

4 Babies of Indigenous mothers

Summary

The perinatal outcomes of babies born to Indigenous mothers were poor when compared with babies born to non-Indigenous mothers during 2001–2004. Fourteen per cent of births to Indigenous mothers were preterm (Table 4.2) compared with 8% of babies born to non-Indigenous mothers. Older Indigenous mothers were more likely to give birth to a preterm baby (Table 4.4).

Thirteen per cent of liveborn babies of Indigenous mothers were low birthweight over the 2001–2004 period (Table 4.5). This was more than double the proportion observed among liveborn babies of non-Indigenous mothers (6%). The proportion of low birthweight babies among babies born to Indigenous mothers was highest in older mothers (15% in those aged 35 years and over) (Table 4.8). The mean birthweight of babies born to Indigenous mothers decreased with increased remoteness and socioeconomic disadvantage (Tables 4.6 and 4.7).

Of liveborn babies of Indigenous mothers, approximately 3% had a low Apgar score at 5 minutes (Table 4.10). This was higher than the proportion observed among liveborn babies of non-Indigenous mothers (1.3%). The proportion of babies born to Indigenous mothers who had a low Apgar score at 5 minutes increased with increased remoteness (Table 4.11).

The median length of stay in hospital for babies of Indigenous mothers was 3 days (Table 4.12), shorter than the median length of stay observed among babies born to non-Indigenous mothers (4 days). The median length of stay among babies born to Indigenous mothers was higher in very remote areas and in the most advantaged socioeconomic quintile (both 4 days) (Tables 4.13 and 4.14).

There were 424 fetal deaths and 201 neonatal deaths reported among babies born to Indigenous mothers for 2001–2004. This equated to a fetal death rate of 12 per 1,000 births and a neonatal death rate of 6 per 1,000 live births (Table 4.15). This was considerably higher than the fetal and neonatal death rates observed among babies born to non-Indigenous mothers (7 and 3 per 1,000 births respectively).

Demographic profile

Birth status

Babies are recorded as liveborn or stillborn (fetal deaths) on perinatal notification forms. A live birth is defined by the World Health Organisation (WHO) as the complete expulsion or extraction from the mother of a baby which, after such separation, breathes or shows any other evidence of life. A fetal death is defined as a death occurring before the complete expulsion or extraction from the mother of a product of conception of 20 or more completed weeks gestation or 400 grams or more birthweight (NHDC 2003). The same criteria are applied to live births for inclusion in the NPDC; that is, live births must also be at least 20 weeks gestation or at least 400 grams birthweight.

There were 35,258 live births and 424 fetal deaths to Indigenous mothers in Australia in 2001–2004, giving a total of 35,682 births to Indigenous mothers reported to the NPDC (Table 2.1).

Sex

Male live births to Indigenous mothers exceeded female live births in all states and territories, except Victoria and the Australian Capital Territory, and accounted for 51% of live births to Indigenous mothers in 2001–2004 (Table 4.1). The sex ratio (defined as the number of male liveborn babies per 100 female liveborn babies) for babies born to Indigenous mothers was 105 nationally and ranged from 95 in the Australian Capital Territory to 109 in the Northern Territory. For live births to non-Indigenous mothers, the sex ratio was 106 males per 100 females.

Table 4.1: Live births to Indigenous mothers by sex and state and territory, 2001–2004

Sex of baby	NSW	Vic	Qld	WA	SA	ACT	NT	Total
Sex ratio (M:F)	104.4	96.3	107.9	100.7	101.7	95.1	108.8	104.9
	Number							
Males	4,469	798	5,735	3,094	899	135	2,918	18,048
Females	4,281	829	5,314	3,073	884	142	2,683	17,206
Indeterminate/ not stated	2	—	—	—	1	—	1	4
Total	8,752	1,627	11,049	6,167	1,784	277	5,602	35,258
	Per cent							
Males	51.1	49.0	51.9	50.2	50.4	48.7	52.1	51.2
Females	48.9	51.0	48.1	49.8	49.6	51.3	47.9	48.8
Indeterminate/ not stated	—	—	—	—	0.1	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Data for Tasmania were not available.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Outcomes

Gestational age

Preterm birth (before 37 weeks gestation) is associated with neonatal problems that cause significant morbidity and mortality in newborn babies. Preterm births were classified according to the criteria of the WHO into groups of 20–27 weeks, 28–31 weeks and 32–36 weeks.

In 2001–2004 there were 4,962 preterm births to Indigenous mothers, accounting for 14% of all births to Indigenous mothers (Table 4.2). This was almost double the proportion of preterm births to non-Indigenous mothers (8%) (Figure 4.1). There was variation in the proportion of preterm births to Indigenous mothers among the states and territories, ranging

from 12% of all births in New South Wales to 22% in the Australian Capital Territory. A large proportion of Indigenous women who gave birth in the Australian Capital Territory were residents of New South Wales, therefore, preterm births appear high when based on births to Indigenous women who gave birth in the Australian Capital Territory. Note that there are a small number of Aboriginal and Torres Strait Islander mothers who give birth in the Australian Capital Territory, and the proportion fluctuates from year to year, making this jurisdiction less comparable to other jurisdictions.

For 2001–2004, the mean gestational age of preterm births to Indigenous mothers was 32.9 weeks and the mean gestational age for babies of Indigenous mothers was 33.2 weeks.

Table 4.2: Preterm births to Indigenous mothers by gestational age and state and territory, 2001–2004

Gestational age (weeks)	NSW	Vic	Qld	WA	SA	ACT ^(a)	NT	Total
Mean	33.2	32.6	32.8	32.9	32.2	31.2	33.1	32.9
	Number							
20–27 ^(b)	106	38	193	115	53	16	104	625
28–31	132	24	171	120	51	13	85	596
32–36	830	171	1,067	728	222	33	690	3,741
Total	1,068	233	1,431	963	326	62	879	4,962
	Per cent^(c)							
20–27 ^(b)	1.2	2.3	1.7	1.8	2.9	5.6	1.8	1.8
28–31	1.5	1.5	1.5	1.9	2.8	4.6	1.5	1.7
32–36	9.4	10.3	9.6	11.6	12.2	11.6	12.2	10.5
Total	12.1	14.1	12.8	15.4	18.0	21.8	15.5	13.9

(a) Care must be taken when interpreting the ACT rates as these rates include babies born in the Australian Capital Territory to Indigenous mothers who were non-ACT residents. For example, the percentage of preterm births among babies who were born in the Australian Capital Territory to ACT-resident Indigenous mothers from 2001 to 2004 was 14.9%.

(b) Includes two babies of less than 20 weeks gestation.

(c) Percentage of all births to Indigenous mothers.

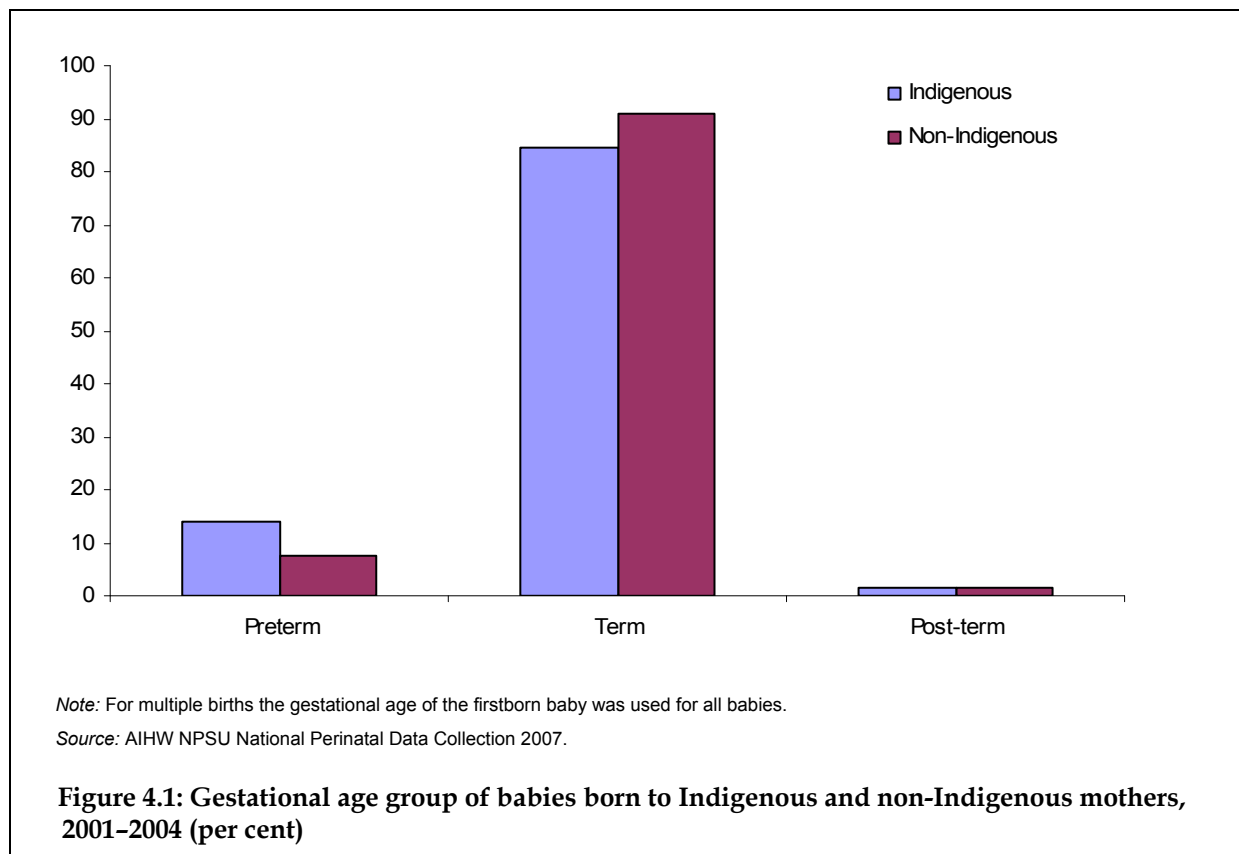
Notes

1. Data for Tasmania were not available.

2. For multiple births the gestational age of the firstborn baby was used for all babies.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Of births to Indigenous mothers, 85% were at term compared with 91% of births to non-Indigenous mothers. Only around 2% of births to Indigenous mothers and non-Indigenous mothers were post-term.



The proportion of preterm multiple births to Indigenous mothers in 2001-2004 was substantially higher than the proportion of preterm singleton births (Table 4.3). Thirteen per cent of singleton births to Indigenous mothers were preterm compared with almost two-thirds of twins (61%). There were 21 higher order multiple births to Indigenous mothers and these births were all preterm.

Table 4.3: Births to Indigenous mothers by gestational age and plurality, 2001–2004

Gestational age (weeks)	Plurality			Total
	One	Two	Three or more	
	Number			
20–27 ^(a)	555	64	6	625
28–31	511	76	9	596
32–36	3,381	354	6	3,741
37–41	29,826	316	—	30,142
42 and over	560	—	—	560
Not stated	18	—	—	18
Total	34,851	810	21	35,682
20–36 ^(a)	4,447	494	21	4,962
	Per cent			
20–27 ^(a)	1.6	7.9	28.6	1.8
28–31	1.5	9.4	42.9	1.7
32–36	9.7	43.7	28.6	10.5
37–41	85.6	39.0	—	84.5
42 and over	1.6	—	—	1.6
Not stated	0.1	—	—	0.1
Total	100.0	100.0	100.0	100.0
20–36 ^(a)	12.8	61.0	100.0	13.9

(a) Includes two babies of less than 20 weeks gestation.

Note: For multiple births the gestational age of the firstborn baby was used for all babies.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Older Indigenous mothers (i.e. those aged 35 years and over) were more likely to have a preterm birth than mothers in the younger age groups during 2001–2004 (Table 4.4). Almost one-fifth of babies born to Indigenous mothers aged 35 years and over were preterm (18%), compared with only 13% of babies born to Indigenous mothers aged 20–24 years and 25–29 years. Around 15% of babies born to Indigenous mothers aged 30–34 years and 14% of babies born to Indigenous mothers aged less than 20 years were preterm.

Indigenous mothers aged 35 years and over had the lowest proportion of births at term (81%). The highest proportion of post-term births was seen in teenage Indigenous mothers.

Table 4.4: Births to Indigenous mothers by gestational age and maternal age, 2001–2004

Gestational age (weeks)	Maternal age					Not stated	Total
	Less than 20	20–24	25–29	30–34	35 and over		
	Number						
20–27 ^(a)	149	200	139	88	48	1	625
28–31	140	149	141	100	66	—	596
32–36	823	1,100	846	619	352	1	3,741
37–41	6,711	9,458	7,244	4,620	2,097	12	30,142
42 and over	153	161	134	84	28	—	560
Not stated	5	6	3	2	2	—	18
Total	7,981	11,074	8,507	5,513	2,593	14	35,682
20–36 ^(a)	1,112	1,449	1,126	807	466	2	4,962
	Per cent						
20–27 ^(a)	1.9	1.8	1.6	1.6	1.9	7.1	1.8
28–31	1.8	1.3	1.7	1.8	2.5	—	1.7
32–36	10.3	9.9	9.9	11.2	13.6	7.1	10.5
37–41	84.1	85.4	85.2	83.8	80.9	85.7	84.5
42 and over	1.9	1.5	1.6	1.5	1.1	—	1.6
Not stated	0.1	0.1	—	—	0.1	—	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
20–36 ^(a)	13.9	13.1	13.2	14.6	18.0	14.3	13.9

(a) Includes 2 babies of less than 20 weeks gestation.

