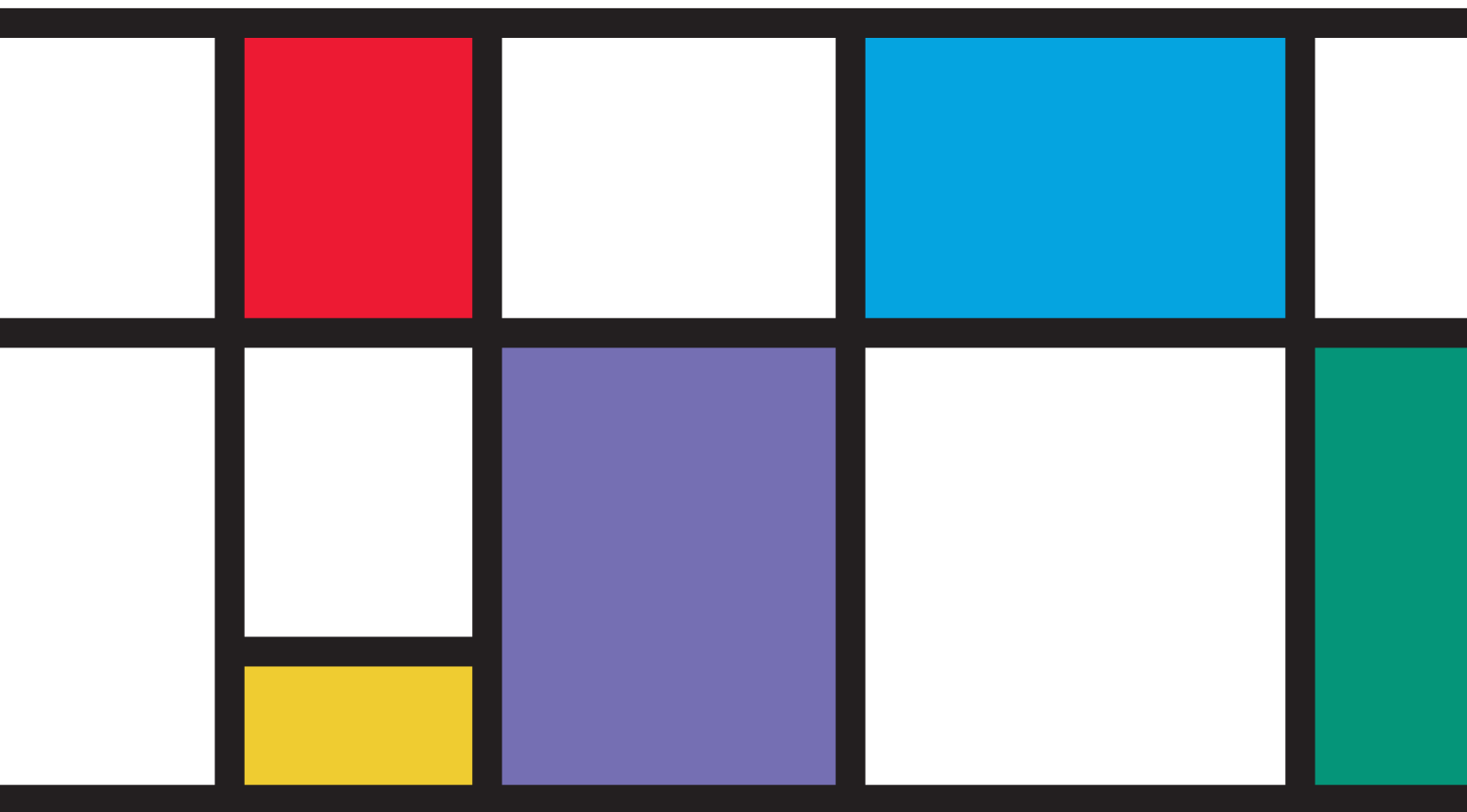


# The Health of Children and Young People in NSW

Report of the Chief Health Officer 2014



CENTRE FOR EPIDEMIOLOGY AND EVIDENCE  
NSW Ministry of Health  
Locked Mail Bag 961  
North Sydney NSW 2059

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# FOREWORD

**The importance of ensuring NSW children and young people grow up as healthy as possible, and adopt healthy behaviours early in life, cannot be overstated. Children and young people remain a key priority for the NSW Health system, reflected in the many population health initiatives focusing on this group and the establishment of NSW Kids and Families. It is paramount that these activities are well informed by robust population health data.**

*The Health of Children and Young People in NSW: Report of the Chief Health Officer 2014* applies a data-driven, population health approach to describe key health issues and health risk factors. It also provides information on available interventions for improving the health and wellbeing of NSW children and young people. The report adopts an equity lens to review health disparities across demographic groups such as age, sex, Aboriginality, socioeconomic status and remoteness.

Infant health is directly related to the health, health behaviours and care of mothers during pregnancy, while immunisation remains crucial in providing protection against previously common childhood infections. Healthy development continues throughout childhood and the teenage years, when individual health behaviours are formed and often become habitual. During these years, promoting positive health behaviours, through population health initiatives, can lead to improved long term health and wellbeing.

It is important to recognise how health issues vary by age and sex. Injuries and poisonings are major causes of hospitalisation and death across all age groups; however, the type of injury and poisoning differs markedly by age. In younger children, health care visits for asthma are common yet largely preventable, whereas from 17 years of age, maternity and mental health issues become increasingly dominant causes of hospitalisation.

Immunisation remains the cornerstone to protect the community from communicable diseases. Endemic measles has been eliminated in Australia yet outbreaks still occur with overseas travel. Notifications of meningococcal disease have declined since the National Meningococcal C Vaccine Program (2003–2004), severe disease due to epiglottitis and meningitis from *Haemophilus influenza* B have virtually disappeared, and the introduction of

rotavirus vaccine to the National Immunisation Program in 2007 has resulted in a substantial reduction in rotavirus notifications and hospitalisations due to gastroenteritis in children.

I am pleased to see smoking rates and alcohol consumption in young people continue to decrease, although high consumption of fast food and high energy drinks in teenagers remains a concern. The percentage of children and young people participating in the recommended amount of daily physical activity has increased slightly, while considerably more teenagers are spending less than 2 hours per day in sedentary behaviours.

Closing the gap in health behaviours, health outcomes and access to health services that exist between Aboriginal and non-Aboriginal children and young people is an ongoing priority for NSW Health. While there have been significant achievements in some areas, such as infant death rates, ongoing attention is required to address continued disparities in areas including:

- birth outcomes and the health of mothers and babies, including rates of perinatal death and low birth weight, access to timely and appropriate antenatal care, and rates of smoking during pregnancy
- hospitalisation for potentially preventable chronic diseases such as diabetes
- hospitalisation for mental health and intentional self harm
- risky behaviours, including excessive alcohol consumption and tobacco use.

Most importantly, this report affords us the opportunity to reflect on the health status and health issues of NSW children and young people today, and how we work together to improve public health policy and services.



**Dr Kerry Chant**

Chief Health Officer and Deputy Secretary  
Population and Public Health

October 2014

# NSW AT A GLANCE

**2.4**  
**MILLION**

CHILDREN AND  
YOUNG PEOPLE



**29%**

OF MOTHERS EXCLUSIVELY  
BREASTFEED THEIR BABY  
TO 6 MONTHS



**IMMUNISATION COVERAGE**  
**90% FOR 1 YEAR OLDS AND**  
**92% FOR 4 YEAR OLDS**

**80%**

OF EARLY CHILDHOOD CENTRES  
PARTICIPATE IN THE NSW  
HEALTHY CHILDREN INITIATIVE

OVER  
**3 IN 4**

CHILDREN  
VISITED A DENTAL  
PROFESSIONAL



**1 IN 10**

YOUNG PEOPLE  
REPORT HIGH  
LEVELS OF  
PSYCHOLOGICAL  
DISTRESS

FEWER  
YOUNG  
PEOPLE  
DRINK  
ALCOHOL  
AT LEVELS  
POSING A  
LIFETIME  
RISK

FEWER  
TEENS ARE  
GIVING  
**BIRTH**



**73%**

OF CHILDREN  
EAT ENOUGH  
**FRUIT**  
EACH DAY



**6%**

OF ALL BABIES  
BORN WERE LOW  
BIRTH WEIGHT



**1 IN 7**

CHILDREN  
HAVE CURRENT  
**ASTHMA**

**61%**

OF MOTHERS HAD THEIR  
FIRST ANTENATAL VISIT  
BEFORE 14 WEEKS GESTATION



**43%**

OF CHILDREN EAT ENOUGH  
**VEGETABLES** EACH DAY

# THE HEALTH OF CHILDREN AGED 0–15 YEARS AND YOUNG PEOPLE AGED 16–24 YEARS

CHILDHOOD  
OVERWEIGHT  
AND  
OBESITY  
HAS  
STABILISED



OVER  
**1 IN 4**  
CHILDREN ARE  
OVERWEIGHT  
OR OBESE



THE GAP BETWEEN ABORIGINAL  
AND NON-ABORIGINAL INFANT  
DEATHS HAS CLOSED



**3 IN 4**  
FAMILIES WITH  
DEPENDENT  
CHILDREN  
LIVE IN  
MAJOR CITIES

**18%**  
OF 16–24  
YEAR OLDS  
CURRENTLY  
**SMOKE**



**DIABETES** HOSPITALISATIONS  
ARE **36% HIGHER** IN ABORIGINAL  
CHILDREN AND YOUNG PEOPLE

**1 IN 7**  
HOSPITALISATIONS  
DUE TO INJURY  
OR POISONING

**SMOKING**  
RATE DURING  
PREGNANCY  
**5 TIMES HIGHER**  
IN ABORIGINAL  
MOTHERS



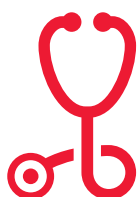
**1 IN 5** CHILDREN ARE  
DEVELOPMENTALLY  
VULNERABLE



OVER 1 IN 4  
STUDENTS AVOID  
SUNBURN IN SUMMER

**29%** OF CHILDREN  
PARTICIPATE IN ADEQUATE  
DAILY **PHYSICAL ACTIVITY**  
OUTSIDE OF SCHOOL HOURS

**84%** OF CHILDREN  
VISITED A  
GP IN THE  
LAST YEAR



APPENDIX 1, 2 AND 3:  
INTERPRETING FIGURES AND DATA,  
METHODS, AND INDICATOR DETAILS

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# INTRODUCTION

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*The Health of People in NSW: Report of the Chief Health Officer* series has been produced regularly since 1996 and is a flagship publication of the NSW Ministry of Health. Prior to 2012, the printed edition provided an overview of the health of the whole state population. From 2012 onwards, the printed edition changed, to provide an in-depth picture of the health of a particular sub-population or health issue. In 2012, the printed edition highlighted the health of Aboriginal people in NSW. In 2014, this printed edition highlights the health of children and young people aged 0–24 years in NSW.

Health in the early years of life provides a foundation for future health, development and wellbeing.<sup>1</sup> Severe illness, poor lifestyles, and exposure to factors that adversely affect the health of children and young people, may have far reaching consequences and result in poor health and adverse health behaviours in adulthood. The health and development of children and young people is a shared responsibility of parents, the wider community, and governments. NSW Health is committed to improving the health of children and young people, and supports a wide range of agencies, services, and health protection, prevention, and promotion initiatives dedicated to this task.

Timely, accurate and comprehensive information about the health of children and young people is critical to informing NSW Health services and initiatives, as well as guiding health priorities in the future. This report presents key population statistics, and health and health service delivery indicators. It condenses, and is intended to complement, a wealth of detailed information openly available on Health Statistics NSW ([www.healthstats.nsw.gov.au](http://www.healthstats.nsw.gov.au)). This interactive application allows users to access the data tables for most of the statistics presented in this report, in addition to providing further breakdowns of selected indicators—for example, by Local Health District—and many complementary indicators not presented in this report. Health Statistics NSW also allows users to tailor reports about the health of the NSW population for their own use.

The recently released *NSW State Health Plan: Towards 2021* provides a strategic framework which brings together NSW Health's existing plans, programs and policies and sets priorities across the system for the delivery of “the right care, in the right place, at the right time”. Many of the indicators presented in this report, and on Health Statistics NSW ([www.healthstats.nsw.gov.au](http://www.healthstats.nsw.gov.au)), link to this plan and the related plans developed on priority issues to improve outcomes for patients and the community including:

- NSW Tobacco Strategy 2012–2017
- NSW Aboriginal Health Plan 2013–2023
- NSW Skin Cancer Prevention Strategy 2012–15
- Oral Health 2020: A Strategic Framework for Dental Health in NSW
- NSW Healthy Eating and Active Living Strategy 2013–2018

This report contains 3 chapters:

- **Chapter 1** presents an overview of selected demographic characteristics, NSW births, and the living arrangements of NSW children and young people: a major determinant of their health
- **Chapter 2** provides information about the many risk factors and protective factors affecting the health of NSW children and young people at various stages in their life
- **Chapter 3** presents information on key health issues affecting NSW children and young people ranging from health service utilisation, to the causes of hospitalisation and death, to childhood development, selected chronic conditions, communicable diseases and injury

More information about NSW Health is available at [www.health.nsw.gov.au](http://www.health.nsw.gov.au).

# CHAPTER 1:

## Who are NSW children and young people and where do they live?

---



# POPULATION

**While the number of NSW children and young people is increasing, their percentage of the total population is decreasing**

## KEY POINTS:



The NSW population is ageing



Most children and young people live in urban areas



The Aboriginal population is younger than the non-Aboriginal population

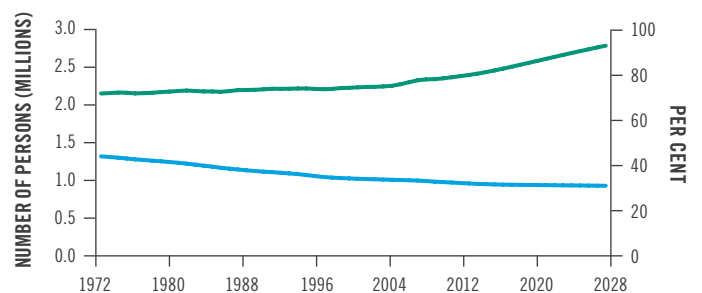


The majority of Aboriginal children and young people live in major cities and inner regional areas

In 2014, approximately 2.4 million residents of NSW were children and young people. While this number has increased over time, the percentage of the total population aged 0–24 years has declined (Figure 1.1). In 2014, this percentage varied substantially by Local Government Area, ranging from 19.8% in North Sydney to 39.0% in Armidale Dumaresq (Figure 1.2). Three-quarters of children and young people lived in major cities and less than 1 per cent lived in remote areas. The majority of Aboriginal children and young people live in major cities and inner regional areas (Table 1.1). However, a greater percentage of the Aboriginal population lives in regional and remote areas, compared with the non-Aboriginal population.

In NSW, the Aboriginal population is younger than the non-Aboriginal population, with about 36.2% of the Aboriginal population less than 15 years of age, compared with 18.8% of the non-Aboriginal population (Figure 1.3). The percentage of the Aboriginal population aged 65 years or older is approximately 4.2% compared with 14.9% of the non-Aboriginal population. This difference is because Aboriginal women have higher fertility rates (see *Chapter 1: Births*) and because life expectancy for Aboriginal people is around 9 years less than non-Aboriginal people.<sup>2</sup>

**FIGURE 1.1:** Population aged 0–24 years and percentage of the total population, NSW



Source: NSW estimated resident population projections

— Number of persons  
— Per cent of total population

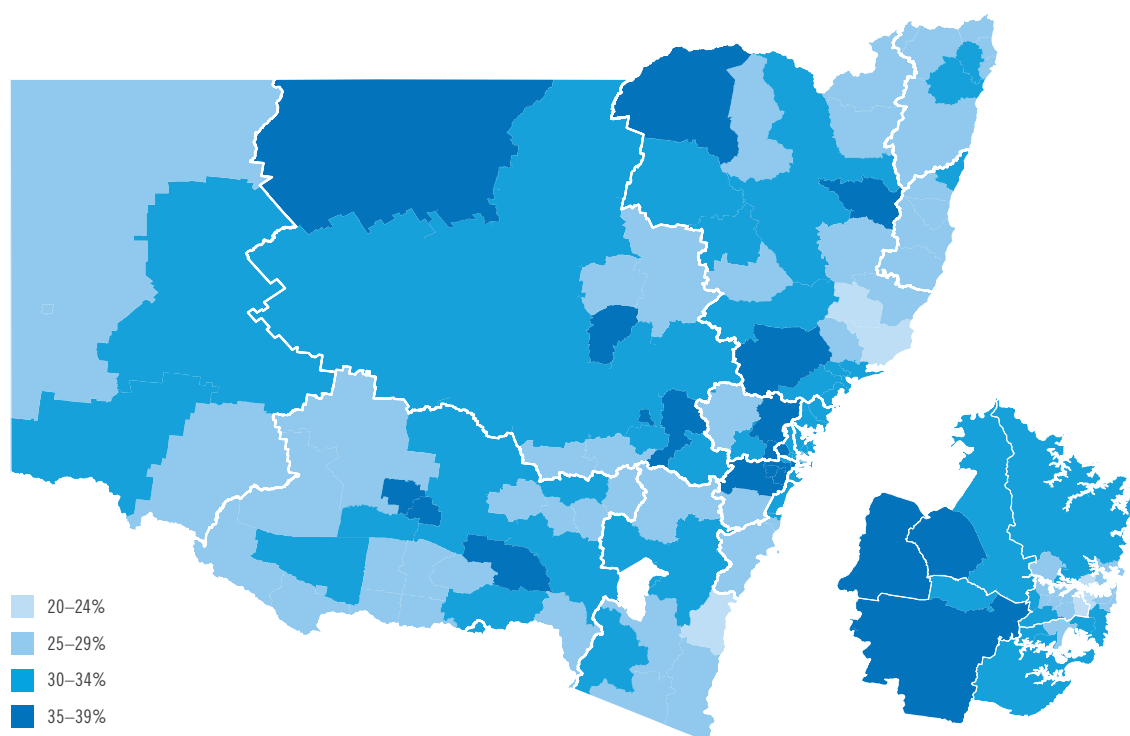
**TABLE 1.1:** Population aged 0–24 years by Aboriginality and remoteness, NSW, 30 June 2014

Remoteness	Number of children and young people* (%)					
	Aboriginal	(%)	Non-Aboriginal	(%)	Total	(%)
Major cities	60,900	(45)	1,710,000	(77)	1,770,900	(75)
Inner regional	47,400	(35)	399,300	(18)	446,700	(19)
Outer regional	22,400	(16)	117,200	(5)	139,500	(6)
Remote	3,300	(2)	6,300	(<1)	9,500	(<1)
Very remote	1,600	(1)	1,200	(<1)	2,800	(<1)
<b>NSW TOTAL</b>	<b>135,600</b>	<b>(100)</b>	<b>2,233,900</b>	<b>(100)</b>	<b>2,369,400</b>	<b>(100)</b>

Note: \* Counts rounded to the nearest 100

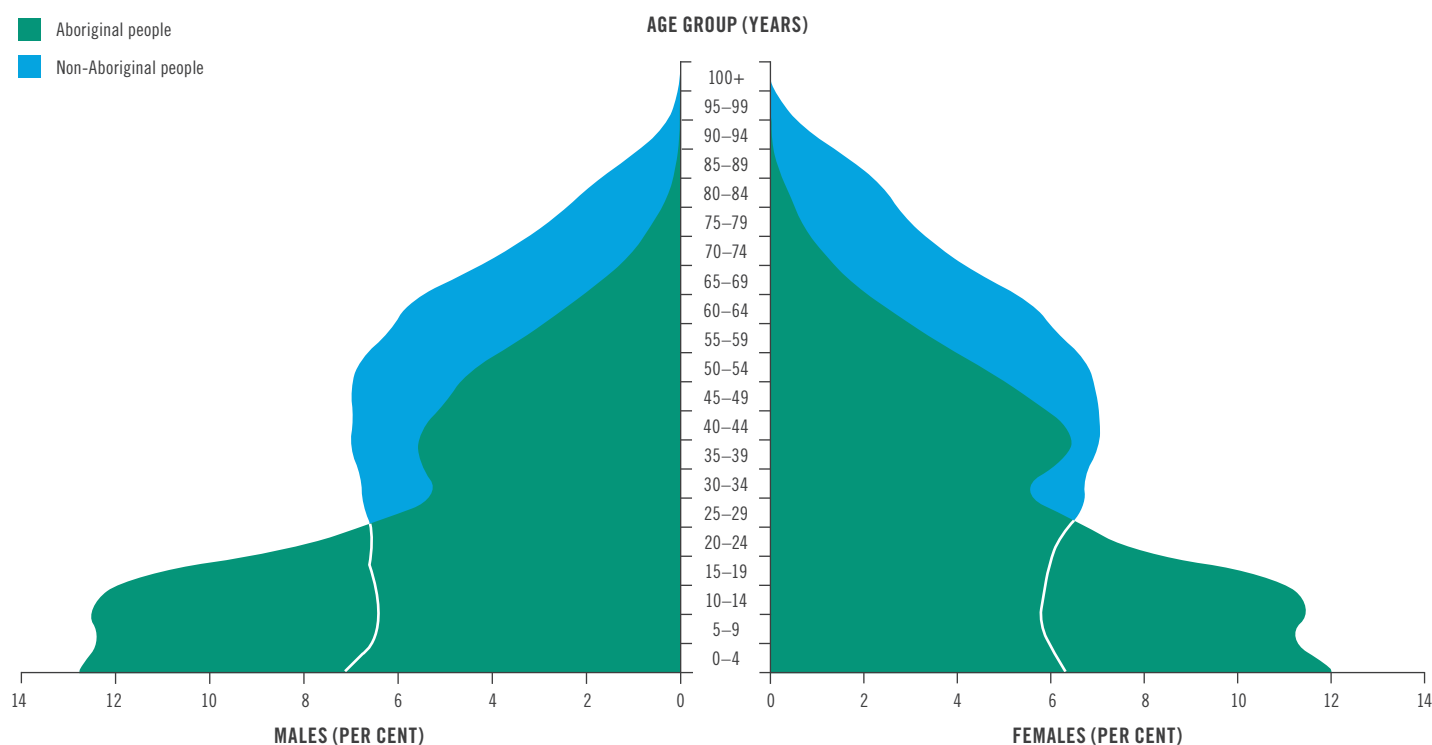
Source: Estimated resident population projections

