The comparison of health status and health services utilisation between Indigenous and non-Indigenous infants in Australia

Abstract

Objective: To examine the differences in health services utilisation and the associated risk factors between Indigenous and non-Indigenous infants at a national level in Australia.

Methods: We analysed data from a national representative longitudinal study, the Longitudinal Study for Australian Children (LSAC) starting in 2004. We used survey logistic regression and survey multiple linear regression to examine the factors associated with health services utilisation. Results: Health status of Indigenous infants was poorer than that of non-Indigenous. In comparison to non-Indigenous infants, in the previous 12-month period, the Indigenous infants were significantly less likely to use the following health services: maternal and child health centre or help lines (OR=0.35, 95%CI: 0.24-0.49); maternal and child health nurse visits (OR=0.45, 95%CI: 0.32-0.63); general practitioners (GPs) (OR=0.45, 95%CI: 0.31-0.64); and paediatrician (OR=0.52, 95%CI: 0.35-0.77). In contrast, they were more likely to visit a hospital outpatient clinic (OR=1.82, 95%CI: 1.16-2.85). Mothers' age, education and marital status were associated with certain health services use. Financial status and residential location were the important predictors of the use of health services. Conclusion: The rates of health services utilisation by Indigenous infants were lower and were associated with mothers' characteristics and socio-economic status. Implications: The gaps in health services utilisation between Indigenous and non-Indigenous infant requires immediate policy initiatives. Further research is needed to explore the causal pathways between health status, health services utilisation and multiple risk factors at different levels. Key words: Indigenous infants, health status, health services, utilisation.

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Lixin Ou, Jack Chen, Ken Hillman

The Simpson Centre for Health Services Research, University of New South Wales

John Eastwood

Australian Health Policy Institute, School of Public Health, University of Sydney, New South Wales

arked disparities in health status and health services utilisation among Indigenous populations have been previously documented. Previous studies have revealed that Indigenous people are less likely to access health services, encounter more barriers in the use of health services, and experience poorer health status and shorter life expectancy compared with non-Indigenous people.¹⁻⁴ In Australia, Indigenous infants have a higher perinatal mortality compared with non-Indigenous infants.^{3,5} Over the period 2002 to 2004, the mortality rate for Indigenous infants was almost three times the rate for non-Indigenous infants in Queensland, Western Australia, South Australia and the Northern Territory combined.3 In Western Australia, Indigenous infants are almost twice as likely to be preterm or of low birth-weight compared with non-Indigenous infants.5 The poor health outcomes for Indigenous infants have challenged the equitable use of health services among Australian children.

Understanding the gaps in health service utilisation between Indigenous and non-Indigenous children would facilitate early intervention and provision of appropriate medical services. Studies of this type are usually limited to state or community levels.⁶⁻⁹ Little is known nationally about the difference in health services utilisation between Indigenous and non-Indigenous

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infants or the risk factors associated with accessibility.

The Longitudinal Study of Australian Children (LSAC) program provides an opportunity to examine health services utilisation at the national level.¹⁰ We undertook this study using data from this large, Australian representative cohort study. We aimed to answer two questions: 1) What are the differences in health services utilisation between Indigenous and non-Indigenous infants? 2) What are the risk factors associated with the health services utilisation apart from aboriginality?

Methods

Study design and sampling

We drew data from the first wave infant cohort (0-12 months old) of the LSAC. The sampling design and its methodology have been described elsewhere.¹¹ Briefly, the LSAC first wave interviews were conducted between March and November 2004 with a two-stage stratified, clustered design.¹¹ Using the Health Insurance Commission (HIC) Medicare database, that includes approximately 98% of all Australian infants and children as the sampling frame, the sample elements were firstly stratified by state or territory and then by urban or rural status. Within each of the strata, about one of the 10 Australian postcodes was randomly included in the study

Correspondence to: Lixin Ou, The Simpson Centre for Health Services Research, The University of New South Wales. Fax: (02) 9612 0742; e-mail: Lixin.Ou@sswahs.nsw.gov.au

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as the primary sampling units to ensure proportional geographic representation. Only one child per family was recruited to the study. Close to 5,000 families and their selected children are involved in wave 1 of both the infant cohort (n=5,107) and the kindergarten cohort (n=4,906). For the infant cohort, 8,921 families were sent a letter of invitation for participation in the study by HIC where 970 of them were non-contacts due to change of address or postal box. This gave rise to a response rate of 64.2% (excluding non-contacts) or 57.2% (including non-contacts).

Data collection

A two-and-half-hour face-to-face interview with the primary care-giving parent, usually the mothers, was undertaken in the home by trained professional interviewers. The parents also completed a written questionnaire during the interview for return later. For each participating child, a written informed consent was obtained. The study was approved by the Australian Institute of Family Studies Ethics Committee.

The Indigenous status of infants was recorded by the interviewers using defined criteria.¹² Infants whose biological mother or biological father identified her or him as being of Aboriginal or Torres Strait Islanders origin, including those people who originated from the Torres Strait Islands to the north of the tip of mainland Queensland were defined as Indigenous. Those who identified as of Kanak (New Caledonia) descent or from Papua New Guinea, the Solomon Islands or other Pacific Islands were not to be treated as being of Aboriginal or Torres Strait Islander origin, unless they are also identified as being of Australian Indigenous origin. Infants from non-English speaking background (NESB; n=525) were excluded from this study because they have been acknowledged as another minority group with health disadvantages.¹³ The final sample comprised 230 Indigenous infants and 4,352 non-Indigenous infants.

Health service utilisation

Health services utilisation was measured at three levels: primary health care (maternal and child health centre, maternal and child health nurse, general practitioner (GP), hospital outpatient clinic, and other medical or dental services); secondary health care (hospitalisation and hospital emergency wards); and tertiary health care (paediatrician and other specialist). Respondents were asked to consider whether they used any of these services for the study child during the past 12 months. A hospitalisation in the present study is a hospital admission due to a medical condition or illness other than injury or accident.

The predicting variables of the health services utilisation

We explored a wide range of variables in relation to the health services utilisation. These variables included infant characteristics (i.e. age, sex and birth-weight), maternal characteristics (age, marital status, education status, employment status, smoking during pregnancy) and current alcohol binge drinking status (six drinks or more in a row and two to three times or more per month), and 'region of residence' (metropolitan versus non-metropolitan). We also included family income per week (less than \$499, \$500-\$999, \$1,000-\$1,499, \$1,500-\$1,999, \$2,000 or more), the advantage and disadvantage index of Socio-Economic Indexes for Areas (SEIFA), and private health insurance. SEIFA value is a composite measure from the 2001 census at the postcode of residence level, and low values indicate an area of disadvantage.¹⁴

The concurrent health outcomes

Four concurrent health outcomes were included in our analysis:

- A five-point Likert scale of the global overall health rating of the infants by the surveyed parents (1 excellent; 2 very good; 3 good; 4 fair; 5 poor).
- A composite physical outcome index that is a composite score of the global overall health rating and six-item special health care needs screening questions for infants.¹⁵

The screening questions included:

- Does child currently need or use medicine prescribed by a doctor, other than vitamins?
- Is this because of any medical, behavioural or other health condition?
- Is this a condition that has lasted or is expected to last for at least 12 months?
- Does child need or use more medical care than is usual for most children of the same age?
- Is this because of any specific medical, behavioural or other health condition (not just the common cold)?
- Is this a condition that has lasted or is expected to last for at least 12 months? This score reflected a physical outcome of the child at a particular point in time.
- Any medical conditions or disabilities that have lasted, or likely to last for six months or more.
- 4) Any injury or accident since birth that required medical attention from a doctor or hospital.

The derivation of the composite score of physical health domain was developed by the LSAC Consortium following a set of prespecified guiding principles¹⁵ and took three steps:

- creating standardised (mean=0, SD=1) variables for both overall health rating variable and the sum of the six-item screening score so that both variables would be of equal weight;
- 2) standardising both variables by the age of infants at interview in five groups (less than six months, six to seven months, eight to nine months, 10 to 11 months and 12 months or more). After this standardisation, the needs screening score was multiplied by -1 so that high score indicated positive outcome;
- the summation of both overall health rating and needs screening score was further standardised to a normally distributed variable (mean=100, SD=10). This final standardised variable was the one used in our analysis.

Data analysis

We analysed the data according to survey statistical principles and took into account the design features of the study. Analyses were weighted for the multistage sampling design, allowing for unequal probabilities of selection into the sample, and for no response. First-order Taylor linearisation was used to obtain estimates of standard error taking account of the stratification and the correlation of responses within postcodes. Rao-Scott chi-square was used to examine the distributional difference between Indigenous and non-Indigenous infants to categorical variables. Survey linear regression was carried out to test the mean difference of the continuous variables between the Indigenous and non-Indigenous infants. We also conducted survey logistic regression to examine the association between estimates of health services utilisation and predictive variables. We tested the interaction effects between Indigenous status and remoteness classification as defined by Australia Bureau of Statistics (ABS) for all multivariate models. If the interaction effect was not significant, the results with only main effects were presented. Statistical significance was calculated with 95% confidence intervals. All analyses were performed with Stata 9.2 (StataCorp. College Station,TX).

