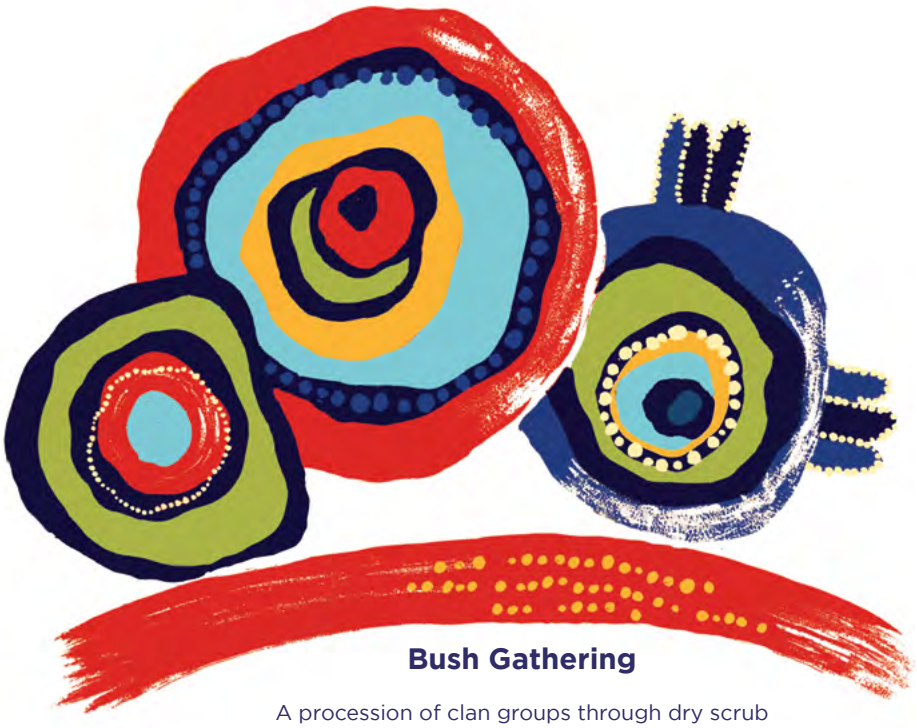
ABORIGINAL KIDS A HEALTHY START TO LIFE

Report of the Chief Health Officer 2018

NSW GOVERNMENT



Bush Gathering

A procession of clan groups through dry scrub
to a warm tropical camping place by the sea.
A celebration of life forces in abundance.

CENTRE FOR EPIDEMIOLOGY AND EVIDENCE
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June 2018

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ABORIGINAL KIDS
A HEALTHY START TO LIFE

Report of the Chief Health Officer 2018

FOREWORD

Every year of a child's life is precious, and when it comes to living a long and healthy life, the first five years are the most important. This is when the foundations for learning, health and wellbeing throughout life are laid down. It is also a time when relationships with role models are at their strongest and represents one of the best opportunities to foster healthy lifestyle behaviours. Our efforts in early childhood immunisation programs, encouraging healthy eating and physical activity all help to reduce chronic disease and illness later in life and close the gap in life expectancy.

Aboriginal people are the first peoples of Australia, and are the oldest continuing culture in human history. The culture is dynamic and strong and continues to evolve and develop in response to historical and contemporary circumstances. It is the resilience of Aboriginal people and their kinship relationships that provide the foundation upon which to build efforts to improve health.

In *Aboriginal kids—a healthy start to life* we focus on the health of Aboriginal children, from conception through to the first five years of life. We reflect on some of the achievements of the past two decades and highlight programs and activities that aim to improve the health of Aboriginal children.

While this report highlights some important improvements in the health of Aboriginal children, there is still much to do. The social determinants of health, such as education, employment and housing, directly contribute to the health disparities experienced by many Aboriginal people. Improvements in the health of Aboriginal children will occur through a better understanding of the context of Aboriginal people's lives and addressing the disproportionate burden of disadvantage. We recognise the need to strengthen partnerships with Aboriginal communities, develop comprehensive and integrated health services and a stronger Aboriginal workforce, and to provide culturally safe work environments and health services.

We are committed to continuing to improve the health of Aboriginal people in NSW through the *Aboriginal Health Plan 2013–2023*. We will continue our efforts through meaningful partnerships with Aboriginal people, their communities, the Aboriginal Community Controlled Health Sector and across government, using approaches that emphasise community empowerment and local decision making. Finally, addressing health inequity cannot be achieved by the health system alone and we must work collaboratively across government to improve outcomes for all Aboriginal people.

Mr Stephen Blunden

Acting Chief Executive Officer
Aboriginal Health and Medical Research Council

Dr Kerry Chant PSM

Chief Health Officer and Deputy Secretary
Population and Public Health

EXECUTIVE SUMMARY

Aboriginal kids—a healthy start to life focuses on key improvements in the health of Aboriginal children in NSW in the first five years of life, and highlights some of the services and programs that have helped to achieve these. While the health of Aboriginal children has improved in important ways, there continues to be a gap compared with non-Aboriginal children. Much of this difference is driven by social disadvantage, and demonstrates the need for stronger partnerships between Aboriginal communities, health services, and across government to ensure that services are culturally safe and appropriate for the most vulnerable Aboriginal people in our community.

BEFORE BIRTH

- The percentage of Aboriginal mothers who are teenagers has almost halved since 1994
- Two-thirds of Aboriginal mothers attended antenatal care in the first 14 weeks of pregnancy in 2016
- Smoking in pregnancy among Aboriginal mothers has fallen by a third since 1996
- The rates of teenage mothers and smoking in pregnancy is six-fold higher among Aboriginal compared to non-Aboriginal mothers, with these differences largely driven by social disadvantage
- While the gap in early antenatal care attendance is 3%, it is important that current services are sustained to ensure that access remains equitable and increases for all mothers

INFANT HEALTH

- The Aboriginal infant mortality rate decreased from 7.2 to 4.6 per 1,000 live births between 2005–2007 and 2014–2016
- The gap in breastfeeding among Aboriginal and non-Aboriginal babies has reduced by a third since 2012
- The percentage of Aboriginal babies that are low birth weight has remained stable since 2012
- Acute gastroenteritis hospitalisation rates have reduced by more than a third in the last decade
- Hospitalisation rates for acute gastroenteritis were almost 50 times higher among Aboriginal infants in the most socially disadvantaged areas compared with the least disadvantaged areas

EARLY CHILDHOOD

- Aboriginal children at five years of age have higher rates of full immunisation than non-Aboriginal children (97% versus 94%)
- Since 2001–02, hospitalisation rates for influenza and pneumonia have decreased from 9.0 to 7.6 per 1,000 Aboriginal children
- The percentage of Aboriginal children receiving health assessments has almost tripled since 2010–11
- 34% of Aboriginal children were developmentally vulnerable in 2015 compared with 39% in 2009; however, Aboriginal children are more likely to be developmentally vulnerable than non-Aboriginal children
- Hospitalisation rates for middle ear infection procedures are almost 100 times higher for Aboriginal children in the most socially disadvantaged areas compared with the least disadvantaged areas

BEFORE BIRTH

Smoking in pregnancy among Aboriginal mothers has fallen by a third since 1996

KEY ACHIEVEMENTS:

- The percentage of Aboriginal mothers who are teenagers has almost halved since 1994
- Two-thirds of Aboriginal mothers attended antenatal care in the first 14 weeks of pregnancy in 2016
- Smoking in pregnancy among Aboriginal mothers has fallen by a third since 1996

In the last 20 years we have seen impressive progress in key measures of health in Aboriginal mothers, with the percentage of Aboriginal mothers who are teenagers almost halving and smoking in pregnancy among Aboriginal mothers falling by a third. Early commencement of antenatal care continues to rise.

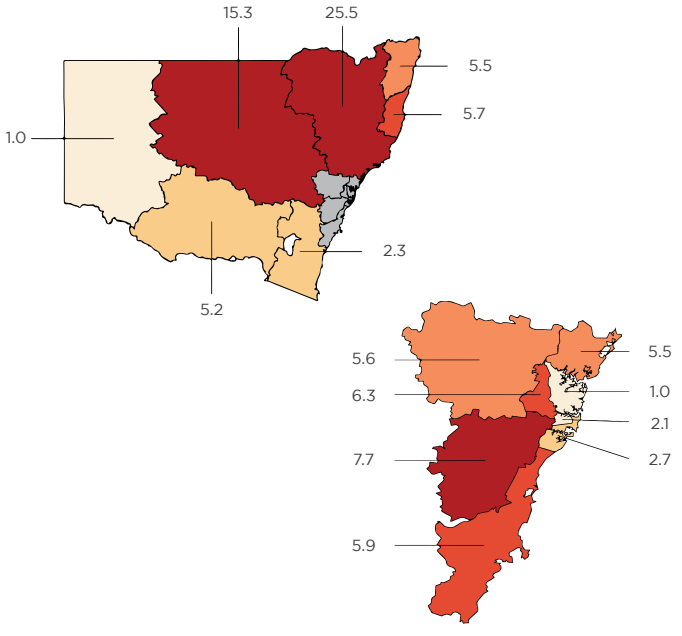
Even so, the rate of teenage mothers and smoking in pregnancy among Aboriginal mothers compared with non-Aboriginal mothers is six-fold higher, with these differences largely driven by social disadvantage. As Aboriginal people are under-reported in health data collections, it is possible that differences are greater than reported here (see *Data Sources* section).

Even before a baby is born, the social and physical environment of their family and community is starting to shape their future. Currently, partnerships between communities, Aboriginal Community Controlled Health Services, non-government organisations, and government agencies are collaborating to provide services and support to assist Aboriginal women to be as healthy as possible in pregnancy. More broadly, access to culturally appropriate antenatal care, smoking cessation support, nutritional advice, and sexual health services are doing their part to help women and their families build a healthy start to life for the next generation of Aboriginal babies. Programs that are developed and implemented in partnership are key to sustaining progress and developing momentum to further reduce disadvantage and disparities in health.

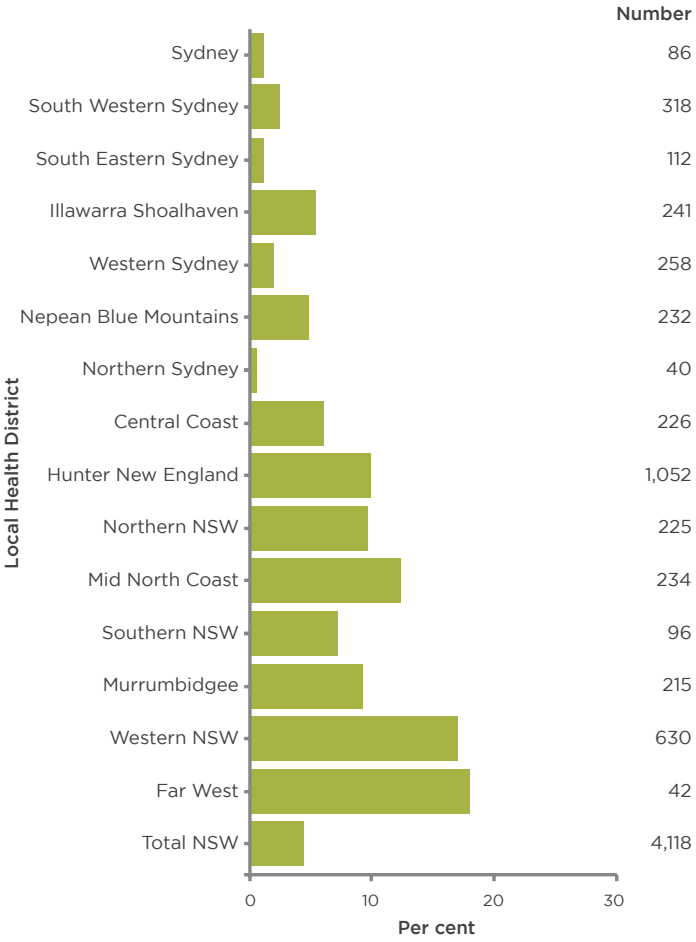
WHERE MOTHERS LIVE

In 2016, 4,118 Aboriginal mothers gave birth in NSW, representing 4% of all mothers. The percentage of mothers who were Aboriginal varied between Local Health Districts (LHD), from less than 1% in Northern Sydney LHD to 18% in Far West LHD. Hunter New England LHD had the largest number of Aboriginal mothers, at 1,052, followed by Western NSW LHD with 630 mothers.

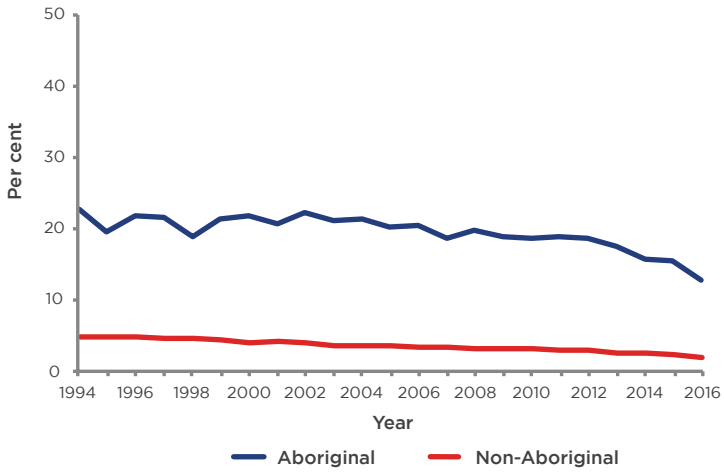
Percentage share of NSW Aboriginal mothers in each local health district, 2016



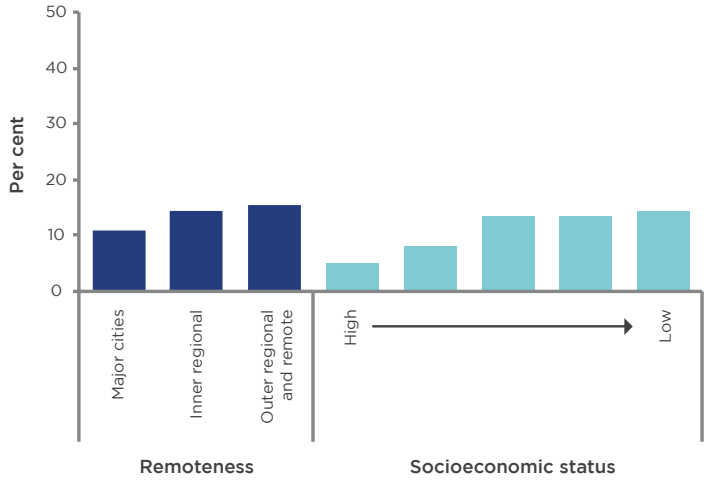
Aboriginal mothers in local health districts, 2016



Teenage mothers, trend



Teenage Aboriginal mothers, 2016



TEENAGE MOTHERS

Motherhood at a young age increases the risk of health problems for the baby such as prematurity and low birth weight, as well as increasing the risk of stillbirth and infant death.[1-3] For mothers themselves, there is an increased risk of medical complications during pregnancy, as well as the consequences of not completing high school education; including fewer employment opportunities compared with older mothers.[4,5]

Aboriginal mothers who gave birth as teenagers almost halved between 1994 and 2016, falling from 23% to 13%, and the gap between Aboriginal and non-Aboriginal teenage mothers reduced by 7 percentage points. However, in 2016, Aboriginal mothers were still over 6 times more likely to be teenagers compared with non-Aboriginal mothers (13% versus 2%).

