



Supporting Information

Supplementary results

**This appendix was part of the submitted manuscript and has been peer reviewed.
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Appendix to: Hengel B, McManus H, Monaghan R, et al. Notification rates for syphilis in women of reproductive age and congenital syphilis in Australia, 2011–2021: a retrospective cohort analysis of national notifications data. *Med J Aust* 2024; doi: 10.5694/mja2.52388.

Table 1. Infectious syphilis notification rate for women aged 15–44 years, Australia, 2011–2021, by Indigenous status and age group

Indigenous status/age group/year	Annual notification rate (per 100,000 population)	
	Actual	Fitted (95% confidence interval)
Aboriginal or Torres Strait Islander women, 15-24 years		
2011	31.38	23.12 (15.92–30.32)
2012	18.91	32.17 (23.81–40.53)
2013	26.96	44.77 (35.27–54.26)
2014	59.50	62.29 (51.65–72.93)
2015	118.91	86.68 (74.37–98.99)
2016	128.36	120.61 (104.46–136.76)
2017	211.78	167.83 (142.66–193.00)
2018	212.24	233.53 (190.57–276.49)
2019	267.70	324.95 (250.88–399.03)
2020	229.58	230.45 (144.95–315.96)
2020.5	281.98	260.90 (198.01–323.78)
2021	287.30	307.16 (229.61–384.70)
Aboriginal or Torres Strait Islander women, 25-34 years		
2011	120.68	82.41 (62.85–101.97)
2012	109.48	93.45 (74.86–112.04)
2013	74.90	105.97 (88.54–123.40)
2014	78.21	120.17 (103.71–136.63)
2015	108.43	136.27 (119.75–152.78)
2016	153.79	154.52 (135.70–173.35)
2017	190.95	175.22 (150.93–199.51)
2018	207.57	198.70 (165.56–231.84)
2019	253.41	225.32 (179.90–270.74)
2020	203.73	204.24 (129.54–278.94)
2020.5	225.34	213.79 (163.80–263.78)
2021	218.44	227.48 (171.83–283.13)
Aboriginal or Torres Strait Islander women, 35-44 years		
2011	25.62	22.26 (15.89–28.63)
2012	27.88	29.10 (22.03–36.17)
2013	21.59	38.04 (30.37–45.71)
2014	45.72	49.72 (41.59–57.85)
2015	81.19	64.99 (56.44–73.55)
2016	84.43	84.95 (75.50–94.41)
2017	141.27	111.04 (98.92–123.17)
2018	123.35	145.15 (126.83–163.47)
2019	184.28	189.73 (160.09–219.37)
2020	139.14	139.25 (91.05–187.45)
2020.5	121.75	119.42 (95.56–143.28)
2021	133.59	134.68 (106.60–162.75)

Indigenous status/age group/year	Annual notification rate (per 100,000 population)	
	Actual	Fitted (95% confidence interval)
Aboriginal or Torres Strait Islander women, 15-44 years		
2011	56.23	39.91 (31.56–48.25)
2012	48.57	50.08 (41.32–58.83)
2013	39.99	62.84 (53.78–71.90)
2014	61.54	78.86 (69.41–88.30)
2015	105.76	98.96 (88.44–109.47)
2016	125.32	124.18 (110.81–137.56)
2017	187.55	155.83 (136.57–175.09)
2018	189.10	195.55 (166.34–224.76)
2019	242.81	245.40 (201.01–289.78)
2020	199.02	199.52 (138.14–260.89)
2020.5	224.16	212.66 (169.08–256.23)
2021	226.79	237.66 (186.67–288.65)
Non-Indigenous women, 15-24 years		
2011	0.56	0.36 (0.22–0.50)
2012	0.69	0.54 (0.36–0.71)
2013	0.62	0.80 (0.58–1.01)
2014	0.82	1.18 (0.92–1.44)
2015	1.03	1.74 (1.44–2.05)
2016	2.85	2.58 (2.21–2.95)
2017	5.18	3.82 (3.29–4.35)
2018	5.21	5.66 (4.75–6.58)
2019	8.13	8.38 (6.69–10.08)
2020	8.40	8.47 (5.64–11.30)
2020.5	8.00	6.72 (5.23–8.21)
2021	7.07	8.01 (6.15–9.86)
Non-Indigenous women, 25-34 years		
2011	1.76	0.97 (0.75–1.19)
2012	1.71	1.29 (1.05–1.54)
2013	1.60	1.72 (1.45–2.00)
2014	1.32	2.30 (2.00–2.59)
2015	2.63	3.06 (2.75–3.38)
2016	3.71	4.08 (3.74–4.43)
2017	5.42	5.45 (5.02–5.87)
2018	7.43	7.26 (6.62–7.90)
2019	10.29	9.68 (8.61–10.75)
2020	10.99	10.99 (8.84–13.13)
2020.5	10.89	11.05 (9.89–12.21)
2021	12.75	12.67 (11.29–14.05)
Non-Indigenous women, 35-44 years		
2011	0.97	0.88 (0.65–1.10)
2012	1.67	1.10 (0.86–1.34)
2013	1.40	1.38 (1.13–1.63)

