

SUPPLEMENTAL MATERIAL

Table S1: Cost (AU\$, 2013) of outpatient diagnosis of RHD

Item	Cost (min-max)	Source
Full Blood Examination	14	MBS, 2013
C Reactive Protein	15	MBS, 2013
Erythrocyte Sedimentation Rate	14	MBS, 2013
Streptococcal serology	13	MBS, 2013
Throat swab- culture	19	MBS, 2013
Blood culture	26	MBS, 2013
Xray-joint/chest	40	MBS, 2013
ECG	27	MBS, 2013
Echocardiogram	196	MBS, 2013
Paediatric cardiologist consult	64	MBS, 2013
Return travel to cardiology appointment*	1,000 (0-4,072)	RDH, 2011/12
Total cost (per episode)	1,428 (428-4,564)	

RHD- rheumatic heart disease; MBS-Medicare Benefits Schedule (available at <http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Home>)

*Includes travel for patient and escort.

Table S2: Cost (AU\$, 2013) of ARF/RHD admission to Royal Darwin Hospital (RDH)

Item	Cost (min-max)	Source
Inpatient admission with average length of stay*	7,057 (4,247-25,786)	NHCDC (2012/13) (RDH)
Return travel to RDH	2,036	NHCDC (2011/12) (RDH)
Boarder costs (travel + accommodation)	2,378	NHCDC (2011/12) (RDH)
Total cost (per episode)	11,471 (8,661-30.200)	

ARF- acute rheumatic fever; RHD- rheumatic heart disease; NHCDC,-National Hospital Cost Data Collection; RDH- Royal Darwin Hospital. *Inpatient cost based on a weighted average of the following Diagnosis Related Groups: F69A, F69B, F75A, F75B, F75C, I66A and I66B. Weights were based on the frequency of ARF/RHD admissions to RDH of 5-14 year olds, between 2008 and 2013. Costs per DRG were obtained from the Royal Darwin Hospital pricing data submitted to the NHCDC.

Table S3: Cost (AU\$, 2013) of cardiac valve surgery including transfer from the Royal Darwin Hospital (RDH) to the Royal Children’s Hospital (RCH) in Melbourne, Victoria, where surgery is performed

Item	Cost (min-max)	Source
Inpatient admission		
Dental procedure pre-surgery (RDH)*	3,431	NHCDC (2012/13) (RDH)
Medical stabilisation pre-surgery (RDH)**	25,246 (0-25,246)	NHCDC (2012/13) (RDH)
Cardiac surgery (RCH)	64,000 (35,000-102,000)	RCH, 2014 [#]
Return travel to RDH (2 people)	4,072	NHCDC (2011/12) (RDH)
Return travel to RCH (2 people)	4,000	Patient Travel, RDH
Total cost (per episode)[^]	88,126 (46,503-138,749)	
Average lifetime cost of surgery[~]	124,495 (65,695-196,010)	

NHCDC,-National Hospital Cost Data Collection; DRG-Diagnosis Related Group.

*DRG D40Z. **DRG F69A. [#]Costs provided by the RCH, Victoria, from a sample of NT RHD patients aged 5-14 during the year 2014 (n=6) who had RHD surgery with a mean cost of \$64,000 each (range \$35,000 - \$102,000.)

[^]Total cost reflects an estimated 50% probability of admission for medical stabilisation at some point prior to surgery (max cost reflects all cases are admitted for medical stabilisation prior to surgery). If a patient has heart failure and requires surgery, only the date of first surgery is simulated but the cost is multiplied by the probability of requiring future surgeries and discounted to reflect the delayed cost. [~]Average lifetime cost represents the possibility of multiple surgeries and was derived from the observed data where 63 children aged 5 to 15 years had 89 surgeries (RHD register 1999-2012).

Table S4: Cost (AU\$ 2013) of outpatient RHD care – annual cost per patient, depending on RHD severity