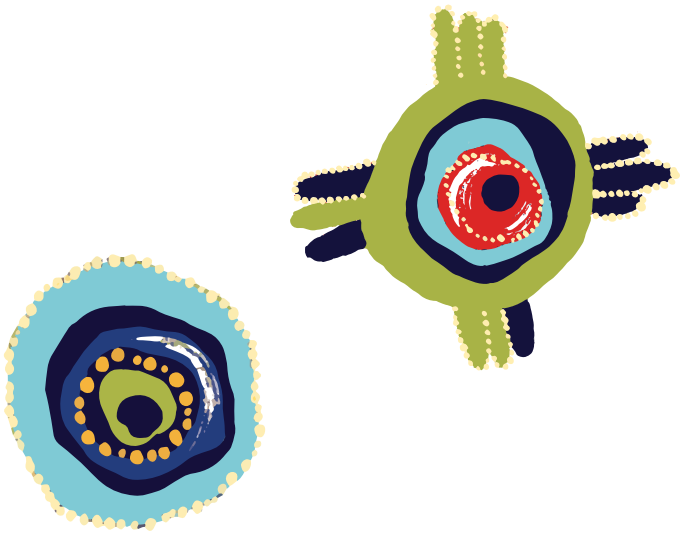
In 2016, the rate of Aboriginal mothers who were teenagers was about three times higher in the most socially disadvantaged areas compared with the least disadvantaged areas (14% versus 5%). Among Aboriginal mothers living in outer regional and remote areas, 15% were teenagers, compared with 11% in major cities.

Northern NSW: Core of Life Program

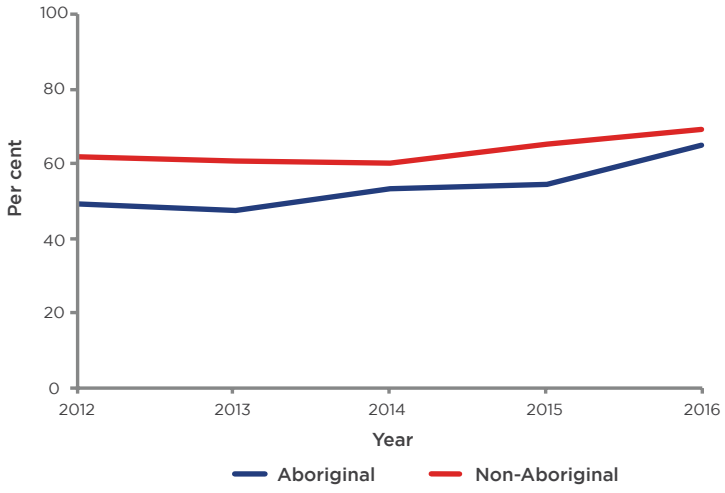
The *Core of Life* Program is a partnership between the Northern NSW LHD, North Coast Primary Health Network, and the Youth and Family Education Resource Program. The *Core of Life* Program was created by midwives and provides high school students with information about parenthood, using a mixture of images, video and role play. The Program aims to reduce unplanned teenage pregnancies and to improve health outcomes for young parents and their babies. The Program engages young Aboriginal people, enabling a better understanding of pregnancy, childbirth, and parenting.

Southern NSW: the Gadhu Family Health Centre

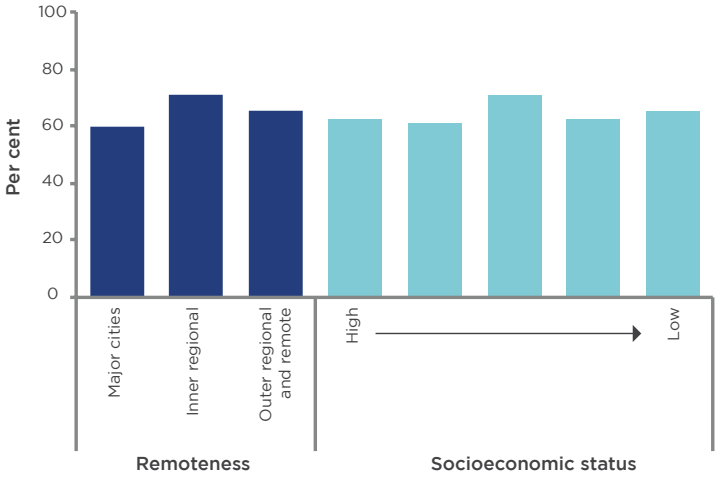
The Gadhu Family Health Centre provides Aboriginal maternal and child health services in one location. The space was purpose built and designed to be culturally appropriate to promote safe provision of services for Aboriginal families. The space allows for the integration of a variety of services in one location, including the Aboriginal Maternal and Infant Health Service and Building Strong Foundations.



First antenatal visit before 14 weeks gestation, trend



First antenatal visit before 14 weeks gestation, Aboriginal mothers, 2016



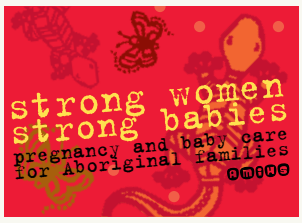
ANTENATAL CARE

Antenatal care is tailored to a woman's needs. It includes regular check-ups with a doctor or midwife, early detection and treatment of medical conditions through screening, as well as monitoring risk factors that can affect the health of the mother and her unborn baby, and advice to promote healthy lifestyles that benefit both mother and child.[6,7] It is important to have the first antenatal visit early, preferably in the first three months of pregnancy, so that any problems can be detected and managed early.

Early commencement of antenatal care is rising in Aboriginal mothers. In 2016, 65% of Aboriginal women had their first antenatal visit before 14 weeks of pregnancy compared with 51% in 2012. Between 2012 and 2016, the gap between Aboriginal and non-Aboriginal mothers fell by 8 percentage points, from 11% to 3%.

Access to antenatal care for Aboriginal mothers is not strongly associated with social advantage or disadvantage. In 2016, Aboriginal mothers in the most socially disadvantaged areas were slightly more likely to have their first antenatal visit before 14 weeks gestation compared with those living in the least disadvantaged areas (65% versus 62%). Access to antenatal care varied by geographic remoteness with 60% of Aboriginal mothers in major cities having their first antenatal visit in the first 14 weeks of pregnancy compared with 71% in inner regional areas and 65% in outer regional and remote areas.

Aboriginal Maternal and Infant Health Service (AMIHS)



AMIHS is a culturally safe maternity service for Aboriginal families in NSW. Aboriginal health workers and midwives work collaboratively with other services to provide continuous, high quality antenatal and postnatal care, health promotion and parenting advice. AMIHS teams provide care from as early as possible in pregnancy through to eight weeks after birth. The care is provided in the community but is linked into mainstream maternity services. AMIHS operates in over 40 sites across NSW, delivering services to mothers of Aboriginal babies in over 80 locations.

Armabubs at Armajun

The Armajun Aboriginal Health Service, in the New England region, runs the Armabubs program. This is a weekly get together for pregnant women to ensure new mothers feel confident and connected with their health care service after their babies are born. Activities such as belly casting and mother's group yarning sessions have encouraged new mothers to come back for regular care and routine check-ups with their newborns. The immunisation rate for babies in the Armabubs program is 99–100%.

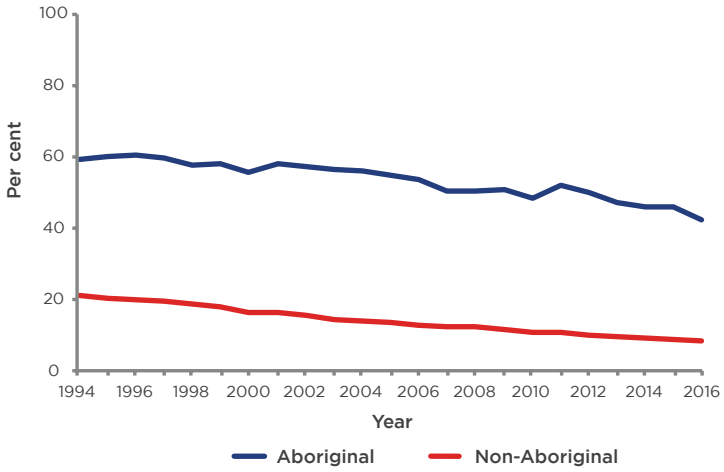
Get Healthy in Pregnancy

Get *Healthy in Pregnancy* is a tailored coaching program in the NSW Get Healthy Information and Coaching Service that aims to support pregnant women to achieve a healthy weight gain in pregnancy, with a module developed specifically for Aboriginal women. Healthy weight gain during pregnancy helps to minimise the risks of complications arising during and after pregnancy. The Program provides personalised support to pregnant women via telephone based health coaching, encourages healthy lifestyle goal setting and supports women to stay active and eat well during pregnancy. Promotion of the service as a referral pathway for AMIHS and Building Strong Foundations services is currently underway.

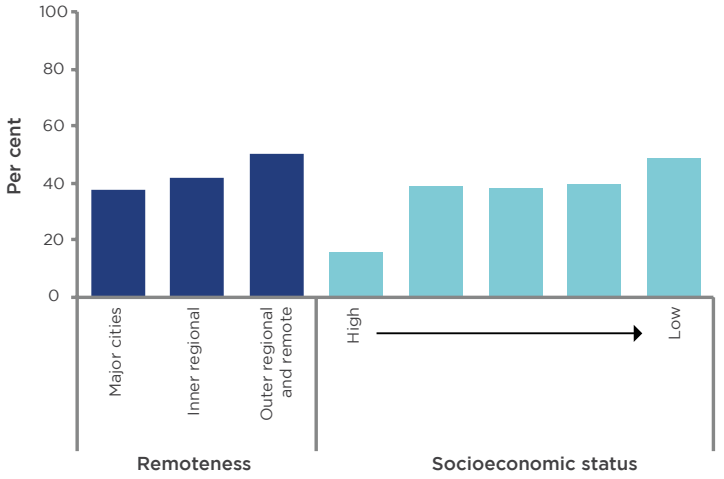
Stay Strong and Healthy it's worth it Project

The *Stay Strong and Healthy Project* aims to raise awareness about the risk of drinking alcohol among Aboriginal pregnant women, their partners and families. The project also promotes the availability of professional services, and the role of partners and family in supporting pregnant women and women with babies. Community and health professional information sessions in regional and metropolitan NSW and resources, including a story book, videos, and a Facebook page, provide ongoing education on the risk of drinking alcohol during pregnancy and Fetal Alcohol Spectrum Disorders (FASD).

Smoking in pregnancy, trend



Smoking in pregnancy, Aboriginal mothers, 2016



SMOKING IN PREGNANCY

Smoking is the leading cause of preventable death and disease in NSW, with Aboriginal people smoking at more than double the rate of non-Aboriginal people. It is the biggest contributing risk factor to cancer, and one of the strongest risk factors for heart attack and stroke. For pregnant mothers, smoking increases the risk of miscarriage, low birth weight, prematurity and stillbirth.[8] Smoking in pregnancy can also lead to respiratory problems in babies, such as asthma and pneumonia,[9,10] as well as middle ear infections (otitis media).[11] Nicotine exposure can affect the baby's brain, leading to health, behavioural and cognitive problems that persist later in life.[12] Smoking cessation is one of the most important measures that can be taken in pregnancy to help ensure a healthy start to life.[8]

Aboriginal mothers' smoking in pregnancy has fallen by a third over the last generation, from a peak of 61% in 1996 to 41% in 2016. However, in 2016 smoking in pregnancy remained about six times higher in Aboriginal mothers compared with non-Aboriginal mothers (41% versus 7%).

Smoking is strongly associated with social disadvantage. In 2016, Aboriginal mothers in the most socially disadvantaged areas were more than three times more likely to smoke in pregnancy compared with those living in the least disadvantaged areas (48% versus 15%). Smoking is also more common in rural and remote areas, with half (50%) of Aboriginal mothers in outer regional and remote areas smoking during pregnancy compared with 37% in major cities.

South Western Sydney LHD (SWSLHD): Quit for New Life

Quit for New Life (QFNL) is a best practice smoking cessation initiative that contributes to an increase in smoking cessation rates among mothers of Aboriginal babies and their household members. SWSLHD, with a relatively large Aboriginal population and a long history in tobacco control, has been a strong supporter of the initiative. Antenatally, QFNL has been implemented in the AMIHS and the Campbelltown and Liverpool hospitals. Postnatally, QFNL is delivered through teams in Community Health. Central to the implementation of QFNL across the District is the role of Smoking Care Advisor (SCA). The SCA provides intensive cessation support to mothers and their household members and provides support to clinical services to effect practice change and build confidence in providing brief intervention. A Steering Group has had a key role in customising QFNL to local conditions with cultural guidance from the District's Aboriginal Child and Family Committee.

Western NSW Local Health District: Yarning about Quitting with Aboriginal Pregnant Women in Western NSW

Implemented state-wide in 2015, the program builds the capacity of health workers to provide culturally appropriate smoking cessation advice to pregnant Aboriginal women and their families. The training is an integrated learning package including an online module, an audio-visual training resource, and a half day smoking cessation training workshop. The Yarning about Quitting training focuses on the Aboriginal cultural practice of having a yarn (coming together and talking), to gain a greater understanding of the client. The 'string exercise' is an example of an activity used in the Yarning training. Participants connect with each other by discussing the challenges they face when talking with clients about quitting smoking. When a participant shares a challenge, others who agree pass a piece of string to that person signalling they are not alone with that challenge.

