



Rheumatic Fever

New Zealand College of Public Health Medicine Policy Statement

Policy Statement

The New Zealand College of Public Health Medicine (NZCPHM) recognises that the incidence and consequent burden of rheumatic fever in Aotearoa New Zealand are unacceptably high and contribute to significant inequities (negative health disparities that are unfair and avoidable) in health.

The NZCPHM considers that the first step to appreciably reducing the incidence of rheumatic fever must be to reduce and then eliminate ethnicity-based inequities in access to social determinants of health, particularly access to appropriate housing and incomes that provide for dignified living. The ultimate goal is for Aotearoa New Zealand to eliminate rheumatic fever altogether.

The NZCPHM continues to support comprehensive approaches to eliminating the primary drivers of rheumatic fever. These involve measures to reduce household crowding, provide more appropriate and accessible health care for Aotearoa New Zealanders at the greatest risk for rheumatic fever, and make meaningful progress towards a vaccine that can prevent group A streptococcal infections. This statement replaces the NZCPHM's Rheumatic Fever Policy Statement of August 2015.¹

Key messages

Rheumatic fever is a preventable cause of long-term heart disease. The incidence of rheumatic fever in Aotearoa New Zealand is much higher than in comparable countries and has a highly inequitable impact on Māori and Pacific children and young people. In 2019/2020, 171 people were hospitalised with first episode rheumatic fever, nearly all (94%) being Māori or Pacific; and the age-adjusted total hospitalisation rate for acute rheumatic fever in Pacific people was 83 times that of non-Māori non-Pacific people, with the Māori rate 25 times so.

Such huge inequity is patently unacceptable. The NZCPHM calls for strong action to prevent rheumatic fever and transmission of group A streptococcal (GAS) infections as well as to prevent rheumatic heart disease from recurring. That action includes:

- improving household living conditions and income
- continuing to support the development of an effective vaccine to prevent GAS infection
- increasing public awareness of the importance of getting sore throats checked
- ensuring that all sore throats in high-risk populations are assessed quickly, by reducing barriers to primary care access, and evaluating whether rapid GAS testing is appropriate for the Aotearoa New Zealand context
- developing a national rheumatic fever register and prophylaxis service
- funding dental care and prophylaxis treatment for dental conditions for people who have had rheumatic fever
- investing in implementing rheumatic heart disease screening among high-risk populations, in particular for households of people who have had rheumatic fever (especially their siblings and parents).

The NZCPHM further calls for resources for ongoing surveillance and monitoring, and research into the causes of rheumatic fever and the effectiveness of prevention programmes, and to investigate making invasive GAS a notifiable disease in Aotearoa New Zealand.

The context of public health and NZCPHM policy statements

Public health is the art and science of preventing disease, prolonging life, and promoting health through the organised efforts of society.²

Public health has historically been the biggest driver of improved health for people.³ Advances in public health in the last 100 years – such as vaccination, control of infectious diseases through clean water and improved sanitation, and the recognition of tobacco use as a health hazard – have led to improvements in health and wellbeing, and a substantial increase in life expectancy.⁴

The NZCPHM represents the medical speciality of public health medicine in Aotearoa New Zealand. Public health medicine is defined as the branch of medicine concerned with the epidemiological analysis of the health and health care of populations and population groups. It involves assessing population health and health care needs, developing policy and strategy, undertaking health promotion activities, controlling, and preventing disease, and organising services. Public health

medicine specialists use the tools of epidemiology and other frameworks such as health-promoting environments, Health in All Policies, Te Pae Mahutonga, Te Whare Tapa Whā and the Ottawa Charter to inform partnerships and structure public services to support thriving communities. These approaches are grounded in the societal,ⁱ economic and environmental determinants of health.⁵⁻¹³

Doctors and other health professionals in general have a responsibility to act as advocates for health for everyone in society.^{14,15} Public health medicine specialists have a particular focus on preventing disease and supporting good health, achieving health equity across ethnic, socioeconomic, age, ability, gender, sexual identity, and cultural groups, and promoting environments in which everyone can be healthy.¹⁶

In Aotearoa New Zealand, health professionals have a specific responsibility to act in ways that achieve the best health outcomes for Māori. Māori are signatories, along with the Crown, to te Tiriti o Waitangi (te Tiriti). For this reason, the NZCPHM advocates for and supports evidence-informed,¹⁷ equity-enhancing¹⁸ policy that accords with te Tiriti o Waitangi and with the United Nations Sustainable Development Goals.⁶

For further information on the context of public health and NZCPHM policy statements, see the [NZCPHM website](#).

