# 1.20 Perinatal mortality

**The number of Aboriginal and Torres Strait Islander babies who die in the perinatal period, expressed as a rate (per 1,000 births)**

## Data sources

Data for this measure come from the ABS Deaths Registration Database.

The ABS Deaths Registration Database contains details of all deaths registered in Australia including information on fetal (stillbirths) and neonatal deaths (deaths occurring in live births up to 28 days of age), by age of the baby, sex, state/territory of birth, Indigenous status and cause of death (ICD-10).

The National Perinatal Data Collection also contains data on fetal and neonatal deaths, by sex, state/territory of birth and the Indigenous status of the mother, but it does not collect information on cause of death for all jurisdictions. Work is under way for this collection to include data on obstetric antecedent factors that initiated the sequence of events leading to death based on the Perinatal Society of Australia and New Zealand Perinatal Death Classification for all jurisdictions.

Data from the ABS Deaths Registration Database have been used in this measure, as cause of death can be ascertained and neonatal deaths are more comprehensively captured in this database.

Data are presented by state/territory of usual residence rather than state/territory of death. Although identification of Indigenous deaths is incomplete in all state and territory registration systems, four jurisdictions (Queensland since 1998, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. These four jurisdictions represent approximately 60% of the Indigenous population of Australia.

Several years of data have been combined because of the small number of deaths from some conditions each year. The latest year for which mortality data are currently available is 2006, but Indigenous status information on fetal deaths is not available for that year. Therefore, data in this measure have been analysed for the period 2001–2005 using the year of registration of death.

The perinatal mortality rate is defined by the ABS as the number of deaths (fetal deaths and neonatal deaths) of babies of at least 400 grams birthweight or, if birthweight is unavailable, a gestational age of at least 20 weeks, up to 28 completed days after birth per 1,000 live births during a given period. This definition has been used for the purposes of this measure.

# Analyses

## Mortality

### Mortality by sex

- Over the period 2001–2005, there were 495 deaths (285 male, 207 female) of Indigenous perinatal infants and 3,524 deaths (1,918 male, 1,582 female) of non-Indigenous perinatal infants in Queensland, Western Australia, South Australia and the Northern Territory combined.
- The perinatal mortality rate for Indigenous infants was around 14 per 1,000 births compared with 10 per 1,000 births for non-Indigenous infants.
- Perinatal mortality rates were higher for males than females for both Indigenous and non-Indigenous infants. The perinatal mortality rate for Indigenous males was 15 per 1,000 births compared with 12 per 1,000 births for Indigenous females. The perinatal mortality rate for non-Indigenous males was 9 per 1,000 births compared with 7 per 1,000 births for non-Indigenous females (Table 1.20.1)

**Table 1.20.1: Perinatal mortality rates per 1,000 births, by Indigenous status and sex, Qld, WA, SA & NT[(a)], 2001–2005**

| | Indigenous | | Non-Indigenous | |
|---|---|---|---|---|
| | Deaths | No. per 1,000 births | Deaths | No. per 1,000 births |
| Males | 285 | 15.2 | 1,918 | 8.5 |
| Females | 207 | 11.6 | 1,582 | 7.4 |
| Persons[(b)] | 495 | 13.5 | 3,524 | 8.1 |

(a) Data are reported for Queensland, Western Australia, South Australia and the Northern Territory. These jurisdictions are considered to have adequate levels of Indigenous identification in mortality data. They do not represent a quasi-Australian figure.

(b) Includes sex indeterminate.

Note: Data are based on state of usual residence and year of registration of death.

Source: ABS Deaths Registration database.

### Mortality by state/territory

Perinatal mortality rates per 1,000 births among Indigenous and non-Indigenous babies are presented in Table 1.20.2 for Queensland, Western Australia, South Australia and the Northern Territory for the years 1996–1998, 1999–2001, and 2002–2005.

- In Queensland, Western Australia, South Australia and the Northern Territory combined, there were 315 perinatal deaths of Indigenous babies in 1996–1998, 350 perinatal deaths of Indigenous babies in 1999–2001 and 372 perinatal deaths of Indigenous babies in 2002–2005.
- Over the period 2002–2005, the perinatal mortality rate for Indigenous babies in Queensland, Western Australia, South Australia and the Northern Territory combined was 12.5 per 1,000 live births compared with 7.9 for non-Indigenous babies.
- Indigenous perinatal mortality rates ranged from 9.5 per 1,000 live births in Western Australia to 18.8 per 1,000 births in the Northern Territory in 2002–05.

- In 2002–05 Indigenous babies in the Northern Territory and South Australia died in the perinatal period at twice the rate of non-Indigenous babies in these jurisdictions. In Queensland, Indigenous babies died in the perinatal period at around 1.5 times the rate of non-Indigenous babies. In Western Australia there was no statistically significant difference between Indigenous and non-Indigenous perinatal death rates.
- The majority of perinatal deaths were fetal deaths. In 2002–2005, the fetal death rate was 6.8 per 1,000 births among Indigenous Australians in Queensland, Western Australia, South Australia and the Northern Territory combined compared to 5.3 among non-Indigenous Australians. The neonatal death rate among Indigenous babies for the same period was 5.9 per 1,000 live births compared with 2.6 among non-Indigenous babies.

