

1.01 Low birthweight infants

The incidence of low birthweight among live-born babies of Aboriginal and Torres Strait Islander mothers

Data sources

Data for this measure come from the Australian Institute of Health and Welfare (AIHW) National Perinatal Statistics Unit National Perinatal Data Collection.

Data on birthweight is collected as part of the Perinatal National Minimum Data Set. Each state and territory has a perinatal collection based on birth notification forms completed by midwives and other staff, using information obtained from mothers and from hospital and other records. These data are provided in electronic format annually to the AIHW National Perinatal Statistics Unit. Perinatal notification forms are completed in Australia for all births of 20 weeks or more gestation, or a birthweight of 400 grams or more.

All jurisdictions collect the Indigenous status of the mother of the baby. However, this data element does not provide the Indigenous status of the baby. Therefore Indigenous births will be underestimated as babies born to Indigenous fathers and non-Indigenous mothers are not included in the data collection.

Data are presented for all states and territories with the exception of Tasmania for which the 'not stated' category for Indigenous status is unable to be distinguished from the category for non-Indigenous.

Data on mothers for whom Indigenous status was 'not stated' have been excluded from analysis. In 2003, there were 77 births with a 'not stated' Indigenous status in all states and territories excluding Tasmania (0.03%).

The World Health Organization (WHO) defines low birthweight as less than 2,500 grams.

Analyses

Births

Between 2001 and 2003 there were 722,450 births recorded in the National Perinatal Minimum Data Set (excluding Tasmania) of which 26,678 (3.7%) were to Aboriginal and Torres Strait Islander mothers.

Low birthweight

Table 1.01.1 presents the number and proportion of live-born low birthweight babies by Indigenous status of the mother and state/territory for the periods 1998–2000 and 2001–2003.

- Over the period 1998–2000, there were 3,087 live-born babies weighing less than 2,500 grams birthweight born to Indigenous mothers in Australia (not including Tasmania). Babies of Indigenous mothers were twice as likely to be of low birthweight as babies born to non-Indigenous mothers (12% compared to 6%).

- Over the period 2001–2003, there were 3,403 live-born babies of low birthweight born to Indigenous mothers in Australia (not including Tasmania). Approximately 13% of babies born to Indigenous mothers were of low birthweight, compared to 6% of babies born to non-Indigenous mothers. When multiple births are excluded, approximately 11.8% of babies born to Indigenous mothers were of low birthweight compared to 4.5% of babies born to non-Indigenous mothers.
- Queensland and New South Wales had the lowest proportion of live-born low birthweight babies born to Indigenous mothers in 2001–2003 (11% and 12% respectively). The Australian Capital Territory had the highest proportion of low birthweight babies (19%), however these data should be interpreted with caution due to the small number of Indigenous babies born in the Australian Capital Territory each year and the likelihood that some women from surrounding New South Wales (especially those with pregnancy complications) are referred to hospitals in the Australian Capital Territory.

Table 1.01.1: Low birthweight babies, by Indigenous status of mother and state/territory, 1998–2000 and 2001–2003^{(a)(b)(c)(d)(e)}

	1998–2000		2001–2003	
	No.	%	No.	%
NSW				
Indigenous	681	11.0	784	12.2
Non-Indigenous	14,429	5.7	14,451	5.8
Vic				
Indigenous	171	13.4	152	12.7
Non-Indigenous	11,542	6.2	11,814	6.3
Qld				
Indigenous	907	10.8	956	11.5
Non-Indigenous	8,319	6.1	8,671	6.2
WA				
Indigenous	606	13.3	675	14.5
Non-Indigenous	4,160	5.8	4,042	5.8
SA				
Indigenous	203	15.7	229	17.6
Non-Indigenous	3,349	6.3	3,193	6.2
ACT^(f)				
Indigenous	29	16.7	39	19.1
Non-Indigenous	950	6.8	901	6.5
NT				
Indigenous	490	12.7	568	13.3
Non-Indigenous	490	7.2	402	6.0
Total^(g)				
Indigenous	3,087	12.0	3,403	12.9
Non-Indigenous	43,239	6.0	43,474	6.1

(a) Table includes live births of 20 weeks gestation or more or of 400 grams or more birthweight. Low birthweight is defined as less than 2,500 grams.