Background

Rheumatic fever is a serious but preventable illness. It is an inflammatory disease that can occur after an autoimmune response to an untreated group A streptococcal (GAS) infection in susceptible people. Up to 3% of untreated GAS pharyngitis infections can lead to rheumatic fever in epidemic situations, while the estimated attack rate in Aotearoa New Zealand is 0.2%.¹⁹⁻²² Rheumatic fever affects the heart, joints, brain and skin. Although most of the symptoms of acute rheumatic fever (ARF) resolve on their own, the inflammation of the heart muscle, pericardium and valves can cause scarring, leading to rheumatic heart disease (RHD). RHD has profound effects on people's longevity and quality of life, creating major lifetime treatment burden and health sector costs including major heart surgery.

The incidence of rheumatic fever in Aotearoa New Zealand is much higher than in comparable countries, and with a highly inequitable impact on Māori and Pacific children and young people. These huge inequities are patently unacceptable.

- In Aotearoa New Zealand, rheumatic fever mainly affects Māori and Pacific children and young people aged 4 to 19 years living in areas of high socioeconomic deprivation of the North Island and/or in crowded households.²³⁻²⁵
- Ethnic inequities in ARF and in RHD have widened over time. For example, while the overall rate of ARF remained relatively constant during 2000 to 2018, there had been a marked shift in distributions, with a major decrease in initial ARF hospitalisation rates in persons of NZ European/other ethnicity, but rates did not decline for Māori and continued to rise for Pacific peoples.²⁶

ⁱ Societal determinants of health include commercial, political, governance, economic, cultural and even religious determinants. Together these societal structures help create the conditions for health and disease. Each of them eventually impacts on a person's health in a positive or negative way.

- In 2019/2020, 171 people were hospitalised with first episodes of rheumatic fever, most being Māori (68) and Pacific peoples (92). That financial year there were 234 total hospitalisations for ARF – with 174 (74%) aged 5 to 19 years and an overall age-standardised rate of 6.6 per 100,000; the age-adjusted rates for Pacific peoples (37.6 per 100,000 age-standardised (as)) and Māori (11.5 per 100,000 as) were 83 and 25 times respectively that of non-Māori non-Pacific people (0.45 per 100,000 as).ⁱⁱ

In 2020 and 2021, in the Auckland region the incidence of ARF fell significantly among Pacific children but not among Māori children. The reduction for Pacific children occurred in the context of the Aotearoa New Zealand COVID-19 pandemic response, which included a range of non-clinical interventions such as the Alert Level system, a major reduction in the volume of international arrivals and the Managed Isolation and Quarantine system for those who did arrive from overseas. However, the specific causal pathways between these policies in response to COVID-19 and the observed changes to the epidemiology of rheumatic fever are currently unclear.

Most other OECD countries have largely eliminated rheumatic fever, and elsewhere several countries have experienced reduced incidence of the disease associated with them using comprehensive programmes.²⁷⁻³¹

Key drivers of success have been reducing household crowding, improving housing quality and improving access to or affordability of health care. With our longstanding very high rates of rheumatic fever in vulnerable population groups, Aotearoa New Zealand is a clear outlier among comparable nations.

