

## 1.06 Acute rheumatic fever and rheumatic heart disease

**Incidence and prevalence of acute rheumatic fever and rheumatic heart disease among Aboriginal and Torres Strait Islander peoples expressed as a rate by age group, age-standardised rate and ratio**

### Data sources

Data for this measure come from the registers of acute rheumatic fever and rheumatic heart disease in the Top End of the Northern Territory and Central Australia. Published data on the incidence of acute rheumatic fever in North Queensland (Hanna & Heazlewood 2005) are also summarised here.

Data from the Top End registry cover the northern part of the Northern Territory including Darwin, East Arnhem, Lower Top End (Katherine region), Alligator, Daly, Finnis and Bathurst–Melville. Data from the Central Australian registry cover the Barkley region and Central Northern Territory (Alice Springs region). Although Central Australia also covers parts of Western Australia and South Australia, data from these areas have not been included because of difficulties in determining denominator populations for the calculation of rates.

Because of small numbers of registrations for acute rheumatic fever among the non-Indigenous population, incidence rates have not been calculated for non-Indigenous Australians. Rates presented for Indigenous Australians are therefore crude rates (that is, not age-standardised). Age-standardised rates and ratios have been used for data on rheumatic heart disease as a measure of morbidity in the Indigenous population relative to non-Indigenous Australians. Ratios of this type illustrate differences between the rates of morbidity among Indigenous people and those of other Australians, taking into account differences in age distributions.

Incidence data for acute rheumatic fever are for the period 2003–2006. Prevalence data for rheumatic heart disease are at 31 December 2006.

The 2001 estimated resident Indigenous populations for the Top End and Central Australia have been used as the denominator for rates. This is because data for the Top End and Central Australia are available from the ABS for Census years only. Caution should therefore be used in interpreting rates presented here.

Hospitalisation data on rheumatic heart disease from the AIHW National Hospital Morbidity Database and prevalence data from the National Aboriginal and Torres Strait Islander Health Survey are presented in Measure 1.05 (Circulatory disease).

# Analyses

## Incidence of acute rheumatic fever

- Between 2003 and 2006 there were 251 new and recurrent cases of acute rheumatic fever in the Top End of the Northern Territory and Central Australia, of which 247 (98.4%) were Aboriginal and Torres Strait Islander peoples (Table 1.06.1).

## Incidence by sex and age group

- For the 4-year period 2003–2006, Aboriginal and Torres Strait Islander children aged 5–14 years in the Top End of the Northern Territory and Central Australia accounted for over half (54%) of new and recurrent cases of acute rheumatic fever in these regions. There are very few cases of acute rheumatic fever in non-Indigenous children of the same age.
- The incidence of acute rheumatic fever among Aboriginal and Torres Strait Islander children aged 5–14 years in the Top End of the Northern Territory and Central Australia was around 2.0 per 1,000 among males and 2.9 per 1,000 among females (Table 1.06.1).
- Approximately 41% of new and recurrent cases of acute rheumatic fever in the Indigenous population were of males and 59% were of females (Table 1.06.1).

**Table 1.06.1: New and recurrent cases of acute rheumatic fever among Indigenous persons in the Top End of the Northern Territory and Central Australia, by age group and sex, 2003–2006<sup>(a)</sup>**

	Males					Females					Persons				
	No.	%	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(c)</sup>	95% UCL <sup>(d)</sup>	No.	%	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(c)</sup>	95% UCL <sup>(d)</sup>	No.	%	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(c)</sup>	95% UCL <sup>(d)</sup>
0–4	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	5	2.0	0.2	0.0	0.3
5–14	58	56.9	2.0	1.5	2.6	75	51.7	2.9	2.3	3.6	133	53.8	2.5	2.0	2.9
15–24	28	27.5	1.2	0.8	1.7	36	24.8	1.6	1.1	2.1	64	25.9	1.4	1.1	1.7
25–34	8	7.8	0.4	0.1	0.7	14	9.7	0.7	0.3	1.1	22	8.9	0.6	0.3	0.8
35–44	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	13	5.3	0.5	0.2	0.7
45+	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	10	4.0	0.3	0.1	0.5
<b>Total</b>	<b>102</b>	<b>100.0</b>	<b>0.9</b>	<b>0.7</b>	<b>1.1</b>	<b>145</b>	<b>100.0</b>	<b>1.3</b>	<b>1.1</b>	<b>1.5</b>	<b>247</b>	<b>100.0</b>	<b>1.1</b>	<b>1.0</b>	<b>1.2</b>

(a) Calender year reporting. Data are presented in 4-year groupings because of small numbers each year.