Note: For multiple births the gestational age of the firstborn baby was used for all babies.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Birthweight

A baby's birthweight is a key indicator of health status. Babies are defined as low birthweight if their weight at birth is less than 2,500 grams. Within this category, those weighing less than 1,500 grams are defined as very low birthweight (WHO 1992).

In 2001–2004, 86% of liveborn babies to Indigenous mothers had a birthweight in the range of 2,500–4,499 grams (Table 4.5). The mean birthweight was 3,162 grams. Thirteen per cent of liveborn babies to Indigenous mothers fell within the low birthweight range. This proportion was considerably higher than the proportion of liveborn babies to non-Indigenous mothers who had a birthweight of less than 2,500 grams (6%). The mean birthweight of liveborn babies of non-Indigenous mothers was 3,381 grams.

The proportion of low birthweight liveborn babies born to Indigenous mothers varied among the states and territories; from 12% in both New South Wales and Queensland to 19% in the Australian Capital Territory. A large proportion of Indigenous women who gave birth in the Australian Capital Territory were residents of New South Wales, therefore, the proportion of low birthweight babies appears high when based on births to Indigenous women who gave birth in the Australian Capital Territory.

Table 4.5: Live births to Indigenous mothers by birthweight and state and territory, 2001–2004

Birthweight (g)	NSW	Vic	Qld	WA	SA	ACT ^(a)	NT	Total
Mean	3,193	3,158	3,200	3,124	3,064	3,085	3,117	3,162
	Number							
Less than 1,500	165	38	255	160	78	18	127	841
1,500 – 2,499	903	184	1,020	732	236	35	627	3,737
2,500 – 4,499	7,560	1,375	9,586	5,199	1,445	223	4,781	30,169
4,500 and over	120	29	185	75	n.p.	<5	66	501
Not stated	4	1	3	1	n.p.	n.p.	1	10
Total	8,752	1,627	11,049	6,167	1,784	277	5,602	35,258
<i>Less than 2,500</i>	<i>1,068</i>	<i>222</i>	<i>1,275</i>	<i>892</i>	<i>314</i>	<i>53</i>	<i>754</i>	<i>4,578</i>
	Per cent							
Less than 1,500	1.9	2.3	2.3	2.6	4.4	6.5	2.3	2.4
1,500 – 2,499	10.3	11.3	9.2	11.9	13.2	12.6	11.2	10.6
2,500 – 4,499	86.4	84.5	86.8	84.3	81.0	80.5	85.3	85.6
4,500 and over	1.4	1.8	1.7	1.2	n.p.	n.p.	1.2	1.4
Not stated	—	0.1	—	—	n.p.	n.p.	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Less than 2,500</i>	<i>12.2</i>	<i>13.6</i>	<i>11.5</i>	<i>14.5</i>	<i>17.6</i>	<i>19.1</i>	<i>13.5</i>	<i>13.0</i>

(a) Care must be taken when interpreting the ACT rates as these rates include babies born in the Australian Capital Territory to Indigenous mothers who were non-ACT residents. For example, the percentage of low birthweight among babies who were born in the Australian Capital Territory to ACT-resident Indigenous mothers from 2001 to 2004 was 12.3%.

Note: Data for Tasmania were not available.

n.p. Data not published to maintain confidentiality of small numbers.

Source: AIHW NPSU National Perinatal Data Collection 2007.

In 2001–2004, the mean birthweight of live babies born to Indigenous mothers decreased with increased remoteness of the mothers' usual place of residence (Table 4.6). The mean birthweight was highest among babies born to Indigenous mothers residing in major cities

(3,188 grams), decreasing with increased remoteness to 3,169 grams in outer regional areas and 3,123 grams in very remote areas.

The proportion of liveborn babies to Indigenous mothers who had a birthweight of less than 2,500 grams was similar across all remoteness areas (between 13% and 14%).

Table 4.6: Live births to Indigenous mothers by birthweight and remoteness area of usual residence, 2001–2004

Birthweight (g)	Major cities	Inner regional	Outer regional	Remote	Very remote	Total ^(a)
Mean	3,188	3,175	3,169	3,146	3,123	3,163
			Number			
Less than 1,500	196	134	236	99	174	839
1,500 – 2,499	866	607	991	471	794	3,729
2,500 – 4,499	7,159	5,002	8,431	3,388	6,177	30,157
4,500 and over	126	88	123	73	91	501
Not stated	—	1	8	—	1	10
Total	8,347	5,832	9,789	4,031	7,237	35,236
<i>Less than 2,500</i>	<i>1,062</i>	<i>741</i>	<i>1,227</i>	<i>570</i>	<i>968</i>	<i>4,568</i>
			Per cent			
Less than 1,500	2.3	2.3	2.4	2.5	2.4	2.4
1,500 – 2,499	10.4	10.4	10.1	11.7	11.0	10.6
2,500 – 4,499	85.8	85.8	86.1	84.0	85.4	85.6
4,500 and over	1.5	1.5	1.3	1.8	1.3	1.4
Not stated	—	—	0.1	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Less than 2,500</i>	<i>12.7</i>	<i>12.7</i>	<i>12.5</i>	<i>14.1</i>	<i>13.4</i>	<i>13.0</i>

(a) Excludes mothers not usually resident in Australia and those whose area of usual residence was 'Not stated'.

Source: AIHW NPSU National Perinatal Data Collection 2007.

The mean birthweight of live babies born to Indigenous mothers in 2001–2004 was lowest in the first and most disadvantaged quintile (3,140 grams) and highest in the fourth and fifth quintiles of socioeconomic disadvantage (around 3,200 grams) (Table 4.7).

The proportion of live babies born to Indigenous mothers who had a birthweight of less than 2,500 grams did not vary greatly by quintile of socioeconomic disadvantage (between 12% and 13%).

Table 4.7: Live births to Indigenous mothers by birthweight and socioeconomic status, 2001–2004

Birthweight (g)	Quintile of socioeconomic disadvantage ^(a)					Not stated	Total
	1st quintile (most disadvantaged)	2nd quintile	3rd quintile	4th quintile	5th quintile (least disadvantaged)		
Mean	3,140	3,159	3,184	3,206	3,200	3,103	3,162
	Number						
Less than 1,500 g	334	211	155	99	29	13	841
1,500 – 2,499 g	1,445	1,028	670	398	113	83	3,737
2,500 – 4,499 g	11,301	8,325	5,770	3,290	1,001	482	30,169
4,500 g and over	173	141	81	78	18	10	501
Not stated	6	4	—	—	—	—	10
Total	13,259	9,709	6,676	3,865	1,161	588	35,258
<i>Less than 2,500 g</i>	<i>1,779</i>	<i>1,239</i>	<i>825</i>	<i>497</i>	<i>142</i>	<i>96</i>	<i>4,578</i>
	Per cent						
Less than 1,500 g	2.5	2.2	2.3	2.6	2.5	2.2	2.4
1,500 – 2,499 g	10.9	10.6	10.0	10.3	9.7	14.1	10.6
2,500 – 4,499 g	85.2	85.7	86.4	85.1	86.2	82.0	85.6
4,500 g and over	1.3	1.5	1.2	2.0	1.6	1.7	1.4
Not stated	—	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Less than 2,500</i>	<i>13.4</i>	<i>12.8</i>	<i>12.4</i>	<i>12.9</i>	<i>12.2</i>	<i>16.3</i>	<i>13.0</i>

(a) Socioeconomic status quintiles are determined by postcode of usual residence based on the Australian Bureau of Statistics SEIFA .

Source: AIHW NPSU National Perinatal Data Collection 2007.

In 2001–2004 the mean birthweight of live babies born to Indigenous mothers was lowest among teenage mothers (3,094 grams) and highest in mothers aged 25–29 years (3,200 grams and 30–34 years (3,210 grams) (Table 4.8).

The proportion of liveborn low birthweight births to Indigenous mothers was highest in older mothers (i.e. those aged 35 years and over) at 15%, and lowest among mothers aged 25–29 years (12%).

Table 4.8: Live births to Indigenous mothers by birthweight and maternal age, 2001–2004

Birthweight	Maternal age						Total
	Less than 20	20–24	25–29	30–34	35 and over	Not stated	
Mean	3,094	3,157	3,200	3,210	3,165	3,200	3,162
	Number						
Less than 1,500	183	259	183	136	80	—	841
1,500 – 2,499	868	1,108	863	587	311	—	3,737
2,500 – 4,499	6,776	9,447	7,241	4,595	2,097	13	30,169
4,500 and over	49	130	130	133	59	—	501
Not stated	2	3	2	2	1	—	10
Total	7,878	10,947	8,419	5,453	2,548	13	35,258
<i>Less than 2,500</i>	<i>1,051</i>	<i>1,367</i>	<i>1,046</i>	<i>723</i>	<i>391</i>	—	<i>4,578</i>
	Per cent						
Less than 1,500	2.3	2.4	2.2	2.5	3.1	—	2.4
1,500 – 2,499	11.0	10.1	10.3	10.8	12.2	—	10.6
2,500 – 4,499	86.0	86.3	86.0	84.3	82.3	100.0	85.6
4,500 and over	0.6	1.2	1.5	2.4	2.3	—	1.4
Not stated	—	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>Less than 2,500</i>	<i>13.3</i>	<i>12.5</i>	<i>12.4</i>	<i>13.3</i>	<i>15.3</i>	—	<i>13.0</i>

Source: AIHW NPSU National Perinatal Data Collection 2007.

For those states and territories where smoking status data were available, the mean birthweight of live babies born to Indigenous mothers in 2001–2004 was considerably lower among mothers who smoked during pregnancy compared with mothers who did not smoke (Table 4.9). The mean birthweight of live babies born to Indigenous mothers who smoked during pregnancy was 3,037 grams, 253 grams lighter than the mean birthweight of babies of Indigenous mothers who did not smoke (3,290 grams). For live births of non-Indigenous mothers who smoked the mean birthweight was 3,210 grams, compared with 3,416 grams for babies of non-Indigenous mothers who did not smoke.

The mean birthweight of live babies born to Indigenous mothers who smoked at all during pregnancy varied among the states and territories, from 2,872 grams in the Australian Capital Territory to 3,061 grams in New South Wales.

Table 4.9: Mean birthweight (g) of live births to Indigenous mothers by tobacco smoking status during pregnancy and state and territory, 2001–2004

Smoking status	NSW	WA	SA ^(a)	ACT	NT ^(b)	Total
Smoked	3,061	3,015	2,955	2,872	3,057	3,037
Did not smoke	3,371	3,230	3,290	3,261	3,243	3,290
Total^(c)	3,193	3,124	3,064	3,085	3,117	3,144

(a) For South Australia, 'Smoked' includes women who quit before the first antenatal visit.

(b) For the Northern Territory, smoking status was recorded at the first antenatal visit.

(c) Includes records where smoking status was not stated.

Note: Data on tobacco smoking during pregnancy were not available for Victoria, Queensland or Tasmania.

Source: AIHW NPSU National Perinatal Data Collection 2007.

The proportion of low birthweight among liveborn babies of Indigenous mothers who smoked was 16%, compared with 10% among babies of Indigenous mothers who did not smoke. For non-Indigenous mothers, these figures were 10% and 5%, respectively.

Apgar scores

Apgar scores are clinical indicators of the baby's condition shortly after birth, based on assessment of the heart rate, breathing, colour, muscle tone and reflex irritability. Between 0 and 2 points are given for each of these five characteristics, and the total score is between 0 and 10. An Apgar score of less than 7 at 5 minutes after birth is considered to be an indicator of compromise for the baby.

In 2001–2004, around 3% of liveborn babies to Indigenous mothers had a low Apgar score (between 0 and 6) at 5 minutes (Table 4.10). This proportion was greater than the proportion in non-Indigenous mothers (1.3%).

Among the states and territories, the distribution of low Apgar scores at 5 minutes for live babies born to Indigenous mothers ranged from 2% in New South Wales, Victoria, Queensland and Western Australia to 4% in the Northern Territory.

Table 4.10: Live births to Indigenous mothers by Apgar score at 5 minutes and state and territory, 2001–2004

Apgar score	NSW	Vic	Qld	WA	SA	ACT	NT	Total
Number								
0–6	196	34	229	139	44	7	216	865
7–10	8,516	1,587	10,792	5,998	1,732	269	5,370	34,264
Not stated	40	6	28	30	8	1	16	129
Total	8,752	1,627	11,049	6,167	1,784	277	5,602	35,258
Per cent								
0–6	2.2	2.1	2.1	2.3	2.5	2.5	3.9	2.5
7–10	97.3	97.5	97.7	97.3	97.1	97.1	95.9	97.2
Not stated	0.5	0.4	0.3	0.5	0.4	0.4	0.3	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Data for Tasmania were not available.

Source: AIHW NPSU National Perinatal Data Collection 2007.

In 2001–2004, the proportion of live babies born to Indigenous mothers who had a low Apgar score at 5 minutes increased with increased remoteness of the mothers' usual place of residence (Table 4.11). Apgar scores of less than 7 at 5 minutes after birth were lower among live babies born to Indigenous mothers residing in major cities and inner regional areas (around 2%) than among live babies born to Indigenous mothers residing in outer regional, remote or very remote areas (around 3%).

Table 4.11: Live births to Indigenous mothers by Apgar score at 5 minutes and remoteness area of usual residence, 2001–2004

Apgar score	Major cities	Inner regional	Outer regional	Remote	Very remote	Total ^(a)
Number						
0–6	145	127	246	115	232	865
7–10	8,174	5,684	9,507	3,905	6,972	34,242
Not stated	28	21	36	11	33	129
Total	8,347	5,832	9,789	4,031	7,237	35,236
Per cent						
0–6	1.7	2.2	2.5	2.9	3.2	2.5
7–10	97.9	97.5	97.1	96.9	96.3	97.2
Not stated	0.3	0.4	0.4	0.3	0.5	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

(a) Excludes mothers not usually resident in Australia and those whose area of usual residence was 'Not stated'.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Hospital births

Length of stay

The majority of babies are discharged from hospital at the same time as their mothers; however, some babies experience morbidity and require hospitalisation. A baby's gestation and birthweight are two factors that influence the duration of hospitalisation. Twins and higher order multiple births usually have longer stays in hospital than singleton babies.