Indigenous status/age group/year	Annual notification rate (per 100,000 population)	
	Actual	Fitted (95% confidence interval)
2014	1.27	1.73 (1.47–1.99)
2015	1.20	2.17 (1.91–2.43)
2016	3.04	2.72 (2.44–3.01)
2017	3.20	3.42 (3.06–3.78)
2018	5.06	4.29 (3.77–4.82)
2019	5.26	5.39 (4.57–6.20)
2020	6.85	6.85 (5.06–8.64)
2020.5	6.85	6.64 (5.70–7.58)
2021	7.30	7.39 (6.31–8.48)
Non-Indigenous women, 15-44 years		
2011	1.11	0.82 (0.61–1.02)
2012	1.38	1.07 (0.85–1.30)
2013	1.23	1.41 (1.17–1.65)
2014	1.15	1.85 (1.59–2.12)
2015	1.66	2.43 (2.13–2.74)
2016	3.23	3.20 (2.81–3.59)
2017	4.62	4.20 (3.62–4.79)
2018	5.98	5.53 (4.60–6.45)
2019	7.98	7.26 (5.79–8.74)
2020	8.83	8.85 (5.86–11.83)
2020.5	8.67	8.38 (6.47–10.28)
2021	9.22	9.52 (7.26–11.78)

Table 2. Infectious syphilis notification rate for women aged 15–44 years, Australia, 2011–2021, by Indigenous status and geographic location

Indigenous status/geographic region (remoteness)/year	Annual notification rate (per 100,000 population)	
	Actual	Fitted (95% confidence interval)
Aboriginal or Torres Strait Islander women, major cities		
2011	6.82	3.68 (1.25–6.11)
2012	11.52	5.16 (2.29–8.03)
2013	7.96	7.24 (3.92–10.55)
2014	3.08	10.15 (6.43–13.87)
2015	4.46	14.24 (10.13–18.35)
2016	17.31	19.97 (15.18–24.76)
2017	29.40	28.01 (21.36–34.66)
2018	33.95	39.29 (28.16–50.41)
2019	73.73	55.11 (35.33–74.88)
2020	84.15	85.24 (41.58–128.91)
2020.5	117.31	92.22 (61.64–122.80)
2021	87.53	108.75 (71.37–146.12)
Aboriginal or Torres Strait Islander women, inner and outer regional		
2011	19.10	25.20 (16.30–34.11)
2012	39.20	34.27 (24.20–44.33)
2013	35.89	46.59 (35.45–57.73)
2014	60.93	63.34 (51.06–75.62)
2015	90.78	86.12 (71.82–100.41)
2016	125.35	117.08 (97.83–136.33)
2017	253.22	159.18 (128.96–189.40)
2018	185.43	216.41 (165.85–266.98)
2019	205.35	294.23 (209.63–378.83)
2020	156.36	157.61 (82.17–233.05)
2020.5	145.94	122.87 (82.74–163.00)
2021	120.12	140.55 (92.44–188.65)
Aboriginal or Torres Strait Islander women, remote and very remote		
2011	210.54	128.86 (93.52–164.19)
2012	131.05	156.28 (120.36–192.20)
2013	105.58	189.54 (153.42–225.67)
2014	171.13	229.88 (193.03–266.73)
2015	329.83	278.81 (238.47–319.14)
2016	337.66	338.14 (287.95–388.34)
2017	370.72	410.10 (340.26–479.95)
2018	518.98	497.38 (395.63–599.14)
2019	683.60	603.24 (454.79–751.69)
2020	542.44	540.95 (309.69–772.22)
2020.5	626.33	665.00 (477.76–852.24)