The costs associated with rheumatic fever and rheumatic heart disease are significant and impact the child or adult patient themselves, their whānau, their community and Aotearoa New Zealand as a whole. These costs result from repeated and prolonged hospitalisation, resources for medical prophylaxis and treatment, surgical intervention, negative physical and psychological experience, disruption of the lives of patients and their families, and often premature death.³²

The NZCPHM acknowledges and supports the equity-focused Rheumatic Fever Roadmap recently published by Te Whatu Ora. The three key areas - addressing the social determinants of rheumatic fever, improving the quality of care for priority populations and developing a systems approach – will ensure there is a concerted plan to reduce rheumatic fever in Aotearoa New Zealand.³³

1. Recommendations for preventing rheumatic fever

To reduce the incidence of rheumatic fever, it is important to reduce the transmission of GAS infections and, where any GAS infections do occur, to assess them quickly and treat them with appropriate antibiotics. A single episode of rheumatic fever can cause permanent and lifelong damage to the heart (rheumatic heart disease) and recurrent episodes can exacerbate this

ⁱⁱ The data cited for first episode hospitalisations for rheumatic fever come from the Te Whatu Ora website. These are hospitalisation data so may underestimate true case numbers. Separately, the age-standardised rates of ARF total hospitalisations are calculated from individual 5-year age band x ethnicity counts, their corresponding populations for that time period, and directly standardised to the 2020/21 Māori population age structure.

damage.³⁴ Therefore, preventing recurrences is another important component in reducing the burden of rheumatic fever (see the second set of recommendations below).

GAS pharyngitis (sore throat caused by GAS infection) has classically been established as the major cause of rheumatic fever. An increasing amount of evidence suggests GAS skin infections can be another cause, either directly or as a determinant of pharyngitis.^{35,36} GAS skin infections cause a significant disease burden in themselves and are a cause of post-streptococcal glomerulonephritis.³⁷ As such, efforts to prevent rheumatic fever should address GAS skin infection in addition to sore throats, as remedying both in combination is often feasible, has co-benefits for other types of morbidity and mortality, and can make bids for funding and cost-benefit analyses more favourable.

Improve primary care access and quality

It is difficult to differentiate between a viral cause and a bacterial cause of a sore throat. More research is required in this area. Therefore, it is important for health professionals to quickly assess all sore throats in high-risk populations (Māori and Pacific children and young people) and manage them appropriately.³⁸ The 2019/20 Aotearoa New Zealand Health Survey reported that Māori children were 1.27 times and Pacific children 1.42 times as likely to have not accessed primary health when they needed it during the previous 12 months as compared with non-Māori and non-Pacific children.³⁹ The barriers to accessing primary health care services may include cost, lack of transport, lack of childcare for other children, inability to register with a primary care provider and inability to get a timely appointment. Barriers to accessing primary health care have been associated with a doubling of the risk of ARF, after adjusting for age, ethnicity, socioeconomic deprivation etc.⁴⁰

Measures to improve access to primary care services will contribute to sore throat management in populations at high risk of rheumatic fever. Running sore throat clinics in schools and providing free services with no appointment needed in high-risk areas are examples of services that increase primary care access. The introduction of free general practice visits and prescriptions for children aged under 13 years from mid-2015 has undoubtedly contributed to reducing the cost barriers associated with access to primary care services.^{39,iii} However, the NZCPHM acknowledges that access to care is a complex concept and, for many families, financial cost at the time of consultation is not the only barrier.

It is necessary to address other important barriers to primary care access, including by ensuring that any service provided: is culturally appropriate, to mitigate the effects of racism,⁴¹⁻⁴³ is age-appropriate,^{37,38} and establishes trust and whanaungatanga with whānau.⁴⁴ Improvements to models of service delivery will enable health services to better respond to the complex needs of patients and whānau. Flexible service-delivery models are required to meet the needs of whānau and communities in regions with high rates of rheumatic fever.^{36,38}

Clinicians and health workers need to follow agreed national guidelines for managing and treating sore throats^{37,45} so that they do not miss GAS sore throats in populations at high risk of rheumatic fever. Training in knowledge of risk factors for, diagnosis and management of rheumatic fever is

ⁱⁱⁱ New Zealand Health Survey (NZHS) data from 2019/20 report families with Māori and Pacific children under 15 years of age are less likely to report unmet need for general practitioner (GP) visits due to cost. This has steadily improved since the NZHS 2011/12, when 7.7% of Māori children's families reported unmet need for GP due to cost; by 2019–20 it had reduced to 1.2%.

important for medical practitioners and other health workers working in primary care and emergency services.