In 2001–2004, the median length of stay for babies born to Indigenous mothers in hospital who were discharged home was 3 days (Table 4.12). The majority of babies born to Indigenous mothers remained in their hospital of birth for less than 6 days (84%), and nearly two-thirds stayed in hospital for less than 4 days (61%). Length of stay in hospital for babies born to Indigenous mothers was generally shorter when compared with babies born to non-Indigenous mothers. Only 45% of babies born in hospital to non-Indigenous mothers had a length of stay of less than 4 days.

There was some variation among the states and territories in the length of stay for babies born to Indigenous mothers who were discharged from hospital in 2001–2004. Over one-fifth of babies born to Indigenous mothers in hospital in the Northern Territory had a length of stay of 7 days or more (21%) compared with only 10% in Victoria. The proportion of babies born to Indigenous mothers who had a length of stay of less than 4 days ranged from 43% in the Northern Territory to 71% in Victoria.

Table 4.12: Live births to Indigenous mothers in hospital^(a) by length of stay and state and territory, 2001–2004

Length of stay	NSW	Vic	Qld	WA	SA	ACT	NT	Total
Median length of stay	3.0	3.0	2.0	3.0	3.0	3.0	4.0	3.0
	Number							
Less than 1 day	228	39	441	113	45	8	43	917
1 day	1,222	189	2,385	753	166	31	279	5,025
2 days	1,763	343	2,552	1,175	330	44	736	6,943
3 days	1,640	357	1,800	1,087	305	37	890	6,116
4 days	1,077	216	1,105	901	238	34	712	4,283
5 days	695	136	594	578	137	31	583	2,754
6 days	327	51	320	283	77	11	318	1,387
7–13 days	492	82	536	468	127	17	610	2,332
14–27 days	171	44	277	123	60	6	201	882
28 or more days	86	23	154	65	39	9	145	521
Not stated	7	—	—	—	—	—	—	7
Total	7,708	1,480	10,164	5,546	1,524	228	4,517	31,167
	Per cent							
Less than 1 day	3.0	2.6	4.3	2.0	3.0	3.5	1.0	2.9
1 day	15.9	12.8	23.5	13.6	10.9	13.6	6.2	16.1
2 days	22.9	23.2	25.1	21.2	21.7	19.3	16.3	22.3
3 days	21.3	24.1	17.7	19.6	20.0	16.2	19.7	19.6
4 days	14.0	14.6	10.9	16.2	15.6	14.9	15.8	13.7
5 days	9.0	9.2	5.8	10.4	9.0	13.6	12.9	8.8
6 days	4.2	3.4	3.1	5.1	5.1	4.8	7.0	4.5
7–13 days	6.4	5.5	5.3	8.4	8.3	7.5	13.5	7.5
14–27 days	2.2	3.0	2.7	2.2	3.9	2.6	4.4	2.8
28 or more days	1.1	1.6	1.5	1.2	2.6	3.9	3.2	1.7
Not stated	0.1	—	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Only babies who were discharged home are included.

Note: Data for Tasmania were not available.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Compared with other remoteness areas, the length of stay for babies born to Indigenous mothers who were discharged from hospital was considerably higher where the mothers' usual place of residence was in very remote areas (Table 4.13). In 2001–2004, babies born to Indigenous mothers whose usual place of residence was in very remote areas accounted for almost one-fifth of babies discharged from hospital with a length of stay of 7 days or more (19%). This compared with 12% in remote areas, 12% in major cities, 9% in outer regional areas and 8% in inner regional areas. The proportion of babies born to Indigenous mothers who were discharged from hospital after a length of stay of less than 4 days ranged from 81% for mothers residing in very remote areas to 92% for mothers residing in inner regional areas.

Table 4.13: Live births to Indigenous mothers in hospital^(a) by length of stay and remoteness area of usual residence, 2001–2004

Length of Stay	Major cities	Inner regional	Outer regional	Remote	Very remote	Total ^(b)
Median length of stay	3.0	3.0	3.0	3.0	4.0	3.0
Number						
Less than 1 day	274	172	325	77	68	916
1 day	1,271	982	1,706	547	519	5,025
2 days	1,705	1,286	2,124	802	1,023	6,940
3 days	1,423	1,133	1,669	702	1,187	6,114
4 days	1,061	710	1,050	471	990	4,282
5 days	675	391	651	282	754	2,753
6 days	308	178	306	145	450	1,387
7–13 days	503	253	480	265	827	2,328
14–20 days	148	102	128	59	166	603
21–27 days	100	43	52	29	53	277
28 or more days	166	48	132	62	111	519
Not stated	2	1	2	1	1	7
Total	7,636	5,299	8,625	3,442	6,149	31,151
Per cent						
Less than 1 day	3.6	3.2	3.8	2.2	1.1	2.9
1 day	16.6	18.5	19.8	15.9	8.4	16.1
2 days	22.3	24.3	24.6	23.3	16.6	22.3
3 days	18.6	21.4	19.4	20.4	19.3	19.6
4 days	13.9	13.4	12.2	13.7	16.1	13.7
5 days	8.8	7.4	7.5	8.2	12.3	8.8
6 days	4.0	3.4	3.5	4.2	7.3	4.5
7–13 days	6.6	4.8	5.6	7.7	13.4	7.5
14–20 days	1.9	1.9	1.5	1.7	2.7	1.9
21–27 days	1.3	0.8	0.6	0.8	0.9	0.9
28 or more days	2.2	0.9	1.5	1.8	1.8	1.7
Not stated	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0

(a) Only babies who were discharged home are included.

(b) Excludes mothers not usually resident in Australia and those whose area of usual residence was 'Not stated'.

Source: AIHW NPSU National Perinatal Data Collection 2007.

In 2001–2004, babies born to Indigenous mothers in the least disadvantaged quintile who were discharged from hospital had a longer median length of stay (4 days) compared with all other socioeconomic quintiles (3 days) (Table 4.14). Babies born to Indigenous mothers in the least disadvantaged quintile accounted for 16% of babies discharged from hospital with a length of stay of 7 days or more. The distribution of the proportion of babies in other socioeconomic quintiles with a length of stay of 7 days or more ranged from 10% in the

second most disadvantaged quintile (second quintile) to 13% in the second least disadvantaged quintile (fourth quintile).

Table 4.14: Live births to Indigenous mothers in hospitals^(a), by length of stay and socioeconomic status, 2001–2004

Length of stay	Quintile of socioeconomic disadvantage ^(b)					Not stated	Total
	1st quintile (most disadvantaged)	2nd quintile	3rd quintile	4th quintile	5th quintile (least disadvantaged)		
Median length of stay	3.0	3.0	3.0	3.0	4.0	3.0	3.0
	Number						
Less than 1 day	332	265	192	97	27	4	917
1 day	1,701	1,418	1,193	556	116	41	5,025
2 days	2,367	2,034	1,466	755	210	111	6,943
3 days	2,287	1,800	1,116	656	172	85	6,116
4 days	1,541	1,163	806	528	169	76	4,283
5 days	1,077	701	487	325	123	41	2,754
6 days	589	346	228	128	70	26	1,387
7–13 days	936	554	410	263	113	56	2,332
14–20 days	224	151	122	71	26	10	604
21–27 days	97	58	60	38	14	11	278
28 or more days	176	129	99	83	23	11	521
Not stated	5	2	—	—	—	—	7
Total	11,332	8,621	6,179	3,500	1,063	472	31,167
	Per cent						
Less than 1 day	2.9	3.1	3.1	2.8	2.5	0.8	2.9
1 day	15.0	16.4	19.3	15.9	10.9	8.7	16.1
2 days	20.9	23.6	23.7	21.6	19.8	23.5	22.3
3 days	20.2	20.9	18.1	18.7	16.2	18.0	19.6
4 days	13.6	13.5	13.0	15.1	15.9	16.1	13.7
5 days	9.5	8.1	7.9	9.3	11.6	8.7	8.8
6 days	5.2	4.0	3.7	3.7	6.6	5.5	4.5
7–13 days	8.3	6.4	6.6	7.5	10.6	11.9	7.5
14–20 days	2.0	1.8	2.0	2.0	2.4	2.1	1.9
21–27 days	0.9	0.7	1.0	1.1	1.3	2.3	0.9
28 or more days	1.6	1.5	1.6	2.4	2.2	2.3	1.7
Not stated	—	—	—	—	—	—	—
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Only babies who were discharged home are included.

(b) Socioeconomic status quintiles are determined by postcode of usual residence based on the Australian Bureau of Statistics SEIFA.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Perinatal mortality

Definitions

There are different definitions in Australia for reporting and registering perinatal deaths. The NHDD specifies a definition of perinatal deaths to include all fetal and neonatal deaths of at least 400 grams birthweight or at least 20 weeks gestation (NHDC 2003). This definition is used in the NPDC.

Figure 4.1 shows the definitions of periods of perinatal and infant deaths used by the NPSU. Neonatal deaths are those occurring in live births up to 28 completed days after birth.

Labour		Birth	7 days	28 days	1 year
At least 20 weeks or 400 grams		0-7 days	7-28 days	28 days-1 year	
Antepartum fetal deaths	Intrapartum fetal deaths	Early neonatal deaths	Late neonatal deaths	Postneonatal deaths	
Fetal deaths		Neonatal deaths			
Perinatal deaths					
Infant deaths					

Figure 4.1: Perinatal and infant death periods

Fetal, neonatal and perinatal deaths

In 2001-2004 there were 424 fetal deaths and 201 neonatal deaths (excluding neonatal deaths from the Northern Territory) among babies born to Indigenous mothers (Table 4.15). This equated to 12 fetal deaths per 1,000 births and 6 neonatal deaths per 1,000 live births among babies born to Indigenous mothers. The perinatal death rate was 18 per 1,000 births. The fetal and neonatal death rates for babies born to non-Indigenous mothers (7 and 3 respectively) were almost half the rate of babies born to Indigenous mothers. The perinatal death rate of babies of Indigenous mothers was 10 per 1,000 births.

There was some variation in perinatal death rates among the states and territories for babies born to Indigenous mothers in 2001-2004. Of those states and territories where data were available, perinatal death rates were highest in the Australian Capital Territory (42 per 1,000 births) and lowest in New South Wales (14 per 1,000 births). Care should be taken, however, when interpreting the perinatal death rates in the Australian Capital Territory because the small number of perinatal deaths in this territory results in large fluctuations in the number of deaths over time.

Table 4.15: Fetal, neonatal and perinatal deaths of babies born to Indigenous mothers by state and territory, 2001–2004

Deaths	NSW	Vic	Qld	WA	SA	ACT ^(a)	NT	Total ^(b)
	Number							
Fetal deaths	91	28	121	84	30	7	63	424
Neonatal deaths	32	15	88	46	15	5	n.a.	201
Perinatal deaths	123	43	209	130	45	12	n.a.	625
	Rate per 1,000 births^(c)							
Fetal deaths	10.3	16.9	10.8	13.4	16.5	24.6	11.1	11.9
Neonatal deaths	3.7	9.2	8.0	7.5	8.4	18.1	n.a.	5.7
Perinatal deaths	13.9	26.0	18.7	20.8	24.8	42.3	n.a.	17.5

(a) Care must be taken when interpreting these rates as the small number of perinatal deaths in the Australian Capital Territory will result in large fluctuations over time. ACT rates include babies born in the Australian Capital Territory to Indigenous mothers who were non-ACT residents. There were four fetal deaths (19.2 per 1,000 births), no neonatal deaths and a perinatal death rate of 19.2 per 1,000 births for babies born to ACT-resident Indigenous women in 2001–2004.

(b) Totals for neonatal and perinatal deaths exclude neonatal deaths in the Northern Territory.

(c) Fetal and perinatal death rates were calculated using all births (live births and still births). Neonatal death rates were calculated using all live births.

n.a. Data on neonatal deaths were not available for the Northern Territory for 2001–2003, therefore neonatal deaths in the Northern Territory have not been included.

Source: AIHW NPSU National Perinatal Data Collection 2007.

5 Assessment of Indigenous status data quality, 1991 to 2004

Summary

An assessment of the quality of Indigenous status information in perinatal data in each state and territory was undertaken. This involved a survey which was sent to the midwifery managers across Australia to determine how many hospitals in each jurisdiction obtain Indigenous status information of mothers giving birth from admission records and how many collect this information independently. The assessment also involved analysis of the variability in the number and proportion of mothers recorded as Indigenous in the perinatal data collection over time and across jurisdictions for the period 1991–2004 (Table 5.3).

The outcomes of this assessment showed that Indigenous status data from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory are suitable for trends analysis. Perinatal data from Tasmania, although improving, were deemed to be of insufficient quality. Although the most recent data in the Australian Capital Territory were of publishable quality, the data were not yet of sufficient stability to support trends analysis.

Introduction

This chapter examines the quality of information collected on Aboriginal and Torres Strait Islander mothers. It assesses the variability of the number of mothers by Indigenous status, by jurisdiction and over time in the National Perinatal Data Collection (NPDC). Combining information from a survey developed by the AIHW to assess the quality of Indigenous identification in perinatal data (Perinatal Survey), the aim of this analysis is to provide guidelines on the following areas:

1. jurisdictions with acceptable data quality
2. time periods for trend analysis
3. the treatment of cases for which Indigenous status is not stated.