2021	772.93	736.20 (519.22–953.17)
Non-Indigenous women, major cities		
2011	1.10	0.80 (0.59–1.00)
2012	1.39	1.06 (0.83–1.29)
2013	1.20	1.41 (1.16–1.66)
2014	1.18	1.88 (1.61–2.15)
2015	1.71	2.50 (2.20–2.80)
2016	3.53	3.33 (2.95–3.72)
2017	5.04	4.44 (3.87–5.01)
2018	6.08	5.91 (4.99–6.83)
2019	8.42	7.87 (6.37–9.38)
2020	9.09	9.10 (6.29–11.92)
2020.5	8.94	8.69 (6.90–10.48)
2021	9.70	9.94 (7.79–12.08)
Non-Indigenous women, inner and outer regional		
2011	1.03	0.66 (0.43–0.88)
2012	1.22	0.87 (0.62–1.12)
2013	1.31	1.16 (0.88–1.44)
2014	0.94	1.54 (1.24–1.85)
2015	1.51	2.05 (1.73–2.38)
2016	2.18	2.73 (2.38–3.09)
2017	3.32	3.64 (3.18–4.09)
2018	5.78	4.84 (4.15–5.53)
2019	6.63	6.44 (5.30–7.58)
2020	8.19	8.21 (5.73–10.69)
2020.5	7.43	6.95 (5.72–8.18)
2021	7.67	7.90 (6.45–9.35)
Non-Indigenous women, remote and very remote		
2011	2.77	2.34 (0.17–4.51)
2012	2.79	2.37 (0.54–4.20)
2013	1.40	2.40 (0.87–3.93)
2014	2.87	2.44 (1.12–3.75)
2015	1.47	2.47 (1.22–3.72)
2016	3.02	2.50 (1.13–3.87)
2017	1.55	2.54 (0.90–4.18)
2018	3.18	2.57 (0.55–4.59)
2019	3.25	2.61 (0.15–5.07)
2020	3.33	3.59 (-3.31–10.49)
2020.5	13.32	7.65 (2.04–13.27)
2021	5.18	7.99 (1.93–14.04)

Table 3. Infectious syphilis notification rate for women aged 15–44 years, Australia, 2011–2021, by Indigenous status and state/territory

Indigenous status/state or territory/year	Annual notification rate (per 100,000 population)	
	Actual	Fitted (95% confidence interval)
Aboriginal or Torres Strait Islander women, NSW		
2011	1.94	2.40 (0.28–4.53)
2012	5.68	2.97 (0.75–5.20)
2013	5.56	3.68 (1.40–5.96)
2014	3.62	4.55 (2.25–6.84)
2015	1.77	5.62 (3.30–7.95)
2016	5.21	6.96 (4.43–9.49)
2017	10.27	8.61 (5.39–11.82)
2018	3.36	10.64 (5.97–15.32)
2019	21.46	13.17 (6.05–20.28)
2020	25.87	26.48 (6.25–46.70)
2020.5	51.74	37.40 (21.70–53.09)
2021	33.17	42.07 (23.72–60.41)
Aboriginal or Torres Strait Islander women, NT		
2011	82.94	47.69 (16.44–78.94)
2012	23.47	71.46 (32.72–110.20)
2013	17.45	107.07 (59.96–154.18)
2014	149.84	160.43 (102.95–217.91)
2015	382.03	240.38 (165.02–315.74)
2016	552.36	360.18 (244.40–475.95)
2017	621.50	539.68 (335.25–744.10)
2018	784.86	808.63 (430.41–1186.85)
2019	710.64	1211.62 (516.47–1906.78)
2020	650.21	654.24 (67.68–1240.81)
2020.5	584.09	512.96 (196.22–829.71)
2021	538.17	614.73 (216.94–1012.51)
Aboriginal or Torres Strait Islander women, Qld		
2011	149.74	119.00 (93.84–144.15)
2012	148.86	133.39 (109.80–156.99)
2013	113.30	149.53 (127.69–171.38)
2014	138.74	167.62 (147.20–188.05)
2015	165.03	187.90 (167.49–208.32)
2016	179.93	210.64 (187.37–233.91)
2017	322.38	236.12 (206.20–266.05)
2018	256.71	264.69 (224.23–305.15)
2019	293.62	296.72 (241.91–351.53)