Individual and institutional bias has been identified as a factor affecting sore throat care.^{46,47} All health care providers and commissioners should be required to undergo and refresh anti-racism and cultural safety education, combined with regular self-audit. A campaign targeted at health care providers to raise awareness of the role of bias in rheumatic fever should be considered.⁴⁸

Rapid GAS antigen point-of-care diagnostic tests (RADTs), which can provide a result within minutes, are available. However, Aotearoa New Zealand has no requirement for them to be assessed for accuracy in this country specifically. The danger is that, because they are developed in overseas populations where the risk of rheumatic fever is low, these tests may miss GAS in Māori or Pacific children (false negatives), where the consequences of missed treatment can be severe. RADTs are not currently recommended without backup throat culture.⁴⁵ High-incidence ARF settings, like New Zealand, need RADTs that are sensitive and thus have strong negative predictive values to enable prompt and accurate treatment decisions, and these tests need to be evaluated locally before they can be recommended for the New Zealand population.^{49,50,45}

Rheumatic fever should always be in the differential diagnosis in high-risk groups presenting with sore throats, even in the context of a respiratory pandemic. In the context of the COVID-19 pandemic, when people present for SARS-CoV-2 (COVID-19) testing, and they are in the high-risk group for rheumatic fever with sore throat as a symptom, it is important to offer a GAS swab or empiric antibiotics at the same time (while following public health instructions).

Empower communities and individuals

Community empowerment and self-determination are important protective measures against rheumatic fever.³³ Health promotion interventions should go beyond advertising campaigns to focus on working with communities to enhance mana motuhake⁴⁹ and working in partnership with affected communities. They should also be youth-inclusive, and take separate approaches for Māori and Pacific communities, drawing on an understanding of how to utilise different cultural strengths. Further, health promotion should mainly focus on primordial and primary preventative measures (e.g., housing, poverty, access to health care, structural racism), with less focus on downstream factors. It should use specific messages around healthy multi-generational living that reject a western paradigm of 'overcrowding'. Well-resourced evaluation of health promotion interventions is required to understand what works and what should be deprioritised.⁴⁸

Improved health literacy is also important in reducing the incidence of rheumatic fever. This includes raising public awareness about the link between a sore throat and rheumatic fever, as well as the importance of getting sore throats checked quickly and taking a full course of antibiotics as prescribed. The communities who are the target of awareness-based campaigns should also be involved in designing and leading those campaigns.

Reduce the transmission of GAS

Prophylaxis

Because up to 40% of people who contract rheumatic fever do not remember having a sore throat,^{52,53,54} a focus on managing and treating sore throats alone will not reduce rheumatic fever significantly. GAS infections (with or without symptoms of a sore throat) are easily spread from person to person through contact with respiratory tract secretions.⁵⁵ Contact tracing with

prophylactic treatment to prevent the spread of GAS pharyngitis may be of value in a limited number of institutional settings.⁵⁶

Improving household living conditions

Crowded living conditions help infections to spread from person to person; household crowding has been associated with nearly a quadrupled risk of ARF, after adjusting for age, ethnicity, socioeconomic deprivation etc.⁴⁰. Therefore reducing household crowding is an important strategy for reducing the transmission of GAS.^{57,40} Reducing crowding will also help reduce other infectious diseases.⁵⁸

Epidemiological studies have linked rheumatic fever to household cold and dampness, which a recent case control study in Aotearoa New Zealand has confirmed in early reporting.⁴⁰ National programmes to improve the quality of housing, such as the Healthy Homes Initiative, should be expanded, and both private and public housing providers should be required to meet minimum standards aligned with World Health Organization Housing and Health Guidelines.⁵⁹

Te Whatu Ora's Rheumatic Fever Roadmap, 2023 – 2028 prioritises increasing warm, dry, and healthy homes for priority groups.³³

Developing a GAS vaccine

Research and funding support for developing a GAS vaccine should continue to be a priority. While antimicrobial resistance (AMR) in GAS is rare, widespread use of antibiotics to treat GAS infections may lead other species to develop AMR.¹⁹ This inequitably affects the Māori and Pacific populations frequently prescribed penicillin for sore throat treatment.⁶⁰ In addition to preventing acute rheumatic fever and other GAS-associated disease, a sterilising vaccine would prevent the need for antibiotic treatment.