**FIGURE 1.2:** Percentage of LGA-specific population aged 0–24 years by LGA, NSW, 30 June 2014



Source: NSW estimated resident population projections

**FIGURE 1.3:** Age and sex distribution of Aboriginal and non-Aboriginal populations, NSW, 30 June 2011



Source: TableBuilder for ABS Census 2011 (Custom Table)

# BIRTHS

## Births to teenage mothers are decreasing and births to mothers aged 35 years and older are increasing

### KEY POINTS:



The majority of births are to mothers aged 20–34 years and mothers living in major cities

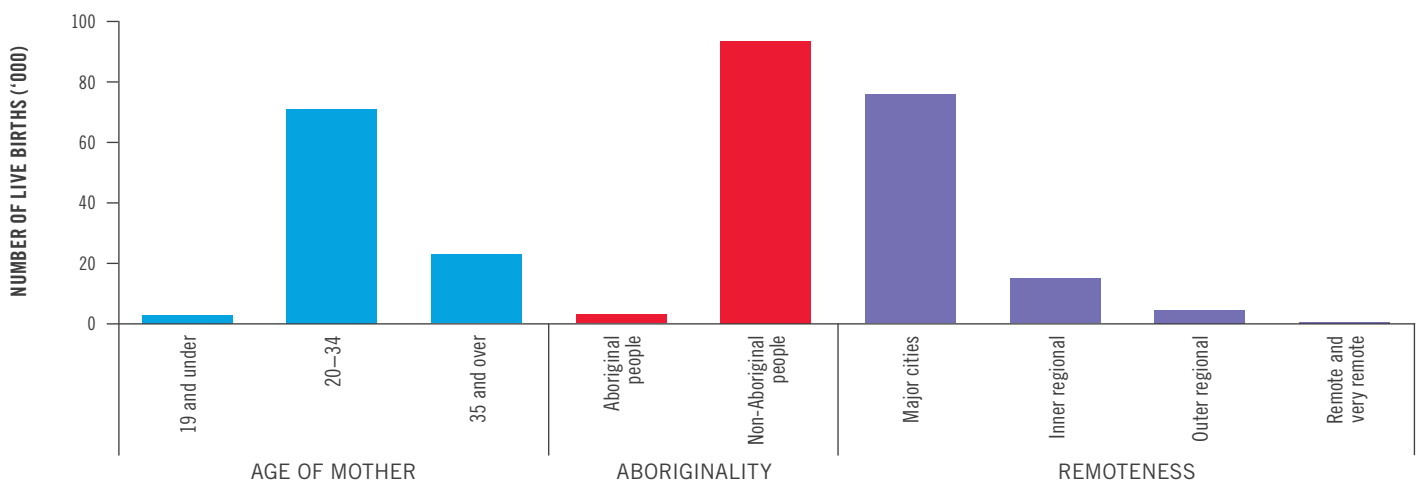


The fertility rate is gradually decreasing in teenagers and increasing for women aged 35 years and over

In 2012, there were 98,436 live births recorded in NSW, a 12.8% increase since 2000. Most babies were born to mothers aged 20–34 years and mothers living in major cities (Figure 1.4). Total fertility rates among Aboriginal females aged 15–49 years were substantially higher than in the overall population. In 2012, the total fertility rate was 2.7 babies per Aboriginal woman compared with 1.9 babies per woman in the overall population.<sup>3</sup> Births to women aged under 30 years contributed three-quarters (76%) of the total fertility rate for Aboriginal women in 2012, compared with less than half of the total fertility rate for all women (45%).

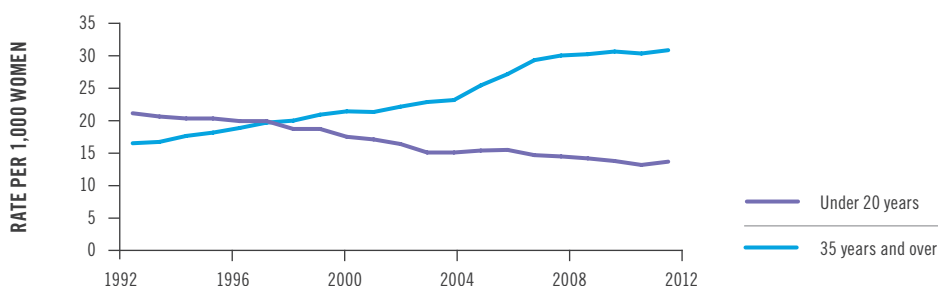
Maternal age is an important risk factor for a baby's health outcomes, with adverse outcomes more likely in younger and older mothers.<sup>4,5</sup> While the fertility rate among teenage females gradually declined between 1992 (21.2 per 1,000 teenage females) and 2012 (13.8 per 1,000 teenage females), the rate among those aged over 35 years has increased substantially, from 16.5 to 30.5 per 1,000 women aged over 35 years, over the same time period (Figure 1.5).

**FIGURE 1.4:** Live births by selected maternal characteristics, NSW, 2012



Source: NSW Perinatal Data Collection

**FIGURE 1.5:** Trends in maternal age-specific fertility rates, NSW



Source: NSW Perinatal Data Collection

# WHERE CHILDREN AND YOUNG PEOPLE LIVE

The environment in which children and young people live and grow plays a major role in their health and development

## KEY POINTS:



Most NSW families with dependent children have 2 parents with 1 or 2 children aged under 15 years



Some children and young people experience family breakdown, or face homelessness or unemployment, which can increase risks of ill-health

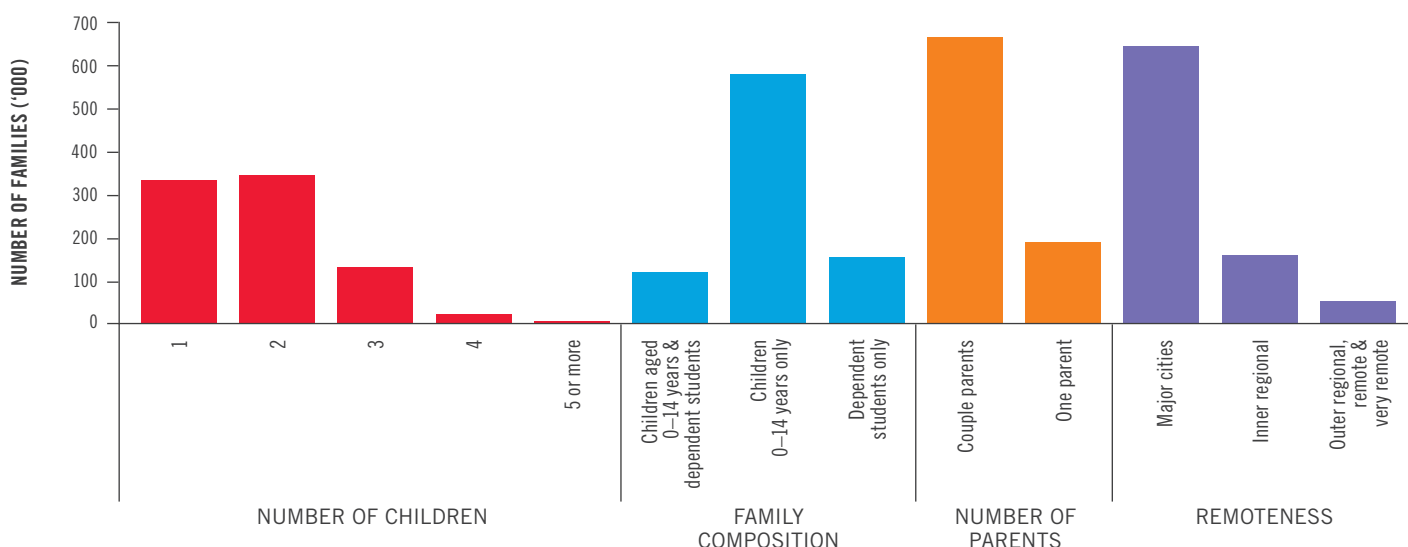
The living arrangements of children and young people are a major determinant of their health. The majority of NSW children live with 1 or both of their parents. However, some children experience family breakdown or emotional or physical trauma, often complicated by disability or poor health, and are especially vulnerable.<sup>6</sup> Unemployment among young people also directly correlates with ill-health, as it is strongly associated with mental health problems and adverse health behaviours such as poor diet, smoking, alcohol consumption and drug misuse.<sup>7</sup>

According to the 2011 Census, of the approximately 1.8 million families in NSW, 61.8% included children living in the family household and 47.6% (approximately 870,000 families) included dependent children. Most families with dependent children included 1 or 2 children aged 0–14 years and were 2-parent families living in major cities (Figure 1.6).

Of NSW families with dependent children, 14.0% were identified as jobless families. The percentage of jobless families was substantially elevated in more remote regions, among one parent families (42.1%) and within Aboriginal households (40.2%) (Figure 1.7).

As of June 2012, 17,192 NSW children aged 0–17 years were living in out-of-home care (a rate of 104 per 10,000); 43.4% of the nation's total and the second highest state-specific rate in Australia. Rates of children in out-of-home care were highest among those aged 5–14 years (Figure 1.8). Aboriginal children aged 0–17 years were almost 9 times as likely as non-Aboriginal children to be in out-of-home care.<sup>6</sup>

**FIGURE 1.6:** Families with dependent children by selected family characteristics, NSW, 2011



Source: TableBuilder for ABS Census 2011 (Custom Table)

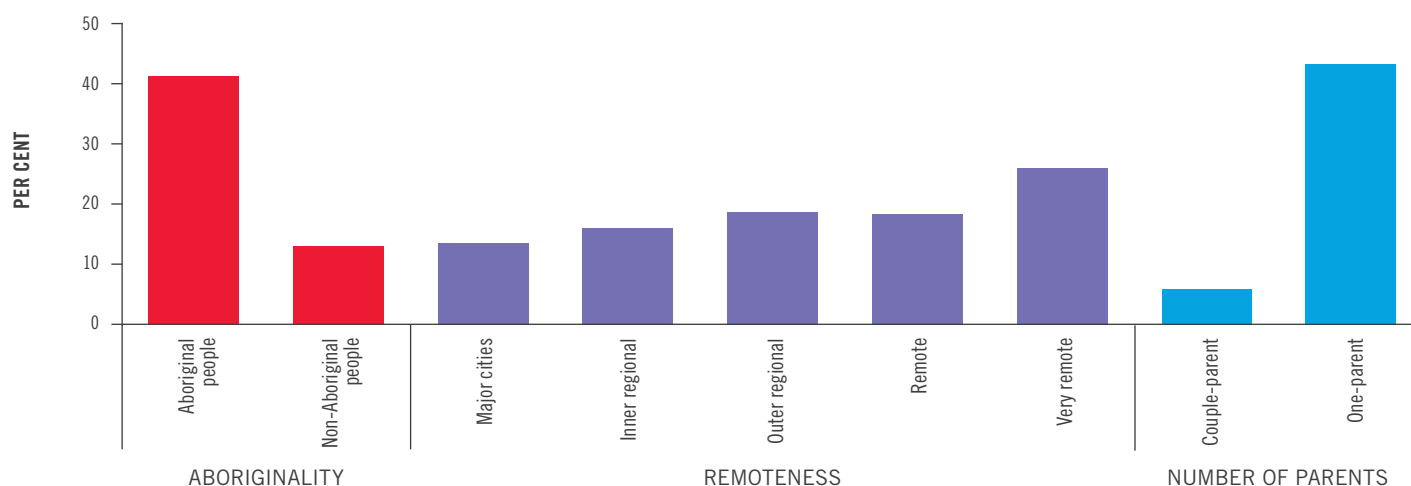
Children and young people in out-of-home care often have high, unrecognised and unmet physical, developmental, psychosocial and mental health needs. The 2011 Children's Guardian Case Files Audit, which focused on health risks and outcomes of NSW children and young people in out-of-home care, reported high rates of health issues in this population including dental problems (31.8%), mental health issues (38.6%) and low immunisation rates (61.6% for children under 8 years). Further, 13.1% were reported as having medical problems such as asthma, diabetes, epilepsy and severe allergies.

According to the 2011 Census, 10,551 NSW children and young people aged 0–24 years were classified as homeless (a rate of 45 per 10,000). This compares with 36 per 10,000 among people aged 25 years and over. Across all ages, homelessness rates were highest among people aged 19–24 years (72 per 10,000). Children and young people are over represented among homeless people, comprising 37.4% of the total NSW homeless population. Moreover, Census records are likely to under-estimate homelessness among young people, as youth who are homeless or “couch surfing” may be missed in these statistics.<sup>8</sup>

During the 12 month period leading to May 2014, unemployment rates in young people ranged from 12.2–19.3% in those aged 15–19 years and 6.8–10.3% in those aged 20–24 years. Given the complex work-study situation among youth, these figures are likely to be an over-estimate; however, they highlight that a substantial percentage of young people are at risk of poor health or unhealthy behaviours associated with unemployment.<sup>9</sup>

According to the 2011 Census, an estimated 11.6% (over 245,000 persons) of NSW children and young people who resided in NSW were born overseas. While the majority of overseas-born migrants to Australia enjoy health that is at least as good, if not better than, the Australian-born population,<sup>10</sup> increased rates of some diseases or risk factors exist in specific population groups (such as refugees). People from non-English speaking backgrounds may also be less likely to report medical conditions or have difficulty accessing health services due to language barriers and are a priority population group.

**FIGURE 1.7:** Jobless families with dependent children, NSW, 2011



Source: TableBuilder for ABS Census 2011 (Custom Table)

**FIGURE 1.8:** Children aged 0–17 years in out-of-home care, NSW, 30 June 2012



Note: Rates calculated using updated NSW estimated population projections

Source: AIHW Child Protection Australia 2011–12<sup>6</sup>

# **CHAPTER 2:**

## **What factors affect the health of children and young people?**

---

# INFANT HEALTH

## More children in NSW are getting a healthy start to life

### KEY POINTS:



The percentage of mothers taking folate during or before pregnancy is increasing



3 in 5 mothers have their 1st antenatal visit in the 1st trimester



Aboriginal mothers are over 5 times more likely to smoke during pregnancy than non-Aboriginal mothers



Aboriginal mothers, teenage mothers and older mothers are most likely to have low birth weight or premature babies



More mothers are breastfeeding their baby until age 6 months

### ANTENATAL CARE

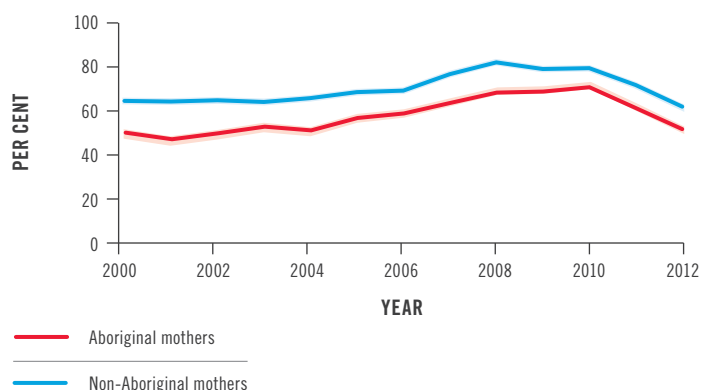
Comprehensive antenatal care should commence as early as possible in pregnancy, and continuity of care should be maintained after the birth, to ensure the best outcomes for the mother and baby and a healthy start to life.

In 2012, 61.2% of mothers had their 1st comprehensive antenatal visit in the 1st trimester (before 14 weeks), and 83.1% attended before 20 weeks. More non-Aboriginal mothers (61.6%) attended antenatal care in the 1st trimester than Aboriginal mothers (51.0%); however, this gap is closing (Figure 2.1). Although differences between remoteness areas are not substantial, there is a socioeconomic inequality, with mothers living in higher socioeconomic status areas more likely to attend an antenatal care clinic in the 1st trimester than mothers living in lower socioeconomic status areas (Figure 2.2). Rates of antenatal care have fallen since 2011 due to the introduction of a stricter definition of “antenatal care” (see Appendix 3 for details).

### FOLATE SUPPLEMENTATION

Approximately 70% of cases of neural tube defects, such as spina bifida, can be prevented if women take folate supplements at least 1 month before conception and during the 1st 3 months of pregnancy.<sup>11,12</sup> This message began to be promoted in Australia in the 1990s and in 2009 it became mandatory for folic acid to be added to all flour used for bread-making (excluding organic bread).<sup>13</sup>

**FIGURE 2.1:** Mothers attending 1st antenatal visit before 14 weeks pregnancy, by Aboriginality, NSW



Source: NSW Perinatal Data Collection

In 2012–2013, just under 3 in 5 (56.2%) mothers reported taking folate supplements 1 month before and at least 3 months after conceiving. Although this was a decrease from 2011–2012 (60.3%), it is a 12% relative increase since 2001 (50.3%). In NSW, a decline in the number of babies born with neural tube defects has been observed, falling from 66 cases in 2005 to 47 cases in 2011.

## SMOKING DURING PREGNANCY

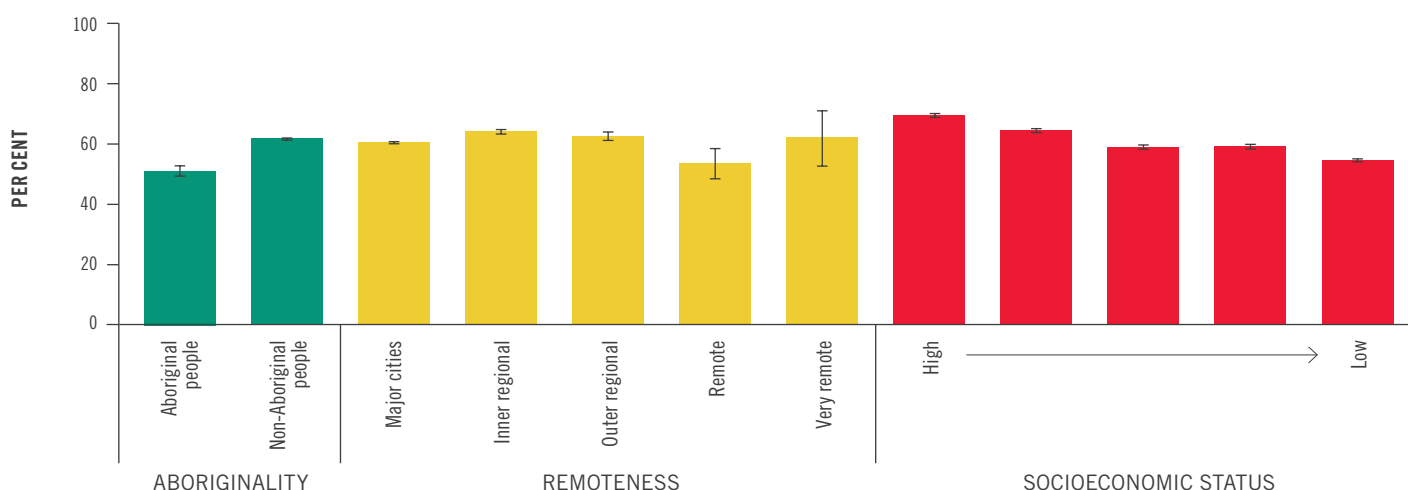
Smoking during pregnancy reduces the amount of oxygen available to the unborn baby. This makes the unborn baby's heart beat faster and increases the overall stress on its developing body. Smokers have a greater risk of complications such as ectopic pregnancy (a pregnancy outside the uterus), miscarriage, and a premature or low birth weight baby. The risk of sudden infant death syndrome is also increased in babies of mothers who smoke.<sup>14</sup>

The percentage of women smoking during pregnancy decreased from 17.4% in 2000 to 10.4% in 2012; however, the gap between pregnant Aboriginal women (49.9%) and pregnant non-Aboriginal women (9.0%) who smoke remains large (Figure 2.3). Women living in regional and remote areas and lower socioeconomic status areas were more likely to smoke during pregnancy than women living in major cities and higher socioeconomic status areas (see also *Chapter 2: Smoking*).

