomes for asthma in all New Zealand children by age, sex, and ethnic group.	Asthma	Retrospective cohort study 1 year	No cultural approach mentioned.	Mixed	<i>n</i> = 80,514 Age (range): 0–14 years Gender: Males (58%); Females (42%) Ethnicity: Māori (24%); Pacific (10%); European/ Other (66%)	Reported Māori and Pacific children are less likely to have their treatment escalated to a higher step than other children. They are also more likely to use oral steroids to control asthma exacerbations and be admitted to hospital for severe asthma episodes.
Hobbs <i>et al.</i> (2017), ⁴⁹ New Zealand	To identify risk factors for infectious disease hospitalisation in infancy within a birth cohort of New Zealand children, and to identify differences in risk factors between ethnic groups.	Infectious disease	Retrospective cohort study 1 year	No cultural approach mentioned.	Mixed	<i>n</i> = 5960 Age (range): 0–12 months Gender: Male (52%) Ethnicity: Māori (13%), Pacific (14%), European (56%), Asian (2%), MELAA (2%)	Reported Māori and Pacific children in New Zealand experience a high burden of infectious disease hospitalisation. Reported risk factors include maternal smoking.
Huang <i>et al.</i> (2019), ⁴⁶ New Zealand	To estimate attack rates (a measure of cumulative incidence of infection over the season) of both influenza infection symptomatic or not) and influenza polymerase chain reaction (PCR)–confirmed influenza-like illness (ILI) across risk groups in unvaccinated cohort and	Influenza	Seroepidemiologic cohort study 8 months	No cultural approach mentioned.	Mixed	<i>n</i> = 911 Age (range): 0–4 (15%); 5–19 (29%); 20–64 (49%); >65 (5%) Gender: Males (41%); Females (49%) Ethnicity: Māori (14%); Pacific (11%); Asian (22%); Other (54%)	Young children (<5 and 5–19 years) including Pacific peoples experienced the highest influenza infection attack rates. Overall, only a quarter of all infected reported influenza PCR-confirmed ILI, and one-quarter of these sought medical attention.

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
	the proportion of those that sought medical care						
Ingham <i>et al.</i> (2019), ⁴⁵ Wellington	To examine the distribution of housing-related risk factors for children with severe acute respiratory infection to form an effective basis for policy and practice to reduce inequalities and prevalence of this disease.	Acute respiratory infection	Case-control study 2 years	Kaupapa Māori framework	Mixed	<i>n</i> = 642 Age: <2 years Gender: Males (53%) Ethnicity: Māori (28%); Pacific (20%); Asian (10%); NZ European (76%); Other (2%)	Reported a dose-response relationship between housing quality measures and young children's acute respiratory infection, particularly dampness and mould.
Jack <i>et al.</i> (2018), ⁵¹ New Zealand	To evaluate the impact of the school-based sore throat service with its unique primary prevention focus on ARF	Acute rheumatic fever (ARF)	Retrospective cohort study 4 years	No cultural approach mentioned.	Mixed	<i>n</i> = 53,376 Age (range): 5–12 years Gender: n/a Ethnicity: Māori (47%); Pacific (41%); Pakeha (12%)	Reported population-based primary prevention of acute rheumatic fever through sore throat management may be effective in well-resourced settings like New Zealand where high-risk populations are geographically concentrated. Where high-risk populations are dispersed, a school-based primary prevention approach appears ineffective and expensive.
Jepsen <i>et al.</i> (2018), ²⁷ South Auckland	To explore the health care experiences of mothers of children with bronchiectasis in the Counties Manukau District Health Board area of Auckland, New Zealand.	Bronchiectasis	Qualitative 14 months	No cultural approach mentioned.	Mixed	<i>n</i> = 10 Age (range): 3–16 years Gender: Females (100%) Ethnicity: Māori (30%); Pacific (50%); NZ Pakeha (20%); Other (10%)	Reported health provider–parent relationship was crucial for fostering positive health care experiences. Mothers' perceptions of the quality and benefit of health services motivated them to overcome barriers to accessing care.

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
Jones <i>et al.</i> (2013), ⁴¹ Wellington	To collect and understand the insights of Māori parents, and their children, exploring their day-to-day realities, beliefs about asthma management as well as their experiences and challenges in achieving optimum asthma outcomes.	Asthma	Qualitative	Kaupapa Māori framework	Māori	<i>n</i> = 32 (families) Age (range): Child 4–11 years Gender: n/a Ethnicity: Māori	Reported the methodology produced a 100% retention rate of the participating families over the course of the follow-up. This was attributed to the research collaboration, the respectful research relationships established with families, and the families' judgement that the methods used enabled them to tell their stories.
Kristiansen <i>et al.</i> (2012), ²⁶ Auckland NZMJ	To evaluate a <i>pictorial asthma medication plan</i> focusing on regular 'everyday' inhaler use and a <i>signs and symptoms sheet</i> for Pacific children	Asthma	Prospective cohort study 11 months	Resources translated into Pacific languages.	Pacific	<i>n</i> = 48 Age: 2–14 years Gender: Female (48%), Male (52%) Ethnicity: Samoan (65%); Cook Island Māori (8%); Niuean (8%); Tongan (6%); Fijian (4%); Tuvaluan (4%); Other Pacific (4%)	The resources were effective at improving inhaler knowledge and supporting symptom recognition. A 'less-is-more' approach, pictorial format, and first language availability are characteristics that may benefit other ethnicities.
Lennon <i>et al.</i> (2017), ²⁸ South Auckland	To assess the effectiveness of a school based sore throat clinic strategy on first presentation acute rheumatic fever incidence	Acute rheumatic fever (ARF) & Group A streptococcal (GAS)	Cross sectional study 6 years	No cultural approach mentioned	Mixed	<i>n</i> = 1500 Age: 5–13 years Gender: Female (50%) Ethnicity: Māori (40%); Pacific (45%); Other (15%)	Acute rheumatic fever declined significantly after school-based GAS pharyngitis management using oral amoxicillin paralleled by a decline in pharyngeal GAS prevalence
Liberty <i>et al.</i> (2010), ⁴² Christchurch	To evaluate whether entering school with asthma was associated with low achievement after the first year	Asthma	Prospective cohort study 1 year	No cultural approach mentioned	Mixed	<i>n</i> = 298 Age: 5–6 years	Reported children who entered school with asthma were more likely to be ≥6 months behind other participants in

