Indigenous birth outcomes at a Victorian urban hospital, a retrospective 5 year cohort study 2010-14

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Abstract:

Background: Indigenous people in Australia experience higher rates of preterm birth and low birth weight than their non-indigenous counterparts. There is currently no data on these rates from Victoria, with the data coming from states with higher indigenous proportions.

Methods: 5 years (1st January 2010 – 31st December 2014) of retrospective data from The Northern Hospital's (Melbourne, Victoria) database was analysed. Mothers and babies were split according to self-reported indigenous status: 13800 non-indigenous mothers, 185 indigenous mothers, 301 indigenous babies, and 13843 non-indigenous babies. Primary outcomes measured were low birth weight (LBW) and preterm birth.

Results: There was a higher incidence of indigenous babies born preterm (8.8% vs 5.9%, $p=0.034$), but the adjusted odds ratios for preterm birth were not significant (indigenous babies OR 1.19, 95% CI: 0.77-1.87, indigenous mothers OR 0.97, CI: 0.52-1.80). There was a similar incidence of LBW amongst indigenous and non-indigenous babies (6.5% vs 5.4%,

p=0.416). The rate of indigenous women smoking was 29.3% compared to 12.3% of non-indigenous women (p<0.001), and 40.3% were obese compared to 28.7% (p=0.001). Indigenous women had lower rates of diabetes (pre-existing or gestational diabetes, 6.1% vs 13.5% p=0.003).

Conclusion: Heterogeneity of indigenous people and geography means that inferences about indigenous health are difficult to make. It appears that Victorian urban indigenous women have similar rates of preterm birth and LBW as non-indigenous women. Whilst there were pleasing results concerning LBW, antenatal care, diabetes and preterm birth, the rates of smoking and obesity remain a challenge in the indigenous population.

Introduction:

Three percent of the Australian population is of Aboriginal or Torres Strait Islander origin, yet they account for a disproportionate amount of disease and continue to suffer worse health outcomes than non-indigenous Australians.^{1,2} This population will be referred to as indigenous throughout the remainder of this manuscript. Studies have shown that obstetric complications such as intrauterine growth restriction (IUGR) are linked to long term morbidity in the offspring, including cardiovascular disease, diabetes, and metabolic syndrome.³ Therefore, obstetric care provides a key point for early intervention and a significant opportunity to address the disparity.

Indigenous women have higher levels of medical complications during their pregnancies than non-indigenous women. They suffer higher rates of gestational diabetes mellitus, much higher rates of smoking during pregnancy (50% vs 13%), lower attendance at antenatal clinics, they have higher rates of preterm delivery (<37 weeks) (14% vs 8%), and experience greater rates of low birth weight (<2500g) (12% vs 6%).^{1, 2, 4, 5} These statistics are sobering and represent an area where significant improvement can be made.

Children born preterm have higher rates of morbidity and long term sequelae, including educational difficulties, which further widens the gap between non-indigenous and indigenous Australians.^{3,6,7} Studies from states with larger indigenous populations have shown an increase in the rate of preterm birth and a widening of the gap between indigenous

and non-indigenous preterm births.⁸ The long term ramifications of preterm birth highlights the need for considered and comprehensive obstetric care particularly of indigenous women.

Although preterm labour has been shown to be caused by multiple mechanisms, tobacco and sub-clinical intrauterine infections are strongly linked to preterm premature rupture of membranes (PPROM).⁹⁻¹¹ Given the increased smoking rates in indigenous women it provides a key risk factor that is not being adequately addressed. There isn't a study that provides an analysis of the causes of indigenous preterm births, therefore, it cannot be assumed that smoking alone is responsible for the increased rates, and most likely results from a complex psychosocial and medical interplay.

Smoking increases the incidence of all causes of spontaneous preterm birth (PPROM, spontaneous preterm labour, intrauterine growth restriction (IUGR) and haemorrhage).¹⁰ Due to smoking's effect on placental blood flow it causes IUGR, which contributes to low birth weight (LBW) independently of preterm birth (PTB), both are conditions that have a higher prevalence in the indigenous population.^{12, 13}