**Table 1.20.2: Fetal, neonatal and perinatal mortality rates per 1,000 births, by Indigenous status, Qld, WA, SA and NT, 1996–1998 to 2002–2005[a][b][c][d][e][f]**

| | 1996–1998[g] | | | | | 1999–2001 | | | | | 2002–2005 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[i] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] |
| | | | | | | | Fetal deaths | | | | | | | | |
| **Qld** | | | | | | | | | | | | | | | |
| Indigenous | 61 | 7.0 | 5.2 | 8.8 | 1.2 | 75 | 7.8 | 6.1 | 9.6 | 1.5* | 76 | 5.5 | 4.2 | 6.7 | 1.0 |
| Non-Indigenous | 759 | 5.7 | 5.3 | 6.1 | | 701 | 5.3 | 4.9 | 5.7 | | 966 | 5.2 | 4.9 | 5.6 | |
| **WA** | | | | | | | | | | | | | | | |
| Indigenous | 56 | 12.3 | 9.1 | 15.6 | 2.4* | 49 | 9.9 | 7.2 | 12.7 | 1.9* | 37 | 5.5 | 3.8 | 7.3 | 1.0 |
| Non-Indigenous | 366 | 5.2 | 4.7 | 5.8 | | 371 | 5.3 | 4.8 | 5.9 | | 494 | 5.3 | 4.8 | 5.8 | |
| **SA** | | | | | | | | | | | | | | | |
| Indigenous | 12 | 6.6 | 2.9 | 10.3 | 1.2 | 23 | 12.1 | 7.1 | 17.0 | 2.4* | 22 | 8.3 | 4.8 | 11.8 | 1.6* |
| Non-Indigenous | 299 | 5.5 | 4.9 | 6.1 | | 255 | 5.0 | 4.3 | 5.6 | | 356 | 5.3 | 4.7 | 5.8 | |
| **NT** | | | | | | | | | | | | | | | |
| Indigenous | 45 | 11.4 | 8.1 | 14.8 | 2.3* | 46 | 9.8 | 7.0 | 12.7 | 1.7* | 65 | 10.4 | 7.9 | 13.0 | 1.8* |
| Non-Indigenous | 35 | 5.0 | 3.4 | 6.7 | | 37 | 5.7 | 3.9 | 7.5 | | 49 | 5.7 | 4.1 | 7.3 | |
| **Qld, WA, SA & NT[c]** | | | | | | | | | | | | | | | |
| **Indigenous** | **174** | **9.2** | **7.8** | **10.5** | **1.7*** | **193** | **9.2** | **7.9** | **10.5** | **1.7*** | **200** | **6.8** | **5.8** | **7.7** | **1.3*** |
| **Non-Indigenous** | **1,459** | **5.5** | **5.2** | **5.8** | | **1,364** | **5.2** | **5.0** | **5.5** | | **1,865** | **5.3** | **5.0** | **5.5** | |

*(continued)*

**Table 1.20.2 (continued): Fetal, neonatal and perinatal mortality rates per 1,000 births, by Indigenous status, Qld, WA, SA and NT, 1996–1998 to 2002–2005[a][b][c][d][e][f]**

| | 1996–1998[g] | | | | | 1999–2001 | | | | | 2002–2005 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] |
| | | | | | | | Neonatal deaths | | | | | | | | |
| **Qld** | | | | | | | | | | | | | | | |
| Indigenous | 57 | 6.6 | 4.9 | 8.3 | 1.8* | 59 | 6.2 | 4.6 | 7.8 | 1.9* | 82 | 5.9 | 4.6 | 7.2 | 2.0* |
| Non-Indigenous | 485 | 3.6 | 3.3 | 4.0 | | 435 | 3.3 | 3.0 | 3.6 | | 555 | 3.0 | 2.8 | 3.3 | |
| **WA** | | | | | | | | | | | | | | | |
| Indigenous | 35 | 7.8 | 5.2 | 10.4 | 2.9* | 40 | 8.2 | 5.7 | 10.7 | 3.8* | 27 | 4.1 | 2.5 | 5.6 | 1.9* |
| Non-Indigenous | 186 | 2.7 | 2.3 | 3.0 | | 151 | 2.2 | 1.8 | 2.5 | | 201 | 2.2 | 1.9 | 2.5 | |
| **SA** | | | | | | | | | | | | | | | |
| Indigenous | n.p. | n.p. | n.p. | n.p. | n.p. | 9 | 4.8 | 1.7 | 7.9 | 1.9 | 10 | 3.8 | 1.4 | 6.2 | 1.7 |
| Non-Indigenous | 134 | 2.5 | 2.1 | 2.9 | | 126 | 2.5 | 2.0 | 2.9 | | 153 | 2.3 | 1.9 | 2.6 | |
| **NT** | | | | | | | | | | | | | | | |
| Indigenous | 46 | 11.8 | 8.4 | 15.3 | 3.6* | 49 | 10.6 | 7.6 | 13.5 | 2.5* | 53 | 8.6 | 6.3 | 10.9 | 3.1* |
| Non-Indigenous | 23 | 3.3 | 2.0 | 4.7 | | 27 | 4.2 | 2.6 | 5.8 | | 24 | 2.8 | 1.7 | 3.9 | |
| **Qld, WA, SA & NT[c]** | | | | | | | | | | | | | | | |
| **Indigenous** | **141** | **7.5** | **6.3** | **8.7** | **2.4*** | **157** | **7.5** | **6.3** | **8.7** | **2.6*** | **172** | **5.9** | **5.0** | **6.8** | **2.2*** |
| **Non-Indigenous** | **828** | **3.1** | **2.9** | **3.4** | | **739** | **2.9** | **2.7** | **3.1** | | **933** | **2.6** | **2.5** | **2.8** | |