(b) Age-specific rates calculated using the average number of registrations for 2003–2006 divided by the 2001 estimated resident Indigenous population for the Top End and Central Australia.

(c) LCL = lower confidence limit.

(d) UCL = upper confidence limit.

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.

### **Incidence by region**

- In the 4-year period 2003–2006, there were over 150 new or recurrent cases of acute rheumatic fever in the Top End of the Northern Territory – 97% of these were Indigenous Australians. For the same period in Central Australia, there were 97 cases of acute rheumatic fever registered, all of which were Indigenous Australians (Table 1.06.2).
- In 2003–2006, incidence of acute rheumatic fever among Indigenous Australians in the Top End of the Northern Territory was around 0.6 per 1,000 and in Central Australia the incidence rate was around 1.1 per 1,000 (Table 1.06.2).
- Incidence rates of acute rheumatic fever among Indigenous Australians were around 80 times those for non-Indigenous Australians, which is the result of the very small number of notifications among non-Indigenous Australians.

**Table 1.06.2: New or recurrent cases of acute rheumatic fever in the Top End of the Northern Territory and Central Australia, by Indigenous status and sex, 2003–2006<sup>(a)</sup>**

	Number		Per cent <sup>(b)</sup>		Indigenous			Non-Indigenous			Ratio <sup>(f)</sup>
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	No. per 1,000 <sup>(c)</sup>	95% LCL <sup>(d)</sup>	95% UCL <sup>(e)</sup>	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(d)</sup>	95% UCL <sup>(e)</sup>	
<b>NT Top End</b>											
Males	70	n.p.	98.6	1.4	0.6	0.4	0.7	n.p.	n.p.	n.p.	174.0
Females	80	n.p.	96.4	3.6	0.7	0.6	0.9	n.p.	n.p.	n.p.	54.5
Persons	150	n.p.	97.4	2.6	0.6	0.5	0.8	n.p.	n.p.	n.p.	80.2
<b>Central Australia<sup>(g)</sup></b>											
Males	32	—	100.0	—	0.7	0.4	1.0	—	—	—	—
Females	65	—	100.0	—	1.5	1.1	1.9	—	—	—	—
Persons	97	—	100.0	—	1.1	0.8	1.3	—	—	—	—

(a) Calendar year reporting. Data are presented in 4-year groupings because of small numbers each year.

(b) Proportion of total male, female and all persons cases in the period 2003–2006.

(c) Directly age-standardised using the Australian 2001 standard population.

(d) LCL = lower confidence limit.

(e) UCL = upper confidence limit.

(f) Rate ratio Indigenous:non-Indigenous.

(g) Excludes cases in Western Australia and South Australia because of difficulties in ascertaining denominator populations.

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.

- Over the 5-year period 1999–2004, there were 144 episodes of acute rheumatic fever among Indigenous Australians in the seven Health Service Districts in North Queensland. The annual incidence rate of acute rheumatic fever among Indigenous people in these seven districts was 61 per 100,000 and throughout North Queensland the incidence rate was 54 per 100,000. Incidence rates were highest in the Cape York and the Torres Strait and Northern Peninsula Area Districts. More than three-quarters (76%) of cases of acute rheumatic fever occurred in children aged less than 15 years and the median age of cases was 12 years. The incidence rate for Indigenous children aged 5–14 years in North Queensland over the 5 years was 133 per 100,000 (Hanna & Heazlewood 2005).

### **Time series analyses**

Incidence rates for acute rheumatic fever among Indigenous Australians in the Top End, Northern Territory and Central Australia are presented in three year groupings for the period 1995–1997 to 2004–2006 in Table 1.06.3. Rates for non-Indigenous Australians are not presented because of the small number of cases each year.

Note that as population data for the Top End and Central Australia are available for Census years only, the 1996 estimated resident Indigenous population for these areas has been used as the denominator for rates for 1995–1997 and 1998–2000 and the 2001 estimated resident Indigenous population for these areas has been used as the denominator for rates for 2001–2003 and 2004–2006.

- Over the period 2001–2003 to 2004–2006 there was a significant decrease of 35% in the rate of acute rheumatic fever among Indigenous Australians in the Top End of the Northern Territory (Table 1.06.3; Figure 1.06.1).
- Over the periods 1995–1997 to 1998–2000 and 2001–2003 to 2004–2006, there were no significant changes in the rate of acute rheumatic fever among Indigenous Australians in Central Australia (Table 1.06.3; Figure 1.06.1).

Note also that changes in the level of accuracy of Indigenous identification in registration data will result in changes in the level of reported cases of acute rheumatic fever for Indigenous Australians. Caution should therefore be used in interpreting rates and changes over time.