Past assessments of Indigenous status data quality

There have been a number of studies that have examined the quality of Indigenous status in hospitalisation data and perinatal data. Some of these studies are outlined below.

Perinatal data

A study conducted at Mercy Hospital for Women in East Melbourne between May 2001 and June 2002 measured the percentage of patients asked about their Indigenous status, and that of their babies on admission in order to audit admission procedures. Initial results indicated that 34% of women interviewed were asked their Indigenous status at admission. Interviews

resumed after various problems were resolved including the addition of a specific question regarding the Indigenous status of the babies' fathers. The percentage of obstetric patients who reported being asked their Indigenous status improved markedly after the resumption of the study. The study also found that there were a number of inconsistencies in the group of women who identified themselves or their babies as Indigenous with the medical records (Middleton et al. 2003).

A similar study was conducted by the University of New South Wales between May and July 1999 (Jackson Pulver et al. 2003). The study attempted to determine the accuracy of routine identification of Aboriginal and Torres Strait Islander women admitted to King George V hospital in Sydney to give birth. Hospital records were compared with self-disclosure of Aboriginal and Torres Strait Islander status to a female Aboriginal health professional.

Of the 536 women surveyed, 29 (5%) self-disclosed as being Indigenous. Only a third of the patients were identified as Aboriginal and Torres Strait Islander in hospital records. The Indigenous women referred by another organisation were significantly more likely to be correctly identified than those who self-referred to the hospital (Jackson Pulver et al. 2003).

In New South Wales, the quality of Indigenous status in perinatal data has also been assessed through linking birth records reported to the NSW Midwives Data Collection (MDC) and birth registrations reported to the NSW Registry of Births, Deaths and Marriages in the period 1994–1998. Records using the two databases were matched using probabilistic linkage software. The results of the linkage found that the estimated percentage of births to Indigenous mothers which were recorded as Aboriginal or Torres Strait Islander in the MDC rose from 59% to 65% over the 5 year period 1994–1998 and reporting was better in rural hospitals than in urban hospitals (i.e. in 1998 47% of births to Indigenous mothers in urban hospitals were recorded compared with 87% in rural hospitals). The study was restricted to births to Indigenous mothers only and thus did not take into account paternal identification (Taylor & Lim 2000).

For the year 2005–06, an assessment of the identification of Indigenous babies recorded in Victorian hospitals which employed Aboriginal Hospital Liaison Officers (AHLOs) found that 77% of mothers recorded as Indigenous also had their baby recorded as Indigenous. In Victoria, all babies of women who identify as Indigenous should be recorded as Aboriginal or Torres Strait Islander. The under-reporting observed in 2005–06 was attributed to a system error in some hospitals, through which babies of Indigenous mothers were not automatically recorded as Indigenous. This error has since been rectified (DHS 2007).

Hospital data

In 2005, the AIHW compiled a report on improving the quality of Indigenous identification in hospital separations data which looked at studies undertaken in various jurisdictions to assess the quality of Indigenous identification in hospital data. As part of this report, a survey was also sent to each state and territory health authority in order to assess Indigenous status data quality for hospital admitted patients. In studies based on patient interviews, the proportions of Indigenous patients found to have been correctly identified in hospital records were:

- 93% overall for the five Northern Territory public hospitals in 1997
- 85% overall for 11 public hospitals in five jurisdictions (Victoria, Queensland, South Australia, Australian Capital Territory and Northern Territory) in 1998
- 86% overall for 26 public hospitals in Western Australia in 2000

- 74% overall for 2 metropolitan public hospitals in Queensland in 2000.

Relatively poor arrangements for ascertaining Indigenous status at private hospitals were confirmed in the analysis of national separations data. For both the public and the private sectors, the 'Not stated/inadequately described' category of Indigenous status had greater similarity with the non-Indigenous category than with the Indigenous category across a wide range of patient characteristics. In this report, four jurisdictions were assessed as having adequate levels of Indigenous identification in hospitalisation data in 2003–04: Queensland, Western Australia, South Australia and the Northern Territory) (AIHW 2005). A more comprehensive study undertaken in Queensland in 2005 showed a small increase in Indigenous identification compared with the 2000 study.

The AIHW is currently undertaking a project to reassess the extent of under-identification of Indigenous people in hospital data in all jurisdictions by comparing the results of interviews with hospital patients with information obtained from hospital records. This is expected to be completed by late-2007 and may result in a revision made to the four states and territories currently recommended for use in the analysis of hospitalisation data on Indigenous Australians.

Each financial year, the Victorian Department of Human Services produces a report as part of the Improving Care for Aboriginal and Torres Strait Islander Patients program which includes an assessment of the under-identification of Indigenous patients in hospital by comparing patient records in the Victorian Admitted Episodes Dataset (VAED) and patient records completed by an AHLO. In 2005–06, in hospitals that employed AHLOs, the number of patients recorded as Indigenous in the VAED was higher than the number of patients recorded as Indigenous by an AHLO (9,626 compared with 8,406). Some of this discrepancy was due to a temporary absence of an AHLO, or differences between counting admissions (AHLO) and counting separations (VAED); however, most of the discrepancies have not been resolved (DHS 2007).

Methods of assessment

Not all Indigenous mothers are recorded as Indigenous in perinatal data. The level of identification varies across jurisdictions. This level can be assessed by examining the variability of data over time and the level and time period of records with Indigenous status 'not stated' in the data collection, and by looking into additional relevant information provided by the Perinatal Survey.

The AIHW developed a short questionnaire to assess the quality of Indigenous identification in the National Perinatal Data Collection. The questionnaire was developed as a result of information obtained from focus group discussions held with hospital staff and midwives in most states and territories between December 2006 and March 2007, as part of a project to improve Indigenous identification in health data. Based on the information obtained from midwives, it was concluded that, in order to adequately assess the quality of Indigenous identification in perinatal data collections, it would be necessary to determine how many hospitals in each jurisdiction obtain Indigenous status information of women giving birth from admission records and how many collect this information independently.

The questionnaire was sent in late March 2007 to the midwifery managers in each state/territory public hospital that normally admits patients for births with the exception of the Australian Capital Territory for which the survey was administered by telephone. The survey form included questions on how the Indigenous status of the mother is obtained and

whether Indigenous status is commonly checked and/or validated by midwives. Results of this survey can be used to assess the reliability of Indigenous status information in the perinatal data collection.

Smooth time trends in the number of Indigenous mothers indicate stable levels of Indigenous identification. With measures undertaken by health service providers and data collectors to improve identification of Indigenous people in perinatal data, smooth time trends can be viewed as indications that the relevant data have satisfactory qualities with stabilised levels of Indigenous identification over time. On the other hand, highly variable time trends suggest unstable identification levels and a need to improve the data quality or small number of cases in the data collection. Analyses of perinatal data should therefore be conducted only for jurisdictions with smooth trends in their data.

In this analysis the level of variability has been assessed by coefficient of variation. Coefficient of variation measures the amount of standard error as a percentage of the average number. The smaller the coefficient of variation, the less variable the underlying data. This analysis examines the coefficient of variation for data for every 5-year period from 1991–1995 to 2000–2004. A cut off point of 10% was used to pick out jurisdictions with satisfactorily small variability in their perinatal data collection.

The presence of a 'not stated' option for Indigenous status can indicate the efforts made to improve data quality by jurisdictions. Jurisdictions started to include this category of Indigenous status in their data collection in the late 1990s. Therefore, to enable comparisons of data over time, guidelines for time trend analysis should take into account whether the 'not stated' category should be included with the category for non-Indigenous or whether analysis should be undertaken only from a particular year onwards.

The AIHW survey to assess the quality of Indigenous identification in perinatal data

A total of 303 survey forms were sent out to Midwifery Managers across Australia and 205 forms were returned (response rate of 68%). The proportion of surveys returned varied by jurisdiction, being highest in Tasmania (100% – only 3 hospitals in Tasmania were surveyed), Victoria (83%) and South Australia (81%). Response rates in the other jurisdictions were 70% for Western Australia, 67% for New South Wales, 60% for the Northern Territory and 52% for Queensland. In the Australian Capital Territory, the survey was administered by telephone and responses were obtained from both public hospitals. These results should be interpreted with caution as they are based on only two respondents. Results of the survey are provided in Tables 5.1 and 5.2.

Two of the three respondent hospitals from Tasmania and 100% of the respondent hospitals from the Australian Capital Territory reported that Indigenous status information on women giving birth is obtained from the hospital database or admission form. In the Australian Capital Territory, the hospital admission forms are usually completed by the prospective mother.

Information on mothers whose babies are born before arrival at hospital and on homebirths is collected by a midwife at the time of birth, if possible, and is then recorded on a perinatal data collection form. This information is not recorded in a hospital database.

One of the respondent hospitals from Tasmania has Indigenous status information checked by midwives and no hospital in the Australian Capital Territory has the Indigenous status

information checked by midwives. The other six jurisdictions generally have more sources to obtain Indigenous status information, or more frequently have the information checked by midwives.

Table 5.1: How the Indigenous status of the mother is obtained, by state and territory, 2007

	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Total
Number									
Always from hospital database/admission form	21	25	8	5	13	2	2	1	77
Always independent from hospital database	32	11	22	6	6	1	—	2	80
Collected by midwife only if information is not recorded in hospital database	6	6	8	9	5	—	—	—	34
Other ^(b)	5	1	5	3	2	—	—	—	16
Total	64	43	43	23	26	3	2	3	207
Per cent									
Always from hospital database/admission form	32.8	58.1	18.6	21.7	50.0	66.7	100.0	33.3	37.2
Always independent from hospital database	50.0	25.6	51.2	26.1	23.1	33.3	0.0	66.7	38.6
Collected by midwife only if information is not recorded in hospital database	9.4	14.0	18.6	39.1	19.2	0.0	0.0	0.0	16.4
Other ^(b)	7.8	2.3	11.6	13.0	7.7	0.0	0.0	0.0	7.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Survey was administered by telephone in the Australian Capital Territory. Results should be interpreted with caution as these are based on only two respondents.

(b) Includes: collected from both the hospital database and by midwives (8 respondents); collected on booking in form; Indigenous status of both parents is recorded and checked at all of the above steps (in antenatal clinic, on admission to birth, after birth, from hospital database etc.); Indigenous status is collected at numerous stages (e.g. hospital database, pregnancy record, perinatal data form and Hep B consent form); known by Aboriginal Health Workers; all women assumed to be Aboriginal in the hospital as it is located among remote Aboriginal communities.

Table 5.2: Whether Indigenous status is commonly checked and/or validated by midwives, by state and territory, 2007

	NSW	Vic	Qld	WA	SA	Tas	ACT ^(a)	NT	Total
	Number								
Yes	47	22	36	16	13	1	—	1	136
No	14	21	4	5	11	2	2	2	61
Don't know/not stated	3	—	3	2	2	—	—	—	10
Total	64	43	43	23	26	3	2	3	207
	Per cent								
Yes	73.4	51.2	83.7	69.6	50.0	33.3	0.0	33.3	65.7
No	21.9	48.8	9.3	21.7	42.3	66.7	100.0	66.7	29.5
Don't know/not stated	4.7	0.0	7.0	8.7	7.7	0.0	0.0	0.0	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Survey was administered by telephone in the Australian Capital Territory. Results should be interpreted with caution as these are based on only two respondents.

Note: In some states and territories, additional validation of Indigenous status data is undertaken by the state or territory health authority. For example, in South Australia, all discrepancies in mother's Indigenous status between Births, Deaths and Marriages data and perinatal data received from hospitals are checked by the South Australian perinatal data collection unit.

Analysis of the Indigenous status of mothers

This section presents analyses of the number and proportion of mothers in the National Perinatal Data Collection by Indigenous status, state and territory and over time. Data from all states and territories are presented with the exception of Tasmania. Data for Tasmania were not included because of systematic misclassification resulting from the way the Indigenous status item was collected. Before 2005, Indigenous status was collected in a way that non-Indigenous records could not be distinguished from those where Indigenous status was 'not stated'. There is currently a project to improve the quality of Indigenous status data in Tasmania. From 2005 births, Indigenous status data will be reported using the National Health Data Dictionary value domains.

Note that a range of factors can affect the number of Indigenous mothers reported over time including changes in the level of accuracy of Indigenous identification in perinatal data. Caution should be used when interpreting changes over time because it is not possible to ascertain whether a change in the reported number of Indigenous mothers is due to changes in the accuracy of Indigenous identification or to real changes in the number of Indigenous women who are giving birth each year.

1. Number of mothers

The number of women who gave birth in the period 1991–2004 by state and territory and Indigenous status is reported in Table 5.3.

The number of women giving birth who identified as Indigenous in the Australian Capital Territory fluctuated over time, partly because of small numbers and the variability in the number of non-resident women who gave birth in the Australian Capital Territory. An additional analysis was performed for the Australian Capital Territory to investigate the impact of Indigenous non-ACT residents who gave birth in the Australian Capital Territory

from 1993 to 2004. Table 5.4 shows the variability in the numbers and proportions of Indigenous non-residents from year to year, compared with little variability among Indigenous ACT residents who give birth in the Australian Capital Territory.

For the other jurisdictions, the number of mothers identified as Indigenous followed smooth trends over time, either increasing at a relatively steady rate (New South Wales, Queensland, and the Northern Territory), or remaining at a relatively stable level (Victoria, Western Australia and South Australia).

Jurisdictions generally started to record mothers with a 'not stated' Indigenous status in or after 1999. In Western Australia and South Australia, no mothers with a 'not stated' Indigenous status were recorded in the period 1991–2004.