(b) Data are presented in three-year groupings due to small numbers each year. These groupings represent three calendar years.

(c) Data relate to the Indigenous status of the mother only and therefore underestimate Indigenous births.

(d) Indigenous and non-Indigenous data exclude births where the mother's Indigenous status is not stated.

(e) State-level data are based on place where birth occurred, not place of usual residence. Cross-border issues need to be considered here, e.g. a high proportion of births in ACT hospitals are to mothers usually resident in NSW.

(f) Because of the small numbers in the ACT, fluctuations over time need to be interpreted with caution.

(g) Excludes Tasmania as the 'not stated' category for Indigenous status was unable to be distinguished from the 'non-Indigenous' category.

Source: AIHW National Perinatal Statistics Unit (NPSU) National Perinatal Data Collection.

Time series analysis

Fluctuations in the number/proportion of low birthweight babies of Indigenous mothers over time partly reflect changing levels of coverage of babies of Indigenous mothers in the perinatal data. Caution should be exercised in assessing trends in low birthweight babies of Indigenous mothers over time and comparisons with the non-Indigenous population.

The rate (proportion) of low birthweight babies per 100 live births, rate ratios and rate differences between Indigenous and non-Indigenous low birthweight babies over the period 1997–2003 are presented in Table 1.01.2 and Figure 1.01.1.

- Over the period 1997–2003, there was a significant increase in the proportion of low birthweight babies born to Indigenous and non-Indigenous mothers. The fitted trend implies an average yearly increase in low birthweight babies born to Indigenous mothers of around 0.25 per 100 live births and around 0.03 per 100 live births for low birthweight babies born to non-Indigenous mothers.
- Over the same period there was a significant increase in both the rate ratio and rate difference between low birthweight babies born to Indigenous and non-Indigenous mothers. The fitted trend implies an average yearly increase in the rate ratio of around 0.03 and an average yearly increase in the rate difference of around 0.22 per 100 live births.

Table 1.01.2: Rate (proportion), rate ratio and rate difference between low birthweight babies of Indigenous and non-Indigenous mothers, 1997–2003

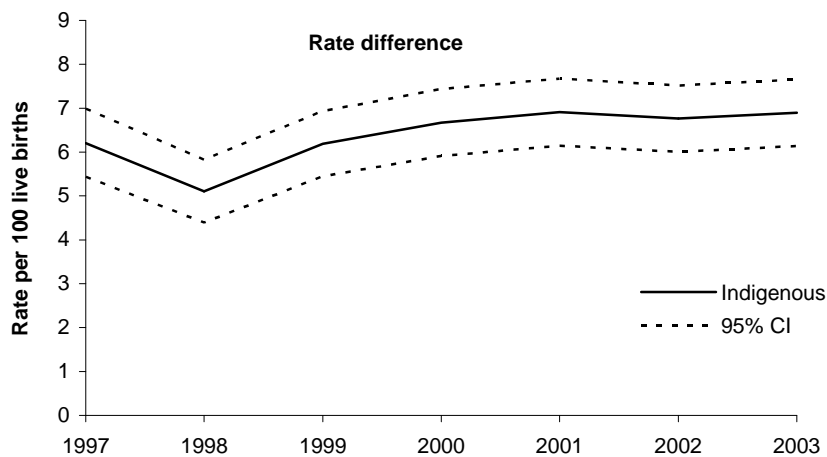
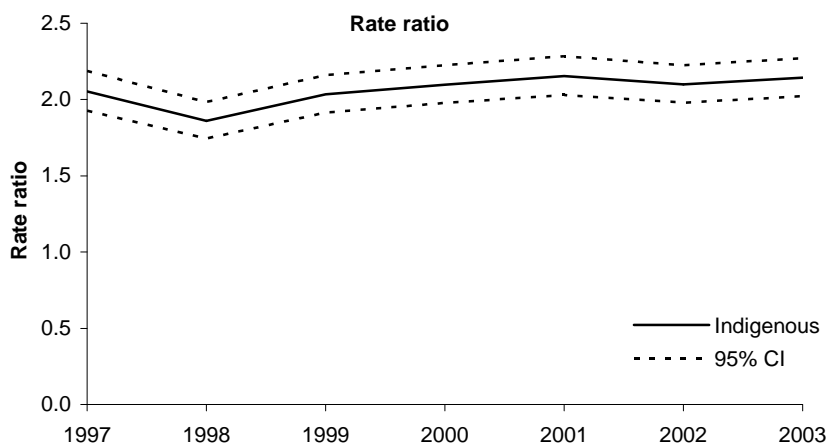
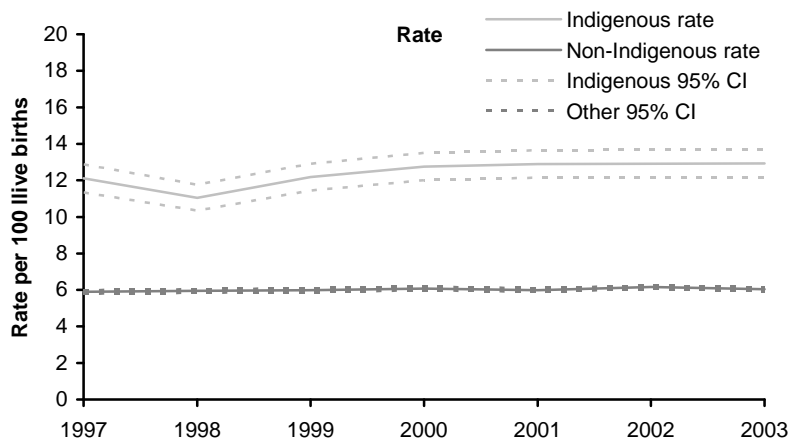
	1997	1998	1999	2000	2001	2002	2003	Annual change ^(a)
Rate per 100 live births (%)								
Indigenous	12.1	11.0	12.2	12.7	12.9	12.9	12.9	0.25*
Non-Indigenous	5.9	5.9	6.0	6.1	6.0	6.2	6.0	0.03*
Rate ratio	2.1	1.9	2.0	2.1	2.2	2.1	2.1	0.03*
Rate difference	6.2	5.1	6.2	6.7	6.9	6.8	6.9	0.22*