Results

There were 4,567 infants included in our analysis, of whom 225 were Indigenous infants (4.9%). The numbers slightly varied within the analyses due to missing items.

Measures of health services utilisation

The average number of visits to health services listed in Table 1 by Indigenous infants was significantly lower than that by non-Indigenous infants in the previous 12 months (2.5 vs 3.1, p < 0.001). Indigenous infants were less likely than non-Indigenous to use maternal and child health centre or phone help (32.7% vs 58.4%, p < 0.001); maternal and child health nurse (48.7% vs 68.0%, p < 0.001); GP (67.7% vs 82.5%, p < 0.001); or paediatrician (25.0% vs 39.1%, p < 0.001). However, Indigenous infants were more likely than non-Indigenous infants to visit a 'hospital outpatient

clinic' (16.3% vs 9.7%, p=0.01;) or to be hospitalised (17.0% vs 9.9%, p=0.01). In the previous 12 months, Indigenous infants were less likely than non-Indigenous infants to obtain health care when services needed (15.2% vs 9.8%, p=0.04). There were no significant differences in terms of visiting other medical or dental services, hospital emergency ward or other specialists.

Infants, maternal and neighbourhood characteristics

There was no difference in the average age of non-Indigenous and Indigenous infants, or the gender ratio (Table 2). The mean birth-weight for Indigenous infants was much lower than that for non-Indigenous infants (3089.3 Gram vs 3410.0 Gram, p<0.001).

Maternal characteristics were significantly different between the two groups. Compared with non-Indigenous mothers, Indigenous mothers were significantly younger (p<0.001); were more likely to be single (37.7% vs 9.1%, p<0.001); were more than twice as likely to have left school before Year 12 (p<0.001); were far less likely to be employed (12.1% vs 35.0%, p<0.001); had more than three times as the rate of smoking during pregnancy (59.6% vs 17.5%, p<0.001); and were more likely to have binge drinking two or three times per month (15.6% vs 7.6%, p<0.001).

There were significant differences across all neighbourhood characteristics between Indigenous and non-Indigenous infants. Indigenous infants were more than three time as likely as non-Indigenous infants to live in households with a weekly income less than \$499. Indigenous infants were also more likely than non-Indigenous infants to live in areas of disadvantage (SEIFA scores 962.7 vs 1006.8, p<0.001). A higher proportion of Indigenous infants were reported to be living in a non-metropolitan area (p<0.001), in a remote or very remote area (13.0% vs 3.7%; p<0.001) and Indigenous infants were far less likely to have insurance coverage (12.1% vs 48.0%, p<0.001), compared with non-Indigenous infants.

Table 1: The utilisation of health services and OR by Indigenous infants versus non-Indigenous infants in the	
past 12 months, %.	

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Health services	Proportions of utilis	(95% CI) (p=3 900)		
	Non-Indigenous (n=3,746)	Indigenous (n=154)	<i>p</i> -value	Indigenous vs Non-Indigenous
Mean visits to any service below (±SD)	3.1±1.5	2.5±1.6	<0.001 ^d	
Maternal & child health centre/phone help	58.4	32.7	<0.001 ^d	0.35 (0.24, 0.49) ^d
Maternal & child health nurse visits	68.0	48.7	<0.001 ^d	0.45 (0.32, 0.63) ^d
General practitioner	82.5	67.7	<0.001 ^d	0.45 (0.31, 0.64) ^d
Hospital outpatient clinic	9.7	16.3	0.01 ^d	1.82 (1.16, 2.85) ^d
Other medical or dental services	8.8	9.9	0.61	1.14 (0.69, 1.88)
Hospital emergency ward	21.4	24.5	0.32	1.19 (0.85, 1.66)
Hospitalisation	9.9	17.0	0.01 ^d	1.85 (1.19, 2.90) ^d
Paediatrician	39.1	25.0	<0.001 ^d	0.52 (0.35, 0.77) ^d
Other specialist	12.1	8.0	0.17	0.64 (0.33, 1.22)
Services needed but not get it ^b	9.8	15.2	0.04 ^c	1.64 (1.03, 2.62) ^c

Notes: a) The proportions were weighted for survey data; b) The observations for this variable = 3,768; c) Significant at 5%; d) Significant at 1%.

Health outcomes between Indigenous and non-Indigenous infants

More Indigenous infants than non-Indigenous infants were rated with a health status of fair or poor (5.7% vs 3.2, p=0.04). Indigenous infants had significantly lower Physical Health Index scores than that of non-Indigenous infants (97.6 vs 100.2, p<0.01), and were twice as likely as non-Indigenous infants to experience lasting medical conditions or disabilities (11.0% vs 5.4%, p < 0.01). There was no difference in medical care needs due to injury or accident between the two groups.

Multivariate analyses

The multivariate logistic regression analyses are listed in Table 3. There were no significant interaction effects between the Indigenous status and the remoteness classification. The older mothers were more likely to use maternal and child health centre or phone help, and more likely to see another specialist compared with those mothers were aged between 15 and 25 years. Married or de facto mothers were more likely to seek help from a maternal and child health centre or its help line and twice as less likely to see other specialists or use other medical or dental services (Table 3). The mothers who completed school year 12 or equivalent, or had tertiary qualification, were more likely to use maternal and child health centres or their help lines, maternal and child health nurse visits, and their infants were less likely to be admitted to a hospital due to medical condition or illness. The mother smoking during pregnancy was inversely associated with the use of the maternal and child health centre or phone help and the use of other specialists. Increased family income was associated with increased use of GPs and other medical or dental services. The impact of the remoteness on the access to health services was the same between Indigenous and non-Indigenous infants as there was no significant interaction effect. Guardians of infants living in a moderately accessible area were less likely to visit a maternal and child health centre (or use help lines) and less likely to see a GP or a paediatrician, compared to those infants living in a highly accessible area. Conversely, those infants living in a remote area were almost twice as likely to be hospitalised due to certain illness or chronic conditions and those infants living in a very remote area were six times less likely to visit other specialists. Guardians with infants covered by private health insurance were more likely to visit maternal and child health centre (or use phone help), other specialists or paediatrician, but were less likely to visit hospital outpatient clinic.

Discussion

In a large national representative sample, we found that Indigenous infants were significantly worse off in both guardian-rated health outcomes and the composite physical health outcome index and had a lower level of health services utilisation. They were also twice as likely to have medical conditions or disabilities lasting more than six months. Indigenous infants or their mothers were less likely to visit a GP or paediatrician; visit a maternal and child health centre Table 2: Characteristics of the study children and their mothers by Indigenous status.^c

Characteristics	Non-Indig n=4,342⁴	Indig n=225₫	<i>p</i> -value
Infant			
Mean age by month (SE)	8.8 (0.06)	8.7 (0.20)	0.62
Male, %	51.4	53.4	0.63
Mean birth weight(Gram)(SE)	3410.0 (10.91)	3089.3 (68.39)	<0.001b
Maternal			
Mothers' age groups			
15~20 years	3.7	18.3	<0.001 ^b
21~25 years	12.6	23.3	
26~30 years	26.1	22.6	
31~35 years	37.3	26.6	
36~40 years	16.6	7.1	
41 years or older	3.7	2.2	
Marital status, %			
Married/de facto	90.9	62.3	<0.001 ^b
Single	9.1	37.7	
Education, %			
Tertiary qualification	67.1	38.2	<0.001 ^b
Year 12 or equivalent only	12.8	9.6	
Under Year 12	20.1	52.3	
Mother employed, %	35.0	12.1	<0.001 ^b
Smoking during pregnancy, %	17.5	59.6	<0.001 ^b
Alcohol binge 2/3 times per month	,% 7.6	15.6	<0.001 ^b
Neighbourhood			
family income per week, %			
Less than \$499	11.9	40.4	<0.001 ^b
\$500-\$999	32.6	41.2	
\$1.000-\$1.499	27.0	12.7	
\$1.500-\$.1999	14.3	4.1	
\$2.000 or more	14.2	1.7	
Mean SEIFA score ^e	1006.8	962.7	<0.001 ^b
Remoteness classification	(4.22)	(6.18)	
Highly accessible	55 9	29.4	<0 001 ^b
Accessible	25.1	15.7	
Moderately accessible	15.3	42.0	
Remote	2 1	7.5	
Verv remote	1.1	5.5	
Region of residence %	1.0	5.5	
Matropolitan	61.2	20.0	~0 001b
Non motropolitan	25.7	61.9	<0.001
Private health incurance covered %	30.7 40 0	10.1	-0 001b
Infonto' hoolth status	9 40.0	12.1	<0.001
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Overall health failing for fail of poo	1, % 3.2	07.C	0.04
	(0.16)	97.6 (0.85)	0.01
Medical conditions or disabilities, 9	% 5.4	11.0	0.01 ^b
Medical care needs due to injury	6.6	7.7	0.58

b) Significant at 1%. Notes: a) Significant at 5%;

c) The percentages were weighted for the survey data.

d) The number may slightly varied due to missing items.

e) SEIFA: Socio-Economic Index for Areas.

Study Child has any medical conditions or disabilities that have lasted, or are likely to last. for six months or more.