Almost 50% of indigenous births take place in areas that are classified as outer regional, remote, or very remote, compared to just 10% of non-indigenous births.² With some studies pointing to a rural residence being associated with poorer neonatal outcomes it is relevant to consider the locality of the indigenous population studied.^{14, 15} Although Victoria has the lowest proportion of indigenous persons of the total population (<1%), the Australian Bureau of Statistics predicts that it will be the 2nd fastest growing indigenous population in Australia, growing between 2.4% to 2.5% over 1991-2021, but it remains difficult to establish the true number of indigenous Australian's in Victoria due to the under-reporting that is a vestige of patriarchal government policies such as the forced removal of indigenous children.^{1,16} There were 920 indigenous women who gave birth in Victoria in 2011 and this figure is expected to climb to 1,300 by 2021.¹⁶ Therefore, a comprehensive review of Victorian indigenous births taking place in an urban setting would be a valuable addition to the current literature. It will provide valuable information regarding perceived versus actual disparity in metropolitan Victoria.

The Northern Hospital at Epping is located 20km to the north of Melbourne's CBD. It services a diverse and rapidly growing area of over 700,000 people. It delivers around 3,000 babies a year. To date, there have not been any studies on the indigenous population that visits this hospital and it is expected that indigenous women will suffer greater rates of

preterm birth and low birth weight, with rates comparable to indigenous women of other states.

Methods:

The study period consisted of all births over the 1st January 2010 to the 31st December 2014 period, with the data extracted from the Birthing Outcome System (BOS) database. The BOS database is maintained by midwives for the National Perinatal Epidemiology and Statistics unit, which collates and reports national data on all births occurring in Australia.

Data was selected by birth episode, resulting in 14,235 births over the 5 year period. Terminations were excluded from the sample, leaving 14,144 births analysed for this study. Where either mother or father were listed as indigenous, the baby was given an indigenous status. Variables collected for each episode were: birth date, primary blood loss, first antenatal visit, gravida, parity, total number of antenatal care visits, birth weight, admission to special care nursery, 5 minute Apgar score, birth status, estimated gestation, Body Mass Index (BMI), mother's date of birth, gestational diabetes, birth type, baby indigenous status, father indigenous status, maternal indigenous status, baby discharge destination, perineum status, birth defect, neonatal morbidity, resuscitation, maternal morbidity, obstetric complications, personal history, and substance use. It was not clear for all cases with diabetes whether the diabetes listed was type 2 diabetes mellitus (T2DM) or gestational diabetes mellitus (GDM), so both pre-existing and gestational diabetes were grouped and referred to as diabetes in the results. When estimated gestation was greater than 20 weeks and a pregnancy was no longer viable as evidence by the absence of a foetal heartbeat, the pregnancy was classified as a fetal death in utero (FDIU).

In order to validate the accuracy of the BOS, 80 patients were selected at random, with the administrative data, investigations, outpatient notes, and obstetric discharge summaries used to cross-check the recorded birth weight, estimated gestation, and diabetes status in the BOS database. There was 100% accuracy from this sample, comprising of 8 diabetes patients, 15 patients with diabetes recorded as negative and 57 patients who had a blank status for diabetes. All the blank statuses were confirmed as diabetes negative. The hospital administrative data identified a further 38 patients who were not recorded as having GDM from the BOS database, with a further 3 patients with T2DM, to add to the 1833 patients with GDM or T2DM identified from the BOS database. These findings are consistent with what

was indicated in Bell (2008) which found that diabetes was more complete and accurately reported in the hospital data.¹⁷

Statistical methods

Only cases with complete data were included in the univariate and multivariate analysis

Indigenous status for baby or mother was considered as the primary exposure variables, with preterm births and low birth weight (LBW) considered as the primary outcomes. Further distinction was made for babies whose parents were both indigenous (termed indigenous), only paternal indigenous status (paternal indigenous), and only maternal indigenous status (maternal indigenous). Descriptive statistics were used to compare indigenous and non-indigenous birth populations. For univariate analysis, Pearson chi-squared tests were used to compare categorical variables, with Fisher's exact tests used on occasions where frequencies were less than 5. Independent group t-tests were conducted for continuous variables that were normally distributed with results presented as Mean $\pm$ SD. For variables that did not follow a normal distribution, Mann-Whitney (ranksum) tests were used, with results reported as median and Inter-quartile range (IQR). Multivariate analyses were conducted using binary logistic regression, with obesity status (BMI>30), diabetes, smoking, and teenage mother included in each multivariate model as potential confounders between the exposure variables and outcomes. Results are presented as Odds Ratios (OR) and associated 95% confidence intervals p-value of less than 0.05 was considered to indicate statistical significance for these analyses, with all statistical tests two-sided. STATA statistical analysis software (version 12.1) was used (StataCorp, College Station, TX, USA).