* Represents results with statistically significant increases or decreases at the $p < .05$ level over the period 1997–2003.

(a) Average annual change in number and proportion of low birthweight babies determined using linear regression analysis.

Note: Excludes Tasmania as the 'not stated' category for Indigenous status was unable to be distinguished from the 'non-Indigenous' category.

Source: AIHW analysis of AIHW NPSU National Perinatal Data Collection.



Note: Excludes Tasmania as the 'not stated' category for Indigenous status was unable to be distinguished from the 'non-Indigenous' category.

Source: AIHW analysis of AIHW NPSU National Perinatal Data Collection.

Figure 1.01.1: Rates, rate ratios and rate differences between low birthweight babies of Indigenous and non-Indigenous mothers, 1997–2003

Mean birthweight

- In 2003, the average birthweight of live-born babies of Indigenous mothers was 3,160 grams. This was 220 grams lighter than the average of 3,380 grams for live-born babies of non-Indigenous mothers in 2003.

Time series analysis

- Over the period 1997–2003, while there was a significant decline in the mean birthweight of babies of Indigenous mothers (the fitted trend implies an average yearly decline of around 2.7 grams), this decline is not necessarily clinically significant. The change could be accounted for by measurement error, for example, instrument calibration or error in the observer making the measurement, which is more likely to occur in births in remote areas or home births for which Indigenous births are over represented. There was no significant change in the mean birthweight of babies of non-Indigenous mothers over the same period (Table 1.01.3). It should also be noted that there is a significant difference between the mean birthweight of male and female babies born of low birthweight (male babies were born an average of 125 grams more than female babies in 2003).
- There was a significant decline in the ratio and difference between the mean birthweight of babies of Indigenous and non-Indigenous mothers over the period 1997–2003.

Table 1.01.3: Mean birthweight, ratio and difference between mean birthweight of live-born babies of Indigenous and non-Indigenous mothers, 1997–2003

	1997	1998	1999	2000	2001	2002	2003	Annual change ^(a)
Mean birthweight (grams)								
Indigenous	3,170	3,186	3,170	3,175	3,166	3,165	3,160	-2.7
Non-Indigenous	3,375	3,382	3,380	3,384	3,382	3,378	3,380	0.3
Rate ratio	0.9	0.9	0.9	0.9	0.9	0.9	0.9	-0.0*
Rate difference (grams)	-205	-196	-210	-209	-216	-213	-220	-1.3*

* Represents results with statistically significant increases or decreases at the $p < .05$ level over the period 1997–2003.