Ensuring appropriate antibiotic use for rheumatic fever primary prevention

The management of patients with GAS, at risk of rheumatic fever, poses a particular problem for antimicrobial stewardship. Despite the much higher incidence of acute rheumatic fever in Māori and Pacific children/young people, rates of dispensing of penicillin have been reported only modestly higher⁶⁰ Reduced rates of inappropriate antibiotic prescribing are needed, while simultaneously increasing the rates of appropriate antibiotic prescribing (including the primary prevention of rheumatic fever). The need to increase appropriate antibiotic prescribing is greatest in Māori and Pacific children/young people. Antimicrobial stewardship programmes should be sufficiently nuanced to not only reduce rates of inappropriate prescribing but also to increase rates of treatment for infections that do require antimicrobial therapy.^{61,62}

Improving household incomes

Most rheumatic fever studies, including a systematic review of the international literature⁵² and the recent Aotearoa New Zealand case control study,⁴⁰ indicate the disease is associated with poor access to health care. A cross-sectoral approach is required so governmental policies can be developed that improve the living standards of the most socioeconomically deprived households.³³

2. Recommendations for preventing recurrences of rheumatic fever and mitigating long-term consequences

Develop a national rheumatic fever register and prophylaxis service

The World Health Organization 2018 Global Resolution (A71/25) on Rheumatic Fever and Rheumatic Heart Disease⁶³ has called for national, regional and global actions to prevent and control ARF and RHD.

The cornerstone of efforts to prevent further attacks of rheumatic fever and rheumatic heart disease is antibiotic prophylaxis. Prophylaxis involves regularly administering antibiotics (usually intramuscular penicillin) to prevent further GAS throat infections.

This approach to prevention is best practised in an organised, coordinated way. Regular auditing of practice is important to monitor late delivery of prophylaxis and loss to follow-up.¹⁹ Currently, Aotearoa New Zealand has no consistent mechanism for delivering secondary prevention services across the country. Until the July 2022 establishment of Te Whatu Ora - Health New Zealand, in some areas, the (previous) district health board (DHB) through its public health unit delivered prophylaxis using a local disease register, while in other areas both the DHB/public health unit and general practitioners were involved in the delivery.^{64,65}

The variation in service delivery both within and between DHBs, and the lack of a national patient management system, has caused problems for auditing practice, timely delivery of secondary prophylaxis, and sharing of information between health professionals. Systems are urgently needed that will allow health professionals to easily share information and ensure appropriate follow-up and delivery of secondary prophylaxis, particularly for people who move frequently between areas.¹⁹

Patient registers are instrumental in helping to organise the medical care of people with ARF/RHD. Registers facilitate monitoring of disease burden and progression, providing epidemiological data that can be used for planning prevention and control programmes.⁶⁶ The World Heart Federation also recommends the use of comprehensive register-based ARF/RHD control programmes.⁶⁷

From July 2022, all DHBs were amalgamated into Te Whatu Ora and all Public Health Units have been amalgamated into one National Public Health Service. The College supports the establishment of a national register and to ensure Rheumatic Fever prevention systems are consistent and appropriately resourced nation-wide. The National Rheumatic Fever Care Coordination System being developed under the Rheumatic Fever Roadmap will incorporate such a register.^{iv,33,68,69,70}

Fund dental care

Patients with rheumatic heart disease require good oral hygiene and regular preventive dental care to reduce the risk of infective endocarditis occurring on damaged heart valves. Patients with rheumatic heart disease and mitral valve replacements may be on blood-thinning medication, and are at risk of greater complications should endocarditis occur.⁷¹ While (previously) DHBs had been funded to provide dental care for children up to the age of 18 years, no nationally funded dental care is available beyond 18 years of age. In the past some DHBs (Canterbury and Waikato) have provided dental care for people on their rheumatic fever registers, but such provision is not systematic or required by Manatū Hauora - Ministry of Health. Patients with damaged heart valves from rheumatic fever need antibiotic prophylaxis to cover dental care and procedures; however,

^{iv} Currently being piloted in two regions.

private dentists do not have systematic access to patient health information from outside services such as laboratory results, medication lists or allergies.