*(continued)*

**Table 1.20.2 (continued): Fetal, neonatal and perinatal mortality rates per 1,000 births, by Indigenous status, Qld, WA, SA and NT, 1996–1998 to 2002–2005[a][b][c][d][e][f]**

| | 1996–1998[g] | | | | | 1999–2001 | | | | | 2002–2005 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] | No. | No. per 1,000 | LCL 95%[h] | UCL 95%[i] | Rate ratio[j] |
| | | | | | | | Perinatal deaths | | | | | | | | |
| **Qld** | | | | | | | | | | | | | | | |
| Indigenous | 118 | 13.4 | 11.0 | 15.9 | 1.5* | 134 | 13.9 | 11.6 | 16.3 | 1.6* | 158 | 11.3 | 9.5 | 13.0 | 1.4* |
| Non-Indigenous | 1,244 | 9.3 | 8.7 | 9.8 | | 1,136 | 8.5 | 8.0 | 9.0 | | 1,521 | 8.2 | 7.8 | 8.6 | |
| **WA** | | | | | | | | | | | | | | | |
| Indigenous | 91 | 19.9 | 15.8 | 24.0 | 2.5* | 89 | 17.9 | 14.2 | 21.6 | 2.4* | 64 | 9.5 | 7.2 | 11.9 | 1.3 |
| Non-Indigenous | 552 | 7.8 | 7.2 | 8.5 | | 522 | 7.5 | 6.9 | 8.1 | | 695 | 7.4 | 6.9 | 8.0 | |
| **SA** | | | | | | | | | | | | | | | |
| Indigenous | 15 | 8.2 | 4.1 | 12.4 | 1.0 | 32 | 16.7 | 10.9 | 22.5 | 2.3* | 32 | 12.0 | 7.9 | 16.2 | 1.6* |
| Non-Indigenous | 433 | 8.0 | 7.2 | 8.7 | | 381 | 7.4 | 6.6 | 8.1 | | 509 | 7.5 | 6.8 | 8.1 | |
| **NT** | | | | | | | | | | | | | | | |
| Indigenous | 91 | 22.9 | 18.2 | 27.6 | 2.7* | 95 | 20.1 | 16.0 | 24.1 | 2.0* | 118 | 18.8 | 15.4 | 22.2 | 2.2* |
| Non-Indigenous | 58 | 8.3 | 6.2 | 10.5 | | 64 | 9.8 | 7.4 | 12.2 | | 73 | 8.5 | 6.5 | 10.4 | |
| **Qld, WA, SA & NT[c]** | | | | | | | | | | | | | | | |
| **Indigenous** | **315** | **16.5** | **14.6** | **18.3** | **1.9*** | **350** | **16.5** | **14.8** | **18.2** | **2.0*** | **372** | **12.5** | **11.3** | **13.8** | **1.6*** |
| **Non-Indigenous** | **2,287** | **8.6** | **8.2** | **9.0** | | **2,103** | **8.1** | **7.7** | **8.4** | | **2,798** | **7.9** | **7.6** | **8.2** | |

*(continued)*

**Table 1.20.2 (continued): Fetal, neonatal and perinatal mortality rates per 1,000 births, by Indigenous status, Qld, WA, SA and NT, 1996–1998 to 2002–2005[(a)(b)(c)(d)(e)(f)]**

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons at the $p < 0.05$ level.

(a) Shading indicates that the Indigenous identification is likely to be less than 50% complete.

(b) Data are presented in 3-year groupings because of small numbers each year.

(c) Data are reported for Queensland, Western Australia, South Australia and the Northern Territory. These jurisdictions are considered to have adequate levels of Indigenous identification in mortality data. They do not represent a quasi-Australian figure.

