# 6 Early child development

|  |
| --- |
| Strategic areas for action |
|  |
|

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Governance, leadership and culture |  | Early child development |  | Education and training |  | Healthy lives |  | Economic participation |  | Home environment |  | Safe and supportive communities |
|  |  |  |
| 6.1 Antenatal care6.2 Health behaviours during pregnancy6.3 Teenage birth rate6.4 Birthweight | 6.5 Early childhood hospitalisations6.6 Injury and preventable disease 6.7 Ear health6.8 Basic skills for life and learning |
|  |  |  |

 |
|  |
|  |

Providing children with a good start can have a long lasting effect on the rest of their lives, opening up opportunities for the future. However, problems at this early stage can create barriers that prevent children achieving their full potential.

The indicators in the early child development strategic area focus on the drivers of long term advantage or disadvantage:

* antenatal care (section 6.1) — the health of women during pregnancy, childbirth and the period following birth is important for the wellbeing of both women and children
* health behaviours during pregnancy (section 6.2) — the health behaviours of women during pregnancy, including the consumption of tobacco and other drugs affects the wellbeing of both mothers and children
* teenage birth rate (section 6.3) — teenage births are associated with lower incomes and poorer educational attainment and employment prospects for young parents
* birthweight (section 6.4) — low birthweight babies require longer periods of hospitalisation after birth and are more likely to have poor health, or even die in infancy and childhood. Low birthweight is also correlated with poorer health outcomes later in life
* early childhood hospitalisations (section 6.5) — the hospitalisation rate provides a broad indicator of serious health issues experienced by children
* injury and preventable disease (section 6.6) — most childhood diseases and injuries can be successfully prevented or treated without hospitalisation
* ear health (section 6.7) — Aboriginal and Torres Strait Islander children tend to have high rates of recurring ear infections that, if not treated early, can become chronic and lead to hearing impairment, which in turn can affect children’s capacity to learn and socialise
* basic skills for life and learning (section 6.8) — the early social and cognitive development of children provides the foundations upon which later relationships and formal learning depend.

Several COAG targets and headline indicators reflect the importance of early child development:

* young child mortality (section 4.2)
* early childhood education (section 4.3)
* substantiated child abuse and neglect (section 4.11).

Other headline indicators are important influences on early childhood outcomes:

* household and individual income (section 4.10)
* family and community violence (section 4.12).

Outcomes in the early child development area can be affected by outcomes in several other strategic areas, or can influence outcomes in other areas:

* healthy lives (access to primary health, obesity and nutrition) (chapter 8)
* economic participation (income support) (chapter 9)
* home environment (overcrowding, access to functioning water, sewerage and electricity services) (chapter 10)
* safe and supportive communities (alcohol/drug misuse and harm) (chapter 11).

Attachment tables for this chapter are identified in references throughout this chapter by an ‘A’ suffix (for example, table 6A.1.1). These tables can be found on the web page (www.pc.gov.au/oid2016).

## 6.1 Antenatal care**[[1]](#footnote-1)**

|  |
| --- |
| Box 6.1.1 Key messages |
| * Antenatal care provides expectant mothers with information and early screening that can identify and help manage issues that may affect birth outcomes. Fifty-two per cent of Aboriginal and Torres Strait Islander women who gave birth in 2013 attended at least one antenatal visit in the first trimester (table 6A.1.1), an increase from 50.0 per cent in 2011 (table 6A.1.3), and 86.1 per cent attended five or more antenatal visits (table 6A.1.33).
* In 2013, after adjusting for population age structure, Aboriginal and Torres Strait Islander mothers attended their first antenatal visit later in pregnancy than non-Indigenous mothers and attended less frequently (attended five or more visits at 0.9 times the rate for non‑Indigenous mothers) (tables 6A.1.9 and 6A.1.16).
* Trends varied across the jurisdictions for which time series data were available but:
* nationally from 2011 to 2013, the proportion of Aboriginal and Torres Strait Islander mothers attending antenatal care in the first trimester in very remote areas increased from 46.8 per cent to 58.1 per cent. The trend was reversed in major cities with a decrease from 46.6 per cent to 43.1 per cent (table 6A.1.8). These changes should be interpreted with caution due to changes in definitions and methods
* for Queensland, SA and the NT combined, from 2011 to 2013, the gap in mothers attending five or more visits narrowed in the very remote and inner regional areas, increased in major cities and remained constant in other areas (tables 6A.1.26–28).
 |
|  |
|  |

|  |
| --- |
| Box 6.1.2 Measures of antenatal care |
| There are two main measures for this indicator (aligned with the associated NIRA indicator). * *Antenatal visits in the first trimester* is defined as the proportion of women who gave birth who attended at least one antenatal visit in the first trimester.
* *Five or more antenatal visits* is defined as the proportion of women who gave birth who attended five or more antenatal visits.

The most recent available data for both main measures are from the AIHW National Perinatal Data Collection (NPDC) (all jurisdictions; remoteness). Key points to note are:* nationally standardised data on *gestation at first antenatal visit* are only available from July 2010, and nationally standardised data on *number of antenatal visits* are only available from July 2012 (caution should be used making jurisdictional comparisons prior to these dates)
* data by remoteness area are provided from 2011. Data for prior years are not directly comparable and are not included in this report.

A supplementary measure on health and nutrition during pregnancy is also reported. |
|  |
|  |

Although many Aboriginal and Torres Strait Islander women experience healthy pregnancies, some experience complications of pregnancy and childbirth, resulting in poorer birth outcomes than those experienced by non-Indigenous women.

Antenatal care provides expectant mothers with information and early screening that can identify and help manage issues that may affect birth outcomes. Inadequate or late access to quality antenatal care has been associated with poor pregnancy outcomes, such as prematurity, low birthweight and increased delivery intervention (AHMAC 2012a). Low birthweight infants are prone to ill health and at greater risk of dying during the first year of life (section 6.4, Birthweight).

Antenatal care may be especially important for Aboriginal and Torres Strait Islander women, as they are at higher risk of giving birth to low birthweight babies and have greater exposure to other risk factors such as anaemia, poor nutritional status, hypertension, diabetes, genital and urinary tract infections and smoking (AHMAC 2012a). Antenatal care is an indicator in the National Indigenous Reform Agreement (NIRA) (COAG 2012), and improved access to antenatal care was a focus of the National Partnership Agreement on Indigenous Early Childhood Development (Australian Government 2009)[[2]](#footnote-2).

The optimal number of antenatal care visits is the subject of some debate (Gausia et al. 2013; Hunt and Lumley 2002). National evidence-based antenatal care guidelines have been developed by the Department of Health in collaboration with State and Territory governments, and approved by the National Health and Medical Research Council (AHMAC 2012b). These guidelines include a recommended first visit within the first 10 weeks of gestation, with the subsequent schedule of antenatal visits to be based on the individual woman’s needs (for uncomplicated pregnancies — 10 visits for the first pregnancy and 7 visits for subsequent pregnancies). However, the indicator in this report is defined against a lower standard of five or more visits to align with the NIRA.

### Antenatal visits in the first trimester

Nationally in 2013, 51.9 per cent of Aboriginal and Torres Strait Islander women who gave birth attended at least one antenatal visit in the first trimester (table 6A.1.1), an increase from 50.0 per cent in 2011 (the earliest period for which data are available for all jurisdictions) (table 6A.1.3). Historical data prior to 2011 are available for selected jurisdictions and reported in tables 6A.1.4–7.

After adjusting for differences in population age structures, the rate for Aboriginal and Torres Strait Islander women was 0.9 times the rate for non‑Indigenous women (table 6A.1.9). Nationally from 2011 to 2013, the gap narrowed from 14.1 to 8.4 percentage points (tables 6A.1.9 and 6A.1.11).

Comparable data are available for three jurisdictions (NSW, SA and the NT) from 2007 to 2013. For these three jurisdictions, the gap between Aboriginal and Strait Islander women and non-Indigenous women in 2013 is narrower than the gap in 2007 (figure 6.1.1).

|  |
| --- |
| Figure 6.1.1 Mothers who attended at least one antenatal visit in the first trimester, NSW, SA and the NT, 2007 to 2013**a, b** |
| Figure 6.1.1 Mothers who attended at least one antenatal visit in the first trimester, NSW, SA and the NT, 2007 to 2013  More details can be found within the text surrounding this image. |
| a Data are by place of usual residence of the mother. b Data are age standardised. |
| *Source*: AIHW (National Perinatal Data Collection), cited in (SCRGSP 2014, 2015); tables 6A.1.9‑15. |
|  |
|  |

Nationally from 2011 to 2013, the proportion of Aboriginal and Torres Strait Islander mothers attending antenatal care in the first trimester in very remote areas increased from 46.8 per cent to 58.1 per cent. The trend was reversed in major cities: 43.1 per cent in 2013 compared to 46.6 per cent in 2011 (table 6A.1.8). These changes should be interpreted with caution due to changes in definitions and methods. Age standardised data are provided for comparisons with non-Indigenous women (tables 6A.1.23–25).

### Five or more antenatal visits

In 2013, 86.1 per cent of Aboriginal and Torres Strait Islander mothers attended five or more antenatal visits (NSW, Queensland, WA, SA, Tasmania, ACT and the NT combined) (table 6A.1.33). Data for selected jurisdictions for 2012 and 2011 are reported in tables 6A.34 and 35 respectively.

After adjusting for differences in population age structures, the rate for Aboriginal and Torres Strait Islander women was 0.9 times the rate for non‑Indigenous women (table 6A.1.16). Data were not available for all jurisdictions in all years, but there are comparable data available for three jurisdictions (Queensland, SA and the NT) from 2007 to 2013. When taking into account differences in population age structures, the gap between Aboriginal and Torres Strait Islander women and non-Indigenous women halved from 16.6 to 8.3 percentage points) (tables 6A.1.16–22). Across remoteness areas for these three jurisdictions the gap narrowed in the very remote and inner regional areas, increased in major cities and remained constant in other areas (tables 6A.1.26–28).

### Health and nutrition during pregnancy

Antenatal care provides an opportunity to identify maternal health issues. Nutrition and diet are important for the health of the mother and baby during pregnancy. Pregnant women and women considering pregnancy are advised to have a balanced diet and in particular to maintain adequate folate levels to decrease the risk of neural tube defects such as spina bifida.[[3]](#footnote-3) A number of studies have reported poor nutrition for Aboriginal and Torres Strait Islander women of childbearing age and during pregnancy (McDermott et al. 2009; Wen et al. 2010). In 2014-15, for Aboriginal and Torres Strait Islander children aged 0–3 years, 3 in 5 mothers took folate prior to or during pregnancy (table 6A.1.29), an increase from 50.7 per cent in 2008 (table 6A.1.30).

Aboriginal and Torres Strait Islander women are at higher risk of having Type 2 diabetes and gestational diabetes than non-Indigenous mothers, and these conditions pose a heightened risk of pre-term birth, delivery with no labour, caesarean section, hypertension and longer stay in hospital. In 2014-15, for Aboriginal and Torres Strait Islander children aged 0–3 years, 9.7 per cent of mothers had diabetes or sugar problems during pregnancy (table 6A.1.29) similar to 2008 (8.4 per cent) (table 6A.1.30).

### Things that work

Culturally safe service provision, involvement of Aboriginal and Torres Strait Islander elders and the community in developing services, and incorporation of traditional midwifery knowledge and skills have been found to encourage Aboriginal and Torres Strait Islander women to access maternity health services, and to lead to better maternal outcomes (Kildea and Van Wagner 2013; Kildea et al. 2012; Murphy and Best 2012; Reibel and Walker 2010; Wilson 2009). In a 2013 South Australian study, women with Aboriginal babies who attended Aboriginal Family Birthing Program services were almost five times as likely as women attending mainstream public care to say that their antenatal care was ‘very good’ (Glover et al. 2013)[[4]](#footnote-4).

Programs after birth also play an important part in health outcomes for mothers and their children (Bar-Zeev et al. 2012). Sivak, Arney and Lewig (2008) found that a family home visiting program for Aboriginal and Torres Strait Islander babies after birth had positive outcomes for the health and wellbeing of both mothers and babies.

Box 6.1.3 includes case studies of some things that are working to improve antenatal care for Aboriginal and Torres Strait Islander women.

|  |
| --- |
| Box 6.1.3 ‘Things that work’ – Antenatal care |
| The **Winnunga Nimmityjah Aboriginal Health Service** (ACT) is an Aboriginal community controlled primary health care service which provides culturally safe and holistic health services to the Aboriginal and Torres Strait Islander people of the ACT and surrounding areas. An independent evaluation in 2011 found that the **Aboriginal Midwifery Access Program** provided by the service was a benchmark program for the delivery of culturally appropriate midwifery services to parents and new-borns. It encouraged women to access treatment at an early stage in pregnancy, and provided comprehensive antenatal and postnatal services, including: home visits; assistance with appointments for antenatal investigations and specialist care; transport; birth support; postnatal follow-up; and immunisations (Wong et al 2011).The **Aboriginal Maternity Group Practice Program** (WA) commenced in 2011 and aimed to improve timely access to existing antenatal and maternity services in south metropolitan Perth, and thereby increase the number of women giving birth safely in a local hospital. The program employed Aboriginal Health Officers (AHOs), Aboriginal grandmothers and midwives in each district to work with the existing services. The program model was culturally secure, with a focus on early access to antenatal care, employment of Aboriginal staff, and holistic care, including awareness of the social determinants of health. An independent evaluation covering the 18 month period to 31 December 2012 found that babies born to AMGPP participants were significantly less likely to be born pre-term, to require resuscitation at birth or to require a hospital stay of more than five days, compared to those not in the program (Bertilone and McEvoy 2015). |
| *Sources*: Winnunga Nimmityjah Aboriginal Health Service 2013, *2012‑13 Annual Report*, http://www.winnunga.org.au/index.php?page=AR; Wong, R., Herceg, A., Patterson, C., Freebairn, L., Baker, A., Sharp, P., Pinnington, P. and Tongs, J. 2011, *Positive impact of a long-running urban Aboriginal medical service midwifery program*, Australian and New Zealand Journal of Obstetrics and Gynaecology, vol. 51, no. 6, pp. 518–522; Bertilone, C and McEvoy, S. 2015, *Success in Closing the Gap: favourable neonatal outcomes in a metropolitan Aboriginal Maternity Group Practice Program*, Medical Journal of Australia 2015; 203 (6), pp. 262e1-e7. |
|  |
|  |

### Future directions in data

The data for both primary measures are from the National Perinatal Data Collection (NPDC) managed by the AIHW. It includes data items specified in the Perinatal National Minimum Dataset (NMDS) plus additional items collected by the states and territories.

The usefulness of NPDC data has historically been affected by some gaps in reporting, lack of national consistency and low response rates. Under schedule F of the National Indigenous Reform Agreement, the AIHW has improved the quality of NPDC data items related to antenatal care, which are now nationally comparable and available for this report.

Data on the nutrition and health of Aboriginal and Torres Strait Islander mothers and young children are only available every six years (from the ABS NATSISS). More regular data and comparative data for non‑Indigenous mothers and children are required.

### References

AHMAC (Australian Health Ministers’ Advisory Council) 2012a, *Aboriginal and Torres Strait Islander Health Performance Framework 2012 Report*, Canberra.

——2012b, *Clinical Practice Guidelines: Antenatal care - Module 1*, http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-antenatal-care-index/$File/ANC\_Guidelines\_Mod1\_v32.pdf (accessed 19 March 2016).

Australian Government 2009, *Closing the Gap: National Partnership Agreement on Indigenous Early Childhood Development*, 2 July.

COAG (Council of Australian Governments) 2012, *National Indigenous Reform Agreement*, www.federalfinancialrelations.gov.au/content/npa/health\_indigenous/ indigenous-reform/national-agreement\_sept\_12.pdf (accessed 4 May 2016).

