

Original Article

Rheumatic Heart Disease in Indigenous Populations—New Zealand Experience[☆]

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Rheumatic fever continues unabated among the indigenous Māori and Pacific Island New Zealanders. Ethnic disparities have increased in the past decade. The major success story for disease control has been secondary penicillin prophylaxis with 28-day intramuscular benzathine penicillin with high penicillin delivery rates and low recurrence rates. A landmark study for primary prevention of acute rheumatic fever for group A streptococcal pharyngitis was published in 2009. New Zealand has helped establish the role of echocardiography in acute rheumatic fever, with subclinical carditis incorporated into guidelines as a major criterion of rheumatic fever in high prevalence regions.

The rates of mitral valve repair for rheumatic heart disease (RHD) are currently greater than 90% in the children's cardiac unit but remain low in adult cardiac units in New Zealand. This is particularly relevant to women of child bearing age where New Zealand data has shown that pregnancy outcomes for mothers with prosthetic valves on warfarin are poor.

There are new initiatives to prevent severe RHD using portable echocardiography by screening school aged children. The prevalence of definite RHD was 2.4% in a large cohort of socially disadvantaged children in South Auckland studied in 2007–2008. Cost benefit models of screening need to be developed. Ongoing research involves international consensus standardisation of RHD patterns, and the need to define the natural history of subclinical RHD.

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This review covers firstly the epidemiology of acute rheumatic fever (ARF) and rheumatic heart disease (RHD) in New Zealand; secondly, aspects of medical, cardiology and surgical clinical endeavour in ARF and RHD; and thirdly the state of primary and secondary prevention in New Zealand.

Epidemiology of Acute Rheumatic fever in New Zealand

In New Zealand ARF is a notifiable disease but RHD is not. Much more data is available about ARF than RHD, but RHD trends will be directly related to ARF incidence. Moreover if there is to be control of RHD there must first be a reduction in ARF.

The incidence of ARF fell in New Zealand during the 20th century, but unlike other developed countries such as Europe where ARF disappeared, rates have remained constant at about 200 cases per year from 1980. This corresponds to 15 cases per 100,000 5–15 year olds for the population. However, there are great inequalities with the age-specific rates in the 1990s of 31.9/100,000 for Māori

children, 64.5/100,000 for Pacific children, and 1.7/100,000 for European children [1].

The Māori population, as the Indigenous or First Nation population of NZ, bears the burden of ARF as they form 15% of NZ's population. Pacific populations, the dominant ethnic group in South Auckland, form 5% of the total population. However, Māori and Pacific people together form 30% of the total population under 15 years of age due to more youthful population proportion than that in European ethnicity groups.

The Ministry of Health's Annual Surveillance Report of notifiable disease rates publish annual notification rates of ARF. The purpose of the notification rates is "the timely dissemination of information derived from these data for effective prevention and control activities". In the last decade notification rates were 100–150 cases per year.

The New Zealand Health and Information Service (NZHIS) publishes hospital admission rates of ARF based on ICD discharge codes. As just about all cases of recognised ARF are admitted to hospital the NZHIS data will be much closer to the true rates of ARF at 150–230 cases per year (Fig. 1) about 50% more than notifications. These differences are largely accounted for by under-notification of ARF rather than by recurrences of ARF which are as low as 5% [2–4] or by readmission rates which are infrequent for ARF. Note also that ARF incidence rates have also risen in

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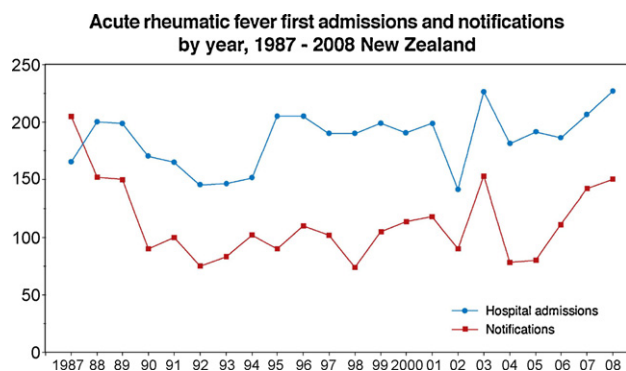


Figure 1. Acute rheumatic fever first admissions and notifications by year, 1987–2008 New Zealand.
Source: ESR <http://www.surv.esr.cri.nz>.

the past 10 years. The Ministry of Health should base policy and “control activities” on ICD discharge data which will more accurately reflect the true ARF incidence than on notification rates.