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
						Gender: Males (48.9%); Females (51.3%) Ethnicity: Māori (15.8%); European (74.8%); Other (9.4%)	reading words and books but not in math at the end of the first year of school. Achievement was not related to asthma severity. Entering school with asthma reliably predicted low reading achievement independent of other known covariates of low achievement (high absenteeism, minority status, male gender, single-parent family, poor academic skills at school entry, and low socioeconomic status).
McBride-Henry <i>et al.</i> (2020), ²⁹ South Auckland	To explore the experiences of parents/ caregivers who encounter repeated admissions of a child with acute lower respiratory tract infections (LRTIs)	Lower respiratory tract infection (LRTI)	Qualitative	Cultural consultation undertaken with Māori Research Review Committee	Mixed	<i>n</i> = 14 Age (range): Child aged <14 years Gender: Male (21%); Female (86%) Ethnicity: Māori (43%); Pacific (71%); European (7%)	Reported parents/ caregivers' experiences were characterised by feelings of powerlessness, offering descriptions of hospitals as harsh and difficult places to reside and 'in-hospitable'. 'The findings suggest that repeated hospitalisations created a cycle of stressful experiences that impacted both familial relationships and interactions with society.
McBride-Henry <i>et al.</i> (2022), ⁴⁰ South Auckland	To explore the societal and health experiences for families who have a child under 2 years of age, admitted to hospitals more than twice for LRTIs	Lower respiratory tract infection (LRTI)	Qualitative	Cultural advisors utilised.	Mixed	<i>n</i> = 14 Age (range): Child aged <14 years Gender: Male (21%); Female (86%)	Reported the importance of bringing meaningful, culturally responsive care to the fore of treatment, particularly when managing vulnerable

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
						Ethnicity: Māori (43%); Pacific (71%); European (7%)	minorities. Formal referral and support processes were key to this responsiveness to lessen the burdens of acute admissions for families.
Moyes <i>et al.</i> (2012), ³⁴ Auckland; Bay of Plenty; Wellington; Nelson; Christchurch	To investigate prevalence, time trends and factors associated with rhinitis and rhinoconjunctivitis not related to acute infections in New Zealand.	Upper respiratory tract infection (URTI, rhinitis and rhinoconjunctivitis)	Retrospective cohort study 1 year	No cultural approach mentioned.	Mixed	Phase 1&3 (6–7 years) <i>n</i> = 11,393/10,873 Phase 1&3 (13–14 years) <i>n</i> = 15,460/13,317 Age (range): 6–7 years & 13–14 years Gender: Females: 51%/50% (6–7 years); 46%/48% (13–14 years) Ethnicity: 6–7 years = Māori (20%/24%); Pacific (8%/8%); European/Pakeha (66%/56%); Other (5%/12%); 13–14 years = Māori (19%/19%); Pacific (8%/12%); European/Pakeha (64%/56%); Other (7%/12%)	Reported symptoms of rhinoconjunctivitis common in Māori and Pacific Island children, especially in the older age group 13–14-year-olds reported high prevalence of current severe rhinoconjunctivitis symptoms
Munro <i>et al.</i> (2011), ³⁹ Auckland	To document 5-year outcomes of children with chest computerised tomography (CT) scan diagnosed bronchiectasis from a tertiary New Zealand respiratory clinic.	Bronchiectasis	Retrospective cohort study 5 years	No cultural approach mentioned.	Mixed	<i>n</i> = 91 Age: <i>n/a</i> Gender: Males (54%); Females (46%) Ethnicity: Māori (24%); Pacific (59%); European (15%); Other (2%)	Reported reduced lung function was associated with male gender, chronic Haemophilus influenzae infection, longevity of disease, and Māori and Pacific Island ethnicity.

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
Oliver <i>et al.</i> (2017), ⁴⁷ New Zealand	To investigate ARF cases' housing conditions and sore throat treatment to identify opportunities for improving ARF prevention in New Zealand.	Acute rheumatic fever (ARF)	Cross sectional study 14 months	No cultural approach mentioned	Mixed	<i>n</i> = 55 Age: 0–31 years Gender: Female (53%), Male (47%) Ethnicity: Māori (64%); Pacific (35%) Other (2%)	The environmental conditions reported could contribute to high group A <i>Streptococcus</i> transmission and susceptibility to infection, thus increasing ARF risk. Sore throat treatment has important limitations as an intervention, particularly as 38% of participants did not recall sore throat preceding the diagnosis. The results support the need to improve rental housing.
Oliver <i>et al.</i> (2018), ⁴³ New Zealand	This study aimed to assess the effectiveness of using hospitalisations for identifying children at risk of subsequent acute rheumatic fever	Acute rheumatic fever (ARF)	Retrospective cohort study 4 years	No cultural approach mentioned.	Mixed	<i>n</i> = 2035 Age: <5 (0.5%), 5–14 (58.7%), 15–29 (25.6%), >29 (15.2%) Gender: Male (54%) Ethnicity: Māori (46%), Pacific (39%), European/ Other (15%)	Reported nearly one-third of acute rheumatic fever patients experienced a potentially avoidable hospital admission as children (before developing ARF). Due to the rarity of ARF however, observing hospitalisations was viewed as not efficient for targeting prevention activities for this condition alone.
Prasad <i>et al.</i> (2019), ⁴⁸ Auckland	To provide comprehensive estimates of laboratory-confirmed respiratory syncytial virus (RSV)-associated hospitalisations.	Respiratory syncytial virus (RSV)	Retrospective cohort study 3 years	No cultural approach mentioned.	Mixed	<i>n</i> = 71,770 Age: <5 years Gender: n/a Ethnicity: Māori (14%); Pacific 27%); European & Other (35%)	Reported being of Māori or Pacific ethnicity or living in a low socio-economic neighbourhood independently increased the risk of having an RSV-associated hospitalisation.

