

# WORLD CONGRESS ON RHEUMATIC HEART DISEASE

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**Title:** POPULATION HEALTH IMPACTS OF THE RHEUMATIC FEVER STRATEGY IN AUSTRALIA, 2010-2017

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**Background & Aims:** In 2020 Australia responded to the 2018 World Health Organisation Global Resolution on acute rheumatic fever (ARF) and rheumatic heart disease (RHD) by developing the 'RHD Endgame Strategy', focussing on primordial and primary prevention of Strep A infections driving ARF/RHD which disproportionately impact First Nations Australians. The 2009 Rheumatic Fever Strategy (RFS) funded Control Programs (incorporating registers) which coordinate secondary prevention and tertiary care for ARF/RHD patients. This study aimed to measure population-level impacts of the 2009 RFS prior to introduction of the Endgame Strategy by examining ARF recurrence rates and progression to RHD complications/mortality and healthcare utilisation/costs 2010-2017.

**Methods:** The study used linked administrative data including RHD registers, hospitalisation/surgery records and International Classification of Disease (ICD-10) coded death records from five Australian jurisdictions (covering 70% of total and 86% of First Nations populations) assembled by the 'End RHD In Australia: Study of Epidemiology' (ERASE) project. A series of retrospective cohort studies and longitudinal analyses of health indicators between 2010 and 2017 was used to: 1. Measure ARF recurrence and ARF/RHD progression rates among young Australians within the context of RFS objectives; 2. Analyse the probability and risk predictors of adverse long-term health outcomes experienced by young Australians with initially uncomplicated RHD; 3. Calculate RHD mortality rates and describe cause of death among First Nations and other people diagnosed with RHD; and 4. Quantify health care utilisation and the hospitalisation costs associated with ARF, RHD and associated complications.

**Results:** Among <35-year olds on the register with initial ARF between 2010-2017, 10.7% had ARF recurrence and 8.4% progressed to severe RHD/death within 2 years of diagnosis, with this rate being constant over the study period. Annual average Benzathine Benzylpenicillin (BPG) delivery rate increased from 53% to 70% days covered between 2010 and 2016; receiving >80% of prescribed doses was associated with reduced risk of disease progression from mild RHD to severe RHD/death (Hazard Ratio 0.2, 95% confidence interval 0.1-0.8). One-fifth of <35-year-olds diagnosed with mild/moderate RHD experienced cardiovascular complications and/or death within 8 years of diagnosis, and of these 3.3% died, 7.8% experienced heart failure and 15.8% required surgery. Metropolitan residence and age >15-years at first RHD diagnosis were associated with increased risk of complication, whereas recorded history of ARF prior to RHD diagnosis reduced risk. Age-standardised RHD mortality in <65-year-olds was estimated to be 5.25 deaths per 100, 000 First Nations people and 0.33 deaths per 100, 000 non-Indigenous people (Rate Ratio 15.9, 95% confidence interval 13.0-19.3). However, cause of death (COD) analysis among a <65-year-old prevalent RHD cohort revealed only 15.0% of deceased people with RHD had RHD as the primary COD, with cancer and diabetes being other frequent causes. Health care utilisation and cost analyses indicated that ARF/RHD-related costs increased each financial year between 2012/13 and 2016/17 for <16-year-olds (from \$3.1m to \$4.1m) and for ≥16-year-olds (from \$16.6m to \$21.1m), with more than 60% of these admissions occurring via emergency presentation.

**Conclusions:** This study has generated evidence that the Australian 2009 RFS focusing on secondary and tertiary prevention of ARF/RHD achieved stable ARF recurrence and RHD progression rates between 2010-2017, but that increasing ARF/RHD notifications and lowered mortality rates among people with RHD contributed to steadily increasing health service demands and related costs. Expanded ARF and RHD interventions that incorporate existing strategies whilst focusing on primordial and primary prevention of ARF/RHD are needed to stabilise and reduce incident ARF/RHD and ever-increasing healthcare utilisation costs. A better understanding of concomitant comorbidities among First Nations Australians with RHD is needed to reduce premature mortality.