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Supporting Information

Supplementary methods and results

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Appendix to: Oliver J, Hardy M, Osowicki J, et al. Acute rheumatic fever and rheumatic heart disease in Victoria, 2006–18. *Med J Aust* 2022; doi: 10.5694/mja2.51374.

Supplementary methods

De-identified line-listed data from the Victorian Admitted Episode Dataset (VAED) and National Cause of Death Unit Record File(1, 2) were provided by the Victorian Department of Health Centre for Victorian Data Linkage (CVDL). Diagnostic information was captured using International Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modifications (ICD-10-AM) codes.(3) A unique person identifier, encrypted to protect privacy, was added by CVDL to all records following individual record linkage.(2) VAED data included unique person identifiers, principal diagnosis, additional diagnoses, month and year of hospital admission, age group, sex, residential local government area, and Aboriginal/Torres Strait Islander status. All VAED admissions where the principal diagnosis corresponded to ARF (ICD-10-AM: I00-I02) or RHD (ICD-10-AM: I05-I09) were included; a single patient could be hospitalised multiple times in either dataset. Patients not recorded as Victorian residents were excluded. Descriptive analyses of selected variables were performed. Population incidence and mortality rates with 95% confidence intervals (CI) were calculated using annual census estimates (Australian Bureau of Statistics).(4) Incidence rate ratios (IRR) with 95% CIs were calculated using Poisson regression. Analyses by Indigenous Australian ethnicity focused first on the population overall and then on those aged less than 40 years. Proportions and rates were compared using Chi-squared or Fisher exact tests. A statistically significant difference was ascribed where $p<0.05$. Statistical analyses were conducted using Stata 16.1 and R 4.1.0.

References

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2. Victorian Department of Health and Human Services. For researchers. Melbourne, Australia. 2020. https://www2.health.vic.gov.au/about/reporting-planning-data/the-centre-for-victorian-data-linkage/for-researchers (accessed 20 Oct 2020).
3. Victorian Department of Health and Human Services. Centre for Victorian Data Linkage. Melbourne, Australia. 2018 [updated Aug 2018]. https://www2.health.vic.gov.au/about/reporting-planning-data/the-centre-for-victorian-data-linkage/for-researchers/vdl-data-linkage-project (accessed 5 Feb 2021).
4. Australian Bureau of Statistics. 3235.0 - Population by Age and Sex, Regions of Australia, 2016. Canberra, Australia. 2018 [updated 28 Aug 2018]. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3235.02016?OpenDocument (accessed 28 Oct 2020).

Table. Hospital admissions among Victorian residents with acute rheumatic fever or rheumatic heart disease as principal diagnosis, Victorian Admitted Episode Dataset, 1 July 2006 to 30 June 2018