## LOW BIRTH WEIGHT AND PREMATUREITY

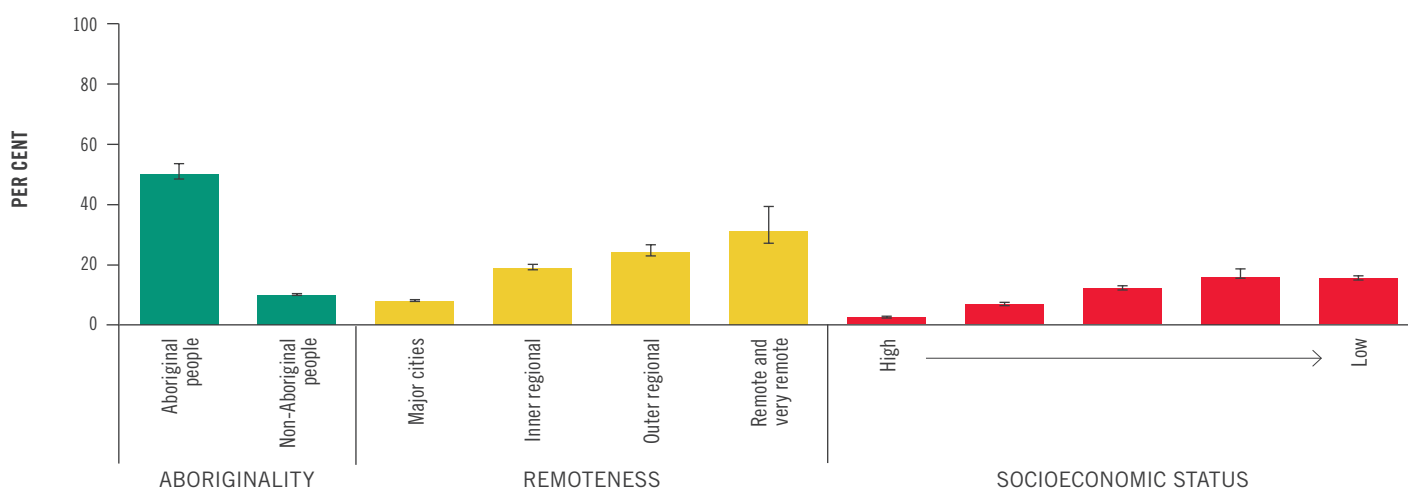
Birth weight and gestational age are interrelated predictors of a baby's health. Babies born prematurely or who are of low birth weight (under 2.5 kg) for any other reason, have a greater risk of poor health and death, stay in hospital for longer after birth, and are more likely to develop disabilities, respiratory conditions, and infections. Maternal factors such as socioeconomic disadvantage, number of previous births, age, weight, nutritional status, smoking, alcohol intake, and illness during pregnancy have been shown to be related to low birth weight babies.<sup>1,15</sup>

**FIGURE 2.2:** Mothers attending 1st antenatal visit before 14 weeks pregnancy, NSW, 2012



Source: NSW Perinatal Data Collection

**FIGURE 2.3:** Smoking during pregnancy, NSW, 2012



Source: NSW Perinatal Data Collection



Rates of low birth weight were almost twice as high for babies born to Aboriginal mothers than for non-Aboriginal mothers (Figure 2.4). Rates of low birth weight were also higher among babies born to mothers in their teens or aged 35 years and older, compared with mothers aged 20–34 years (Figure 2.5). There were no substantial differences in rates of low birth weight babies between geographic or socioeconomic areas. The same patterns are seen in premature babies (less than 37 weeks gestation) and babies with a low Apgar score.

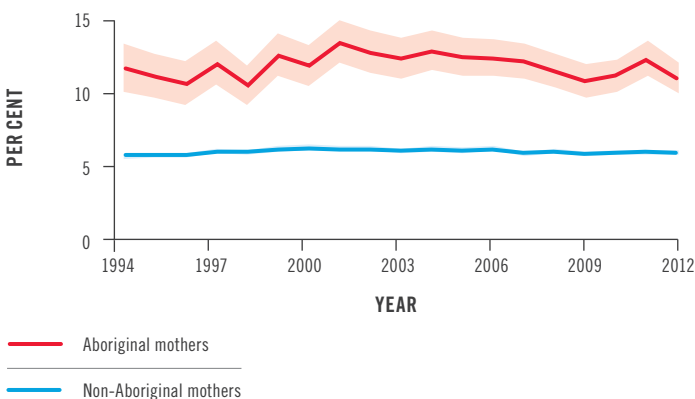
## BREASTFEEDING

Breastfed infants have a reduced risk of gastrointestinal infection, asthma, ear infections and later childhood obesity.<sup>16</sup> It is recommended infants be exclusively breastfed (that is, no water or formula) for around the first 6 months of life when solid foods are introduced.<sup>17</sup> The Australian National Breastfeeding Strategy 2010–2015 aims to increase the percentage of mothers who meet this recommendation and who continue breastfeeding with complementary foods to 12 months and beyond.<sup>17,18</sup>

Mothers who breastfeed but are unable or choose not to exclusively breastfeed can be categorised as: “full breastfeeding” (supplementing with water and water-based drinks but not infant formula) or “any breastfeeding” (supplementing with infant formula or solid food).

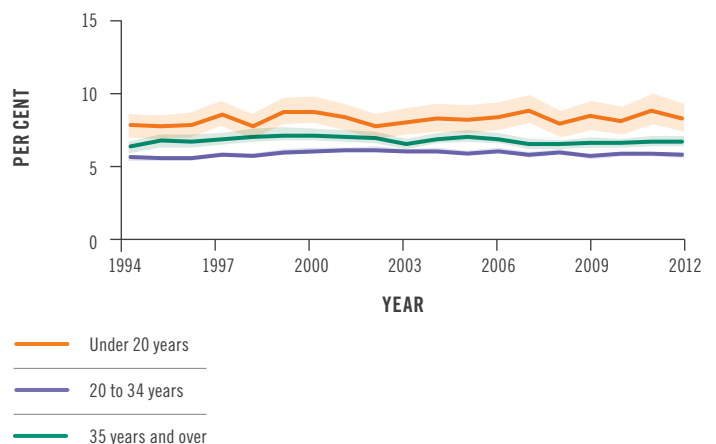
The percentage of infants exclusively breastfed at 6 months of age doubled between 2003–2004 and 2012–2013, from 12.6% to 29.2% (Figure 2.6). A further 32% of mothers practiced full breastfeeding at 6 months of age. Around 6 months of age, it is recommended that an infant-led introduction of solid foods commence, which is reflected in the substantial decline in exclusive and full breastfeeding at 7 months (Figure 2.7).

**FIGURE 2.4:** Low birth weight babies by maternal Aboriginality, NSW



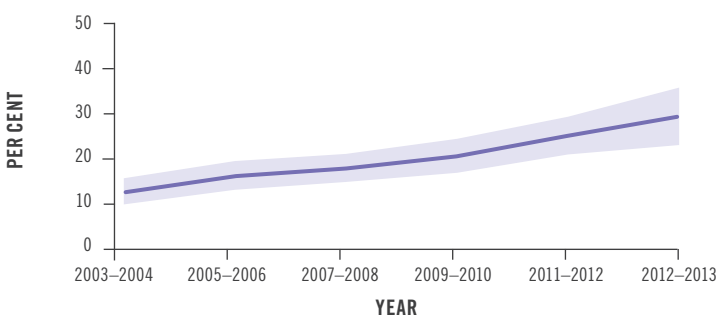
Source: NSW Perinatal Data Collection

**FIGURE 2.5:** Low birth weight babies by maternal age, NSW



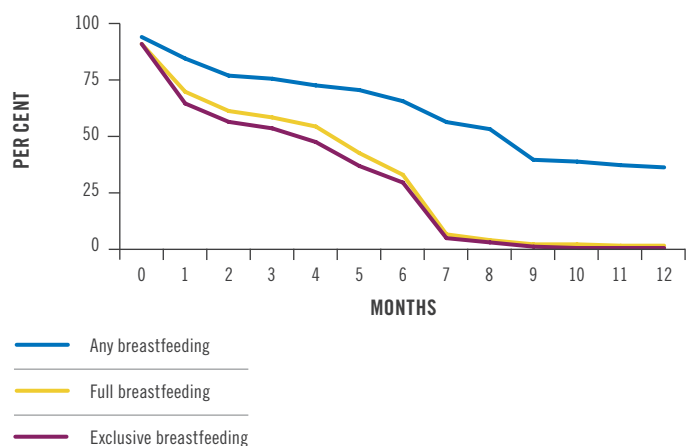
Source: NSW Perinatal Data Collection

**FIGURE 2.6:** Infants exclusively breastfed to age 6 months, NSW



Source: NSW Population Health Survey

**FIGURE 2.7:** Duration of breastfeeding, children 0–12 months, NSW, 2012–2013



Source: NSW Population Health Survey

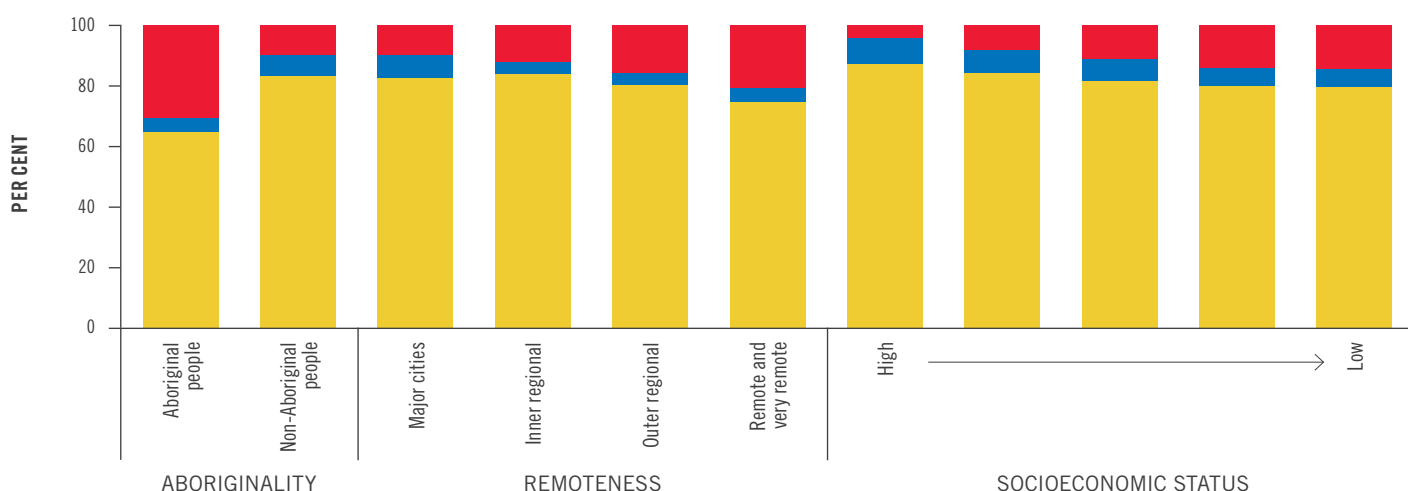
In 2012, 4 in 5 (82.1%) NSW women fully breastfed their baby at hospital discharge. Non-Aboriginal mothers (82.7%) and mothers living in high socioeconomic status areas were more likely to fully breastfeed at hospital discharge than Aboriginal mothers (63.4%) and mothers living in lower socioeconomic status areas (Figure 2.8).

## POPULATION HEALTH INITIATIVES

A wide variety of population health strategies in NSW aim to promote the best outcomes for mother and baby including:

- Information booklets for women *Having a baby* and *Breastfeeding your baby*<sup>19,20</sup>
- *General Practitioners Antenatal Shared Care* protocol aims to provide high standards of antenatal care to women who have a low risk pregnancy
- *Early Childhood Health Services* are provided free to all new parents to promote, maintain and support breastfeeding and the safe and timely introduction of complementary foods
- *Strong Women Strong Babies Pregnancy Diary* is a culturally appropriate resource for Aboriginal families which promotes healthy pregnancies and breastfeeding with a strong focus on prevention and early intervention
- *Stay Strong and Healthy—It's Worth It* is a resource package with educational materials designed for pregnant Aboriginal women, their partners, and families (including a Facebook page)
- Provision of culturally appropriate antenatal, postnatal and child health care and health promotion for Aboriginal families across NSW through *Aboriginal Maternal and Infant Health Services* and *Building Strong Foundations for Aboriginal Children, Families and Communities*
- *Quit for New Life* Program supports pregnant Aboriginal women and members of their household to quit smoking during the pre-natal and post-natal periods and to remain smoke-free
- Mandatory addition of folic acid to all flour used for bread-making (excluding organic bread)
- Universal infant immunisations (see *Chapter 2: Immunisation*)
- Screening to detect and treat congenital conditions early in life (see *Chapter 2: Newborn, infant and child screening*)

**FIGURE 2.8:** Infant feeding at hospital discharge, NSW, 2012



■ Infant formula only  
■ Any breastfeeding  
■ Full breastfeeding

Source: NSW Perinatal Data Collection

# NEWBORN, INFANT AND CHILD SCREENING

Screening rates for congenital conditions, hearing loss and vision problems in newborns and early childhood remain high

## KEY POINTS:



1 in 760 screened newborns were diagnosed with a rare congenital metabolic disorder



1 in 10 screened preschool children had a potential vision problem



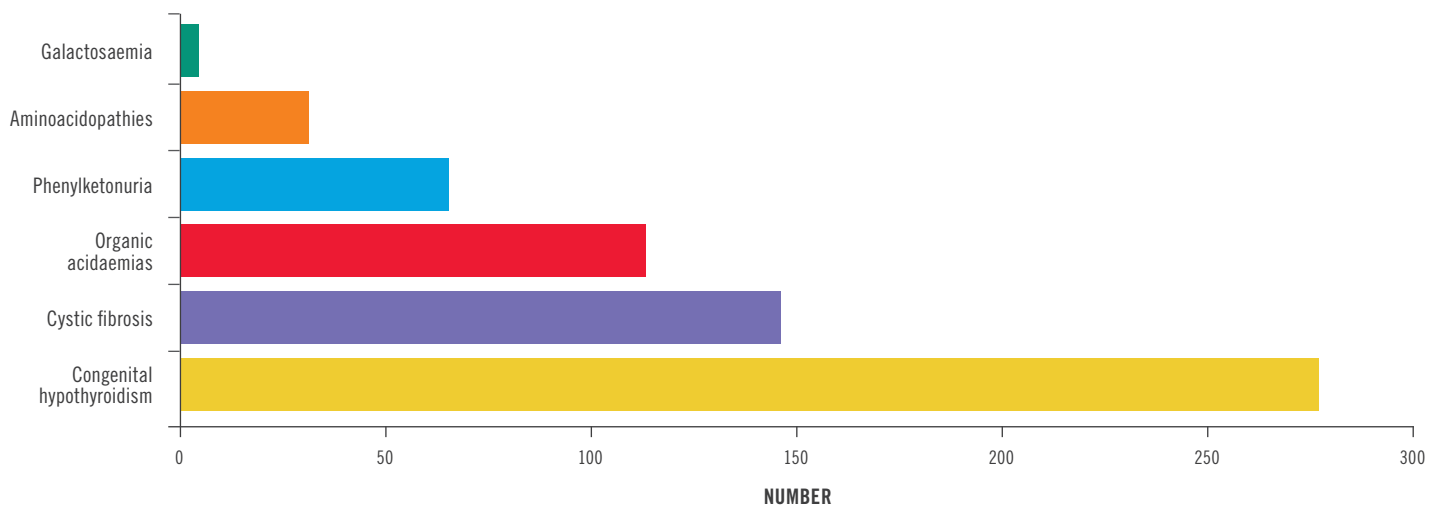
1 in 200 screened infants had a potential hearing problem

## NEWBORN SCREENING PROGRAM

Early detection of treatable disease in children allows for early intervention and results in better health and development throughout life. Newborn screening aims to detect congenital metabolic disorders in apparently healthy babies, which may result in physical or intellectual problems, serious illness or even death.<sup>21</sup> Early diagnosis of these conditions reduces their impact on health and development throughout life.

Almost all babies born in NSW received the Newborn Screening Program.<sup>22</sup> Between 2008 and 2012, 0.13% (636) of babies screened were diagnosed with a congenital condition (approximately 127 babies per year). The most common conditions were congenital hypothyroidism (babies born with a missing or improperly functioning thyroid gland) and cystic fibrosis (a condition affecting the functioning of the lungs, pancreas, liver and intestine) (Figure 2.9).

**FIGURE 2.9:** Number of babies identified through the NSW Screening Program with a congenital condition, 2008-2012

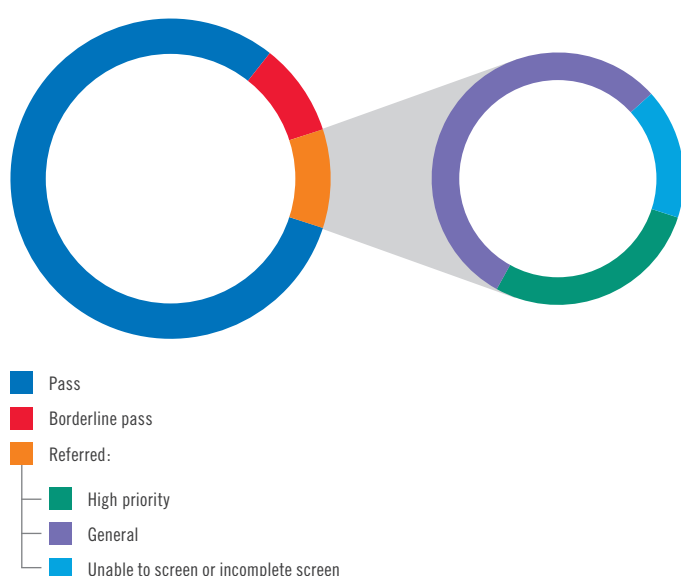


Source: NSW Newborn Screening Program, The Children's Hospital at Westmead

## STATEWIDE EYESIGHT PRESCHOOLER SCREENING (StEPS) PROGRAM

After 8 years of age, some childhood vision problems cannot be treated and may lead to lifelong poor vision. Early intervention to address vision problems leads to better outcomes.<sup>23</sup> The StEPS program provides universal vision screening to preschool children aged 4 years in NSW. There were 99,677 StEPS screening offers made in 2012–13, with 75% of these accepted and screened. One in 10 (7,444) children were referred for specialist testing based on StEPS findings (Figure 2.10).

**FIGURE 2.10:** StEPS program results, NSW, 2012–13



Source: NSW Statewide Eyesight Preschooler Screening Program

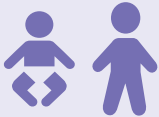
## STATEWIDE INFANT SCREENING-HEARING (SWIS-H) PROGRAM

Early detection of hearing loss in children is associated with better developmental outcomes.<sup>24</sup> The SWIS-H program provides universal hearing screening to all babies born in NSW. This program uses a 2-step process to identify babies with potential hearing problems and refer them for specialist diagnostic and treatment services. Babies with congenital conditions that may affect hearing or SWIS-H testing are referred straight to diagnostic audiology without needing to be screened. In 2011–12, of the 97,161 babies eligible for the SWIS-H program, nearly all (99.6%) were screened or directly referred to diagnostic audiology. In total, 0.7% (706) of babies who participated in the program were referred to diagnostic audiology, of whom 193 were directly referred.

# IMMUNISATION

## Immunisation coverage in NSW continues at high levels

### KEY POINTS:



The vaccination rates in 2013 were 90% at 1 year of age and 92% at 4 years of age



In 2013, 94% of Aboriginal children and 92% of non-Aboriginal children were fully immunised by their 4th birthday



Uptake of school-based HPV and diphtheria, tetanus and pertussis (whooping cough) vaccination has increased



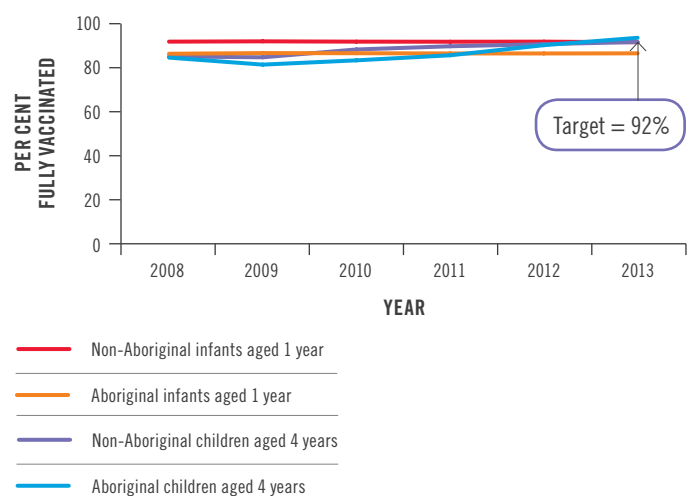
Coverage of hepatitis B vaccination and preventative antibody treatment for high risk babies have remained high

Immunisation is the safest and most effective way of providing protection against previously common life-threatening childhood infections. Although vaccine preventable diseases have become infrequent in NSW, maintaining high immunisation coverage is required to continue to prevent transmission and outbreaks, and protect those that may not directly benefit from vaccination by reducing their exposure to vaccine preventable disease.

NSW children and young people are provided universal access to free vaccinations included in the National Immunisation Program schedule, as well as school-based vaccinations against chickenpox (varicella), pertussis (whooping cough), diphtheria and tetanus, and human papillomavirus (HPV). Vaccination requirements for enrolling in child care have recently been strengthened, requiring evidence that children are up to date with their vaccinations, or are on a recognised catch-up schedule, have a medical contraindication to vaccination, or their parents have a conscientious objection to vaccination.<sup>25,95</sup>

Vaccination rates at 1 year of age have remained relatively high and stable since 2008, at about 90%. For children aged 4 years, vaccination rates have improved almost 10% over this period, and currently sit at about 92%. In 2013, rates for 4 year old Aboriginal children were higher than for non-Aboriginal children (94% compared with 92%) (Figure 2.11).