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Mothers' marial status I.04 (1.38-2.74) 0.30 (0.83-1.29) 1.09 (0.76-1.58) 1.04 (0.62-1.75) 0.50 (0.28-0.86) ⁺ Mothers' education status I.00 1.00 1.00 1.00 1.00 1.00 year 12 or equivalent 1.11 (0.85-1.45) 1.86 (1.28-2.21) ⁺ 1.28 (0.99-1.82) 1.26 (0.86-1.85) 0.81 (0.46-1.36) Wother smoking during pregrams/year were were were were were were were w	41 and older	1.20 (0.66-2.16)	1.20 (0.69-2.09)	1.69 (0.85-3.35)	1.39 (0.59-3.30)	2.67 (0.88-8.10)
married vs single 1.94 (1.38.2.74) 0.90 (0.83-1.29) 1.09 (0.76-1.58) 1.04 (0.62-1.75) 0.50 (0.28-0.86) [×] under Yoar 12 1.00	Mothers' marital status					
Mother's eriducation status view rid 2 or equivalent 1.10 0.00 1.00 1.00 1.00 1.00 1.00 year 12 or equivalent 1.11 0.851 0.81 </td <td>married vs single</td> <td>1.94 (1.38-2.74)^b</td> <td>0.90 (0.63-1.29)</td> <td>1.09 (0.76-1.58)</td> <td>1.04 (0.62-1.75)</td> <td>0.50 (0.28-0.86)ª</td>	married vs single	1.94 (1.38-2.74) ^b	0.90 (0.63-1.29)	1.09 (0.76-1.58)	1.04 (0.62-1.75)	0.50 (0.28-0.86)ª
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Mothers' education status					
year 12 or equivalent 1.11 (0.85-1.45) 1.88 (1.28-2.21)° 1.38 (0.99-1.82) 1.26 (0.85-1.85) 0.81 (0.48-1.36) Mother samking during pregnancy year van 0 0.76 (0.63-0.91)° 0.91 (0.74-1.13) 1.06 (0.86-1.36) 1.18 (0.33-1.67) 1.30 (0.87-1.96) Family income per weak least than 3409 0.91 (0.67-1.25) 1.01 (0.75-1.88) 1.38 (0.99-1.86) 1.02 (0.74-1.41) 1.10 (0.78-1.99) sets than 3409 0.91 (0.67+1.25) 1.01 (0.72-1.80) 1.36 (0.98-1.36) 1.05 (0.65-1.70) 1.38 (0.78-2.41) \$1,000-\$1,499 0.98 (0.68-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59) 1.05 (0.65-1.70) 1.38 (0.78-2.44) \$1,000-\$1,499 0.98 (0.68-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59) 1.03 (0.56-1.61) 1.58 (0.86-2.90) \$1,500-\$1,999 0.98 (0.68-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59) 1.03 (0.56-1.82) 2.03 (1.07-3.65) [*] Pennoteness classification highly accessible 0.83 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.70-1.17) 0.52 (0.61-1.73) 1.56 (0.61-27) medicatably accessible 0.58 (0.67-1.03) 0.98 (0.77-1.42) 0.91 (0.70-1.17) 0.52 (0.61-1.71) 1.16 (0.88-1.52) medicatably accessible 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.49) [*] 1.12 (0.332.40) 1.13 (0.72-1.78) Private health insurance coverage yeas no 1.22 (1.02-1.44) [*] 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.80) 1.12 (0.84-1.51) Covarlates Mespital means coverage yeas no 1.26 (0.21-1.43) 1.12 (0.92-1.65) 1.03 (0.52-2.05) 0.99 (0.62-1.05) medigenous status yeas no 1.05 (0.72-1.52) 1.56 (0.32-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) 1.11 (0.63-1.94) 2.6-30 0.72 (0.47-1.25) 0.73 (0.41-1.32) 5.77 (1.72-1.18)P 1.20 (0.67-2.13) 3.1-36 0.72 (0.47-1.25) 0.73 (0.41-1.32) 5.77 (1.21-1.89) 1.20 (0.67-2.13) 3.1-36 0.72 (0.47-1.25) 0.73 (0.41-1.32) 5.74 (1.72-1.18)P 1.20 (0.67-2.13) 3.1-36 0.72 (0.47-1.25) 0.73 (0.41-1.32) 5.74 (1.72-1.18)P 1.20 (0.67-2.13) 3.1-36 (0.72-1.01) 0.04 (0.62-1.55) 0.44 (0.42-0.99) [*] 0.99 (0.62-1.61) 3.1-36 (0.72-1.52) 0.73 (0.41-1.32) 5.74 (1.72-1.81)P 1.20 (0.67-1.32) 3.1-36 (0.72-1.52) 0.73 (0.41-1.32) 5.74 (1.72-1.81)P 1.20 (0.67-1.32) 3.1-36 (0.72-1.32) 0.76 (0.51-1.31) 0.88	under Year 12	1.00	1.00	1.00	1.00	1.00
inflarg qualification 1.33 (1.08-1.65) 1.71 (1.38-2.12) ² 1.28 (0.99-1.86) 1.18 (0.83-1.67) 1.30 (0.87-1.96) Worther answing during pregnancy 0.76 (0.63-0.91) ⁴ 0.91 (0.74-1.13) 1.06 (0.86-1.36) 1.02 (0.74-1.41) 1.11 (0.76-1.59) Pamily income per week 0.76 (0.63-0.91) ⁴ 0.91 (0.75-1.38) 1.00 1.00 1.00 1.00 1.00 1.00 (0.76-2.41) S1.000-\$1,499 0.01 (0.74-1.35) 1.01 (0.72-1.40) 1.61 (1.11-2.34) 0.56 (0.56-1.70) 1.58 (0.68-2.60) S2.000 or more 1.90 (0.87-1.72) 0.86 (0.58-1.72) 0.66 (0.57-0.55) 0.33 (0.57-1.80) 0.88 (0.77-1.24) 0.91 (0.70-1.7) 0.28 (0.51-0.55) 0.57 (0.56-0.35) Permote 0.56 (0.27-1.05) 0.58 (0.47-1.05) 0.58 (0.57-0.55) 0.51 (0.56-1.17) 0.57 (0.56-0.35) 0.57 (0.56-0.35) 0.57 (0.56-0.35) 0.57 (0.56-0.35) 0.57 (0.56-0.35) 0.57 (0.56-0.35) 0.57 (0.57-0.35) 0.51 (0.16-1.58) 0.57 (0.57-1.78) 0.57 (0.57-0.45) 0.47 (0.27-0.45) ⁴ 1.12 (0.82-1.60) 0.57 (0.57-1.78) 0.57 (0.57-0.45) 0.57 (0.57-0.45) 0.57 (0.57-0.45) 0.56 (0.52-1.60)	vear 12 or equivalent	1.11 (0.85-1.45)	1.68 (1.28-2.21) ^b	1.38 (0.99-1.92)	1.26 (0.86-1.85)	0.81 (0.48-1.36)
Mother smoking during pregnancy The field in the present of the field in the present of the field in the present of	tertiary qualification	1 33 (1 08-1 65) ^b	1 71 (1 38-2 12) ^b	1 28 (0 99-1 66)	1 18 (0 83-1 67)	1 30 (0 87-1 96)
Nome intensity out in parallel. 0.76 (0.63-0.91) ^b 0.91 (0.74-1.13) 1.08 (0.86-1.36) 1.02 (0.74-1.41) 1.11 (0.75-1.59) Family income per week 1.00 1.00 1.00 1.00 1.00 SSUG-8999 0.91 (0.67-1.25) 1.01 (0.75-1.38) 1.36 (0.99-1.86) 1.05 (0.65-1.70) 1.58 (0.86-280) \$1,000-51,499 0.00 (7.41-38) 1.01 (0.72-1.40) 1.61 (1.11-2.34) 0.65 (0.56-1.61) 1.58 (0.86-280) \$2,000 or more 1.19 (0.83-1.72) 0.86 (0.58-1.27) 0.66 (0.56-1.61) 1.00 1.01 1.01 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1.31) 1.12 (0.84-1	Mother smoking during pregner			1.20 (0.00 1.00)	1110 (0.00 1.07)	1.00 (0.07 1.00)
yes vin 0 0.76 (0.55 0.57) 0.57 (0.57 1.57) 1.06 (0.69 1.50) 1.06 (0.67 1.57) 1.07 (0.75 1.59) less than \$499 1.00 (0.71 2.5 1.01 (0.75 1.38) 1.36 (0.99 1.66 1.05 (0.65 1.61) 1.58 (0.65 2.64) \$1,000 531,499 1.09 (0.68 1.13) 1.01 (0.75 1.38) 1.36 (0.99 1.66 1.05 (0.65 1.61) 1.58 (0.65 2.64) \$1,500 531 99 0.99 (0.68 1.44 1.23 (0.48 1.82) 1.73 (1.15 2.54) \$2,000 or more 1.19 (0.83 1.72) 0.66 (0.58 1.27) 2.06 (1.36 3.12) 1.03 (0.56 1.82) 2.03 (1.07 3.85) [*] Highly accessible 0.67 (0.54 0.64) ⁴ 0.84 (0.65 1.10) 0.66 (0.57 1.05 (0.65 1.77) 0.82 (0.61 1.77) 0.87 (0.65 1.82) 2.03 (1.07 3.85) [*] metoreness classification Highly accessible 0.57 (0.57 1.49) 1.05 (0.48 2.31) 0.91 (0.38 2.16) 1.34 (0.56 1.77) 0.87 (0.66 1.27) Remote 0.95 (0.75 1.19) 1.05 (0.48 2.31) 0.91 (0.38 2.16) 1.34 (0.56 1.17) 0.87 (0.66 1.27) Private health insurance overage Very remote 1.22 (1.02 1.44) [*] 1.12 (0.94 1.34) 1.14 (0.92 1.41) 0.64 (0.48 -0.86)b 1.12 (0.84 1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Pacialist Indigenous status yes van 1.05 (0.72 1.52) 1.56 (0.82 2.65) 1.03 (0.52 2.05) 0.99 (0.62 1.60) Mothers' age 15-20 1.00 1.00 1.00 1.00 1.00 21-25 0.41 (0.49 1.34) 0.93 (0.53 1.63) 3.28 (0.93 1.158) 1.11 (0.63 1.94) 26-30 0.77 (0.47 1.25) 0.73 (0.41 1.32) 5.77 (1.24 1.80) [*] 1.28 (0.72 2.26) 31 -35 0.77 (0.47 1.25) 0.73 (0.41 -1.32) 5.77 (1.24 1.80) [*] 1.28 (0.72 2.26) 41 and older 0.52 (0.27 1.01) 0.63 (0.26 1.52) 4.42 (1.18 1.64) [*] 1.36 (0.72 2.53) Mothers' angle 0.76 (0.51 1.13) 1.08 (0.65 1.80) 0.64 (0.42 0.99) [*] 0.94 (0.67 1.32) Mothers' angle 0.76 (0.51 1.13) 1.08 (0.65 1.80) 0.64 (0.42 0.99) [*] 0.94 (0.67 1.32) Mothers' angle 0.76 (0.51 1.13) 1.08 (0.65 1.80) 0.64 (0.42 0.99) [*] 0.94 (0.67 1.32) Mothers' angle 0.76 (0.57 1.48) 0.87 (0.62 1.51) 1.00 1.00 1.00 21 -25 0.01 (0.07 1.52) 0.73 (0.41 1.32) 5.77 (1.24 2.09) [*] 1.22 (0.67 2.13) 31 -35 0.77 (0.47 1.25) 0.73 (0.41 -1.32) 5.77 (1.42 1.80) [*] 1.28 (0.72 2.25) Mothers' martial status martid vasingle 0.76 (0.57 1.			0 01 (0 74 1 19)	1 00 (0 06 1 06)	1 00 (0 74 1 41)	1 11 (0 79 1 50)
Family income per views i.o.0 1.00 1.00 1.00 1.00 \$500-\$5999 0.91 (0.67-1.25) 1.01 (0.75-1.38) 1.38 (0.99-1.86) 0.05 (0.55-1.70) 1.36 (0.75-2.44) \$51,000-\$1,499 0.09 (0.68-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59) 0.15 (0.65-1.70) 1.35 (0.28-2.90) \$52,000 cr more 1.19 (0.83-1.72) 0.86 (0.58-1.27) 2.06 (1.36-3.12) 1.00 (0.58-1.82) 2.03 (1.07-3.85)* Remoteness classification 1.00 1.00 1.00 1.00 1.00 1.00 accessible 0.83 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.37-0.17) 0.82 (0.61-1.11) 0.16 (0.88-1.52) moderately accessible 0.67 (0.54+0.24)* 0.44 (0.65-1.10) 0.66 (0.51-0.43)* 0.51 (0.16-1.65) Very remote 0.54 (0.27-1.05) 0.91 (0.37-1.43) 0.47 (0.27-0.84)* 1.24 (0.70-2.59) 0.51 (0.16-1.56) Very remote 0.54 (0.27-1.62) 1.56 (0.22-2.65) 1.03 (0.52-0.05) 0.91 (0.82-1.16) Indigenous status very remote 1.05 (0.72-1.52) 1.56 (0.22-2.65) 1.03 (0.52-0.05) 0.99 (0.62-1.6		0.76 (0.63-0.91)*	0.91 (0.74-1.13)	1.00 (0.00-1.30)	1.02 (0.74-1.41)	1.11 (0.76-1.59)
less than \$499 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	Family income per week					
\$500-\$5999 0.91 (0.67-1.25) 1.01 (0.75-1.38) 1.36 (0.99-1.86) 1.05 (0.56-1.61) 1.36 (0.36-2.40) \$51.000-\$1,999 0.99 (0.66-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59) 1.05 (0.56-1.61) 1.95 (1.02-3.74) \$52.000 or more 1.19 (0.83-1.72) 0.86 (0.58-1.27) 2.06 (1.36-3.12)b 1.03 (0.58-1.82) 2.03 (1.07-3.85)* Remoteness classification 1.00 1.00 1.00 1.00 1.00 1.00 accassible 0.83 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.37-1.17) 0.82 (0.51-1.11) 0.16 (0.88-1.52) moderately accessible 0.67 (0.54-0.84)* 0.84 (0.85-1.10) 0.66 (0.51-0.83)* 0.81 (0.56-1.87) 0.57 (1.61-1.85) very remote 0.54 (0.27-1.05) 0.91 (0.57-1.43) 1.14 (0.92-1.41) 0.64 (0.46-0.86)b 1.12 (0.84-1.51) Indigenous status yes van 0 1.22 (1.02-1.44)* 1.12 (0.93-1.63) 0.99 (0.62-1.60) 0.99 (0.62-1.60) Indigenous status yes van 0 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Indigenous status yes van 0 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.6	less than \$499	1.00	1.00	1.00	1.00	1.00