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Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
Shetty <i>et al.</i> (2014), ²² Northland	To assess adherence by general practitioners and school-based sore throat programmes to national guidelines for the management of GAS pharyngitis in Northland.	Group A streptococcal (GAS)	Audit 3 months	No cultural approach mentioned.	Māori & Non-Māori	<i>n</i> = 5411 Age (range): 5–15 years Gender: n/a Ethnicity: Māori (62%); Non-Māori (38%)	Reported a significant proportion of those seen in general practice received antibiotics not recommended by guidelines, an inadequate length of treatment or no prescription
Shetty <i>et al.</i> (2018), ²³ Northland	To reassess general practice adherence to national guidelines for the management of GAS pharyngitis in Northland, New Zealand, following implementation of the national Rheumatic Fever Prevention Programme.	Group A streptococcal (GAS)	Audit 3 months	No cultural approach mentioned.	Māori & Non-Māori	<i>n</i> = 5795 (swabs) Age (mean): Māori 9.1 years; Non-Māori (9.6 years) Gender: Males (46%) Ethnicity: Māori (52%); Non-Māori (48%)	Reported the management of GAS pharyngitis by general practice in Northland remains substandard.
Trenholme <i>et al.</i> (2013), ³¹ South Auckland	To determine and describe the presence of respiratory morbidity in young children 1 year after being hospitalised with a severe LRTI.	Lower respiratory tract infection (LRTI)	Retrospective cohort study 5 months	No cultural approach mentioned.	Mixed	<i>n</i> = 94 Age (range): 0–24 months Gender: n/a Ethnicity: Māori (21%); Pacific (65%); Other (14%)	Most of the children hospitalised with severe bronchiolitis or pneumonia <2 years of age were found to have continued respiratory morbidity 1 year later when seen at the time of stability, with a small number already having sustained significant lung disease.
Trenholme <i>et al.</i> (2017), ³⁰ South Auckland	To describe respiratory virus detection in children under 2 years of age in a population admitted with LRTI and to assess correlation with measures of severity.	Lower respiratory tract infection (LRTI)	Retrospective cohort study 1 year	No cultural approach mentioned.	Māori & Pacific	<i>n</i> = 1371 Age: <2 years Gender: n/a Ethnicity: Māori (34%); Pacific (43%)	Reported picornavirus is commonly found as a sole virus, RSV is frequent, but immunisation preventable influenza is infrequent among Māori and Pacific children.

(Continued on next page)

Table 2. (Continued)

Author (year), location	Aim	Target condition	Study design & duration	Culturally responsive approach	Study population	Demographics <i>n</i> = study participants; Age, gender (%); ethnicity (%)	Main findings
Walsh <i>et al.</i> (2020), ³⁶ Bay of Plenty	To evaluate the effectiveness of strategies for reducing ARF with GAS pharyngitis treatment in 2011–18.	Acute rheumatic fever (ARF)	Retrospective cohort study	No cultural approach mentioned	Māori	<i>n</i> = 128 Age: 5–14 years Gender: n/a Ethnicity: Māori (100%)	School-based programs with indigenous Māori health workers' sore-throat swabbing and GP/nurse support reduced first-presentation ARF incidence in Māori students in highest-risk settings.
Watson and McDonald (2013), ³⁵ Upper North Island	To investigate the association of subcutaneous body fat levels in pregnant women with wheezing in their 18-month-old infants	Asthma & Wheeze	Prospective cohort study 1 year	No cultural approach mentioned.	Māori & Pacific	<i>n</i> = 369 Age: n/a Gender: Females (100%) Ethnicity: Polynesian (Māori & Pacific)	Reported a significant intergenerational association between subcutaneous body fat levels in pregnant women and wheeze in their infants at 18 months, which may be a contributing factor to the increased incidence of asthma in New Zealand children.

Table 3. Summary of characteristics of respiratory research among Māori and Pacific children in New Zealand.

	Number of studies	% of total studies <i>n</i> = 29
Respiratory condition		
Asthma	7	24
GAS/ARF	7	24
LRTI	5	17
Bronchiectasis	3	10
URTI	2	7
Influenza	1	3
RSV	1	3
Infectious disease	1	3
Respiratory tract infection	1	3
Snoring	1	3
Study location		
Northland	2	7
Whangarei	1	3
Auckland	11	38
Bay of Plenty	2	7
Wellington	7	24
Nelson	1	3
Christchurch	3	10
Dunedin	2	7
National (region not specified)	8	28
Study design		
Retrospective cohort study	11	38
Qualitative	4	14
Cross sectional study	4	14
Prospective cohort study	3	10
Randomised control trial	2	7
Audit	2	7
Nonrandomised study	1	3
Case control	1	3
Sero-epidemiologic cohort study	1	3
Cultural frameworks		
Kaupapa Māori	2	7
Cultural consultation	1	3
Sample size		
<100	8	28
100–199	1	3
200–499	3	10

(Continued on next column)

Table 3. (Continued)

	Number of studies	% of total studies <i>n</i> = 29
500–999	5	17
1000–4999	4	14
5000–9999	4	14
>10,000	4	14
	Number of studies	% of total studies <i>N</i> = 28
Study population		
Māori	28	97
Pacific	24	83
New Zealand European	18	62
Asian	5	17
Middle Eastern Latin American African	2	7
Other	16	55
Sample size of Māori		
<20%	5	17
20–39%	12	41
40–59%	7	24
60–79%	2	7
80–99%	0	–
100%	2	7
Sample size of Pacific		
<20%	5	17
20–39%	7	24
40–59%	7	24
60–79%	4	14
80–99%	0	–
100%	1	3
Gender of participants		
Female and male	20	69
Female only	2	7
Male only	0	–
Not disclosed	7	24

Christchurch and Dunedin,³³ and the second across Auckland, Bay of Plenty, Wellington, Nelson and Christchurch.³⁴ Other study locations included Northland,^{22,23} the upper North Island,³⁵ the Bay of Plenty³⁶ and Dunedin.³⁷

Most studies reported on respiratory conditions such as asthma (*n* = 7), group A streptococcal (GAS) and acute rheumatic fever (ARF) (*n* = 7), lower respiratory tract

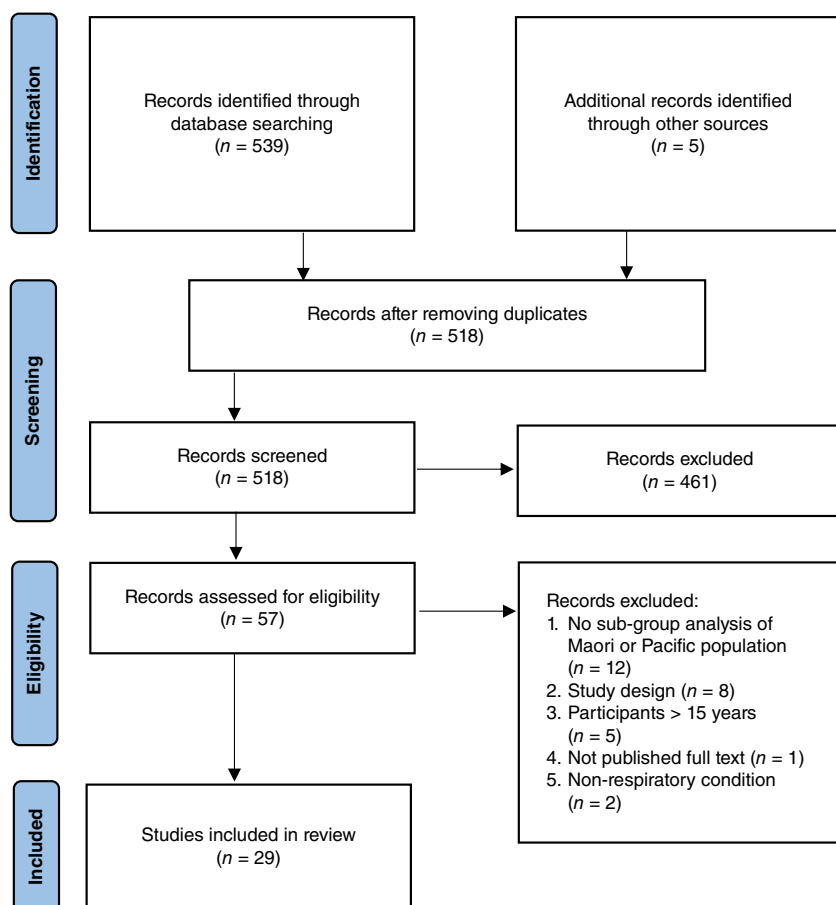


Fig. 1. PRISMA study selection process.