Gausia, K., Thompson, S., Nagel, T., Rumbold, A., Connors, C., Matthews, V., Boyle, J., Schierhout, G. and Bailie, R. 2013, ‘Antenatal Emotional Wellbeing Screening in Aboriginal and Torres Strait Islander Primary Health Care Services in Australia’, *Contemporary Nurse*, pp. 4076–4096.

Glover, K., Buckskin, M., Ah Kit, J., Miller, R., Weetra, D., Gartland, D., Yelland, S. and Brown, S. 2013, *Antenatal Care: Experiences of Aboriginal Women and Families in South Australia. Preliminary Findings of the Aboriginal Families Study*, April, Murdoch Childrens Research Institute and Aboriginal Health Council of South Australia, Melbourne, Victoria and Adelaide, South Australia.

Hunt, J.M. and Lumley, J. 2002, ‘Are recommendations about routine antenatal care in Australia consistent and evidence-based?’, *Obstetrical & Gynecological survey*, vol. 57, no. 10, pp. 652–654.

Kildea, S., Stapleton, H., Murphy, R., Low, N.B. and Gibbons, K. 2012, ‘The Murri clinic: a comparative retrospective study of an antenatal clinic developed for Aboriginal and Torres Strait Islander women’, *BMC Pregnancy and Childbirth*, vol. 12, no. 1, p. 159.

—— and Van Wagner, V. 2013, *‘Birthing on Country’ Maternity Service Delivery Models: a Rapid Review*, The Sax Institute.

McDermott, R., Campbell, S., Li, M. and McCulloch, B. 2009, ‘The health and nutrition of young indigenous women in north Queensland-intergenerational implications of poor food quality, obesity, diabetes, tobacco smoking and alcohol use’, *Public Health Nutrition*, vol. 12, no. 11, p. 2143.

Murphy, E. and Best, E. 2012, ‘The Aboriginal Maternal and Infant Health Service: a decade of achievement in the health of women and babies in NSW’, *New South Wales Public Health Bulletin*, vol. 23, no. 4, pp. 68–72.

Reibel, T. and Walker, R. 2010, ‘Antenatal services for Aboriginal women: the relevance of cultural competence’, *Quality in Primary Care*, vol. 18, no. 1, pp. 65–74.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2014, *National Agreement performance information 2013-14: National Indigenous Reform Agreement*, Productivity Commission, Canberra, http://www.pc.gov.au/research/ supporting/national-agreements/indigenous-reform/indigenous-reform-agreement-2013-14.pdf (accessed 10 March 2016).

——2015, *National Agreement performance information 2014-15: National Indigenous Reform Agreement*, Productivity Commission, Canberra.

Simmonds, D., West, L., Porter, J., Tangey, A., Davies, M., O’Rourke, P. and Holland, C. 2010, ‘A “Two Ways” Approach to Improving Antenatal Education for Ngaanyatjarra Women’, *Aboriginal and Islander Health Worker Journal*, vol. 34, no. 2, p. 10.

Sivak, L., Arney, F. and Lewig, K. 2008, *A Pilot Exploration of a Family Home Visiting Program for Families of Aboriginal and Torres Strait Islander Children: Report and Recommendations: Perspectives of Parents of Aboriginal Children and Organisational Considerations*, Australian Centre for Child Protection, University of South Australia.

Wen, L.M., Flood, V.M., Simpson, J.M., Rissel, C. and Baur, L.A. 2010, ‘Dietary behaviours during pregnancy: findings from first-time mothers in southwest Sydney, Australia’, *International Journal Behavioural Nutrition Physical Activity*, vol. 7, no. 13, pp. 1–7.

Wilson, G. 2009, *What do Aboriginal Women Think is Good Antenatal Care*, Lowitja Institute, Melbourne.

Bar-Zeev, S.J., Barclay, L., Farrington, C. and Kildea, S. 2012, ‘From hospital to home: The quality and safety of a postnatal discharge system used for remote dwelling Aboriginal mothers and infants in the top end of Australia’, *Midwifery*, vol. 28, no. 3, pp. 366–373.

## 6.2 Health behaviours during pregnancy**[[5]](#footnote-5)**

|  |
| --- |
| Box 6.2.1 Key messages |
| * Tobacco smoking, alcohol and illicit substance use during pregnancy can lead to miscarriage, stillbirth, fetal growth restriction, congenital anomalies, premature birth and low birthweight.
* Nationally (excluding Victoria), the proportion of Aboriginal and Torres Strait Islander mothers who smoked during pregnancy declined by 6.5 percentage points from 2005 to 2013 (tables 6A.2.1–6A.2.9).
* Nationally in 2013, just under half of Aboriginal and Torres Strait Islander mothers (48.0 per cent) smoked during pregnancy (table 6A.2.1), with the proportion lower in major cities and inner regional areas (47.8 per cent and 43.3 per cent respectively) compared with more remote areas (49.0–55.1 per cent) (table 6A.2.10).
* After adjusting for differences in population age structures, the rate of smoking during pregnancy for Aboriginal and Torres Strait Islander mothers in 2013 was almost four times the rate for non-Indigenous mothers (table 6A.2.11). This ratio was highest in major cities and very remote areas (3.7 and 3.5 times as high, respectively) and lower in other areas (2.7–2.9 times as high) (table 6A.2.20).
* Self-reported consumption of alcohol during pregnancy by mothers of Aboriginal and Torres Strait Islander children has halved from 2008 to 2014-15 (19.6 per cent to 9.8 per cent) (table 6A.2.23).
 |
|  |
|  |

|  |
| --- |
| Box 6.2.2 Measuring of health behaviours during pregnancy |
| There is one main measure for this indicator (aligned with the associated NIRA indicator). *Tobacco smoking during pregnancy* is defined as the number of women who smoked during pregnancy as a proportion of the total number of women who have given birth.The most recent available data are from the AIHW National Perinatal Data Collection (NPDC) (all jurisdictions; remoteness). Key points to note are:* nationally standardised data items on tobacco smoking are available from July 2010. Caution should be used in making jurisdictional comparisons prior to this date
* nationally comparable time series data, excluding Victoria, are available from 2005
* remoteness data are presented from 2011 onwards (not comparable with previous years).

Data are also provided for three supplementary measures: The proportion of mothers, with Aboriginal and Torres Strait Islander children aged 0–3 years, who: used tobacco during pregnancy; consumed alcohol during pregnancy; used illicit drugs during pregnancy. (continued next page) |
|  |
|  |

|  |
| --- |
| Box 6.2.2 (continued) |
| The most recent available data for these measures are from the ABS National Aboriginal and Torres Strait Islander Social Survey (NATSISS) 2014-15 (data available every six years) (all jurisdictions; remoteness). Data on tobacco use during pregnancy from the NPDC and the NATSISS are not directly comparable. |
|  |
|  |

Smoking in pregnancy can lead to miscarriage, stillbirth or premature birth and low birthweight (Gilligan et al. 2007; Samper et al. 2012; Walters 2009), with similar perinatal outcomes reported for cannabis use during pregnancy (Brown et al. 2016). When a pregnant woman smokes, fetal levels of nicotine have been found to be 15 per cent higher than maternal levels, and fetal nicotine exposure can damage the brain, leading to health, behavioural and cognitive problems that emerge later in life (Behl et al. 2013; Hutchinson et al. 2010; Pickett et al. 2008; Stone KC et al. 2010; Stroud et al. 2009). A retrospective cohort study of births in SA found that smoking cessation in the first trimester reduced the risks of adverse perinatal outcomes to levels comparable with non-smokers (Hodyl et al. 2014).

Negative health effects of maternal tobacco smoking may continue after birth via nicotine in breast milk and via passive (or second-hand) smoking (Johnston et al. 2011; Julvez et al. 2007). Passive smoking has been linked with higher rates of respiratory illness, sudden infant death syndrome (SIDS), vascular dysfunction, asthma and effects on hearing in children (Durante 2012; Ferrence 2010; Jones et al. 2011).

A study comparing tobacco, alcohol and cannabis use amongst pregnant Aboriginal and Torres Strait Islander women in NSW and the NT found that women using any one substance were more likely to also use others (Passey et al. 2014).

### Tobacco consumption during pregnancy

Nationally in 2013, the proportion of Aboriginal and Torres Strait Islander females who smoked during pregnancy was 48.0 per cent (table 6A.2.1). The proportion was lower in major cities (47.8 per cent) and inner regional areas (43.3 per cent) compared with other areas (49.0–55.1 per cent), though the pattern varied across jurisdictions (table 6A.2.10).

Nationally (excluding Victoria), the proportion of Aboriginal and Torres Strait Islander females smoking during pregnancy decreased from 54.8 per cent in 2005 to 48.3 per cent in 2013 — a decrease of 6.5 percentage points (figure 6.2.1).

|  |
| --- |
| Figure 6.2.1 Rates of tobacco smoking during pregnancy for Aboriginal and Torres Strait Islander females, 2005 to 2013**a, b, c** |
| Figure 6.2.1 Rates of tobacco smoking during pregnancy for Aboriginal and Torres Strait Islander females, 2005 to 2013  More details can be found within the text surrounding this image. |
| a Excludes births where the mother's Indigenous status was not stated. b Data are not available for Victoria prior to 2009. Total excludes women who gave birth in Victoria. Due to small numbers, the total also excludes women who were Victorian residents who gave birth elsewhere in Australia. c Excludes mothers for whom smoking status was not stated. |
| *Source*: AIHW (unpublished) National Perinatal Data Collection; tables 6A.2.1—6A.2.9. |
|  |
|  |

After adjusting for differences in population age structures, the rate of smoking during pregnancy for Aboriginal and Torres Strait Islander women was 3.6 times the rate for
non-Indigenous women (table 6A.2.11). This ratio was highest in major cities and very remote areas (3.7 and 3.5 times as high, respectively) and lower in other areas
(2.7–2.9 times as high) (table 6A.2.20).

Survey data on smoking by mothers of Aboriginal and Torres Strait Islander children aged 0–3 years in 2014-15 show slightly lower proportions compared to the 2013 NPDC data, although the survey data should be used with caution due to differences in collection methodology and high relative standard errors for some survey results (tables 6A.2.23-24).

### Alcohol consumption during pregnancy

Heavy alcohol consumption during pregnancy may cause physical and neurocognitive disorders termed ‘fetal alcohol spectrum disorders’ (FASD) (Fitzpatrick et al. 2012; O’Leary et al. 2007). FASD are characterised by various combinations of growth restriction of the fetus, facial anomalies and impaired brain structure and function, including memory, cognition, gross and fine motor control, intellectual disability, language and behaviour problems (Fitzpatrick et al. 2012; O’Leary et al. 2007).

Measured prevalence of FASD varies depending on the method of identification, and the true prevalence of FASD in Australia unknown (Burns et al. 2013; Elliott 2013; Fitzpatrick et al. 2012; House of Representatives 2012). The House of Representatives’ Inquiry into FASD estimates the prevalence in Australia to be between 0.06 and 0.68 per 1000 live births, and for Aboriginal and Torres Strait Islander Australians between 2.76 and 4.7 per 1000 births (House of Representatives 2012). A recent study in WA provided the first population-based estimates of birth prevalence of FASD, which identified the prevalence rate of FAS and partial FAS in the Fitzroy Valley to be 120 per 1000 children (born between 2002 and 2003) (Fitzpatrick et al. 2015).

In 2013, the National Drug Strategy Household Survey found that, of all women surveyed who had been pregnant in the previous twelve months, 56 per cent consumed alcohol while pregnant before knowledge of their pregnancy, and 26 per cent consumed alcohol while pregnant after knowledge of their pregnancy (AIHW 2014).

In 2014-15, around 9.8 per cent of mothers of Aboriginal and Torres Strait Islander children aged 0–3 years reported that they consumed alcohol during pregnancy, significantly lower than in 2008 (19.6 per cent) (table 6A.2.23).

### Illicit drug use during pregnancy

Illicit drug use during pregnancy has detrimental effects on the fetus and the mother’s health. Effects on the mother and baby differ according to the drugs used, and can range from fetal drug dependency (neonatal abstinence syndrome), intra‑uterine growth retardation, prematurity, mortality, problems with normal brain development, low birthweight, and problems with behaviour such as sleeping patterns, mood, attention and cognitive deficits later in life (Brown et al. 2016; Derauf et al. 2009; Kennare, Heard and Chan 2005; Ludlow, Evans and Hulse 2004).

In 2013, 2.2 per cent of all women aged 14–49 years used illicit drugs while pregnant and/or breastfeeding (AIHW 2014). In 2014-15, 4.1 per cent of mothers of Aboriginal and Torres Strait Islander children aged 0–3 years reported using illicit drugs or substances during pregnancy, similar to 2008 (5.0 per cent) (table 6A.2.23). There were no significant differences between jurisdictions or remoteness areas (tables 6A.2.23-24).

### Things that work

There are currently no evaluated programs on things that work to reduce smoking or alcohol consumption during pregnancy. Research on programs that support Aboriginal and Torres Strait Islander pregnant women and parents of young children to stop smoking is increasing, but researchers note the need for more evidence of strategies that work (Eades et al. 2012; Gould et al. 2013; Hefler and Thomas 2013; Marley et al. 2012; Wood et al. 2008).

Passey et al. (2012) found that knowledge of antenatal smoking risks was an insufficient strategy to stop smoking for Aboriginal and Torres Strait Islander women, whose social environment and daily stressors may be exacerbated by pregnancy. Glover et al. (2013) found that over half the women participating in a study of the antenatal experiences of Aboriginal women and families reported having to deal with three or more social health issues (e.g., housing problems, drug and alcohol issue, family violence, death of a family member) when they were pregnant.

### Future directions in data

Limited information is available about the prevalence of Fetal Alcohol Spectrum Disorders (FASD) in Australia, due to factors including a low level of awareness by clinicians, complexity of diagnosis and until May 2016 the absence of nationally agreed and consistent diagnostic criteria and definitions. The Australian FASD Diagnostic Tool was released in May 2016 and may impact data reporting in the future. In 2016, the University of Sydney was funded to develop a national FASD Register to complement the FASD Diagnostic Tool and will improve the ability to monitor prevalence trends over time. It is anticipated the Register will be finalised in 2017.

The AIHW is continuing to pursue the collection of data on alcohol use during pregnancy. Its National Maternity Data Development project (NMDDP) is developing nationally consistent perinatal data. Through the project, a list of high priority data items for national standardisation and addition to the Perinatal National Minimum Data Set (NMDS) has been developed, including data on Alcohol consumption in pregnancy. In June 2012, the AIHW sought agreement from states and territories to pilot the data item alcohol use in pregnancy for potential implementation. As at the time of preparing this report full agreement had not been received from the states and territories to commence the pilot.

### References

AIHW (Australian Institute of Health and Welfare) 2014, *National Drug Strategy Household Survey Detailed Report 2013*, Cat. PHE 145, Drug statistics series no. 28. Cat. no. PHE 183, AIHW, Canberra.

Behl, M., Rao, D., Aagaard, K., Davidson, T.L., Levin, E.D., Slotkin, T.A., Srinivasan, S., Wallinga, D., White, M.F., Walker, V.R., Thayer, K.A. and Holloway, A.C. 2013, ‘Evaluation of the Association between Maternal Smoking, Childhood Obesity, and Metabolic Disorders: A National Toxicology Program Workshop Review’, *Environmental Health Perspectives*, vol. 121, no. 2, pp. 170–180.

Brown, S.J., Menash, F.K., Kit, J.A., Stuart-Butler, D., Glover, K., Leane, C., Weetra, D., Gartland, D., Newbury, J. and Yelland, J. 2016, ‘Use of cannabis during pregnancy and birth outcomes in an Aboriginal birth cohort: a cross-sectional, population-based study’, *BMJ Open*, vol. 6, no. 2, p. p e01286.