Eleanor Duncan AMS: Strengthening capacity of the ACCHS sector to Tackle Tobacco

Since 2016, Aboriginal Community Controlled Health Services (ACCHSs) across NSW have been collaborating on Continuous Quality Improvement (CQI) initiatives to strengthen the capacity of the sector to deliver brief interventions and help community members quit smoking. In 2017, these efforts were strengthened through a new partnership between the Aboriginal Health and Medical Research Council of NSW (AHMRC) and Cancer Council New South Wales (CCNSW) to focus on Tackling Tobacco. Local links have been pivotal to the sustainability and success of the project, with funding grants enabling services to strengthen tobacco control foundations through initiatives such as policy review, staff training on data collection and analysis, provision of consistent quit support, and the purchase and use of dedicated tools and resources. Visual resources that help staff yarn with community members about stopping smoking have been especially powerful. Recently, Yerin (Eleanor Duncan Aboriginal Medical Service, Central Coast region) received an award from the AHMRC and Cancer Council NSW for their work on Tackling Tobacco in their local community.

INFANT HEALTH

The gap in the Aboriginal infant mortality rate has almost halved over the last decade

KEY ACHIEVEMENTS:

- The Aboriginal infant mortality rate decreased from 7.2 to 4.6 per 1,000 live births between 2005–2007 and 2014–2016
- The gap in breastfeeding among Aboriginal and non-Aboriginal babies has reduced by a third since 2012
- Acute gastroenteritis hospitalisation rates have reduced by more than a third in the last decade

In the last decade, there has been a substantial improvement in Aboriginal infant mortality, with the rate and gap almost halving over the last ten years. Further, there has been a one-third reduction in the gap in breastfeeding on discharge between Aboriginal and non-Aboriginal infants.

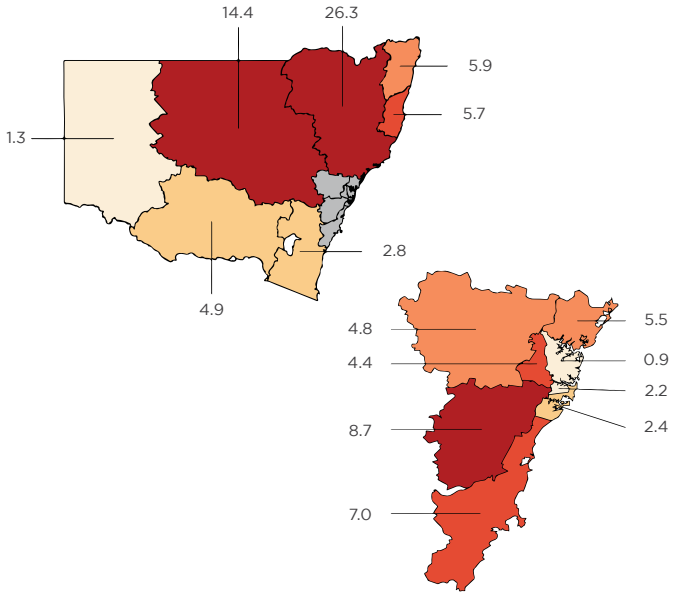
However, rates of low birth weight have remained stable since 2012. In addition, Aboriginal infants living in the most socially disadvantaged areas had hospitalisation rates for acute gastroenteritis almost 50 times higher than Aboriginal infants living in the least disadvantaged areas, demonstrating the large impact of social determinants on the health of Aboriginal infants. As Aboriginal people are under-reported on health data collections, it is possible that differences are greater than reported here (see *Data Sources* section).

After a baby is born, the mother, family and wider community play a vital role in ensuring a healthy start to life. Partnerships between communities and government health services support babies' healthy growth and development. Programs that tackle social determinants of health, such as *Building Strong Foundations, Breastfeeding: Good for Mum, Good for Bub* and the *New Directions Expansion Program* make important contributions. More broadly, access to culturally appropriate postnatal and family and child health services through government and community partnerships are key to ensuring that Aboriginal babies grow and develop into healthy vibrant children.

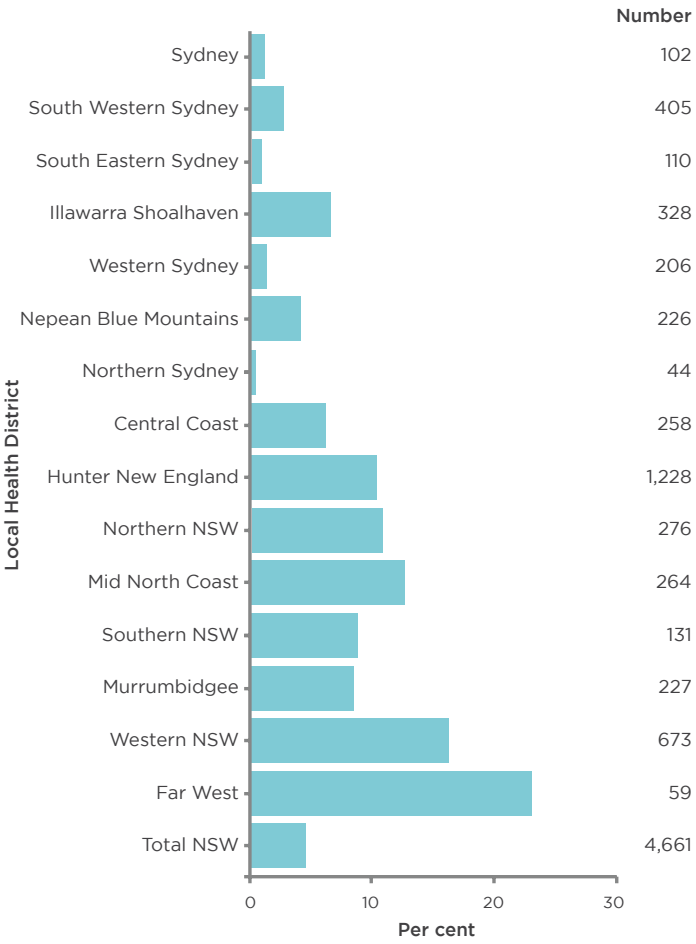
WHERE ABORIGINAL BABIES LIVE

In 2016, 4,661 Aboriginal babies were born in NSW, representing 5% of all babies. The percentage of babies born in each LHD who were Aboriginal varied from 0.4% in Northern Sydney LHD to 25% in Far West LHD. Hunter New England LHD had the largest number of Aboriginal babies, at 1,228, followed by Western NSW with 673 babies.

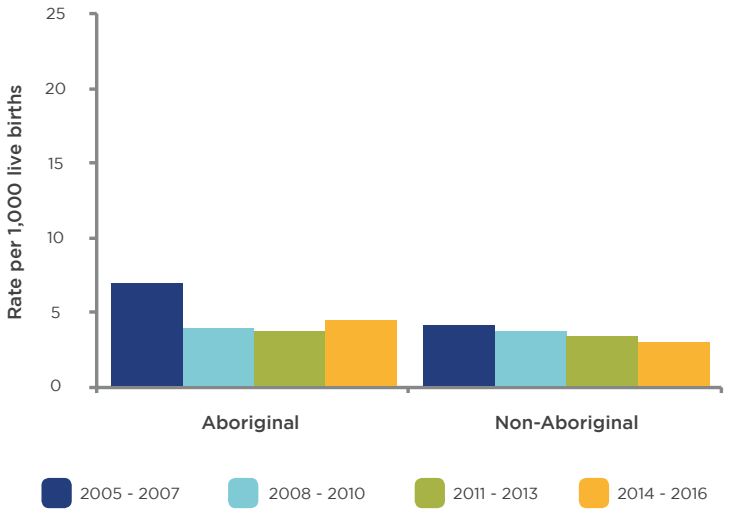
Percentage share of NSW Aboriginal babies in each local health district, 2016



Aboriginal babies in local health districts, 2016



Infant mortality, trend

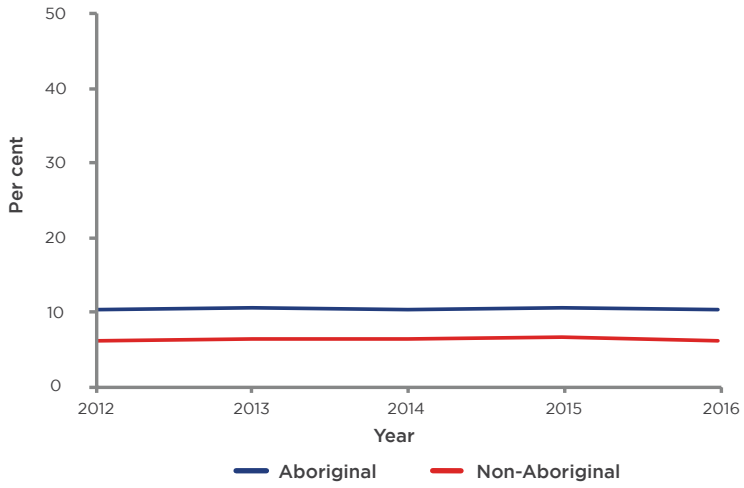


INFANT MORTALITY

Infant mortality is the number of deaths among children less than one year of age for every one thousand live births and is an important marker of the overall health of a nation.[13,14] The key risk factors that contribute to infant mortality include low birth weight, pre-term birth, maternal medical conditions, smoking, and alcohol consumption.[15,16]

Aboriginal infant mortality has almost halved between 2005–2007 and 2014–2016, falling from 7.2 to 4.6 deaths per 1,000 live births. The gap in mortality between Aboriginal and non-Aboriginal infants has also halved since 2005–2007. However, in 2014–2016 Aboriginal infants were still 50% more likely to die in the first year of life compared with non-Aboriginal infants (4.6 versus 3.1 per 1,000 live births). When interpreting infant mortality rates, it is important to note that the number of Aboriginal infant deaths is relatively small, with an average of 28 per year in 2005–2007 and 26 per year in 2014–2016. As a consequence, small changes in the number of deaths or increases in birth counts can lead to fluctuations in official statistics.

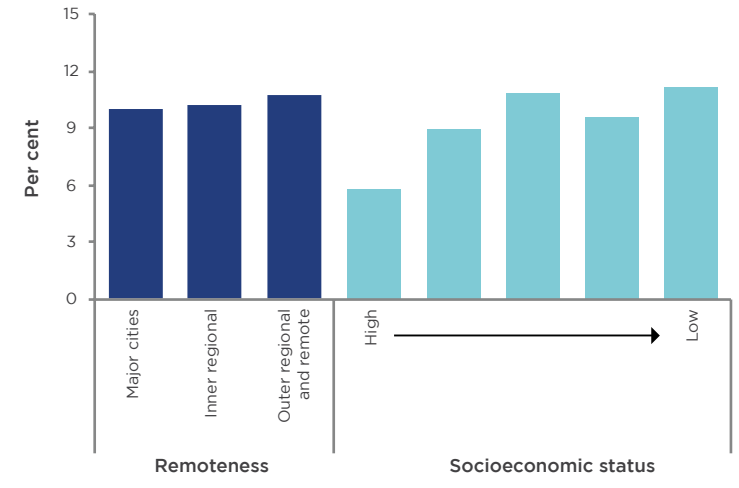
Low birth weight, trend



BIRTH WEIGHT

Both high and low birth weights pose risks to the development and long-term health of individuals, even into adulthood. High birth weight infants are more likely to be obese as children, as well as into adulthood.[17,18] While many babies born low birth weight (that is, less than 2.5 kilograms) will go on to develop normally, low birth weight babies are at risk of poorer developmental outcomes, with the impact of low birth weight still evident in adolescence.[19–21] There is also evidence that low birth weight infants are at a greater risk of developing a range of conditions in adulthood, coronary heart disease, kidney disease and type 2 diabetes.[22–25] Reducing smoking and alcohol consumption in pregnancy, a healthy maternal diet, and regular antenatal care to detect any problems early, will reduce the risk of low birth weight in babies.

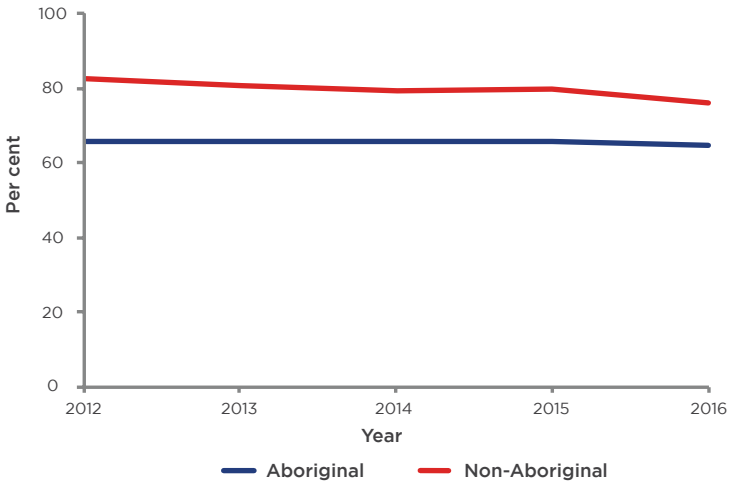
Low birth weight, Aboriginal babies, 2016



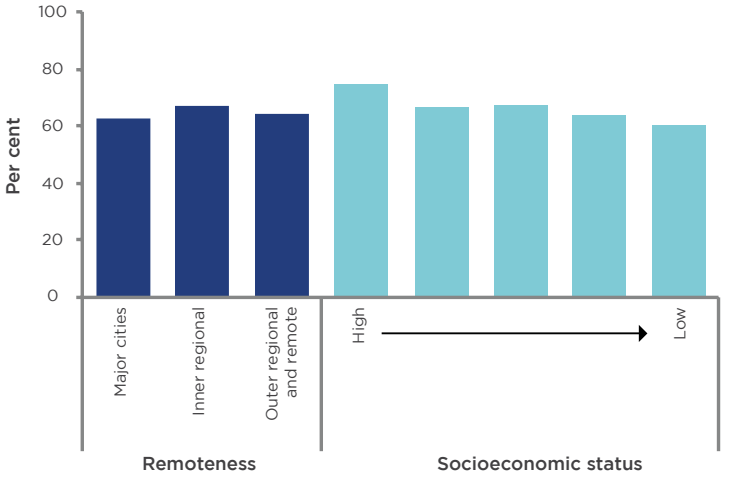
Low birth weight is almost twice as common among Aboriginal babies than non-Aboriginal babies, and this pattern has not changed in recent years. In 2016, 10% of Aboriginal babies were low birth weight compared with 6% of non-Aboriginal babies, with the gap between Aboriginal and non-Aboriginal babies remaining relatively stable at 4%.