Item	Unit cost (min-max)	Source	Annual frequency (min-max) of cost, by RHD severity*			
			Inactive	Mild	Mod	Severe
GP consult (in community)	70 (36-103)	MBS 2013	1	1	2	4
Paediatrician consult (in community)	64 (64-128)	MBS 2013		1	1	2
Dental consult (in community)	128	PHIAC 2013	1	2 (1-2)	2 (1-2)	2 (2-2)
Cardiology consult (in hospital)	64	MBS 2013		0.5 (0.5-1)	1 (1-2)	2 (2-4)
Echocardiogram (in hospital)	196	MBS 2013		0.5	1	2 (2-4)
Return travel for cardiology consult**	1000 (0-2036)	RDH 2011-12		0.5 (0-1)	1 (0-2)	2 (1-4)
BPG Prophylaxis	29	MBS 2013		13	13	13 (13-17)
Prophylaxis nurse	50	NTPS EA 2011-14		13	13	13 (13-17)
ARF recurrence admission***	11,471	Table A1		0.045 (0.025-0.045)	0.045 (0.025-0.045)	0.045 (0.025-0.045)
Total cost per patient per year (min-max)			198 (164-231)	2567 (1,676-4,233)	3267 (1,843-6,534)	4732 (3,368-13,809)

RHD- rheumatic heart disease; GP-general practitioner; MBS-Medicare Benefits Schedule; PHIAC, Private Health Insurance Administration Council; RDH-Royal Darwin Hospital Patient Travel; BPG, Benzathine penicillin G; NTPS EA- Northern Territory Public Sector Enterprise Agreement; ARF acute rheumatic fever. *As recommended by the Australian guidelines. **Includes travel for patient and escort. ***Annual probability of ARF recurrence =4.5% (min 2.5%); sourced from Lawrence et al¹

Table S5: Estimated annual cost of portable echocardiographic screening for RHD

Item	Unit cost (AU\$)	Echo A (screen 2000 children/year in 80 sites)		Echo B (screen 4000 children/year in 40 sites)		Source
		Freq.	Total cost (min-max)	Freq.	Total cost (min-max)	
Fixed costs						
Equipment (lasts 5 years)						
Vivid I portable echo machine*	90,000	2	180,000	2	180,000	GE sales, 2013
Patient bed	360	2	720	2	720	Primemed.com.au, 2013
Laptop (mid-range)	1,000	2	2,000	2	2,000	Officeworks.com.au, 2013
Sub-total (5 years)			182,720		182,720	
Sub-total (annual)**			37,045		37,045	
Consumables (annual)						
Gel, ECG dots, tissues	-	-	500	-	500	Estimated
Administration, phones, stationary	-	-	5,000	-	5,000	Estimated
Sub-total			5,500 (4,500-6,500)		5,500 (4,500-6,500)	
Staff (annual FTE)						
Echo technician	117,000	1	117,000 (100,100-130,000)	1	117,000 (100,100-130,000)	NTPS award
Program coordinator (nurse)	117,000	1	117,000 (91,000-117,000)	1	117,000 (91,000-117,000)	NTPS award
Cardiologist	250,000	0.1	25,000 (25,000-50,000)	0.1	25,000 (25,000-50,000)	NTPS award
Sub-total			259,000 (216,100-297,000)		259,000 (216,100-297,000)	
Travel (annual- for 2 staff)						
Commercial plane (2 people, return)	1,500	10	15,000	10	15,000	SONT
Charter plane –day trip	5,000	10	50,000	5x2	50,000	SONT
Charter plane –overnight trip	8,000	10	80,000	-	-	SONT
Four-wheel drive (per week)	470	50	23,500	25	11,750	SONT
Fuel (per round trip)***	105	50	5,250	25	2,625	Average pump price, 2013
Accommodation (2 people per night)	300	50x2	30,000	40x3	36,000	SONT
Travel allowance (2 people per night)	175	50x2	17,520	40x3	21,024	NTPS award
Sub-total			221,270 (156,524-270,782)#		136,399 (89,274-206,115)^	
Total fixed (annual)			522,815 (414,169-611,327)		437,944 (346,919-546,660)	
Variable costs						
Positive screen (follow-up)						
Diagnostic echocardiogram	196	1	196	1	196	MBS, 2013
Cardiology consult	64	1	64 (64-128)	1	64 (64-128)	MBS, 2013
Travel (patient + escort)	1000	1	1,000 (0-2,000)	1	1,000 (0-2,000)	Patient Travel, RDH
Sub-total (per child)			1,260 (260-2,324)		1,260 (260-2,324)	
Total variable (2.5% positive cases)		n=50	63,000 (13,015-116,220)	n=100	126,000 (26,030-232,440)	
Total screening costs (\$AU per year)			585,815 (427,184-727,547)		563,944 (422,949-779,100)	

RHD- rheumatic heart disease; FTE- full-time equivalent. NTPS - Northern Territory Public Sector; SONT - Specialist Outreach Northern Territory; MBS- Medicare Benefits Schedule; RDH- Royal Darwin Hospital.