**FIGURE 2.11:** Childhood vaccination coverage, NSW

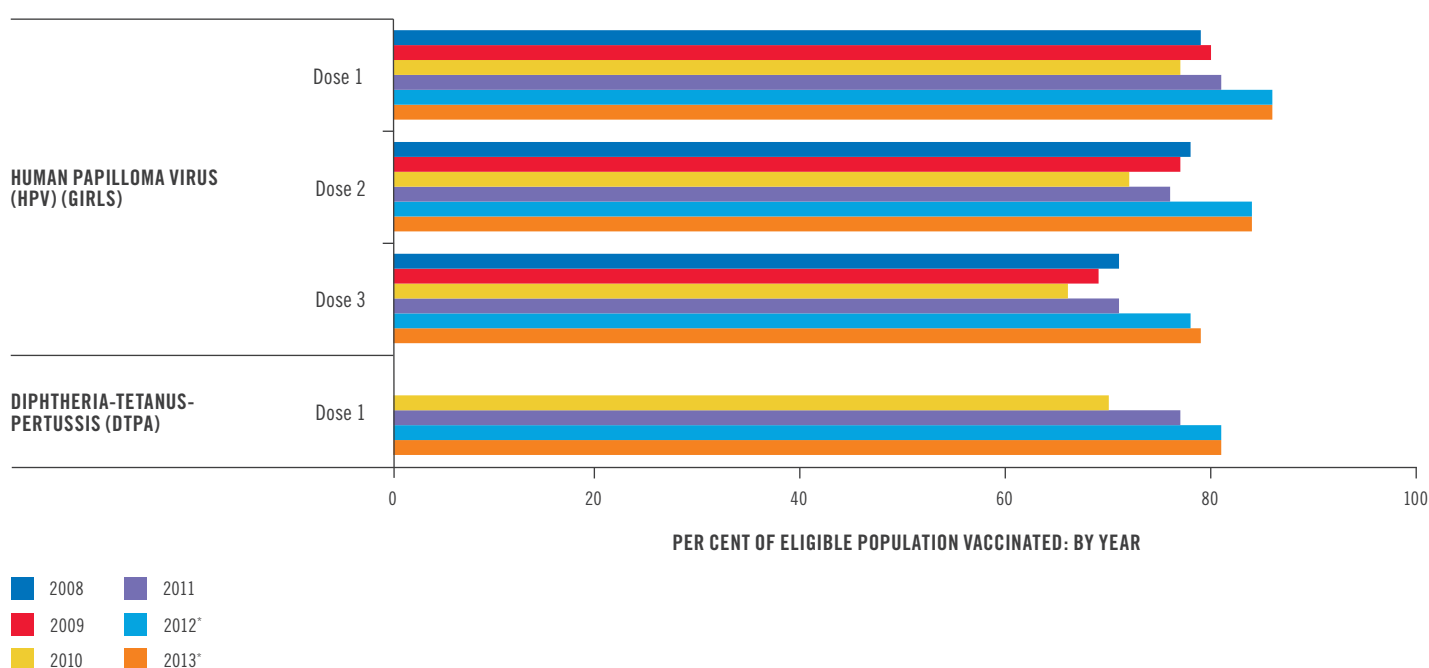


Source: Australian Childhood Immunisation Register

HPV vaccination is effective in preventing HPV infection, genital warts and pre-cancerous lesions of the cervix.<sup>25,26</sup> HPV vaccination of girls in Year 7 commenced in 2008 in NSW. The success of this program has been augmented by the introduction of HPV vaccination of boys from 2013, with a 3-dose uptake of 75% achieved in schools for the 1st cohort of Year 7 boys. Diphtheria, tetanus and pertussis vaccination of students in Year 7 continues at high coverage levels, providing protection to adolescents through to their early adult years, and prevention against transmission of pertussis to unvaccinated babies within families and in the community (Figure 2.12).

It is recommended that all pregnant women are screened for hepatitis B, and babies born to mothers with hepatitis B infection are offered hepatitis B immunoglobulin, in addition to vaccinations, to help prevent transmission from their mothers. In 2012, 98.7% of pregnant women were screened for hepatitis B, 95.3% of babies received the birth dose of hepatitis B vaccine and 97.5% of babies born to hepatitis B positive mothers were given immunoglobulin in the first 12 hours of life.<sup>27</sup>

**FIGURE 2.12:** School-based vaccination coverage, NSW



Note: \* 2012 data includes HPV catch-up doses given in 2013 to girls who commenced the vaccine course in 2012

\* 2013 data includes catch-up doses given in Terms 1 and 2 of 2014 to girls who commenced the vaccine course in 2013

Source: NSW School Vaccination Program Register

# OVERWEIGHT, OBESITY AND UNDERWEIGHT

## Early indication of a decline in overweight and obese children

### KEY POINTS:



In 2013, 26.8% of children aged 5–16 years were overweight or obese, a decline from 33.7% in 2012



A higher percentage of girls aged 5–8 years were overweight and obese compared with girls aged 9–16 years



In 2013, 32.9% of young males aged 16–24 years were overweight and obese compared with 22.6% of young females of the same age

## OVERWEIGHT AND OBESITY

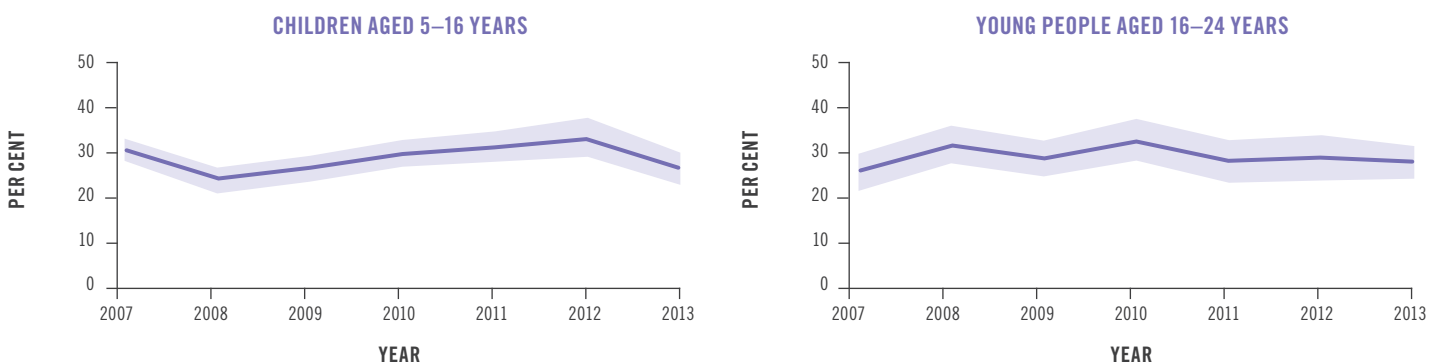
Excess weight in children increases the risk of poor health during childhood and later in adulthood. Overweight or obese children are at greater risk of developing chronic conditions such as asthma and type 2 diabetes, and may experience negative social and mental wellbeing.<sup>28</sup>

A target of the *NSW State Health Plan: Towards 2021* is to reduce overweight and obesity rates of children and young people aged 5–16 years to 21% by 2015. The Schools Physical Activity and Nutrition Survey (SPANS) is used to report against this target and collects measured height and weight information to calculate body mass index (BMI). The last survey was conducted in 2010 and found that 22.8% of students aged 5–16 years were overweight and obese; of whom, two-thirds were overweight (17.1%) and one-third obese (5.8%).<sup>29</sup> The next SPANS will be conducted in 2015.

More recent surveillance data from the NSW Population Health Survey uses parent-reported height and weight to estimate their child's BMI. In 2013, 26.8% of NSW children aged 5–16 years were estimated to be overweight and obese compared with 33.7% in 2012 (Figure 2.13). This decline was statistically significant and may be an early indication of improvement. Ongoing monitoring is required to confirm whether the difference reflects random fluctuation in a stable trend or the beginning of a downward trend.

The percentage of young people aged 16–24 years who were overweight and obese has remained relatively steady between 2007 and 2013 (Figure 2.13). In 2013, a higher percentage of young males were overweight and obese (32.9%) than young females (22.6%).

**FIGURE 2.13:** Proportion of children and young people whose BMI indicated overweight and obese, NSW



Source: NSW Population Health Survey (SAPHaRI)

Over the period 2012–2013, a higher percentage of girls aged 5–8 years were overweight and obese than girls aged 9–16 years (Figure 2.14). No such differences were apparent between younger boys and older boys. There were no substantial differences in overweight and obesity between children living in lower and higher socioeconomic status areas.

## UNDERWEIGHT

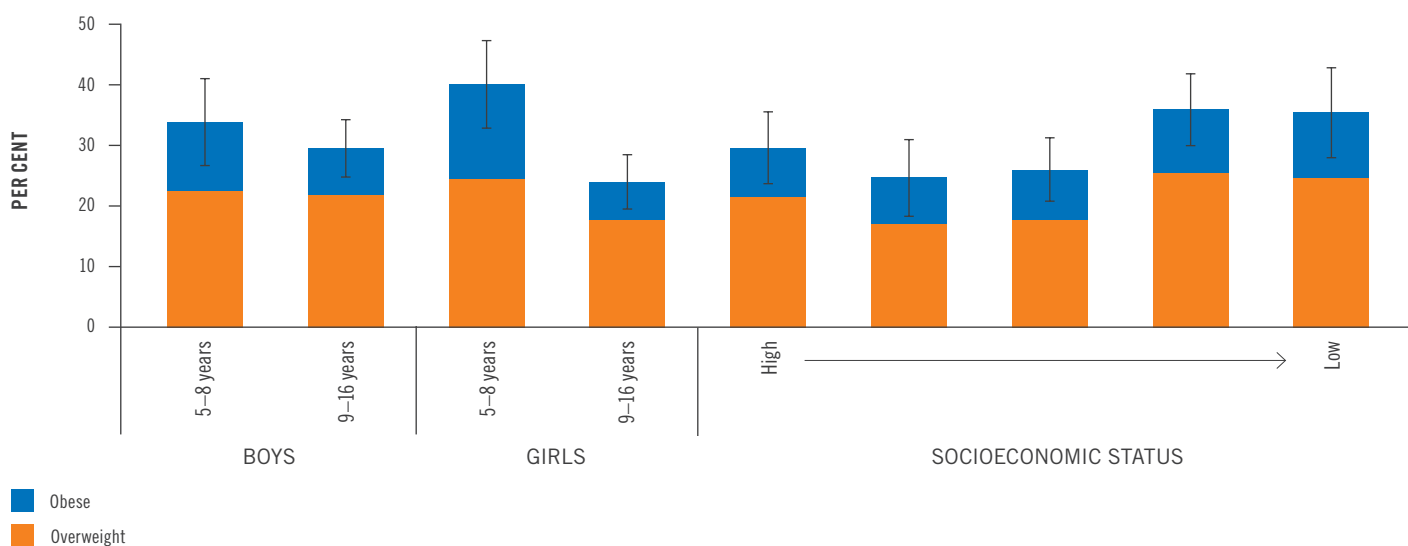
Being extremely underweight is also a health risk. Over the period 2012–2013, the NSW Population Healthy Survey found 3.4% of children aged 5–16 years had a BMI in the underweight category. There were no substantial differences between males and females of this age group.

## POPULATION HEALTH INITIATIVES

Population health strategies focused on healthy eating and active living are aimed at promoting healthy weight, including:

- *My Personal Health Record* (The Blue Book), distributed to all new parents, includes regular measurement of the child's height, weight and BMI, and information for parents on the importance of healthy weight in children
- *NSW Healthy Children Initiative* (see Chapter 2: *NSW Healthy Children Initiative*) that includes *Live Life Well @ School*, *Crunch&Sip*, *Munch & Move®* and *Go4Fun®* programs
- *Healthy Eating and Active Living Strategy 2013–2018* promotes and supports healthy eating and active living to reduce the impact of lifestyle-related chronic disease

**FIGURE 2.14:** Overweight and obese children aged 5–16 years, NSW, 2012–2013



Note: Confidence intervals presented for combined “overweight or obese” group

Source: NSW Population Health Survey



# HEALTHY EATING

## Fruit and vegetable consumption is on the rise

### KEY POINTS:



73% of children aged 2–15 years consumed adequate amounts of fruit each day



43% of children aged 2–15 years consumed adequate amounts of vegetables each day



In 2012–2013, over half (53%) of children aged 9–15 years consumed 2 or more cups of soft drink each day, and just over one-third (35%) consumed fast food at least once a week



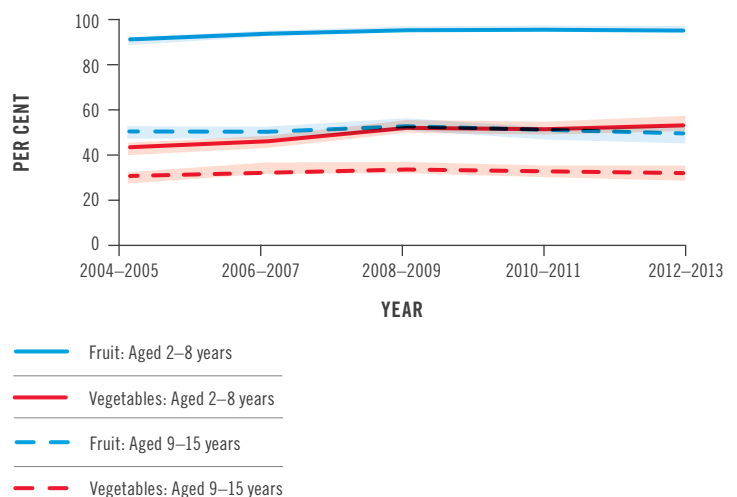
In 2012, 5% of children aged 0–15 years and 10% of young people aged 16–24 years lived in households with food shortages

Healthy eating during childhood promotes physical growth and cognitive development, prevents childhood diseases such as obesity, dental decay and anaemia, and decreases the risk of the development of diseases in adulthood.<sup>29</sup> The *NSW Healthy Eating and Active Living Strategy 2013–2018* ([www.health.nsw.gov.au/obesity/Pages/nsw-healthy-eating-strategy.aspx](http://www.health.nsw.gov.au/obesity/Pages/nsw-healthy-eating-strategy.aspx)) aims to encourage the community to make healthy lifestyle changes including reducing intake of energy-dense nutrient poor food and increasing consumption of fruit and vegetables.<sup>30,31</sup>

In 2012–2013, 73% of children aged 2–15 years consumed the recommended 1 or more pieces of fruit each day. In these years, most children aged 2–8 years consumed enough fruit each day (95.8%), a slight increase from 2004–2005 (90.4%). By comparison, only 48.9% of children aged 9–15 years ate enough fruit each day in 2012–2013 (Figure 2.15).

There has been a gradual improvement in the percentage of children aged 2–15 years who consumed the recommended 2 or more serves of vegetables each day, from 36.3% in 2004–2005 to 43.4% in 2012–2013. While vegetable intake by children aged 9–15 years has remained steady over time (32.1% in 2012–2013), the percentage of children aged 2–8 years consuming the recommended amount of vegetables each day has increased from 42.8% to 54.1% in the last 8 years (Figure 2.15).

**FIGURE 2.15:** Percentage of children with adequate fruit and vegetable consumption, NSW



Source: NSW Population Health Survey

The consumption of energy-dense nutrient-poor food and drink contributes to overweight and obesity in children and young people, and limited intake is recommended.<sup>31</sup> One-quarter of children aged 2–15 years (24.6%) consumed fast food on a weekly basis in 2012–2013, while there were no differences in fast food consumption between children aged 2–8 years and those aged 9–15 years. About 40% of children aged 2–15 years drank at least 2 cups of soft drink, cordial or sports drink (high energy drinks) per day, and 21.2% drank 6 or more cups per day. Children aged 9–15 years were almost twice as likely to drink 2 or more cups daily (52.6%) than children aged 2–8 years (27.6%) (Figure 2.16).

## FOOD SECURITY

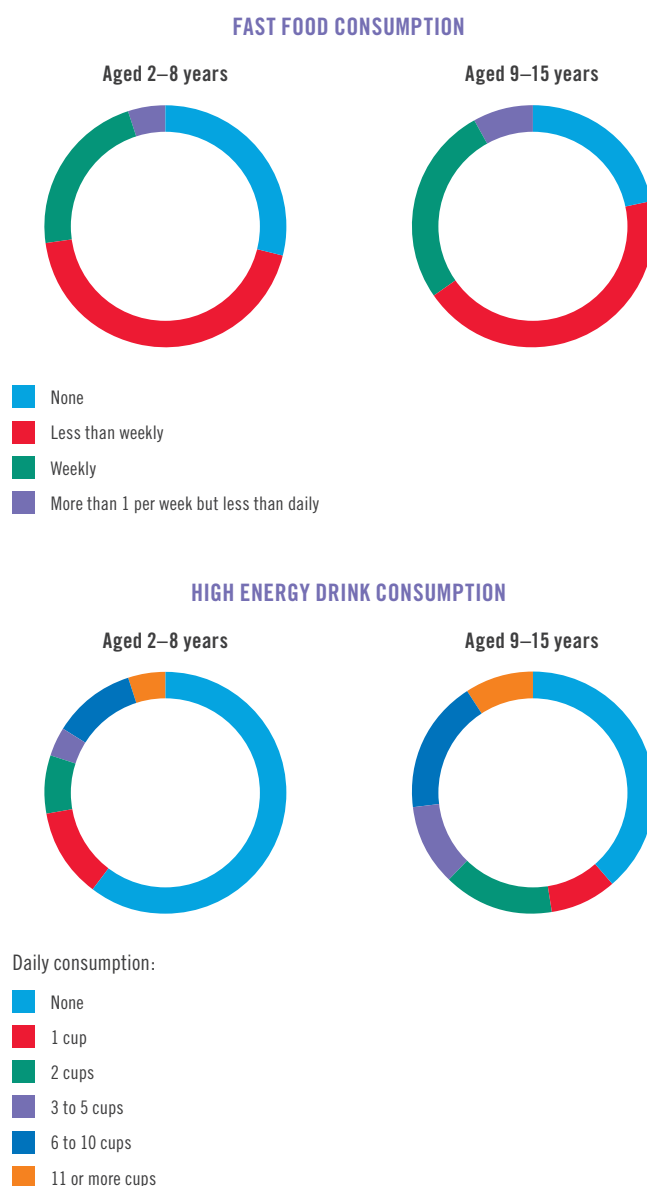
In 2012, according to the NSW Population Health Survey, about 5% of children aged 0–15 years and 10% of young people aged 16–24 years lived in households that ran out of food at times in the last 12 months and could not afford to buy more. The 2011–12 Australian Health Survey estimated that 3% of young people aged 18–24 years in NSW ran out of food in the last 12 months.<sup>32</sup>

## POPULATION HEALTH INITIATIVES

There are various programs under the *NSW Healthy Eating and Active Living Strategy 2013–2018* that promote healthy eating in children and young people, including:

- *NSW Healthy Children Initiative* (see Chapter 2: *NSW Healthy Children Initiative*)
- *Healthy Kids* website ([www.healthykids.nsw.gov.au](http://www.healthykids.nsw.gov.au))
- *8700 Find Your Ideal Figure* website ([www.8700.com.au](http://www.8700.com.au))

**FIGURE 2.16:** Consumption of fast food and high energy drinks by children (%), NSW, 2012–2013



Source: NSW Population Health Survey

# ACTIVE LIVING

## More children are engaging in less than 2 hours of small screen sedentary behaviour each day

### KEY POINTS:



In 2012–2013, 28.6% of children aged 5–15 years participated in more than 1 hour of physical activity each day outside of school hours, an increase from 21.9% in 2004–2005



The percentage of children aged 5–15 years engaging in less than 2 hours of sedentary behaviour each day outside of school hours has increased from 35.3% in 2004–2005 to 58.1% in 2012–2013



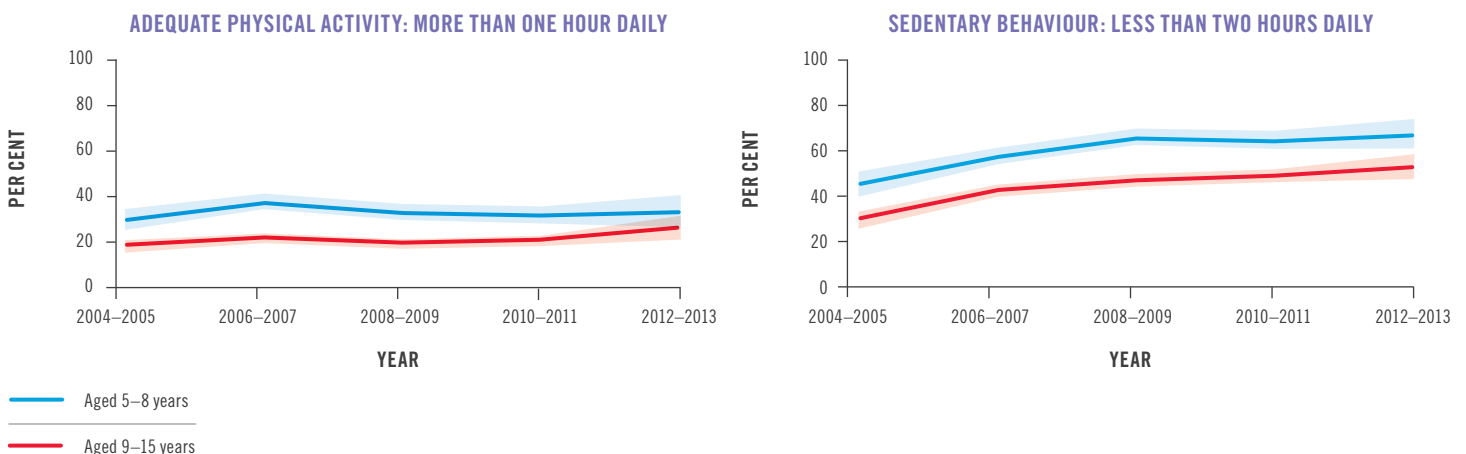
Just over 60% of young people aged 18–24 years met 150 minutes of recommended physical activity in a particular week

Physical activity promotes good health and prevents chronic disease across all life stages. Sedentary behaviours, such as “screen time” (that is, TV and video games and computers), are associated with increased risk of chronic disease and obesity.<sup>33,34</sup> It is recommended that children aged 5–17 years undertake at least 60 minutes of moderate to vigorous physical activity each day and have no more than 2 hours of sedentary time outside of school each day.<sup>35</sup> Two key objectives of *NSW Healthy Eating and Active Living Strategy 2013–2018* are to increase physical activity, and reduce time spent engaging in sedentary behaviours.<sup>31</sup>

Over 1 in 4 (28.6%) children aged 5–15 years had adequate physical activity each day outside of school hours in 2012–2013, an increase since 2004–2005 (21.9%) (Figure 2.17). It is likely that more children met the recommendation when including physical activity inside of school hours. Adequate physical activity was higher in boys (32.5%) than girls (24.0%), while differences between socioeconomic status areas were not substantial (Figure 2.18). A small increase in adequate cardiorespiratory fitness from 64% to 68% was observed between 1997 and 2010 for school students in Year 4–10.<sup>29</sup> The Australian Health Survey indicates that 60.6% of young people aged 18–24 years in NSW met 150 minutes of recommended physical activity in the week before the survey.<sup>36</sup>

The percentage of children aged 5–15 years who spent less than 2 hours per day engaging in small screen sedentary behaviours increased from 35.3% in 2004–2005 to 58.1% in 2012–2013, with a consistently higher percentage of children aged 5–8 years meeting this recommendation than children aged 9–15 years (Figure 2.17).