Burns, L., Breen, C., Bower, C., O’ Leary, C. and Elliott, E.J. 2013, ‘Counting Fetal Alcohol Spectrum Disorder in Australia: The evidence and the challenges’, *Drug and Alcohol Review*, vol. 32, no. 5, pp. 461–467.

Derauf, C., Kekatpure, M., Neyzi, N., Lester, B. and Kosofsky, B. 2009, ‘Neuroimaging of children following prenatal drug exposure’, *Seminars in Cell & Developmental Biology*, vol. 20, no. 4, pp. 441–454.

Durante, A.S. 2012, ‘Effect of passive smoking on measures of hearing of school-age children’, http://www.bv.fapesp.br/en/auxilios/47033/effect-of-passive-smoking-on-measures-of-hearing-of-school-age-children/ (accessed 11 August 2016).

Eades, S.J., Sanson-Fisher, R.W., Wenitong, M., Panaretto, K., D’Este, C., Gilligan, C. and Stewart, J. 2012, ‘An intensive smoking intervention for pregnant Aboriginal and Torres Strait Islander women: a randomised controlled trial’, *Medical Journal of Australia*, vol. 197, no. 1, https://www.mja.com.au/journal/2012/197/1/intensive-smoking-intervention-pregnant-aboriginal-and-torres-strait-islander (accessed 11 August 2016).

Elliott, E.J. 2013, ‘The challenges in addressing fetal alcohol spectrum disorders’, in Carpenter, B., Blackburn, C. and Egerton, J. (eds), *Fetal Alcohol Spectrum Disorders: Interdisciplinary Perspectives*, Routledge.

Ferrence, R. 2010, ‘Passive smoking and children’, *BMJ*, vol. 340, mar24 1, pp. c1680–c1680.

Fitzpatrick, J.P., Elliott, E.J., Latimer, J., Carter, M., Oscar, J., Ferreira, M., Olson, H.C., Lucas, B., Doney, R., Salter, C., Peadon, E., Hawkes, G. and Hand, M. 2012, ‘The Lililwan Project: Study Protocol for a Population-based Active Case Ascertainment Study of the Prevalence of Fetal Alcohol Spectrum Disorders in Remote Australian Aboriginal Communities’, *BMJ Open*, vol. 2, no. 3, p. e000968.

Fitzpatrick, J.P., Latimer, J., Carter, M., Oscar, J., Ferreira, M.L., Carmichael Olson, H., Lucas, B.R., Doney, R., Salter, C., Try, J., Hawkes, G., Fitzpatrick, E., Hand, M., Watkins, R.E., Martiniuk, A.L.C., Bower, C., Boulton, J. and Elliott, E.J. 2015, ‘Prevalence of fetal alcohol syndrome in a population-based sample of children living in remote Australia: the Lililwan Project’, *Journal of Paediatrics and Child Health*, vol. 51, no. 4, pp. 450–457.

Gilligan, C., Sanson-Fisher, R., Eades, S. and D’Este, C. 2007, ‘Antenatal smoking in vulnerable population groups: An area of need’, *Journal of Obstetrics & Gynaecology*, vol. 27, no. 7, pp. 664–671.

Glover, K., Buckskin, M., Ah Kit, J., Miller, R., Weetra, D., Gartland, D., Yelland, S. and Brown, S. 2013, *Antenatal Care: Experiences of Aboriginal Women and Families in South Australia. Preliminary Findings of the Aboriginal Families Study*, April, Murdoch Childrens Research Institute and Aboriginal Health Council of South Australia, Melbourne, Victoria and Adelaide, South Australia.

Gould, G.S., Munn, J., Avuri, S., Hoff, S., Cadet-James, Y., McEwen, A. and Clough, A.R. 2013, ‘“Nobody smokes in the house if there”s a new baby in it’: Aboriginal perspectives on tobacco smoking in pregnancy and in the household in regional NSW Australia’, *Women and Birth*, vol. 26, no. 4, pp. 246–253.

Hefler, M. and Thomas, D. 2013, *The use of incentives to stop smoking in pregnancy among Aboriginal and Torres Strait Islander women*, Discussion Paper, August, Lowitja Institute.

Hodyl, N.A., Grzeskowiak, L.E., Stark, M.J., Scheil, W. and Clifton, V.L. 2014, ‘The impact of Aboriginal status, cigarette smoking and smoking cessation on perinatal outcomes in South Australia’, *Medical Journal of Australia*, vol. 201, no. 5,
pp. 274–278.

House of Representatives 2012, *FASD: The Hidden Harm - Inquiry into the prevention, diagnosis and management of Fetal Alcohol Spectrum Disorders*, November, The Parliament of fhe Commonwealth of Australia, Canberra, http://www.aph.gov.au/ parliamentary\_business/committees/house\_of\_representatives\_committees?url=spla/fasd/report.htm (accessed 11 August 2016).

Hutchinson, J., Pickett, K.E., Green, J. and Wakschlag, L.S. 2010, ‘Smoking in pregnancy and disruptive behaviour in 3-year-old boys and girls: an analysis of the UK Millennium Cohort Study’, *Journal of Epidemiology and Community Health*, vol. 64, no. 1, pp. 82–88.

Jacoby, P.A., Coates, H.L., Arumugaswamy, A., Elsbury, D., Stokes, A., Monck, R., Finucane, J.M., Weeks, S.A. and Lehmann, D. 2008, ‘The effect of passive smoking on the risk of otitis media in Aboriginal and non-Aboriginal children in the Kalgoorlie–Boulder region of Western Australia’, *Medical Journal of Australia*, vol. 188, no. 10, https://www.mja.com.au/journal/2008/188/10/effect-passive-smoking-risk-otitis-media-aboriginal-and-non-aboriginal-children (accessed 11 August 2016).

Johnston, V., Thomas, D.P., McDonnell, J. and Andrews, R.M. 2011, ‘Maternal smoking and smoking in the household during pregnancy and postpartum: findings from an Indigenous cohort in the Northern Territory’, *Medical Journal of Australia*, vol. 194, no. 10, https://www.mja.com.au/journal/2011/194/10/maternal-smoking-and-smoking-household-during-pregnancy-and-postpartum-findings (accessed 11 August 2016).

Jones, L.L., Hashim, A., McKeever, T., Cook, D.G., Britton, J. and Leonardi-Bee, J. 2011, ‘Parental and household smoking and the increased risk of bronchitis, bronchiolitis and other lower respiratory infections in infancy: systematic review and meta-analysis’, *Respiratory Research*, vol. 12, no. 5, pp. 1–11.

Julvez, J., Ribas-Fitó, N., Torrent, M., Forns, M., Garcia-Esteban, R. and Sunyer, J. 2007, ‘Maternal smoking habits and cognitive development of children at age 4 years in a population-based birth cohort’, *International Journal of Epidemiology*, vol. 36, no. 4, pp. 825–832.

Kennare, R., Heard, A. and Chan, A. 2005, ‘Substance use during pregnancy: risk factors and obstetric and perinatal outcomes in South Australia’, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, vol. 45, no. 3, pp. 220–225.

Ludlow, J.P., Evans, S.F. and Hulse, G. 2004, ‘Obstetric and perinatal outcomes in pregnancies associated with illicit substance abuse’, *Australian and New Zealand Journal of Obstetrics and Gynaecology*, vol. 44, no. 4, pp. 302–306.

Marley, J.V., Atkinson, D., Nelson, C., Kitaura, T., Gray, D., Metcalf, S., Murray, R. and Maguire, G.P. 2012, ‘The protocol for the Be Our Ally Beat Smoking (BOABS) study, a randomised controlled trial of an intensive smoking cessation intervention in a remote Aboriginal Australian health care setting’, *BMC Public Health*, vol. 12, no. 1, p. 232.

O’Leary, C.M., Heuzenroeder, L., Elliott, E.J. and Bower, C. 2007, ‘A review of policies on alcohol use during pregnancy in Australia and other English-speaking countries, 2006’, *Medical Journal of Australia*, vol. 186, no. 9, https://www.mja.com.au/ journal/2007/186/9/review-policies-alcohol-use-during-pregnancy-australia-and-other-english-speaking (accessed 2 June 2016).

Passey, M.E., D’este, C.A., Stirling, J.M. and Sanson-Fisher, R.W. 2012, ‘Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions’, *Drug and Alcohol Review*, vol. 31, no. 5, pp. 608–616.

——, Sanson-Fisher, R.W., D’este, C.A. and Stirling, J.M. 2014, ‘Tobacco, alcohol and cannabis use during pregnancy: Clustering of risks’, *Drug and Alcohol Dependence*, vol. 134, pp. 44–50.

Pickett, K.E., Wood, C., Adamson, J., DeSouza, L. and Wakschlag, L.S. 2008, ‘Meaningful differences in maternal smoking behaviour during pregnancy: implications for infant behavioural vulnerability’, *Journal of Epidemiology and Community Health*, vol. 62, no. 4, pp. 318–324.

Roza, S.J., Verhulst, F.C., Jaddoe, V.W., Steegers, E.A., Mackenbach, J.P., Hofman, A. and Tiemeier, H. 2009, ‘Maternal smoking during pregnancy and child behaviour problems: the Generation R Study’, *International Journal of Epidemiology*, vol. 38, no. 3, pp. 680–689.

Samper, M.P., Jiménez-Muro, A., Nerín, I., Marqueta, A., Ventura, P. and Rodríguez, G. 2012, ‘Maternal active smoking and newborn body composition’, *Early Human Development*, vol. 88, no. 3, pp. 141–145.

Stone KC, LaGasse LL, Lester BM and et al 2010, ‘Sleep problems in children with prenatal substance exposure: The maternal lifestyle study’, *Archives of Pediatrics & Adolescent Medicine*, vol. 164, no. 5, pp. 452–456.

Stroud, L.R., Paster, R.L., Goodwin, M.S., Shenassa, E., Buka, S., Niaura, R., Rosenblith, J.F. and Lipsitt, L.P. 2009, ‘Maternal Smoking During Pregnancy and Neonatal Behavior: A Large-Scale Community Study’, *Pediatrics*, vol. 123, no. 5, pp. e842–e848.

Walters, B.N.J. 2009, ‘Effect of smoking among Indigenous and non-Indigenous mothers on preterm birth and full-term low birthweight’, *Medical Journal of Australia*, vol. 190, no. 7, https://www.mja.com.au/journal/2009/190/7/effect-smoking-among-indigenous-and-non-indigenous-mothers-preterm-birth-and-full (accessed 11 August 2016).

Wood, L., France, K., Hunt, K., Eades, S. and Slack-Smith, L. 2008, ‘Indigenous women and smoking during pregnancy: Knowledge, cultural contexts and barriers to cessation’, *Social Science & Medicine*, vol. 66, no. 11, pp. 2378–2389.

## 6.3 Teenage birth rate**[[6]](#footnote-6)**

|  |
| --- |
| Box 6.3.1 Key messages |
| * Giving birth as a teenager can pose additional risks for both the mother and the baby.
* The Aboriginal and Torres Strait Islander teenage birth rate is at its lowest level since reporting began in 2004, with a rate of 57.2 births per 1000 women aged 15–19 years in 2014. This was also the same for the non‑Indigenous teenage birth rate, with a rate of 10.1 births per 1000 women aged 15–19 years in 2014 (table 6A.3.1).
* Over time, there has been a change in the age profile of Aboriginal and Torres Strait Islander mothers, with a decrease in the proportion of mothers aged under 18 years from 9.5 per cent in 1998 to 5.8 per cent in 2014 (table 6A.3.3).
* In 2014, 30.6 per cent of fathers of children of Aboriginal and Torres Strait Islander teenage mothers were aged less than 20 years, similar to the proportion of fathers of children of non‑Indigenous teenage mothers (27.7 per cent) (table 6A.3.7).
 |
|  |
|  |

|  |
| --- |
| Box 6.3.2 Measures of teenage birth rate |
| The main measure for this indicator is *Teenage birth rate*, defined as the number of live births per 1000 female population aged 15–19 years.Data are also provided for two supplementary measures:* Births to teenage mothers, by age of mother
* Births to teenage mothers, by age of father.

The most recent available data for all measures are from the ABS Birth Registrations Collection (all jurisdictions; age; remoteness). Births are reported according to the date of registration (which may occur in a different year to the birth itself).Another potential source of data on teenage births is the AIHW’s National Perinatal Data Collection (NPDC), which records births reported by State and Territory health authorities to the National Perinatal Data Unit (a collaborating unit of the AIHW). However, data from the ABS Birth Registrations Collection are not directly comparable to data from the NPDC due to differences in methods, timing and reporting. Also, the NPDC has a shorter time series than the ABS birth data, with nationally comparable NPDC data on Indigenous status of the mother only available from 2005, and data on Indigenous status of the baby was only available for selected jurisdictions from 2012. |
|  |
|  |

Giving birth as a teenager can pose a greater risk of adverse pregnancy outcomes (Shrim et al. 2011). A Western Australian study of pregnancies between 2004 and 2006 found that, compared to adults, teenagers had an increased risk of stillbirth (Lewis et al. 2009).

Many studies have measured the association between teenage pregnancy and the likelihood that the mother or child will experience socioeconomic disadvantage both at the time of birth and later in the mother’s or child’s life. Jeon, Kalb and Vu (2011) examined welfare participation among Australian teenage mothers and found a strong association between welfare participation and being a teenage mother. In Australia, teenage mothers are overrepresented among recipients of the main income support payment for single mothers (Morehead and Soriano 2005), and are overrepresented among disability support payment recipients (Jeon, Kalb and Vu 2011). Teenage mothers are less likely than older mothers to have completed year 12, be employed or to have a post-school qualification (Kalb, Le and Leung 2012).

For some young women, motherhood can have transformative potential (Brand 2013; Keys 2007; Smith, Skinner and Fenwick 2012). Larkins et al (2011) found that teenage women in their Townsville study of 186 young Aboriginal and Torres Strait Islander women took motherhood very seriously and spoke about how becoming a mother gave meaning to their lives. Those who had supportive families that provided emotional and practical support found the transition to motherhood easier than those who did not (Larkins et al. 2011). Unfortunately, Larkins et al (2011) found the young mothers in their study were highly mobile and generally had poor relationships with their mothers, distrust of men and a family history of early parenting. Some of these women also had experienced sexual or physical abuse or domestic violence in their families.

The Aboriginal and Torres Strait Islander population has a younger age structure than the non-Indigenous population. The median age of the Aboriginal and Torres Strait Islander population at 30 June 2011 was 21.8 years, compared to 37.6 years for the non-Indigenous population (ABS 2013b). This difference in age structure contributes to the relatively high fertility of Aboriginal and Torres Strait Islander women. In 2014, the median age of Aboriginal and Torres Strait Islander mothers was 25.1 years and the fertility rate was 2.71 babies per woman, compared to a median age of 30.9 years for all mothers and a fertility rate of 1.80 babies per woman (ABS 2015).

### Teenage birth rate

Aboriginal and Torres Strait Islander teenagers have a much higher birth rate and poorer outcomes compared to their non-Indigenous counterparts. Similar results have been found for other indigenous peoples internationally. Luong (2008) noted that, for Canadian Aboriginals, teenage pregnancy is much more common than for other Canadians. Teenage pregnancy is also much more common for Māori than other New Zealanders (Lawton et al. 2013).

The Aboriginal and Torres Strait Islander teenage birth rate is at its lowest level since reporting began in 2004. From a rate of 64.6 births per 1000 women aged 15–19 years, it increased to 77.0 births per 1000 women aged 15–19 years in 2009, before declining to 57.2 births per 1000 women aged 15–19 years in 2014. The non-Indigenous teenage birth rate recorded a similar pattern, with its lowest recorded rate in 2014 with 10.1 births per 1000 women aged 15–19 years (table 6A.3.1).

|  |
| --- |
| Figure 6.3.1 Teenage birth rate for Aboriginal and Torres Strait Islander females, by age, 2004 to 2014 |
| Figure 6.3.1 Teenage birth rate for Aboriginal and Torres Strait Islander females, by age, 2004 to 2014  More details can be found within the text surrounding this image. |
| *Sources*: ABS (unpublished) Births, Australia, 2014; ABS 2014, *Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026*, Cat. no. 3238.0; Table 6A.3.1. |
|  |
|  |

For Aboriginal and Torres Strait Islander females, the year at which the decrease in rates occurred differed by age. For those aged 17 years or younger, the decrease occurred from 2008, and for those aged 18 and 19 years, the decrease occurred from 2009 (figure 6.3.1).