**Cost includes service and insurance over the recommended 5-year life span.*

***Annuity in advance over five years calculated as the upfront cost minus discounted re-sale price of 10% purchase price (\$168,403).*

****Based on pump price of \$1.40 per litre and fuel efficiency of 10L/100km, average travel distance 750km round trip.*

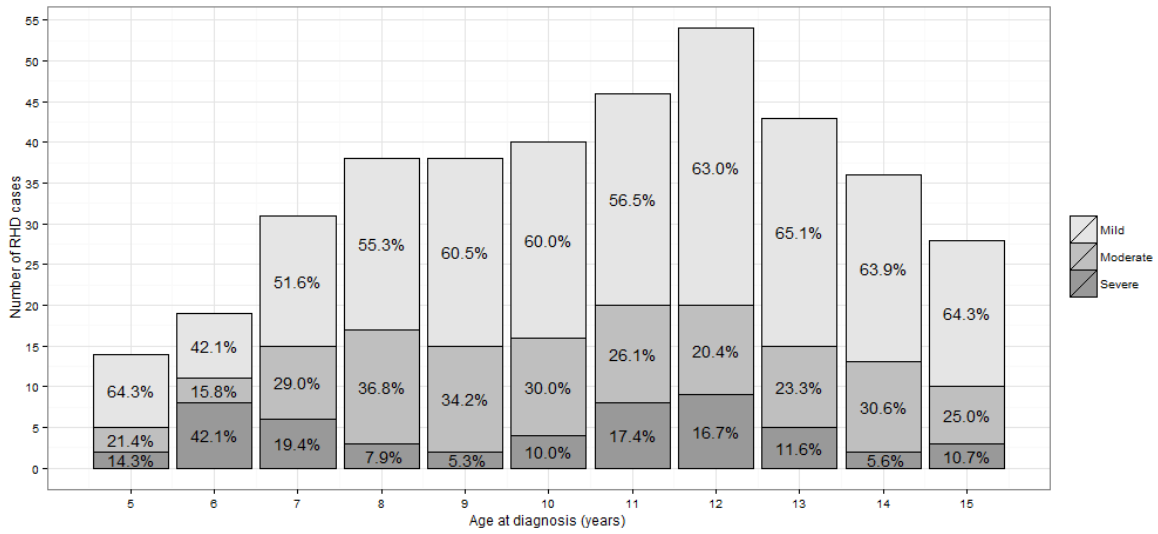
#Minimum cost based on 10 commercial plane trips (day trip) + 10 charter plane trips (day trip) + 60 road trips (four-wheel drive hire and fuel, accommodation and travel allowance);

maximum cost based on 10 commercial plane trips (overnight trip including accommodation and travel allowance) + 20 charter plane trips (overnight trip including accommodation and travel allowance) + 50 road trips (four-wheel drive hire and fuel, accommodation and travel allowance).

^Minimum cost based on 10 commercial plane trips (overnight trip including accommodation and travel allowance) + 30 road trips (four-wheel drive hire and fuel, accommodation and travel allowance);

maximum cost based on 5 commercial plane trips (overnight trip including accommodation and travel allowance) + 10 charter plane trips (overnight trip including accommodation and travel) + 25 road trips (four-wheel drive hire and fuel, accommodation and travel allowance)

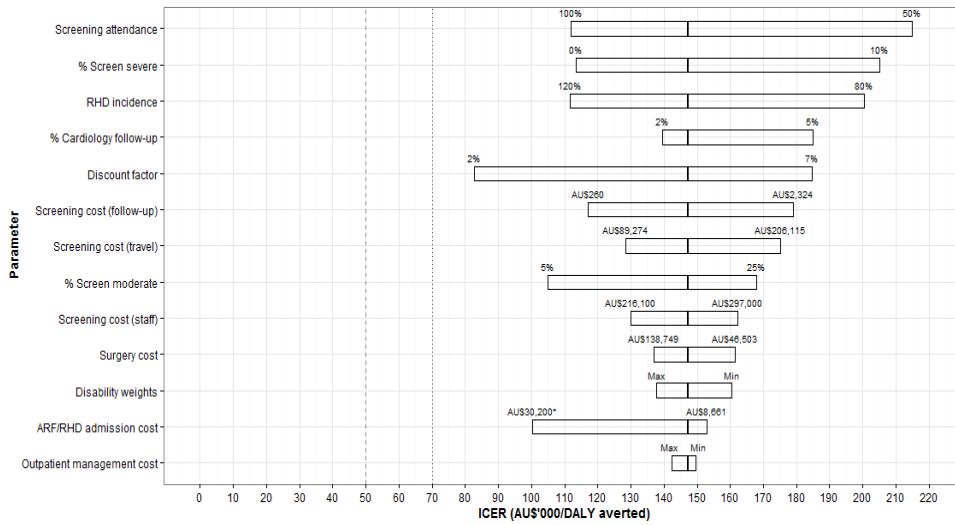
Figure S1: Number and severity of RHD cases diagnosed between 1999 and 2012 in Indigenous children of the Northern Territory, Australia (n=387*)