**FIGURE 2.17:** Trends in meeting active living recommendations, NSW



Source: NSW Population Health Survey

There were no substantial differences between girls (62.9%) and boys (53.8%) or between children living in different socioeconomic status areas (Figure 2.18).

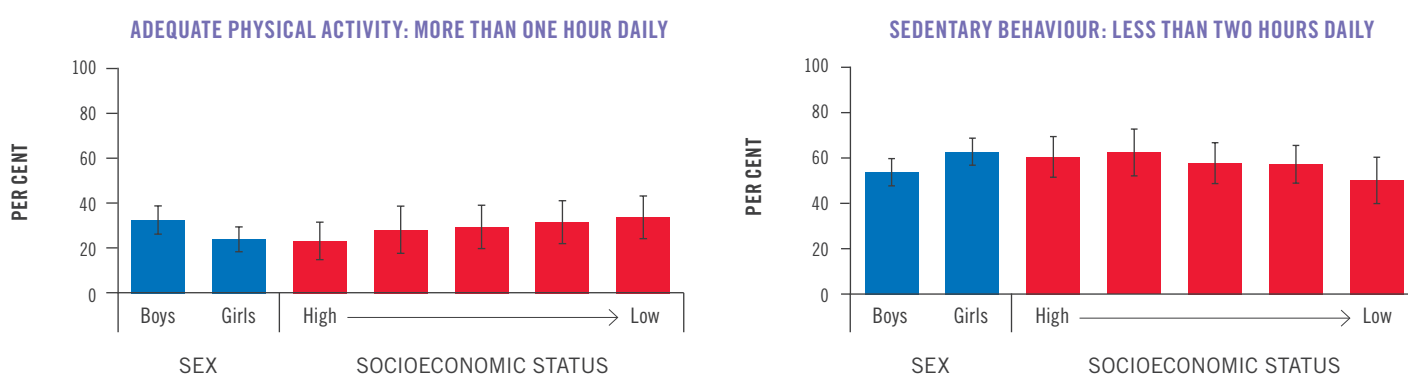
Some children are active for at least 60 minutes and also spend less than 2 hours in small screen recreation each day, while others achieve only 1 recommendation. In 2013, of those children aged 5–15 years who met at least 1 recommendation, just under one-half of boys and two-thirds of girls met the sedentary behaviour recommendation but not the physical activity recommendation. For the same population, over one-quarter of boys and girls met both the physical activity and also the sedentary behaviour recommendations (Figure 2.19).

## POPULATION HEALTH INITIATIVES

There are various strategies and programs that promote active living in children and young people including:

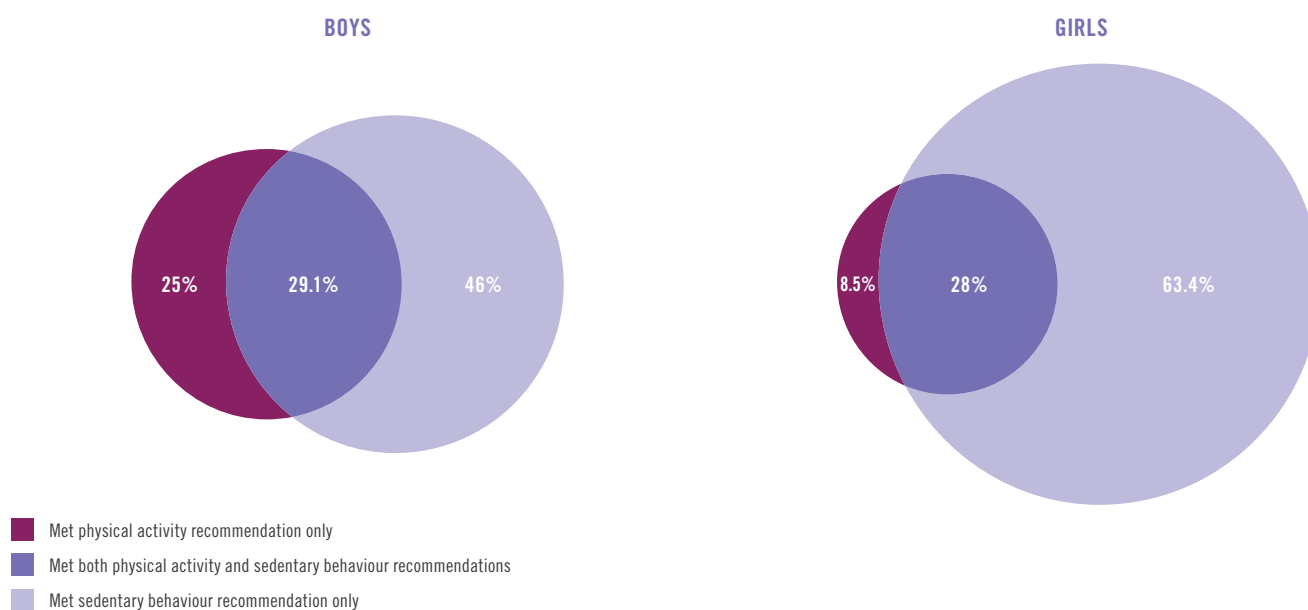
- *NSW Healthy Eating and Active Living Strategy 2013–2018*
- Healthy Children Initiative (see *Chapter 2: NSW Healthy Children Initiative*)
- *Healthy Kids* website ([www.healthykids.nsw.gov.au](http://www.healthykids.nsw.gov.au))

**FIGURE 2.18:** Active living in children and young people aged 5–15 years, NSW, 2012–2013



Source: NSW Population Health Survey

**FIGURE 2.19:** Children and young people aged 5–15 years who met 1 or both of the physical activity and sedentary behaviour recommendations, NSW, 2013



Source: NSW Population Health Survey

# NSW HEALTHY CHILDREN INITIATIVE

The *NSW Healthy Children Initiative* has helped to stabilise an increasing trend in childhood overweight and obesity

## KEY POINTS:



As of March 2014, 80% of early childhood centres and 71% of primary schools were participating in the *NSW Healthy Children Initiative*



A high percentage of early childhood services have adopted practices to support healthy eating and physical activity



Over 80% of participating primary schools have adopted fruit, vegetable and water breaks in class

**Go4Fun**

**Crunch&Sip**



The *NSW Healthy Children Initiative* includes a range of evidence-based programs targeted at improving fruit and vegetable intake, drinking water, physical activity and sedentary behaviours in children, young people and their families. These programs are delivered in the early childhood setting, schools, recreational settings and the community. Key programs include:

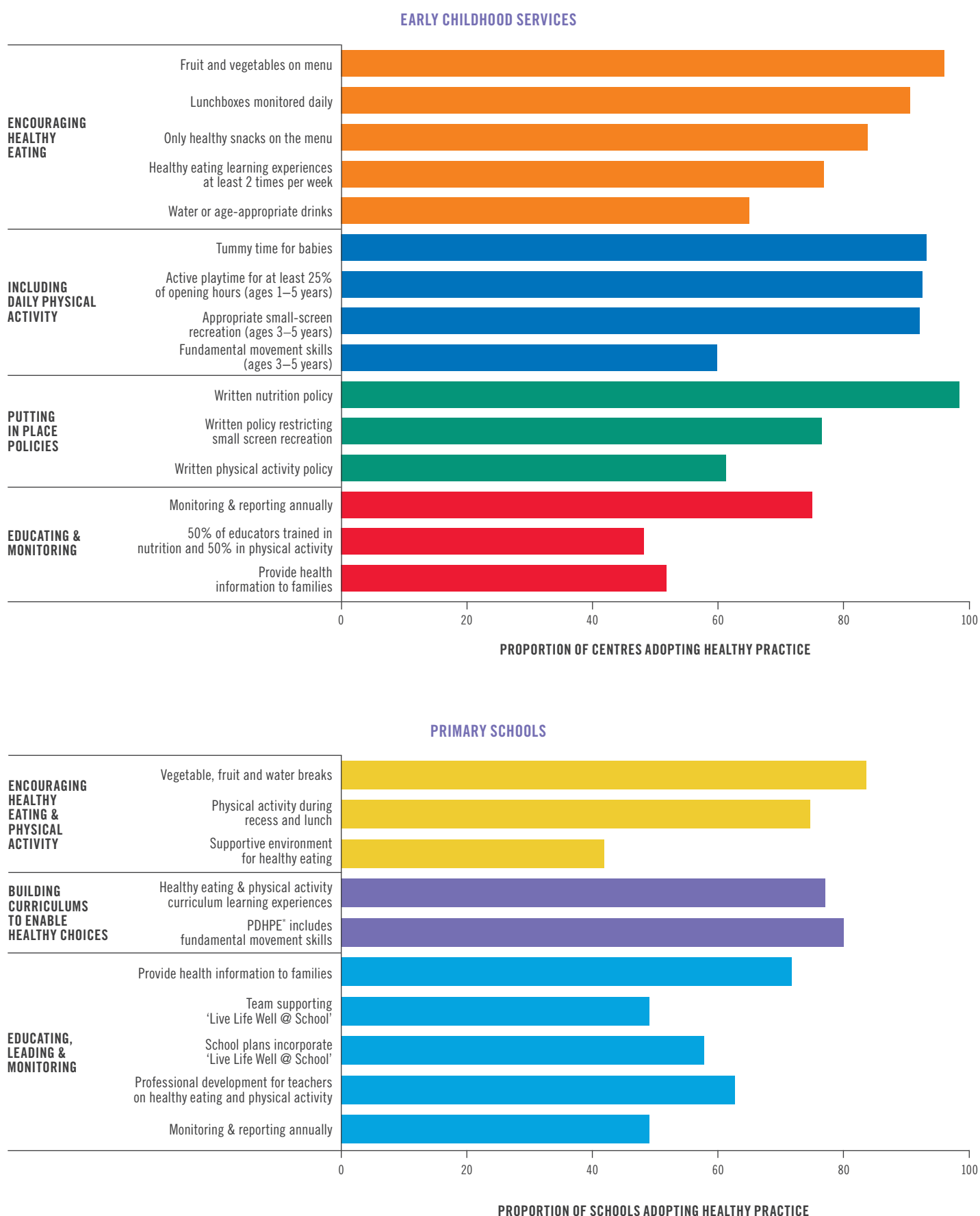
- *Crunch&Sip* encourages schools to provide set times for children to eat fruit and vegetables and drink water
- *Munch & Move*<sup>®</sup> builds capacity and influences policies in early childhood settings to encourage physical activity and fundamental movement skill development, healthy eating and reduce time spent on small screen activities
- *Live Life Well @ School* builds the capacity of schools to implement whole of school strategies to encourage healthy eating and physical activity and enhances the knowledge, skills and confidence of teachers through training to teach nutrition and physical activity and build fundamental movement skills
- *Go4Fun*<sup>®</sup> is a multidisciplinary prevention program which contributes to improved weight status, fitness and self-esteem in children aged 7–13 years who are above their ideal weight. The program incorporates family involvement, practical education in nutrition, physical activity and lifelong behaviour change.

These programs have excellent reach into childhood settings across NSW. By March 2014, 2,757 (80%) early childhood centres and 1,859 (71%) primary schools were participating across NSW.<sup>37,38</sup>

There have been a number of key achievements where these programs have been implemented (Figure 2.20). Among participating early childhood services, 95.9% have adopted daily fruit and vegetable practices, 92.4% include daily active play time and 98.3% have written policies on nutrition. Among participating primary schools, 83.5% have adopted the *Crunch & Sip* practices, 74.6% encourage physical activity during recess and lunch, and 71.6% provide regular nutrition and physical activity information to families. In addition, between July 2011 and June 2013, *Go4Fun* has achieved substantial outcomes, including (on average) a:

- 0.7kg/m<sup>2</sup> reduction of body mass index
- 1.6cm reduction of waist circumference
- 6.4 beats per minute reduction of recovery heart rate
- 3.5 hour increase of weekly physical activity
- 4.4 hours reduction of weekly sedentary activity

These activities have contributed to stabilising the rate of childhood overweight and obesity, which had been increasing since 1985.

**FIGURE 2.20:** Percentage of early childhood services and primary schools adopting healthy eating and physical activity practices, NSW, end March 2014


Note: \* K-6 Personal Development, Health and Physical Education (PDHPE)

Source: PHIMS Interim Solution data monitoring and management

# ORAL HEALTH

Teenagers who brush their teeth, avoid sugary drinks and have access to fluoridated water have better oral health

## KEY POINTS:



Oral health problems can be prevented by regular tooth brushing with fluoride toothpaste, avoiding sugary drinks, visiting the dentist regularly, and drinking fluoridated water



In 2012–2013, more than three-quarters of NSW children aged 5–15 years visited a dental professional in the last 12 months



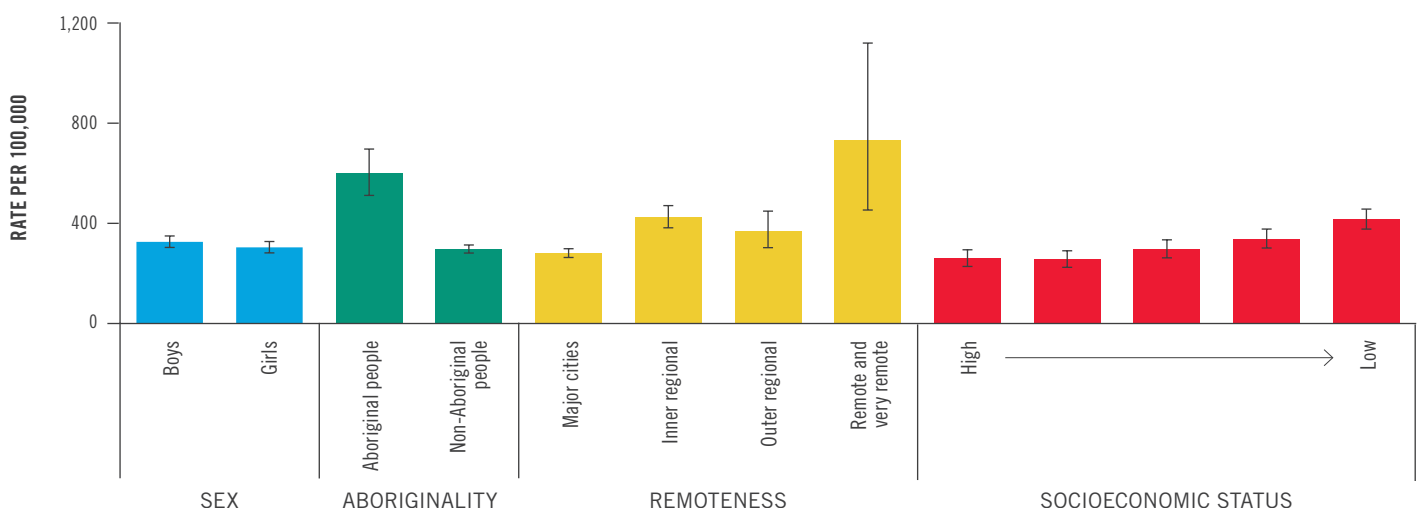
Hospitalisations for dental caries are disproportionately high in Aboriginal children and children living in areas that are more remote or have a lower socioeconomic status

Poor oral health is associated with a range of adverse health outcomes including systemic infections, poor nutrition and growth, difficulty sleeping, problematic social behaviour, poor academic performance and increased risk of chronic diseases.<sup>1,39</sup> Regular tooth brushing, oral health examinations, a healthy diet, and fluoridation of public water supplies are proven strategies for preventing dental decay and its associated adverse health outcomes.<sup>1</sup>

In 2012–2013, according to the NSW Population Health Survey, 76.8% of children aged 5–15 years visited a dental professional (such as a dentist, dental technician and orthodontist) in the last 12 months (see *Chapter 3: Health service utilisation* for further details about public dental services). Visits to a dentist are consistently less common among children aged 5–8 years. Poorer dental health care behaviours were also reported among children living in areas with a lower socioeconomic status.

Children aged less than 5 years who require the removal or restoration of teeth due to dental caries are likely to be hospitalised in order to access general anaesthesia. Among children in this age group, hospitalisation rates for dental procedures were disproportionately high in Aboriginal children, compared with non-Aboriginal children, and children living in remote areas compared with major cities, and the lowest socioeconomic status areas compared with the highest socioeconomic status areas (Figure 2.21).

**FIGURE 2.21:** Hospitalisations for removal and restoration of teeth for dental caries in children aged 0–4 years, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

The NSW Teen Dental Survey 2010 reported that teenagers aged 14–15 years had on average 1.2 permanent decayed, missing or filled teeth (DMFT) per person, and 45.4% of 14–15 year olds had dental decay in 1 or more of their permanent teeth. Dental decay in teenagers was similar across socioeconomic status areas, but more common in teenagers living in unfluoridated areas. Decay was, however, less common in those who avoided sugary drinks, and those who brushed their teeth twice or more per day (Figure 2.22).<sup>40</sup>

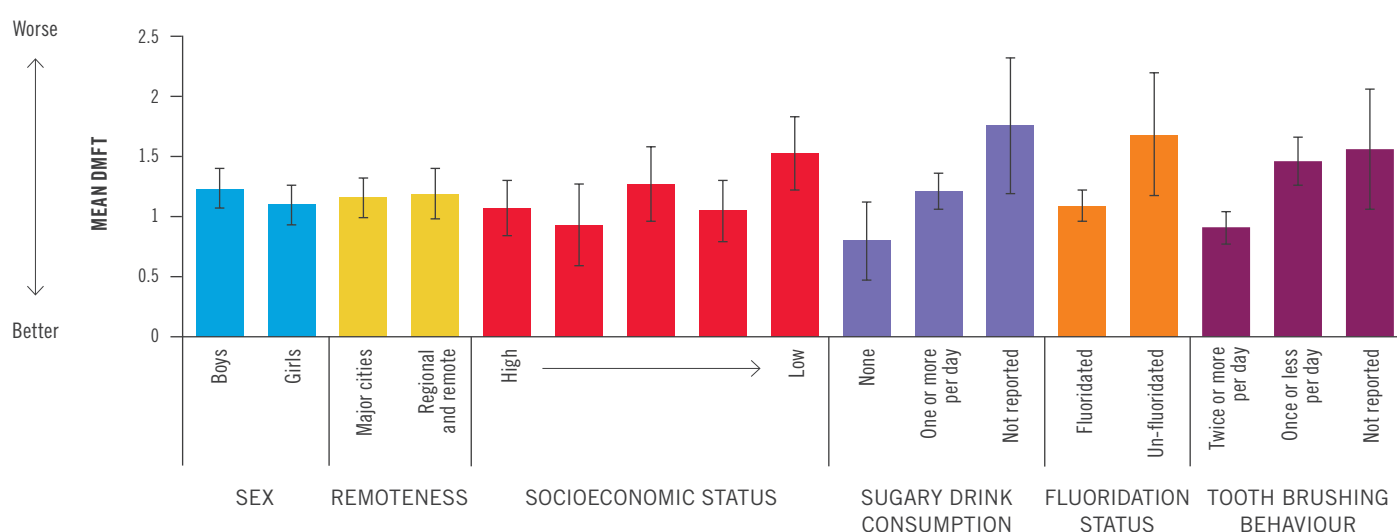
Fluoridation of public water supplies prevents dental caries in all ages, regions and across socioeconomic groups. Most communities have access to fluoridated water, with approximately 96% of the NSW population on a town water supply having access to fluoridated drinking water.<sup>41</sup> Teenagers living in areas with fluoridated water had a 35% lower average number of decayed missing or filled teeth than those living in unfluoridated areas. Further, a higher percentage of teenagers had never experienced decay in their permanent teeth, compared with those living in unfluoridated areas.<sup>40</sup>

## POPULATION HEALTH INITIATIVES

NSW Health has continued to support numerous population health initiatives to promote oral health, including:

- Fluoridation of public water supplies to prevent dental decay across the population
- Providing free public oral health care to children and young people under 18 years of age and eligible adults
- The Early Childhood Oral Health policy encourages child health professionals to regularly check for signs of early childhood caries by “lifting the lip” and describes the responsibilities and procedures for implementing the policy
- *My Personal Health Record* (The Blue Book), distributed to all new parents, includes information about “lifting the lip” and checklists for child oral health
- A range of oral health promotion activities targeting early childhood and priority population groups such as Aboriginal communities and culturally and linguistically diverse communities

**FIGURE 2.22:** Average number of decayed, missing and filled teeth (DMFT) in teenagers aged 14–15 years, NSW, 2010



Source: NSW Teen Dental Survey 2010



# SMOKING

## Fewer young people are taking up smoking

### KEY POINTS:



Smoking has substantially decreased in students aged 12–17 years, from 27.3% in 1984 to 7.5% in 2011



Just over 90% of students aged 12–17 years identified themselves as a non-smoker in 2011

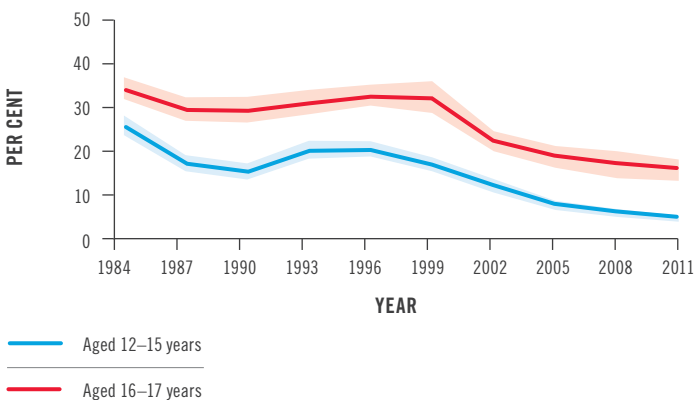
Smoking usually begins during the high school years, with 8 out of 10 new smokers in Australia being children or adolescents.<sup>42,43</sup> A key priority of the *NSW Tobacco Strategy 2012–2017* is to reduce smoking among young people.