In Western Australia, data for the mother's Indigenous status were drawn from two sources – (1) from the mother's record in the Hospital Morbidity Data Collection, and (2) if these data were missing on the inpatient record or the mother did not give birth in hospital, from the form completed by the midwife (Notification of Case Attended form). This form does not allow for a 'not stated' option and a valid response category must be recorded.

Table 5.3: Women who gave birth by Indigenous status^(a) and state and territory, 1991 to 2004

Indigenous status ^(a)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
NSW														
Indigenous	1,385	1,428	1,456	1,530	1,739	1,712	1,842	2,043	2,059	2,105	2,110	2,155	2,161	2,308
Non-Indigenous	84,397	86,371	85,193	85,206	84,524	83,590	85,078	83,029	83,900	84,307	82,223	82,383	82,831	81,949
Not stated	—	—	—	—	—	—	—	—	9	49	46	49	40	32
Total	85,782	87,799	86,649	86,736	86,263	85,302	86,920	85,072	85,968	86,461	84,379	84,587	85,032	84,289
Vic														
Indigenous	406	402	452	428	417	448	379	445	445	376	416	416	366	435
Non-Indigenous	63,873	64,997	63,343	63,555	62,315	61,580	60,932	60,626	61,136	61,196	60,692	61,607	62,039	62,080
Not stated	—	—	—	—	—	—	—	—	6	0	0	0	1	28
Total	64,279	65,399	63,795	63,983	62,732	62,028	61,311	61,071	61,587	61,572	61,108	62,023	62,406	62,543
Qld														
Indigenous	2,148	2,316	2,234	2,347	2,483	2,606	2,486	2,731	2,849	2,801	2,693	2,721	2,860	2,767
Non-Indigenous	41,983	43,646	44,530	45,009	45,380	44,696	44,792	44,719	45,191	45,712	46,207	45,593	46,643	47,280
Not stated	—	—	—	—	—	—	—	—	1	9	8	10	8	4
Total	44,131	45,962	46,764	47,356	47,863	47,302	47,278	47,450	48,041	48,522	48,908	48,324	49,511	50,051
WA														
Indigenous	1,460	1,418	1,442	1,433	1,446	1,411	1,539	1,504	1,545	1,498	1,527	1,606	1,526	1,505
Non-Indigenous	23,219	23,552	23,531	23,638	23,644	23,781	23,317	23,787	23,833	23,320	22,967	22,790	22,753	23,606
Not stated	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	24,679	24,970	24,973	25,071	25,090	25,192	24,856	25,291	25,378	24,818	24,494	24,396	24,279	25,111

(continued)

Table 5.3 (continued): Women who gave birth by Indigenous status^(a) and state and territory, 1991 to 2004

	Indigenous status ^(a)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
SA															
	Indigenous	397	435	396	388	382	348	393	412	445	447	398	443	468	484
	Non-Indigenous	19,071	19,433	19,283	19,131	18,928	18,436	18,001	18,008	17,788	17,131	17,029	16,978	17,049	16,744
	Not stated	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Total	19,468	19,868	19,679	19,519	19,310	18,784	18,394	18,420	18,233	17,578	17,427	17,421	17,517	17,228
ACT															
	Indigenous	20	11	48	44	63	80	58	63	59	53	52	72	80	73
	Non-Indigenous	4,459	4,632	4,664	4,686	4,767	4,621	4,650	4,582	4,522	4,625	4,353	4,610	4,683	4,711
	Not stated	—	—	—	—	—	—	—	—	5	6	9	26	21	15
	Total	4,479	4,643	4,712	4,730	4,830	4,701	4,708	4,645	4,586	4,684	4,414	4,708	4,784	4,799
NT															
	Indigenous	1,209	1,243	1,221	1,220	1,244	1,210	1,197	1,248	1,295	1,348	1,485	1,409	1,396	1,332
	Non-Indigenous	2,254	2,343	2,286	2,260	2,363	2,212	2,328	2,240	2,252	2,273	2,228	2,233	2,216	2,096
	Not stated	—	—	—	—	—	—	—	—	—	8	16	32	6	9
	Total	3,463	3,586	3,507	3,480	3,607	3,422	3,525	3,488	3,547	3,629	3,729	3,674	3,618	3,437
Australia^(b)															
	Indigenous	7,025	7,253	7,249	7,390	7,774	7,815	7,894	8,446	8,697	8,628	8,681	8,822	8,857	8,904
	Non-Indigenous	239,256	244,974	242,830	243,485	241,921	238,916	239,098	236,991	238,622	238,564	235,699	236,194	238,214	238,466
	Not stated	—	—	—	—	—	—	—	—	21	72	79	117	76	88
	Total	246,281	252,227	250,079	250,875	249,695	246,731	246,992	245,437	247,340	247,264	244,459	245,133	247,147	247,458

(a) The categories used for recording Indigenous status are based on the National Health Data Dictionary value domains. From 1999 onwards the recording categories used were Indigenous: Aboriginal but not Torres Strait Islander origin, Torres Strait Islander origin but not Aboriginal origin, Both Aboriginal and Torres Strait Islander origin; Non-Indigenous: Neither Aboriginal nor Torres Strait Islander origin; Not stated: Not stated/inadequately described. Before 1999 the categories used were Aboriginal or Torres Strait Islander, and Other.

(b) Excludes data from Tasmania.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Table 5.4: Resident and non-resident women who gave birth in the Australian Capital Territory by Indigenous status, 1993 to 2004

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
ACT residents						Number						
Indigenous	53	50	59	67	51	47	50	38	40	50	58	54
Non-Indigenous	4,097	4,192	4,306	4,167	4,053	4,003	3,992	4,060	3,762	3,907	3,979	3,951
Total	4,150	4,242	4,365	4,234	4,104	4,050	4,042	4,098	3,802	3,957	4,037	4,005
						Per cent						
Indigenous	1.3	1.2	1.4	1.6	1.2	1.2	1.2	0.9	1.1	1.3	1.4	1.3
Non-Indigenous	98.7	98.8	98.6	98.4	98.8	98.8	98.8	99.1	98.9	98.7	98.6	98.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Non-ACT residents						Number						
Indigenous	10	6	5	14	7	16	9	15	12	22	22	19
Non-Indigenous	439	495	509	510	597	579	530	565	591	703	704	760
Total	449	501	514	524	604	595	539	580	603	725	726	779
						Per cent						
Indigenous	2.2	1.2	1.0	2.7	1.2	2.7	1.7	2.6	2.0	3.0	3.0	2.4
Non-Indigenous	97.8	98.8	99.0	97.3	98.8	97.3	98.3	97.4	98.0	97.0	97.0	97.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes

1. Excludes records where Indigenous status or state of usual residence were 'Not stated.'
2. Data before 1993 not available in the required format.

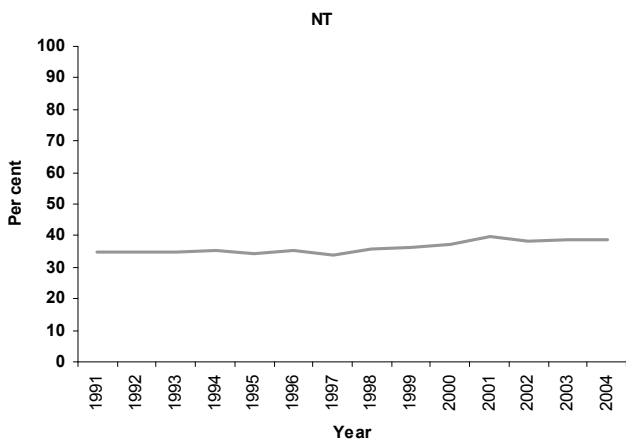
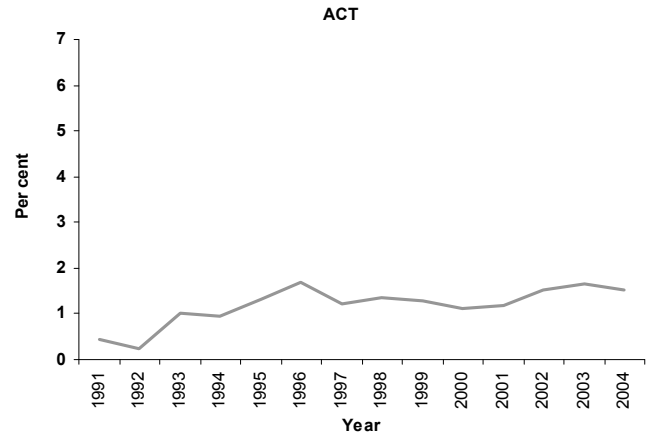
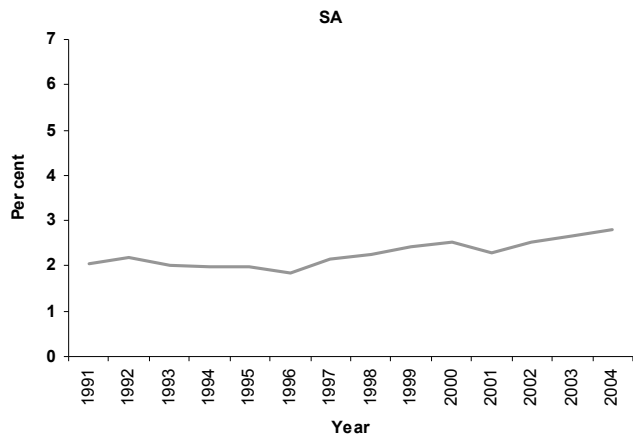
Source: ACT Maternal Perinatal Data Collection.

2. Proportion of Indigenous mothers

The proportion of women who gave birth and identified as Indigenous between 1991 and 2004 are presented by state and territory in Figures 5.1a and 5.1b.

Similar to the raw data provided in Table 5.3, the proportions of Indigenous mothers showed a variable pattern in the Australian Capital Territory over the period 1991–2004. There was less variation when only ACT-resident Indigenous mothers were considered (Table 5.4). In the other states and territories, the proportion of Indigenous mothers remained relatively stable over this period.





Note: The scale used for the Northern Territory is different to that used for the other states and territories.

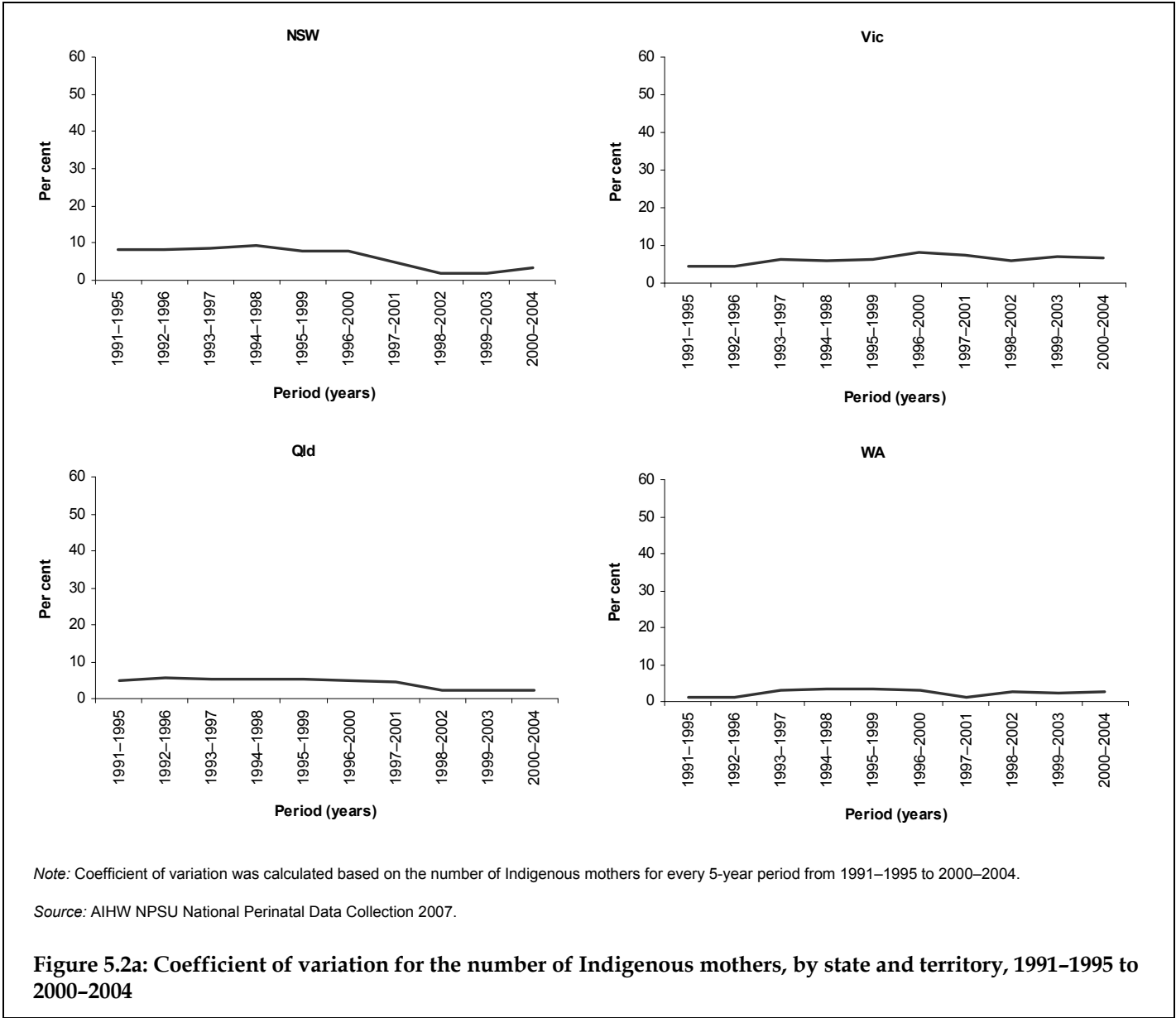
Source: AIHW NPSU National Perinatal Data Collection 2007.