2020	179.73	179.88 (112.43–247.34)
2020.5	183.48	180.18 (137.99–222.37)
2021	187.96	190.27 (143.66–236.87)
Aboriginal or Torres Strait Islander women, SA		
2011	22.83	15.60 (4.36–26.84)
2012	22.46	21.39 (8.26–34.52)
2013	22.10	29.32 (14.34–44.30)
2014	10.79	40.19 (23.56–56.83)
2015	63.42	55.10 (37.03–73.16)
2016	52.26	75.53 (55.56–95.49)
2017	164.24	103.53 (78.55–128.52)
2018	161.45	141.93 (103.66–180.19)
2019	157.54	194.55 (129.09–260.01)
2020	153.76	156.81 (49.27–264.35)
2020.5	192.20	125.11 (74.05–176.16)
2021	112.57	143.83 (82.64–205.02)
Aboriginal or Torres Strait Islander women, Vic		
2011	8.40	3.82 (-0.03–7.67)
2012	0.00	6.06 (0.82–11.30)
2013	8.14	9.60 (2.65–16.56)
2014	8.03	15.23 (6.28–24.17)
2015	15.79	24.14 (13.06–35.23)
2016	46.88	38.28 (24.94–51.61)
2017	91.72	60.68 (43.87–77.49)
2018	97.13	96.21 (69.56–122.86)
2019	130.97	152.53 (99.37–205.69)
2020	28.41	27.00 (-11.31–65.31)
2020.5	42.61	73.60 (41.29–105.91)
2021	110.54	96.15 (52.42–139.87)
Aboriginal or Torres Strait Islander women, WA		
2011	32.66	17.47 (9.01–25.93)
2012	18.54	25.73 (15.19–36.28)
2013	27.62	37.90 (25.07–50.74)
2014	45.61	55.83 (40.55–71.11)
2015	129.98	82.24 (64.13–100.35)
2016	97.43	121.14 (98.30–143.97)
2017	138.64	178.44 (144.59–212.28)
2018	186.33	262.84 (204.16–321.52)
2019	518.50	387.16 (279.65–494.67)
2020	519.42	520.47 (299.39–741.55)
2020.5	673.62	646.73 (471.46–821.99)

2021	759.94	785.80 (563.10–1008.50)
Non-Indigenous women, NSW		
2011	0.77	0.55 (0.33–0.77)
2012	1.04	0.72 (0.48–0.96)
2013	1.02	0.94 (0.68–1.20)
2014	1.15	1.23 (0.96–1.50)
2015	1.00	1.61 (1.32–1.90)
2016	1.51	2.10 (1.77–2.44)
2017	2.00	2.75 (2.29–3.21)
2018	4.02	3.59 (2.86–4.32)
2019	6.00	4.70 (3.51–5.88)
2020	5.68	5.71 (3.34–8.09)
2020.5	5.30	4.59 (3.27–5.91)
2021	4.65	5.16 (3.60–6.72)
Non-Indigenous women, NT		
2011	0.00	0.27 (-0.43–0.96)
2012	2.65	0.41 (-0.49–1.32)
2013	0.00	0.63 (-0.52–1.79)
2014	0.00	0.97 (-0.45–2.39)
2015	0.00	1.49 (-0.22–3.19)
2016	0.00	2.28 (0.22–4.35)
2017	2.57	3.50 (0.66–6.35)
2018	15.51	5.37 (0.43–10.31)
2019	2.61	8.24 (-1.41–17.88)
2020	10.48	10.78 (-8.48–30.04)
2020.5	10.48	5.12 (-2.00–12.24)
2021	2.66	6.06 (-2.74–14.85)
Non-Indigenous women, Qld		
2011	1.34	1.07 (0.69–1.44)
2012	2.41	1.39 (0.98–1.80)
2013	1.40	1.82 (1.38–2.25)
2014	2.36	2.37 (1.92–2.82)
2015	1.92	3.09 (2.62–3.56)
2016	3.18	4.03 (3.50–4.57)
2017	4.82	5.26 (4.52–6.00)
2018	6.83	6.86 (5.69–8.03)
2019	10.93	8.95 (7.02–10.88)
2020	12.74	12.82 (8.76–16.87)
2020.5	12.74	11.14 (8.83–13.44)
2021	11.45	12.55 (9.87–15.23)
Non-Indigenous women, SA		
2011	0.00	0.12 (-0.02–0.26)
2012	0.63	0.18 (0.00–0.37)
2013	0.00	0.29 (0.05–0.53)