\$1.000.\$1,499 1.00 (0.74-1.35) 1.01 (0.72-1.40) 1.61 (1.11-2.34)a 0.80 (0.56-1.61) 1.58 (0.26-2.61) \$1.500.\$1.1999 0.981 (0.84-1.41 1.23 (0.84-1.82) 1.05 (0.61-1.71) 1.95 (0.15-1.78) 1.55 (0.12-3.74) Remoteness classification 1.00 1.00 1.00 1.00 1.00 1.00 accessible 0.83 (0.67-1.03) 0.99 (0.77-1.24) 0.91 (0.70-1.17) 0.82 (0.61-1.11) 1.16 (0.88-1.52) moderately accessible 0.83 (0.75-1.19) 1.06 (0.48-3.31) 0.91 (0.37-0.84) 0.84 (0.65-1.10) 0.66 (0.51-0.85) 0.81 (0.56-1.70) 0.51 (0.61-1.70)	\$500-\$999	0.91 (0.67-1.25)	1.01 (0.75-1.38)	1.36 (0.99-1.86)	1.05 (0.65-1.70)	1.36 (0.76-2.44)
\$1.50.051.999 0.99 (0.68-1.44) 1.23 (0.84-1.82) 1.73 (1.15-2.59)b 1.03 (0.58-1.82) 2.03 (1.07-3.85) ⁺ Remoteness classification 1.00 1.00 1.00 1.00 1.03 (0.58-1.82) 2.03 (1.07-3.85) ⁺ Remoteness classification 0.83 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.70-1.17) 0.82 (0.61-1.11) 1.16 (0.88-1.52) moderately accessible 0.67 (0.54-0.84) ⁺ 0.84 (0.65-1.01) 0.66 (0.51-0.85) ⁺ 0.81 (0.56-1.17) 0.87 (0.60-1.27) Remote 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.84) ⁺ 1.12 (0.53-2.40) 1.13 (0.72-1.78) Private health insurance coverage 1.122 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Ves va no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothers' age 1.50 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) 15-20 0.71 (0.41-1.34) 0.93 (0.53-1.63) 3.28 (0.93-11.58) 1.11 (0.63-1.94) 26-30 0.72 (0.41-1.18) 0.73 (0.41-1.32) 5.74 (1.72-1.81) ⁺ 1.20 (0.62-1.95) 15-20 1.00 1.00 1.0	\$1,000-\$1,499	1.00 (0.74-1.35)	1.01 (0.72-1.40)	1.61 (1.11-2.34)a	0.95 (0.56-1.61)	1.58 (0.86-2.90)
\$2,00 or more 1.19 (0.83-1.72) 0.86 (0.58-1.27) 2.06 (1.36-3.12)b 1.03 (0.58-1.82) 2.03 (1.07-3.85)* Remoteness classification 0.00 1.00 1.00 1.00 1.00 accessible 0.83 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.70-1.17) 0.82 (0.61-1.11) 1.16 (0.88-1.52) moderately accessible 0.96 (0.75-1.44) 0.91 (0.65-1.15) 0.91 (0.57-1.55) 0.41 (0.56-1.71) 0.75 (0.64-0.27) Permote 0.95 (0.75-1.49) 1.05 (0.48-2.31) 0.91 (0.38-2.16) 1.34 (0.70-2.59) 0.51 (0.16-1.58) Private health insurance coverage yes vano 1.22 (1.02-1.44)* 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospital status 1.00<	\$1.500-\$1.999	0.99 (0.68-1.44)	1.23 (0.84-1.82)	1.73 (1.15-2.59)b	1.05 (0.61-1.78)	1.95 (1.02-3.74)ª
Remoteness classification International construction Internation Internation Internation Internation Internatis construction Internatis construc	\$2.000 or more	1.19 (0.83-1.72)	0.86 (0.58-1.27)	2.06 (1.36-3.12)b	1.03 (0.58-1.82)	2.03 (1.07-3.85)ª
Instructions 1.00 1.00 1.00 1.00 1.00 1.00 accessible 0.33 (0.67-1.03) 0.98 (0.77-1.24) 0.91 (0.70-1.17) 0.82 (0.61-1.11) 1.16 (0.88-1.52) moderately accessible 0.57 (0.54-0.84)* 0.84 (0.65-1.10) 0.68 (0.51-0.85)* 0.81 (0.56-1.17) 0.87 (0.50-1.27) Permote 0.55 (0.75-1.19) 1.05 (0.48-2.31) 0.91 (0.38-2.16) 1.34 (0.70-2.59) 0.51 (0.16-1.58) Very remote 0.54 (0.27-1.65) 0.91 (0.57-1.45) 0.47 (0.27-0.84)* 1.12 (0.38-2.40) 1.13 (0.72-1.78) Private health insurance coverage yes vs no 1.22 (1.02-1.44)* 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Otes rescalatist Paediatrician yes vs no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-0.05) 0.99 (0.62-1.60) Mothers' age 1 1.00 1.00 1.00 1.00 21-25 0.81 (0.49-1.34) 0.93 (0.53-1.63) 5.74 (1.72-19.18) 1.20 (0.67-2.13) 31-35 0	Remoteness classification			,		,
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addessibile 0.63 (0.67-1.03) 0.63 (0.77-1.24) 0.91 (0.70-1.71) 0.42 (0.65-1.17) 0.67 (0.55-0.48) ² 0.68 (0.65-1.27) Remote 0.95 (0.75-1.19) 1.05 (0.48-2.31) 0.91 (0.38-2.16) 1.34 (0.70-2.59) 0.51 (0.16-1.58) Very remote 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.84) ⁴ 1.12 (0.54-1.7) 1.13 (0.72-1.78) Private health insurance coverage yes vs no 1.22 (1.02-1.44) ⁴ 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Paediatrician Indigenous status yes vs no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothrer's age 1.52 (0.93-1.58) 1.11 (0.63-1.94) 0.93 (0.53-1.63) 3.28 (0.93-1.58) 1.11 (0.63-1.94) 26-30 0.72 (0.44+1.18) 0.77 (0.43-1.35) 5.74 (1.72-19.18) ⁴ 1.20 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.32) 5.67 (1.82-18.90) ⁴ 1.28 (0.72-2.26) 36-40 0.72 (0.41-1.24) 0.84 (0.42+0.60) 7.62 (2.20-3.94) ⁴ 1.10 (0.63-1.95) 41 a			1.00	1.00		
moderately accessible 0.67 (0.54-0.54)* 0.84 (0.55-1.10) 0.66 (0.51-0.56)* 0.81 (0.57-1.7) 0.67 (0.51-0.57) Pervate health insurance coverage 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.54)* 1.12 (0.53-2.40) 1.13 (0.72-1.78) Private health insurance coverage 1.22 (1.02-1.44)* 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Paediatrician rindigenous status yes vs no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothers' age 1.00 1.00 1.00 1.00 1.00 52.0 0.81 (0.49-1.34) 0.93 (0.53-1.63) 3.28 (0.39-11.58) 1.11 (0.63-1.94) 26-30 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.77 (0.47-1.25) 5.87 (1.82-18.90)* 1.20 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.24) 0.84 (0.44-1.60) 7.26 (2.20-23.94)* 1.10 (0.62-1.95) Mother's ingle 0.76 (0.51-1.13) 0.66 (0.42-0.99)* 0.94 (0.67-1.32) Mother'	accessible	0.83(0.67-1.03)	0.98 (0.77-1.24)	0.91(0.70-1.17)	0.82 (0.61-1.11)	1.10 (0.88-1.52)
Remote 0.95 (0.75-1.19) 1.05 (0.48-2.31) 0.91 (0.38-2.16) 1.34 (0.70-2.59) 0.51 (0.16-1.58) very remote 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.84)* 1.12 (0.53-2.40) 1.13 (0.72-1.78) Private health insurance coverage Hospital emergency word Hospitalisation Other specialist Paediatrician Indigenous status Hospital emergency word Hospital (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothers' age 1 1.00 1.00 1.00 1.00 21-25 0.81 (0.49-1.34) 0.93 (0.53-1.63) 3.28 (0.93-11.58) 1.11 (0.63-1.94) 26-30 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.73 (0.41-1.32) 5.87 (1.72-19.18)* 1.20 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.60) 7.26 (2.20-23.94)* 1.36 (0.72-2.55) Mothers' marital status married vs single 0.76 (0.51-1.13) 1.08 (0.65-1.80) 0.64 (0.42-0.99)* 0.29 (0.67-1.32) Mothers' education status under Year 12 1.00 1.00 1.00 1.00 Under Year 12 1.00 <td>moderately accessible</td> <td>0.67 (0.54-0.84)</td> <td>0.84 (0.65-1.10)</td> <td>0.66 (0.51-0.85)</td> <td>0.81 (0.56-1.17)</td> <td>0.87 (0.60-1.27)</td>	moderately accessible	0.67 (0.54-0.84)	0.84 (0.65-1.10)	0.66 (0.51-0.85)	0.81 (0.56-1.17)	0.87 (0.60-1.27)
very remote 0.54 (0.27-1.05) 0.91 (0.57-1.45) 0.47 (0.27-0.84)* 1.12 (0.53-2.40) 1.13 (0.72-1.78) Private health insurance coverage 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Paediatrician Indigenous status	Remote	0.95 (0.75-1.19)	1.05 (0.48-2.31)	0.91 (0.38-2.16)	1.34 (0.70-2.59)	0.51 (0.16-1.58)
Private health insurance coverage yes vs no 1.22 (1.02-1.44)* 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Paediatrician Indigenous status yes vs no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothers' age 15-20 1.00 1.00 1.00 1.00 1.00 21-25 0.81 (0.49-1.34) 0.93 (0.53-1.63) 3.28 (0.93-11.58) 1.11 (0.63-1.94) 26-30 0.72 (0.44-1.18) 0.77 (0.43-1.35) 5.74 (1.72-19.18)* 1.20 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.32) 5.87 (1.82-18.90)* 1.28 (0.72-2.26) 36-40 0.72 (0.41-1.24) 0.64 (0.44-1.60) 7.26 (2.20-23.94)* 1.10 (0.62-1.95) 41 and older 0.52 (0.27-1.01) 0.63 (0.26-1.52) 4.42 (1.18-16.48)* 1.35 (0.72-2.55) Mothers' marital status married vs single 0.76 (0.51-1.13) 1.08 (0.65-1.80) 0.64 (0.42-0.99)* 0.94 (0.67-1.32) Mothers' education status under Year 12 1.00 1.00 1.00 1.00 Nother smoking during pregnancy yes vs no 1.17 (0.93-1.49) 0.44 (0.29-0.66)b 1.06 (0.70-1.62) 0.96 (0.74-1.24) tertiary qualification 1.19 (0.93-1.52) 0.71 (0.53-0.94)a 1.10 (0.67-1.57) 1.22 (0.98-1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week less than \$499 1.00 1.00 1.00 1.00 \$500-\$9999 1.05 (0.75-1.48) 0.87 (0.54-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 1.07 (0.74-1.51) \$1,000-\$1,999 1.12 (0.74-1.68) 0.67 (0.51-1.39) 0.99 (0.68-1.49) 0.99 (0.68-1.41) \$1,000-\$1,999 1.12 (0.74-1.68) 0.67 (0.51-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,000-\$1,999 1.12 (0.74-1.68) 0.67 (0.51-1.29) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remotences area highly accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97)* moder at 95 vs no 0.94 (0.66-1.14) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97)* moder at 95 vs no 0.94 (0.66-1.14) 0.99 (0.74-1.22) 1.	very remote	0.54 (0.27-1.05)	0.91 (0.57-1.45)	0.47 (0.27-0.84) ^a	1.12 (0.53-2.40)	1.13 (0.72-1.78)
yes vs no 1.22 (1.02-1.44) ^a 1.12 (0.94-1.34) 1.14 (0.92-1.41) 0.64 (0.48-0.86)b 1.12 (0.84-1.51) Covariates Hospital emergency ward Hospitalisation Other specialist Paediatrician Indigenous status yes vs no 1.05 (0.72-1.52) 1.56 (0.92-2.65) 1.03 (0.52-2.05) 0.99 (0.62-1.60) Mothers' age 15-20 1.00 1.00 1.00 1.00 21-25 0.81 (0.49-1.34) 0.93 (0.53-1.63) 3.28 (0.93-11.58) 1.11 (0.63-1.94) 26-30 0.72 (0.41-1.24) 0.84 (0.44-1.60) 7.26 (2.20-23.94) ^a 1.20 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.24) 0.84 (0.29-0.65) 1.00 1.00 (0.62-1.95) 41 and older 0.52 (0.27-1.01) 0.63 (0.26-1.52) 4.42 (1.18-16.48) ^a 1.35 (0.72-2.55) Mothers' marital status married vs single 0.76 (0.51-1.13) 1.08 (0.65-1.80) 0.64 (0.42-0.99) ^a 0.94 (0.67-1.32) Mothers' ducation status under Year 12 1.00 1.00 1.00 1.00 Inder Yean 20 0.76 (0.51-1.13) 0.87 (0.62-	Private health insurance covera	ge				