Low birth weight in Aboriginal babies is more common in socially disadvantaged areas. In 2016, Aboriginal babies born to mothers living in the most socially disadvantaged areas were twice as likely to be low birth weight compared with the least socially disadvantaged areas (11% versus 6%). Aboriginal babies born to mothers living in the least socially disadvantaged areas had low birth weight rates similar to all non-Aboriginal babies (6%). Rates of low birth weight were similar for Aboriginal babies born to mothers living in major cities and outer regional and remote areas (10% versus 11%).

Breastfeeding, trend



Breastfeeding, Aboriginal babies, 2016



BREASTFEEDING

Breastfeeding gives babies the best start for a healthy life and has benefits for the health and wellbeing of both mothers and babies. Breastfed infants are less likely to have gastrointestinal infections, asthma, ear infections, and to be obese in later childhood.[26,27] For mothers, breastfeeding promotes mother-baby bonding, and can reduce the risk of developing breast cancer later in life, as well as help new mothers to return to their pre-pregnancy figure.[28,29] It is recommended that children be exclusively breastfed for the first six months of life.[30] Information on breast feeding in this section refers to breastfeeding on discharge from the hospital of birth.

Despite declines in breastfeeding rates for non-Aboriginal babies, from 82% in 2012 to 76% in 2016, breastfeeding rates for Aboriginal babies have remained stable at around 65%. As a consequence, the gap in breastfeeding rates has reduced by a third since 2012 (from 17% to 11%).

Breastfeeding is more common in more socially advantaged areas. In 2016, breastfeeding was highest among Aboriginal babies of mothers in the least socially disadvantaged areas and lowest in the most disadvantaged areas (74% versus 60%). Higher rates of breastfeeding were observed for Aboriginal babies in inner regional areas than major cities (67% versus 62% respectively).

Good for Mum Good for Bub

The NSW Ministry of Health is working in partnership with the Australian Breastfeeding Association to provide Deadly Dads workshops and the Aboriginal Community Breastfeeding Mentoring program. Birra-Li Aboriginal Maternal and Child Health Services have successfully run the Deadly Dads workshop and the Aboriginal Community Breastfeeding Mentoring program as part of the Good for Mum Good for Bub initiative. The Deadly Dad's program is a one day workshop run by Aboriginal men for Aboriginal men. The courses are attended by expectant fathers, fathers and grandfathers from different communities. The Aboriginal Community Breastfeeding Mentor Course trains mums, community members and family workers on how to support breastfeeding. Participants in both courses rated the program highly and felt they had developed confidence to breastfeed, or to support their partner's efforts.

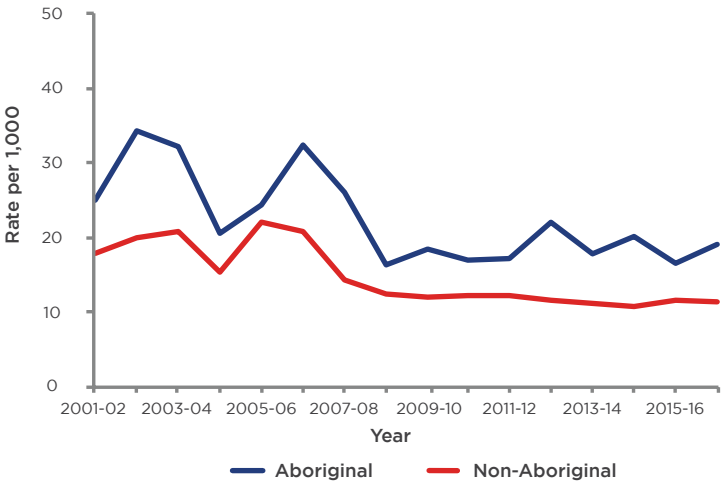
Southern NSW Local Health District: New Directions

Southern NSW's New Directions Expansion Program provides improved access to antenatal, postnatal, and early childhood services in the Eurobodalla region. The Program aims to increase access to antenatal and postnatal care, provide practical advice and assistance with breastfeeding, nutrition and parenting, monitor developmental milestones, immunisations and infections, and provide health checks and referrals to treatment for Aboriginal children.

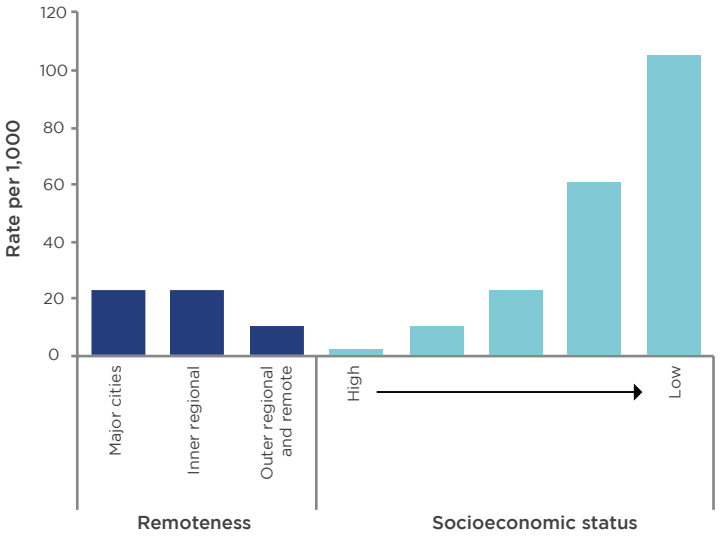
Awabakal Aboriginal Medical Service: Mums and Bubs Group

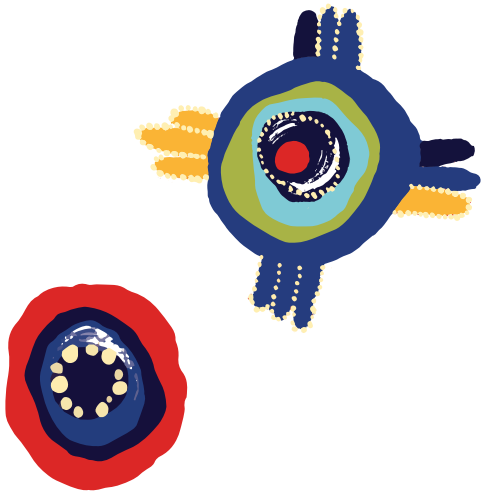
The Mums and Bubs group at Awabakal Aboriginal Medical Service (AMS), in the Newcastle area, provides an innovative platform for promoting access to comprehensive primary health care services for young families. In addition to the usual activities and support provided by mothers groups, Awabakal AMS offers both mothers and babies access to a wide range of services, including general consultations with GPs and Aboriginal Health Workers, immunisations, health checks, mental health care plans, women's health checks, and referrals to other services. Presentations by invited service providers provide advice and information on a range of topics, ranging from nutrition and dental care, to domestic and family violence, state debt recovery, and Centrelink support. Siblings participate in early education activities and mums are able to engage in other Awabakal AMS programs such as the NSW Knockout Health Challenge and the NSW Koori Netball Tournament. Awabakal AMS hopes to expand and duplicate this model of family engagement in other parts of Newcastle and the surrounding areas.

Acute gastroenteritis hospitalisations, trend



Acute gastroenteritis hospitalisations, Aboriginal infants, 2016





ACUTE GASTROENTERITIS

Acute gastroenteritis is an infection of the stomach and intestines that cause diarrhoea that may lead to dehydration. Acute gastroenteritis is a common cause of preventable hospitalisations in children, and is strongly associated with social disadvantage.[31] A vaccine against rotavirus, a common cause of gastroenteritis in young children, was added to the National Immunisation Program in 2007.[32] The vaccine is given to infants at six weeks of age, with a booster at four months of age. The microorganisms that cause acute gastroenteritis are most commonly transmitted from person to person or by eating contaminated food or drinking untreated water.

In 2016–17, hospitalisation rates for acute gastroenteritis were higher for Aboriginal infants compared with non-Aboriginal infants (19 versus 11 hospitalisations per 1,000 infants). Hospitalisation rates for Aboriginal infants have decreased by almost one-third since 2007–08. However, the gap in acute gastroenteritis hospitalisations between Aboriginal and non-Aboriginal infants has remained relatively stable since 2007–08.

In 2016–17, hospitalisation rates for acute gastroenteritis were almost fifty times higher among Aboriginal infants living in the most socially disadvantaged areas compared with the least disadvantaged areas (105 versus 2 per 1,000 infants). Hospitalisation rates for Aboriginal infants in major cities and inner regional areas were around double those of Aboriginal infants in outer regional and remote areas (23 versus 11 per 1,000 infants). These rates may not reflect the true burden of more severe gastroenteritis in regional and remote areas as people living in these areas may have difficulty accessing hospital services.

Building Strong Foundations for Aboriginal Children, Families and Communities (BSF)

BUILDING STRONG FOUNDATIONS FOR ABORIGINAL CHILDREN FAMILIES AND COMMUNITIES

BSF services provide culturally safe child and family health care to Aboriginal children, from birth to school entry age, and their families. Aboriginal health workers and child and family health nurses provide the service. BSF services can be provided in the home, local community health centre–clinic, or in a place where families, parents, carers and children feel safe and comfortable.

Families can access assistance and information on: breastfeeding, other feeding issues, their child's sleep and settling issues, their child's immunisations, childhood safety, their child's growth and development, and other parenting issues. BSF services are in 15 locations across NSW, with 11 services in rural and regional NSW.

Mister Germ

Mister Germ is a hand hygiene education package targeted to 3–12 year olds. The Mister Germ activities incorporate the use of glowing hand cream, that is only visible under UV light, to mimic germs and show the effectiveness of hand washing. Information is provided on when and how to wash your hands and how germs are transferred. Over 60 childcare centres in NSW regularly use the package in their educational programs. Mister Germ is also used by the Malpa young doctors program in Primary Schools, and by Local Health Districts and Public Health Units at various community events, family days and festivals across NSW. The Mister Germ package is flexible in its approach and delivery methods, and is currently being adapted for use in primary schools.

EARLY CHILDHOOD

Aboriginal children have higher rates of full immunisation at age five compared with non-Aboriginal children

KEY ACHIEVEMENTS:

- Aboriginal children at five years of age have higher rates of full immunisation than non-Aboriginal children (97% versus 94%)
- Since 2001–02, hospitalisation rates for influenza and pneumonia have decreased from 9.0 to 7.6 per 1,000 Aboriginal children
- The percentage of Aboriginal children receiving health assessments has almost tripled since 2010–11

The foundations of a healthy life that are laid down throughout pregnancy and birth are cemented during early childhood. This is an opportunity for partnerships between government and community health services to build on the resilience and strengths of Aboriginal people to close the gap in health and life expectancy. The last decade has proven to be particularly successful in immunising Aboriginal infants and children in NSW, with full immunisation rates exceeding those of non-Aboriginal infants and children. The percentage of Aboriginal children that received a health assessment has tripled since 2010–11: another remarkable achievement.

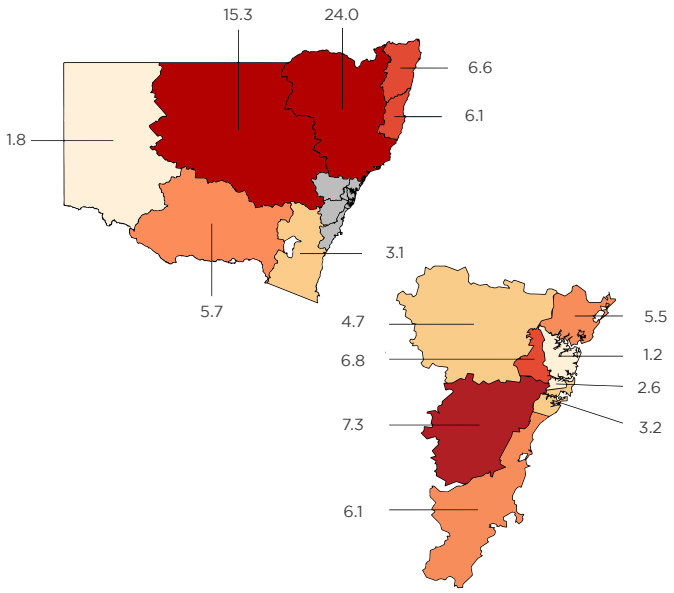
However, Aboriginal children are more likely than non-Aboriginal to be developmentally vulnerable, when assessed using the Australian Early Development Census. While rates of otitis media procedure hospitalisations have increased, this has occurred in the context of a burden of otitis media among Aboriginal children that is at least double that of non-Aboriginal children. As Aboriginal people are under-reported on health data collections, it is possible that differences are greater than reported here (see *Data Sources* section). Meanwhile, influenza and pneumonia hospitalisation rates have remained relatively stable for Aboriginal children since 2001–02.

The achievements in full immunisation represent the efforts of the Community Controlled Health Sector and NSW Health, including local interventions such as the *Armabubs* group at the Armajun Aboriginal Health Service and the state-wide *Aboriginal Immunisation Health Worker Program*. The continuous quality improvement project at Bila Muuji Aboriginal Corporation Health Services aims to improve the quality of care, including Aboriginal heath checks, while the *Healthy Start Program* at Maari Maa Health offers an integrated multidisciplinary child and family health service. Multi-sector approaches that consider the local context provide the best opportunity to sustain achievements in child health.

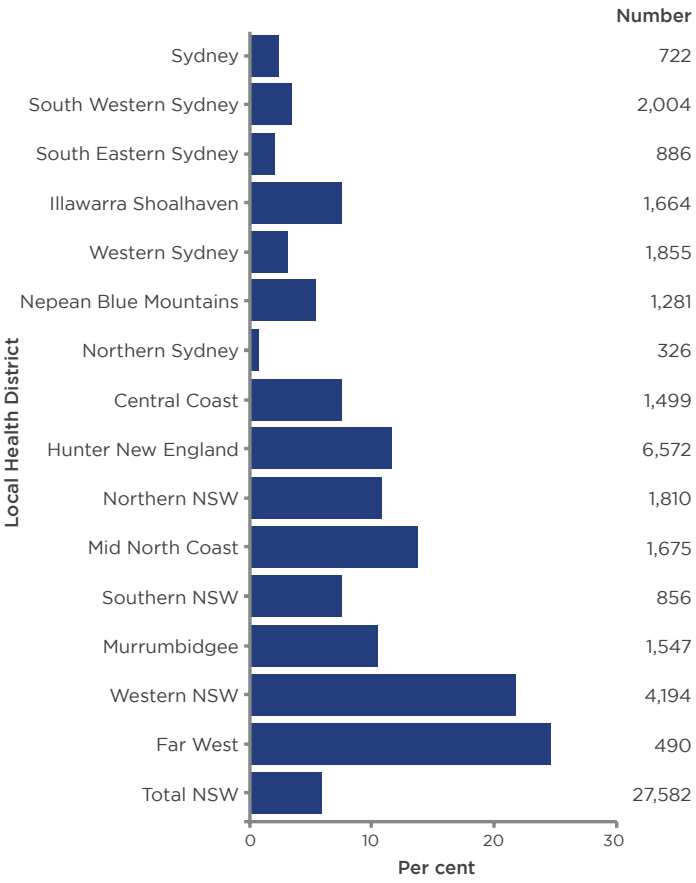
WHERE ABORIGINAL KIDS LIVE

In 2016, there were a total of 27,582 Aboriginal children under five years of age in NSW, representing 5% of all children under five years in NSW. The percentage of children in each LHD who were Aboriginal varied between LHDs, from 0.6% in Northern Sydney LHD to 25% in Far West LHD. Hunter New England LHD had the largest number of Aboriginal children under five years, at 6,572, followed by Western NSW LHD with 4,194 children.