A recent epidemiology analysis has shown that ethnic disparities of ARF incidence are also actually widening [5]. From 1996 to 2005 the already low ARF rate among the New Zealand European population decreased, whereas the higher Māori and Pacific rates increased further (Fig. 2).

In 2001, 37% of Māori and 40% of Pacific population were under 15 years of age, compared to 23% European. The projection is that there will be a sustained youthful age structure in Māori and Pacific populations and without intervention, the rates of ARF will increase further in the next decade [3]. Despite the high Māori and Pacific rates of ARF and RHD it has not been proven that they have increased genetic susceptibility to rheumatic fever. It is more likely that their over-representation is due to a number of factors including overcrowding, poverty, increased incidence of streptococcal upper respiratory tract infections, decreased health care access and utilisation [3]. It remains unclear precisely what factor or factors render a person particularly susceptible to rheumatic fever [6].

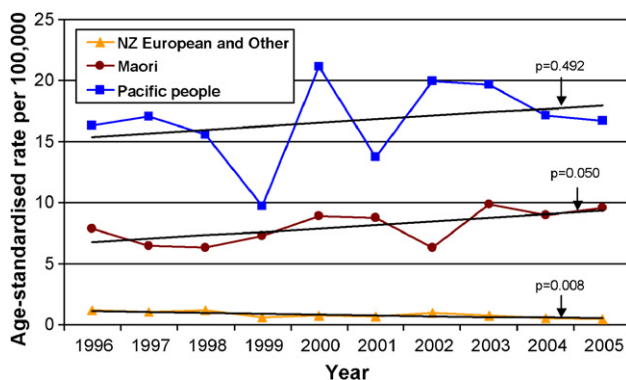


Figure 2. Annual rates of ARF first admissions by ethnicity, 1996–2005 all ages. Note that these are age adjusted rates for the total population, not just the 5–15 year age group [5].

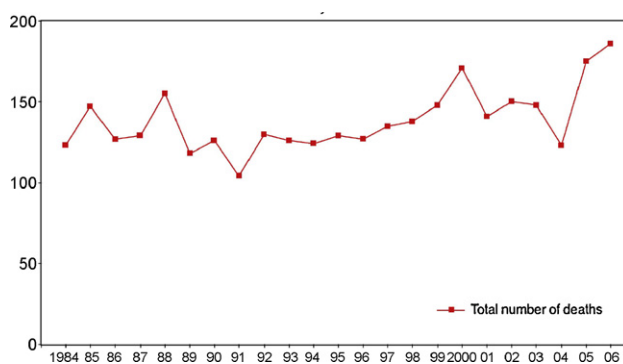


Figure 3. Chronic rheumatic heart disease deaths by year, 1984–2006, New Zealand.
Source: New Zealand Health and Information Service. www.nzhis.govt.nz/moh.

By Region

Māori are most populated in the upper north Island. Historically, the Wairoa College Study from 1956 to 1973 showed that the decline in incidence of ARF seen in other developed countries was not occurring in New Zealand [7]. These East Coast regions had some of the highest rates of ARF ever recorded at over 2000 per 100,100 Māori 5–15 year olds [7]. Currently the urban settings of Auckland and South Auckland account for over 60% of cases of ARF [3]. There are ARF rates of over 100 per 100,000 5–14 year olds in the Pacific population of Porirua East, Wellington (M. Mclean, Public Health Officer, personal communication).

Epidemiology of RHD

RHD is rare in affluent countries but it is still seen in adult patients as the legacy of RF of earlier decades [3]. Failure to prevent RF now means RHD will be a burden for decades to come for Māori and Pacific communities and for the health services and society. RHD is a significant cause of premature death in New Zealand [8,9]. From 1971 to 1980 there were on average 123 deaths from chronic RHD [10], between 1992 and 1996 there were 127 deaths per year (Progress on Health Targets, Ministry of Health, NZ 1997), in 2005 there were 175 deaths and in 2006 186 deaths (NZHIS) (Fig. 3)

History of Clinical Endeavour in ARF and RHD in New Zealand

Medical Aspects of ARF

There were a number of surveys conducted since the early 1900s, with the data reviewed by Stanhope in 1975 [11]. A rheumatic fever working party convened in Rotorua in 1983 with sentinel publications appearing in the New Zealand Medical Journal the following year [9,14,55,56]. There have been further workshops in Rotorua [12], Auckland in 1994, in 2005 to establish the rheumatic fever guidelines [3], and most recently in 2009.

Neutze and Clarkson collaborated in the important international study examining allergic reactions to

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