**Table 1.06.3: Numbers and rates<sup>(a)</sup> of acute rheumatic fever in the Top End of the Northern Territory and Central Australia, Indigenous Australians, 1995–1997 to 1998–2000 and 2001–2003 to 2004–2006**

	1995–97	1998–2000	Difference in rates <sup>(b)</sup>	% change <sup>(c)</sup>	2001–03	2004–06	Difference in rates <sup>(b)</sup>	% change <sup>(c)</sup>
<b>Top End NT</b>								
Number	88	96	..		149	97	..	
Rate	0.8	0.9	0.1	9.1	1.3	0.8	–0.4*	–34.9
<b>Central Australia</b>								
Number	67	90	..		91	67	..	
Rate	1.3	1.7	0.4	34.3	1.7	1.2	–0.4	–26.4

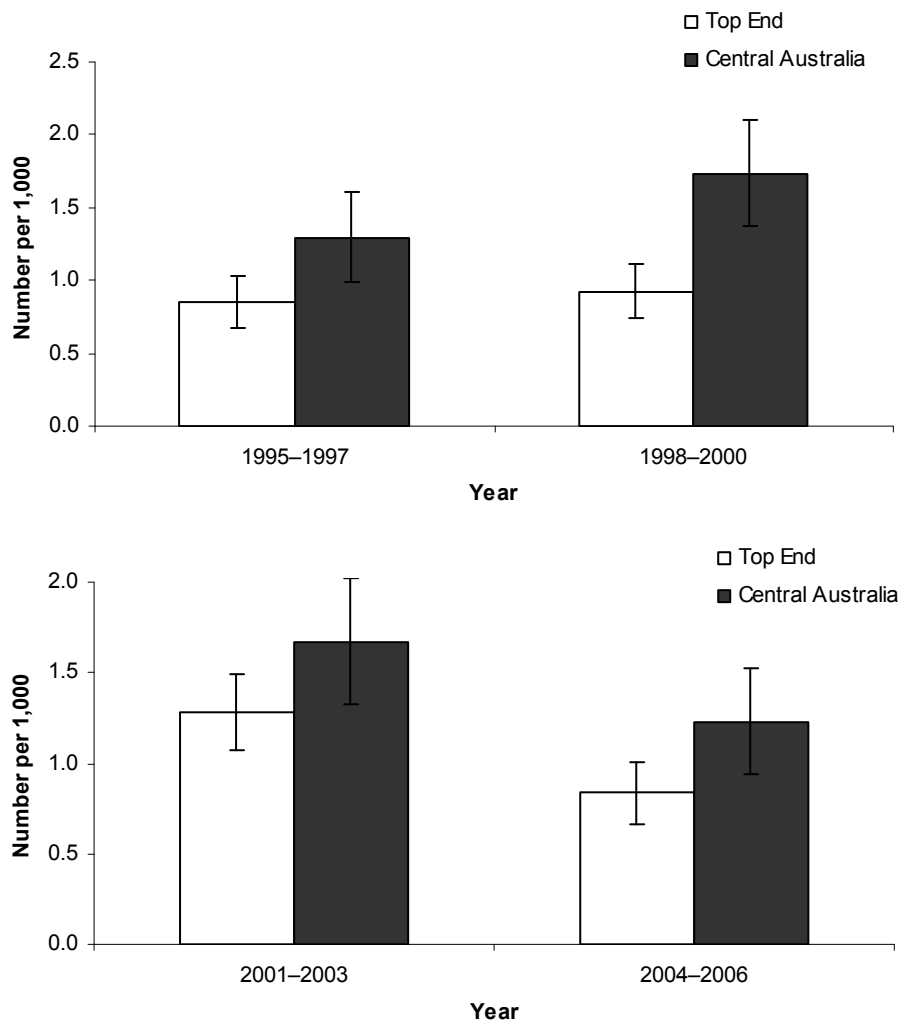
\* Represents significant increases or decreases over the period 1995–1997 to 1998–2000 and 2001–03 to 2004–2006 at the  $p < 0.05$  level.

(a) Crude rates per 1,000 population calculated using the 1996 estimated resident Indigenous population for the Top End and Central Australia for 1995–1997 and 1998–2000 and the 2001 estimated resident Indigenous population for the Top End and Central Australia for 2001–2003 and 2004–2006.

(b) Average annual change in rates determined using linear regression analysis.

(c) Per cent change between 1995–97 and 1998–2000 and per cent change between 2001–03 and 2004–06 based on the difference in rates over the period.

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.