These data are also available by State and Territory (table 6A.3.1).

### Teenage birth by age of mother

Younger teenage mothers have higher risks than older teenage mothers, because their bodies have not had time to fully develop (Roth et al. 1998).

The age profile of Aboriginal and Torres Strait Islander teenage mothers has changed over time. From 1998 to 2014, the proportion of babies born to Aboriginal and Torres Strait Islander mothers aged 17 years or younger declined from 9.5 per cent in 1998 to 5.8 per cent in 2014, while the proportions of babies born to Aboriginal and Torres Strait Islander mothers aged 18 and 19 years remained relatively stable around 5 and 6 per cent respectively (table 6A.3.3). The proportions of babies born to non‑Indigenous teenage mothers for most age groups decreased from 1998 to 2014 (table 6A.3.4). These data are also reported by Indigenous status of the baby (table 6A.3.2) and by State and Territory (tables 6A.3.2–4). The number of births to teenage mothers, by age of mother between 1998 and 2014 is provided in table 6A.3.6.

The proportion of babies born to Aboriginal and Torres Strait Islander teenage mothers increases with remoteness (from 14.3 per cent in major cities, to 19.5 per cent in remote areas and 21.9 per cent in very remote areas in 2014). The proportion of babies born to non‑Indigenous teenage mothers is highest in regional areas (7.8 per cent), followed by remote areas (4.5 per cent) and major cities (1.7 per cent). This pattern is consistent over time (table 6A.3.5).

### Teenage birth by age of father

International research indicates that children of young and teenage fathers also have an increased risk of adverse birth outcomes such as preterm birth, low birthweight, small for gestational age births, low Apgar Score[[7]](#footnote-7) and infant mortality (Chen et al. 2008; Doamekpor, Amutah and Ramos 2013), congenital malformations (Archer et al. 2007) and schizophrenia (Wohl and Gorwood 2007).

Information about the age of fathers of babies born to teenage females can assist in developing age appropriate programs to reduce teenage birth rates. Lohan et al. (2010) suggest that greater understanding of teenage fathers’ perspectives could re‑frame the idea that adolescent pregnancy is solely a women’s issue. Larkins et al. (2011) found that young Aboriginal and Torres Strait Islander men who had not yet become parents had idealised perceptions about teenage pregnancy and parenthood.

Nationally in 2014, 30.6 per cent of fathers of children of Aboriginal and Torres Strait Islander teenage mothers were aged less than 20 years, similar to the proportion of fathers of children of non-Indigenous teenage mothers (27.7 per cent) (table 6A.3.7). However, the age of the father is unknown in a large proportion of records (29.7 per cent where the mother is Aboriginal and Torres Strait Islander and 14.4 per cent where the mother is non‑Indigenous), which makes interpretation of these data difficult (table 6A.3.7). These data are also reported by State and Territory (table 6A.3.7) and remoteness (table 6A.3.8).

### Things that work

Programs have been developed to assist teenage and young mothers to care for their children. Box 6.3.3 provides an example of programs designed to assist young Aboriginal and Torres Strait Islander mothers.

|  |
| --- |
| Box 6.3.3 Things that work — Teenage birth rate |
| The **Ngala Nanga Mai pARenT Group** Program is a small scale program operating in La Perouse, Sydney. The aims of the program are to: improve the health of young Aboriginal parents and their children; facilitate parents’ return to educational opportunities; and improve social connectedness (ARCHI 2014). The program provides: twice-weekly art sessions for young parents; regular health talks; cultural events; exhibiting artwork; childcare and transport; and, TAFE enrolments and tutoring services. The program is supported by an Aboriginal Health Education Officer, early childhood nurse, social worker and paediatric doctors.A 2011-2012 evaluation found that, between 2009 and 2012, 92 parents (of 133 children) attended the group at least once, with 31 parents identified as regular attendees. Participation in the group led to improved access to paediatric health care services with a resulting increase in early detection of treatable childhood conditions, support for parents in accessing educational and employment opportunities, and a detectable increase in empowerment and social connectedness. There was evidence of an improvement in maternal and child wellbeing, as well as parenting confidence. (Jersky et al 2015). However, it should be noted that participation in the evaluation was voluntary, and there was no control group.The Closing the Gap Clearinghouse has found that effective parenting support programs for Aboriginal and Torres Strait Islander families generally include the following:* use of cultural consultants in conjunction with professional parent education facilitators and home visitors
* long-term rather than short-term programs
* a focus on the needs of both parents/carers and the child
* a supportive approach that focuses on family strengths
* use of structured early intervention program content while also responding flexibly to families (AIHW 2012).
 |
| *Sources*: ARCHI (Australian Resource Centre for Healthcare Innovations) 2014; Jersky, M., Titmuss, A., Haswell, M., Freeman, N., Osborne, P., Callaghan, L., Winters, J., Fitzpatrick, S. and Zwi, K. 2015, Improving health service access and wellbeing of young Aboriginal Parents in an urban setting: mixed methods evaluation of an arts-based program, Australian and New Zealand Journal of Public Health AIHW 2012, *Parenting in the early years: effectiveness of parenting support programs for Indigenous families*, Resource sheet no. 16 produced for the Closing the Gap Clearinghouse. |
|  |
|  |

### Future directions in data

There are limited data on teenage mothers’ and fathers’ access to sexual or reproductive health services, apart from contraception use (for women aged 18–49 years from ABS Aboriginal and Torres Strait Islander health surveys) and the number of antenatal check‑ups (from the AIHW National Perinatal Data Collection and included in section 6.1 of this report).

*Births, Australia* (ABS 2013a) is published annually by the ABS. While this collection includes the age of the father, for a high proportion of births by teenage mothers the age of the father is unknown. Identification of the father is currently not compulsory on birth registrations.

A complete estimation of teenage *pregnancy* rates would combine abortion figures with numbers of births and perinatal deaths. However, it is not currently possible to gain a precise figure for the number of abortions performed, for all women, including Aboriginal and Torres Strait Islander teenage women.

### References

ABS (Australian Bureau of Statistics) 2013a, *Births, Australia, 2012*, Cat. 3301.0, Canberra, http://www.abs.gov.au/ausstats/abs@.nsf/mf/3301.0 (accessed 12 August 2016).

—2013b, *Estimates of Aboriginal and Torres Strait Islander Australians, June 2011*, Cat. 3238.0.55.001, Canberra, ACT.

—2015, *Births, Australia, 2014*, Cat. 3301.0, Canberra, http://www.abs.gov.au/ausstats/ abs@.nsf/mf/3301.0 (accessed 21 March 2016).

Archer, N.P., Langlois, P.H., Suarez, L., Brender, J. and Shanmugam, R. 2007, ‘Association of paternal age with prevalence of selected birth defects’, *Birth Defects Research Part A: Clinical and Molecular Teratology*, vol. 79, no. 1, pp. 27–34.

Brand, G. 2013, ‘“You Don’t Know Half the Story”: Deepening the Dialogue with Young Mothers’, Murdoch University.

Chen, X.-K., Wen, S.W., Krewski, D., Fleming, N., Yang, Q. and Walker, M.C. 2008, ‘Paternal age and adverse birth outcomes: teenager or 40+, who is at risk?’, *Human Reproduction*, vol. 23, no. 6, pp. 1290–1296.

Doamekpor, L.A., Amutah, N.N. and Ramos, L.J. 2013, ‘Fathers Matter The Role of Paternal Age in Infant Mortality’, *American Journal of Men’s Health*, p. 1557988313511492.

Jeon, S.-H., Kalb, G. and Vu, H. 2011, ‘The Dynamics of Welfare Participation among Women Who Experienced Teenage Motherhood in Australia’, *Economic Record*, vol. 87, no. 277, pp. 235–251.

Kalb, G., Le, T. and Leung, F. 2012, *Outcomes for Teenage Mothers in the First Years after Birth*, Final Report, Melbourne Institute of Applied Economic and Social Research, Melbourne.

Keys, D. 2007, *Opportunity for Change: Young Motherhood & Homelessness*, Becoming a Mother Project, Family Access Network, Melbourne.

Larkins, S., Page, R.P., Panaretto, K., Mitchell, M., Alberts, V., McGinty, S. and Veitch, P.C. 2011, ‘The transformative potential of young motherhood for disadvantaged Aboriginal and Torres Strait Islander women in Townsville, Australia’, *Medical Journal of Australia*, vol. 194, no. 10, pp. 551–555.

Lawton, B., Cram, F., Makowharemahihi, C., Ngata, T., Robson, B., Brown, S. and Campbell, W. 2013, ‘Developing a Kaupapa Maori research project to help reduce health disparities experienced by young Maori women and their babies’, *AlterNative: An International Journal of Indigenous Peoples*, vol. 9, no. 3, p. 246.

Lewis, L.N., Hickey, M., Doherty, D.A. and Skinner, S.R. 2009, ‘How do pregnancy outcomes differ in teenage mothers? A Western Australian study’, *Medical Journal of Australia*, vol. 190, no. 10, https://www.mja.com.au/journal/2009/190/10/how-do-pregnancy-outcomes-differ-teenage-mothers-western-australian-study (accessed 22 August 2016).

Lohan, M., Cruise, S., O’Halloran, P., Alderdice, F. and Hyde, A. 2010, ‘Adolescent Men’s Attitudes in Relation to Pregnancy and Pregnancy Outcomes: A Systematic Review of the Literature From 1980–2009’, *Journal of Adolescent Health*, vol. 47, no. 4, pp. 327–345.

Luong, M. 2008, *Life After Teenage Motherhood*, Statistics Canada, Ottawa, canada.

Morehead, A. and Soriano, G. 2005, ‘Teenage Mothers: Constructing Family: What are the supports, pressures and additional labour that shape decisions teenage mothers make about family life?’, *Family Matters*, vol. 72, pp. 64–71.

Roth, J., Hendrickson, J., Schilling, M. and Stowell, D.W. 1998, ‘The Risk of Teen Mothers Having Low Birth Weight Babies: Implications of Recent Medical Research for School Health Personnel’, *Journal of School Health*, vol. 68, no. 7, pp. 271–275.

Shrim, A., Ates, S., Mallozzi, A., Brown, R., Ponette, V., Levin, I., Shehata, F. and Almog, B. 2011, ‘Is Young Maternal Age Really a Risk Factor for Adverse Pregnancy Outcome in a Canadian Tertiary Referral Hospital?’, *Journal of Pediatric & Adolescent Gynecology*, vol. 24, no. 4, pp. 218–222.

Smith, J.L., Skinner, S.R. and Fenwick, J. 2012, ‘Perceptions of teen motherhood in Australian adolescent females: Life-line or lifederailment’, *Women and Birth*, vol. 25, no. 4, pp. 181–186.

Wohl, M. and Gorwood, P. 2007, ‘Paternal ages below or above 35 years old are associated with a different risk of schizophrenia in the offspring’, *European Psychiatry*, vol. 22, no. 1, pp. 22–26.

## 6.4 Birthweight**[[8]](#footnote-8)**

|  |
| --- |
| Box 6.4.1 Key messages |
| * Birthweight is a key indicator of the health status of babies and a predictor of their health outcomes later in life.
* For available jurisdictions (NSW, Victoria, Queensland, WA, SA and the NT), the proportion of low birthweight babies born to Aboriginal and Torres Islander mothers decreased from 11.8 per cent in 2000 to 10.9 per cent in 2013 (figure 6.4.1).
* Nationally in 2013 for all jurisdictions, 10.9 per cent of babies born to Aboriginal and Torres Strait Islander mothers had low birthweight, compared to 4.6 per cent of babies born to non‑Indigenous mothers (table 6A.4.2).
* For the combined years 2011–2013, the proportion of low birthweight babies born to Aboriginal and Torres Strait Islander mothers increased with remoteness, whilst the proportion of low birthweight babies born to non-Indigenous mothers decreased as remoteness increased (excluding major cities) (table 6A.4.11).
 |
|  |

|  |
| --- |
| Box 6.4.2 Measures of birthweight |
| There is one main measure for this indicator (aligned with the associated NIRA indicator). *Incidence of low birthweight among live-born babies* is defined as the number of low birthweight (less than 2500 grams) live-born singleton infants as a proportion of the total number of live‑born singleton infants with known birthweight.The most recent available data for this measure are from the AIHW National Perinatal Data Collection (NPDC) (all jurisdictions; remoteness). Key points to note are:* since 2011, data are available by the Indigenous status of the baby. Historical data are only available by the Indigenous status of the mother
* data disaggregated by remoteness are presented for 2011 onwards as remoteness data are not directly comparable for previous years.
 |
|  |

Children with a low birthweight require longer periods of hospitalisation after birth and are more likely to have poor health, or even die in infancy (AIHW 2011). Data on birthweight for Aboriginal and Torres Strait Islander and non-Indigenous fetal deaths shows similar proportions of low birthweight babies (table 6A.4.25). Low birthweight can also affect brain development and increase the likelihood of developing chronic diseases in adulthood, including cardiovascular disease, kidney disease and diabetes mellitus (Arnold, Hoy and Wang 2015, Barker 2012; DeKieviet et al. 2012; Khalidi et al. 2012; Luyckx et al. 2013; Singh 2011).

Low birthweight can be a result of pre-term birth (although the infant may be within the expected weight range for its gestational age) or being born at the normal time (after 37 weeks) but of low birthweight (indicating fetal growth retardation) (ABS and AIHW 2008). In 2011, 65.5 per cent of Aboriginal and Torres Strait Islander pre-term births were of low birthweight and 4.8 per cent of full term births were of low birthweight, compared with 56.4 per cent pre-term births and 1.9 per cent full term births for non‑Indigenous mothers (AIHW 2015).

For Aboriginal and Torres Strait Islander babies, the evidence is mixed on whether fetal growth retardation or pre-term birth is the main cause of low birthweight (Mackerras 1998; Rousham and Gracey 2002; Sayers and Powers 1997). Predictors of fetal growth retardation and pre-term birth are listed in table 6.4.1. Of these predictors, information on tobacco and alcohol consumption during pregnancy (section 6.2) is available in this report. A multivariate analysis for the period 2009–2011 indicated that, excluding pre-term and multiple births, 51 per cent of low birthweight births to Aboriginal and Torres Strait Islander mothers can be attributed to smoking during pregnancy, compared with 19 per cent for other mothers (AHMAC 2015). If the smoking rate during pregnancy among Aboriginal and Torres Strait Islander mothers were the same as for other mothers, after accounting for other factors, the proportion of babies with low birthweight among the Aboriginal and Torres Strait Islander population could be reduced by 26 per cent (AIHW 2015). Increasing the number of antenatal visits (section 6.1) has also been identified as having a positive impact on the birthweight of babies (Khalidi et al. 2012; Taylor et al. 2013). Antenatal visits enable education and monitoring of risk factors.

|  |
| --- |
| Table 6.4.1 Predictors of fetal growth retardation and pre-term birth |
|

|  |  |
| --- | --- |
| Fetal growth retardation | Pre-term birth |
| Maternal pre-pregnancy weightPrior low birthweight infantGestational weight gain (maternal nutrition)Maternal cigarette smokingAlcohol consumption | Maternal anaemiaInfectionsMaternal cigarette smokingMaternal diabetesPregnancy induced hypertension |

 |
| *Sources*: Mackerras, D (2001) ‘Birthweight changes in the pilot phase of the Strong Women Strong Babies Strong Culture Program in the Northern Territory’, *Australian and New Zealand Journal of Public Health*, vol. 25, no. 1, pp34–40; Algert et al 1993 cited in Bambrick, H. J. 2003, ''Dying fast and young': Contemporary Aboriginal Health, Chapter 3' in Child Growth and Type 2 Diabetes Mellitus in a Queensland Aboriginal Community, April 2003, thesis submitted for the degree of Doctor of Philosophy, Australian National University, https://digitalcollections.anu.edu.au/bitstream/1885/46071/30/04chapter3.pdf (accessed 10 February 2014). |
|  |
|  |

Results from the Gudaga study (a birth cohort study of Aboriginal infants in an urban area of NSW) found that when all risk and protective factors were accounted for, there was no statistically significant difference in birthweight between Aboriginal and non‑Aboriginal infants (Comino et al. 2012). This reinforces that Indigeneity itself is not a factor for low birthweight, but rather the prevalence of individual risk and protective factors.