(d) Although most perinatal deaths of Indigenous perinatal babies are registered, it is likely that some are not accurately identified as Indigenous. Therefore, these statistics are likely to underestimate the Indigenous perinatal mortality rate. There may also be under-identification of Indigenous babies in the denominator and the under-identification may be different for fetal deaths and live births, which would also affect the perinatal mortality rate. The ABS calculated the completeness of identification of Indigenous deaths for the period 1999–2003 using population estimates as 54% for Queensland, 72% for Western Australia, 66% for South Australia and 95% for the Northern Territory. The completeness of Indigenous identification for perinatal deaths may differ from the estimates for 'all causes'.

(e) Because of changes in the level of accuracy of Indigenous identification in the births and deaths data over time, caution should be used in interpreting changes in Indigenous perinatal mortality rates. It is also difficult to exactly identify the difference between the Indigenous and non-Indigenous perinatal mortality rates because of these data quality issues.

(f) Deaths are by year of registration and state/territory of usual residence.

(g) Queensland data are only reliable from 1998 (National Health Performance Committee 2004).

(h) LCL = lower confidence limit.

(i) UCL = upper confidence limit.

(j) Rate ratio Indigenous:non-Indigenous.

*Source:* ABS Deaths Registration Database.

## Mortality by cause of death

Table 1.20.3 presents fetal, neonatal and total perinatal deaths of Indigenous and non-Indigenous babies by main underlying cause of death. Note that perinatal cause of death data should be used with caution as the level of identification by cause is unknown and may not be suitable for the calculation of rates.

- Over the period 2001–2005, in Queensland, Western Australia, South Australia and the Northern Territory combined, of conditions which originate in the fetus or infant, the most common cause of perinatal death among Indigenous babies was 'other conditions originating in the perinatal period' (such as birth trauma) which were reported as an underlying or associated cause of death in 41% of deaths of Indigenous babies. For 23% of Indigenous babies, disorders relating to length of gestation and fetal growth were reported as the main underlying cause of death.
- Of conditions which originate in the mother, the most common cause of perinatal death among Indigenous babies was the fetus or newborn affected by complications of the placenta, cord and membranes (30%). For approximately 18% of Indigenous babies, the fetus and newborn affected by maternal complications of pregnancy was reported as the main underlying cause of death.
- For fetal deaths, the most common causes of death among Indigenous babies were other conditions originating in the perinatal period (62%) and fetus or newborn affected by complications of the placenta, cord and membranes (38%). For neonatal deaths, the most common causes of death among Indigenous babies were fetus and newborn affected by maternal complications of pregnancy (31%) and disorders related to length of gestation and fetal growth (31%).

**Table 1.20.3: Main underlying cause of death for perinatal babies, by Indigenous status, Qld, WA, SA and NT, 2001–2005[(a)(b)(c)(d)(e)]**

| | Foetal deaths | | | | Neonatal deaths | | | | Perinatal deaths | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total number | | Per cent | | Total number | | Per cent | | Total number | | Per cent | |
| Cause of death | Indig. | Non-Indig. | Indig. | Non-Indig. | Indig. | Non-Indig. | Indig. | Non-Indig. | Indig. | Non-Indig. | Indig. | Non-Indig. |
| **Main condition in the fetus/infant** | | | | | | | | | | | | |
| Disorders related to length of gestation and fetal growth (P05–P08) | 45 | 238 | 16.5 | 10.2 | 68 | 254 | 30.6 | 21.3 | 113 | 492 | 22.8 | 14.0 |
| Respiratory and cardiovascular disorders specific to the perinatal period (P20–P29) | 25 | 291 | 9.2 | 12.5 | 39 | 239 | 17.6 | 20.1 | 64 | 530 | 12.9 | 15.0 |
| Infections specific to the perinatal period (P35–P39) | 9 | 45 | 3.3 | 1.9 | 19 | 84 | 8.6 | 7.1 | 28 | 129 | 5.7 | 3.7 |
| Other conditions originating in the perinatal period (P10–P15 and P50–P96) | 169 | 1,355 | 61.9 | 58.1 | 34 | 227 | 15.3 | 19.1 | 203 | 1,582 | 41.0 | 44.9 |
| Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99) | 25 | 381 | 9.2 | 16.3 | 38 | 324 | 17.1 | 27.2 | 63 | 705 | 12.7 | 20.0 |
| Other conditions | — | 23 | — | 1.0 | 24 | 63 | 10.8 | 5.3 | 24 | 86 | 4.8 | 2.4 |
| **Total deaths** | **273** | **2,333** | **100.0** | **100.0** | **222** | **1,191** | **100.0** | **100.0** | **495** | **3,524** | **100.0** | **100.0** |
| **Main condition in the mother** | | | | | | | | | | | | |
| Fetus and newborn affected by complications of placenta, cord and membranes | 104 | 733 | 38.1 | 31.4 | 45 | 218 | 20.3 | 18.3 | 149 | 951 | 30.1 | 27.0 |
| Fetus and newborn affected by maternal complications of pregnancy | 21 | 215 | 7.7 | 9.2 | 68 | 404 | 30.6 | 33.9 | 89 | 619 | 18.0 | 17.6 |
| Fetus and newborn affected by maternal conditions that may be unrelated to present pregnancy | 48 | 395 | 17.6 | 16.9 | 23 | 72 | 10.4 | 6.0 | 71 | 467 | 14.3 | 13.3 |
| Fetus and newborn affected by other complications of labour and delivery and noxious influences transmitted via placenta or breast milk | 12 | 148 | 4.4 | 6.3 | 6 | 41 | 2.7 | 3.4 | 18 | 189 | 3.6 | 5.4 |
| **Total deaths** | **273** | **2,333** | **100.0** | **100.0** | **222** | **1,191** | **100.0** | **100.0** | **495** | **3,524** | **100.0** | **100.0** |