Percentage share of NSW Aboriginal children under five years of age in each local health district, 2016



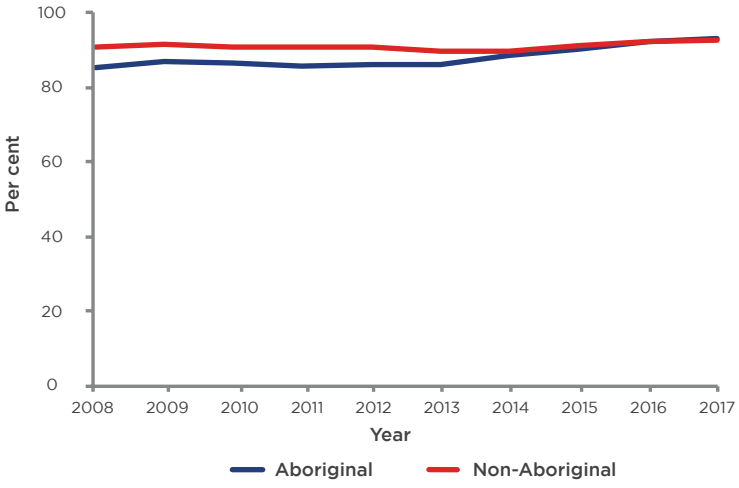
Aboriginal children under five years of age in local health districts, 2016



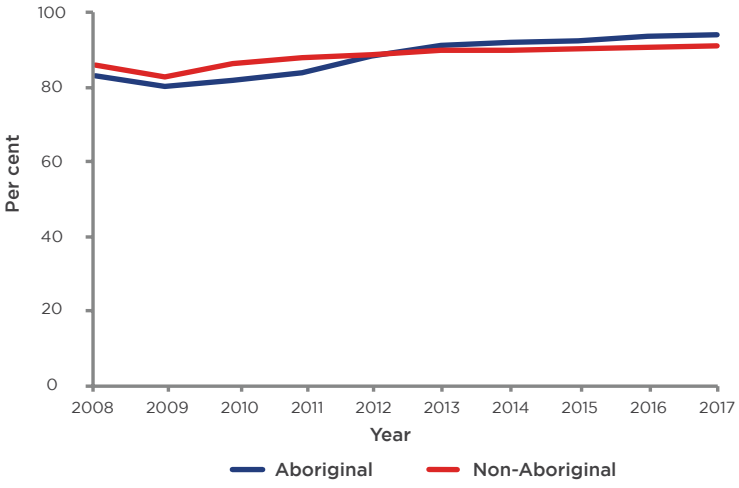
Scheduled vaccines for children up to five years of age

- Diphtheria
- Tetanus
- Pertussis
- Haemophilus influenzae type B
- Hepatitis B
- Polio
- Pneumococcal disease
- Rotavirus
- Measles
- Mumps
- Rubella (German measles)
- Varicella (Chickenpox)
- Meningococcal C (meningococcal ACWY from 1 July 2018)

Full immunisation, infants at one year of age, trend



Full immunisation, children aged five years, trend



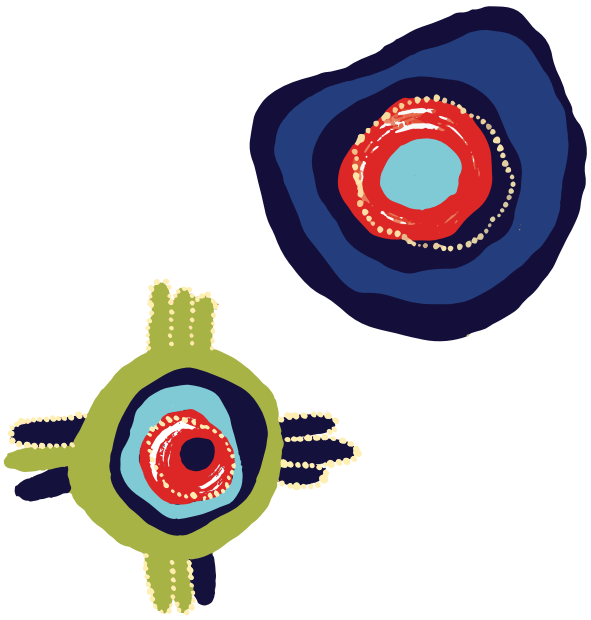
IMMUNISATION

Immunisation is the most effective way of protecting children against previously common life-threatening infections. High immunisation coverage prevents disease transmission and outbreaks, and reduces the risk of infection in people for whom immunisation may not be recommended.[33] The NSW Immunisation Program Schedule outlines the immunisations given at specific times throughout an individual's life, with the schedule extending into adulthood.[34]

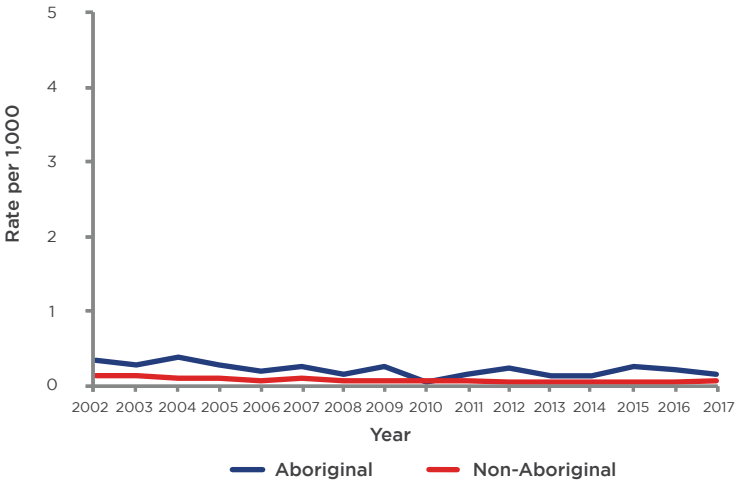
The NSW Annual Immunisation Coverage Report 2016 shows trends in immunisation coverage in children, adolescents and adults.[35] This report reflects the continued, successful delivery of the vaccination program across NSW. Improved vaccination coverage has been achieved through a number of strategies including the Save the Date to Vaccinate campaign and smartphone app, the Aboriginal Immunisation Healthcare Worker program and other strategies implemented in low immunisation coverage areas such as follow-up of overdue children.

Immunisation rates among Aboriginal infants at one year of age increased by 9% between 2008 and 2017, with the gap closed in 2015. By 2017, 94% of all infants were fully immunised at one year of age.

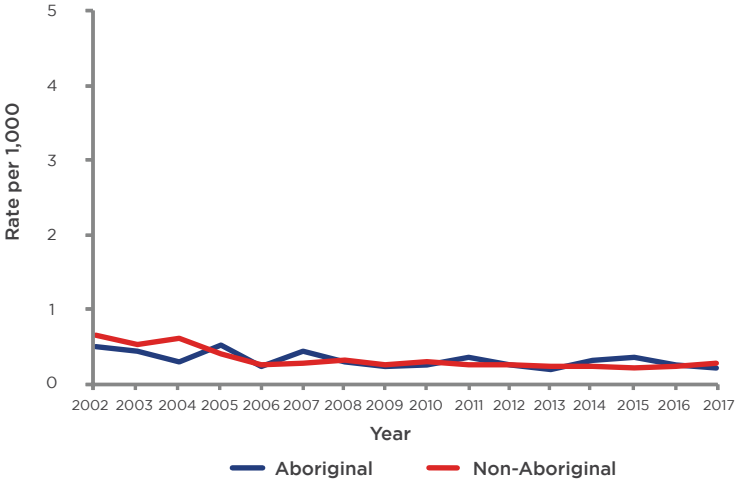
Since 2008, rates of full immunisation have increased by 13% for Aboriginal children five years of age, with immunisation rates 3% higher among Aboriginal children in 2017. In 2017, 97% of Aboriginal children had achieved full immunisation compared with 94% of non-Aboriginal children.



Invasive meningococcal disease, children under five years, trend



Invasive pneumococcal disease, children under five years, trend



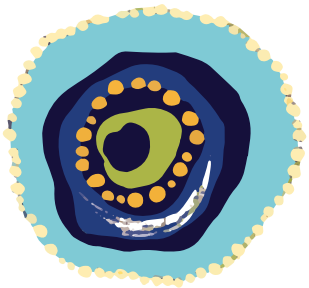
VACCINE PREVENTABLE DISEASES

Aboriginal children in Australia have higher rates of most vaccine preventable diseases than non-Aboriginal children.[36] This is likely due to both lower historical vaccination rates, and other factors such as large numbers of people sharing houses. In NSW, the introduction of effective vaccines has reduced the incidence of most vaccine preventable diseases, and is contributing to closing the gap in disease burden for Aboriginal children.

Meningococcal and invasive pneumococcal disease are severe bacterial infections that usually manifest as an infection of the blood (septicaemia) or swelling of the lining of the brain (meningitis). The meningococcal C vaccine was introduced into the National Immunisation Program in 2003, followed by a rapid reduction in disease due to this serogroup. In 2016, serogroup W became the predominant type in Australia, and from July 2018 a vaccine covering serogroups A, C, W and Y will replace the current vaccine on the National Immunisation Program.

Due to small numbers of notifications of meningococcal disease in Aboriginal children under five years of age (1–10 per annum) there is no consistent trend in the gap with non-Aboriginal children, however notification rates for invasive meningococcal disease tend to be higher in Aboriginal children.

Vaccination against pneumococcal disease was included on the National Immunisation Program for Aboriginal children in 2001 and for all children in 2005. Between 2002 and 2017, rates of invasive pneumococcal disease in Aboriginal children has remained low, with two to 11 cases in children under five years of age notified each year. Rates of other vaccine preventable diseases such as polio, diphtheria, tetanus, measles, rubella, and mumps are very rare (or absent) in Aboriginal children in NSW.



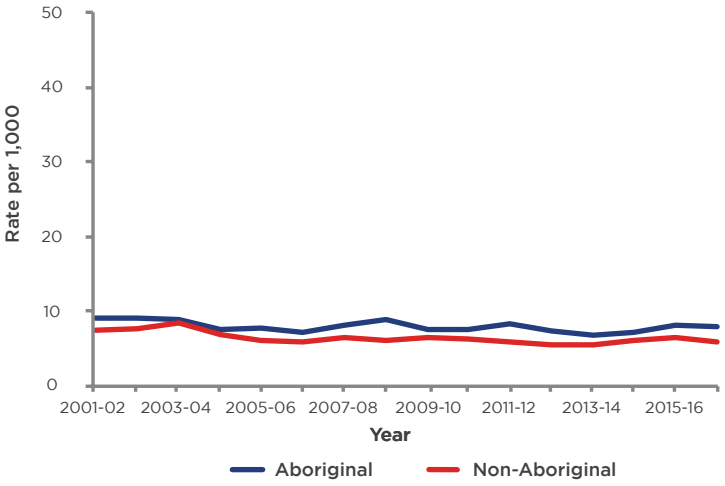
Aboriginal Immunisation Healthcare Worker Program

Since 2012, Aboriginal Immunisation Healthcare Workers (AIHW) have been employed in public health units across NSW to help improve the timeliness of vaccination and close the gap in immunisation coverage between Aboriginal and non-Aboriginal children. AIHWs work with families and health services to overcome barriers to help Aboriginal children get vaccinated on time, as well as promoting immunisation in Aboriginal communities, and increasing the reporting of Aboriginal children on vaccination records. Significant improvements in coverage rates and timeliness for Aboriginal children have been achieved, with the coverage gap between Aboriginal and non-Aboriginal children now closed in NSW.

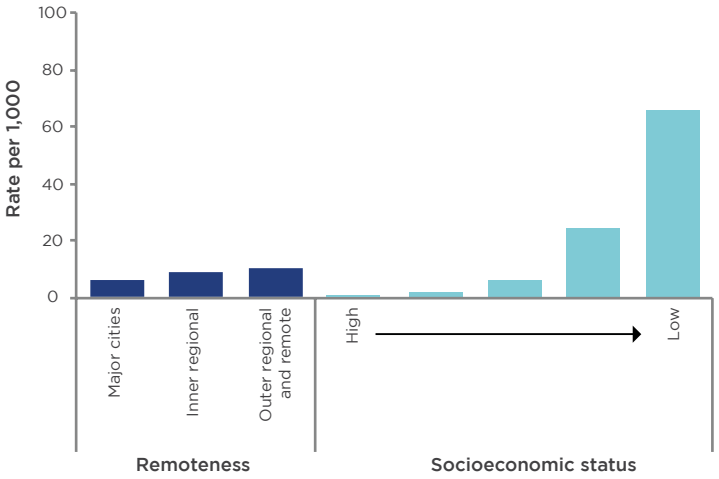
Western Sydney Local Health District: Improving immunisation among Aboriginal Children

In Western Sydney, the Aboriginal Immunisation Health Worker Program helped to establish organisational partnerships and networks with Aboriginal health workers in the District's Community Health Service, Family and Community Services, Baabayn Aboriginal Corporation and local Aboriginal childcare centres. Not only do these broader networks help the District improve immunisation rates for Aboriginal children in their area, they also allow for the broader delivery of other health promotion resources for Aboriginal children and their families.

Influenza and pneumonia hospitalisations, children under five years, trend



Influenza and pneumonia hospitalisations, Aboriginal children under five years, 2016-17



INFLUENZA AND PNEUMONIA

Influenza and pneumonia are respiratory infections that interfere with normal breathing. People who smoke, or are exposed to passive smoking, especially young children, are at higher risk of acquiring either influenza or pneumonia if not immunised. Since 2010, Aboriginal children from six months up to five years of age have been eligible for free annual influenza vaccines under the National Immunisation Program;[37] however measured uptake has been low. In 2018, NSW Health is funding free influenza vaccines for all children from six months up to five years of age.