	Admissions						Deaths		
	Acute rheumatic fever			Rheumatic heart disease			Rheumatic heart disease[2]		
	Number[3]	Mean annual admissions per 100,000 (95% confidence interval) [1]	Incidence rate ratio (95% confidence interval)	Number	Mean annual admissions per 100,000 (95% confidence interval) [1]	Incidence rate ratio (95% confidence interval)	Number	Mean annual admissions per 100,000 (95% confidence interval) [1]	Incidence rate ratio (95% confidence interval)
Total	146	0.21 (0.18–0.25)	—	6758	9.89 (9.64–10.1)	—	1043	1.53 (1.43–1.62)	—
Age group (years)[5]									
< 5	5 (3%)	0.11 (0.04–0.27)	1	16 (0.2%)	0.36 (0.21–0.59)	1	1 (0.1%)	0.03 (0.00–0.14)	1
5–9	31 (21%)	0.73 (0.50–1.04)	6.4 (2.5–17)	22 (0.3%)	0.52 (0.33–0.79)	1.4 (0.7–2.7)	—	—	—
10–14	48 (33%)	1.17 (0.86–1.55)	10 (4.1–26)	30 (0.4%)	0.73 (0.49–1.04)	2.0 (1.1–3.7)	—	—	—
15–19	30 (20%)	0.69 (0.47–0.99)	6.1 (2.4–16)	33 (0.5%)	0.76 (0.52–1.07)	2.1 (1.2–3.8)	1 (0.1%)	0.03 (0.00–0.14)	1 (0.1–16)
20–29	17 (12%)	0.16 (0.10–0.26)	1.4 (0.5–3.9)	116 (1.7%)	1.12 (0.92–1.34)	3.1 (1.8–5.2)	2 (0.2%)	0.02 (0.00–0.08)	0.9 (0.1–9)
30–39	15 (10%)	0.15 (0.08–0.25)	1.3 (0.5–3.6)	211 (3.1%)	2.10 (1.83–2.41)	5.8 (3.5–9.6)	11 (1.1%)	0.11 (0.05–0.20)	4.4 (0.6–34)
40–49	—	—	—	358 (5.3%)	3.75 (3.37–4.16)	10.3 (6.3–17.0)	16 (1.5%)	0.17 (0.10–0.28)	6.9 (0.9–52)
50–59	—	—	—	789 (11.7%)	9.28 (8.64–9.95)	25.5 (15.6–41.8)	51 (4.9%)	0.66 (0.49–0.87)	26 (3.6–190)
60–69	—	—	—	1648 (24.4%)	24.8 (23.6–26.0)	68.1 (41.6–111)	107 (10.3%)	1.70 (1.38–2.06)	68 (9.4–485)
70–79	—	—	—	2198 (32.5%)	52.2 (50.0–54.4)	144 (87.8–235)	269 (25.8%)	6.69 (5.89–7.56)	267 (37.5–1900)
≥ 80	—	—	—	1337 (19.8%)	49.1 (46.5–51.8)	135 (82.5–221)	585 (56.1%)	22.7 (20.9–24.7)	907 (128–6450)
Sex									
Female	58 (40%)	0.31 (0.23–0.39)	0.6 (0.5–0.9)	3787 (56.0%)	11.1 (10.7–11.4)	1.3 (1.2–1.4)	669 (64.1%)	2.06 (1.91– 2.23)	1.8 (1.6–2.1)
Male	88 (60%)	0.48 (0.38–0.59)	1	2971 (44.0%)	8.5 (8.2–8.8)	1	373 (35.8%)	1.12 (1.00–1.24)	1
Unknown	—	—	—	—	—	—	1 (0.1%)	—	—
Indigenous Australians									
Yes	8 (6%)	1.83 (0.79–3.61)	4.9 (2.4–10)	45 (0.7%)	7.7 (5.6–10.3)	0.8 (0.6–1.1)	—	—	—
No	138 (94%)	0.37 (0.31–0.44)	1	6586 (97.5%)	9.6 (9.4 –9.9)	1	—	—	—
Unknown	—	—	—	127 (1.9%)	—	—	—	—	—
Indigenous Australians under 40 years of age				428	1.2 (1.0–1.3)	—	0	—	—
Yes	8 (6%)	1.8 (0.79–3.6)	4.9 (2.4–10)	18 (4.2%)	4.1 (2.4–6.5)	3.8 (2.4–6.2)	0	—	—
No	138 (94%)	0.37 (0.31–0.44)	1	397 (92.8)	1.1 (0.97–1.2)	1	0	—	—
Unknown	—	—	—	13 (3.0%)	—	—	0	—	—

[1] Per 100,000 population aged <40 years except where age group is specified.

[2] Following exclusion of people with acute rheumatic fever (ARF) aged ≥40 years no deaths with ARF were identified.

[3] Eleven people received a principal diagnosis of ARF and a principal diagnosis of rheumatic heart disease (RHD) for separate hospital admissions.

[4] Restricted to July 2006 through June 2017 which corresponds to population year of July–June. Cause Of Death Unit Record File (COD URF) data runs through to December 2017 and Victorian Admitted Episodes Dataset (VAED) data to June 2018.

[5] Age group categories for COD URF were supplied as: 26–30, 31–35, 36–40, 41–45, 46–50, 51–55, 56–60, 61–65, 66–70, 71–75, 76–80, >80 years. Individuals identified in COD URF were assigned to their closest VAED age group. This means individuals identified in COD URF aged 30, 40, 50, 60, 70 or 80 years are miscategorised.