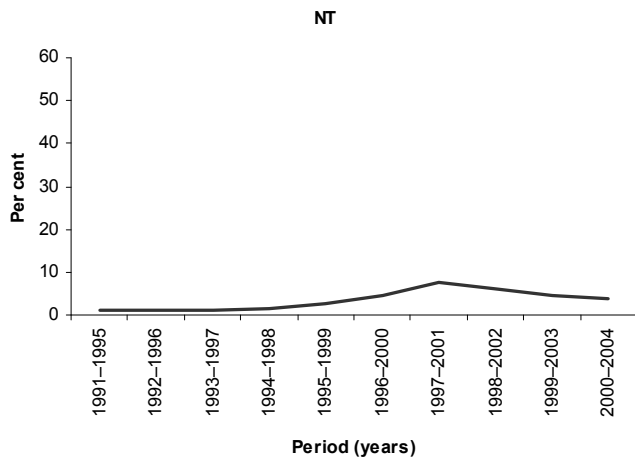
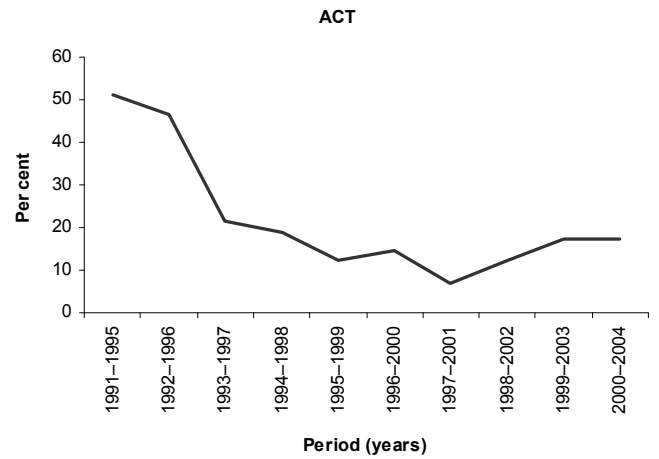
Figure 5.1b: Proportions of Indigenous mothers, by state and territory, 1991 to 2004

3. Variability of the number of Indigenous mothers based on coefficient of variation

Over the period 1991–2004, the number of mothers identified as Indigenous was most variable in the Australian Capital Territory compared with other states and territories, although this has become more stable in later years. In Figure 5.2b, the coefficient of variation in the number of Indigenous mothers in the Australian Capital Territory decreased from 51% for the 5-year period 1991–1995 to 17% for the 5-year period 2000–2004. Among ACT resident mothers, the coefficient of variation was lower, remaining between 11% and 19% throughout the five-year periods between 1993–1997 and 2000–2004.

However, for the other six jurisdictions, the coefficient of variation stayed below 10%, showing stable time trends of the underlying data. Note that the small number of Indigenous women who gave birth in the Australian Capital Territory was likely to contribute to the high degree of variability observed from year to year in the Australian Capital Territory.





Note: Coefficient of variation was calculated based on the number of Indigenous mothers for every five-year period from 1991-1995 to 2000-2004.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Figure 5.2b: Coefficient of variation for the number of Indigenous mothers, by state and territory, 1991-1995 to 2000-2004

Conclusions and recommendations on trend analysis of perinatal data

1. Choice of jurisdiction

Based on the analyses of the number and proportion of Indigenous mothers recorded over the period 1991–2004, perinatal data from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory showed little variability over this period. The Indigenous status of mothers recorded in the perinatal data collection in the Australian Capital Territory showed much greater variability than the other states and territories presented. Data for Tasmania were not included in this analysis because of data quality issues regarding the collection and recording of Indigenous status in the state's perinatal data collection. Tasmania also has great variability in its perinatal data, in terms of the proportion of mothers identified as Indigenous, over time (DHHS 2006).

Based on the analysis of the AIHW Perinatal Survey, Tasmania and the Australian Capital Territory rely heavily on the hospital database for obtaining the Indigenous status of women giving birth in hospital. According to an assessment of the quality of Indigenous status in hospitalisation data in 2005, Tasmania and the Australian Capital Territory do not have satisfactory Indigenous identification levels in their hospitalisation data (AIHW 2005). Findings from the Perinatal Survey also found that in these two jurisdictions, Indigenous status is not commonly checked or validated by midwives as is the case in most other states and in the Northern Territory.

It is therefore recommended that Tasmania and the Australian Capital Territory should be excluded from all trend analyses of Indigenous status in perinatal data. Only data from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory should be used.

2. Choice of time period

Based on analyses over the period 1991–2004, the number and proportion of Indigenous mothers recorded in the perinatal data collection were relatively stable over the entire period examined (i.e. there was no clear increase or decrease in the numbers from a specific year). It is therefore recommended that data from 1991 onwards may be used in the analyses of trends in perinatal data where Indigenous status is examined.

3. Analysis of perinatal data with 'not stated' Indigenous status

Over the period 1991–2004, mothers with a 'not stated' Indigenous status were included in the number of non-Indigenous mothers in, or before, 1999. Since the Indigenous status of a baby is determined by the Indigenous status of the mother, babies with a 'not stated' Indigenous status should be treated in the same way as mothers with a 'not stated' Indigenous status.

It is therefore recommended that to ensure comparability across time, perinatal data with a 'not stated' Indigenous status should be included in the 'non-Indigenous' category in time trend analysis for pre-1999 data when comparison between Indigenous and non-Indigenous

data is required. This recommendation will be reviewed after 2008, when 10 years of time series data are available where 'not stated' responses can be excluded.

Where to next

In order for the quality of Indigenous perinatal data to continue to improve in the future, midwives must ensure they ask all mothers their Indigenous status. If Indigenous status has already been recorded, such as when the data are taken from the hospital database or admission form, or the woman has given birth before, then this should be verified with the mother. Consistent validation of these data at a state/territory and national level will also assist in improving Indigenous status data quality in perinatal collections.

The Aboriginal and Torres Strait Islander Health and Welfare Unit within the AIHW is currently undertaking an audit of hospital data to assess the level of under-identification of Indigenous status in all jurisdictions. In addition, the unit is writing national best practice guidelines to improve the collection of Indigenous status information in six health data sets. The outcome of both projects should help improve the quality of information collected on the Indigenous population.

6 Trends

Summary

Although Indigenous mothers remain considerably younger than non-Indigenous mothers, there was a trend over the 1991–2004 period of increasing age of both Indigenous and non-Indigenous mothers (Table 6.1).

The age-standardised caesarean section rate increased significantly over time among both Indigenous and non-Indigenous mothers, but this increase was greater among non-Indigenous mothers. The caesarean section rate increased from 20% to 26% among Indigenous mothers compared with an increase from 19% to 29% among non-Indigenous mothers during the 1991–2004 period (Table 6.3).

The birth outcomes for babies born to Indigenous mothers continue to be poor when compared with babies born to non-Indigenous mothers. Although the proportion of low birthweight babies has been increasing over time for babies born to both Indigenous and non-Indigenous mothers, this increase has been greater among babies born to Indigenous mothers, with an average increase of around 1% per annum over the 1991–2004 period. In 2004, the proportion of low birthweight babies born to Indigenous mothers (12%) was more than double the proportion observed among babies born to non-Indigenous mothers (around 5%) (Table 6.4).

There was no change in the proportion of preterm babies born to both Indigenous and non-Indigenous mothers between 1991 and 2004. However, the proportion of preterm babies born to Indigenous mothers (between 10% and 12%) was consistently more than double the proportion seen among babies born to non-Indigenous mothers (around 5%) (Table 6.5).

The fetal death rate among babies born to Indigenous mothers decreased over the 1991–2004 period and remained stable among babies born to non-Indigenous mothers. Despite the decrease in Indigenous fetal deaths, in the period 2002–2004 the fetal death rate remained almost double among babies born to Indigenous mothers (11 per 1,000 births) when compared with babies born to non-Indigenous mothers (7 per 1,000 births) (Table 6.6).

Background

Based on the findings outlined in Chapter 5, data from six jurisdictions were considered to be of consistent quality for the analysis of Indigenous perinatal trends over the period 1991–2004. Data from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory were all assessed as suitable for inclusion in this analysis (see Chapter 5). Data from Tasmania and the Australian Capital Territory were excluded because of variation over time in Indigenous identification within these jurisdictions. Trends were analysed for maternal age, maternal age of first-time mothers, caesarean sections, low birthweight, preterm births and fetal deaths. These variables were selected because the data were of consistent quality over the reporting period. Perinatal death rates are not presented because the data are incomplete for neonatal deaths for some years.

Long-term trends for each of the variables presented in this chapter have been analysed by modelling trends throughout the period 1991–2004. A linear regression model has been used for the analysis of trends which takes into account all observations throughout the period and fits a line of best fit to the data. The average annual change occurring from year to year over the period has been calculated based on the fitted trend. When the 99% confidence intervals for the trend (p-value of less than 0.01) both lie above or below zero, the trend is characterised in subsequent text as a ‘significant’ increase or a ‘significant’ decline.

The trends analyses presented in this chapter on the proportion of mothers who have given birth by caesarean section have used age-standardised data. Age-standardisation allows for comparisons between populations which have different age structures, as is the case with Indigenous and non-Indigenous mothers. All age-standardised rates and rate ratios have been calculated using the direct standardisation method and ‘all women who gave birth in Australia in 2001’ has been used as the standard population. The Appendix contains further detail on these methods.

As discussed in Chapter 5, fluctuations in the proportion of Indigenous mothers over time may partly reflect changing levels of coverage of Indigenous mothers in the perinatal data. Therefore, caution should be used when assessing trends over time and when making comparisons with non-Indigenous mothers.

Maternal age

Table 6.1 presents the rate of Indigenous and non-Indigenous women who gave birth per 100 women in the reproductive population and the rate ratios of Indigenous and non-Indigenous mothers over the period 1991–2004.

The proportion of Indigenous women in the population who gave birth during the 1991–2004 period remained stable and the proportion of non-Indigenous women who gave birth over this period decreased significantly (Table 6.1). The fitted trend indicated an average yearly decrease of four non-Indigenous mothers per 10,000 population.

There was a trend towards increasing proportions of older mothers and decreasing proportions of younger mothers in both Indigenous and non-Indigenous mothers during the 1991–2004 period. Among Indigenous women, there was a significant decrease in the proportion of teenage mothers and a significant increase in the proportion of mothers aged 25–29 years, 30–34 years and 35 years and over.

Among non-Indigenous women, there was a significant decrease in teenage mothers and those aged 20–24 years and 25–29 years. There was a significant increase in the proportion of non-Indigenous mothers aged 30–34 years and 35 years and over.

The rate ratios between Indigenous and non-Indigenous mothers increased significantly for those aged less than 20 years, 20–24 years, 25–29 years and 30–34 years over the 1991–2004 period. The proportion of teenage mothers decreased among both Indigenous and non-Indigenous women; however, the decrease was greater for Indigenous teenage mothers (an average annual decrease of 0.13%) compared with non-Indigenous mothers (an average annual decrease of 0.04%). The proportion of Indigenous mothers aged 20–24 years did not change significantly over time but non-Indigenous mothers in this age group decreased significantly by a yearly average of 0.16%. The proportion of Indigenous mothers aged 25–29 years increased significantly (by an annual average of 14 mothers per 10,000

population) whereas the proportion of non-Indigenous mothers in this age group decreased (by an annual average of 24 mothers per 10,000 population).

The proportions of both Indigenous and non-Indigenous mothers aged 30–34 years increased significantly over the period; however, the increase was greater in Indigenous mothers.

Table 6.1: Rates (proportions)^(a) and rate ratios of Indigenous and non-Indigenous mothers by maternal age, 1991 to 2004

Maternal age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Annual change ^(b)
Indigenous rate per 100 women ^(a)(%)															
Less than 20	10.0	9.9	9.4	10.2	9.9	9.5	9.8	9.3	9.5	9.4	8.9	8.7	8.5	8.1	-0.13
20–24	14.3	14.0	13.6	13.8	14.3	14.2	14.2	14.6	15.4	14.5	14.9	14.8	14.3	13.9	0.05
25–29	9.7	10.3	10.5	10.1	11.6	11.2	11.1	12.0	12.2	11.6	11.7	11.6	11.7	11.3	0.14*
30–34	5.6	6.0	6.1	5.8	5.8	6.3	6.3	7.5	7.2	7.4	7.5	7.2	7.2	7.5	0.16*
35 and over	1.4	1.6	1.5	1.5	1.6	1.7	1.7	2.0	2.0	2.2	1.9	2.2	2.1	2.3	0.07*
Total	8.2	8.3	8.1	8.1	8.4	8.3	8.2	8.6	8.7	8.5	8.3	8.3	8.1	8.0	0.00
Non-Indigenous rate per 100 women ^(a)(%)															
Less than 20	2.0	2.0	1.9	2.0	1.9	1.9	1.9	1.8	1.8	1.7	1.6	1.6	1.5	1.5	-0.04*
20–24	7.2	7.2	7.0	6.9	6.6	6.4	6.2	6.1	6.1	5.9	5.8	5.5	5.3	5.2	-0.16*
25–29	12.9	13.0	12.8	12.6	12.2	11.7	11.4	11.2	11.1	10.9	10.6	10.4	10.3	10.1	-0.24*
30–34	9.9	10.3	10.4	10.4	10.6	10.5	10.7	10.7	10.9	11.0	10.9	11.1	11.3	11.4	0.10*
35 and over	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.8	2.9	2.9	3.0	3.2	3.3	0.09*
Total	6.2	6.3	6.2	6.2	6.2	6.0	6.0	6.0	6.0	5.9	5.8	5.8	5.8	5.8	-0.04*
Rate ratio															
Less than 20	5.0	5.0	4.9	5.2	5.1	5.0	5.2	5.2	5.4	5.6	5.5	5.5	5.8	5.5	0.06*
20–24	2.0	1.9	1.9	2.0	2.2	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.7	2.7	0.07*
25–29	0.7	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.03*
30–34	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.01*
35 and over	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.00
Total	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.4	0.01*

(a) Based on women aged 15–44 years in the population.