Since 2001–02, hospitalisation rates for influenza and pneumonia have decreased from 9.0 to 7.6 per 1,000 Aboriginal children. In 2016–17, for children under five years of age, there were 7.6 hospitalisations for influenza and pneumonia per 1,000 Aboriginal children compared with 5.3 per 1,000 non-Aboriginal children. The gap in influenza and pneumonia hospitalisation rates is small and has remained relatively stable since 2001–02.

Hospitalisation rates for influenza and pneumonia were over 200 times higher for Aboriginal children living in the most socially disadvantaged areas, compared with children living in the least disadvantaged areas (66.2 versus 0.3 per 1,000 children). There were 5.8 hospitalisations for influenza and pneumonia per 1,000 Aboriginal children living in major cities compared with 10.1 per 1,000 Aboriginal children living in outer regional and remote areas.

Casino Aboriginal Medical Service Fruit and Vegetable Trial

Casino Aboriginal Medical Service, in collaboration with Housing for Health, provides fresh fruit and vegetable boxes to identified households. Families with young children or pregnant women, transport challenges, and known chronic health or dental conditions were the focus of the program. Casino Aboriginal Medical Service staff, including a nutritionist, social worker, and Aboriginal Health Workers, deliver the boxes during home visits and communicate with families to identify their support needs. The program has reduced social isolation for vulnerable families and improved immunisation rates.

Save the Date immunisation campaign

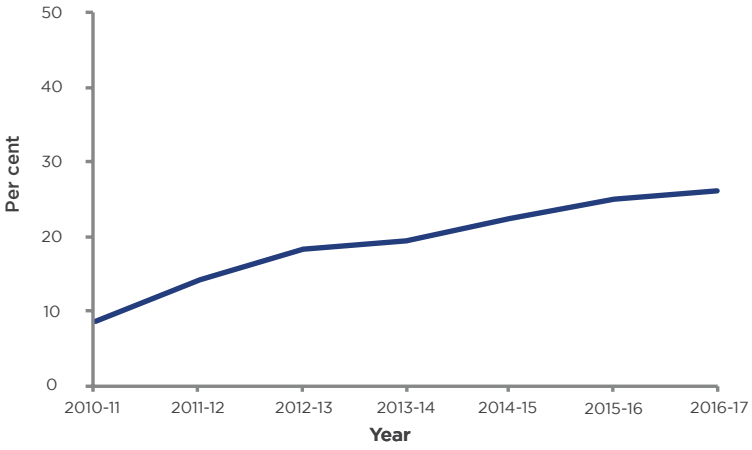
The *Save the Date immunisation campaign* is an annual campaign that aims to improve understanding of the importance of timely immunisation among all parents. The campaign includes components that specifically target Aboriginal families. In addition to the campaign, a smartphone application has been developed for all major mobile operating systems which reminds parents of the immunisation schedule.

Housing for Health

Housing for Health is a health-focused program that aims to improve the health and safety of people, especially children under five years of age, by ensuring they have access to safe and well functioning housing and an improved living condition. This program primarily focusses on Aboriginal community housing and is run by NSW Health with Aboriginal communities across NSW.

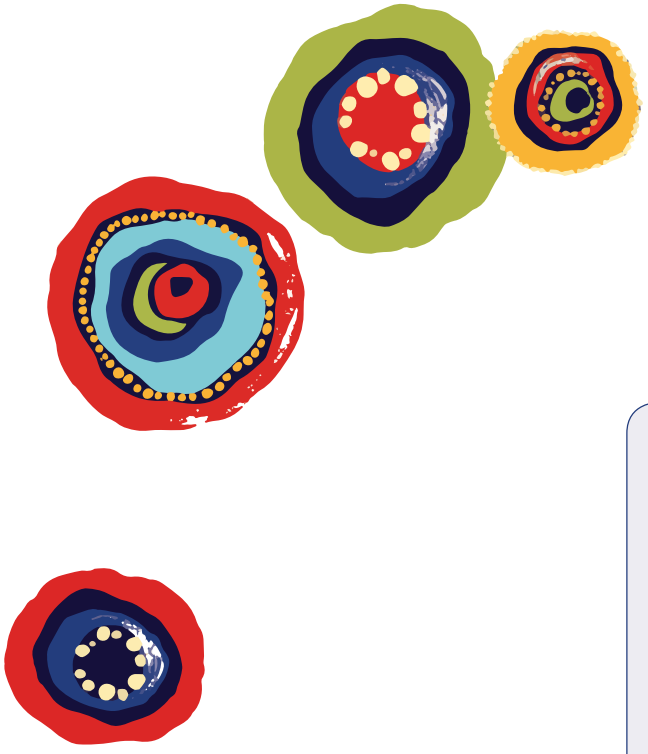
The Housing for Health projects aim to improve the functionality of the houses so that it is possible for all occupants to carry out basic healthy living practices, including: working bathroom facilities to wash people; working laundry facilities to wash clothing and bedding; ability to safely store, prepare and cook food; reducing the impacts of overcrowding; removing waste water safely; reducing the impact of animals, vermin or dust; controlling temperature and reducing hazards that can cause minor injuries.

Aboriginal health assessment, children under five years, trend



ABORIGINAL HEALTH ASSESSMENT

Health assessments for Aboriginal children under five years have almost tripled, from 9% in 2010–11 to 26% in 2016–17. The Medicare Health Assessment for Aboriginal and Torres Strait Islander People is a billing item funded by Medicare that is designed to help Aboriginal people receive primary health care matched to their needs.[38] The Health Assessment, which is specific to the patient's age, covers physical, psychological, and social wellbeing. The Commonwealth Government aims to have 69% of Aboriginal children under five attending general practice services for a health assessment by 2023.[39]



Bila Muuji Aboriginal Corporation Health Services: Continuous Quality Improvement Project

The Bila Muuji Aboriginal Corporation Health Services represent a group of Aboriginal Medical Services based in Western NSW, covering an area from the Queensland border to the north, Orange to the east and Forbes to the south. The Continuous Quality Improvement project is aimed at improving the constituent Medical Services' approach to improving the quality of processes of care, including development of an Aboriginal Health Check audit, which has led to improvements in the quality of Aboriginal health checks carried out in these health services.

Maari Ma Health: Healthy Start Program

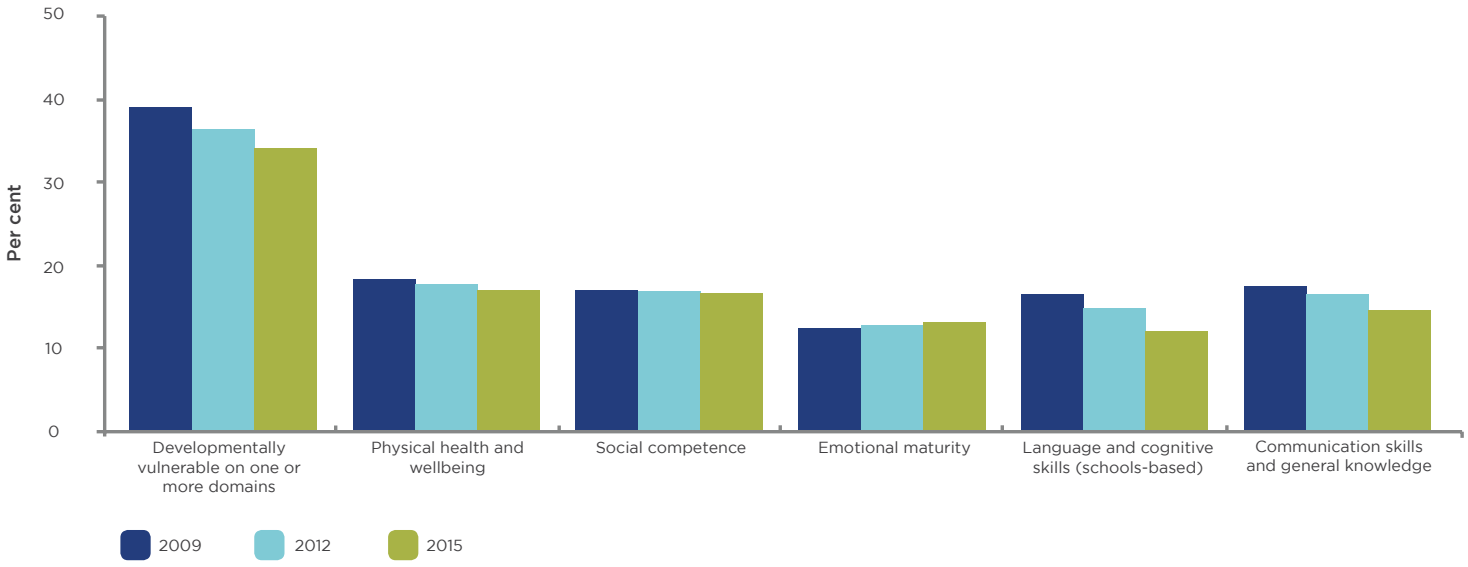
Maari Ma Health, based in Broken Hill, runs the Healthy Start Program, which is a maternal, child and youth health program delivering antenatal care and evidence-based standard, scheduled care services from birth to 15 years. The Program is complemented by an early learning and literacy program (the Early Years Project) that includes significant community engagement strategies. The first iteration of the Program focused on the implementation of nurse and Aboriginal Health Worker-administered child development health checks, and oral health checks delivered by the child dental team. Over a decade the Program has expanded and evolved into an integrated GP-clinically led multidisciplinary child and family health service featuring five core service components: Maternal Health, Child Health, Child Dental, Youth Health, and Early Years.

EARLY DEVELOPMENT

According to The Australian Early Development Census (AEDC), 34% of Aboriginal children were developmentally vulnerable in 2015 compared with 39% in 2009. This improvement is most marked in the domains that relate to language and cognitive skills (schools-based) and communication skills and general knowledge. There has been a 5 percentage point reduction in developmental vulnerability for language and cognitive skills from 17% to 12%, and a 3 percentage point reduction for communication skills and general knowledge from 18% to 15%. In 2015, 34% of Aboriginal children were developmentally vulnerable on one or more domains, compared with 19% of non-Aboriginal children.

The AEDC is a national measure of children's development, as they enter their first year of full-time school.[40] Development is measured by a teacher-completed questionnaire that assesses a child's physical health and wellbeing, social competence, emotional maturity, language and cognitive skills, and communications and general knowledge. Students that are assessed as being in the lowest 10% of all students are considered developmentally vulnerable on that specific domain.[41]

Developmentally vulnerable in each AEDC domain, Aboriginal children entering first year of school, trend



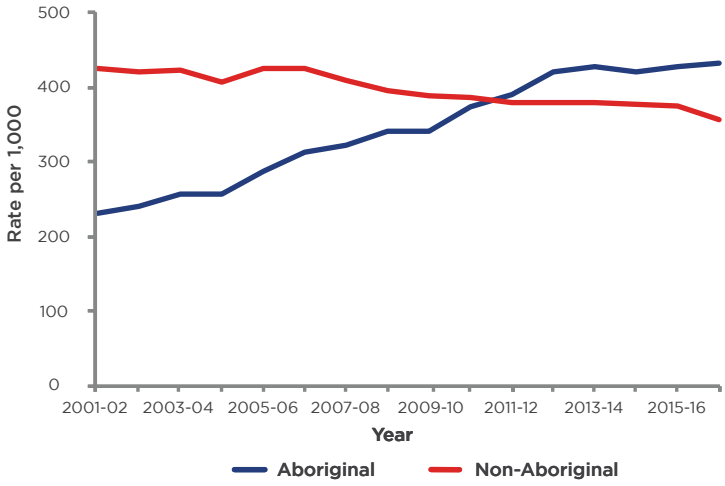
Orange Aboriginal Medical Service: Partnerships addressing the cultural and health needs of vulnerable Aboriginal children in NSW

In 2016, Orange Aboriginal Medical Service (OAMS) entered an agreement with their LHD and Family and Community Services (FACS), establishing OAMS as a mandatory health care provider for all Aboriginal children living in Out Of Home Care (OOHC) in the region. OAMS provides a range of services, including comprehensive primary health care, dental, hearing and optometry services on site, for children in OOHC as well as their non-Aboriginal carers. Care is offered to non-Aboriginal carers to improve connections between the OOHC sector and the Aboriginal community in Orange. OAMS is well placed to provide culturally safe and appropriate approaches to promoting and protecting the health and wellbeing of children in OOHC.

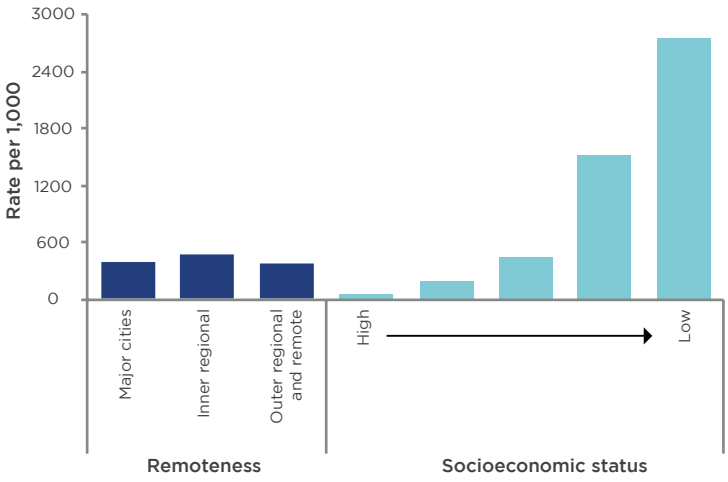
Maari Ma Health: Home Interaction Program for Parents and Youngsters (HIPPY)

Maari Ma Health, based in Broken Hill, runs HIPPY as part of their Early Years Project. HIPPY helps children develop skills in school readiness in the year before they start school and their first year of school. The Project also supports parents to become more confident as their child's first teacher, and to enrol their children in local preschools as an important step towards longer term school success.