### Low birthweight

For available jurisdictions (NSW, Victoria, Queensland, WA, SA and the NT), the proportion of low birthweight babies born to Aboriginal and Torres Strait Islander mothers decreased from 11.8 per cent in 2000 to 10.9 per cent in 2013 (figure 6.4.1). Over the same period, the proportion for non-Indigenous mothers remained relatively constant around 4.5 per cent (table 6A.4.1).

|  |
| --- |
| Figure 6.4.1 Proportion of low birthweight babies born in NSW, Victoria, Queensland, WA, SA and the NT, to Aboriginal and Torres Strait Islander mothers, 2000 to 2013**a, b, c** |
| Figure 6.4.1 Proportion of low birthweight babies born in NSW, Victoria, Queensland, WA, SA and the NT, to Aboriginal and Torres Strait Islander mothers, 2000 to 2013  More details can be found within the text surrounding this image. |
| a Data exclude stillbirths, multiple births and births both less than 20 weeks gestation and less than 400 grams birthweight. b Data are by place of usual residence of the mother. Table excludes non-residents, residents of external territories and not stated State/Territory of residence. Babies born to mothers residing in Tasmania and the ACT are excluded. c Data were obtained from the most recent version of the NPDC and may differ slightly from that used for previously published data which are incorporated in other tables in this section. |
| *Source*: AIHW (unpublished) National Perinatal Data Collection; table 6A.4.1. |
|  |

Nationally in 2013 for all jurisdictions, 10.9 per cent of babies born to Aboriginal and Torres Strait Islander mothers had low birthweight, compared to 4.6 per cent of babies born to non-Indigenous mothers (table 6A.4.2).

The proportion of low birthweight babies born born to Aboriginal and Torres Strait Islander mothers varies across remoteness areas — in 2013, the proportion was lowest in in major cities and outer regional areas (9.8 per cent) followed by inner regional areas (10.4 per cent), remote areas (11.4 per cent) and very remote areas (13.7 per cent). Proportions decreased for non‑Indigenous mothers decreased as remoteness increased (excluding major cities) (tables 6A.4.8–10). Aggregating three years of data enables year to year volatility to be smoothed out. For 2011–2013, the proportion of low birthweight babies born to Aboriginal and Torres Strait Islander mothers increased as remoteness increased (table 6A.4.11).

Aggregating three years of data enables disaggregation of low birthweight into very low and extremely low birthweights. For 2011–13, the ratio of proportions for Aboriginal and Torres Strait Islander mothers compared to non-Indigenous mothers for very low birthweight was around 2:1, but for extremely low birthweights this ratio was reversed (for the first time in the 15 years of data reported) at around 0.4:1 (table 6A.4.14).

From 2011, data were available by Indigenous status of the infant (that is, where the mother and/or the father are Aboriginal or Torres Strait Islander), and for all jurisdictions except WA and SA for whom data were available from 2012 (table 6A.4.13-14). Nationally in 2013 for all jurisdictions, 9.8 per cent of babies born to Aboriginal and Torres Strait Islander mothers had low birthweight, compared to 4.5 per cent of babies born to non‑Indigenous mothers (table 6A.4.12). The number of births for whom the Indigenous status of the infant could not be determined has decreased over time which makes comparisons over time difficult. Trends by remoteness areas for proportions of low birthweight babies by Indigenous status of the baby (tables 6A.4.15–17) are similar to those for babies by Indigenous status of the mother (tables 6A.4.8–10).

Additional data on selected birth outcomes for women are reported in tables 6A.4.20–22. Associations between birthweight and maternal health for Aboriginal and Torres Strait Islander children are reported in table 6A.4.23 (in 2014-15, the only significant difference was for mothers who had regular check-ups whilst pregnant — 83.9 per cent of those with a child born with low birthweight, compared to 97.8 per cent for those with a child not of low birthweight).

### Things that work

Box 6.4.3 includes a case study of some things that are working to improve neonatal outcomes around birthweight of babies for Aboriginal and Torres Strait Islander women.

|  |
| --- |
| Box 6.4.3 Things that work — Birthweight |
| The national **Healthy for Life (HfL) program**, funded by the Office for Aboriginal and Torres Strait Islander Health, commenced in 2005-06 and includes a formal objective of improving child and maternal health care services.The HfL program is available to established primary health-care providers in Aboriginal Community Controlled Health Services (ACCHS), State and Territory health services and Divisions of General Practice.  |
| (continued next page) |
|  |
|  |

|  |
| --- |
| Box 6.4.3 (continued) |
| An independent evaluation found over the year to June 2008 there was a decrease in the proportion of low birthweight babies, but also an increase in the proportion of high birthweight babies (Urbis 2009). More recent data from the HfL Report Card found that the number of Aboriginal and Torres Strait Islander babies with normal birthweight increased from 583 (81.5 per cent) in 2007–08 to 850 (84.2 per cent) in 2010–11 (AIHW 2013). The Healthy for Life data collection conducted by the AIHW ceased in June 2011. |
| *Sources*: AIHW (2013) *Healthy for Life – Aboriginal Community Controlled Health Services Report card;* Urbis (2009) *Evaluation of the Healthy for Life Program*, Final report 30 June 2009. Prepared for the Department of Health. |
|  |
|  |

### References

ABS and AIHW (Australian Bureau of Statistics and Australian Institute of Health and Welfare) 2008, *The Health and Welfare of Australia’s Aboriginal and Torres Strait Islander Peoples*, Cat. no. 4704.0, Canberra.

AHMAC (Australian Health Ministers’ Advisory Council) 2015, *Aboriginal and Torres Strait Islander Health Performance Framework 2014 Report*, Canberra.

AIHW 2011, *The Health and Welfare of Australia’s Aboriginal and Torres Strait Islander People: An Overview 2011*, Cat. no. IHW 42, Australian Institute of Health and Welfare, Canberra.

—— 2015, *Aboriginal and Torres Strait Islander Health Performance Framework 2014: Detailed Analyses*, Canberra.

Arnold, L., Hoy, W. and Wang, Z. 2015, ‘Low birthweight increases risk for cardiovascular disease hospitalisations in a remote Indigenous Australian community – a prospective cohort study’, *Australian and New Zealand Journal of Public Health*.

Barker, D.J.P. 2012, ‘Developmental origins of chronic disease’, *Public Health*, vol. 126, no. 3, pp. 185–189.

Comino, E., Knight, J., Webster, V., Pulver, L.J., Jalaludin, B., Harris, E., Craig, P., McDermott, D., Henry, R. and Harris, M. 2012, ‘Risk and Protective Factors for Pregnancy Outcomes for Urban Aboriginal and Non-Aboriginal Mothers and Infants: The Gudaga Cohort’, *Maternal and Child Health Journal*, vol. 16, no. 3, pp. 569–578.

DeKieviet, J.F., Zoetebier, L., van ELBURG, R.M., Vermeulen, R.J. and Oosterlaan, J. 2012, ‘Brain development of very preterm and very low-birthweight children in childhood and adolescence: a meta-analysis’, *Developmental Medicine & Child Neurology*, vol. 54, no. 4, pp. 313–323.

Khalidi, N., McGill, K., Houweling, H., Arnett, K. and Sheahan, A. 2012, *Closing the Gap in Low Birthweight Births between Indigenous and Non-Indigenous Mothers, Queensland*, Statbite #46, Health Statistics Centre, Queensland Health.

Luyckx, V.A., Bertram, J.F., Brenner, B.M., Fall, C., Hoy, W.E., Ozanne, S.E. and Vikse, B.E. 2013, ‘Effect of fetal and child health on kidney development and long-term risk of hypertension and kidney disease’, *The Lancet*, vol. 382, no. 9888, pp. 273–283.

Mackerras, D. 1998, *Evaluation of the Strong Women, Strong Babies, Strong Culture Program: Results for the Period 1990-1996 in Three Pilot Communities*, Issue no 2/98, Menzies Occasional Papers, Menzies School of Health Research, Darwin.

Rousham, E. and Gracey, M. 2002, ‘Factors affecting birthweight of rural Australian Aborigines’, *Annals of Human Biology*, vol. 29, no. 4, pp. 363–372.

Sayers, S. and Powers, J. 1997, ‘Risk factors for Aboriginal low birthweight, intrauterine growth retardation and preterm birth in the Darwin Health Region’, *Australian and New Zealand Journal of Public Health*, vol. 21, no. 5, pp. 524–530.

Singh, G. 2011, ‘Neonatal Problems’, *Indigenous Health*, vol. 13, no. 3.

Taylor, L.K., Lee, Y.Y.C., Lim, K., Simpson, J.M., Roberts, C.L. and Morris, J. 2013, ‘Potential prevention of small for gestational age in Australia: a population-based linkage study’, *BMC Pregnancy and Childbirth*, vol. 13, no. 1, p. 210.

## 6.5 Early childhood hospitalisations**[[9]](#footnote-9)**

|  |
| --- |
| Box 6.5.1 Key messages |
| * Nationally in 2014-15, for children aged 0–4 years:
* 31 005 per 100 000 Aboriginal and Torres Strait Islander children were hospitalised, compared with 23 747 per 100 000 non‑Indigenous children (table 6A.5.1)
* hospitalisation rates for Aboriginal and Torres Strait Islander children were similar in major cities and regional areas (27 092 and 27 575 per 100 000 population, respectively) but were almost twice as high in remote areas (46 816 per 100 000 population), whilst for non-Indigenous children the rates decreased slightly as remoteness increased (from 23 976 to 20 762 per 100 000 population respectively) (table 6A.5.5)
* from 2004‑05 to 2014‑15, for NSW, Victoria, Queensland, WA, SA and the NT combined, hospitalisation rates for Aboriginal and Torres Strait Islander children increased from 23 725 to 31 736 per 100 000 population. Rates for other children fluctuated over the period with no clear trend, leading to a widening of the gap (figure 6.5.1).
 |
|  |
|  |

|  |
| --- |
| Box 6.5.2 Measures of early childhood hospitalisations |
| The main measure for this indicator is the *hospitalisation rate,* which is defined as the hospital separation rate per 100 000 Aboriginal and Torres Strait Islander children aged 0–4 years, by principal diagnoses. Data are sourced from the National Hospital Morbidity Database (NHMD) (all jurisdictions; remoteness), with the most recent data available for 2014‑15. |
|  |
|  |

This section and the next section (section 6.6 Injury and preventable diseases) should be read together. Section 6.6 provides data on a subset of hospitalisations that are potentially preventable. Related data on young child mortality are included in section 4.2.

Early childhood hospitalisation rates are an indicator of the health of young children. However, hospitalisations represent the most serious cases and are not a measure of the actual prevalence of injury and disease. Many children suffering disease and injury do not require hospital treatment — most do not require formal medical treatment or are treated by doctors, nurses and other primary health care providers outside of hospital. A high rate of hospitalisation may also indicate differential access and use of primary health care, as many hospital admissions could be prevented if more effective non‑hospital care were available and used (AIHW 2014; AHMAC 2011).

Monitoring the leading causes of hospitalisations can uncover emerging health risks, as well as highlight where there may be a need for more effective primary health care. The types of major diseases children present with, the number of multiple diagnoses and the duration and frequency of children’s hospitalisations are all important measures of the health of Aboriginal and Torres Strait Islander children.

The stage of a child’s development affects the types and seriousness of injuries requiring hospitalisation; for example, as children’s mobility increases, the hazards they are exposed to change. Steenkamp and Cripps identified that the risk of hospitalisation for falls increases with age but, for other conditions such as poisoning, children under five years have the highest risk of hospitalisation (AIHW 2014).

A Telethon Institute of Child Health study in Western Australia found that the most common reason for hospitalisation before the age of two years was infection (mainly respiratory and gastrointestinal), accounting for 34 per cent of all admissions. Aboriginal children had significantly higher admission and comorbidity rates, stayed longer and were more likely than non‑Indigenous children to die in hospital. Hospitalisation rates for Aboriginal children for infections were more than four times as high as those for non‑Indigenous children — although, over time, admission rates had declined for Aboriginal children and increased for non‑Indigenous children (Carville et al. 2007). Another Western Australian study indicates that hospitalisation rates for Aboriginal and Torres Strait Islander children under five for burn injury were three times as high as those for non-Indigenous children for 1983 to 2008 (Duke et al. 2011).

O’Grady et al. (2010) found that Aboriginal and Torres Strait Islander infants (aged less than 12 months) in the Central Australian region were hospitalised for pneumonia at among the highest rates reported in the world, with 78.4 episodes per 1000 child-years.

### Hospitalisation rate

Nationally in 2014‑15, 31 005 per 100 000 Aboriginal and Torres Strait Islander children were hospitalised, whilst the rate for non‑Indigenous children was 23 747 per 100 000 population (table 6A.5.1). Rates for Aboriginal and Torres Strait Islander children were similar in major cities and regional areas (27 092 and 27 575 per 100 000 population, respectively) but were almost twice as high in remote areas (46 816 per 100 000 population), whilst for non-Indigenous children the rates decreased slightly as remoteness increased (from 23 976 to 20 762 per 100 000 population respectively) (table 6A.5.5).

In 2014‑15, diseases of the respiratory system were the most common cause of hospitalisation for Aboriginal and Torres Strait Islander children and non-Indigenous children aged 0–4 years, accounting for 1 in 4 hospitalisations and 1 in 5 hospitalisations respectively (table 6A.5.1). Aboriginal and Torres Strait Islander children aged 0–4 years were twice as likely as other children to be hospitalised due to infectious and parasitic diseases (table 6A.5.1).

For this report, hospitalisations data are presented for the non-Indigenous population from 2012-13 onwards (for prior years the data are presented for ‘other’ which includes non‑Indigenous Australians and those for whom Indigenous status is unknown or not stated). Prior to 2010‑11, six jurisdictions (NSW, Victoria, Queensland, WA, SA and the NT) were considered to have acceptable quality of Aboriginal and Torres Strait Islander identification in hospitalisation data. The attachment tables for this report include hospitalisations data for all jurisdictions for 2012‑13 to 2014-15 for Aboriginal and Torres Strait Islander and non-Indigenous Australians, as well as data for the six jurisdictions for 2004-05 to 2014-15 for Aboriginal and Torres Strait Islander and other Australians.

|  |
| --- |
| Figure 6.5.1 Hospitalisation rates for children aged 0–4 years, NSW, Victoria, Queensland, WA, SA and public hospitals in the NT, 2004-05 to 2014-15**a, b** |
| Figure 6.5.1 Hospitalisation rates for children aged 0–4 years, NSW, Victoria, Queensland, WA, SA and public hospitals in the NT, 2004-05 to 2014-15  More details can be found within the text surrounding this image. |
| a Data includes six jurisdictions for which the quality of Indigenous identification in hospitalisation data is considered acceptable (NSW, Victoria, Queensland, WA, SA and the NT only). b ‘Other children’ includes hospitalisations of non-Indigenous children and those for whom Indigenous status was not stated. |
| *Source*: AIHW (unpublished) National Hospital Morbidity Database; table 6A.5.4. |
|  |
|  |

From 2004-05 to 2014-15, hospitalisation rates for NSW, Victoria, Queensland, WA, SA and the NT combined for Aboriginal and Torres Strait Islander children increased from 23 725 to 31 736 per 100 000 population. Rates for other children fluctuated over the period with no clear trend, leading to a widening of the gap (figure 6.5.1). For Aboriginal and Torres Strait Islander children, hospitalisation rates for five of the six top diagnoses increased, while hospitalisations for ‘certain infectious and parasitic diseases’ decreased from 3086 to 2537 per 100 000 population (but remains twice the rate for other children) (table 6A.5.4).