(b) Average annual change in number and proportion of mothers determined using linear regression analysis.

* Represents results with a statistically significant increase or decrease over the 1991–2004 period using 99% confidence intervals.

Note: Excludes data from Tasmania and the Australian Capital Territory.

Sources: AIHW NPSU National Perinatal Data Collection 2007; ABS population data.

Age of first-time mothers

Table 6.2 presents the rate of first-time Indigenous and non-Indigenous women who gave birth per 100 mothers and the rate ratios of Indigenous and non-Indigenous first-time mothers by maternal age, over the period 1991–2004.

The proportion of first-time Indigenous mothers did not change significantly over the 1991–2004 period. The proportion of first-time non-Indigenous mothers, however, increased significantly. The fitted trend indicated an average increase of 0.20 first-time non-Indigenous mothers per 100 mothers.

Analysing changes over time in the proportion of first-time mothers across the different age groups revealed a significant increase of Indigenous first-time teenage mothers between 1991 and 2004. The fitted trend implies an average increase of 0.36 first-time teenage Indigenous mothers per 100 Indigenous teenage mothers. First-time Indigenous mothers aged 20–24 years and 30–34 years also increased significantly between 1991 and 2004; an average increase of 0.26% and 0.17% per annum respectively.

Significant increases in the proportion of first-time mothers were also evident for older non-Indigenous mothers, as seen in the 25–29 year, 30–34 year and 35 years and over age groups. The fitted trends showed an average annual increase in these age groups of 0.48, 0.82 and 0.61 per 100 mothers respectively.

There was a significant increase in the rate ratios between Indigenous and non-Indigenous first-time mothers for those aged less than 20 years and 20–24 years over the 1991–2004 period, indicating that the proportion of Indigenous first-time mothers in these age groups has increased compared with the proportion of non-Indigenous mothers. The proportion of first-time teenage mothers increased significantly among Indigenous mothers (an average annual increase of 0.36%), but the increase was not significant for non-Indigenous teenage mothers. The proportion of non-Indigenous mothers aged 20–24 years did not change significantly over time, whereas Indigenous mothers in this age group increased significantly by a yearly average of 0.26%.

Table 6.2: Rates (proportions)^(a) and rate ratios of Indigenous and non-Indigenous first-time mothers by maternal age, 1991 to 2004

Maternal age	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Annual change ^(b)
Indigenous rate per 100 women who gave birth (%)															
Less than 20	67.8	68.6	67.4	68.8	69.3	69.4	70.2	69.1	72.8	72.8	72.2	69.7	71.6	72.4	0.36*
20–24	25.6	25.4	24.7	25.9	25.7	26.2	28.1	25.8	27.2	24.9	26.8	27.6	28.8	29.6	0.26*
25–29	12.3	11.4	12.8	12.7	12.2	12.4	13.0	13.9	13.7	12.9	12.6	11.5	13.3	12.9	0.05
30–34	8.0	9.1	7.5	9.9	8.7	8.3	9.6	10.8	11.0	9.1	9.6	10.5	9.8	10.7	0.17*
35 and over	7.2	7.8	3.8	5.5	7.4	8.1	8.0	7.8	8.5	7.9	10.4	6.8	6.4	8.5	0.15
Total	31.5	30.4	28.9	30.6	29.4	29.0	30.5	28.6	30.3	29.3	29.8	29.2	30.4	30.7	-0.03
Non-Indigenous rate per 100 women who gave birth (%)															
Less than 20	84.8	83.3	83.9	83.4	84.3	84.2	83.7	83.0	83.9	83.7	85.0	85.3	85.5	85.1	0.11
20–24	57.5	56.5	56.2	56.0	55.6	56.2	56.2	55.5	56.1	56.6	56.0	56.0	57.2	56.9	0.00
25–29	40.9	41.5	42.3	42.7	43.4	43.4	44.0	44.1	45.5	45.9	45.4	45.8	47.2	47.5	0.48*
30–34	26.4	27.0	27.9	28.7	29.2	29.6	30.6	31.3	32.5	33.6	34.4	34.9	35.9	37.0	0.82*
35 and over	19.8	19.9	20.0	21.0	21.1	21.5	22.5	23.5	24.0	24.9	25.4	25.8	26.5	27.3	0.61*
Total	40.1	39.8	40.0	40.1	40.2	40.2	40.4	40.4	41.2	41.6	41.5	41.5	42.2	42.6	0.20*
Rate ratio															
Less than 20	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.9	0.003*
20–24	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.005*
25–29	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-0.002
30–34	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-0.002
35 and over	0.4	0.4	0.2	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.3	0.2	0.3	-0.002
Total	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	-0.004*

(a) Based on women who gave birth.

(b) Average annual change in number and proportion of mothers determined using linear regression analysis.

* Represents results with a statistically significant increase or decrease over the 1991–2004 period using 99% confidence intervals.

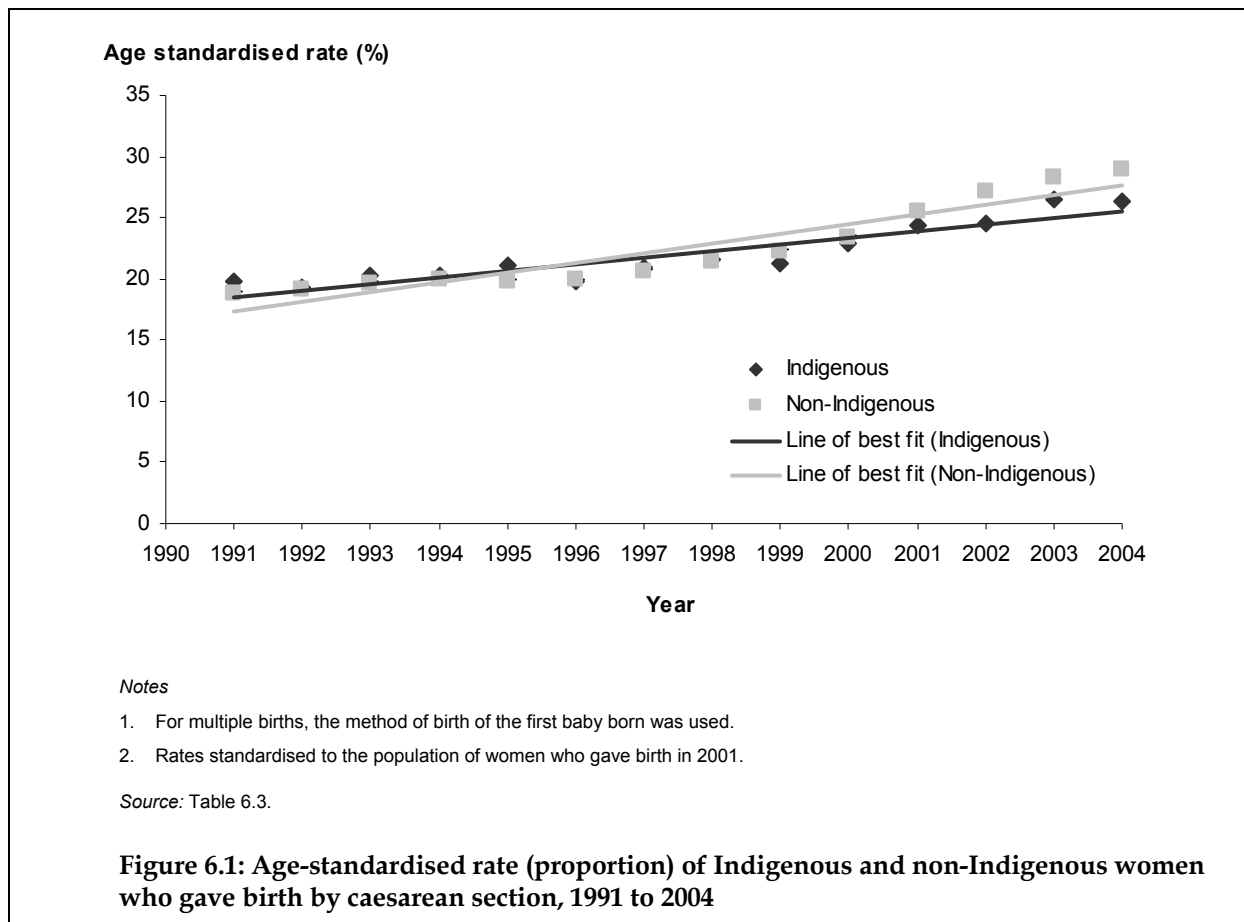
Note: Excludes data from Tasmania and the Australian Capital Territory.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Caesarean sections

The caesarean section age-standardised rate has increased significantly over the 1991–2004 period among both Indigenous and non-Indigenous mothers (Figure 6.1). Rates were directly standardised to the 2001 population of women who gave birth in order to control for the effect of maternal age on the prevalence of caesarean sections.

The Indigenous age-standardised caesarean section rate increased from 20% in 1991 to 26% in 2004, an average annual increase of 0.54% per annum (Table 6.3). The caesarean section rate among non-Indigenous women increased at a greater rate over this same period. In 1991, 19% of non-Indigenous mothers had a caesarean section, increasing to 29% in 2004. This was an average annual increase of 0.8% per annum.



Over the 1991–2004 period there was a significant decrease in the rate ratio between the age-standardised proportion of Indigenous and non-Indigenous mothers who had a caesarean section. This implies that the difference in the proportion of caesarean sections among Indigenous and non-Indigenous mothers has been significantly decreasing over time. The fitted trend shows an average annual decrease in the rate ratio of 0.01 per 100 mothers (Table 6.3).

Table 6.3: Age-standardised rate (proportion)^(a) and rate ratios of Indigenous and non-Indigenous women who gave birth by caesarean section, 1991 to 2004

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Annual change ^(b)
Age-standardised rate per 100 women who gave birth (%)															
Indigenous	19.8	19.4	20.2	20.2	21.1	19.8	20.9	21.5	21.2	22.8	24.4	24.6	26.5	26.4	0.54*
Non-Indigenous	18.8	19.1	19.7	20.0	19.9	19.9	20.6	21.4	22.2	23.5	25.5	27.1	28.3	29.0	0.80*
Rate ratio	1.1	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	-0.01*

(a) Standardised to the population of women who gave birth in 2001.

(b) Average annual change in number and proportion of mothers determined using linear regression analysis.

* Represents results with a statistically significant increase or decrease over the 1991–2004 period using 99% confidence intervals.

Note: Excludes data from Tasmania and the Australian Capital Territory.

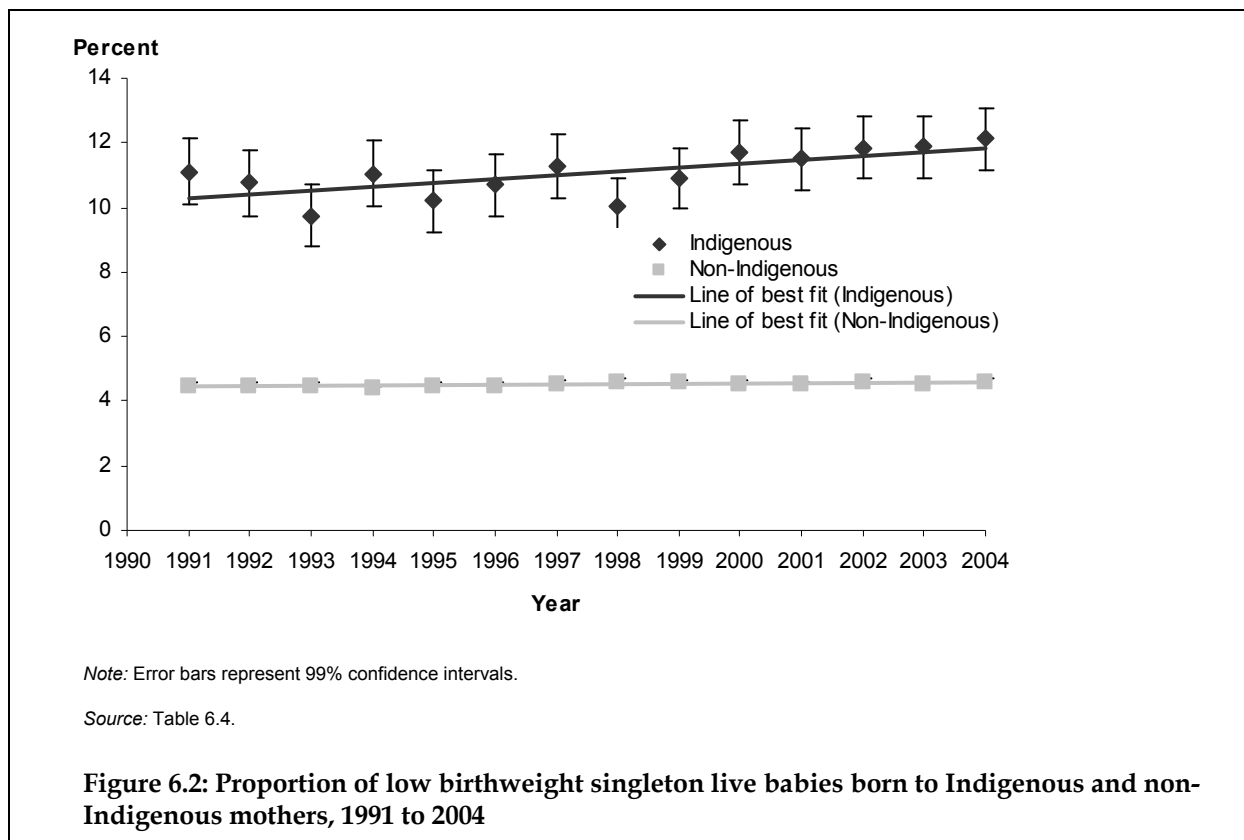
Source: AIHW NPSU National Perinatal Data Collection 2007.