Otitis media procedure hospitalisations, children under five years, trend



Otitis media procedure hospitalisations, Aboriginal children under five years of age, 2016-17



MIDDLE EAR INFECTION

Otitis media, or middle ear infection, can result in hearing loss that impacts on a child's learning and development. Otitis media occurs when the eustachian tube, which runs from the middle of the ear to the back of the throat, becomes swollen or blocked and traps fluid in the middle ear. Unless the swelling or blockage can be reversed, this trapped fluid may become infected. Swelling or blockage of the eustachian tube is associated with passive smoking, allergies, influenza and sinus infections.[42]

The rate of otitis media in the community among Aboriginal children is at least double that of non-Aboriginal children.[43] Treatment of otitis media where admission to hospital was required usually involves draining infected fluid via a tube inserted into the eardrum (myringotomy). Additional work to correct damage to the middle ear and restore the integrity of the eardrum and bones of the middle ear may be required (tympanoplasty).

Since 2001-02, the hospitalisation rate for otitis media procedures for Aboriginal children have increased from 238 to 433 per 1,000 children and are now more common than in non-Aboriginal children. Higher otitis media procedure rates in Aboriginal children are expected, to address the higher burden of otitis media in Aboriginal children. In 2016-17, for children under five years of age, there were 433 hospitalisations per 1,000 Aboriginal children for otitis media procedures compared with 358 per 1,000 non-Aboriginal children.

Hospitalisation rates for these procedures were almost 100 times higher for Aboriginal children living in the most socially disadvantaged areas compared with the least disadvantaged areas (2,789 versus 29 per 1,000 children). In 2016–17, there were 428 hospitalisations for otitis media procedures per 1,000 Aboriginal children living in major cities compared with 419 per 1,000 Aboriginal children in outer regional and remote areas.

NSW Aboriginal Ear Health Program

The NSW Aboriginal Ear Health Program aims to prevent middle ear infections in Aboriginal children. Health promotion, screening, and early intervention strategies are implemented in public maternity and child and family health services and in Aboriginal community-controlled health organisations. In addition, the *Healthy Ears, Happy Kids* initiative has been developed to support the Aboriginal Ear Health Program. The resources consist of a poster, brochures, a story book, and stickers.

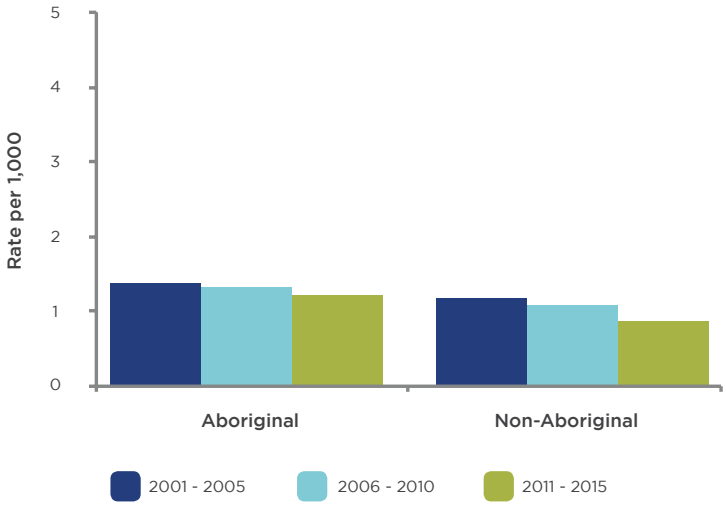
NSW Rural Doctors' Network: Healthy Ears—Better Hearing, Better Listening program

The *Healthy Ears—Better Hearing, Better Listening program* aims to improve access to ear and hearing services for Aboriginal children and youth, with a focus on rural and remote locations. The program supports multidisciplinary outreach services provided by a range of health professionals, including medical specialists, GPs, nurses, audiologists and speech pathologists.

Riverina Medical and Dental Aboriginal Corporation (RivMed): Face Stand

The RivMed Face Stand was designed as a fun, interactive and practical resource to help children to independently manage their own ear health. Child-friendly and practical health promotion activities are used in clinical rooms, waiting areas, school screening programs, outreach programs or community and organisation events to educate children on how to blow their nose and clean their hands using the tissues and hand sanitiser provided. Informational resources provided in the RivMed Face Stand include *Healthy Ears, Happy Kids* stickers, *Care for Kids' Ears* colouring pages and brochures, and *Deadly Ears, Deadly Listening* temporary tattoos.

Deaths from all causes, children under five years of age, trend



UNDER-FIVE MORTALITY

Since 2001–2005, the Aboriginal under-five mortality rate has declined slightly, from 1.3 to 1.1 deaths per 1,000 children. In 2011–2015, the Aboriginal under-five mortality rate was 1.1 deaths per 1,000 children, compared with 0.8 per 1,000 for non-Aboriginal children. It should be noted that the number of deaths in Aboriginal children under-five was small, with an average of 31 per year in 2001–2005 and 29 per year in 2011–2015. Small changes in the number of deaths and increases in the reported Aboriginal population can lead to large fluctuations in official statistics.

CHILDHOOD OVERWEIGHT AND OBESITY

The SEARCH Study found that 34% of urban Aboriginal children in the study were overweight or obese at baseline data collection between 2008 and 2012.[44] Childhood obesity is a serious concern as obese children have a greatly increased likelihood of becoming obese adults.[17,18] Overweight and obesity increases the risk of developing chronic disease, including diabetes, high blood pressure, heart disease and some cancers. Obese adults who were overweight as children also have higher levels of weight-related health problems, and a higher risk of preventable mortality than those obese adults who only became obese in adulthood.

The early childhood years are therefore the time to establish patterns of good eating and exercise, patterns which can help people to live long and healthy lives. The home environment and early childhood services and programs support the development of healthy nutritional and exercise habits. Tackling Childhood Obesity is a Premier's Priority, with a significant focus on reducing rates of overweight and obesity among 5–16 year olds by 5% by 2025. In order to meet this target, a number of whole of government and multi-sectoral programs have been established to address risk factors for obesity in early childhood.

Aboriginal Go4Fun

Aboriginal Go4Fun is a family-based healthy lifestyle program which aims to improve health, fitness and self-esteem of participants. The program follows a co-delivery model and encourages capacity building. The delivery model requires that LHDs enter into partnership agreements with local Aboriginal organisations and work together with those organisations throughout the implementation of the program. The program targets Aboriginal families with children aged 7–13 years who are above a healthy weight, and includes practical advice on nutrition, physical activity and behaviour change strategies.

Northern NSW: Healthy lifestyle

The Healthy lifestyle program is a partnership between Northern NSW LHD, Aboriginal Medical Services and other non-government organisations in the area that are attempting to improve the health outcomes of their clients through exercise and healthy eating. The partnership supports client referrals to programs such as the Get Healthy Coaching Service, Go4Fun, and Quit for New Life.

Bulgarr Ngaru Medical Aboriginal Corporation: Fruit and vegetable program

The Aboriginal Medical Service in Richmond Valley, in collaboration with NSW Health, has implemented a program to assist identified households to eat more fresh fruit and vegetables. Families with young children or pregnant women in the communities of Casino, Box Ridge, Muli Muli and Jubulam are the focus of the program. Medical Service staff conduct health assessments on all family members and with the support of local greengrocers provide a subsidised voucher for a box of fresh fruit and vegetables for the family each week. A nutritionist, social worker and Aboriginal Health Workers communicate with families to identify their support needs. The program, which includes cooking lessons and involvement in child exercise groups, has increased fruit and vegetable consumption and resulted in greater interaction between some vulnerable families and the local health services.

ORAL HEALTH

Tooth decay is one of the most common chronic illnesses among young children and can affect a child's development and wellbeing. About one quarter of children experience tooth decay that requires filling by early primary school and one in ten require extraction of teeth.[45,46] Establishing good oral health habits during early childhood offers the greatest opportunity for prevention of disease and better health later in life. This includes having a dental check-up when their teeth first come through, or otherwise at 12 months of age. Routine and regular dental checks will help to detect any problems with teeth early on, and allow parents to make adjustments to their children's eating habits and lifestyle.

Northern Sydney Local Health District: Oral Health and Aboriginal Health pathway

Northern Sydney Local Health District, in conjunction with their local Aboriginal Medical Service, Bungee Bidgel, developed a pilot program which enabled all Aboriginal clients to have access to free dental care, regardless of whether they held a government concession card. The pilot program then expanded to focus on a whole of family approach and enable non-Aboriginal people on the same Medicare card to also be eligible for dental services.

Dental Assistant Workforce Development

Partnerships established between NSW Health, the Aboriginal Community Controlled Health Sector, the Poche Centre for Indigenous Health, and the Rotary Club of Sydney have led to an expansion in dental assistant workforce capability, through a financial assistance scheme for Aboriginal people interested in studying dental assistant work, including certificates in oral health promotion and dental radiography. Improved capability in the dental assistant workforce has already started to have an impact on the accessibility of oral health promotion services such as providing fluoride varnish in areas where fluoridated public water is not currently available.

INJURY PREVENTION

Injury is an important health issue for children and is a major contributor to hospitalisations in young children.[47–49] Since 2001–02, injury hospitalisation rates have increased from 12.1 to 20.8 per 1,000 Aboriginal children. In 2016–17, the rate of injury hospitalisation was higher for Aboriginal children compared with non-Aboriginal children (20.8 versus 12.3 per 1,000 children).

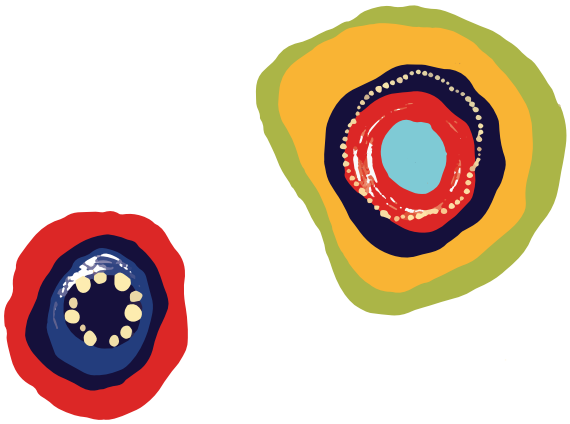
Given the diversity of causes and types of injuries, and the settings and circumstances in which they occur, injury prevention is best addressed through initiatives and programs that are cross-government and cross-sectoral.[47,48] Programs such as *Housing for Health, Building Strong Foundations*, and *Buckle up Safely*, which are managed across a variety of government agencies in partnership with Aboriginal communities, are instrumental in addressing the underlying social determinants that contribute to the disparity in injury hospitalisation rates.

Sydney Children's Hospital Network: Buckle-up Safely—Safe travel for Aboriginal children

The Buckle-up Safely program is an injury prevention pilot study that aims to increase the number of Aboriginal children travelling safely in road vehicles. The project, led by the George Institute for Global Health and delivered in partnership with local community organisations, provides subsidised car restraints, health promotion programs and engages the community in monitoring safe car restraint usage.

St Vincent's Hospital Network: Orthopaedics Outreach Clinic

The Orthopaedics Outreach Clinic, based at the Redfern Aboriginal Medical Service, includes the services of a physiotherapist and an orthopaedic surgeon to assess, treat and refer patients with orthopaedic and musculoskeletal injuries. The aims of the clinic are to improve access to specialist orthopaedic injury treatment, and to support early and appropriate referral to surgical and physiotherapy services at St Vincent's Hospital.



SUPPORTING INFORMATION

HOW LOCAL HEALTH DISTRICTS COMPARE

Before birth

Local Health District	Teenage mothers		Antenatal care		Smoking in pregnancy	
	1994	2016	2012	2016	1994	2016
	%	%	%	%	%	%
Sydney	24.2	8.1	59.6	76.7	54.5	41.9
South Western Sydney	20.3	10.1	44.2	60.7	68.4	38.1
South Eastern Sydney	10.3	7.1	55.7	50.0	48.7	34.8
Illawarra Shoalhaven	15.4	12.0	21.1	53.1	56.4	39.0
Western Sydney	22.2	9.7	42.5	38.8	67.6	47.7
Nepean Blue Mountains	18.2	9.5	52.5	49.1	54.5	34.5
Northern Sydney	23.1	2.5	34.8	70.0	30.8	5.0
Central Coast	18.8	11.9	36.5	43.4	43.8	31.4
Hunter New England	23.2	14.7	56.1	81.1	59.9	41.5
Northern NSW	19.1	14.2	58.6	76.9	64.3	40.4
Mid North Coast	22.0	15.4	55.8	76.5	62.4	40.6
Southern NSW	33.3	19.8	39.8	47.9	59.5	52.1
Murrumbidgee	30.9	14.4	60.4	60.5	63.0	45.6
Western NSW	24.6	13.2	55.4	62.1	59.6	45.4
Far West	20.5	9.5	58.7	73.8	64.1	71.4
Total NSW [a]	22.7	12.8	51.0	64.6	60.3	41.3

Infant health

Local Health District	Low birth weight		Breastfeeding on discharge		Acute gastroenteritis	
	2012	2016	2012	2016	2006/07	2016/17
	%	%	%	%	Rate per 1,000	Rate per 1,000
Sydney	12.8	13.7	68.8	59.8	11.6	37.4
South Western Sydney	7.3	10.6	59.1	47.9	31.6	30.2
South Eastern Sydney	7.3	7.3	72.7	65.5	21.5	21.4
Illawarra Shoalhaven	9.1	8.2	63.1	64.0	16.2	18.8
Western Sydney	14.1	9.2	52.7	51.5	60.1	18.4
Nepean Blue Mountains	11.2	9.3	63.9	62.4	20.3	39.7
Northern Sydney	5.0	4.5	76.7	81.8	0.0	0.0
Central Coast	12.0	8.9	70.7	73.6	8.4	7.1
Hunter New England	10.7	11.4	68.2	65.6	19.9	19.2
Northern NSW	11.2	7.6	78.8	76.4	52.9	30.7
Mid North Coast	8.8	9.5	73.2	75.0	37.8	3.4
Southern NSW	7.6	6.9	74.0	79.4	44.9	12.4
Murrumbidgee	8.7	12.8	58.5	57.3	51.5	34.1
Western NSW	10.4	11.3	59.4	60.8	47.5	12.8
Far West	6.5	5.1	48.4	59.3	21.2	9.6
Total NSW	10.2	10.2	65.6	64.1	33.1	18.9