To safeguard patients, the NZCPHM recommends providing private dentists with nationally agreed access to basic laboratory and health information. Providing free dental care for people with a diagnosis of rheumatic fever would ensure access is consistent nationally. NZCPHM recommends that Te Whatu Ora urgently addresses this.

Consider screening for rheumatic heart disease and screening relatives

Emerging evidence suggests rheumatic heart disease screening among high-risk populations and relatives may be cost-effective. This is based on a recent Aotearoa New Zealand echocardiogram screening study of 70 children with acute rheumatic fever, where three siblings were found to have definite and nine had borderline rheumatic heart disease (about three times its prevalence in other high-risk children in Aotearoa New Zealand) which had not previously been known or diagnosed. In addition, four parents had definite rheumatic heart disease.⁷²

Further consideration should be given to screening households of identified cases. Implementing this measure would require additional workforce and appropriate follow-up care by clinicians.

3. Recommendations for monitoring, surveillance and research

Continued monitoring, surveillance and research are needed to understand the causes of rheumatic fever and evaluate any changes in its incidence that occur due to the implementation of primary prevention activities or other policies.⁷³ In particular, research should be directed towards understanding the reasons behind the large decrease in the incidence of rheumatic fever in Pacific children in Auckland during the COVID-19 pandemic alongside no reduction in Māori children. Screening programmes should meet screening best practice, as stated in the NZCPHM's Screening Policy Statement.⁷⁴

Further research should be funded to establish, first, whether it is possible to differentiate between bacterial and viral sore throats in the Aotearoa New Zealand setting. Funding is also needed for research on whether any of the new-generation rapid group A streptococcal tests (RADTs) are sufficiently accurate and predictive in vivo (real-life) in young Māori and Pacific populations to be recommended for local use in a setting at high risk of rheumatic fever (or for lay use by health workers), making sure they have strong test negative predictivity clinically in New Zealand.^{49,50}

Summary

Rheumatic fever causes unacceptable health inequity in Aotearoa New Zealand. To address and reduce this inequity, a comprehensive approach is required that includes strategies to:

- increase awareness of the importance of getting sore throats checked in high-risk populations through community-based, co-designed and co-governed health promotion programmes
- improve access to high-quality primary care for high-risk populations and eliminate individual and institutional biases across all health workforces
- ensure health professionals manage high-risk groups with appropriate antibiotics

- improve household minimum incomes and reduce poverty through cross-government policies (such as increasing the minimum wage and increasing benefit levels)
- improve access to good-quality homes (insulated, dry and warm), including rentals that meet compliance standards under the Healthy Homes Standards and facilitate healthy multi-generational living arrangements
- consider screening households of people with rheumatic heart disease (with or without targeted screening – prioritising siblings and parents, given the strong evidence that, among contacts of people with rheumatic fever, siblings and parents are at particular and high risk⁵⁵)
- provide free dental care for people who have experienced rheumatic fever
- establish a national rheumatic fever register that facilitates information-sharing across the health sector (including dentists)
- conduct ongoing surveillance and monitoring (including timely notifications)
- continue research into the causes of rheumatic fever and the effectiveness of prevention programmes⁵⁶
- continue research into a safe and effective GAS vaccine
- conduct further research on the signs, symptoms, and diagnostics of sore throats
- investigate making invasive GAS a notifiable disease in Aotearoa New Zealand, to improve data and monitoring capacity⁷⁵
- urgently fund research to establish the utility of RADTs in New Zealand for clinical screening practice.

Links with other NZCPHM policies

Health equity

Māori health

Pacific peoples' health

Child poverty and health

Housing

Public health as an investment

Screening

Acknowledgement

This policy statement was developed by the NZCPHM Policy Committee, NZCPHM members and staff. Authorship or review is recorded in the list of policy statement main authors on the NZCPHM's policy statements webpage at <https://nzcphm.org.nz/Policy-Statements/10944/>.

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