*(continued)*

**Table 1.20.3 (continued): Main underlying cause of death for perinatal babies, by Indigenous status, Qld, WA, SA and NT, 2001–2005[(a)(b)(c)(d)(e)]**

(a) Data are reported for Queensland, Western Australia, South Australia and the Northern Territory only. These four jurisdictions are considered to have adequate levels of Indigenous identification in mortality data. They do not represent a quasi-Australian figure.

(b) Includes all fetuses and babies delivered weighing at least 400 grams or, if birthweight is unavailable, at gestational age of 20 weeks or more.

(c) Data are presented in 5-year groupings because of small numbers each year.

(d) Data based on state of usual residence of mother.

(e) Deaths are by year of registration.

*Source:* ABS Deaths Registration Database.

## Time series analysis

Longer term mortality trend data are limited to three jurisdictions—Western Australia, South Australia and the Northern Territory, which have over 10 years of adequate identification of Indigenous deaths in their recording systems.

As there is a consistent time series of population estimates from 1991, data for the period 1991–2005 have been used for the analysis of Indigenous mortality in this indicator.

Because of the late inclusion of a 'not stated' category for Indigenous status in 1998 (before which 'not stated' responses were included with non-Indigenous deaths), Indigenous mortality rates have been compared with the mortality rates of other Australians (which include deaths of both non-Indigenous people and people for whom Indigenous status was not stated).

Fluctuations in the level of Indigenous mortality over time partly reflect changing levels of identification of Indigenous deaths and population estimates. Given the volatility in the measures of Indigenous mortality, caution should be exercised in assessing trends in Indigenous mortality over time and comparisons between jurisdictions and with the non-Indigenous population.

Perinatal mortality rates, rate ratios and rate differences between Indigenous and other babies over the period 1991–2005 are presented in Table 1.20.4 and Figure 1.20.1.

- Over the period 1991–2005, there were significant declines in perinatal mortality rates of Indigenous babies in Western Australia, South Australia and the Northern Territory. The fitted trend implies an average yearly decline in the rate of around 0.8 deaths per 1,000 births, which is equivalent to a 51% decline in the rate over this period.
- Over the same period, there were also significant declines in perinatal mortality rates of other babies, with an average yearly decline in the rate of around 0.2 deaths per 1,000 births, which is equivalent to a 24% decline in the rate over this period.
- There were significant declines in both the mortality rate ratios and mortality rate differences between Indigenous and other babies between 1991 and 2005 (33% decline in the rate ratio and 70% decline in the rate difference).
- There was a large drop in the number of perinatal deaths of Indigenous infants in Western Australia in 2002, which has resulted in a decline in the perinatal mortality rate for Indigenous infants in the three jurisdictions combined for that year (Figure 1.20.1). It is not known why there were so few Indigenous perinatal deaths in Western Australia in 2002.

*Fetal and neonatal mortality rates*

- Fetal mortality rates are available for the period 1991–2005. Over this period there was a significant decline in the fetal mortality rate for both Indigenous and other babies (47% decline for Indigenous and 15% decline for other babies). There was also a significant decline in the mortality rate ratio and mortality rate difference between Indigenous and other fetuses between 1991 and 2005.
- Neonatal mortality rates are available for the period 1991–2006. Over this period there was a significant decline in the neonatal mortality rate for both Indigenous and other babies (41% decline for Indigenous and 35% decline for other babies). There was also a significant decline in the mortality rate ratio and mortality rate difference between Indigenous and other neonates between 1991 and 2005.