### References

AIHW 2014, *Indigenous Child Safety*, Cat. no. IHW 127, Australian Institute of Health and Welfare, Canberra, http://www.aihw.gov.au/publication-detail/?id=60129547839 (accessed 13 July 2016).

Australian Health Ministers’ Advisory Council 2011, *Aboriginal and Torres Strait Islander Health Performance Framework 2010 Report*, AHMAC, Canberra, http://www.health.gov.au/internet/publications/publishing.nsf/Content/health-oatsih-pubs-framereport-toc (accessed 13 July 2016).

Carville, K., Lehmann, D., Hall, G., Moore, H., Richmond, P. and et. al. 2007, ‘Infection Is the Major Component of the Disease Burden in Aboriginal and Non-Aboriginal Australian Children: A Population-Based Study’, *Pediatric Infectious Disease Journal*, vol. 26, no. 3, pp. 210–216.

Duke, J., Wood, F., Semmens, J., Edgar, D.W., Spilsbury, K., Hendrie, D. and Rea, S. 2011, ‘A Study of Burn Hospitalizations for Children Younger Than 5 Years of Age: 1983–2008’, *Pediatrics*, vol. 127, no. 4, pp. e971–e977.

O’Grady, K., Taylor-Thomson, D., Chang, A., Torzillo, P., Morris, P., Mackenzie, G. and Wheaton, G. 2010, ‘Rates of radiological confirmed pneumonia as defined by the World Health Organization in Northern Territory Indigenous children.’, *Medical Journal of Australia*, vol. 192, no. 10, pp. 592–595.

## 6.6 Injury and preventable disease**[[10]](#footnote-10)**

|  |
| --- |
| Box 6.6.1 Key messages |
| * For children aged 0–4 years:
* nationally in 2014-15, 16 102 per 100 000 Aboriginal and Torres Strait Islander children were hospitalised for potentially preventable diseases and injuries, while the rate for non‑Indigenous children was 9991 per 100 000 population. Diseases of the respiratory system accounted for almost half of all hospitalisations for both Aboriginal and Torres Strait Islander and non-Indigenous children (table 6A.6.1)
* from 2004-05 to 2014-15, potentially preventable hospitalisation rates (for NSW, Victoria, Queensland, WA, SA and the NT combined) increased by 13 per cent for Aboriginal and Torres Strait Islander children (with the largest increases for respiratory diseases and external causes including accidental injuries) and decreased by 6 per cent for other children (table 6A.6.15)
* in 2010–2014, for NSW, Queensland, WA, SA and the NT combined, the death rate from injury and preventable diseases for Aboriginal and Torres Strait Islander children was 32.1 deaths per 100 000 population, a decrease from 41.7 per 100 000 population in 2003–2007 (figure 6.6.1). The rate for non-Indigenous children also decreased over this period (from 15.8 to 10.1 deaths per 100 000 population) (tables 6A.6.16–17).
 |
|  |
|  |

|  |
| --- |
| Box 6.6.2 Measures of injury and preventable disease |
| There are two main measures for this indicator:* *Potentially preventable hospitalisations* is defined as the number of hospital separations for injury and potentially preventable disease for children aged 0–4 years as a rate per 100 000 children aged 0–4 years. The main data source is the AIHW National Hospital Morbidity Database (NHMD), with the most recent available data for 2014‑15 (all jurisdictions: remoteness)
* *Potentially avoidable deaths* is defined as the number of deaths from potentially preventable and treatable injury and disease for children aged 0–4 years as a rate per 100 000 children aged 0–4 years. The main data source is the ABS Causes of Death collection with the most recent available data for 2014 (NSW, Queensland, WA, SA and the NT).
 |
|  |
|  |

In Australia, many childhood diseases are generally prevented or successfully treated without hospitalisation. The main focus of this indicator is on the most serious cases of disease and injury that result in a hospital admission. Some infections that may appear minor can have serious longer term health effects. Recurring skin and throat infections (caused by group A streptococcal bacteria) in some Aboriginal communities are associated with the highest worldwide rates of acute rheumatic fever, which can lead to rheumatic heart disease (Currie and Carapetis 2000 in Zubrick et al. 2004). The major pathogen of skin infection, group A streptococcus, is also associated with chronic renal failure — a prevalent and highly burdensome condition among Aboriginal adults (Zubrick et al. 2004).

Aboriginal and Torres Strait Islander children have substantially higher respiratory morbidity than non-Indigenous children, which can have life-long impacts on lung function (Chang et al. 2014). A study of Aboriginal and Torres Strait Islander infants hospitalised in Darwin between 2008 and 2013 (McCallum et al. 2016) found that the main factors associated with respiratory readmissions were previous respiratory hospitalisation and household smoke (section 6.2 includes information on smoking during pregnancy and section 8.4 includes information on current smoking rates). Further chronic respiratory disease is a risk factor for cardiovascular disease, one of the most common chronic diseases in the adult population (section 4.9 includes information on chronic diseases).

A wide range of social, cultural, physical and economic factors, influence the health of children. Communities and governments can assist in preventing disease and promote the health of children through improved access to quality medical care, disease registers to improve follow up care, free vaccination programs, the provision of adequate housing, education on the benefits of good nutrition and sanitation, and policies and promotion to reduce the risk of injury. Breastfeeding can reduce the risk of hospitalisation for a range of acute childhood illnesses, including gastrointestinal diseases and infections, and prevent the development of infections and chronic diseases such as diabetes and obesity in later life (FaHCSIA 2013; Queensland Health 2014).

Access to effective and appropriate health care services (including dental and immunisation services) can influence the health of children in the short and long term. More information on immunisation rates in children and the prevalence of vaccine preventable diseases as well as access to primary health care in general, is included in section 8.1. Section 6.7 includes information on ear infections in children and section 8.6 covers tooth decay in children (and adults). See section 10.2 for more information on diseases associated with poor environmental health.

### Potentially preventable hospitalisations

Hospitalisation rates are not a measure of the prevalence of a condition in the community, but they do provide an indication of the extent to which serious illnesses are being treated in hospitals. Potentially preventable hospitalisations include conditions that potentially could have been prevented by the provision of appropriate non-hospital health services, and injuries that potentially could have been prevented (usually outside the health system in broader society).

These data should be interpreted with care — research suggests that parents of Aboriginal and Torres Strait Islander infants use health services differently to parents of non‑Indigenous infants. Ou et. al (2010), using the Longitudinal Study of Australian Children, found that the health status of Aboriginal and Torres Strait Islander infants in the study was poorer than that of non‑Indigenous infants, and that parents of Aboriginal and Torres Strait Islander infants accessed certain health services less frequently than non‑Indigenous parents. The parents of Aboriginal and Torres Strait Islander infants were less likely to have used maternal and child health centres, help lines, maternal and child health nurse visits, general practitioners and paediatricians. However, Aboriginal and Torres Strait Islander infants were more likely than other Australian children to have received treatment at hospital outpatient clinics or to have been hospitalised (Ou et al. 2010).

Nationally in 2014-15, the rate of hospitalisation of Aboriginal and Torres Strait Islander children aged 0–4 years for potentially preventable diseases was 16 102 per 100 000 population (table 6A.6.1), with the rate almost twice as high in remote areas (30 646 per 100 000 population) (figure 6.6.1). The national rate for non-Indigenous children was 9991 per 100 000 population (table 6A.6.1).

| Figure 6.6.1 Potentially preventable hospitalisations for children aged 0–4 years, by Indigenous status by remoteness area, 2014-15**a** |
| --- |
|

| Figure 6.6.1 Potentially preventable hospitalisations for children aged 0–4 years, by Indigenous status by remoteness area, 2014-15  More details can be found within the text surrounding this image. |
| --- |

 |
| a Includes public and private hospitals in all jurisdictions. |
| *Source*: AIHW (unpublished) National Hospital Morbidity Database; table 6A.6.12.  |
|  |
|  |

Diseases of the respiratory system were the most common cause of hospitalisation for both Aboriginal and Torres Strait Islander children and non-Indigenous children (around half of all hospitalisations for both) with the rate for Aboriginal and Torres Strait Islander children almost double that of non-Indigenous children (table 6A.6.1).

For this report, hospitalisations data are presented for the non-Indigenous population from 2012-13 onwards (for prior years the data are presented for ‘other’ which includes non‑Indigenous Australians and those for whom Indigenous status is unknown or not stated). Prior to 2010‑11, six jurisdictions (NSW, Victoria, Queensland, WA, SA and the NT) were considered to have acceptable quality of Aboriginal and Torres Strait Islander identification in hospitalisation data. The attachment tables for this report include hospitalisations data for all jurisdictions for 2012‑13 to 2014-15 for Aboriginal and Torres Strait Islander and non-Indigenous Australians, as well as data for the six jurisdictions for 2004-05 to 2014-15 for Aboriginal and Torres Strait Islander and other Australians.

From 2004-05 to 2014-15 in NSW, Victoria, Queensland, SA, WA and the NT combined, potentially preventable hospitalisation rates increased by 13 per cent for Aboriginal and Torres Strait Islander children (from 14 652 to 16 567 per 100 000 population — with the largest increases for respiratory diseases and external causes including accidental injuries) and decreased by 6 per cent for other children (from 10 835 to10 201 per 100 000 population) (table 6A.6.15).

### Potentially preventable deaths of Aboriginal and Torres Strait Islander children

Mortality data disaggregated by Indigenous status are available for NSW, Queensland, WA, SA and the NT, as these jurisdictions have sufficient levels of Aboriginal and Torres Strait Islander identification and numbers of deaths to support analysis.

For 2010–2014, around one in five deaths (19.3 per cent) of Aboriginal and Torres Strait Islander children aged 0–4 years was attributable to external causes and preventable diseases, a rate of 32.1 per 100 000 population (table 6A.6.16).

There has been an overall decrease in the death rate from external causes and preventable diseases for Aboriginal and Torres Strait Islander children aged 0–4 years, from
41.7 per 100 000 population in 2003–2007 to 32.1 per 100 000 population in 2010–2014 (figure 6.6.1). Over the same period the rate also decreased for non‑Indigenous children, from 15.8 deaths per 100 000 population to 10.1 deaths per 100 000 population (tables 6A.6.16–17).

|  |
| --- |
| Figure 6.6.2 Deaths from external causes and preventable diseases, Aboriginal and Torres Strait Islander children aged 0–4 years, NSW, Queensland, WA, SA and the NT, 2003–2007 and 2010–2014**a** |
| Figure 6.6.2 Deaths from external causes and preventable diseases, Aboriginal and Torres Strait Islander children aged 0–4 years, NSW, Queensland, WA, SA and the NT, 2003–2007 and 2010–2014  More details can be found within the text surrounding this image. |
| a Data on deaths of Aboriginal and Torres Strait Islander Australians are affected by differing levels of coverage of deaths identified as Aboriginal and Torres Strait Islander across states and territories. Care should be exercised in analysing these data, particularly in making comparisons across states and territories and between the Aboriginal and Torres Strait Islander and non-Indigenous data.  |
| *Source*: ABS (unpublished) Causes of Death, Australia, 2014; tables 6A.6.16-17. |
|  |
|  |

### References

Chang, A.B., Brown, N., Toombs, M., Marsh, R.L. and Redding, G.J. 2014, ‘Lung disease in indigenous children’, *Paediatric Respiratory Reviews*, vol. 15, pp. 325–332.

FaHCSIA 2013, *Footprints in Time - The Longitudinal Study of Indigenous Children - Key Summary Report from Wave 4*, former Department of Families, Housing, Community Services and Indigenous Affairs, Canberra, https://www.dss.gov.au/about-the-department/publications-articles/research-publications/longitudinal-data-initiatives/footprints-in-time-the-longitudinal-study-of-indigenous-children-lsic/key-summary-report-from-wave-4 (accessed 13 July 2016).

McCallum, G.B., Chatfield, M.D., Morris, P.S. and Chang, A.B. 2016, ‘Risk Factors for Adverse Outcomes of Indigenous Infants Hosptilised with Bronchiolitis’, *Pediatric Pulmonology*, vol. 51, pp. 613–623.

Ou, L., Chen, J., Hillman, K. and Eastwood, J. 2010, ‘The comparison of health status and health services utilisation between Indigenous and non-Indigenous infants in Australia’, *Australian and New Zealand Journal of Public Health*, vol. 34, no. 1, pp. 50–56.

Queensland Health, Q.G. 2014, *Baby and early childhood health issues and concerns*, Text, Health and wellbeing, http://www.qld.gov.au/health/children/babies/ checks/index.html#breastfeeding (accessed 13 July 2016).

Zubrick, S., Lawrence, D., Silburn, S., Blair, E., Milroy, H., Wilkes, T., Eades, T. and et al 2004, *The Western Australian Aboriginal Child Health Survey: The Health of Aboriginal Children and Young People*, Telethon Institute for Child Health Research, Perth.

6.7 Ear Health

|  |
| --- |
| Box 6.7.1 Key messages |
| * The proportion of Aboriginal and Torres Strait Islander children aged 0–14 years with a hearing condition decreased from 11.2 per cent in 2001 (2.4 times the rate for non‑Indigenous children) to 8.4 per cent in 2014-15 (2.9 times the rate for non-Indigenous children in 2014-15) (figure 6.7.1). In remote areas, the proportion decreased from 17.7 per cent in 2001 to 11.4 per cent in 2014-15 (figure 6.7.2).
* Across age ranges for Aboriginal and Torres Strait Islander children in 2014-15, there was a greater proportion aged 4–14 years with a hearing condition compared to those aged 0–3 years (10.4 per cent compared to 3.2 per cent). There was no statistically significant trend across age ranges for non‑Indigenous children (figure 6.7.1).
* In 2014-15, the hospitalisation rate for diseases of the ear and mastoid process for Aboriginal and Torres Strait Islander children aged 0–14 years was 7.5 per 1000 population, similar to the rate for non-Indigenous children (7.1 per 1000 population) (table 6A.7.5). The rate varied by remoteness — for Aboriginal and Torres Strait Islander children the rate in remote areas was more than twice that in non-remote areas, whilst for non-Indigenous children the rate decreased as remoteness increased (table 6A.7.7).
* Rates of hospitalisation for diseases of the ear and mastoid process for younger children (0–3 years) were lower for Aboriginal and Torres Strait Islander children compared to non‑Indigenous children (9.5 and 12.7 per 1000 population respectively), with the direction reversed for older children (4–14 years) (table 6A.7.5).
 |
|  |

|  |
| --- |
| Box 6.7.2 Measures of ear health |
| There are two main measures for this indicator:* *Prevalence of hearing conditions in children* is defined as the proportion of children aged 0–14 years with a reported hearing condition. Data are available from the ABS Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS)/National Aboriginal and Torres Strait Islander Social Survey (NATSISS), with the most recent data available from the 2014-15 NATSISS. Data for the non-Indigenous population are sourced from the ABS Australian Health Survey (AHS)/National Health Survey (NHS), with the most recent data available from the 2014-15 NHS. Data are self-reported by proxies of children.
* *Hospitalisation rates for ear and hearing problems in children* is defined as the proportion of hospital separations for children aged 0–14 years where the principal diagnosis was diseases of the ear and mastoid. Data are sourced from the National Hospital Morbidity Database (NHMD) with the most recent data available for 2014‑15 (all jurisdictions; by age; remoteness).
 |
|  |

Ear disease and associated hearing loss are highly prevalent across Aboriginal and Torres Strait Islander children and much more common than in the broader Australian population (Burns and Thomson 2013; DoHA 2015). Aboriginal and Torres Strait Islander Australians, particularly in remote areas, experience some of the highest levels of ear disease and hearing loss in the world (Senate Community Affairs References Committee 2010).