2014	0.00	0.45 (0.14–0.75)
2015	1.25	0.69 (0.32–1.07)
2016	0.94	1.08 (0.64–1.53)
2017	1.88	1.69 (1.12–2.25)
2018	2.81	2.63 (1.72–3.54)
2019	3.72	4.10 (2.33–5.88)
2020	3.08	2.96 (0.18–5.74)
2020.5	1.23	3.92 (2.18–5.67)
2021	6.21	4.91 (2.65–7.18)
Non-Indigenous women, Vic		
2011	1.71	1.18 (0.75–1.61)
2012	1.76	1.58 (1.10–2.06)
2013	1.89	2.12 (1.59–2.65)
2014	1.13	2.83 (2.25–3.41)
2015	2.85	3.79 (3.13–4.45)
2016	6.34	5.07 (4.21–5.93)
2017	9.29	6.78 (5.49–8.08)
2018	9.15	9.08 (6.98–11.17)
2019	10.56	12.14 (8.72–15.57)
2020	12.35	12.35 (6.66–18.05)
2020.5	9.91	9.92 (6.81–13.03)
2021	11.29	11.28 (7.58–14.97)
Non-Indigenous women, WA		
2011	1.46	0.49 (0.22–0.76)
2012	0.20	0.67 (0.35–0.98)
2013	1.18	0.91 (0.55–1.27)
2014	0.20	1.24 (0.84–1.63)
2015	1.17	1.69 (1.26–2.11)
2016	3.13	2.30 (1.82–2.77)
2017	2.56	3.13 (2.52–3.73)
2018	4.53	4.26 (3.33–5.19)
2019	6.09	5.80 (4.22–7.37)
2020	7.41	7.39 (4.06–10.73)
2020.5	15.21	15.64 (13.04–18.24)
2021	18.98	18.78 (15.56–21.99)

Table 4. Numbers and notification rate of notifications of congenital syphilis, Australia, 2011–2021, by Indigenous status

Year	Number of notifications		Notification rate (per 100,000 live births)	
	Aboriginal and Torres Strait Islander people	Non-Indigenous people*	Aboriginal and Torres Strait Islander people	Non-Indigenous people*
2011	3	3	17.0	1.1
2012	0	0	0.0	0.0
2013	4	3	21.8	1.0
2014	3	0	16.9	0.0
2015	2	1	10.8	0.3
2016	1	1	5.4	0.3
2017	5	3	24.5	1.0
2018	4	5	18.2	1.7
2019	1	3	4.6	1.1
2020	8	9	36.3	3.3
2021	9	6	38.3	2.1

* Includes two cases with unknown Indigenous status.

STROBE Statement: checklist of items that should be included in reports of observational studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2-3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants	3-4
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3-4
Bias	9	Describe any efforts to address potential sources of bias	4-5
Study size	10	Explain how the study size was arrived at	n/a
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-5
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	4-5
		(b) Describe any methods used to examine subgroups and interactions	5
		(c) Explain how missing data were addressed	n/a
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	n/a
		(e) Describe any sensitivity analyses	4
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5-7
		(b) Give reasons for non-participation at each stage	n/a
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	n/a

		(b) Indicate number of participants with missing data for each variable of interest	n/a
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	n/a
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time	n/a
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure	n/a
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures	n/a
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	5-7
		(b) Report category boundaries when continuous variables were categorized	n/a
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	5-7
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	18	Summarise key results with reference to study objectives	7
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	9
Generalisability	21	Discuss the generalisability (external validity) of the study results	n/a
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	n/a

* The page numbers in this table refer to the submitted manuscript, not to the published article or its Supporting Information file.