The project was reviewed and approved by Northern Health Low-Risk Research Ethics Committee (approval number ALR 07.2015).

Results:

Of the 14,144 births over 1 January 2010 to 31 December 2014 period, there were 138 multiple births (1.0%). Two percent of babies identified as indigenous (301 live births), with 61% (n=185) of the indigenous babies having an indigenous mother. Of the indigenous babies 40 (0.3%) were from parents identifying as both indigenous, 145 (1.0%) were from an indigenous mother and a non-indigenous father, and 96 (0.7%) had a non-indigenous mother with an indigenous father (Table 1c).

Indigenous babies were more likely to have younger mothers, with the proportion of teenage mothers being 11.9% in the indigenous group compared to 3.0% in the non-indigenous group ($p<0.001$) (Table 1a). Indigenous mothers were also more likely to be teenage mothers compared to non-indigenous mothers (10.5% vs 3.1% $p<0.001$) (Table 1b). The rate of indigenous mothers attending antenatal clinics in the first trimester was 84%. The rate of obesity of mothers in the indigenous babies group was also higher (39.9% vs 28.6%, $p<0.001$), with a higher prevalence of smokers in the indigenous group (31.2% vs 12.2%, $p<0.001$) and a lower rate of diabetes (7.8% vs 13.6%, $p=0.004$) (Table 1a). The indigenous mothers group had higher rates of obesity (40.3% vs 28.7%, $p=0.001$), smoking (29.3% vs 12.3%, $p<0.001$), and a lower rates of diabetes (6.1% vs 13.5%, $p=0.003$) (Table 1b). There was no statistically significant difference in birth-weight or estimated gestation across the indigenous status groups, nor for the outcome of LBW ($p=0.416$). The rate of preterm births was higher in the indigenous group (8.8% vs 5.9%, $p=0.034$).

Upon the univariate analysis for outcomes of LBW and PTB we find that the indigenous status of the mother or father is not associated with either LBW or PTB, nor indigenous status of the baby when considering LBW. The rate of indigenous babies born preterm was slightly higher than non-indigenous babies (8.8% vs 5.9%, $p=0.034$). Obesity and smoking were found to be significant predictors of LBW ($p<0.001$), while diabetes and smoking were found to be significant predictors of PTB ($p<0.001$).

The results of the multivariate logistic regression analysis (Table 3a) indicate no difference in the odds of LBW for either indigenous babies (OR 1.01, 95% CI: 0.067-1.67) or indigenous mothers (OR 0.98, 95% CI: 0.51-1.87) after adjustment for teenage mothers, obesity, diabetes, or smoking. Whilst the odds of PTB for indigenous babies was slightly elevated when compared to non-indigenous babies (OR 1.19, 95% CI: 0.77-1.87) this result was not statistically significant ($p=0.434$), and there was no increased odds of PTB for indigenous mothers (OR 0.97, 95% CI: 0.52-1.80). Likewise, it was shown that paternal status did not influence PTB or LBW outcome (Table 3b).

Discussion:

Indigenous women and babies at The Northern Hospital had a similar prevalence of PTB as non-indigenous women have nationally (8.3%[babies], 7.7%[mothers] vs 8%).¹ Whilst they did experience a higher rate of preterm birth than non-indigenous women at The Northern Hospital this was not significant when confounding variables were accounted for in the multivariate logistic regression. Indigenous babies had a higher rate of preterm birth but the difference did not achieve statistical significance when multivariate analyses was conducted.

Nationally, the incidence of LBW is 6.3% and The Northern Hospital compared favourably at 5.4%, with both indigenous and non-indigenous women having a similar incidence.¹ The smoking rate among indigenous mothers remains problematic, and whilst it is lower than the national figures (29.3% vs 50%), it remains significantly higher than the rate present in non-indigenous women at The Northern Hospital (29.3% vs 12.3%).²

Indigenous women had a higher incidence of obesity (40.3% vs 28.7%), which was a significant predictor of LBW. Smoking gave an increased odds ratio of PTB and LBW. With indigenous women smoking more and having a higher rate of obesity, it was difficult to tease out why indigenous women had such better birth outcomes at The Northern Hospital and it was assumed that the obesity, which had a negative correlation to LBW, may have been artificially inflating the birth weights, however, the adjusted odds ratio proved that indigenous women and babies at The Northern Hospital do experience better birth outcomes than nationally.