Conditions affecting ear health are classified by the part of the ear (external, middle or inner) in which the condition occurs. The ear condition with the most significant impact on hearing for Aboriginal and Torres Strait Islander Australians is otitis media (inflammation and/or infection of the middle ear), which is primarily caused by bacterial or viral infections.

There are different levels of severity of otitis media, and complications, particularly if not monitored and treated where necessary, can result in hearing loss. Some forms of otitis media are treatable either through antibiotics or surgery, but public health strategies focus on prevention, awareness and early identification for best results (Burns and Thomson 2013; DoHA 2015).

Generally, the incidence of otitis media peaks in two age groups: between 6 and 24 months (when many infants are weaned and exposed to environmental conditions); and at
4-5 years (when children start kindergarten) (Kong and Coates 2009; Burns and Thomson 2013). Aboriginal and Torres Strait Islander children under three years of age are at the highest risk of ear disease — this is the most critical development period for speech development, underpinning communication, learning, and social and emotional development (Aithal, Yonovitz and Aithal 2008; Brouwer et al. 2005; Couzos, Metcalf and Murray 2007; Williams and Jacobs 2009).

Severe cases of otitis media can lead to ongoing medical complications that negatively affect a child’s early acquisition of language, intellectual development, social skills and educational attainment, and employment outcomes later in life. Hearing loss can have long term effects on overall wellbeing (AIHW 2014; WHO 2016).

Factors identified as increasing the risk of ear health issues include: social disadvantage; limited access to primary health care and treatment (see section 8.1); nutritional problems (see section 8.5); crowded housing conditions (see section 10.1); inadequate access to water, functioning sewerage and waste removal systems (see section 10.3); and passive smoking (see section 8.4). Breastfeeding is associated with a reduced risk of otitis media (Bowatte et al. 2015; Burns and Thomson 2013).

### Prevalence of hearing conditions in children

| Figure 6.7.1 Prevalence of hearing conditions in children aged 0‑14 years, by age, 2001 to 2014-15**a** |
| --- |
|

| Figure 6.7.1 Prevalence of hearing conditions in children aged 0 14 years, by age, 2001 to 2014-15  More details can be found within the text surrounding this image. |
| --- |

 |
| a 95 per cent confidence intervals around each estimate are available in attachment table 6A.7.1. |
| *Source*: ABS (unpublished) National Health Survey (NHS) 2001; ABS (unpublished) NHS 2004-05; ABS (unpublished) National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2004‑05; ABS (unpublished) National Aboriginal and Torres Strait Islander Social Survey (NATSISS) 2008; ABS (unpublished) NHS 2007‑08; ABS (unpublished) Australian Aboriginal and Torres Strait Islander Health Survey 2012‑13 (2012‑13 NATSIHS component); ABS (unpublished) Australian Health Survey (AHS) 2011–13 (2011-12 NHS component); ABS (unpublished) 2014-15 NATSISS; ABS (unpublished) 2014-15 NHS; table 6A.7.1. |
|  |
|  |

Nationally in 2014-15, 8.4 per cent of Aboriginal and Torres Strait Islander children aged 0–14 years had a hearing condition[[11]](#footnote-11) (2.9 times the rate for non‑Indigenous children), a decrease from 11.2 per cent in 2001 (table 6A.7.1).

Across age ranges for Aboriginal and Torres Strait Islander children in 2014-15, there was a greater proportion aged 4–14 years with a hearing condition compared to those aged
0–3 years (10.4 per cent compared to 3.2 per cent). There was no statistically significant trend across these two age ranges for non‑Indigenous children (figure 6.7.1).

In remote areas, the proportion of Aboriginal and Torres Strait Islander children aged
0–14 years with a hearing condition decreased from 17.7 per cent in 2001 to 11.4 per cent in 2014‑15. There was no statistically significant difference in the equivalent rates for non‑remote areas over this period (8.5 per cent in 2001 compared to 7.5 per cent in 2014‑15) (figure 6.7.2).

Data specifically for otitis media are available in table 6A.7.2. Prevalence rates for this condition for Aboriginal and Torres Strait Islander children aged 0–14 years is 2.9 per cent in 2014‑15, compared to 1.1 per cent for non-Indigenous children. For Aboriginal and Torres Strait Islander children, the prevalence rate for 5–9 year olds (4.6 per cent) is more than twice the rate for children of other ages (1.9-2.0 per cent for 0–4 year old and 10–14 year olds) (table 6A.7.2).

| Figure 6.7.2 Prevalence of hearing conditions in Aboriginal and Torres Strait Islander children aged 0–14 years, by remoteness, 2001 to 2014‑15**a** |
| --- |
|

| Figure 6.7.2 Prevalence of hearing conditions in Aboriginal and Torres Strait Islander children aged 0–14 years, by remoteness, 2001 to 2014-15  More details can be found within the text surrounding this image. |
| --- |

 |
| a Error bars represent 95 per cent confidence intervals around each estimate. |
| *Source*: ABS (unpublished) National Health Survey 2001; ABS (unpublished) National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2004‑05; ABS (unpublished) National Aboriginal and Torres Strait Islander Social Survey 2008; ABS (unpublished) Australian Aboriginal and Torres Strait Islander Health Survey 2012‑13 (2012‑13 NATSIHS component); ABS (unpublished) 2014-15 NATSISS; table 6A.7.3. |
|  |
|  |

Data for types of treatment for hearing conditions for Aboriginal and Torres Strait Islander children in 2014-15 are available in table 6A.7.4.

### Hospitalisations for ear and hearing problems in children

Hospitalisations data only include those who have accessed medical services, and have been diagnosed and admitted to hospital for the specified conditions. Cases that result in a visit to a general practitioner or to an emergency department, but do not lead to hospitalisation, are excluded. There may also be a large share of 0–3 year olds whose parents may not be aware that their children have an ear or hearing problem or where access to hospitals may be limited.

The following analysis focusses on diseases of the middle ear and mastoid (including otitis media), which are the most common reasons for hospitalisation related to ear and hearing problems. The attachment tables include additional information on hospitalisations for diseases of the external and inner ear, and other disorders of the ear.

For this report, hospitalisations data are presented for the non-Indigenous population from 2012-13 onwards (for prior years the data are presented for ‘other’ which includes non‑Indigenous Australians and those for whom Indigenous status is unknown or not stated). Prior to 2010‑11, six jurisdictions (NSW, Victoria, Queensland, WA, SA and the NT) were considered to have acceptable quality of Aboriginal and Torres Strait Islander identification in hospitalisation data. The attachment tables for this report include hospitalisations data for all jurisdictions for 2012‑13 to 2014-15 for Aboriginal and Torres Strait Islander Australians and non-Indigenous Australians, as well as data for the six jurisdictions for 2004-05 to 2014-15 for Aboriginal and Torres Strait Islander Australians and other Australians.

Nationally in 2014-15, the hospitalisation rate for children aged 0–14 years for diseases of the ear and mastoid process was similar for Aboriginal and Torres Strait Islander children (7.5 per 1000 population) and non-Indigenous children (7.1 per 1000 population), with the highest rates for both relating to diseases of the middle ear and mastoid (table 6A.7.5).

For younger children (0–3 years), the hospitalisation rate for Aboriginal and Torres Strait Islander children was lower than the rate for non-Indigenous children (9.5 and 12.7 per 1000 population respectively), whilst for older children (4–14 years) the direction was reversed (6.8 and 4.9 per 1000 population respectively) (table 6A.7.5).

The hospitalisation rate for children aged 0–14 years varied by remoteness area. For Aboriginal and Torres Strait Islander children, the rate in remote areas (13.6 per 1000 population) was more than double the rate in non-remote areas (5.9–6.3 per 1000 population), whilst for non-Indigenous children the rate decreased slightly as remoteness increased (from 7.2 to 6.2 per 1000 population) (table 6A.7.7).

Over time (from 2004-05 to 2014-15) hospitalisation rates for both Aboriginal and Torres Strait Islander and other children have fluctuated with no clear trend (table 6A.7.6).

### Things that work

An effective approach for ear health for Aboriginal and Torres Strait Islander children needs to be part of a comprehensive approach to family, maternal and child health and be embedded in coordinated primary care systems (AIHW 2014).

Outlined below is an example of an initiative that has worked to improve ear health for Aboriginal and Torres Strait Islander children (box 6.7.3).

|  |
| --- |
| Box 6.7.3 Things that work – Ear health |
| The national **Care for Kids’ Ears** Campaign, launched on 1 July 2011, was designed and produced by the Australian Government to increase awareness of ear disease and hearing loss in Aboriginal and Torres Strait Islander communities, particularly for families and carers of children aged 0–5 years. The goal was to increase awareness of ear disease and highlight the importance of seeking and following treatment to prevent hearing loss. A website was developed to include resources for parents and carers; early childhood groups; teachers; and health professionals. The website includes talking books in 22 Indigenous languages, and resources continue to be available (DoH 2015).An independent evaluation conducted from July 2011 to June 2013 by the Cultural and Indigenous Research Centre Australia (CIRCA) found that the Campaign had a positive impact on awareness of ear disease among Aboriginal and Torres Strait Islander communities, including increased knowledge of symptoms and prevention, and increased help‑seeking behaviours. A follow-up survey of 200 mothers/female carers was conducted around 18 months after the campaign launch in urban and rural locations nationally. The survey found that those exposed to the Campaign were more likely than those who weren’t to identify at least one prevention action unprompted (74.1 per cent compared to 51.3 per cent) and were also more likely to say they had taken their child to have their ears checked in the last 12 months when they did not have any signs or symptoms (70.4 per cent compared to 43.7 per cent of those not exposed) (CIRCA 2013). |
| *Sources*: DoH 2014, *Care for Kids’ Ears*, http://www.careforkidsears.health.gov.au/ (accessed 20 May 2016); CIRCA 2013, *Australian Government Department of Health and Ageing, Evaluation of the National Indigenous Ear Health Campaign – Final Report*. |
|  |
|  |

### Future directions in data

Only limited data are available on the burden of poor ear health in Aboriginal and Torres Strait Islander children, with current survey data limited due to the difficulty in obtaining reliable estimates for small populations. More comprehensive and reliable data are required to enable the assessment of the type and severity of ear infections in Aboriginal and Torres Strait Islander children and any resulting hearing loss.

### References

AIHW (Australian Institute of Health and Welfare) 2014, *Ear Disease in Aboriginal and Torres Strait Islander Children*, Resource sheet no. 35, Closing the Gap Clearinghouse, Canberra.

Aithal, S., Yonovitz, A. and Aithal, V. 2008, ‘Perceptual Consequences of Conductive Hearing Loss: Speech Perception in Indigenous Students Learning English as a “School” Language’, *The Australian and New Zealand Journal of Audiology*, vol. 30, no. 1, pp. 1–18.

Bowatte, G., Tham, R., Allen, K., Tan, D., Lau, M., Dai, X. and Lodge, C. 2015, ‘Breastfeeding and childhood acute otitis media: a systematic review and meta-analysis’, *ACTA Paediatrica Nurturing the Child*, vol. 104, pp. pp.85–95.

Brouwer, C., Maille, A., Rovers, M., Veenhoven, R., Grobbee, D., Sanders, E. and Schilder, A. 2005, ‘The impact of recurrent acute otitis media on the quality of life of children and their caregivers’, *Clinical Otolaryngology*, vol. 30, no. 3, pp. 258–265.

Burns, J. and Thomson, N. 2013, *Review of Ear Health and Hearing Among Indigenous Australians*, Australian Indigenous HealthInfoNet, http://www.healthinfonet.ecu.edu.au /other-health-conditions/ear/reviews/our-review (accessed 20 May 2016).

Couzos, S., Metcalf, S. and Murray, R. 2007, ‘Ear health’, *Aboriginal Primary Health Care: An Evidence-based Approach*, 3rd edn, Oxford University Press, South Melbourne, pp. 265–307.

DoHA (Australian Government Department of Health and Ageing) 2015, *Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations*, Commonwealth of Australia, http://www.health.gov.au/internet/publications/publishing.nsf/Content/oatsih-otitis-media-toc (accessed 20 May 2016).

Kong, K. and Coates, H. 2009, ‘Natural history, definitions, risk factors and burden of otitis media’, *The Medical Journal of Australia*, vol. 193, no. 10, pp. S39–S43.

Senate Community Affairs References Committee 2010, *Hear Us: Inquiry into Hearing Health in Australia*, Commonwealth of Australia, Canberra, http://www.aph.gov.au/ Parliamentary\_Business/Committees/Senate/Community\_Affairs/Completed\_inquiries/2008-10/hearing\_health/report/index (accessed 20 May 2016).

WHO (World Health Organization) 2016, *Childhood Hearing Loss - Act Now, Here’s How!*

Williams, C. and Jacobs, A. 2009, ‘The impact of otitis media on cognitive and educational outcomes’, *The Medical Journal of Australia*, vol. 191, no. 9, pp. S69–S72.

## 6.8 Basic skills for life and learning[[12]](#footnote-12)

|  |
| --- |
| Box 6.8.1 Key messages |
| * Basic skills for life and learning focuses on the development and learning of children in their early years (up to 8 years of age). In 2015, 59–63 per cent of Aboriginal and Torres Strait Islander children were classified as developmentally ‘on track’ in all of the five Australian Early Development Census domains, compared to 76–86 per cent of non‑Indigenous children (table 6A.8.1).
* Between 2009 and 2015 the proportions of Aboriginal and Torres Strait Islander children ‘on track’ increased across all domains, with the largest increase for language and cognitive skills (from 48.0 per cent to 62.8 per cent) (tables 6A.8.1 and 6A.8.3).
* The proportion of children receiving a fourth year Aboriginal and Torres Strait Islander Health Assessment has increased from around 1 in 5 children in 2007‑08 to 4 in 5 children in 2014‑15 (table 6A.8.8), with rates increasing with remoteness (table 6A.8.8).
* In 2014-15, 98.8 per cent of Aboriginal and Torres Strait Islander children aged 3–8 years did some form of informal learning activity with their main carer in the previous week (table 6A.8.11).
 |
|  |
|  |

|  |
| --- |
| Box 6.8.2 Measures of basic skills for life and learning |
| There are four main measures for this indicator. Data are available for all jurisdictions.* *Children on track on Australian Early Development Census (AEDC) domains* is defined as the proportion of children entering their first year of full time school who are on track (top 75 per cent) in the five AEDC domains: physical health and wellbeing; social competence; emotional maturity; language and cognitive skills (school-based); and communication skills and general knowledge. The most recent available data are for 2015.
* *Language background* is defined as the proportion of Aboriginal and Torres Strait Islander children entering their first year of school with a language background other than English. The most recent available data are for 2015 from the AEDC.
* *Health checks* is defined as the proportion of children aged 4 years receiving a fourth year developmental health check. The most recent available data are for 2014‑15 from the Australian Government Department of Health.
* *Informal learning activities* is defined as the proportion of children aged 3–8 years who undertook informal learning activities with their main carer in the last week. The most recent available data are for 2014-15 from the ABS National Aboriginal and Torres Strait Islander Social Survey (NATSISS) for Aboriginal and Torres Strait Islander children and for 2014 from the ABS Childhood Education and Care Survey (CEaCS) for non-Indigenous children.
 |
|  |
|  |

This indicator, basic skills for life and learning focuses on the development and learning of children in their early years (up to 8 years of age). The early years are important as skill attainment at one stage of life raises skill attainment at later stages of the life. With birth to school age the period of greatest growth and development, these first skills are very important as they form the foundations for children’s ongoing development and affect their mental health and wellbeing, now and into the future (G. Kalb and van Ours 2012). When children transition to school already equipped with basic skills for life and learning, they have higher levels of social competence and academic achievement, which in turn increases the likelihood of achieving their potential (AIHW 2012).