Note: Figures have been split for the periods 1995-97 to 1998-2000 and 2001-2003 to 2004-2006 because of the use of a different denominator population used for each period (1996 population for 1995-97 to 1998-2000 and 2001 population for 2001-2003 to 2004-2006).

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.

**Figure 1.06.1: Rate of new and recurrent cases of acute rheumatic fever among Indigenous persons in the Top End of the Northern Territory and Central Australia, all ages, 1995-1997 to 1998-2000 and 2001-2003 to 2004-2006**

## **Prevalence of rheumatic heart disease**

- As at 31 December 2006, there were 1,402 cases of rheumatic heart disease in the Top End of the Northern Territory and Central Australia, of which 1,288 (92%) were Indigenous peoples.

### **Prevalence by sex and age group**

- As at 31 December 2006, rates of rheumatic heart disease in the Top End of the Northern Territory and Central Australia were between 19 and 28 per 1,000 among Indigenous adults between the ages of 25 and 64 years (Table 1.06.4).
- The biggest differences in rates of rheumatic heart disease between Indigenous and non-Indigenous Australians were in the 0-14, 15-24 and 25-34 year age groups, where rate ratios were between 47 and 61 (Table 1.06.4).
- Approximately 35% of cases of rheumatic heart disease in the Indigenous population were among Indigenous males and 65% among Indigenous females (Table 1.06.4).
- The overall prevalence rate for Indigenous males in the Top End of the Northern Territory and Central Australia was around 15 per 1,000. For Indigenous females, the prevalence rate was much higher at around 26-30 per 1,000.

**Table 1.06.4: Rheumatic heart disease registrations for Indigenous persons in the Top End of the Northern Territory and Central Australia, by age group and sex, as at 31 December 2006**

	Males						Females						Persons					
	No.	%	No. per 1,000 <sup>(a)</sup>	95% LCL <sup>(b)</sup>	95% UCL <sup>(c)</sup>	Rate ratio <sup>(d)</sup>	No.	%	No. per 1,000 <sup>(a)</sup>	95% LCL <sup>(b)</sup>	95% UCL <sup>(c)</sup>	Rate ratio <sup>(d)</sup>	No.	%	No. per 1,000 <sup>(a)</sup>	95% LCL <sup>(b)</sup>	95% UCL <sup>(c)</sup>	Rate ratio <sup>(d)</sup>
0–14	132	29.5	12.5	10.3	14.6	28.3*	194	23.1	19.9	17.1	22.7	148.7*	326	25.3	16.0	14.3	17.8	54.9*
15–24	119	26.6	20.6	16.9	24.4	42.7*	238	28.3	42.3	36.9	47.6	77.4*	357	27.7	31.3	28.1	34.6	61.1*
25–34	94	21.0	19.0	15.2	22.9	88.3*	184	21.9	36.9	31.6	42.2	37.2*	278	21.6	28.0	24.7	31.3	47.3*
35–44	44	9.8	13.0	9.1	16.8	29.3*	92	11.0	25.2	20.1	30.4	27.5*	136	10.6	19.3	16.1	22.6	29.1*
45–54	33	7.4	16.0	10.5	21.4	37.1*	80	9.5	35.9	28.0	43.7	27.1*	113	8.8	26.3	21.5	31.2	31.3*
55–64	18	4.0	17.0	9.2	24.9	13.6*	38	4.5	31.8	21.7	41.9	8.6*	56	4.3	24.9	18.4	31.4	11.1*
65+	8	1.8	12.0	3.7	20.3	4.8*	14	1.7	14.8	7.0	22.5	3.2*	22	1.7	13.6	7.9	19.3	3.9*
<b>Total</b>	<b>448</b>	<b>100</b>	<b>15.7</b>	<b>14.3</b>	<b>17.2</b>	<b>28.1*</b>	<b>840</b>	<b>100.0</b>	<b>29.6</b>	<b>27.6</b>	<b>31.6</b>	<b>27.1*</b>	<b>1288</b>	<b>100.0</b>	<b>22.6</b>	<b>21.4</b>	<b>23.9</b>	<b>28.0*</b>
<b>Total ASR<sup>(e)</sup></b>	<b>448</b>	<b>100</b>	<b>15.6</b>	<b>13.7</b>	<b>17.4</b>	<b>18.8*</b>	<b>840</b>	<b>100.0</b>	<b>29.0</b>	<b>26.7</b>	<b>31.2</b>	<b>19.3*</b>	<b>1288</b>	<b>100.0</b>	<b>22.3</b>	<b>20.9</b>	<b>23.8</b>	<b>25.5*</b>

\* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons at the  $p < 0.05$  level.