**Table 1.20.4: Perinatal mortality rates, rate ratios and rate differences, WA, SA and NT, 1991–2005**

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Annual change[(a)] | % change over period[(b)] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Indigenous rate (no. per 1,000 births)** | | | | | | | | | | | | | | | | | |
| Number | 79 | 89 | 96 | 77 | 65 | 61 | 71 | 65 | 69 | 80 | 67 | 34 | 70 | 48 | 62 | | |
| Rate | 22.8 | 25.2 | 27.4 | 21.9 | 18.8 | 17.4 | 20.9 | 18.7 | 18.7 | 20.2 | 16.9 | 9.1 | 17.7 | 12.2 | 15.4 | –0.8* | –50.8 |
| **Other[(c)] rate (no. per 1,000 births)** | | | | | | | | | | | | | | | | | |
| Number | 429 | 423 | 423 | 360 | 424 | 404 | 339 | 300 | 316 | 333 | 318 | 321 | 332 | 299 | 325 | | |
| Rate | 9.5 | 9.4 | 9.2 | 8.0 | 9.4 | 9.1 | 7.8 | 6.9 | 7.3 | 7.7 | 7.7 | 7.7 | 7.9 | 7.1 | 7.4 | –0.2* | –23.5 |
| **Rate ratio[(d)]** | 2.4 | 2.7 | 3.0 | 2.7 | 2.0 | 1.9 | 2.7 | 2.7 | 2.6 | 2.6 | 2.2 | 1.2 | 2.2 | 1.7 | 2.1 | –0.1* | –33.2 |
| **Rate difference[(e)]** | 13.4 | 15.8 | 18.1 | 13.9 | 9.4 | 8.3 | 13.2 | 11.8 | 11.4 | 12.5 | 9.2 | 1.4 | 9.7 | 5.2 | 8.0 | –0.7* | –70.1 |

* Represents statistically significant increases or decrease over the period 1991–2005 at the $p < 0.05$ level.

(a) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.

(b) Per cent change between 1991 and 2005 based on the average annual change over the period.

(c) 'Other' includes deaths of non-Indigenous people and those for whom Indigenous status was not stated.

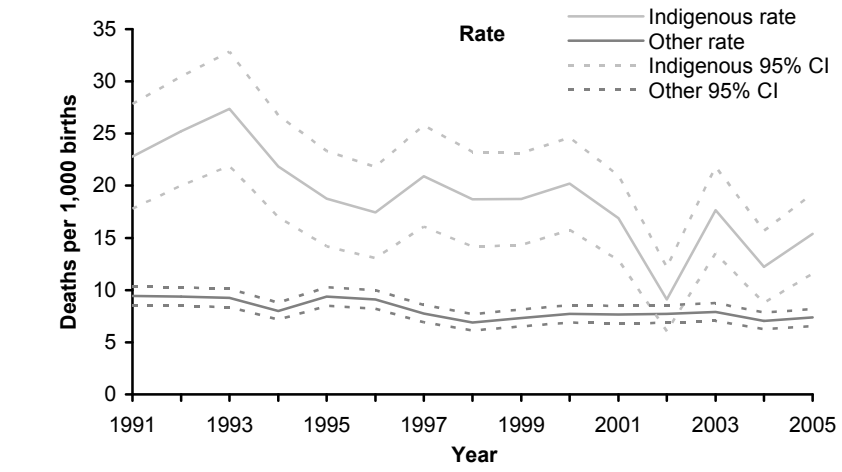
(d) Mortality rate for Indigenous Australians divided by the mortality rate for other Australians.

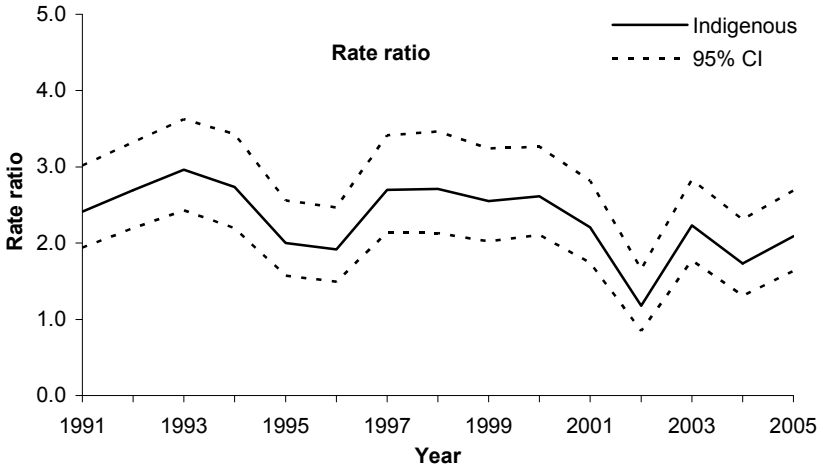
(e) Mortality rate for Indigenous Australians minus the mortality rate for other Australians.

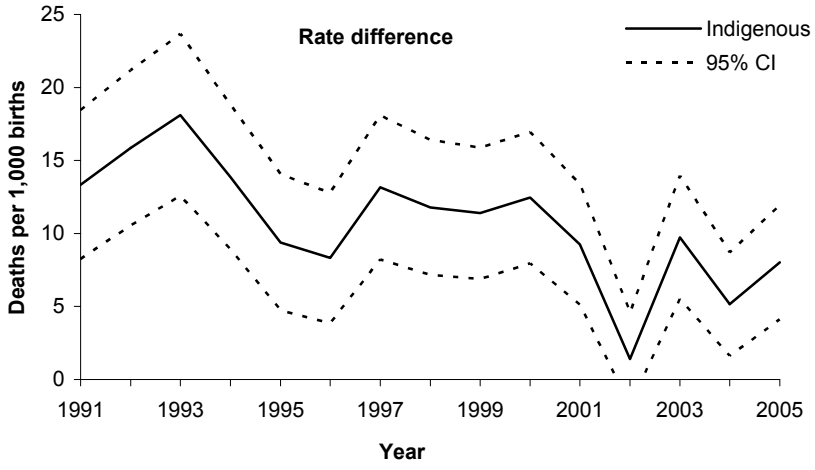
*Notes*

1. Perinatal deaths were not available in South Australia in 1996.
2. The average of births over the period 1993–1995 in Western Australia was used for births in 1991 and 1992, as there were errors in the number of Indigenous births recorded.