infections (LRTI) ($n = 5$), bronchiectasis ($n = 3$) and upper respiratory tract infections (URTI) ($n = 2$). Other respiratory conditions included influenza, respiratory syncytial virus (RSV), respiratory tract infection and snoring.

Participants

Most studies included Māori and Pacific children or whānau as part of a multi-ethnic cohort at the Level one ethnicity category.³⁸ Five studies reported multiple ethnicities at the Level two category.^{26,29,31,39,40} Out of the 29 studies, 28 involved Māori children/whānau, while 24 focused on Pacific children/families. Two studies explicitly focused on Māori,^{36,41} and only one study had a Pacific-only cohort,²⁶ although one study used the term ‘Polynesian’ to describe their combination of Māori and Pacific participants.³⁵ The remaining studies included a mix of ethnicities such as New Zealand European, Asian, Middle Eastern, Latin American, African (MELAA), and Other ethnicities. Participant numbers varied across studies, ranging from 14 to over 80,000. Most studies had less than 100 participants, with some including less than 39% of Māori or Pacific participants. However, there were also studies with over 40% representation from these groups. Most studies included both male and female participants, while a few focused specifically on

females. Some studies did not provide detailed information on participant age or gender, and only a limited number of studies presented comprehensive demographic tables.

Study design and intervention elements

Eleven of the 29 studies were retrospective cohort studies – including two audits – which used datasets from the New Zealand Ministry of Health, the Pharmaceutical Claims Data Mart (PHARMS), New Zealand Health Information Service (NZHIS) or the National Minimum Dataset (Hospital Events) to explore hospitalisation rates, treatment outcomes and prevalence of a range of respiratory conditions.

While four studies were qualitative, two studies were randomised control trials. The first lasted 12 months, where the control group was waitlisted for the intervention.³³ The second was a single-blind trial enrolling children aged less than 2 years hospitalised for lower respiratory tract infections to intervention or control.³² Three were prospective cohort studies. In the first, the association between a pregnant mother’s maternal body fat and the prevalence of infant wheeze was explored,³⁵ the second looked at whether starting school with known asthma contributed to low achievement after the first year of school⁴² and the third reviewed how translated Pacific resources

assisted families with managing asthma with their children.²⁶ Four were cross-sectional studies, where one assessed the prevalence of habitual snoring among New Zealand pre-schoolers,³⁷ one explored the pharyngeal GAS prevalence among a cohort of children who attended schools with sore throat clinics,²⁸ one investigated ARF cases' housing conditions and sore throat treatment to identify opportunities to improve ARF prevention,⁴³ while another described the pharmacological management of children's asthma to assess whether there were ethnic differences in pharmacological management.²⁵

Three of the four qualitative studies reported on the experiences of families whose children had respiratory infections.^{27,29,40} The fourth qualitative study⁴¹ captured the whānau and children's perspectives of asthma and asthma management and used drawing lung representations as an interactive and fun way to engage with children. Other studies included a non-randomised study where children either received an intervention or placebo,⁴⁴ a case control study that examined the distribution of housing-related risk factors for children with severe acute respiratory infection⁴⁵ and a sero-epidemiologic cohort study which captured influenza infection rates by risk group.⁴⁶ Time frames for each study ranged from 3 months to 6 years.

Methods for recruitment or engagement

Three studies recruited from a tertiary paediatric hospital, two focusing on children^{30,32} and the other on parents' perspectives regarding their child's respiratory health.²⁹ Another study utilised a public health unit to reach out to families with children who had ARF,⁴⁷ while a different study employed a research nurse and a community health worker to connect with families after their hospital admission.³¹ A similar approach was taken in another study,²⁷ which recruited participants from a tertiary hospital and a paediatric and youth outpatient clinic, relying on clinical staff and flyers placed in waiting rooms. Recruitment challenges prompted this study to expand the age range (from 0–10 to 0–17 years) and adopt snowball sampling as an additional method.

Four studies^{26,35,41,45} worked alongside primary care and community organisations to recruit, with one study also advertising in the local newspaper and on the radio.³³ One of these studies, conducted by Jones *et al.*,⁴¹ worked closely with nurses at a community-based organisation – Tu Kotahi Māori Asthma Trust – known for its work with Māori communities. This partnership used kanohi-ki-te-kanohi (face to face approach), facilitated by the organisation's nurses, leading to the involvement of other families through snowball sampling. A Māori researcher subsequently met with participants to explain the study and obtain written consent. Ingham's study,⁴⁵ a sub-study within the Whiti Te Ra Case Control Study, provided a flow diagram outlining the recruitment process. Although it did not provide detailed information on

household recruitment, the study involved an advisory group comprising Māori and Pacific community members and local health care organisations, who played a role in recruitment procedures, study design and implementation.

Three studies collaborated with primary and intermediate schools to recruit children.^{28,42,44} Two studies directly contacted families through invitation letters and follow-up phone calls.^{37,46} Another study, consisting of three cohorts, worked alongside schools, a Māori health provider and a primary care organisation.³⁶ In one study, random residential addresses were used as starting points, with households then being asked about the eligibility of their children, and caregivers were subsequently invited to participate.²⁵ All studies involving direct contact with participants obtained ethics approval. Twelve studies did not require direct recruitment as they utilised previously reported datasets to collect the necessary information. However, two^{22,23} of these 12 studies sought approval from their District Health Board assessment committee and Primary Health Organisation clinical governance group before conducting their audits.