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Indigenous status yes vs no1.05 (0.72-1.52)1.56 (0.92-2.65)1.03 (0.52-2.05)0.99 (0.62-1.60)Mothers' age15-201.001.001.001.001.0021-250.81 (0.49-1.34)0.93 (0.53-1.63)3.28 (0.93-11.58)1.11 (0.63-1.94)26-300.77 (0.47-1.25)0.73 (0.41-1.32)5.74 (1.72-19.18)*1.20 (0.67-2.13)31-350.77 (0.47-1.25)0.73 (0.41-1.32)5.87 (1.82-18.90)*1.28 (0.72-2.26)36-400.72 (0.41-1.24)0.84 (0.44-1.60)7.26 (2.20-23.94)*1.10 (0.62-1.95)41 and older0.52 (0.27-1.01)0.63 (0.26-1.52)4.42 (1.18-16.48)*1.35 (0.72-2.55)Mothers' marital statusmarried vs single0.76 (0.51-1.13)1.08 (0.65-1.80)0.64 (0.42-0.99)*0.94 (0.67-1.32)Mothers' education statusunder Year 121.001.001.001.00year 12under Year 121.001.001.001.001.00yeas 1.52)urber smoking during pregnancyyes vs no1.17 (0.95-1.44)0.87 (0.62-1.21)0.97 (0.69-1.36)1.02 (0.82-1.27)Family income per week1.001.001.001.001.001.00S2,000 rmore1.21 (0.80-1.83)0.73 (0.39-1.37)0.99 (0.69-1.41)0.53 (0.39-1.37)0.99 (0.69-1.41)\$1,000-\$1,4991.17 (0.81-1.70)0.78 (0.51-1.49)0.82 (0.57-1.66)1.07 (0.76-1.51)\$1,000-\$1,4991.10 (0.75-1.54)0.87 (0.69-1.37)0.99 (0.69-1.41)0.93 (0.69-1.27)0.92 (0.72-1.18)0.79 (0	•	. ,				
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2F-30 0.72 (0.44-1.18) 0.73 (0.43-1.35) 5.26 (0.35-1.36) 1.27 (0.67-2.13) 31-35 0.77 (0.47-1.25) 0.73 (0.41-1.32) 5.87 (1.82-18.90) ¹⁶ 1.28 (0.72-2.26) 36-40 0.72 (0.41-1.24) 0.84 (0.44-1.60) 7.26 (2.20-23.94) ¹⁶ 1.10 (0.62-1.95) 41 and older 0.52 (0.27-1.01) 0.63 (0.26-1.52) 4.42 (1.18-16.48) ¹⁶ 1.35 (0.72-2.55) Mothers' marital status married vs single 0.76 (0.51-1.13) 1.08 (0.65-1.80) 0.64 (0.42-0.99) ¹⁶ 0.94 (0.67-1.32) Mothers' education status under Year 12 1.00 1.00 1.00 1.00 year 12 or equivalent 1.10 (0.81-1.49) 0.44 (0.29-0.66)b 1.06 (0.70-1.62) 0.96 (0.74-1.24) tertiary qualification 1.19 (0.93-1.52) 0.71 (0.53-0.94)a 1.10 (0.77-1.57) 1.22 (0.98-1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week 1.00 1.00 1.00 1.00 \$1,000-\$1,499 1.07 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) <	Covariates Indigenous status yes vs no Mothers' age 15-20	Hospital emergency 1.05 (0.72-1.52)	y ward Hospital	isation 2-2.65)	Other specialist	Paediatrician 0.99 (0.62-1.60) 1.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Covariates Indigenous status yes vs no Mothers' age 15-20	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.40.1.24)	y ward Hospital	isation 2-2.65)	Other specialist 1.03 (0.52-2.05) 1.00	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.62-1.04)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 20 20	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44141)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53	isation 2-2.65) 3-1.63)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.70 10 10)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 4.00 (0.7.0.10)
36-40 0.72 (0.41-1.24) 0.84 (0.44-1.60) 7.26 (2.20-23.94)° 1.10 (0.62-1.95) 41 and older 0.52 (0.27-1.01) 0.63 (0.26-1.52) 4.42 (1.18-16.48)° 1.35 (0.72-2.55) Mothers' marital status married vs single 0.76 (0.51-1.13) 1.08 (0.65-1.80) 0.64 (0.42-0.99)° 0.94 (0.67-1.32) Mothers' education status under Year 12 1.00 1.00 1.00 1.00 year 12 or equivalent 1.10 (0.81-1.49) 0.44 (0.29-0.66)b 1.06 (0.70-1.62) 0.96 (0.74-1.24) tertiary qualification 1.19 (0.93-1.52) 0.71 (0.53-0.94)a 1.10 (0.77-1.57) 1.22 (0.98-1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week iess than \$499 1.00 1.00 1.00 1.00 §soo-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$st_1000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$st_1000-\$1,499 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) <td>Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30</td> <td>Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18)</td> <td>y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43</td> <td>isation 2-2.65) 3-1.63) 3-1.35)</td> <td>Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18)^b</td> <td>Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13)</td>	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43	isation 2-2.65) 3-1.63) 3-1.35)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13)
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Mothers' education status 1.00 1.00 1.00 1.00 year 12 or equivalent 1.10 (0.81-1.49) 0.44 (0.29-0.66)b 1.06 (0.70-1.62) 0.96 (0.74-1.24) tertiary qualification 1.19 (0.93-1.52) 0.71 (0.53-0.94)a 1.10 (0.77-1.57) 1.22 (0.98-1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week 1.00 1.00 1.00 1.00 \$500-\$9999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000 \$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area 1.00 1.00 1.00 1.00 accessible 0.99 (0.64-0.97)^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97)^a <	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26)	isation 2-2.65) 3-1.63) 3-1.35) I-1.32) I-1.60) 5-1.52)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55)
under Year 12 1.00 1.00 1.00 1.00 year 12 or equivalent $1.10 (0.81-1.49)$ $0.44 (0.29-0.66)b$ $1.06 (0.70-1.62)$ $0.96 (0.74-1.24)$ tertiary qualification $1.19 (0.93-1.52)$ $0.71 (0.53-0.94)a$ $1.10 (0.77-1.57)$ $1.22 (0.98-1.52)$ Mother smoking during pregnancyyes vs no $1.17 (0.95-1.44)$ $0.87 (0.62-1.21)$ $0.97 (0.69-1.36)$ $1.02 (0.82-1.27)$ Family income per weekless than \$499 1.00 1.00 1.00 1.00 1.00 \$500-\$999 $1.05 (0.75-1.48)$ $0.86 (0.54-1.36)$ $1.01 (0.66-1.56)$ $1.07 (0.76-1.51)$ \$1,000-\$1,499 $1.17 (0.81-1.70)$ $0.78 (0.47-1.29)$ $1.22 (0.76-1.96)$ $0.99 (0.69-1.41)$ \$1,500-\$1,999 $1.12 (0.74-1.68)$ $0.87 (0.51-1.49)$ $0.98 (0.57-1.66)$ $1.07 (0.74-1.55)$ \$2,000 or more $1.21 (0.80-1.83)$ $0.73 (0.39-1.37)$ $0.99 (0.58-1.68)$ $1.11 (0.75-1.64)$ Remoteness areahighly accessible 1.00 1.00 1.00 1.00 accessible $0.99 (0.79-1.23)$ $0.93 (0.69-1.27)$ $0.92 (0.72-1.18)$ $0.79 (0.64-0.97)^{a}$ moderately accessible $0.87 (0.66-1.14)$ $0.93 (0.64-1.34)$ $0.81 (0.60-3.37)$ $0.87 (0.68-1.10)$ very remote $0.74 (0.36-1.51)$ $1.99 (1.19-3.34)^{b}$ $1.42 (0.60-3.37)$ $0.87 (0.68-1.10)$ very remote $0.84 (0.68-1.03)$ $0.99 (0.74-1.32)$ $1.77 (1.38-2.27)^{b}$ $3.71 (3.13-4.41)^{b}$	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65	isation 2-2.65) 3-1.63) 3-1.35) I-1.32) I-1.60) 5-1.52) 5-1.80)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32)
year 12 or equivalent 1.10 (0.81-1.49) 0.44 (0.29-0.66)b 1.06 (0.70-1.62) 0.96 (0.74-1.24) tertiary qualification 1.19 (0.93-1.52) 0.71 (0.53-0.94)a 1.10 (0.77-1.57) 1.22 (0.98-1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week Iess than \$499 1.00 1.00 1.00 1.00 \$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74+1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area 1.00 1.00 1.00 1.00 accessible 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65	isation 2-2.65) 3-1.63) 3-1.35) I-1.32) I-1.60) 3-1.52) 5-1.80)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32)
yes in 2 of operation 1.19 (0.01 + 1.0) 0.11 (0.12 + 0.05) 1.00 (0.17 + 1.2) Mother smoking during pregnancy 0.71 (0.53 - 0.94) 1.10 (0.77 - 1.57) 1.22 (0.98 - 1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95 - 1.44) 0.87 (0.62 - 1.21) 0.97 (0.69 - 1.36) 1.02 (0.82 - 1.27) Family income per week less than \$499 1.00 1.00 1.00 1.00 \$500-\$999 1.05 (0.75 - 1.48) 0.86 (0.54 - 1.36) 1.01 (0.66 - 1.56) 1.07 (0.76 - 1.51) \$1,000-\$1,499 1.17 (0.81 - 1.70) 0.78 (0.47 - 1.29) 1.22 (0.76 - 1.96) 0.99 (0.69 - 1.41) \$1,500-\$1,999 1.12 (0.74 - 1.68) 0.87 (0.51 - 1.49) 0.98 (0.57 - 1.66) 1.07 (0.74 - 1.55) \$2,000 or more 1.21 (0.80 - 1.83) 0.73 (0.39 - 1.37) 0.99 (0.58 - 1.68) 1.11 (0.75 - 1.64) Remoteness area	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00	isation 2-2.65) 3-1.63) 3-1.35) I-1.32) I-1.60) 3-1.52) 5-1.80)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00
Mother smoking during pregnancy 0.17 (0.50 0.54)d 1.10 (0.77 1.57) 1.22 (0.50 1.52) Mother smoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week less than \$499 1.00 1.00 1.00 1.00 \$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area highly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-3.37) 0.87 (0.68-1.10) very remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.42-3.63) 0.17 (0.55-0.53) ^b 0.56 (0.24-1.32) Private health insurance cover	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.25)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 5-1.52) 5-1.80)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24)
whother shoking during pregnancy yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week Isss than \$499 1.00 1.00 1.00 1.00 §500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area highly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97)^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91)^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34)^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53)^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no <	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.25 0.71 (0.55)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 5-1.52) 5-1.80)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.20 (0.81.52)