*Source:* ABS Deaths Registration Database.




*Source:* ABS Deaths Registration Database.

**Figure 1.20.1: Perinatal mortality rates, rate ratios and rate differences between Indigenous and other Australians, WA, SA and NT, 1991–2005**

**Sensitivity of mortality trends to changes in identification**

- The fitted trends described above have been examined for their sensitivity to changes in Indigenous identification. Three scenarios for identification were posted—constant identification, increasing identification and decreasing identification.
  - Under the constant identification scenario, the numbers of deaths for the period under study were adjusted using the following identification estimates derived from the most recent ABS analyses (relating to the period 2002–2005):
    - Western Australia 72%
    - South Australia 62%
    - Northern Territory 90%.
  - Under the increasing identification scenario, deaths were adjusted by linearly increasing the identification through the period under study—from 64% in 1991 to 72% in 2005 for Western Australia, from 52% to 62% for South Australia, and from 80% to 90% for the Northern Territory.
  - Under the decreasing identification scenario, deaths were adjusted by linearly decreasing the identification from 80% in 1991 to 72% in 2005 for Western Australia, from 72% to 62% for South Australia, and from 100% to 90% for the Northern Territory.
- The adjustments in the latter two scenarios were based on judgments about the largest plausible shifts in identification during the period; of course, if any actual shift in identification was more extreme than has been posted under these scenarios, then the observed trends in mortality might not persist.
- All of the observed trends in perinatal mortality mentioned above remained statistically significant under all three identification scenarios except for the decline in the rate ratio, which did not remain significant under the decreasing identification scenario.

## International comparisons

International data are available for New Zealand, the United States and Canada using the World Health Organization (WHO) definition of perinatal mortality. However, the WHO definition differs significantly from the Australian definition of the perinatal period. Australian data include babies of at least 400 grams (or at least 20 weeks if birthweight is unavailable) whereas the WHO definition starts at 500 grams (22 weeks if birthweight is unavailable). In addition, the WHO defines perinatal deaths as less than 7 days whereas Australia includes deaths up to 28 days. Perinatal mortality rates of Aboriginal and Torres Strait Islander babies are therefore not comparable to rates for Indigenous populations in the other countries. Therefore, international comparisons have not been presented here.

# Additional information

## Influencing factors

The main risk factors for perinatal mortality are low birthweight and pre-term birth. Other factors which may be associated with perinatal mortality are smoking during pregnancy, infection, maternal nutrition and underutilisation of antenatal services. Data on these influencing factors is available from the National Perinatal Data Collection and the state and territory perinatal data collections.

**Low birthweight/pre-term birth**

- Over the period 2003–2005, babies born to Indigenous mothers were twice as likely to have low birthweight as babies born to non-Indigenous mothers (12% compared with 6%). In Australia (excluding Tasmania and the Northern Territory for 2003), 81% of perinatal deaths among babies born to Indigenous mothers had low birthweight compared with 78% among babies born to non-Indigenous mothers.
- Between 2003 and 2005, live-born babies of Indigenous mothers were also more likely to be pre-term than live-born babies born to non-Indigenous mothers (14% compared with 8%) (see Measure 1.01 for more information on low birthweight babies). Over the same period, approximately 59% of perinatal deaths of babies born to Indigenous mothers in Australia (excluding Tasmania and the Northern Territory for 2003) had a gestation period of less than 28 weeks. The proportion for babies born to non-Indigenous mothers was similar (58%) (see Measure 1.01 for more information on low birthweight infants).

**Smoking during pregnancy**

- Data on smoking during pregnancy show that in 2005 Indigenous mothers were three times more likely to smoke during pregnancy than non-Indigenous mothers (52% compared with 16%). Smoking during pregnancy rates were highest in South Australia (66%) followed by New South Wales and Western Australia (54%) (see Measure 2.19 for more information on smoking during pregnancy).

**Underutilisation of antenatal care services**

- In 2005, in the two jurisdictions where data are collected on the duration of pregnancy at first antenatal visit (New South Wales and the Northern Territory), Indigenous mothers were two to three times as likely as non-Indigenous mothers to be in their third trimester of pregnancy at their first antenatal session and less likely to be in their first trimester.
- In the three jurisdictions where data were collected in 2005 on the number of antenatal sessions attended during pregnancy (Queensland, South Australia and the Northern Territory), Indigenous mothers were less likely to have attended five or more antenatal sessions during pregnancy than non-Indigenous mothers (see Measure 3.01 for more information on antenatal care).