In 2011, in the NSW School Students Health Behaviours Survey, 7.5% of students aged 12–17 years reported they were current smokers (4.2% of 12–15 year olds and 15.4% of 16–17 year olds); a substantial decrease since 1984 when 27.3% reported current smoking (Figure 2.23). There were no differences between male and female students reporting current smoking. In the same year, over 90% of students participated in at least part of a lesson at school about smoking.<sup>44</sup> Just over 90% of students aged 12–17 years identified themselves as a non-smoker.<sup>44</sup>

In 2013, in the NSW Population Health Survey, 17.8% of young people aged 16–24 years reported they were current smokers; a 36% decrease since 2003 (27.6%) (Figure 2.24). There were no substantial differences in current smoking between males (20.3%) and females (15.2%) aged 16–24 years. This gender difference becomes more prominent between the ages of 25 and 64.<sup>45</sup> In the same year, 43.1% of males and 57.8% of females aged 16 years and over reported they had never smoked.

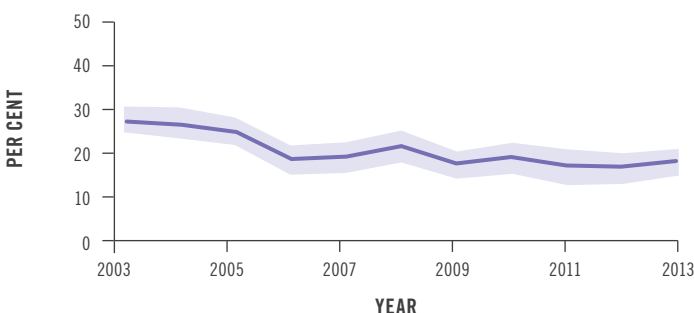
Electronic cigarettes (or e-cigarettes or e-cigs) are battery powered devices which vaporise a solution called electronic-liquid (or e-juice) that can be inhaled by the users.<sup>46–48</sup> Electronic cigarettes are becoming increasingly popular, with reports from other countries suggesting their use is growing rapidly. This has led to increasing discussion about the risks and benefits of electronic cigarettes and a need to better understand how and to what extent they are being used. To obtain information for the NSW context, the NSW Ministry of Health has included questions about public awareness and use of e-cigarettes in the 2014 NSW Population Health Survey.

**FIGURE 2.23:** Current smokers aged 12–17 years, NSW



Source: NSW School Students Health Behaviours Survey

**FIGURE 2.24:** Current smokers aged 16–24 years, NSW



Source: NSW Population Health Survey

## POPULATION HEALTH INITIATIVES

Population health strategies targeted at reducing the uptake and prevalence of smoking in children and young people include:

- *NSW Tobacco Strategy 2012–2017*
- Enforcement of legislation, including the *Smoke-free Environment Act 2000* and the *Public Health (Tobacco) Act 2008*
- Providing support to quit smoking, such as *iCanQuit* and *Quitline*
- Public education campaigns to increase awareness of the harmful effects of smoking and motivate and support smokers to quit

# ALCOHOL CONSUMPTION

## Alcohol misuse and resulting hospital visits have begun to decline in young people

### KEY POINTS:



Rates of alcohol drinking among school students have declined



Rates of emergency department visits for alcohol problems remain high at 203 per 100,000 15–17 year olds and 327 per 100,000 people aged 18–24 years



Alcohol-attributable hospitalisations are highest among young males, young Aboriginal people, and young people living in more remote areas and lower socioeconomic status areas



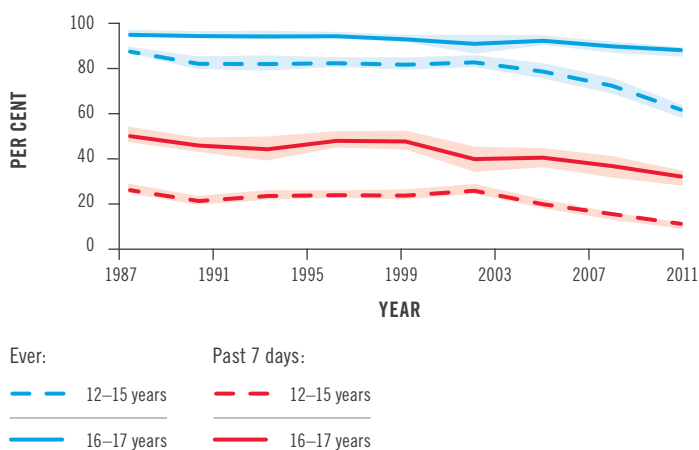
Most of these hospitalisations were for injuries

Drinking alcohol at young ages may affect brain development and increase the risk of later alcohol and other substance dependencies.<sup>49–51</sup> High levels of alcohol consumption are associated with injury and participation in high-risk behaviours (for example, coercive sexual activity, unprotected sex and violence) in young people.<sup>1,52,53</sup> A key target of the *NSW State Health Plan: Towards 2021* is to reduce total risk drinking to below 25% by 2015.<sup>54</sup> NHMRC guidelines recommend that drinking no more than 2 standard drinks on any day reduces lifetime risk of harm from alcohol-related disease or injury, and no more than 4 standard drinks on a single occasion reduces risk of alcohol-related injury arising from that occasion.<sup>53</sup>

In 2011, in the NSW School Students Health Behaviours Survey, 68.8% of students aged 12–17 years reported they had consumed an alcoholic drink at some point in their lives and 16.2% had a drink in the last week. Rates of consumption were higher among students aged 16–17 years than those aged 12–15 years (Figure 2.25). Declines in both groups occurred over time (especially for those aged 12–15 years); suggesting a delay in the age at which children start trying alcoholic drinks. In 2011, of students aged 12–17 years who had consumed alcohol in the 7 days prior to being interviewed, 7.2% reported drinking 4 or more drinks in a day; a decline from 10.5% in 1984. Over 90% of students reported they had attended a school lesson about drinking.

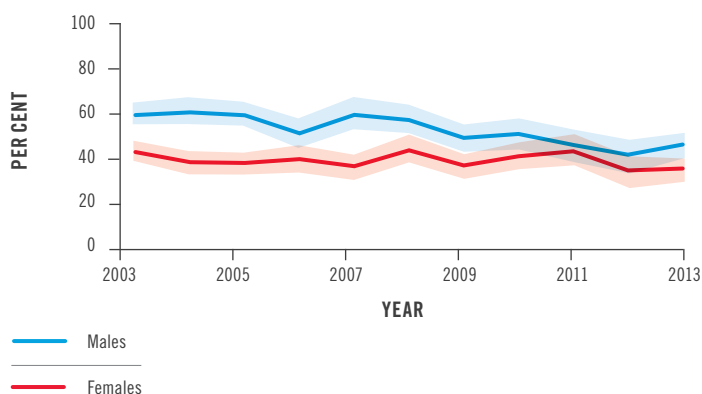
In 2013, in the NSW Population Health Survey, 40.9% of young people aged 16–24 years reported they had consumed more than 2 standard drinks on a day when they drank alcohol; posing a lifetime risk to their health. A decline has occurred in the percentage of males and females drinking at this level since 2003; although historically more males drank at such high levels than females, this difference is not substantial (Figure 2.26).

**FIGURE 2.25:** Recent alcohol consumption in school students aged 12–17 years, NSW



Source: NSW School Students Health Behaviours Survey

**FIGURE 2.26:** Young people aged 16–24 years who had more than 2 standard drinks on any day, NSW



Source: NSW Population Health Survey

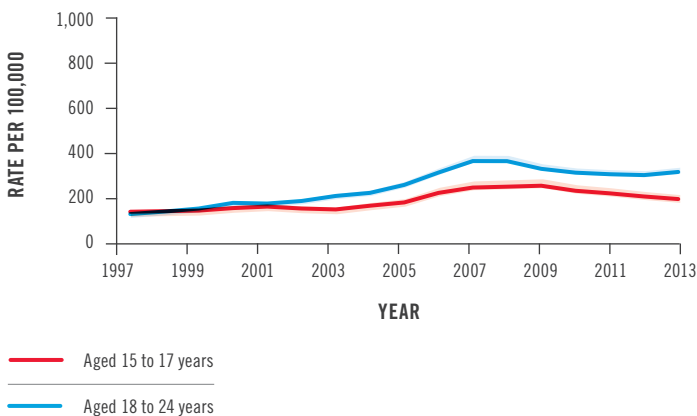
Emergency department visits for acute alcohol problems peaked between 2007 and 2009 (Figure 2.27). In recent years, rates were similar in males and females but were substantially higher in those aged 18–24 years (327 per 100,000) than those aged 15–17 years (203 per 100,000). Given the diversity of health problems associated with alcohol misuse, and the associated challenges with capturing alcohol-related problems in emergency department data collections, the rates presented underestimate the true magnitude of this public health problem.

Alcohol-attributable hospitalisations in people aged 15–24 years have been consistently two-fold higher in males than in females since 1998–99 and peaked in

2006–07 (Figure 2.28). Higher hospitalisation rates occurred among young people who were Aboriginal, and those living in areas that are more remote or with lower socioeconomic status (Figure 2.29). In 2012–13, injuries (for example, falls, road accidents or assaults) accounted for an overwhelming majority of alcohol-attributable hospitalisations in both males (78.1%) and females (61.9%).

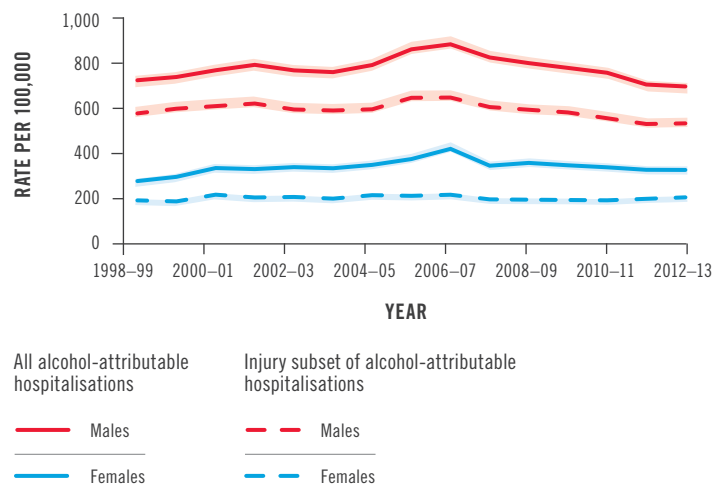
Alcohol-attributable hospitalisations may also occur in children under 15 years from accidental or intentional consumption. In 2012–13, an estimated 246 (17.8 per 100,000) children aged 0–14 years had an alcohol-attributable hospitalisation; a reduction from 407 (30.5 per 100,000) in 1999–00.

**FIGURE 2.27:** Emergency department visits for acute alcohol problems in young people, NSW



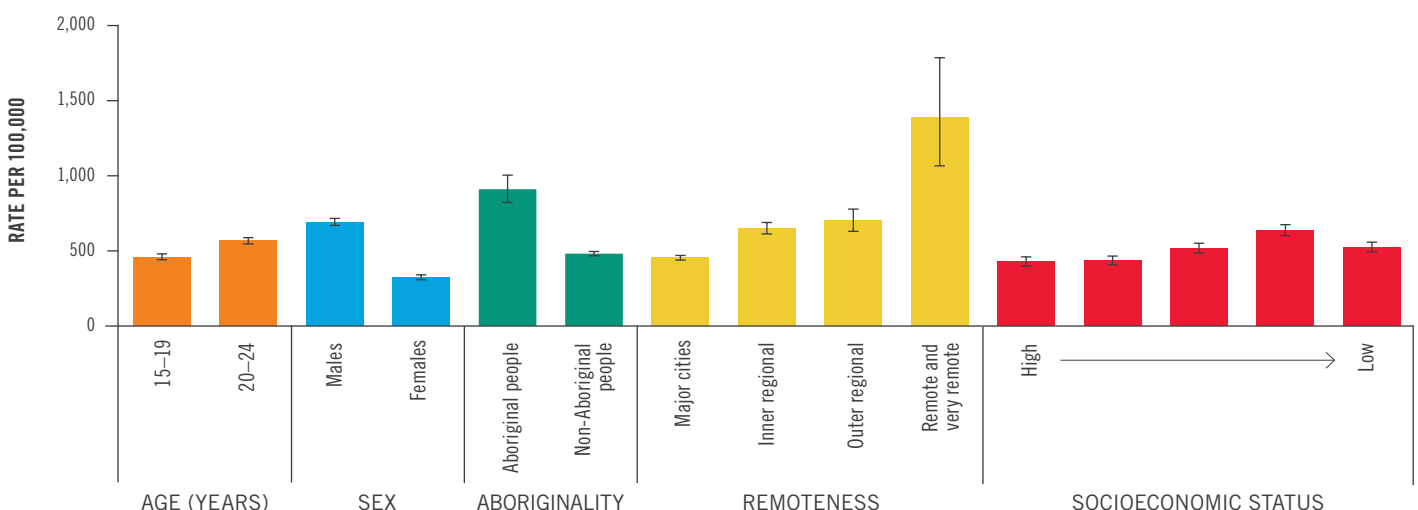
Source: NSW Emergency Department Data Collection

**FIGURE 2.28:** Alcohol-attributable hospitalisations in young people aged 15–24 years, NSW



Source: NSW Admitted Patient Data Collection

**FIGURE 2.29:** Alcohol-attributable hospitalisations among young people aged 15–24 years, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

## POPULATION HEALTH INITIATIVES

Population health initiatives for reducing alcohol consumption in young people in NSW primarily focus on education and harm minimisation in large-scale advertising campaigns such as:

- *What are you doing to yourself?* encourages youth to “know your limits and you’ll have a much better time”
- *Know when to say when* challenges the broader NSW community to assess the role excessive alcohol consumption plays in Australian culture
- Community Drug Action Teams deliver education, information and skills building programs to their local communities to prevent and reduce alcohol misuse and related harm
- *Drug info @ your library* is a partnership project providing drug and alcohol information through the network of NSW public libraries
- *Save-a-mate* is a partnership project providing drug and alcohol information, education, support and care at music festivals, dance parties and other youth cultural events across NSW
- *Your Room* offers information about alcohol and a wide range of drugs, how they affect people, side effects, withdrawal, and how to get help
- *Be the influence: Tackling binge drinking* uses social media and sporting ambassadors to promote positive messages about responsible drinking and reducing risk-taking behaviour

# SUBSTANCE MISUSE

## Misuse of illicit drugs, inhalants and medications is decreasing

### KEY POINTS:



The percentage of students who use illicit or other substances has declined



Rates of emergency department visits for drug overdose were highest among young people aged 15–24 years and have risen among females aged 15–19 years



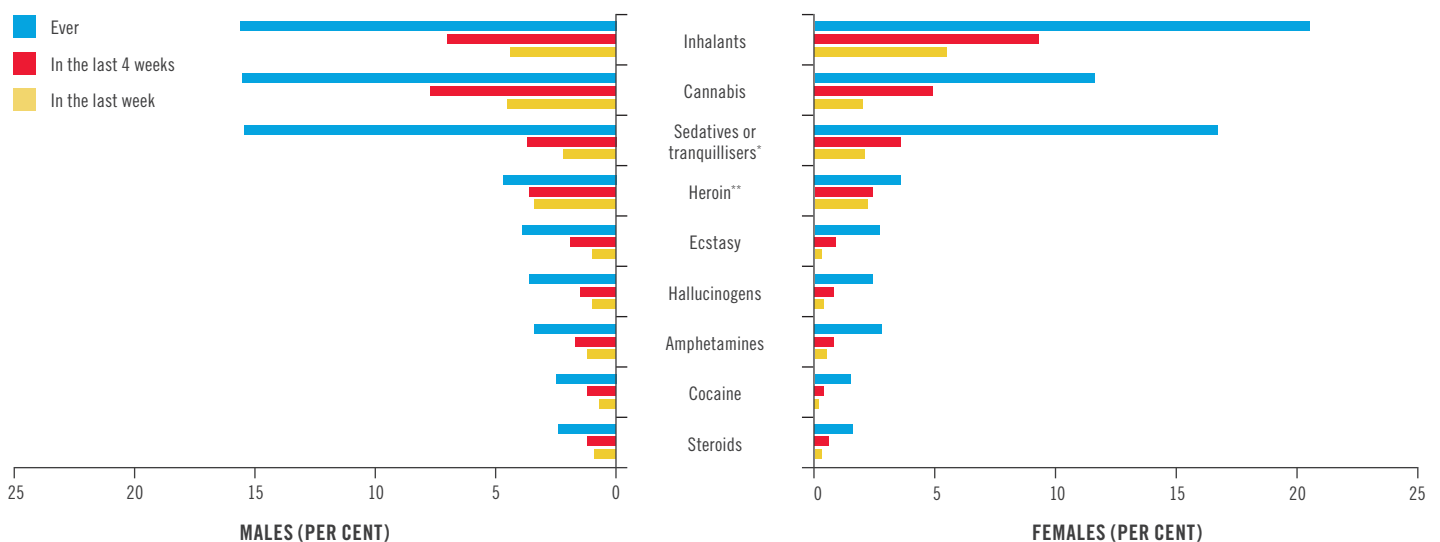
There were over 7,500 ambulance calls for accidental or intentional use of an illicit or other substance

### DRUG MISUSE AND ABUSE

Drug misuse is associated with substantial health risks, including injury, mental health problems, organ failure and blood borne virus transmission. While around 85% of high school students have never used an illicit substance,<sup>44</sup> this issue remains a public health concern due to the associated health and social problems. Further, the misuse of inhalants such as petrol, paint and glue, synthetic drugs, prescription medicines and steroids are also problematic in young people.<sup>55</sup> Currently, a range of strategies are in place to prevent illicit and licit drug use through reducing supply and demand and by minimising harms from use.<sup>56</sup>

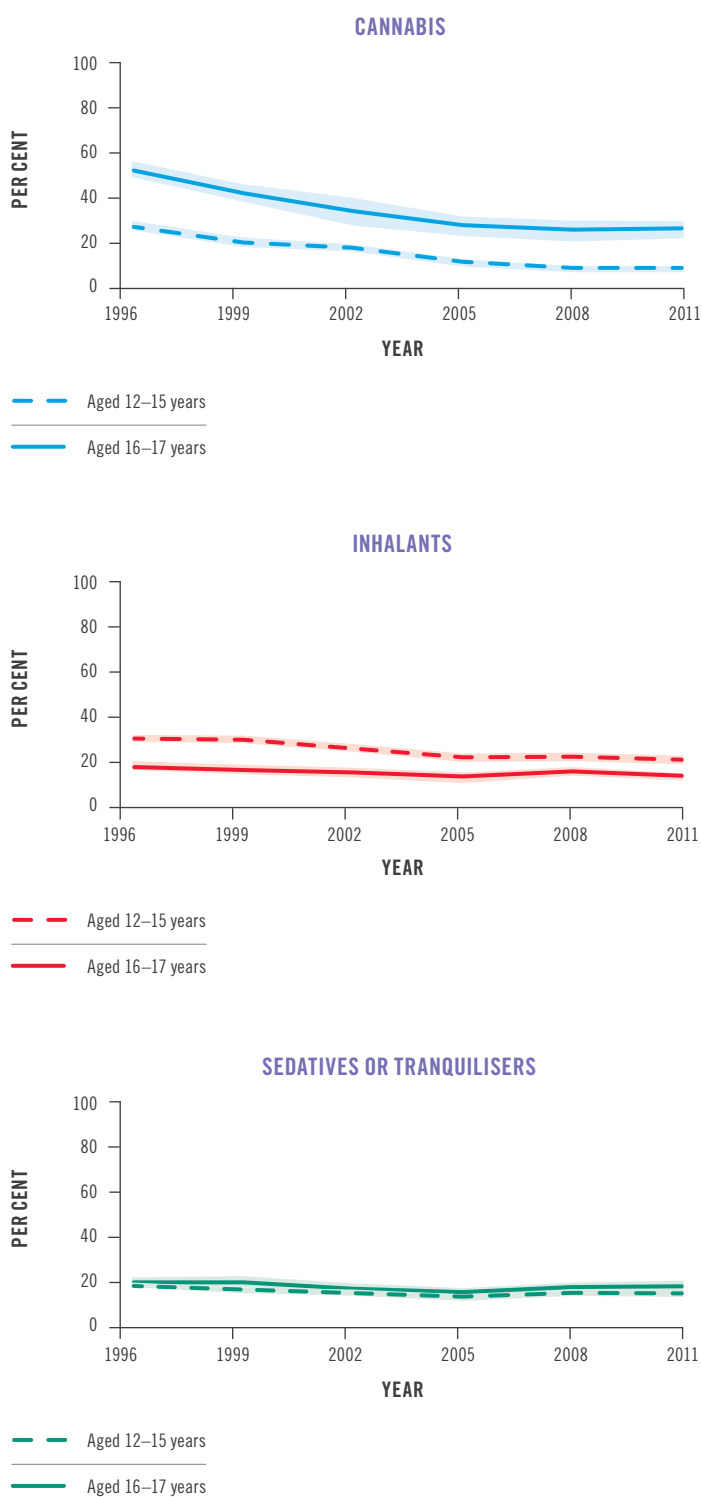
In 2011, in the NSW School Students Health Behaviours Survey, students aged 12–17 years most commonly reported they had used inhalants (18.0%), sedatives or tranquilisers for non-medical reasons (16.0%), or cannabis (13.6%). A higher percentage of males had used illicit drugs than females; however, more females reported to have used inhalants, sedatives or tranquilisers (Figure 2.30). Between 1996 and 2011, there were substantial decreases in the percentage of students who had ever used drugs (excluding ecstasy, steroids and heroin) (Figure 2.31). For most drugs, a higher or comparable percentage of students aged 16–17 years reported to have ever used a substance than students aged 12–15 years; however, a higher percentage of younger students had used inhalants.<sup>44</sup>

**FIGURE 2.30:** Substance use among students aged 12–17 years, NSW, 2011



Note: \* Sedatives or tranquilisers used for purposes other than for medical reasons \*\* Includes other opiates

Source: NSW Schools Students Behaviour Survey

**FIGURE 2.31:** Trends in the percentage of students that had ever used selected substances, NSW

Note: Substances used other than for medical reasons

Source: NSW Schools Students Behaviour Survey

## OVERDOSE AND ACCIDENTAL EXPOSURE

An emergency response is often needed following either accidental exposure to toxic substances (usually in children), or intentional or accidental overdose with an illicit or other substance in young people. In 2013, over 7,500 triple zero calls for overdose, poisoning or ingestion of substances in children and young people were received by NSW Ambulance Services (32.1% of all calls for overdose, poisoning or ingestion). Rates of ambulance calls were considerably higher in young people aged 15-24 years and in females (Figure 2.32).