(a) Age-specific rates calculated using the 2001 estimated resident Indigenous population for the Top End and Central Australia.

(b) LCL = lower confidence limit.

(c) UCL = upper confidence limit.

(d) Rate ratio Indigenous:non-Indigenous.

(e) Total age-standardised rates.

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.

## Prevalence by region

Table 1.06.5 presents numbers and rates of rheumatic heart disease among Indigenous and non-Indigenous Australians in the Top End of the Northern Territory and Central Australia as at 31 December 2006.

- As at 31 December 2006, there were 1,053 cases of rheumatic heart disease in the Top End of the Northern Territory, of which 91% (959) were Indigenous Australians (Table 1.06.5).
- For the same reference period, there were 349 cases of rheumatic heart disease in Central Australia, of which 94% (329) were Indigenous Australians (Table 1.06.5).
- After adjusting for differences in age structures, rates of rheumatic heart disease among Indigenous males and females in the Top End of the Northern Territory were around 22 and 19 times the rates for non-Indigenous males and females respectively (Table 1.06.5).
- In 2006, the prevalence rate of rheumatic heart disease among Indigenous males and females in Central Australia was around 11 and 23 times the rates for non-Indigenous males and females respectively (Table 1.06.5).

**Table 1.06.5: Total number of rheumatic heart disease registrations in the Top End of the Northern Territory and Central Australia, by Indigenous status and sex, as at 31 December 2006**

	Number		Per cent <sup>(a)</sup>		Indigenous			Non-Indigenous			Ratio <sup>(e)</sup>
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(c)</sup>	95% UCL <sup>(d)</sup>	No. per 1,000 <sup>(b)</sup>	95% LCL <sup>(c)</sup>	95% UCL <sup>(d)</sup>	
<b>NT Top End</b>											
Males	332	33	91.0	9.0	15.4	13.3	17.6	0.7	0.4	1.0	21.7*
Females	627	61	91.1	8.9	30.1	27.4	32.8	1.6	1.1	2.1	18.8*
Persons	959	94	91.1	8.9	22.8	21.1	24.6	1.1	0.7	1.5	20.9*
<b>Central Australia<sup>(f)</sup></b>											
Males	116	9	92.8	7.2	15.2	11.9	18.5	1.4	0.2	2.5	11.2*
Females	213	11	95.1	4.9	25.9	22.0	29.7	1.1	0.4	1.8	23.1*
Persons	329	20	94.3	5.7	20.6	18.1	23.2	1.1	0.9	1.4	18.0*

\* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons at the p < 0.05 level.

(a) Proportion of total registrations for males, females and all persons.

(b) Directly age-standardised using the Australian 2001 standard population.

(c) LCL = lower confidence limit.

(d) UCL = upper confidence limit.

(e) Rate ratio Indigenous:non-Indigenous.

(f) Excludes cases in Western Australia and South Australia because of difficulties in ascertaining denominator populations.

Source: AIHW analysis of Top End Rheumatic Heart Disease Register and Central Australian Rheumatic Heart Disease Register data.

## Time series analyses

The registration of cases of rheumatic heart disease among Indigenous and non-Indigenous Australians has only been accurately ascertained in recent years since the Top End and Central Australian registries have become fully operational (June 2002 in Central Australia and June 1998 in the Top End). Trends have therefore not been presented here and any increase in prevalence over this period is likely to be due to an improvement in reporting and case finding, and to better awareness of the condition and its symptoms, rather than to an actual rise in the number of cases.

### Data quality issues

#### Registries of acute rheumatic fever and rheumatic heart disease

##### Registrations

*Registrations do not measure the incidence or prevalence of conditions in a population. Under-reporting of these conditions can occur at a number of stages. A person infected may not feel ill or may not seek medical care. The condition may not be diagnosed or a registration may not occur.*

*Liaison with the data custodians for these registers will be needed to identify any particular data quality issues to be taken into account in the use of these data.*

##### Under-identification

*The accurate identification of Aboriginal and Torres Strait Islander peoples within this data collection is less likely to be a problem given the high proportion of Aboriginal and Torres Strait Islander peoples in the Top End of the Northern Territory and in Central Australia and the predominance of Aboriginal and Torres Strait Islander peoples with this disease. Only 8 of the 153 cases of acute rheumatic fever registered in North Queensland from mid-1999 to mid-2004 were identified as non-Indigenous and 3 of these were of Pacific Island descent (Hanna & Heazlewood 2005).*

## References

Hanna JN & Heazlewood RJ 2005. The epidemiology of acute rheumatic fever in Indigenous people in north Queensland. *Australian and New Zealand Journal of Public Health* 29(4):313-17.