Culturally responsive approaches

Out of the 29 studies, only two studies reported utilising a Kaupapa Māori Research framework. The first study emphasised Māori leadership and tikanga (Māori cultural protocols) by involving Māori at all stages of the research, including the formation of an advisory group comprising Māori and Pacific community members and health care organisations.⁴⁵ This partnership supported the development, design, recruitment and implementation phases of the study. In the second study, a qualitative approach was taken, involving interviews with whānau to understand their experiences related to asthma outcomes. Within this study, Kaupapa Māori methods were employed to recruit 32 Māori whānau, achieving a 100% retention rate. The researchers obtained formal ethics approval and sought consultation and permission from kaumātua and kuia (tribal elders) to undertake the research in partnership with their community, accompanied by a launch ceremony and blessing at their local marae.

One study²⁹ reported conducting a cultural consultation to ensure Māori and Pacific perspectives were considered before submitting their ethics application. The study team also included Māori and Samoan researchers who assisted in reviewing research protocols, data analysis and findings. Another study adopted a bilingual approach in their intervention and provided translated asthma resources to families.²⁶ While one study offered the availability of a translator if needed, it was not utilised.²⁷ Several studies incorporated Māori and Pacific researchers or health care professionals in their team, although they were not the primary investigators.

Outcomes

Several studies addressed health disparities experienced by Māori and Pacific children, highlighting areas that require

improvement. Two studies^{22,23} focused on the inadequate management of sore throats in primary care practices for Māori children, emphasising the need for significant improvements in this setting. Another study examined the ongoing respiratory morbidity 1 year after hospitalisation with pneumonia or severe bronchiolitis among Māori and Pacific children.³¹ Three studies reported disparities in hospitalisation rates for RSV,⁴⁸ non-cystic fibrosis bronchiectasis²⁴ and infectious diseases during the first year of life, comparing Māori and Pacific children with non-Māori/non-Pacific children.⁴⁹

Regarding asthma management, one study²⁵ found no ethnic differences in the use of spacers but revealed that Māori and Pacific children were more likely to receive a nebuliser than European/other children. The same study reported that Māori and Pacific children who experienced severe morbidity were less likely to receive inhaled corticosteroids. In another study,⁵⁰ it was observed that Māori and Pacific children were less likely to have their asthma treatment escalated to a higher step (step one to step three) and were more likely to use oral steroids for asthma exacerbations and not receive prescribed asthma medication in primary care when admitted to the hospital. Other findings included the association between asthma and low reading achievement,⁴² higher prevalence of rhinoconjunctivitis symptoms among Māori and Pacific children,³⁴ higher incidence of habitual snoring among Māori children³⁷ and an association between subcutaneous body fat levels in pregnant women and wheezing in their infants at 18 months.³⁵ The qualitative studies provided a range of participants' experiences, with one study reporting a 100% retention rate,⁴¹ and another study²⁶ highlighting the positive impact of translated resources on inhaler knowledge and symptom recognition for Pacific families.

The effectiveness of school-based sore throat clinics in reducing ARF hospitalisation rates was demonstrated in three studies.^{28,36,51} Two studies focused on housing conditions and found that improvements in housing quality measures such as dampness and mould led to a reduction in hospitalisations for acute respiratory infections,⁴⁵ while another study showed improved school attendance among children with asthma who received a household intervention.³³ Additionally, one study⁴⁷ highlighted the role of environmental conditions in increasing the risk of ARF among families due to high GAS transmission and susceptibility to infection. One study⁴⁴ reported no significant difference in the intervention group receiving treatment for GAS, while another⁴³ reported observing hospitalisations for ARF were not efficient for targeting prevention activities for this condition.

Discussion

This systematic review, to our knowledge, is the first to explore and outline the characteristics of respiratory

research specifically focused on Māori and Pacific children (aged 0–14 years) in New Zealand. In total, 29 studies were included in the review, offering valuable and novel insights. Most of these studies concentrated on asthma, GAS/ARF and LRTI, and were primarily conducted in Auckland, particularly South Auckland, as well as the Wellington region.

The included studies exhibited a diverse range of study designs, intervention components, recruitment strategies and methods of data collection and analysis. Retrospective cohort studies based on national datasets were the most common study design, followed by cross-sectional studies and qualitative studies that explored the experiences of whānau in managing their child's asthma^{27,41} or caring for children hospitalised with respiratory conditions.²⁹ Among the included studies, 28 focused on Māori children and/or their caregivers, while 24 involved Pacific populations, often with mixed variations of population groups and varying sample sizes. It is worth noting that the sample sizes varied, and only a few studies included more than 40% Māori and Pacific participants. Additionally, one study³⁵ grouped Māori and Pacific participants together as 'Polynesians,' which can be problematic as it homogenises these distinct communities. Although Māori and Pacific communities share historical and cultural connections across Te-Moana-Nui-a-Kiwa,⁵² acknowledging their unique differences is essential and should not be overlooked.

Māori, as the indigenous people of Aotearoa New Zealand, have a special relationship with the Crown established through Te Tiriti o Waitangi. The Crown has a responsibility to protect and uphold the well-being of Māori based on the principles of Te Tiriti.⁵² Pacific people support the importance of Te Tiriti O Waitangi and are tauiwi within the bicultural framework that it establishes.⁵² 'Pacific people' is a collective term used to represent diverse communities from various countries in Polynesia, Melanesia and Micronesia, residing in New Zealand.⁵³ It is important to note the differences among these Pacific countries in terms of language, customs, geography, migration history, constitutional ties and political influences.^{54,55} With each new generation born in New Zealand, the acquisition of additional ethnicities becomes relevant, as young people are increasingly identifying with multiple ethnic backgrounds.⁵⁶ Only four studies in this review reported multiple ethnicities at level two, acknowledging the ethnic mobility of a new generation of children.^{26,29,31,39} Using the standard prioritisation of Māori ethnicity however unintentionally creates under-reporting of Pacific people who are more likely to report multiple ethnicities. A researcher's judgement on ethnic affiliation and classification of participants therefore needs to be guided by appropriate Māori and Pacific leadership to ensure data consistency and accurate reporting.⁵⁷

Several studies have drawn attention to the persistent health disparities experienced by Māori and Pacific children, particularly in relation to inadequate management of sore throats in primary care,^{22,23} insufficient asthma

treatment and care in hospitals⁵⁰ or primary care,²⁵ and the ongoing respiratory health issues even after hospitalisation for severe bronchiolitis or pneumonia.^{31,32} It is not surprising that Māori and Pacific communities have historically faced discrimination, unconscious biases and racism within the health care system.^{5,58} The Waitangi Tribunal report acknowledges that the Crown have failed to address Māori health inequities and were in breach of Te Tiriti O Waitangi.⁵⁹ To truly advance Māori health, which ultimately benefits all New Zealanders, there is a need for investment in culturally appropriate and impactful research and health care approaches.¹⁹