In 2013, over 5,000 visits to NSW emergency departments for illicit drug use, poisoning or overdose among children and young people were recorded (less than 1% of all emergency department visits). Substantial declines in the rate of emergency department visits were observed for children and young people aged 0-4 years and 20-24 years. Since 2011, there has been a rise in emergency department visits for illicit drug use, poisoning and overdose in females aged 15-19 years (Figure 2.33). This has been primarily due to a rise in emergency department visits for overdose or poisoning (from 384 per 100,000 in 2011 to 558 per 100,000 females in 2013).

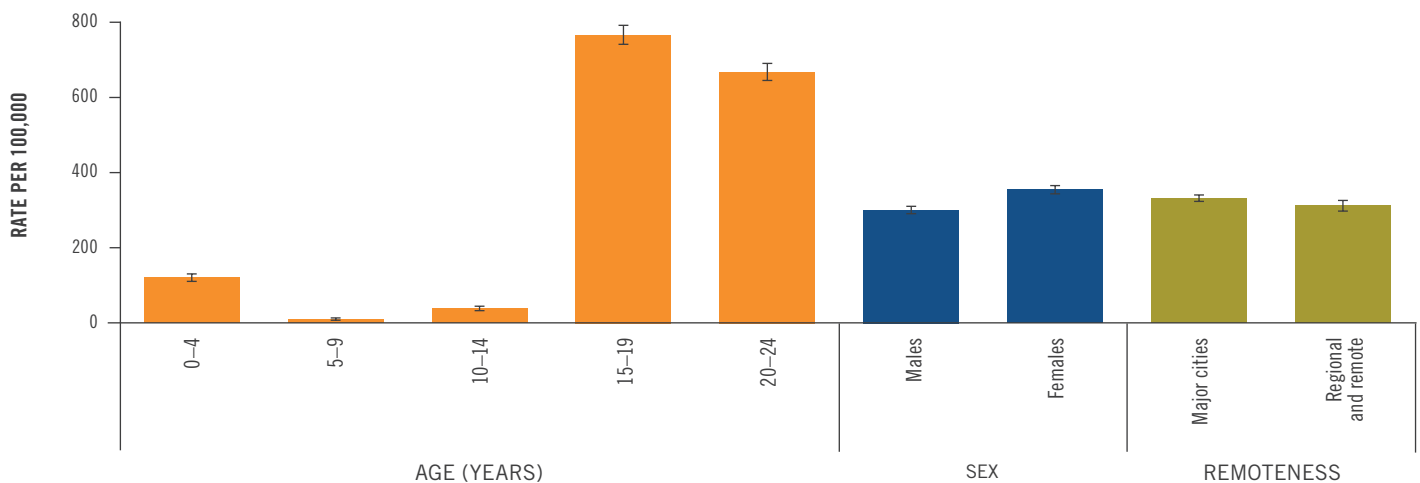
In NSW, the rate of hospitalisation attributed to illicit drug use during 2012-13 was approximately 35% higher in young people aged 15-24 years (287.9 per 100,000 population) than in the general adult population (213.3 per 100,000).

## POPULATION HEALTH INITIATIVES

Population health initiatives to reduce drug misuse have largely focused on educating young people about risk, and coordinating many programs that support young people who misuse drugs, including:

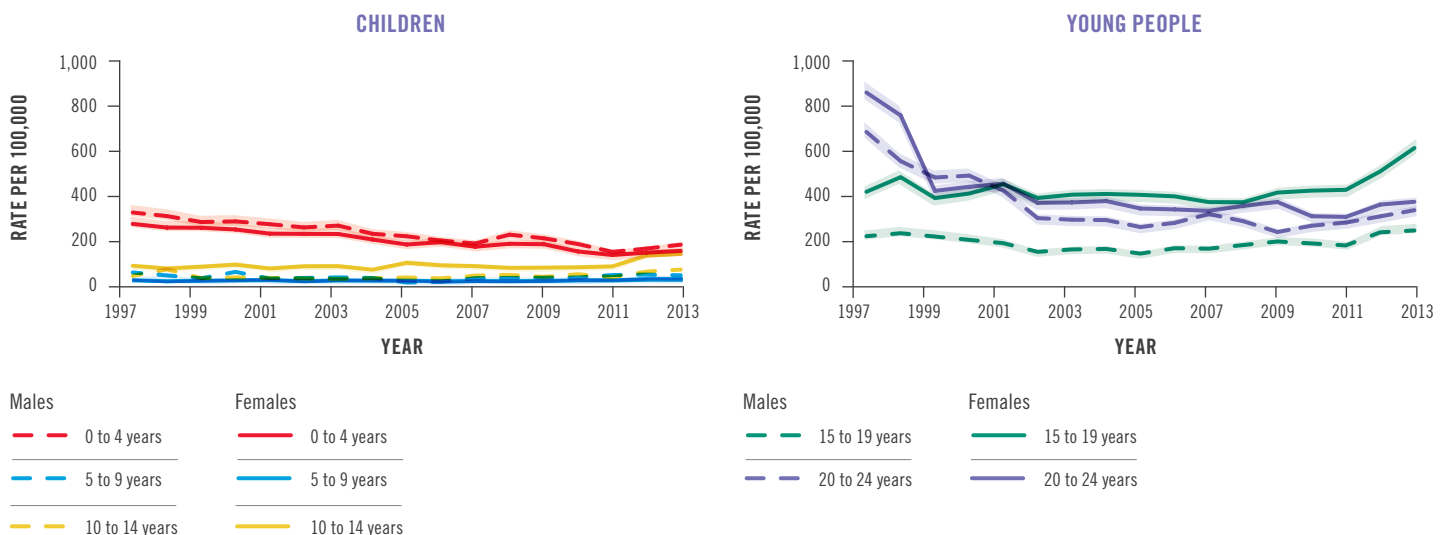
- Community Drug Action Teams deliver education, information and skills building programs to their local communities to prevent and reduce alcohol misuse and related harm
- *Drug info @ your library* is a partnership project providing drug and alcohol information through the network of NSW public libraries
- *Save-a-mate* is a partnership project providing drug and alcohol information, education, support and care at music festivals, dance parties and other youth cultural events across NSW
- *Your Room* offers information about alcohol and a wide range of drugs, how they affect people, side effects, withdrawal, and how to get help
- *National Drugs Campaign* provides information about counselling and support for youth who misuse drugs

**FIGURE 2.32:** Triple zero ambulance calls for overdose, poisoning or ingestion of substances, 2013



Source: Ambulance Service of NSW Dispatch Database

**FIGURE 2.33:** Emergency department visits for illicit drug use, poisoning or overdose, aged 0–24 years, NSW



Source: NSW Emergency Department Data Collection

# ENVIRONMENTAL EXPOSURES

Sun exposure, passive smoking and lead exposure can negatively impact the future health of children and young people

## KEY POINTS:



Over 1 in 4 students did not get sunburnt in the summer prior to 2011, a significant increase since 1999



Almost 9 in 10 young people aged 16–24 years live in a smoke-free household and drive a smoke-free car



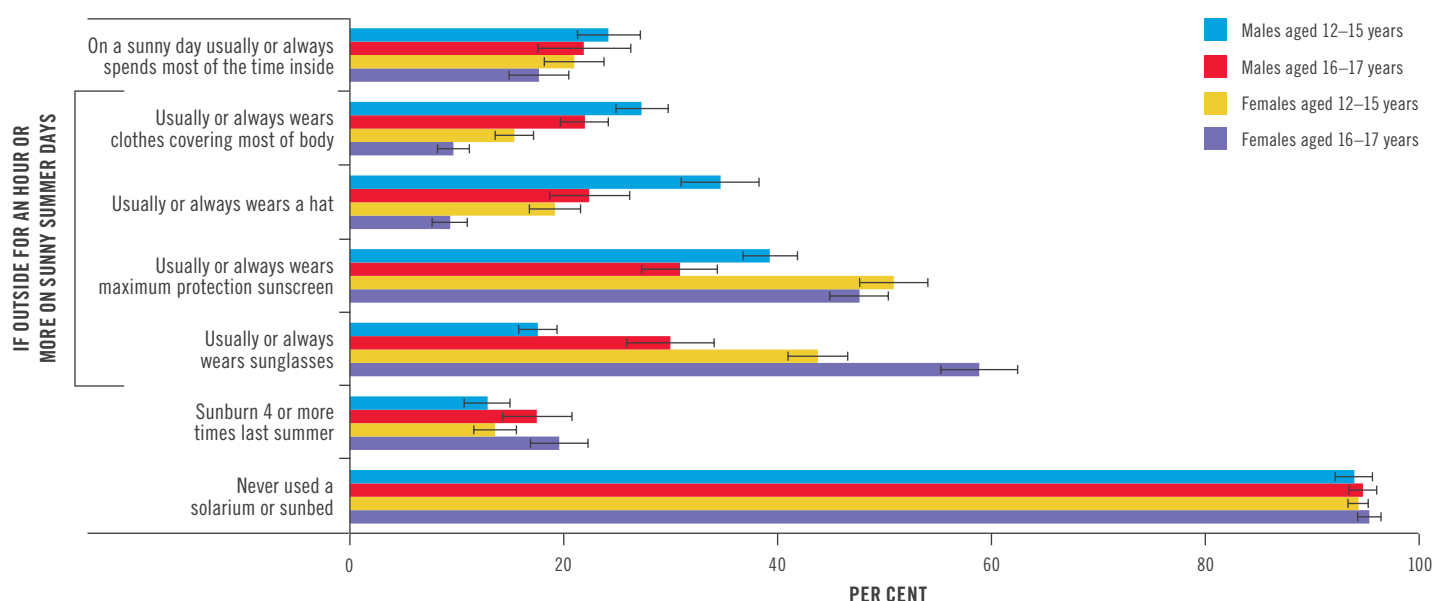
The average blood lead levels in children aged 1–4 years in Broken Hill have decreased from a high of 16.7µg/dL in 1991, to 5.6µg/dL in 2013

## SUN EXPOSURE

Excessive sun exposure can harm the body, leading to skin cancer (including melanoma) and other health problems. Australia has the highest incidence of melanoma in the world and skin cancer is the 4th most common cancer in NSW.<sup>57</sup> Although melanoma is most often diagnosed in older adults, it can occur in young adults and teenagers, and may result from UV exposure and repeated episodes of sunburn during childhood and adolescence.<sup>58</sup> Sun protection is the best way to prevent skin cancer, by seeking shade, wearing a broad brimmed hat and sun-protective clothing, using appropriate sunscreen and wearing wrap-around sunglasses.<sup>59</sup>

In 2011, in the NSW School Student Health Behaviours Survey, 1 in 5 (21.8%) students aged 12–17 years spent most of their time inside, during peak exposure times on sunny summer days, and just under 1 in 2 (43.3%) wore maximum protective sunscreen. For students who were in the summer sun for more than 1 hour, a higher percentage of females aged 12–17 years wore maximum protection sunscreen or sunglasses, than boys of the same age; while a higher percentage of males aged 12–15 years wore a hat or covered most of their body with clothes than other students. In 2011, 1 in 4 (26.3%) students did not experience sunburn at all in the summer prior to being interviewed; a substantial increase since 1999 (20.1%).<sup>44</sup> However, 1 in 7 (14.8%) experienced sunburn 4 or more times. A large majority (94.4%) of students in 2011 had never used a solarium or sunbed (Figure 2.34).

FIGURE 2.34: Sun protection behaviours by students, 2011



Source: NSW School Student Health Behaviours Survey



## SECOND-HAND SMOKE

Second-hand smoke contains carcinogenic chemicals and other toxic substances.<sup>60</sup> It can remain in the environment for a considerable amount of time, with 1 recent study reporting that it takes around 160 minutes for second-hand smoke to reduce to levels recommended by the World Health Organization.<sup>61</sup> Babies of mothers who smoke, or who are exposed to second-hand smoke (passive smoking) after birth, are at increased risk of sudden infant death syndrome. Compared with children whose parents do not smoke, children of smokers have higher rates of lower respiratory illnesses such as bronchitis and pneumonia during their first 18 months of life. Children exposed to passive smoking are more likely to suffer from asthma (see *Chapter 3: Asthma*) and are at greater risk of meningococcal disease.<sup>60</sup>

The NSW Population Health Survey found that the percentage of people aged 16–24 years driving a smoke-free car increased from 73.7% to 86.9% between 2003 and 2012.<sup>62</sup> Similarly, there was an increase in the percentage of people aged 16–24 years living in smoke-free households from 74.6% in 2002 to 88.8% in 2012.<sup>63</sup> For further information about smoking see *Chapter 2: Smoking* and smoking during pregnancy see *Chapter 2: Infant health*.

In NSW, amendments to the Smoke-free Environment Act (SFE) 2000 have been introduced, restricting smoking in outdoor public places, and from 2015 this will be expanded to include commercial outdoor dining areas.<sup>64</sup> NSW Health Authorised Inspectors can issue infringement notices (on the spot fines) under the SFE Act and NSW Police Officers can issue fines for smoking in transport settings under the SFE Act and the Passenger Transport Regulation 2007. Between January 2013 and June 2014, 5,193 infringement notices were issued to people seen to be smoking in smoke-free areas, public areas and public transport, while 446 were issued to people seen to be smoking in cars with a person under 16 years old. In mid-2014, NSW Health Authorised Inspectors estimated that 98% of observed people complied with the legislation.

## LEAD

Ingestion and inhalation of lead contaminated particles can lead to increased blood lead levels and subsequent adverse outcomes, including: effects on intelligence and memory at low levels, poor educational attainment at moderate levels (30–50µg/dL), brain damage, seizures, and death at high levels. Even at very low levels (under 10µg/dL) lead is neurotoxic, affecting behaviour and intellectual development.<sup>65–67</sup>

Lead exposure substantially decreased in Australian urban populations after being phased out of petrol and domestic paint; however, the potential for environmental exposure remains in areas surrounding lead mines or smelters, or when renovating old houses.<sup>68</sup> Since 1991 in Broken Hill, the location of 1 of the largest lead mines in the world, newborns and children have been routinely offered free voluntary blood lead testing, and a steady decline in blood lead levels has been observed. The average blood lead levels in children aged 1–4 years have decreased from a high of 16.7µg/dL in 1991 to 5.6µg/dL in 2013.<sup>69</sup> The percentage of children aged 1–4 years with blood lead levels ≥10 g/dL fell from 74% in 1993 to 21% in 2013. While blood lead levels among Aboriginal children remain higher than non-Aboriginal children, there has been a downward trend in the average blood lead level for Aboriginal children since 1998.<sup>70</sup>

## POPULATION HEALTH INITIATIVES

Several population health initiatives relate to educating about the risks of environmental exposures, including:

- a range of skin cancer prevention and tobacco campaigns developed by the Cancer Institute NSW such as Pretty Shady, Wes Bonny Testimonial, No Smoking in Cars with Children and iCanQuit (see also *Chapter 3: Cancer*)
- the *NSW Tobacco Strategy 2012–2017* ([www0.health.nsw.gov.au/pubs/2012/nsw\\_tobacco\\_strategy\\_2012.html](http://www0.health.nsw.gov.au/pubs/2012/nsw_tobacco_strategy_2012.html)) provides an overarching framework for the actions that the NSW Government will lead to reduce smoking and tobacco related harm
- the *Lead: It's In Our Hands* ([www.leadnsw.com.au](http://www.leadnsw.com.au)) website provides information to stakeholders and the community about lead health and services

# CHAPTER 3:

## How healthy are children and young people?

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# HEALTH SERVICE UTILISATION

Most children and young people see a GP at least once a year, and a minority visit an emergency department or stay overnight in hospital

## KEY POINTS:



In 2013, on an average day in NSW, there were 2,500 visits to an emergency department and 1,200 hospitalisations of children and young people



In 2012–13, the rate of hospitalisation was substantially higher for children and young people living in remote areas than those living in major cities and regional areas



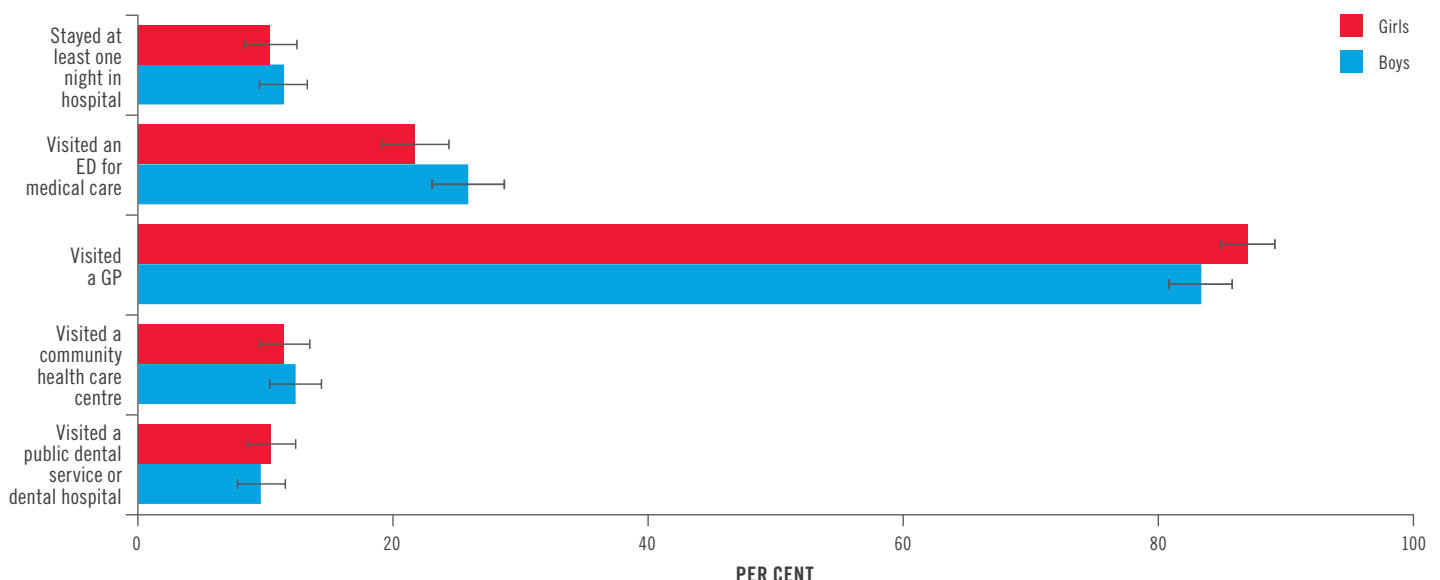
Since 1997 there has been a 19% increase in the rate of emergency department presentations among children and young people

NSW Health provides a range of quality health services to meet the needs of the community, regardless of where people live and whether they can pay.<sup>71</sup> Health service utilisation is one measure of disease occurrence and access to health care services,<sup>72</sup> and reflects the burden of disease in children and young people and their ability to access high quality care when needed. Higher hospitalisation rates in some populations (for example, Aboriginal people or those living in remote areas) may indicate higher rates of disease, improvement in access to health services, or both.<sup>73</sup>

## PREVALENCE OF HEALTH SERVICE UTILISATION

Children and young people in NSW are considerable users of health care services, with a large majority having visited a GP at least once each year (84%). In the period 2012–2013, children aged 0–8 years were more likely to visit a community health care centre, visit a GP, present at an emergency department, and stay in hospital overnight, than children aged 9–15 years (Figure 3.1). There were no substantial differences between boys and girls or children living in different socioeconomic status areas. About 10% of children aged 0–15 years visited a public or government run dental service or dental hospital.

FIGURE 3.1: Health service utilisation by children aged 0 to 15 years, NSW, 2012–2013

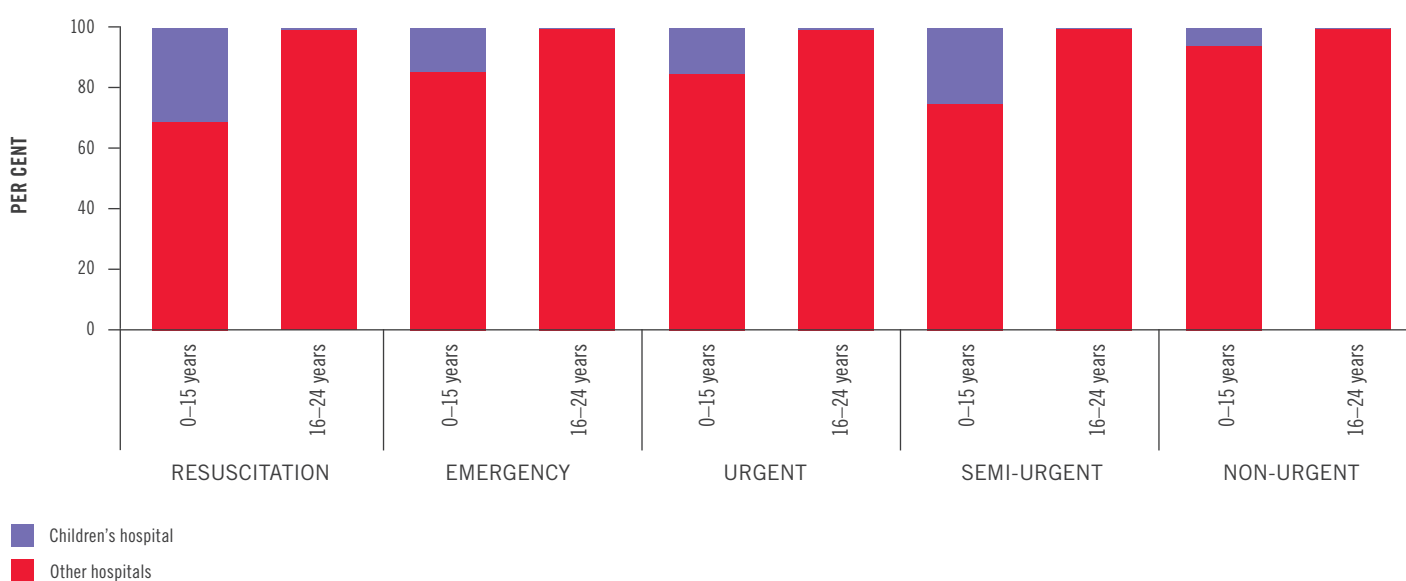


Source: NSW Population Health Survey

## EMERGENCY DEPARTMENT VISITS

In 2013, there were over 895,000 emergency department visits by children and young people. This equates to an average of about 2,500 emergency department visits each day. From the 39 emergency departments where trend data are available, the rate of emergency department presentations was 225 per 1,000 children and young people, representing a 19% increase since 1997. In 2013, a large percentage of emergency department visits for people aged 0–15 years and 16–24 years were semi-urgent (requiring treatment within 60 minutes; 52.6% and 48.2% respectively). Of the semi-urgent presentations for children aged 0–15 years, about one-quarter (25.1%) presented at children's hospitals (Figure 3.2). Of the approximate 1,750 presentations at emergency department by children aged 0–15 years categorised as resuscitation, about one-third (31.1%) presented to children's hospitals.