(a) Average annual change in number and proportion of low birthweight babies determined using linear regression analysis.

Note: Excludes Tasmania as the category 'not stated' Indigenous status was unable to be distinguished from the category 'non-Indigenous'.

Source: AIHW analysis of AIHW NPSU National Perinatal Data Collection.

Preterm births

Preterm birth before 37 weeks gestation is associated with neonatal problems that cause significant morbidity and mortality in newborn babies.

- Over the period 2001–2003, approximately 13% of live-born babies of Indigenous mothers were preterm compared to 7% of live-born babies born to non-Indigenous mothers (NPSU unpublished data).
- Of live-born low birthweight babies born to Indigenous mothers in 2001–03, approximately 67% were preterm. This compared to 69% of babies born to non-Indigenous mothers (NPSU unpublished data).

International comparisons

International Indigenous data are available for Indigenous persons from New Zealand, the United States and Canada using the WHO definition of low birthweight.

International statistics on low birthweight show that Indigenous mothers in Canada and the United States have lower rates of low birthweight babies than the general population, Indigenous mothers in New Zealand have slightly higher rates of low birthweight babies than the general population but the gap is not as great as for Aboriginal and Torres Strait Islander Australians. In Australia, babies of Aboriginal or Torres Strait Islander mothers are more than twice as likely to be of low birthweight as babies born to Australian mothers (13% compared to 6% – Laws & Sullivan 2005). The latest available data from the United States, Canada and New Zealand are outlined below.

- For the period 2001–2003, 7.3% of babies born to American Indian or Alaskan native mothers on reserves were of low birthweight. This compared to 7.8% of babies born to all mothers in the United States (National Center for Health Statistics, 2005).
- In 2000, 4.7% of Canadian First Nation babies were of low birthweight. This compared with the 2001 Canadian rate of 5.5% (Health Canada 2005).
- For the period 2001–2002, 7.9% of babies born to Maori mothers were of low birthweight. This compared to 6.3% of babies born to all mothers in New Zealand (Statistics New Zealand 2005).

Additional information

Risk factors for low birthweight

There are a range of factors that can affect a baby's birthweight. Low birthweight babies may also be the result of preterm birth, fetal growth restriction, or a combination of the two, or other factors such as socioeconomic disadvantage, the size and age of the mother, the number of babies previously born to the mother, the mother's nutritional status, smoking and other risk factors such as the use of alcohol, illness during pregnancy, multiple births and the duration of pregnancy (Horta et al. 1997; Kramer 1998). Data on some of these risk factors for low birthweight are presented below for Indigenous and non-Indigenous mothers.

- Aboriginal and Torres Strait Islander mothers smoke during pregnancy at around four times the rate of non-Indigenous mothers (see 2.25 for more information on smoking during pregnancy).
- Indigenous females are more likely to have babies at younger ages than non-Indigenous mothers. In 2003, more than one in five (22.7%) Aboriginal and Torres Strait Islander mothers were teenagers, compared with 3.9% of non-Indigenous mothers (Laws & Sullivan 2005). Teenage pregnancies are associated with a number of adverse reproductive outcomes including low birthweight (Fraser et al. 1995).
- Indigenous mothers have twice the rate of preterm birth (gestational age of less than 37 weeks) as non-Indigenous mothers. In 2003, 14% of births to Indigenous mothers were preterm compared with 8% of births to non-Indigenous mothers (Laws & Sullivan 2005).
- Indigenous mothers are more likely to have had a higher number of previous pregnancies. In 2003, 28% of Aboriginal and Torres Strait Islander mothers had given birth three or more times previously. This compared to 9% of all mothers (Laws & Sullivan 2005).

Data quality issues

Perinatal data

Births

Birth notification forms are completed for all births of 20 weeks or more gestation, or a birthweight of 400 grams or more. The Perinatal National Minimum Data Set includes all births in Australia in hospitals, birth centres and the community.