Attendance at antenatal clinics was earlier amongst indigenous women and much better than published attendance rates (84.0% v 59.7%).⁵ This suggests that there is better engagement with the health service than elsewhere in Australia. The diabetes prevalence in indigenous women was surprisingly positive and may warrant a further investigation using prospective data to confirm this result.

Additionally, the parental status of indigenous babies was shown to have an insignificant impact on PTB and LBW.

Limitations: Indigenous status was self-reported and may represent an undercount of the true population. Many patients had not nominated the fathers ethnicity and this could also contribute to the undercount. The data obtained is per baby episode and does not account for women having more than one birth during this time period, which may have resulted in the demographics of a number of women being represented more than once. There was a dearth of data on antenatal attendance numbers among other variables, which made it difficult to

analyse. As this is a retrospective study, control of the data entry was not possible, erroneous figures may have escaped scrutiny and where data was blank it was omitted from the statistical testing. Inferences from this data should only be made to similar populations in similar areas. This paper does not purport to be a comprehensive state of indigenous health.

Conclusion:

Indigenous women in an urban Victoria setting do not experience worse perinatal outcomes than non-indigenous women. Specifically, indigenous babies and mothers do not have higher rates of preterm birth or low birth weight than non-indigenous women. Indigenous women giving birth at The Northern Hospital over the five year study period did not have rates of preterm birth or low birth weight that are comparable to indigenous people outside of the study area. The published figures of preterm birth and low birth weight are strongly weighted to indigenous health outcomes occurring in areas of greater indigenous population.

Indigenous women at The Northern Hospital had lower smoking rates than nationally reported rates but they still smoked at twice the rate of non-indigenous women. This represents a significant concern and an area of public health that needs more focus.

The results of this study are a positive in the efforts to close the gap between indigenous and non-indigenous Australians. Secondary measures, such as antenatal attendance show an indigenous population that is engaged with the Victorian health system and perhaps help to explain the unexpected positive results of this study.

This study confirms the need to limit inferences made regarding indigenous health as they are not a homogenous group of people and there are differences in health outcomes based on geography and population demographics. The Victorian indigenous population remains an under-studied population and the results of this warrant a need to further evaluate their outcomes. Moving forward, the Victorian health system needs to implement further projects evaluating the needs of this population before targeted interventions. Studies from other states cannot be relied upon to inform policy decisions in this state. Due to the complex psychosocial interplay with regards to indigenous health, perhaps an indigenous-specific smoking intervention and weight-loss intervention may need to be implemented, as well as a prospective study confirming the results of this study.

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Table 1a, Comparison of Indigenous vs Non-Indigenous Liveborn[§] Babies

Variable[#]	Non-Indigenous	Indigenous	p-value
Babies ^{##}	13,843 (97.9)	301 (2.1)	
Multiple births	136 (1.0)	2 (0.7)	1.000
Maternal Age (years)	29.5 ± 5.4	27.1 ± 6.0	<0.001
Maternal Age<20 years	415 (3.0)	35 (11.9)	<0.001
Maternal BMI (kg/m ²)	26 (23,30)	27 (23,33)	0.011
Obese [‡]	3,872 (28.6)	115 (39.9)	<0.001
Diabetes	1,850 (13.6)	23 (7.8)	0.004
Smoking	1,658 (12.2)	92 (31.2)	<0.001
Outcomes			
Birthweight ^{††} (g)	3350 (3020, 3670)	3370 (3040, 3740)	0.411
Gestational Age (weeks)	39.3 (38.3, 40.2)	39.3 (38.4,40.2)	0.923
Low Birth Weight [†]	733 (5.4)	19 (6.5)	0.416
Preterm ^{††}	799 (5.9)	26 (8.8)	0.034

[§] In addition there were 77 stillbirths: 73 (0.5%) of non-indigenous babies and 4 (1.3%) of indigenous babies: chi-square p = 0.082

[#] Data are n (%), Median (25th centile, 75th centile), or Mean ± Standard deviation

^{##} Total babies and mothers are slightly different in different tables due to occasional missing data about infant, maternal or paternal ethnicity, differences in listed baby ethnicity and parental ethnicity, unknown or implausible gestational age or birthweight or missing information about maternal body mass index, diabetes or smoking.