Early Childhood

Local Health District	Full immunisation to five years		Otitis media procedures		Influenza and pneumonia	
	2008	2017	2006/07	2016/17	2006/07	2016/17
	%	%	Rate per 1,000	Rate per 1,000	Rate per 1,000	Rate per 1,000
Sydney	78.2	93.7	257.1	331.0	2.8	5.5
South Western Sydney	83.0	97.1	198.4	444.5	2.5	8.5
South Eastern Sydney	81.7	95.2	238.2	397.2	1.2	4.5
Illawarra Shoalhaven	87.5	97.4	317.7	474.7	4.0	9.0
Western Sydney	81.9	96.9	310.8	357.4	5.3	6.5
Nepean Blue Mountains	80.4	96.9	208.7	479.5	5.1	7.0
Northern Sydney	90.2	94.6	201.9	285.5	0.0	3.1
Central Coast	91.3	97.5	224.9	473.7	3.4	3.3
Hunter New England	83.7	97.0	287.9	493.3	8.2	11.0
Northern NSW	83.3	94.4	351.0	400.0	2.3	7.2
Mid North Coast	81.0	97.5	376.6	394.6	21.5	6.0
Southern NSW	81.4	95.5	320.1	371.4	5.8	5.8
Murrumbidgee	85.8	98.0	386.3	484.7	6.2	8.4
Western NSW	81.9	97.9	408.7	419.8	8.0	6.9
Far West	84.6	98.9	399.1	355.0	15.0	4.1
Total NSW	83.6	97.0	316.4	432.7	6.8	7.6

List of links to Indicators in this Report

Indicator	Link
Before birth	
Teenage mothers	http://www.healthstats.nsw.gov.au/Indicator/mab_mbth_age/mab_mbth_age_atsi_trend
Antenatal care	http://www.healthstats.nsw.gov.au/Indicator/mum_antegage/mum_antegage_atsi_trend
Smoking in pregnancy	http://www.healthstats.nsw.gov.au/Indicator/mab_smo_cat/mab_smo_cat_atsi_trend
Infant health	
Low birth weight	http://www.healthstats.nsw.gov.au/Indicator/mab_lbw/mab_lbw_atsi_trend
Breastfeeding on discharge	http://www.healthstats.nsw.gov.au/Indicator/mab_feed_cat/mab_feed_cat_atsi_trend
Acute Gastroenteritis	http://www.healthstats.nsw.gov.au/Indicator/com_gastrohos/com_gastrohos_atsi_trend
Early Childhood	
Full immunisation by five years	http://www.healthstats.nsw.gov.au/Indicator/com_immukid_age/com_immukid_age
Influenza and pneumonia	http://www.healthstats.nsw.gov.au/Indicator/res_infpneuhos/res_infpneuhos_atsi_trend

Footnotes:
[a] Total NSW includes non-NSW residents and residents of Albury LGA who had a health encounter in NSW.

INTERPRETING GRAPHS

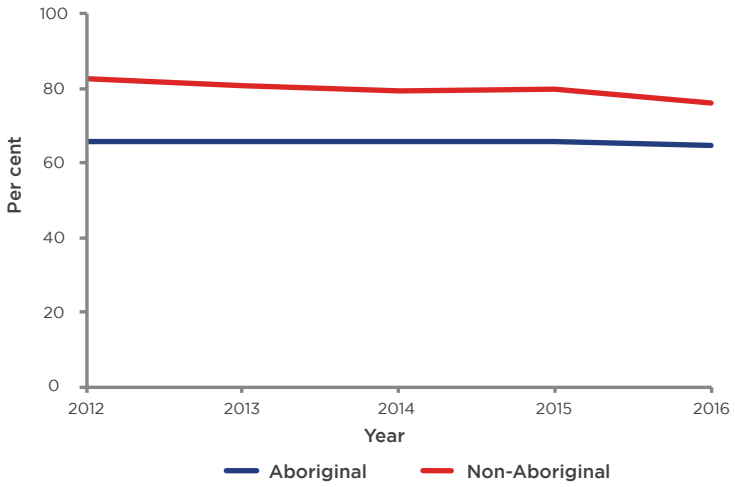
This report presents a selection of information on the health of mothers and babies, childhood immunisation, developmental vulnerability and common childhood diseases, and has attempted to present the longest possible trends based on available data. For the chapter *Before birth*, NSW Health has collected information on each mother's Aboriginality since the early 1990s. For the chapter *Infant health*, measures of low birth weight and breastfeeding were only able to be reported from 2012, which is when NSW Health started to collect information on Aboriginal babies.

In preparing this report, we found there were more Aboriginal babies than Aboriginal mothers in NSW, with about 35% of Aboriginal babies having a non-Aboriginal mother. We also found that some babies of Aboriginal mothers are reported as non-Aboriginal. In the chapter *Before Birth* we have provided statistics on Aboriginal mothers as we have data on long-term trends that tell an important story. However, we acknowledge that Aboriginal babies born to non-Aboriginal mothers are an important part of the story, and statistics for the period 2012 onwards are shown in the *Appendix* of the report for this group.

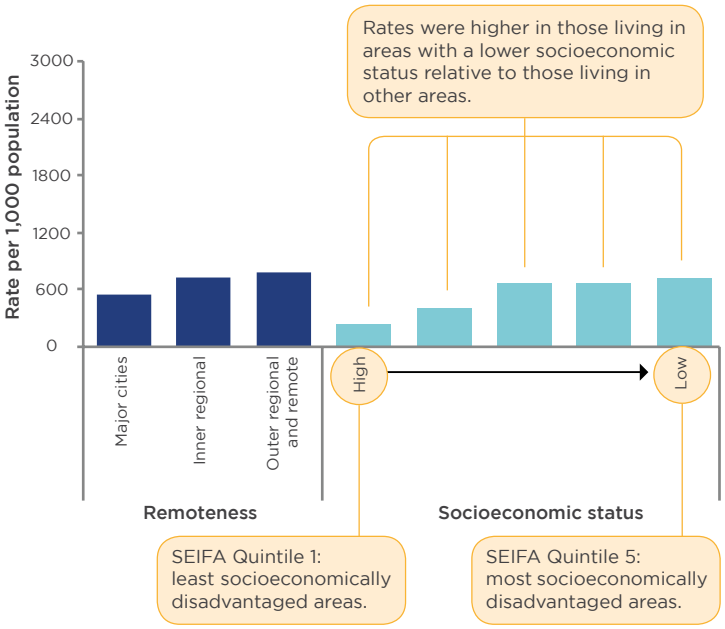
Throughout this report, two types of graphs have been used: trend graphs and equity graphs. Trend graphs are used to highlight changes in the rate of a health condition or outcome over time. Where possible, trend graphs have compared outcomes for the most relevant Aboriginal and non-Aboriginal population. Across all trend graphs, Aboriginal populations have been represented by a blue line, with non-Aboriginal populations represented by a red line.

By contrast, equity graphs only contain data relating to Aboriginal people. Rates for health conditions or outcomes for the relevant Aboriginal population have been further broken down into remoteness areas and socioeconomic status quintiles. Remoteness areas and socioeconomic status quintiles have been defined using data from the Australian Bureau of Statistics. Socioeconomic status has been defined based on the area of residence, and does not directly measure an individual or family's socioeconomic status but represents the context of the neighbourhood in which they live. The category "Low" represents Aboriginal people living in the most socioeconomically disadvantaged areas, with the category "High" representing Aboriginal people living in the least socioeconomically disadvantaged areas.

Example of a trend graph



Example of an equity graph, remoteness and socioeconomic status



DATA SOURCES

Reporting of Aboriginal people on health data collections

Aboriginal people are under-reported on administrative data collections. The Enhanced Reporting of Aboriginality (ERA) algorithm has been developed to monitor the level of reporting of Aboriginal people on NSW Health data collections. ERA uses information about an individual from multiple points of contact with the health system and creates a weight of evidence as to whether a person is considered Aboriginal for statistical purposes. The NSW Ministry of Health monitors and reports on the quality of reporting of Aboriginality across the Perinatal Data Collection,[50] and admitted patient[51] and emergency department data collections.[52] In 2016, it was estimated that 88% of Aboriginal mothers and 68% of Aboriginal babies were correctly reported as Aboriginal; in 2016–17, 89% of Aboriginal patients admitted to hospital were correctly reported as Aboriginal. The level of correct reporting varies across LHDs; information at an LHD level is available on the HealthStats NSW website.

Correct reporting of Aboriginal mothers and children relies on health staff asking patients about their Aboriginality at the point of heath care, and a patient or carer feeling safe in providing the information. NSW Health supports programs and activities designed to provide culturally appropriate health care, providing regular feedback to health services on data quality, and publication of information on data quality.

Admitted patient data

The NSW Combined Admitted Patient Epidemiology Data (CAPED) records all inpatient separations (for example discharges, transfers and deaths) from all public, private, psychiatric and repatriation hospitals in NSW, as well as public multi-purpose services, private day procedure centres, and public nursing homes. CAPED includes data on hospitalisations of NSW residents which occurred in public hospitals interstate.

Perinatal Data Collection

The NSW Perinatal Data Collection (PDC) is a population-based surveillance system covering all births in NSW public and private hospitals, as well as homebirths. The PDC is a statutory data collection under the *NSW Public Health Act 2010*. The PDC encompasses all live births, and stillbirths of at least 20 weeks gestation or at least 400 grams birth weight.

Cause of Death Unit Record File

The Cause of Death Unit Record File contains all deaths registered in NSW and includes demographic and cause of death information between 2006 and 2011.

Australian Immunisation Register

The Australian Immunisation Register is a national register administered by Medicare that records details of vaccinations given to people of all ages who live in Australia. Children who are enrolled in Medicare are automatically included on the Register. For more information, see the Australian Immunisation Register (https://www.humanservices.gov.au/individuals/services/medicare/australian-immunisation-register).

Notifiable Conditions Information Management System

The Notifiable Conditions Information Management System (NCIMS) is primarily used by public health units located across NSW to register communicable disease notifications. NCIMS provides state-wide data capture, management and reporting of scheduled medical conditions notifiable under the *NSW Public Health Act 2010* from general practitioners, hospitals, and pathology laboratories.

Australian Early Development Census

The Australian Early Development Census is a population-based measure of children's development as they enter their first year of full-time school, and takes place nationally every three years. Teachers complete the Australian version of the Early Development Instrument for each child in their class based on the teacher's knowledge and observations. For further information see http://www.aedc.gov.au/about-the-aedc/history/validation-and-trial-of-the-aedi/the-aedi-and-indigenous-children.

Population estimates

Population estimates produced by Prometheus Consulting Pty Ltd have been used for indicators that used the Combined Admitted Patient for Epidemiology Dataset. Population estimates for Aboriginal people from the 2016 Census were not available at time of publication. Between the 2011 Census and the 2016 Census, Biddle et al, estimated there was a 21% increase in the number of people reported as Aboriginal and/or Torres Strait Islander in NSW compared with 2011.[53] Analyses of hospitalisation rates used population estimates as at June 2015, and hence, will likely over-estimate hospitalisation rates for Aboriginal people.

METHODS

Secure Analytics for Population Health Research and Intelligence (SAPHaRI)

All NSW Health data sources have been accessed via Secure Analytics for Population Health Research and Intelligence (SAPHaRI). SAPHaRI is a data warehouse and an analysis tool based on SAS. It is managed by the Centre for Epidemiology and Evidence, NSW Ministry of Health, and employs sophisticated business intelligence technology to enable analysis of key health data sets.

Reporting on Aboriginal mothers and babies using the Perinatal Data Collection

The PDC has captured information on the mother's Aboriginality from 1990 and on the baby's Aboriginality from 2012. This allows us to report on Aboriginal mothers and Aboriginal babies. Information on the father's Aboriginality is not collected in the PDC. For the purposes of this report, the chapter 'Before birth' uses mother's Aboriginality and the chapter 'Infant health' uses baby's Aboriginality as the basis for defining the statistics. There is evidence to suggest there are different health outcomes for Aboriginal babies born to Aboriginal mothers compared with Aboriginal babies born to non-Aboriginal mothers. This is most

pronounced for smoking in pregnancy, where Aboriginal mothers with Aboriginal babies have the highest rates of smoking in pregnancy, followed by non-Aboriginal mothers with Aboriginal babies.

Further analyses of the impact of selecting different population groups is shown in the following table.

Selected perinatal health outcome measures, 'Before birth' chapter, trend

Year	Aboriginal mothers	Aboriginal babies	Aboriginal babies born to Aboriginal mothers	Aboriginal babies born to non-Aboriginal mothers	Non-Aboriginal babies
Teenage mothers					
2012	18.6	17.7	18.6	16.1	2.4
2013	17.6	17.1	17.6	16.3	2.1
2014	15.8	15.0	16.0	13.2	2.0
2015	15.4	14.1	15.7	11.1	1.8
2016	12.8	13.0	13.7	11.2	1.6
Smoking in pregnancy					
2012	49.9	44.9	50.3	34.8	8.6
2013	46.6	42.3	46.5	34.4	7.8
2014	45.2	42.4	46.3	35.0	7.3
2015	45.0	40.9	46.1	31.4	6.9
2016	41.3	41.5	45.1	32.6	6.5
Antenatal care in first trimester					
2012	51.0	52.2	50.8	54.8	61.8
2013	49.8	50.6	49.9	51.9	60.7
2014	54.4	55.1	54.7	56.0	60.1
2015	55.6	56.0	55.2	57.6	64.9
2016	64.6	65.8	64.8	68.2	68.1
Population size					
2012	3,348	5,105	3,316	1,789	94,305
2013	3,492	5,428	3,540	1,888	91,479
2014	3,756	5,459	3,574	1,885	91,848
2015	3,823	5,524	3,589	1,935	90,864
2016	4,118	4,661	3,332	1,329	91,724

Selected perinatal health outcome measures, 'Infant health' chapter, trend

Year	Babies born to Aboriginal mothers	Aboriginal babies	Aboriginal babies born to Aboriginal mothers	Aboriginal babies born to non-Aboriginal mothers	Non-Aboriginal babies
Low birth weight					
2012	11.0	10.2	11.0	8.8	5.9
2013	11.4	10.4	11.4	8.5	6.1
2014	11.3	10.1	11.1	8.2	6.1
2015	11.3	10.4	11.3	8.8	6.4
2016	10.8	10.2	11.1	7.8	6.0
Breastfeeding on discharge#					
2012	62.8	65.6	62.8	70.8	82.4
2013	62.8	65.5	62.7	70.6	80.2
2014	62.7	65.6	62.4	71.8	78.9
2015	62.7	65.5	62.2	71.5	79.2
2016	62.3	64.1	61.7	70.0	75.5
Population size					
2012	3,399	5,105	3,316	1,789	94,305
2013	3,542	5,428	3,540	1,888	91,479
2014	3,808	5,459	3,574	1,885	91,848
2015	3,872	5,524	3,589	1,935	90,864
2016	4,174	4,661	3,332	1,329	91,724

#Analyses restricted to live births.

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