Three studies^{28,36,44} found that schools were effective in treating sore throats and extending treatment to family members. This highlights the acceptability and accessibility of schools treating preventable respiratory conditions in children. Despite free primary care for children, barriers to access remain, including financial constraints, transportation issues, distance, childcare and work commitments.^{5,6} Three studies highlighted the importance of addressing housing conditions and household income in improving respiratory outcomes.^{33,45,47} Māori and Pacific populations, who often live in overcrowded housing with poor ventilation, are particularly affected.^{33,45,47,60} The typical design of New Zealand homes often fails to accommodate the lifestyles of most Māori and Pacific families.⁶¹ Efforts to improve housing design and availability are crucial to prevent respiratory diseases associated with housing conditions.^{47,62}

Acknowledging and utilising culturally responsive and indigenous approaches is critical when conducting research with Māori and Pacific communities. Only two studies explicitly employed a Kaupapa Māori Framework,^{29,41} with others incorporating the use of tikanga, translators, Māori and Pacific researchers and undertaking a cultural consultation. It is recommended that such approaches be considered for a broader range of studies involving Māori and Pacific communities. Building partnerships with Māori communities and health providers, as exemplified by Jones *et al.*'s study,⁴¹ is important for research to yield tangible benefits. Tuhuiwai Smith¹⁸ describes how researchers should, whenever conducting research regarding Indigenous peoples, centre Indigenous values and follow Indigenous protocols. The acknowledgement of Māori and Pacific research approaches as valid methodologies and methods recognises the move away from Eurocentric frameworks.⁶³ It also recognises cultural frameworks can be applied to support research processes. Furthermore, co-designing interventions that incorporate Māori and Pacific frameworks is essential. In a review of Kaupapa Māori health interventions undertaken by Rolleston and colleagues,⁶⁴ the Ol@-Or@ mHealth Tool study⁶⁵ highlighted the integration of cultural values and co-design throughout the research process, enabling Māori and Pacific values and aspirations about wellbeing to be captured and implemented into the design and application of the intervention. More studies focusing on the needs of

Māori and Pacific families and communities are needed to ensure culturally responsive care and tailored approaches.^{24,27} Authentic partnerships and co-design from the outset are essential to acknowledge and translate health aspirations and interactions within the health care system.⁶⁴

A strength of this systematic review lies in its comprehensive approach, synthesising existing research on respiratory health in Māori and Pacific children (10–14) in New Zealand. However, limitations include the heterogeneous range of studies found, preventing meta-analysis to assess the quality of the research or interventions within the studies. Additionally, the focus is limited to a period of 12 years (2010–2022) and primarily Māori and Pacific children, potentially excluding other relevant respiratory studies in New Zealand.

Conclusion

This review underscores the remaining challenges in improving respiratory health outcomes for Māori and Pacific children, emphasising the need for culturally appropriate frameworks and approaches guided by Te Tiriti O Waitangi and Pacific values in research practices. To achieve equity, Māori and Pacific communities should be considered equal research partners, actively involved in all stages of the research process, going beyond mere consultation. Additionally, the scarcity of qualitative studies exploring the experiences of Māori and Pacific families within the health care system highlights the importance of including their voices in shaping health aspirations for whānau and families. These insights are crucial for future service planning, policy development and the responsiveness of health services to respiratory diseases.

References

- 1 Child Poverty Action Group. Left further behind: How New Zealand is failing its children. Auckland: Child Poverty Action Group; 2011. Available at <https://www.cpag.org.nz/assets/sm/upload/d4/ei/sg/g4/LFBDec2011.pdf>
- 2 Cure Kids. State of child health in Aotearoa New Zealand. Auckland: Cure Kids; Available at <https://www.curekids.org.nz/downloads/assets/5c03/1>
- 3 Duncanson M, Oben G, Adams J, *et al.* Health and wellbeing of under-15 year olds in the Northland region 2018 (Health and wellbeing of under-15 year olds). 2019. Available at <http://hdl.handle.net/10523/9438>
- 4 Ministry of Health. Pacific child health. A paper for the Pacific health and disability action plan review. Wellington: Ministry of Health; 2008. Available at <https://www.health.govt.nz/publication/pacific-peoples-and-mental-health-paper-pacific-health-and-disability-action-plan-review>
- 5 Ryan D, Grey C, Mischewski B, Tofa Saili: A review of evidence about health equity for Pacific Peoples in New Zealand. Wellington: Pacific Perspectives Ltd; 2019. Available at https://www.pacificperspectives.co.nz/_files/ugd/840a69_e60e351af88048ed8fa005ad28955f9a.pdf
- 6 Palmer SC, Gray H, Huria T, *et al.* Reported Māori consumer experiences of health systems and programs in qualitative research: a systematic review with meta-synthesis. *Int J Equity Health* 2019; 18: 163. doi:10.1186/s12939-019-1057-4