[‡] Obese: BMI ≥ 30.0 in early pregnancy

^{††} includes 138 multiple births

[†]Low birth weight defined as birth weight < 2.5 kg

^{††} Preterm defined as birth before 37+0 weeks gestation

BMI: Body mass index = weight (kg)/height(m)²

Table 1b, Comparison of Indigenous vs Non-Indigenous Mothers

Variable [§]	Non-Indigenous	Indigenous	p-value
Number of births	13,800 (98.7)	185 (1.3)	
Multiple births	139 (1.0)	1 (0.5)	1.000
Maternal Age (years)	29.5 ± 5.4	26.8 ± 5.9	<0.001
Maternal Age<20	426 (3.1)	19 (10.5)	<0.001
Maternal BMI (kg/m ²)	26 (23, 30)	28 (23, 34)	0.018
Obese	3,887 (28.7)	71 (40.3)	0.001
Diabetes	1,851 (13.5)	11 (6.1)	0.003
Smoking	1,683 (12.3)	53 (29.3)	<0.001
Outcomes			
Birthweight [#] (g)	3350 (3020, 3670)	3390 (3060, 3750)	0.139
<i>Median birthweight for state of Victoria (g)¹⁸</i>			
	3369	3298	
Gestational age (weeks)	39.3 (38.3, 40.2)	39.3 (38.4, 40.3)	0.688
Low birth weight (LBW)	736 (5.4)	11 (6.1)	0.683
<i>LBW rate (%) for state of Victoria¹⁸</i>			
	6.1	9.6	
Pre-term, n (%)	808 (5.9)	14 (7.7)	0.306

[§] includes 138 multiple births

Note: Results only describe livebirths

¹⁸ Victorian Perinatal statistics: Hilder L, Zhichao Z, Parker M, Jahan S, Chambers GM 2014

Data are n (%), Median (25th centile, 75th centile), or Mean $\pm$ Standard deviation

‡ Obese: BMI $\geq$ 30.0 in early pregnancy

‡‡ includes 138 multiple births

† Low birth weight defined as birth weight < 2.5 kg

†† Preterm defined as birth before 37+0 weeks gestation

BMI: Body mass index = weight (kg)/height(m)²

Table 1c, Comparison of Babies' Ethnicity

Variable	Non-Indigenous	Indigenous	Maternal		p-value
			Indigenous	Paternal Indigenous	
Number of births	13,707 (98.0)	40 (0.3)	145 (1.0)	96 (0.7)	
Multiple births	136 (1.0)	0	1 (0.7)	1 (1.0)	0.911
Maternal Age (years)	29.5 ± 5.4	27.3 ± 6.2	26.6 ± 5.8	27.5 ± 5.9	<0.001
Maternal Age<20	415 (3.0)	6 (15.8)	13 (9.1)	14 (14.6)	<0.001
Maternal BMI (kg/m ²)	26 (23, 30)	29 (23, 36)	27 (22, 33)	26 (23, 32)	0.036
Obese	3,872 (28.6)	18 (47.4)	53 (38.4)	36 (37.5)	0.001
Diabetes	1,850 (13.6)	3 (7.9)	8 (5.6)	9 (9.4)	0.012
Smoking	1,658 (12.2)	11 (28.9)	42 (29.4)	33 (34.4)	<0.001
Outcomes					
Birthweight [†] (g)	3350 (3020, 3670)	3495 (3190, 3885)	3355 (3040, 3685)	3340 (3020, 3670)	0.159
Gestational age (weeks)	39.3 (38.3, 40.2)	39.6 (38.6, 40.5)	39.2 (38.4, 40.2)	39.3 (38.4, 40.2)	0.477
Low birth weight	733 (5.4)	1 (2.6)	10 (7.0)	4 (4.2)	0.726
Preterm	799 (5.9)	3 (7.9)	11 (7.7)	7 (7.3)	0.540

[†] includes 138 multiple births

Note: Results only describe the non-FDIU births

Table 2 – Results of Univariate analysis of low birth weight and preterm birth outcomes