yes vs no 1.17 (0.95-1.44) 0.87 (0.62-1.21) 0.97 (0.69-1.36) 1.02 (0.82-1.27) Family income per week less than \$499 1.00 1.00 1.00 1.00 \$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area nighly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b very remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03)	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 5-1.52) 5-1.80) 0-0.66)b 3-0.94)a	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52)
Family income per week less than \$499 1.00 1.00 1.00 \$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area nighly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) Icy	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.77 (0.65)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 5-1.60) 5-1.52) 5-1.80) 9-0.66)b 3-0.94)a	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.07 (0.00 1.00)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52)
less than \$499 1.00 1.00 1.00 1.00 \$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICY 1.17 (0.95-1.44)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.25 0.71 (0.53 0.87 (0.62	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27)
\$500-\$999 1.05 (0.75-1.48) 0.86 (0.54-1.36) 1.01 (0.66-1.56) 1.07 (0.76-1.51) \$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICY 1.17 (0.95-1.44)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.25 0.71 (0.53 0.87 (0.62	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27)
\$1,000-\$1,499 1.17 (0.81-1.70) 0.78 (0.47-1.29) 1.22 (0.76-1.96) 0.99 (0.69-1.41) \$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICY 1.17 (0.95-1.44) 1.00	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00
\$1,500-\$1,999 1.12 (0.74-1.68) 0.87 (0.51-1.49) 0.98 (0.57-1.66) 1.07 (0.74-1.55) \$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICY 1.17 (0.95-1.44) 1.00 1.05 (0.75-1.48)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00 0.86 (0.54	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.00 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51)
\$2,000 or more 1.21 (0.80-1.83) 0.73 (0.39-1.37) 0.99 (0.58-1.68) 1.11 (0.75-1.64) Remoteness area highly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b Notes: a) Significant at 5%; b) Significant at 1%. X X X X X	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICY 1.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00 0.86 (0.54 0.78 (0.47)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21) 1-1.36) 7-1.29)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41)
Remoteness area 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICV 1.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00 0.86 (0.54 0.78 (0.47 0.78 (0.47 0.87 (0.51) 0.87 (0.51) 0.51 (0.5	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.94)a 2-1.21) 4-1.36) 7-1.29) 1-1.49)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96) 0.98 (0.57-1.66)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55)
highly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICV 1.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83)	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00 0.86 (0.54 0.78 (0.47 0.87 (0.51 0.73 (0.38)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 1-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21) 4-1.36) 7-1.29) 1-1.49) 3-1.37)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64)
Inightly accessible 1.00 1.00 1.00 1.00 accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$1,999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more Bemoteness area	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICV 1.17 (0.95-1.44) 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83)	y ward Hospital 1.56 (0.92 1.00 1.03 (0.53 0.77 (0.43) 0.77 (0.43) 0.73 (0.41) 0.84 (0.44) 0.63 (0.26) 1.08 (0.65) 1.08 (0.65) 1.00 0.44 (0.25) 0.71 (0.53) 0.87 (0.62) 1.00 0.86 (0.54) 0.78 (0.47) 0.87 (0.51) 0.73 (0.39) 0.39	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21) 4-1.36) 7-1.29) 1-1.49) 3-1.37)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64)
accessible 0.99 (0.79-1.23) 0.93 (0.69-1.27) 0.92 (0.72-1.18) 0.79 (0.64-0.97) ^a moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more Remoteness area bigbly accessible	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) I.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83) 1.00	y ward Hospital 1.56 (0.92 1.00 0.93 (0.53 0.77 (0.43 0.73 (0.41 0.84 (0.44 0.63 (0.26 1.08 (0.65 1.00 0.44 (0.29 0.71 (0.53 0.87 (0.62 1.00 0.86 (0.54 0.78 (0.47 0.87 (0.51 0.73 (0.39) 1.00	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 5-1.52) 5-1.80) 0-0.66)b 3-0.94)a 2-1.21) 1-1.36) 7-1.29) 1-1.49) 0-1.37)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68) 1.00	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64)
moderately accessible 0.87 (0.66-1.14) 0.93 (0.64-1.34) 0.81 (0.60-1.08) 0.71 (0.55-0.91) ^b remote 0.74 (0.36-1.51) 1.99 (1.19-3.34) ^b 1.42 (0.60-3.37) 0.87 (0.68-1.10) very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b Notes: a) Significant at 5%; b) Significant at 1%. 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more Remoteness area highly accessible	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) ICV 1.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83) 1.00 0.00 (0.70.1.02)	y ward Hospital 1.56 (0.92 1.00 1.03 (0.53 0.77 (0.43) 0.77 (0.43) 0.73 (0.41) 0.84 (0.44) 0.63 (0.26) 1.08 (0.65) 1.08 (0.65) 1.00 0.44 (0.29) 0.71 (0.53) 0.87 (0.62) 1.00 0.86 (0.54) 0.78 (0.47) 0.87 (0.51) 0.73 (0.39) 1.00 1.00 0.26 (0.54)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 5-1.60) 5-1.52) 5-1.80) 3-0.66)b 3-0.66)b 3-0.94)a 2-1.21) 1-1.36) 7-1.29) 1-1.49) 3-1.37)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68) 1.00	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64) 1.00
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very remote 1.47 (0.90-2.39) 1.24 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32) Private health insurance coverage yes vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b Notes: a) Significant at 5%; b) Significant at 1%. 0.40 (0.42-3.63) 0.17 (0.05-0.53) ^b 0.56 (0.24-1.32)	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more Remoteness area highly accessible moderately accessible	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) I.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83) 1.00 0.99 (0.79-1.23) 0.87 (0.66-1.14)	y ward Hospital 1.56 (0.92 1.00 1.93 (0.53 0.77 (0.43) 0.77 (0.43) 0.73 (0.41) 0.84 (0.44) 0.63 (0.26) 1.08 (0.65) 1.08 (0.65) 1.00 0.44 (0.25) 0.71 (0.53) 0.87 (0.62) 1.00 0.86 (0.54) 0.78 (0.47) 0.87 (0.51) 0.73 (0.38) 1.00 0.93 (0.64) 0.93 (0.64)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 5-1.60) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21) 1-1.36) 7-1.29) 1-1.49) 3-1.37) 3-1.27) 1-1.34)	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.00 1.01 (0.66-1.56) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68) 1.00 0.92 (0.72-1.18) 0.81 (0.60-1.08)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64) 1.00 0.79 (0.64-0.97) ^a 0.71 (0.55-0.91) ^b
Private health insurance coverage 985 vs no 0.84 (0.68-1.03) 0.99 (0.74-1.32) 1.77 (1.38-2.27) ^b 3.71 (3.13-4.41) ^b Notes: a) Significant at 5%; b) Significant at 1%.	Covariates Indigenous status yes vs no Mothers' age 15-20 21-25 26-30 31-35 36-40 41 and older Mothers' marital status married vs single Mothers' education status under Year 12 year 12 or equivalent tertiary qualification Mother smoking during pregnar yes vs no Family income per week less than \$499 \$500-\$999 \$1,000-\$1,499 \$1,500-\$1,999 \$2,000 or more Remoteness area highly accessible accessible moderately accessible remote	Hospital emergency 1.05 (0.72-1.52) 1.00 0.81 (0.49-1.34) 0.72 (0.44-1.18) 0.77 (0.47-1.25) 0.72 (0.41-1.24) 0.52 (0.27-1.01) 0.76 (0.51-1.13) 1.00 1.10 (0.81-1.49) 1.19 (0.93-1.52) I.17 (0.95-1.44) 1.00 1.05 (0.75-1.48) 1.17 (0.81-1.70) 1.12 (0.74-1.68) 1.21 (0.80-1.83) 1.00 0.99 (0.79-1.23) 0.87 (0.66-1.14) 0.74 (0.36-1.51)	y ward Hospital 1.56 (0.92 1.00 1.93 (0.53 0.77 (0.43) 0.73 (0.41) 0.84 (0.44) 0.63 (0.26) 1.08 (0.65) 1.00 0.44 (0.25) 0.71 (0.53) 0.87 (0.62) 1.00 0.44 (0.25) 0.71 (0.53) 0.87 (0.62) 1.00 0.86 (0.54) 0.78 (0.47) 0.87 (0.51) 0.73 (0.38) 1.00 1.00 0.93 (0.64) 1.99 (1.15) 0.93 (0.64)	isation 2-2.65) 3-1.63) 3-1.35) 1-1.32) 1-1.32) 3-1.52) 5-1.80) 3-0.66)b 3-0.94)a 2-1.21) 4-1.36) 7-1.29) 1-1.49) 3-1.37) 3-1.27) 1-1.34) 3-3.34)°	Other specialist 1.03 (0.52-2.05) 1.00 3.28 (0.93-11.58) 5.74 (1.72-19.18) ^b 5.87 (1.82-18.90) ^b 7.26 (2.20-23.94) ^b 4.42 (1.18-16.48) ^a 0.64 (0.42-0.99) ^a 1.00 1.06 (0.70-1.62) 1.10 (0.77-1.57) 0.97 (0.69-1.36) 1.22 (0.76-1.96) 0.98 (0.57-1.66) 0.99 (0.58-1.68) 1.00 1.22 (0.72-1.18) 0.81 (0.60-1.08) 1.42 (0.60-3.37)	Paediatrician 0.99 (0.62-1.60) 1.00 1.11 (0.63-1.94) 1.20 (0.67-2.13) 1.28 (0.72-2.26) 1.10 (0.62-1.95) 1.35 (0.72-2.55) 0.94 (0.67-1.32) 1.00 0.96 (0.74-1.24) 1.22 (0.98-1.52) 1.02 (0.82-1.27) 1.00 1.07 (0.76-1.51) 0.99 (0.69-1.41) 1.07 (0.74-1.55) 1.11 (0.75-1.64) 1.00 0.79 (0.64-0.97) ^a 0.71 (0.55-0.91) ^b 0.87 (0.68-1.10)
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Table 3: The survey logistic regression models (ORs and 95%CI) for health services utilisation and its associated risk factors (n=3,696).