- 7 Schlichting D, Fadason T, Grant CC, *et al.* Childhood asthma in New Zealand: the impact of ongoing socioeconomic disadvantage (2010–2019). *N Z Med J* 2021; 134(1533): 80–95.
- 8 Simpson J, Duncanson M, Oben G, *et al.* The health status of Pacific children and young people in New Zealand 2015. Dunedin: New Zealand Child and Youth Epidemiology Service; 2017. Available at <http://hdl.handle.net/10523/7391>
- 9 Simpson J, Oben G, Craig E, *et al.* The determinants of health for children and young people in New Zealand (2014). Dunedin: New Zealand Child and Youth Epidemiology Service; 2016. Available at <http://hdl.handle.net/10523/6383>
- 10 Asthma and Respiratory Foundation. National Respiratory Strategy, Te Hā Ora: The Breath of Life. Wellington: Asthma and Respiratory Foundation; 2015.
- 11 Te Whatu Ora Health New Zealand. Te Pae Tata: Interim New Zealand health plan. Wellington, New Zealand: Te Whatu Ora Health New Zealand; 2022.
- 12 Ministry of Health. He Korowai Oranga: Māori health strategy. Wellington: Ministry of Health; 2014. Available at <http://www.health.govt.nz/our-work/populations/Māori-health/hekorowai-oranga>
- 13 Ministry of Health. Equity of health care for Māori: A framework. Wellington: Ministry of Health; 2014. Available at <http://www.health.govt.nz/publication/equity-health-care-Māoriframework>
- 14 Minister of Health. Te Mana Ola: The Pacific Health Strategy. Wellington: Ministry of Health, New Zealand; 2023.
- 15 Ministry for Pacific Peoples. All-of-Government Pacific Wellbeing Strategy. Wellington, New Zealand: Ministry for Pacific Peoples; 2022. Available at <https://www.mpp.govt.nz/assets/Reports/Pacific-Aotearoa-Lalanga-Fou-Report.pdf>
- 16 Ofanoa M, Percival T, Huggard P, *et al.* Talanga: the Tongan way enquiry. *Sociol Study* 2015; 5(4): 334–340. doi:10.17265/2159-5526/2015.04.009
- 17 Otsuka S. Talanoa Research: Culturally Appropriate Research Design in Fiji. International Education Research Conference: Creative Dissent-Constructive Solutions. Melbourne, Australia: Anonymous; 2006.
- 18 Tuhiwai Smith L. Decolonizing methodologies: research and Indigenous Peoples, 2nd edn. New Zealand: Otago University Press; 2012.
- 19 Health Research Council. Māori health advancement guidelines. Auckland: Health Research Council of New Zealand; 2019. Available at https://gateway.hrc.govt.nz/funding/downloads/HRC_Maori_Health_Advancement_Guidelines.pdf
- 20 Moher D, Liberati A, Tetzlaff J, *et al.* Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* 2009; 6(7): e1000097. doi:10.1371/journal.pmed.1000097
- 21 Aromataris E, Fernandez R, Godfrey CM, *et al.* Summarizing systematic reviews: methodological development, conduct and reporting of an umbrella review approach. *Int J Evid Based Healthc* 2015; 13(3): 132–140. doi:10.1097/XEB.0000000000000055
- 22 Shetty A, Mills C, Eggleton K. Primary care management of group A streptococcal pharyngitis in Northland. *J Prim Health Care* 2014; 6(3): 189–194.
- 23 Shetty A, Mills C, Eggleton K. A repeat audit of primary care management of group A streptococcal pharyngitis in Northland, New Zealand 2016. *J Prim Health Care* 2018; 10(1): 18–24. doi:10.1071/HC17056
- 24 Bibby S, Milne R, Beasley R. Hospital admissions for non-cystic fibrosis bronchiectasis in New Zealand. *N Z Med J* 2015; 128(1421): 30–38.
- 25 Crengle S, Robinson E, Grant C, *et al.* Pharmacological management of children's asthma in general practice: findings from a community-based cross-sectional survey in Auckland, New Zealand. *N Z Med J* 2011; 124(1346): 44–56.
- 26 Kristiansen J, Hetutu E, Manukia M, *et al.* An evaluation of a pictorial asthma medication plan for Pacific children. *N Z Med J* 2012; 125(1354): 42–50.
- 27 Jepsen N, Charania NA, Mooney S. Health care experiences of mothers of children with bronchiectasis in Counties Manukau, Auckland, New Zealand. *BMC Health Serv Res* 2018; 18: 722. doi:10.1186/s12913-018-3532-9
- 28 Lennon D, Anderson P, Kerdemilidis M, *et al.* First presentation acute rheumatic fever is preventable in a community setting: a school-based intervention. *Pediatr Infect Dis J* 2017; 36(12): 1113–1118. doi:10.1097/INF.0000000000001581
- 29 McBride-Henry K, Miller C, Trenholm A, *et al.* Occupying 'in-hospitable' spaces: parental/primary-caregiver perceptions of the impact of repeated hospitalisation in children under two years of age. *PLoS ONE* 2020; 15(1): e0228354. doi:10.1371/journal.pone.0228354
- 30 Trenholme AA, Best EJ, Vogel AM, *et al.* Respiratory virus detection during hospitalisation for lower respiratory tract infection in children under 2 years in South Auckland, New Zealand. *J Paediatr Child Health* 2017; 53(6): 551–555. doi:10.1111/jpc.13529
- 31 Trenholme AA, Byrnes CA, McBride C, *et al.* Respiratory health outcomes 1 year after admission with severe lower respiratory tract infection. *Pediatr Pulmonol* 2013; 48: 772–779. doi:10.1002/ppul.22661
- 32 Byrnes CA, Trenholme A, Lawrence S, *et al.* Prospective community programme versus parent-driven care to prevent respiratory morbidity in children following hospitalisation with severe bronchiolitis or pneumonia. *Thorax* 2020; 75(4): 298–305. doi:10.1136/thoraxjnl-2019-213142
- 33 Free S, Howden-Chapman P, Pierse N, *et al.* More effective home heating reduces school absences for children with asthma. *J Epidemiol Community Health* 2010; 64(5): 379–386. doi:10.1136/jech.2008.086520
- 34 Moyes CD, Clayton T, Pearce N, *et al.* Time trends and risk factors for rhinoconjunctivitis in New Zealand children: an International Study of Asthma and Allergies in Childhood (ISAAC) survey. *J Paediatr Child Health* 2012; 48(10): 913–920. doi:10.1111/j.1440-1754.2012.02518.x
- 35 Watson PE, McDonald BW. Subcutaneous body fat in pregnant New Zealand women: Association with wheeze in their infants at 18 months. *Matern Child Health J* 2013; 17(5): 959–967. doi:10.1007/s10995-012-1124-6
- 36 Walsh L, Innes-Smith S, Wright J, *et al.* School-based streptococcal A sore-throat treatment programs and acute rheumatic fever amongst Indigenous Māori: a retrospective cohort study. *Pediatr Infect Dis J* 2020; 39(11): 995–1001. doi:10.1097/INF.0000000000002770
- 37 Gill AI, Schaughency E, Galland BC. Prevalence and factors associated with snoring in 3-year olds: early links with behavioral adjustment. *Sleep Med* 2012; 13(9): 1191–1197. doi:10.1016/j.sleep.2012.05.007
- 38 Ministry of Health. HISO 10001:2017 ethnicity data protocols. Wellington: Ministry of Health; 2017. Available at https://www.health.govt.nz/system/files/documents/publications/hiso_10001-2017_ethnicity_data_protocols_may-21.pdf
- 39 Munro KA, Reed PW, Joyce H, *et al.* Do New Zealand children with non-cystic fibrosis bronchiectasis show disease progression? *Pediatr Pulmonol* 2011; 46(2): 131–138. doi:10.1002/ppul.21331
- 40 McBride-Henry K, Miller C, Trenholm A, *et al.* 'You have to do what is best': the lived reality of having a child who is repeatedly hospitalized because of acute lower respiratory infection. *Health Expect* 2022; 25(1): 466–475. doi:10.1111/hex.13408
- 41 Jones B, Ingham TR, Cram F, *et al.* An indigenous approach to explore health-related experiences among Māori parents: the Pukapuka Hauora asthma study. *BMC Public Health* 2013; 13(1): 228. doi:10.1186/1471-2458-13-228
- 42 Liberty KA, Pattemore P, Reid J, *et al.* Beginning school with asthma independently predicts low achievement in a prospective cohort of children. *Chest* 2010; 138(6): 1349–1355. doi:10.1378/chest.10-0543
- 43 Oliver J, Foster T, Williamson DA, *et al.* Using preceding hospital admissions to identify children at risk of developing acute rheumatic fever. *J Paediatr Child Health* 2018; 54(5): 499–505. doi:10.1111/jpc.13786
- 44 Doyle H, Pierse N, Tiatia R, *et al.* Effect of oral probiotic streptococcus salivarius K12 on group A streptococcus pharyngitis: a pragmatic trial in schools. *Pediatr Infect Dis J* 2018; 37(7): 619–623. doi:10.1097/INF.0000000000001847
- 45 Ingham T, Keall M, Jones B, *et al.* Damp mouldy housing and early childhood hospital admissions for acute respiratory infection: a case control study. *Thorax* 2019; 74(9): 849–857. doi:10.1136/thoraxjnl-2018-212979
- 46 Huang QS, Bandaranayake D, Wood T, *et al.* Risk factors and attack rates of seasonal influenza infection: Results of the southern hemisphere influenza and vaccine effectiveness research and surveillance