### Children on track on Australian Early Development Census[[13]](#footnote-13) (AEDC) domains

The AEDC is a population measure of children’s development as they enter full time school. The AEDC assists communities to understand the development of local children compared to other children nationally. In 2015, the Australian version of the Early Development Instrument (tool that collects AEDC data) was completed for 302 003 children in their first year of full-time school (96.5 per cent of all children enrolled to begin school in 2015), including 17 351 Aboriginal and Torres Strait Islander children (5.7 per cent of all children surveyed) (Australian Government 2016). The five developmental domains of the AEDC are presented in table 6.8.1.

|  |
| --- |
| Table 6.8.1 AEDC domains of children’s development |
|

|  |  |
| --- | --- |
| *Domain* | *Domain description* |
| Physical health and wellbeing | Children’s physical readiness for the school day, physical independence and gross and fine motor skills. |
| Social competence | Children’s overall social competence, responsibility and respect, approach to learning and readiness to explore new things. |
| Emotional maturity | Children’s pro-social and helping behaviours and absence of anxious and fearful behaviour, aggressive behaviour and hyperactivity and inattention. |
| Language and cognitive skills | Children’s basic literacy, interest in literacy, numeracy and memory, advanced literacy and basic numeracy. |
| Communication skills and general knowledge | Children’s communication skills and general knowledge based on broad developmental competencies and skills. |

 |
| *Source*: Australian Government 2016, *Australian Early Development Census National Report 2015: A Snapshot of Early Child Development in Australia*, Canberra. |
|  |
|  |

In 2015:

* Across all domains between 59–63 per cent of Aboriginal and Torres Strait Islander children were ‘on track’, compared to 76–86 per cent of non‑Indigenous children (table 6A.8.1), with the highest proportion of Aboriginal and Torres Strait Islander children on track for ‘language and cognitive skills’ (62.8 per cent) (table 6A.8.1).
* The proportion of Aboriginal and Torres Strait Islander children classified as ‘on track’ decreased in all domains as remoteness increased (table 6A.8.4), with Aboriginal and Torres Strait Islander children showing the greatest difference between major cities and very remote areas for language and cognitive skills (figure 6.8.1).

| Figure 6.8.1 Proportion children classified ‘on track’ in the language and cognitive skills domain, 2015**a** |
| --- |
| Figure 6.8.1 Proportion children classified ‘on track’ in the language and cognitive skills domain, 2015  More details can be found within the text surrounding this image. |
| a ‘On track’ children score in the highest 26 to 100th percentile of the AEDC |
| *Source*: Australian Early Development Census 2015 (unpublished), Social Research Centre; table 6A.8.4 |
|  |
|  |

From 2009 to 2015:

* Across all domains the proportion of Aboriginal and Torres Strait Islander children classified as ‘on track’ increased, with the gap between Aboriginal and Torres Strait Islander and non-Indigenous children narrowing between 0.5 and 7.4 percentage points (tables 6A.8.1–3)
* The largest percentage point increase for Aboriginal and Torres Strait Islander children was for ‘language and cognitive skills’ (from 48.0 to 62.8 per cent), which also had the greatest narrowing of the gap to non‑Indigenous children (from 30.4 to 23.0 percentage points) (tables 6A.8.1–3).

Data for all three collection years are also reported by State and Territory (tables 6A.8.1–3) and by remoteness (tables 6A.8.4–6).

### Language background

Language development is one of the dimensions that determines a child’s readiness for school (Dockett et al. 2008). A child whose first language is not English may be disadvantaged in an English learning environment (Dockett, Perry and Kearney 2010; Fogarty and Schwab 2012).

Language is also important for life. Research indicates that a person’s primary language — the first language learnt, or the mother tongue — is used to gain knowledge of the world and is inextricably linked with how people become social beings and form their earliest memories. Language forms a significant component of a person’s cultural identity (Kral and Morphy 2006; LoBianco and Slaughter 2009).

The AEDC collects data on language background other than English, encompassing children who speak languages other than, or in addition to, English at home, or are reported by teachers to have English as a second language. In 2015, 15.0 per cent of Aboriginal and Torres Strait Islander children entering their first year of school had a language background other than English (a decrease from 19.6 per cent in 2009). The proportion of Aboriginal and Torres Strait Islander children whose first language was not English was lowest in inner regional and metropolitan areas (3.2 and 8.0 per cent) and highest in very remote areas (55.8 per cent) (table 6A.8.7).

### Health checks

This section provides data on the proportion of Aboriginal and Torres Strait Islander and non-Indigenous children receiving a fourth year developmental health check. The aim of the checks is to improve the health and wellbeing of Australian children by promoting early detection of lifestyle risk factors and delayed development.

Two types of Medicare Benefits Schedule checks are reported in this section:

* The Aboriginal and Torres Strait Islander Health Assessment, which is available to
0–14 year old Aboriginal and Torres Strait Islander children[[14]](#footnote-14). (Data for the Aboriginal and Torres Strait Islander Health Assessments are restricted to children aged 3–5 years, to align with the age scope for the Health Assessments)
* The Health Assessment, which is available to all children (Aboriginal and Torres Strait Islander children and non-Indigenous children) aged 3–5 years[[15]](#footnote-15).

This section does not report on developmental health check activity conducted outside Medicare, such as State and Territory early childhood health assessments in preschools and community health centres.

In 2014‑15 79.6 per cent of Aboriginal and Torres Strait Islander children received a fourth year developmental health assessment, compared to 54.5 per cent of non-Indigenous children (table 6A.8.8). Assessment rates increased with remoteness for Aboriginal and Torres Strait Islander children (from 61.2 per cent in major cities to 94.1 per cent in remote/very remote areas) (table 6A.8.9).

|  |
| --- |
| Figure 6.8.2 Proportion of children receiving a fourth year developmental health check, 2007‑08 to 2014‑15**a** |
| Figure 6.8.2 Proportion of children receiving a fourth year developmental health check, 2007 08 to 2014-15  More details can be found within the text surrounding this image. |
| a The Health Assessment commenced in 2008 therefore non-Indigenous data are not available for 2007-08.  |
| *Sources*: DoH (unpublished) Medicare Benefits Schedule (MBS) data collection; ABS (2014) *Estimates and Projections, Aboriginal and Torres Strait Islander Australians 2001 to 2026*, Cat. no. 3238.0; ABS (various years) *Australian Demographic Statistics, June 30* Cat. no. 3101.0; ABS (2012) *Population Projections, Australia,* Cat. no. 3222.0 table 6A.8.8 |
|  |
|  |

The proportion of children receiving developmental health checks has increased over time for both Aboriginal and Torres Strait Islander and non‑Indigenous children. The proportion of Aboriginal and Torres Strait Islander children receiving fourth year developmental health checks increased from 17.8 per cent in 2007-08 to 79.6 per cent in 2014-15. The rate for non‑Indigenous children increased from 15.7 per cent in 2008-09 to 54.5 per cent in 2014‑15 (figure 6.8.2).

These data are also reported by State and Territory in table 6A.8.8.

### Informal learning activities

Informal learning, particularly from a carer, is important to Aboriginal and Torres Strait Islander children because it builds resilience and cultural knowledge, both of which are recognised in a strengths based approach to school readiness (Armstrong et al. 2012; Biddle 2013).

In 2014-15, almost all Australian children aged 3–8 years did some form of informal learning activity with their main carer in the previous week, with the proportion of Aboriginal and Torres Strait Islander children (98.8 per cent) similar to the Australian total.

The most common activities for both Aboriginal and Torres Strait Islander children and all Australian children, with their main carers, were telling stories, reading or listening to the child read (88.6 per cent and 95.9 per cent, respectively) and watching television, a video or DVD (89.9 per cent and 84.8 per cent, respectively) (table 6A.8.12).

Data are also reported by State and Territory in table 6A.8.10 and by remoteness in table 6A.8.13.

### Things that work

The Closing the Gap Clearinghouse identified that preschool programs with the following characteristics can contribute to positive educational outcomes:

* extensive involvement and consultation with local Aboriginal and Torres Strait Islander communities and a culturally appropriate approach
* connections with services and organisations in the local community
* flexibility to adapt to the needs of the local community (especially where mainstream education programs are being provided)
* well-trained staff, using a mix of home and childcare-centre-based activities, with an explicit focus on child development (Osbourne, Baum and Brown 2013).

|  |
| --- |
| Box 6.8.3 Things that work — Basic skills for life and learning |
| Home Interaction Program for Parents and Youngsters (HIPPY)After its initial introduction by the Brotherhood of St Laurence, the Australian Government rolled out the HIPPY program nationally from 2008. As at April 2016, 100 HIPPY communities were fully operational including in 50 Aboriginal and Torres Strait Islander communities. Home tutors (usually parents participating in the program in the community) deliver a two-year structured learning and parent support program for children from disadvantaged communities to transition to school. In 2015, 26.7 per cent of the 4500 children enrolled in HIPPY were identified as Aboriginal and/or Torres Strait Islander and 57 per cent of the 599 Aboriginal and Torres Strait Islander children enrolled in the Age 5 cohort graduated from the program. HIPPY employed 112 local Aboriginal and Torres Strait Islander staff in 2015, around 29 per cent of all staff employed at that time (HIPPY Australia unpublished). A 2011 evaluation found that the HIPPY program provided significant benefits for parents including: increased confidence to teach their child and to talk to the child’s teacher; improved parenting skills; better relationships between parents and children; social connectedness with other parents; increased knowledge about the school’s requirements; improved awareness of the child’s skills and abilities; and pride in the child’s learning achievement. Benefits for the children included improved familiarity and confidence with school work. The evaluation noted that HIPPY was more successful where the local Aboriginal and Torres Strait Islander leaders and community were closely involved and where there were strong relationships between the agency delivering HIPPY and other child and family services (Liddell et al. 2011; AIHW 2013). The evaluation did not collect data on cognitive abilities and school readiness (such as AEDC data) or literacy and numeracy once children were at school, to compare outcomes of children participating in HIPPY with those from similarly disadvantaged communities who did not participate. Such data would be useful for future evaluations.HIPPY Australia commissioned the Brotherhood of St Laurence, in partnership with the University of Melbourne, to undertake an independent evaluation for families who enrol children in HIPPY at 4 years. Cohorts will be surveyed in 2016 and 2017, with the survey to provide data on participating Aboriginal and Torres Strait Islander families to assist in determining outcomes (Brotherhood of St Laurence unpublished). |
| *Sources*: Liddell et al (2011) *Investing in our future: an evaluation of the national rollout of the Home Interaction Program for Parents and Youngsters (HIPPY)* final report to the Department of Education, Employment and Workplace Relations, August 2011; HIPPY Australia (unpublished) *Quarter 4 2015 Community Progress Report*, report to Department of Social Services. |
|  |
|  |

### Future directions in data

Data on fourth year developmental health checks are sourced from the Medicare Benefits Schedule data collection. The relevant health checks include a Health Assessment (available to all children aged 3, 4 and 5 years) and the Aboriginal and Torres Strait Islander Health Assessment (available to all Aboriginal and Torres Strait Islander children aged 0–14 years). Data are not currently able to be disaggregated by Indigenous status for the Health Assessment, due to data quality issues. This disaggregation is important to provide a more accurate assessment of the number of Aboriginal and Torres Strait Islander children receiving fourth year developmental health checks.

Babies and young children may also receive regular developmental health checks from maternal and child health nurses employed by State, Territory or local governments. Data for health checks provided by maternal and child health nurses are currently not available.

### References

AIHW (Australian Institute of Health and Welfare) 2012, *A Picture of Australia’s children, 2012*, Cat. no. PHE 167, Canberra.

Armstrong, S., Buckley, S., Lonsdale, M., Milgate, G., Kneebone, L., Cook, L. and Skelton, F. 2012, ‘Starting school : a strengths‐based approach towards Aboriginal and Torres Strait Islander children’, *Indigenous Education*.

Australian Government 2016, *Australian Early Development Census National Report 2015: A Snapshot of Early Child Development in Australia*, Canberra.

Biddle, N. 2013, *Education Part 2: School Education*, Indigenous Population Project: 2011 Census Papers, Centre for Aboriginal Economic Policy Research, ANU, Canberra.

Dockett, S., Perry, B. and Kearney, E. 2010, *School Readiness: What Does it Mean for Indigenous Children, Families, Schools and Communities?*, AIHW and AIFS Closing the Gap Clearinghouse.

——, Mason, T., Simpson, T., Howard, P., Whitton, D., Gilbert, S., Pearce, S., Sanagavarapu, P., Skattebol, J. and Woodrow, C. 2008, *Successful Transition Programs From Prior-to-school to School for Aboriginal and Torres Strait Islander Children*, Final Report, Charles Sturt University.

Fogarty, W. and Schwab, R.G. 2012, *Indigenous Education: Experiential Learning and Learning Through Country*, CAEPR Working Paper No. 80/2012, Centre for Aboriginal Economic Policy Research.

G. Kalb and van Ours, J.. 2012, *Reading to Young Children: a Head-start in Life*, Melbourne Institute of Applied Economic and Social Research.

Kral, I. and Morphy, F. 2006, ‘Language’, in Hunter, B. (ed), *Assessing the Evidence on Indigenous Socioeconomic Outcomes: A Focus on the 2002 NATSISS*, ANU E Press, Canberra.

LoBianco, J. and Slaughter, Y. 2009, ‘Second Languages and Australian Schooling’, *Australian Education Review*.

Osbourne, K., Baum, F. and Brown, L. 2013, *What Works? A Review of Actions Addressing the Social and Economic Determinants of Indigenous Health*, December, Closing the Gap Clearinghouse issues Paper no. 7, Australian Institute of Health and Welfare and the Australian Institute of Family Studies, Canberra & Melbourne.

1. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-1)
2. The National Partnership Agreement on Indigenous Early Childhood Development expired on 30 June 2014. The antenatal and reproductive healthcare provisions were funded for an additional 12 months to 30 June 2015 under the Project Agreement for Indigenous teenage sexual and reproductive health and young parent support. [↑](#footnote-ref-2)
3. Neural tube defects are where an opening in the spinal cord or brain occurs during early fetal development. Spina bifida is one form of neural tube defect that affects spine development. [↑](#footnote-ref-3)
4. The questionnaire was undertaken by women living in Adelaide (44 per cent) and regional areas including Ceduna, Port Lincoln, Whyalla, Port August, Murray Bridge and Mt Gambier (56 per cent). [↑](#footnote-ref-4)
5. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-5)
6. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-6)
7. The Apgar score is a numerical score that indicates a baby’s condition shortly after birth. Apgar scores are based on an assessment of the baby’s heart rate, breathing, colour, muscle tone and reflex irritability. [↑](#footnote-ref-7)
8. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-8)
9. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-9)
10. The Steering Committee notes its appreciation to Associate Professor Karen Martin, Griffith University who reviewed a draft of this section of the report. [↑](#footnote-ref-10)
11. Includes partial hearing loss and deafness in one ear, otitis media, tinnitus, Meniere’s disease/vertiginous syndrome and type of hearing problem not known. [↑](#footnote-ref-11)
12. The Steering Committee notes its appreciation to Associate Professor, Karen Martin, Griffith University, who reviewed a draft of this section of the report. [↑](#footnote-ref-12)
13. Prior to 1 July 2014 the Australian Early Development Census (AEDC) was known as the Australian Early Development Index (AEDI). [↑](#footnote-ref-13)
14. Prior to 1 May 2010 this was called the Aboriginal and Torres Strait Islander Child Health Check [↑](#footnote-ref-14)
15. Prior to 1 May 2010 this was called the Healthy Kids Check. [↑](#footnote-ref-15)