The state/territory of birth is provided for all births in each state/territory. State-level data is based on place where birth occurred, not place of usual residence. Complicated pregnancies from surrounding New South Wales may be referred to the Australian Capital Territory and hence there may be poorer outcomes attributed to Australian Capital Territory births. Because of this and the small numbers involved, care should be taken in interpreting data from the Australian Capital Territory (Laws & Sullivan 2004b).

Indigenous status question

A standard data item for Indigenous status is specified in the Perinatal National Minimum Data Set. However, at this stage not all states and territories use this standard wording for the Indigenous status question on their forms. This impacts on the quality and comparability of the data collected (ABS & AIHW 2003).

Under-identification

All jurisdictions collect Indigenous status of the mother for each baby. However, this statistic does not necessarily indicate the Indigenous status of the baby.

Studies linking perinatal data with birth registration data and hospital admissions show that Indigenous data are under-reported (Human Resources Development Canada & Health Canada, 2003). However, there has not been a systematic audit of the accuracy of these data across the nation. Therefore, at this stage, it is not possible to quantify or adjust for errors in identification.

All jurisdictions are working towards improving the quality of the Indigenous status data. Data on Indigenous status are not reported for Tasmania as the not stated category for Indigenous status is included with the non-Indigenous category. The not stated category for Indigenous status is high for Tasmania (around 75%) and low for the other jurisdictions, not more than 0.5% (Laws & Sullivan 2004a).

The not stated category for birthweight was found to be small nationally in the evaluation of the Perinatal National Minimum Data Set. Therefore, the exclusion of not stated for birthweight will not have a significant impact on these data.

International comparisons

International Indigenous data are available for New Zealand, the United States and Canada using the WHO definition of low birthweight. These data are subject to similar data quality issues experienced in Australia around the accuracy of identification. The Canadian data exclude births less than 500 grams due to changes over time in the quality of reporting babies' birthweight less than 500 grams. This definition is slightly different from Australia's criteria – excluding babies less than 400 grams or less than 20 weeks gestation.

The scope of data collections in Canada and the United States is often limited to the registered or reserve Indigenous populations and therefore does not cover the whole Indigenous population. International comparisons need to take into account that the definition of Indigenous status is specific to each country.

References

- ABS & AIHW (Australian Bureau of Statistics and Australian Institute of Health and Welfare) 2003. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2003. ABS cat. no. 4704.0, AIHW cat. no. IHW 11. Canberra: ABS.
- Fraser AM, Brockert JE & Ward RH 1995. Association of young maternal age with adverse reproductive outcomes. *The New England Journal of Medicine* 221:1113-18.
- Health Canada 2005. First Nations comparable health indicators. <www.hc-sc.gc.ca/fnih-spni/pubs/gen/2005-01_health-sante_indicat/index_e.html>.
- Horta BL, Victoria CG, Menezes AM, Halpern R & Barros FC 1997. Low birthweight, preterm babies and intrauterine growth retardation in relation to maternal smoking. *Paediatric and Perinatal Epidemiology* 11:140-51.
- Human Resources Development Canada & Health Canada 2003. The well-being of Canada's young children. Canada: Government of Canada.
- Kramer MS 1998. Socioeconomic determinants of intrauterine growth retardation. *European Journal of Clinical Nutrition* 52(S1):S29-33.
- Laws PJ & Sullivan EA 2004a. Australia's mothers and babies 2002. AIHW cat. no. PER 28, Sydney: AIHW National Perinatal Statistics Unit (Perinatal Statistics Series No. 15).
- Laws PJ & Sullivan EA 2004b. Report on the evaluation of the Perinatal National Minimum Data Set. Perinatal Statistical Series No. 14. AIHW cat. no. PER 27. Sydney: AIHW National Perinatal Statistics Unit.
- Laws PJ & Sullivan EA 2005. Australia's mothers and babies 2003. Perinatal Statistics Series No. 16. AIHW cat. no. PER 29. Sydney: AIHW National Perinatal Statistics Unit.
- National Center for Health Statistics 2005. Health, United States 2005: chartbook on trends in the health of Americans. Maryland: United States Department of Health and Human Services.
- Statistics New Zealand 2005. Demographic trends 2004. Wellington: Statistics New Zealand.