- (SHIVERS) sero-epidemiologic cohort study. *J Infect Dis* 2019; 219(3): 347–357. doi:10.1093/infdis/jiy443
- 47 Oliver JR, Pierse N, Stefanogiannis N, et al. Acute rheumatic fever and exposure to poor housing conditions in New Zealand: a descriptive study. *J Paediatr Child Health* 2017; 53(4): 358–364. doi:10.1111/jpc.13421
 - 48 Prasad N, Newbern EC, Trenholme AA, et al. Respiratory syncytial virus hospitalisations among young children: a data linkage study. *Epidemiol Infect* 2019; 147: e246. doi:10.1017/S0950268819001377
 - 49 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): 223–231. doi:10.1111/jpc.13377
 - 50 Gillies TD, Tomlin AM, Dovey SM, et al. Ethnic disparities in asthma treatment and outcomes in children aged under 15 years in New Zealand: analysis of national databases. *Prim Care Respir J* 2013; 22(3): 312–318. doi:10.4104/pcrj.2013.00068
 - 51 Jack SJ, Williamson DA, Galloway Y, et al. Primary prevention of rheumatic fever in the 21st century: evaluation of a national programme. *Int J Epidemiol* 2018; 47(5): 1585–1593. doi:10.1093/ije/dyy150
 - 52 Health Research Council. Pacific health research guidelines. Auckland: Health Research Council New Zealand; 2014. Available at https://www.hrc.govt.nz/sites/default/files/2019-05/Resource%20Library%20PDF%20-%20Pacific%20Health%20Research%20Guidelines%202014_0.pdf
 - 53 Ministry for Pacific Peoples. Pacific Aotearoa lalanga fou. Wellington: Ministry for Pacific Peoples; 2018. Available at <https://www.mpp.govt.nz/assets/Reports/Pacific-Aotearoa-Lalanga-Fou-Report.pdf>
 - 54 Ministry for Pacific Peoples. Yavu: Foundations of Pacific engagement. Wellington: Ministry for Pacific Peoples; 2018. Available at <https://www.mpp.govt.nz/assets/Uploads/MPP8836-Yavu-Pacific-Engagement-Digital-Book.pdf>
 - 55 Tiatia-Seath J. The importance of Pacific cultural competency in healthcare. *Pac Health Dialog* 2018; 21(1): 8–9. doi:10.26635/phd.2018.909
 - 56 Callister P, Didham R, Kivi A. Who are we? The conceptualisation and expression of ethnicity, Official Statistics Research Series 4. Wellington; 2009. Available at <http://www.statisphere.govt.nz/official-statisticsresearch/series/default.htm>
 - 57 Stats NZ. Understanding and working with ethnicity data: A technical paper. Wellington: Statistics New Zealand; 2005. doi:10.13140/RG.2.1.1347.0804
 - 58 Talamaivao N, Harris R, Cormack D, et al. Racism and health in Aotearoa New Zealand: a systematic review of quantitative studies. *N Z Med J* 2020; 133(1521): 55–68.
 - 59 Waitangi Tribunal. Hauora: Report on stage one of the health services and outcomes kaupapa inquiry. Lower Hutt, New Zealand: Legislation Direct; 2019. Available at https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_195476216/Hauora%202023%20W.pdf
 - 60 Stats NZ. Living in a crowded house: Exploring the ethnicity and well-being of people in crowded households; 2018. Available at <https://www.stats.govt.nz/reports/living-in-a-crowded-house-exploring-the-ethnicity-and-well-being-of-people-in-crowded-households> [accessed 12 December 2021].
 - 61 Malungahu GM. Too little space!: Experiences and perspectives of housing and housing policy: Tongan families with rheumatic fever in South Auckland and key housing informants. University of Auckland; 2020.
 - 62 Jaie R, Baker M, Venugopal K. Acute rheumatic fever associated with household crowding in a developed country. *Paediatr Infect Dis J* 2011; 30(4): 315–319. doi:10.1097/INF.0b013e3181fbd85b
 - 63 Ponton V. Utilizing Pacific methodologies as inclusive practice. *SAGE Open* 2018; 8(3): 215824401879296. doi:10.1177/2158244018792962
 - 64 Rolleston AK, Cassim S, Kidd J, et al. Seeing the unseen: evidence of kaupapa Māori health interventions. *AlterNative* 2020; 16(2): 129–136. doi:10.1177/1177180120919166
 - 65 Ni Mhurchu C, Te Morenga L, Tupai-Firestone R, et al. A co-designed mHealth programme to support healthy lifestyles in Māori and Pasifika peoples in New Zealand (OL@-OR@): a cluster-randomised controlled trial. *Lancet Digit Health* 2019; 1(6): e298–e307. doi:10.1016/S2589-7500(19)30130-X

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Author affiliations

^AMoana Connect, 141 Bader Drive, Mangere, Auckland, New Zealand.

^BMinistry for Pacific Peoples, 101–103 The Terrace, Wellington, New Zealand.

^CANU College of Asia & the Pacific, The Australian National University, 9 Fellows Road, Canberra, Australia.

^DKids First Childrens Hospital, 100 Hospital Road, Auckland 2025, New Zealand.

^EHapai Te Hauora, 6/8 Pioneer Street, Henderson, Auckland 0612, New Zealand.

^FCentre for Medical and Health Sciences Education, Faculty of Medical and Health Sciences, University of Auckland, 85 Park Road, Grafton, Auckland 1023, New Zealand.