Birthweight

Figure 6.2 shows the trend in low birthweight of singleton liveborn babies over the period 1991–2004 by Indigenous status. Over the 14-year period, the proportion of low birthweight babies (i.e. less than 2,500 grams) increased significantly for babies born to both Indigenous and non-Indigenous mothers.

The proportion of low birthweight babies born to non-Indigenous mothers increased slightly from 4.5% in 1991 to 4.6% in 2004; however, this increase was significant, with an average yearly increase of 0.01 per 100 live births (Table 6.4).

The proportion of low birthweight babies born to Indigenous mothers increased at a greater rate and remained more than double the proportion seen among babies born to non-Indigenous mothers over the 1991–2004 period. In 1991, 11% of babies born to Indigenous mothers were of low birthweight. This increased to 12% in 2004, an average yearly increase of 0.12 per 100 liveborn babies.



Over the 1991–2004 period there was a significant increase in the rate ratio between the proportion of low birthweight babies born to Indigenous and non-Indigenous mothers. This implies that the proportion of low birthweight babies born to Indigenous mothers compared with non-Indigenous mothers has been increasing significantly over time. The fitted trend shows an average annual increase in the rate ratio of 0.02 (Table 6.4).

Table 6.4: Rates (proportion) and rate ratios of low birthweight babies^(a) born to Indigenous and non-Indigenous mothers, 1991 to 2004

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Annual change ^(b)
Age-standardised rate per 100 births (%)															
Indigenous	11.1	10.8	9.7	11.0	10.2	10.7	11.3	10.0	10.9	11.7	11.5	11.8	11.9	12.1	0.12*
Non-Indigenous	4.5	4.4	4.5	4.4	4.5	4.5	4.5	4.6	4.6	4.5	4.5	4.6	4.5	4.6	0.01*
Rate ratio	2.5	2.4	2.2	2.5	2.3	2.4	2.5	2.2	2.4	2.6	2.6	2.6	2.6	2.6	0.02*

(a) Includes liveborn singleton babies only.

(b) Average annual change in number and proportion of mothers determined using linear regression analysis.

* Represents results with a statistically significant increase or decrease over the 1991–2004 period using 99% confidence intervals.

Note: Excludes data from Tasmania and the Australian Capital Territory.

Source: AIHW NPSU National Perinatal Data Collection 2007.

Gestational age

Over the 14-year period 1991–2004, the proportion of liveborn singleton preterm babies (i.e. less than 37 weeks gestation) did not change for babies born to either Indigenous mothers or non-Indigenous mothers (Figure 6.3). The fitted trend implies an average annual increase of 0.05% for babies born to Indigenous mothers and 0.02% for babies born to non-Indigenous mothers, but neither increase was statistically significant (Table 6.5).

The proportion of preterm babies born to Indigenous mothers was consistently more than double the proportion of preterm babies born to non-Indigenous mothers over time. The proportion of preterm babies born to Indigenous mothers varied from 10% to 12% over the 1991–2004 period. The proportion of preterm babies born to non-Indigenous mothers remained between 5% and 6% over the 1991–2004 period (Table 6.5).

There was no change over time in the rate ratio between the proportion of preterm babies born to Indigenous and non-Indigenous mothers (Table 6.5)

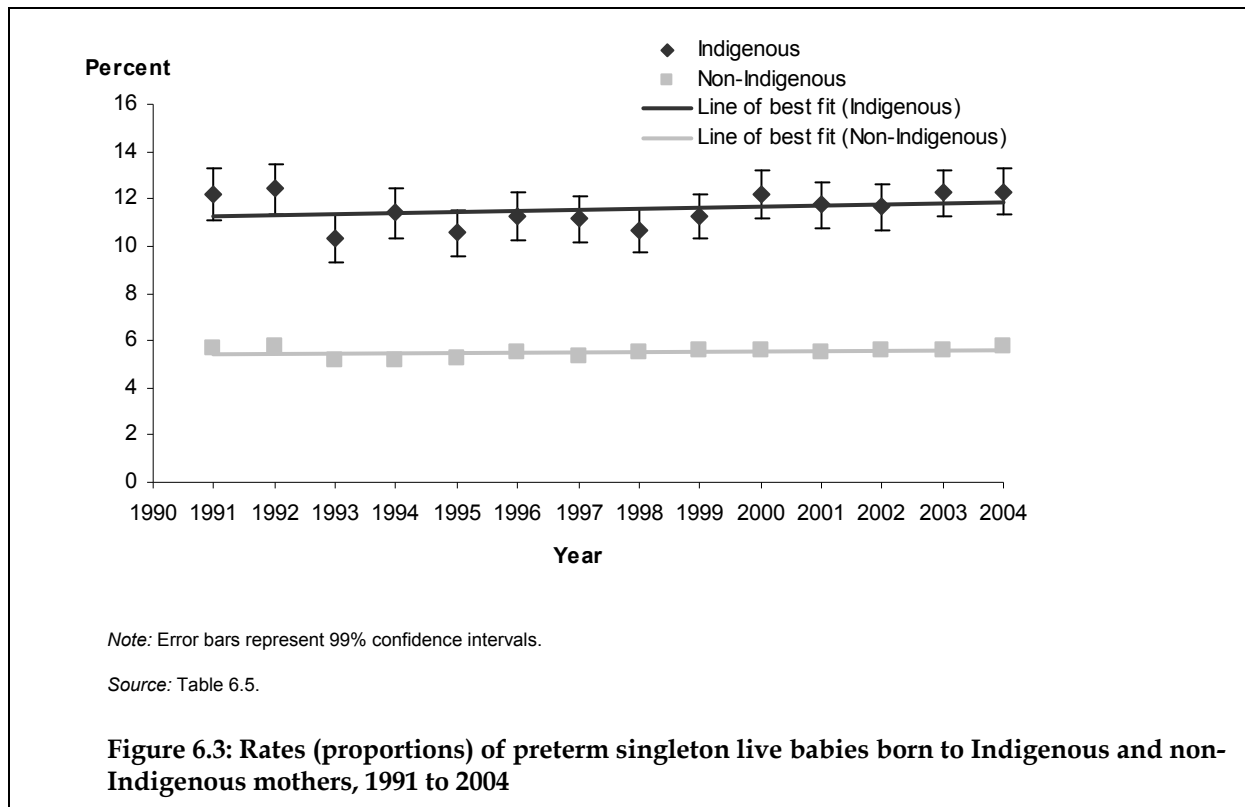


Table 6.5: Rates (proportion) and rate ratios of preterm babies^(a) born to Indigenous and non-Indigenous mothers, 1991 to 2004

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Annual change ^(b)
Age-standardised rate per 100 births (%)															
Indigenous	12.2	12.4	10.3	11.4	10.6	11.2	11.2	10.7	11.2	12.2	11.7	11.7	12.2	12.3	0.05
Non-Indigenous	5.6	5.8	5.2	5.1	5.2	5.5	5.4	5.5	5.6	5.6	5.5	5.6	5.6	5.8	0.02
Rate ratio	2.2	2.2	2.0	2.2	2.0	2.0	2.1	1.9	2.0	2.2	2.1	2.1	2.2	2.1	0.00

(a) Includes liveborn singleton babies only.

(b) Average annual change in number and proportion of mothers determined using linear regression analysis.

Note: Excludes data from Tasmania and the Australian Capital Territory.

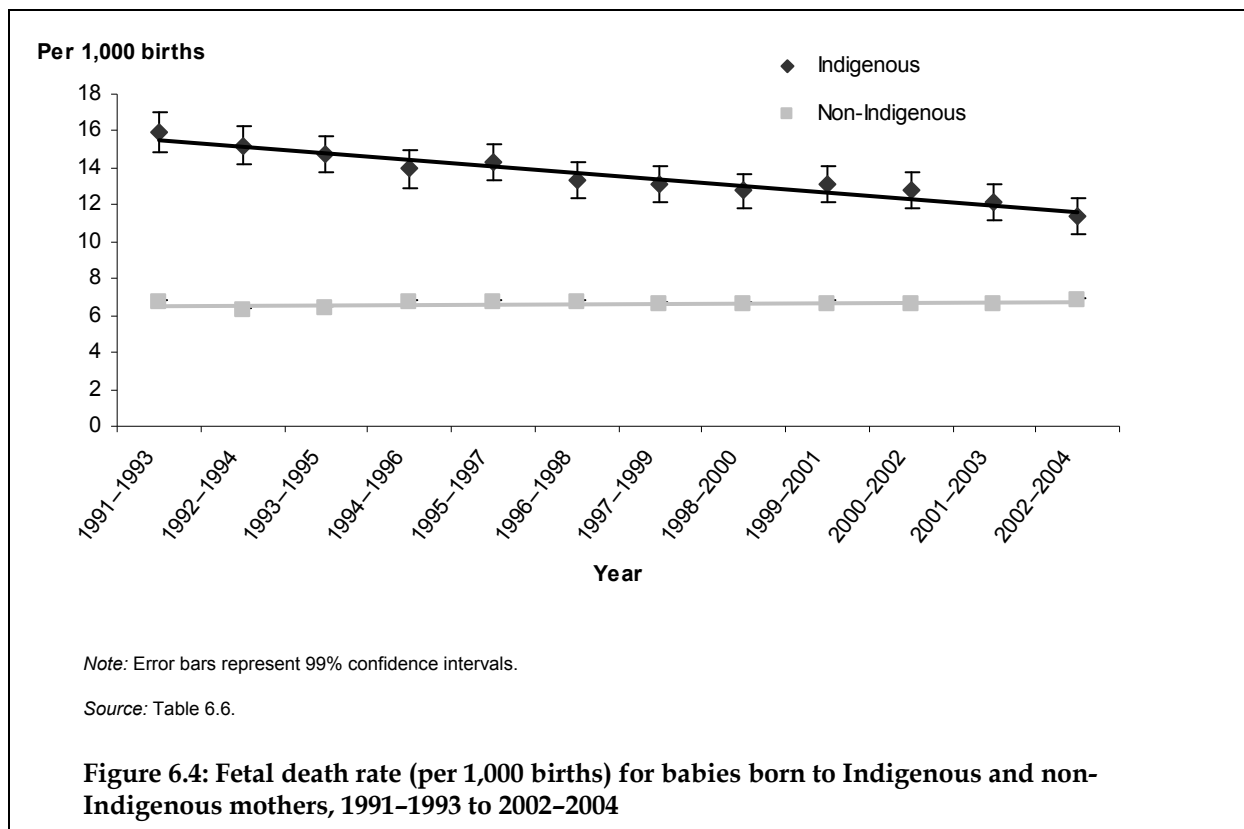
Source: AIHW NPSU National Perinatal Data Collection 2007.

Fetal deaths

Figure 6.4 shows the trend in fetal deaths per 1,000 births for babies born to Indigenous and non-Indigenous mothers over the 1991–1993 to 2002–2004 periods. Perinatal death rates have not been presented because the data are incomplete for neonatal deaths for some years. Because of the small number of fetal deaths among babies born to Indigenous mothers and the instability in these fetal deaths over time, 3-year moving averages were calculated. As year groupings overlapped, linear regression could not be used when analysing the fetal death trend.

Fetal death rates decreased over time among babies born to Indigenous mothers, from 16 deaths per 1,000 births in 1991–1993 to 11 deaths per 1,000 births in 2002–2004 (Table 6.6). Despite the decrease in fetal deaths among babies born to Indigenous mothers, the rate remained almost double that of the fetal death rate for babies born to non-Indigenous mothers in 2002–2004.

The fetal death rate decreased between 1991–1993 and 2002–2004 for babies born to Indigenous mothers; the rate for babies born to non-Indigenous mothers remained stable over time, at around 6 fetal deaths per 1,000 births.



Over the 1991–1993 to 2002–2004 period there was a decrease in the rate ratio between the rate of fetal deaths among babies born to Indigenous and non-Indigenous mothers. This implies that the rate of fetal deaths among babies born to Indigenous mothers compared with non-Indigenous mothers has been decreasing over time (Table 6.6).

Table 6.6: Fetal deaths per 1,000 births to Indigenous and non-Indigenous mothers, 1991–1993 to 2002–2004

	1991– 1993	1992– 1994	1993– 1995	1994– 1996	1995– 1997	1996– 1998	1997– 1999	1998– 2000	1999– 2001	2000– 2002	2001– 2003	2002– 2004	Average change ^(a)
Indigenous	15.9	15.2	14.8	14.0	14.3	13.3	13.1	12.7	13.1	12.8	12.1	11.4	-0.35*
Non-Indigenous	6.7	6.3	6.4	6.7	6.8	6.7	6.7	6.6	6.7	6.6	6.6	6.9	0.02
Rate ratio	2.4	2.4	2.3	2.1	2.1	2.0	2.0	1.9	2.0	1.9	1.8	1.7	-0.06*

Note: Excludes data from Tasmania and the Australian Capital Territory.

Source: AIHW NPSU National Perinatal Data Collection 2007.