## Data quality issues

### Mortality data

#### *Deaths*

*The mortality rate for Indigenous Australians can be influenced by late registration of deaths, identification of Indigenous deaths and changes to death forms and/or processing systems. Because of the small size of the Indigenous population, these factors can significantly affect trends over time and between jurisdictions.*

#### *Indigenous status question*

*All jurisdictions comply with the standard wording for the Indigenous status question and categories for their death registration forms. However, New South Wales, Victoria, South Australia, the Northern Territory and the Australian Capital Territory all have slightly different wording from the national standard for the instruction on those with both Aboriginal and Torres Strait Islander origin (ABS & AIHW 2005). Although the wording is only slightly different, it would be ideal to have all jurisdictions asking the question in exactly the same way. The National Perinatal Data Collection has more significant problems with compliance with the standard wording.*

#### *Under-identification*

*Almost all deaths in Australia are registered. However, the Indigenous status of the deceased is not always recorded or recorded correctly. The incompleteness of Indigenous identification means the number of deaths registered as Indigenous is an underestimate of deaths occurring in the Aboriginal and Torres Strait Islander population (ABS 1997). As a result, the observed differences between Indigenous and non-Indigenous mortality are underestimates of the true differences.*

*Although the identification of Indigenous deaths is incomplete in all state and territory registration systems, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. Longer term mortality trend data are limited to three jurisdictions (Western Australia, South Australia and the Northern Territory) with over 10 years of adequate identification of Indigenous deaths in their recording systems. The quality of the time series data is also influenced by the late inclusion of a 'not stated' category for Indigenous status in 1998. Before this time, the 'not stated' responses were probably included with the non-Indigenous. The ABS calculated the implied coverage (identification) of Indigenous deaths for the period 2002–2006 using population estimates: New South Wales 45%, Victoria 32%, Queensland 51%, South Australia 62%, Western Australia 72%, the Northern Territory 90%, Tasmania and the Australian Capital Territory were not calculated because of small numbers, Australia 55% (ABS 2007a).*

*Note that different causes may have levels of under-identification that differ from the all-cause coverage estimates. Note also that the quality of the cause of death data depends on every step of the process of recording and registering deaths (including the documentation available at each step of the process) from certification to coding of cause of death.*

*There are also current concerns about data quality for causes of death especially relating to external causes of death of all Australians (not just Indigenous) (ABS 2006).*

#### *Numerator and denominator*

*The perinatal mortality rate also relies on birth registration data. Unfortunately, as with deaths, some Indigenous births are not correctly identified as Indigenous. The estimated identification of births as Indigenous in 2002–06 was 95%. Identification for the states and territories ranged from 83% for the Australian Capital Territory to 107% for the Northern Territory (ABS 2007b). Given that the identification is higher in births than deaths, it is likely that Indigenous perinatal mortality rates are underestimated.*

*(continued)*

**Data quality issues (continued)**

*The numerator and denominator are not based on the same collection or the same method of collection. Births are registered by the parents whereas death registration forms are completed by doctors and funeral directors. Therefore there would be inconsistency of Indigenous identification between the numerator and denominator.*

***Cause of death coding***

*Causes of death are based on the 10th revision of the International Classification of Diseases (ICD-10). Mortality coding using ICD-10 was introduced into Australia on 1 January 1997.*

***International data***

*International data are available for New Zealand, the United States and Canada using the WHO definition of perinatal mortality. However, the WHO definition differs markedly from the Australian definition of the perinatal period (see above) which was developed to be relevant for the Australian context. Therefore, Australian data include babies of at least at 400 grams (at least 20 weeks if birthweight is unavailable) whereas the WHO definition starts at 500 grams (22 weeks if birthweight is unavailable). In addition, the WHO defines perinatal deaths as less than 7 days whereas Australia includes deaths up to 28 days (Laws & Sullivan 2004). It would be possible to analyse Australian data on the WHO definitional basis, but it is not recommended for this performance measure.*

# References


ABS (Australian Bureau of Statistics) 1997. Occasional paper: Mortality of Aboriginal and Torres Strait Islander Australians. ABS cat. no. 3315.0. Canberra: ABS.

ABS 2006. Causes of death 2004. ABS cat. no. 3303.0. Canberra: ABS.

ABS 2007a. Deaths, Australia 2006. ABS cat. no. 3302.0 ABS: Canberra.

ABS 2007b. Births Australia 2006. ABS cat. no. 3301.0. Canberra: ABS.

ABS & AIHW (Australian Institute of Health and Welfare) 2005. The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples 2005. ABS cat. no. 4704.0, AIHW Cat. no. IHW 14. Canberra: ABS & AIHW.

Laws PJ & Sullivan EA 2004. Australia's mothers and babies 2002. Perinatal statistics series no. 15. Cat. no. PER 28. Sydney: AIHW National Perinatal Statistics Unit.

National Health Performance Committee 2004. National report on health sector performance indicators 2003. Cat. no. HWI 78. Canberra: AIHW.