or use its help line; or be visited by a nurse. Indigenous infants were also more likely to visit a hospital outpatient clinic and be admitted to a hospital. Infants living in even a moderately accessible area were less likely to visit a maternal and child heath centre (or use its help line), and were less likely to see a GP or paediatrician. This geographic effect on the access to health services was the same for both Indigenous and non-Indigenous infants.

Our findings are consistent with previously reported studies that found poor Indigenous infant health status and a concerning gap between Indigenous and non-Indigenous outcomes. Although only 5.7% of the Indigenous mother rated their child's overall health as 'poor or fair', there were 11% of the Indigenous infants who have suffered a medical condition or disability that lasted, or was likely to last for more than six months, which is more than double the incidence among non-Indigenous infants (5.4%).

Our study also showed that Indigenous infants were more likely to be admitted to hospital due to a medical condition or illnesses, but were less likely to see a paediatrician. This is consistent with a previous study reporting that Indigenous infants were more likely to be admitted to hospital and less likely to use specific treatments.¹⁶ The increased use of the hospital outpatient clinics may be related to poor perinatal health outcomes, including low birth weight, higher maternal smoking rate during pregnancy and higher concurrent binge drinking among Indigenous mothers. Alternatively those with poorer health outcomes tend to infrequently use GPs and maternal and child health services thus failing to prevent and treat health problems in a timely manner.