Variable	Low birth weight [†]			Preterm [§]		
	No	Yes	p-value	No	Yes	p-value
Number of births [†]	13,174 (94.6)	753 (5.4)		13,080 (94.1)	826 (5.9)	
Ethnicity			0.647			0.540
non-indigenous (reference)	12,962 (98.0)	802 (98.0)		12,809 (98.0)	799 (97.4)	
indigenous	37 (0.3)	1 (0.1)		35 (0.3)	3 (0.4)	
maternal indigenous	133 (1.0)	11 (1.3)		132 (1.0)	11 (1.3)	
paternal indigenous	91 (0.7)	4 (0.5)		89 (0.7)	7 (0.9)	
Maternal Age (years)	29.4 ± 5.4	29.6 ± 5.5	0.281	29.4 ± 5.4	30.1 ± 5.8	<0.001
Maternal Age<20	426 (3.2)	23 (3.1)	0.787	416 (3.2)	33 (4.0)	0.199
Maternal BMI (kg/m ²)	26 (23, 30)	24 (22, 29)	<0.001	26 (23, 30)	26 (23, 31)	0.994
Obese ^{††}	3,814 (29.2)	171 (23.1)	<0.001	3,744 (28.8)	237 (29.3)	0.796
Diabetes	1,766 (13.4)	107 (14.2)	0.529	1,729 (13.2)	143 (17.3)	0.001

Smoking	1,589 (12.1)	159 (21.1)	<0.001	1,589 (12.2)	158 (19.1)	<0.001
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[†] includes 138 multiple births: 136 born to non-indigenous and 2 to indigenous mothers

[#] Only cases with complete information for infant and parental ethnicity, birthweight and gestational age

[‡] Low birth weight defined as birth weight < 2.5 kg

[§] Preterm defined as birth before 37+0 weeks gestation

^{††} Obese defined as body mass index > or = to 30.0 kg/m² in early pregnancy

BMI: body mass index

Table 3a –Multivariate logistic regression analysis for the prediction of low birth weight and preterm birth

Variable	Low birth weight [†]			Preterm [‡]		
	OR	95% CI	p-value	OR	95% CI	p-value
Model 1						
Baby Indigenous	1.01	0.61, 1.67	0.966	1.19	0.77, 1.87	0.434
Obese [§]	0.70	0.59, 0.84	<0.001	0.97	0.83, 1.14	0.696
Diabetes	1.17	0.94, 1.45	0.154	1.43	1.18, 1.74	<0.001
Smoking	1.94	1.61, 2.35	<0.001	1.72	1.43, 2.07	<0.001
Maternal age<20 years	0.89	0.58, 1.37	0.588	1.27	0.88, 1.83	0.208
Model 2						
Mother Indigenous	0.98	0.51, 1.87	0.943	0.97	0.52, 1.80	0.928
Obese [§]	0.7	0.58, 0.83	<0.001	0.96	0.82, 1.13	0.658
Diabetes	1.18	0.95, 1.46	0.135	1.44	1.19, 1.74	<0.001
Smoking	1.97	1.63, 2.37	<0.001	1.75	1.36, 2.11	<0.001
Maternal age<20 years	0.90	0.58, 1.38	0.619	1.29	0.89, 1.85	0.177

[†]Low birth weight defined as birth weight < 2.5 kg

[‡]Preterm defined as birth before 37+0 weeks gestation

[§] Obese defined as body mass index > or = to 30.0 kg/m² in early pregnancy

Table 3b –Multivariate logistic regression analysis for the prediction low birth weight and preterm birth

Variable	Low birth weight [†]			Preterm [‡]		
	OR	95% CI	p-value	OR	95% CI	p-value
Ethnicity of infant						
non-indigenous (reference)	1	-	-	1	-	-
indigenous	0.45	0.06, 3.29	0.429	1.25	0.38, 4.09	0.716
maternal indigenous	1.13	0.57, 2.23	0.736	0.91	0.44, 1.88	0.802
paternal indigenous	0.69	0.25, 1.89	0.469	1.10	0.50, 2.39	0.812
Obese [§]	0.70	0.59, 0.84	<0.001	0.97	0.83, 1.13	0.678

Diabetes	1.18	0.95, 1.46	0.142	1.43	1.18, 1.73	<0.001
Smoking	1.95	1.62, 2.36	<0.001	1.71	1.42, 2.06	<0.001
Maternal age<20 years	0.91	0.59, 1.40	0.67	1.29	0.89, 1.86	0.177

[†] Low birth weight defined as birth weight < 2.5 kg

[‡] Preterm defined as birth before 37+0 weeks gestation

[§] Obese defined as body mass index > or = to 30.0 kg/m² in early pregnancy

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