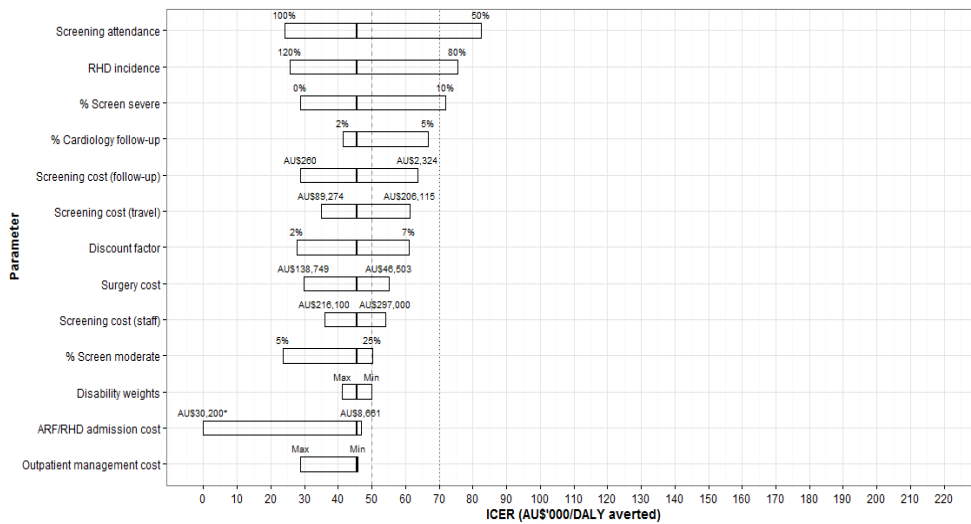
**Average annual incidence of RHD: 27.6 new cases per year in children aged 5-15 years.*

Figure S2: One-way sensitivity analysis of Echo B, Scenarios 1, 2 and 3

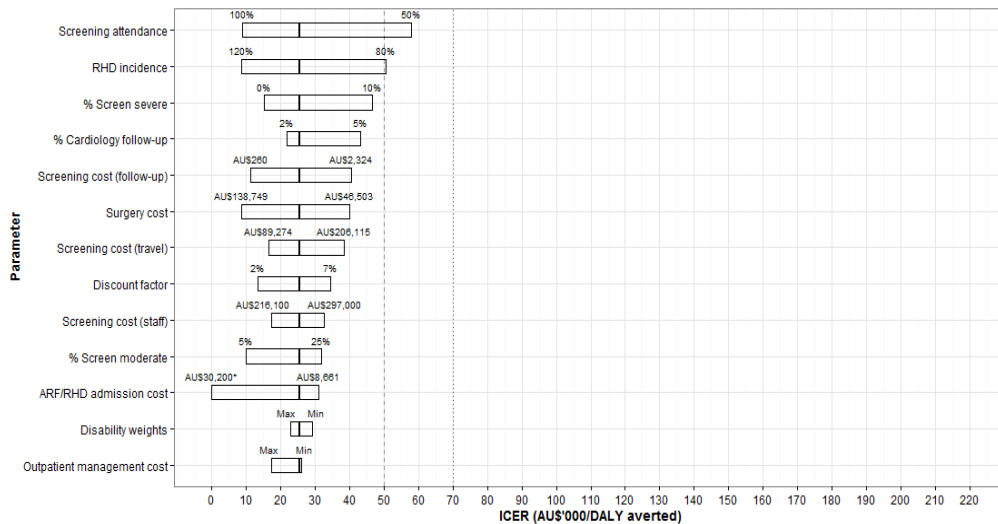
Scenario 1



Scenario 2



Scenario 3



Supplemental Reference:

1. Lawrence JG, Carapetis JR, Griffiths K, Edwards K, Condon JR. Acute rheumatic fever and rheumatic heart disease: incidence and progression in the Northern Territory of Australia, 1997 to 2010. *Circulation*. 2013;128:492-501.