Our results also found other important factors associated with the access to health services apart from the aboriginality. Older mothers were more likely to visit maternal and child health centre or utilise its help line and more likely to use other specialist services. The mothers who were married, tertiary qualified, privately insured, higher income earners and who lived in the metropolitan area were likely to use more health services. Arguably, higher educated women may have a higher 'health literacy' and better health knowledge, be more aware of their infants health problems, know more about the available resources of health care; and be able to access proper medical care whenever they perceive it is necessary.¹⁷ The private health insurance coverage played a stronger role than family income in predicting the use of specialist or paediatrician. Previous research has demonstrated that uninsured children were more likely to encounter delayed care, unmet health care needs as well as lacking a usual place for care.18 In our study, health insurance coverage positively affected access to maternal and child health and specialist services, and was negatively associated with hospital outpatient clinic attendance.

The Indigenous mothers included in our study were less educated; gave birth at a much younger age; had a lower family income; were more likely to be single, unemployed and not covered by the private health insurance; and to live in a rural or socio-economically disadvantaged neighbourhood. Such results reinforce the proposition that the inequitable access of services may be deeply rooted in the socio-economic status of the mothers and families. There are numerous studies reporting

that maternal characteristics including mothers' age, education status, and employment status were associated with infants using health services.^{17,19,20} Those findings also indicate that attempts to improve health care access for Indigenous infants should include not only health system changes such as improved delivery of high quality of the care, but also the socio-economic status of Indigenous populations. Our results, to some extent, confirm the previous suggestion that to effectively reduce inequalities in health, we need an account of what links social structure to health outcomes, an understanding of the potential causal factors that may be interrelated and a guide to potential intervention strategies.²¹ Further study is required using a multi-dimensional approach that takes account social structure linked to social determinants of health, and explores the causal pathways of health services utilisation for the various disparate outcomes between the Indigenous and non-Indigenous infants. Our study also showed that 38% of Indigenous mothers were either not married or in a de facto relation while having an infant (compared to 9% of non-Indigenous mothers). The lack of emotional, social and financial support from fathers for Indigenous mothers, the difficulty in raising an infant in a single parent family may have contributed to the less health service utilisation and poorer health outcomes for Indigenous mothers.

Our study showed that the unfavourable impact of remoteness on the access to health services was the same for both Indigenous and non-Indigenous mothers. However, as greater proportion of Indigenous mothers living in less accessible areas (42% living in a moderately accessible area versus 15% for non-Indigenous mothers), more Indigenous mothers would encounter services access problems due to their residential locations. Compared to the infants living in a highly accessible area, infants from both accessible and moderately accessible area were 20% to 30% less likely to visit a paediatrician. Those infants living in a very remote area were in great needs of access to maternal and child health centre help, GP and other specialists. These results pointed to the needs of further review of the current health service providing plan and the ways of improving accessibility in the remote areas.

Our study has several strengths. The results are from a large national representative sample that provides a direct comparison of health services utilisation and health status between Indigenous and non-Indigenous infants. To our knowledge, this is the first study to provide such a comparison at a national level. Moreover, the study provides the comprehensive analyses across primary, secondary and tertiary health services utilisation among Australian infants.

Our study has several limitations. First, we only used the crosssectional data in providing the comparison of the access to care. Caution should be exercised in making causal inferences. Second, we limited our study sample to those infants whose primary caring parents were their biological mothers and whose main language spoken at home was English. The generalisations of such results to other settings need to be further examined. Third, our study only explored the data on general health services utilisation but lack of data on use of Aboriginal-specific health services. Fourth, there may be some differential recall biases for self-reported overall health rating between Indigenous and non-Indigenous mothers, and different approaches could be adopted in deriving the composite physical health index. Furthermore, we did not apply any specific theoretical framework in modelling the risk factors of health service utilisation and health outcomes. One of the most widely-used models in understanding the utilisation of health services is the Anderson behavioural model²² that was developed between 1960s (phase I) and 1990s (phase IV) with the latest proposed model allowing complex dynamic reciprocal relationships between individual characteristics, individual behaviour, and the health outcomes. A full exploration of the complex causal pathways as postulated in the phase IV Anderson behavioural model is beyond the scope of the current paper and will be the subject of further research. This research needs to use the latest structural equation modelling technique^{23,24} in both addressing the extraordinary complex theoretical framework and the unique designing features of the LSAC.

Conclusion

In comparison with non-Indigenous infants, Indigenous infants had poorer self-rated and physical health outcomes. They also used less health services even when there were greater needs. Indigenous mothers had an overwhelmingly unfavourable profile in education, employment, private health insurance ownership and were also much younger and more likely to be single.

Implications

Intervention to reduce the gap between health status of Indigenous and non-Indigenous infants should take into account the multi-level determinants of both health and health services utilisation. Further research should carefully disentangle the complex causal pathways based on a broad ecological and system approach and develop appropriate policy initiatives.

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