**FIGURE 3.2:** Triage category of emergency department visits for children and young people by type of hospital, NSW, 2013



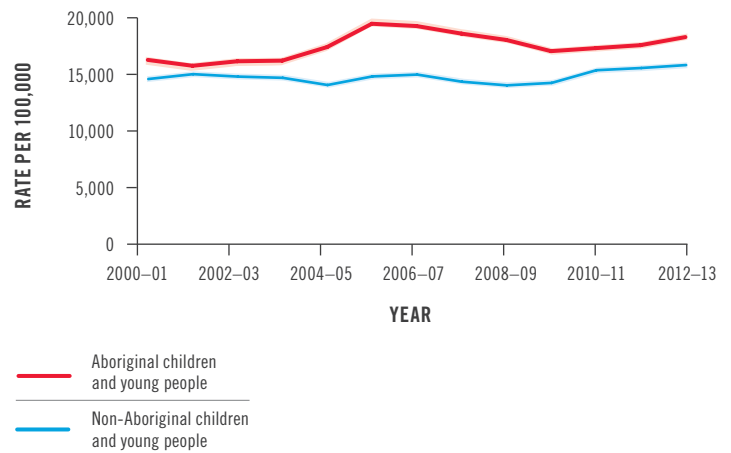
Note: Children's hospitals include The Children's Hospital at Westmead, Sydney Children's Hospital, and John Hunter Children's Hospital. The stacked bars represent percentages of emergency department presentations for each hospital type within each triage category

Source: NSW Emergency Department Data Collection

## HOSPITALISATIONS

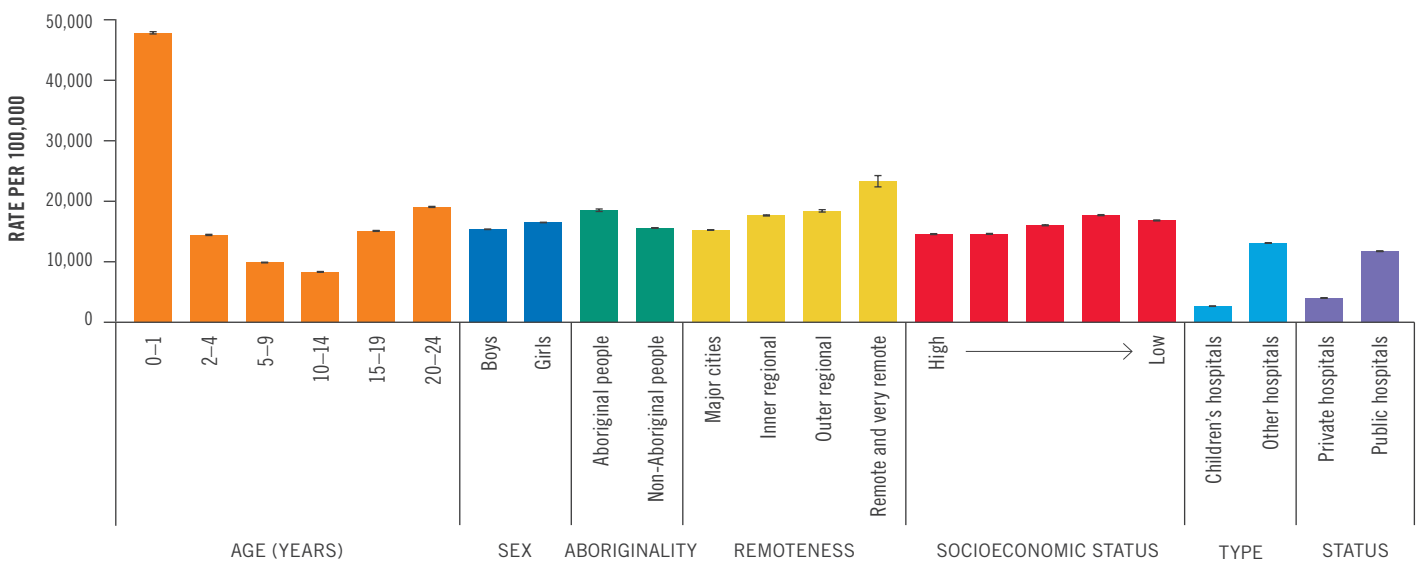
In 2012–13, there were just under 379,000 hospitalisations of children and young people in NSW (an overall rate of 15,806 per 100,000 people). In addition, there were approximately 58,000 babies born in NSW hospitals who did not require any special care. The highest hospitalisation rates, after excluding these healthy babies, were for infants aged under 1 year (Figure 3.3). Lower hospitalisation rates occurred in young children and early adolescents, followed by a rapid increase among older teens and young adults (see also *Chapter 3: Preventable and leading causes of hospitalisation*). Hospitalisation rates were higher in girls than in boys, as well as in children and young people living in remote areas and lower socioeconomic status areas, than those living in other areas. Hospitalisation rates were also higher in Aboriginal compared with non-Aboriginal children and young people (Figure 3.4).

**FIGURE 3.4:** Hospitalisations of children and young people aged 0–24 years, NSW



Source: NSW Admitted Patient Data Collection

**FIGURE 3.3:** Hospitalisations of children and young people, NSW, 2012–13



Note: Excludes unqualified neonates (uncomplicated births)

Source: NSW Admitted Patient Data Collection

# PREVENTABLE AND LEADING CAUSES OF HOSPITALISATION

The main causes of hospitalisation in children are infection and respiratory conditions. Mental health problems are the leading cause of hospitalisation in young people.

## KEY POINTS:



Injury and poisoning were common reasons for hospitalisation, although the underlying cause of injury and poisoning differs by age



73% of potentially preventable hospitalisations were for acute conditions such as gastroenteritis or respiratory conditions



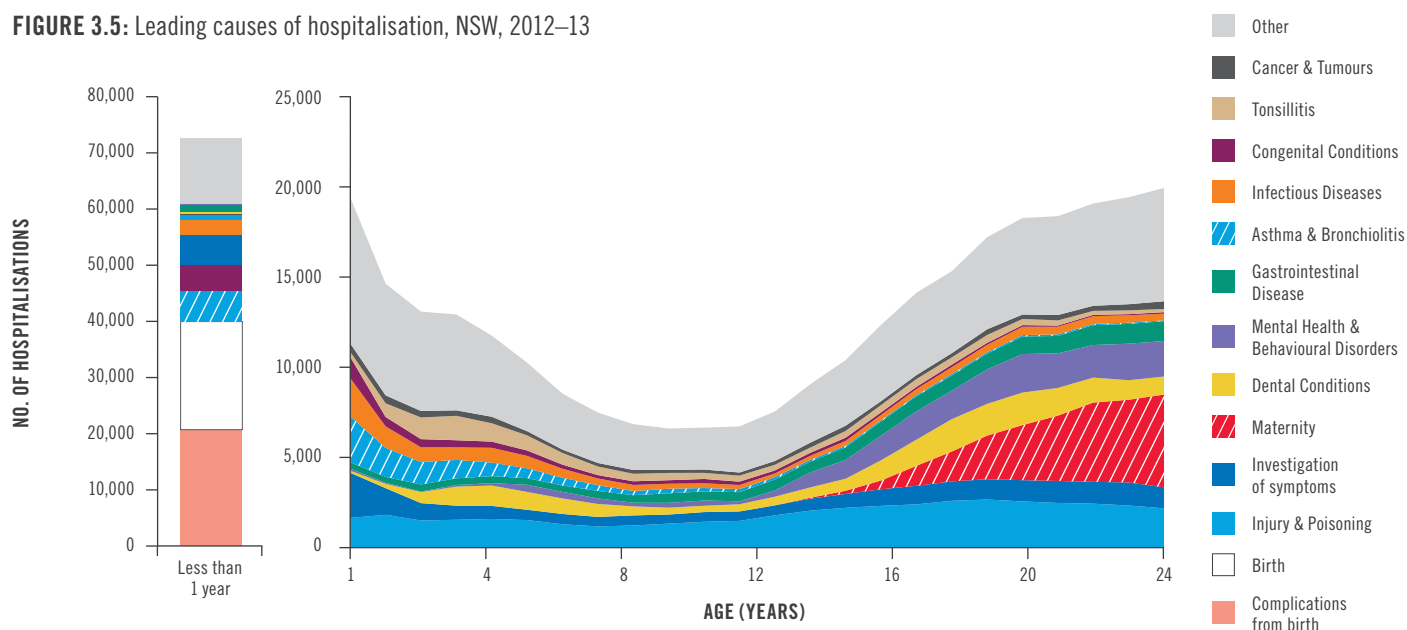
The top conditions leading to potentially preventable hospitalisations were asthma in infants, dental conditions in children, and ear nose and throat infections, dehydration and gastroenteritis in young people

Hospitalisations provide a proxy measure of serious illness and access to care when needed. Increases in hospitalisation rates over time may indicate increasing rates of serious illness or improved access to health care.

## LEADING CAUSES OF HOSPITALISATION

In 2012–13, there were just under 379,000 hospitalisations among NSW children and young people aged 0–24 years. The pattern and the number of hospitalisations varied markedly by age (Figure 3.5). Of hospitalisations in infants aged under 1 year, most were for births (26.5%) or complications of birth (28.5%). Injury and poisoning was consistently a leading cause of hospitalisation among those aged 1–24 years (14.9%), varying between 8.3% for 1 year olds and 23.7% for 13 year olds. However, the underlying cause of injury or poisoning differs markedly by age (see *Chapter 3: Injury* for further information). Hospitalisations due to infectious diseases, asthma and bronchiolitis declined rapidly with age. Conversely, hospitalisations due to mental and behavioural disorders increased with age. From 16 years onwards, hospitalisations due to factors related to pregnancy and childbirth became increasingly common in females relative to other causes.

FIGURE 3.5: Leading causes of hospitalisation, NSW, 2012–13



Note: Excludes unqualified neonates

Source: NSW Admitted Patient Data Collection

## POTENTIALLY PREVENTABLE HOSPITALISATIONS

Potentially preventable hospitalisations provide a measure of admissions which may be avoided with appropriate earlier care or preventative interventions delivered in a primary health care setting (see *Appendix 3* for more details). They fall within 3 broad categories: vaccine preventable, chronic conditions, and acute conditions. In 2012–13 overall, 11.7% of all hospitalisations (1,863 per 100,000) in children and young people were potentially preventable. The rate of potentially preventable hospitalisations was highest in infants and young children, Aboriginal people and people living in remote areas and lower socioeconomic status areas (Figure 3.6).

Most potentially preventable hospitalisations in children and young people were for acute conditions (73%), such as gastroenteritis or respiratory conditions. Potentially preventable hospitalisations for chronic conditions were less frequent in children and young people (458 per 100,000 in 2012–13), when compared with people aged 25 years or over (1,270 per 100,000 in the same year). See *Chapter 3: Communicable diseases* for further information about vaccine-preventable potentially preventable hospitalisations.

## POPULATION HEALTH INITIATIVES

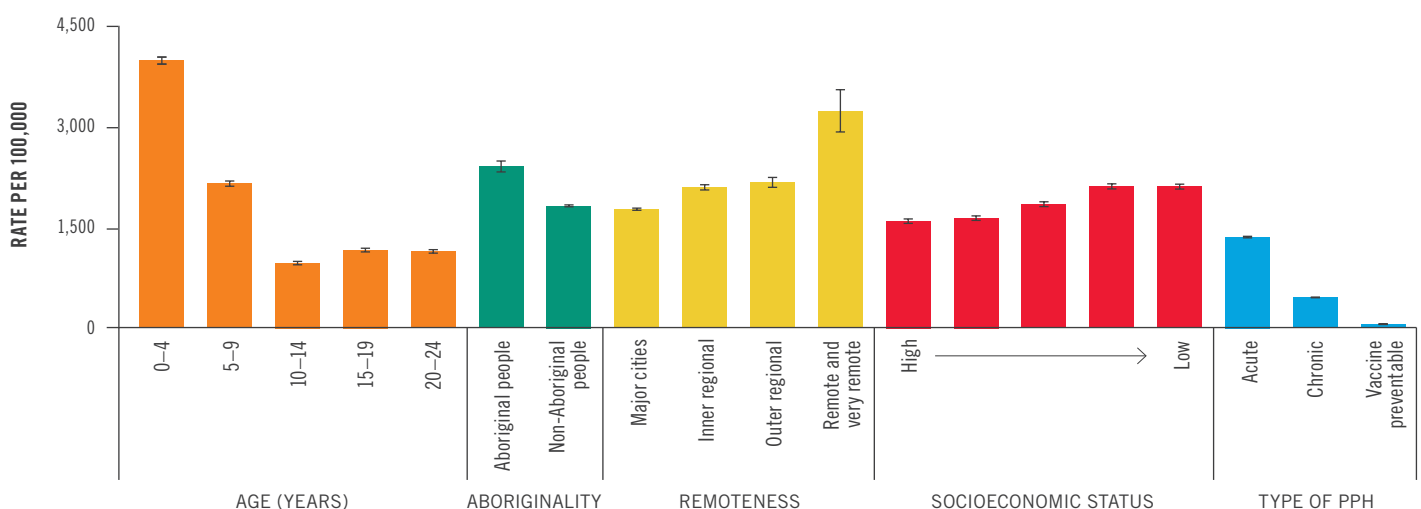
Health protection and promotion strategies focus on implementing interventions to reduce preventable hospitalisations due to the leading causes of morbidity. In children and young people, examples include strategies to reduce hospitalisations due to injuries and poisoning (see *Chapter 3: Injury*), vaccine-preventable diseases (see *Chapter 3: Communicable diseases*) and asthma (see *Chapter 3: Asthma*).

### LEADING CAUSES OF POTENTIALLY PREVENTABLE HOSPITALISATIONS (PER 100,000) IN 2012–13

- **Aged 0–4 years:** asthma (1,062), ear, nose and throat infections (1,058), convulsions and epilepsy (453)
- **Aged 5–9 years:** dental conditions (843), asthma (493), ear, nose and throat infections (221)
- **Aged 10–14 years:** dental conditions (233), asthma (189), convulsions and epilepsy (115)
- **Aged 15–19 years:** ear, nose and throat infections (199), dental conditions (153), urinary tract infections and pyelonephritis (145)
- **Aged 20–24 years:** dehydration and gastroenteritis (210), urinary tract infections and pyelonephritis (160), dental conditions (158)

HealthOne NSW aims to create a stronger and more efficient primary health care system. Key features of HealthOne NSW are integrated care provided by general practice and community health services, organised multidisciplinary team care, care across a spectrum from prevention to continuing care, and client and community involvement. The objectives are to prevent illness and reduce the risk and impact of disease and disability, improve chronic disease management in the community, reduce avoidable admissions (and unnecessary demand for hospital care), improve service access and health outcomes for disadvantaged and vulnerable groups, and build a sustainable model of health care delivery.

**FIGURE 3.6:** Potentially preventable hospitalisations in people aged 0–24 years, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

# DEATHS

## Infant death rates have more than halved over the last 25 years

### KEY POINTS:



Injury and poisoning is the leading cause of death in children and young people aged over 1 year



The gap between Aboriginal and non-Aboriginal infant death rates has closed



Higher rates of perinatal death continue among babies of Aboriginal mothers and mothers living in more remote areas

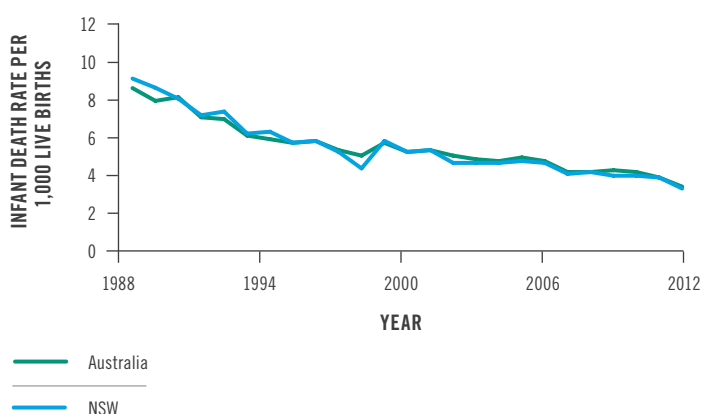
Death rates are a key indicator of the health of a population, providing insights into changes in social and environmental conditions, medical interventions, health behaviours and underlying risk factors.

### TRENDS

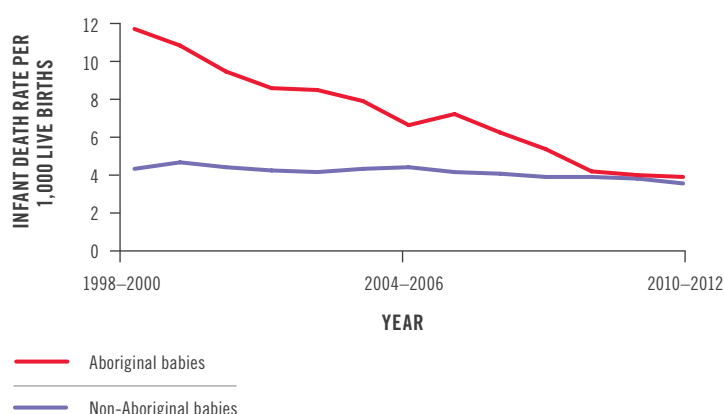
Infant survival is greatly affected by maternal factors such as nutrition, access to medical treatment, and health behaviours.<sup>1</sup> In NSW, infant death rates (death of a live born baby within the 1st year of life) have more than halved over the last 25 years, from 9.2 per 1,000 live births in 1988 to 3.2 per 1,000 live births in 2012. In 2011, 10 deaths were due to sudden infant death syndrome (SIDS).<sup>74</sup> The gap in infant death rates between Aboriginal and non-Aboriginal babies has also closed in recent years. In 2010–2012, the infant death rate for Aboriginal babies was 3.8 per 1,000 babies born compared with 3.5 for non-Aboriginal babies (Figure 3.7).

Despite the overall decline in infant deaths, there continue to be disparities in infant survival during pregnancy and immediately after birth among some population groups. Perinatal deaths include stillbirths and deaths in the first 28 days of life. In 2012, 73.9% of 812 reported perinatal deaths recorded in NSW were stillbirths. There were higher rates of perinatal death among babies of Aboriginal mothers, and babies of mothers living in more remote areas, compared with other babies (Figure 3.8). This risk of loss of a baby is also substantially higher in younger teenage mothers and even more so in mothers in their late 30s and older.<sup>75,76</sup>

**FIGURE 3.7:** Trends in infant death rates, NSW



Source: ABS Deaths, Australia, 2012<sup>76</sup>

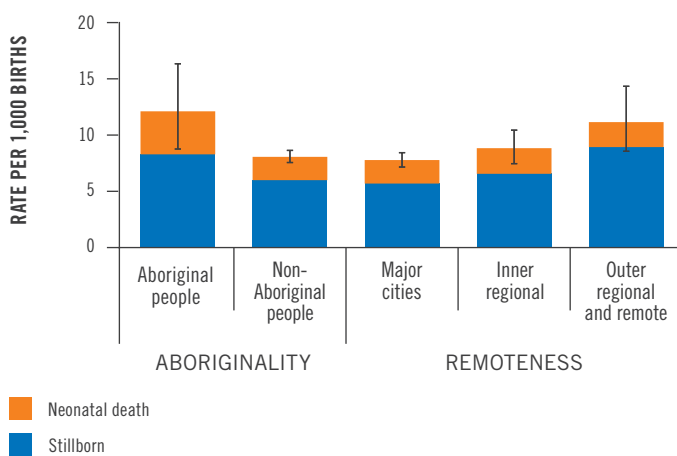




In NSW, the overall under-5 death rate declined from 437 per 100,000 children in 1972 to 95 per 100,000 children in 2011. Deaths in children aged 1–14 years have similarly fallen from 9.6 per 100,000 children in 1972 to 2.3 per 100,000 children in 2011.

NSW has the lowest under-5 death rate in Aboriginal children compared with other states and territories.<sup>77</sup> However, the rate for Aboriginal children in NSW (124.3 per 100,000 Aboriginal children for the period 2008 to 2012) remains considerably higher than the rate in non-Aboriginal children (92.1 per 100,000 non-Aboriginal children for the same period).

**FIGURE 3.8:** Perinatal death rate by selected maternal characteristics, NSW, 2012



Note: Confidence intervals presented for the total perinatal death rate  
Source: NSW Perinatal Data Collection

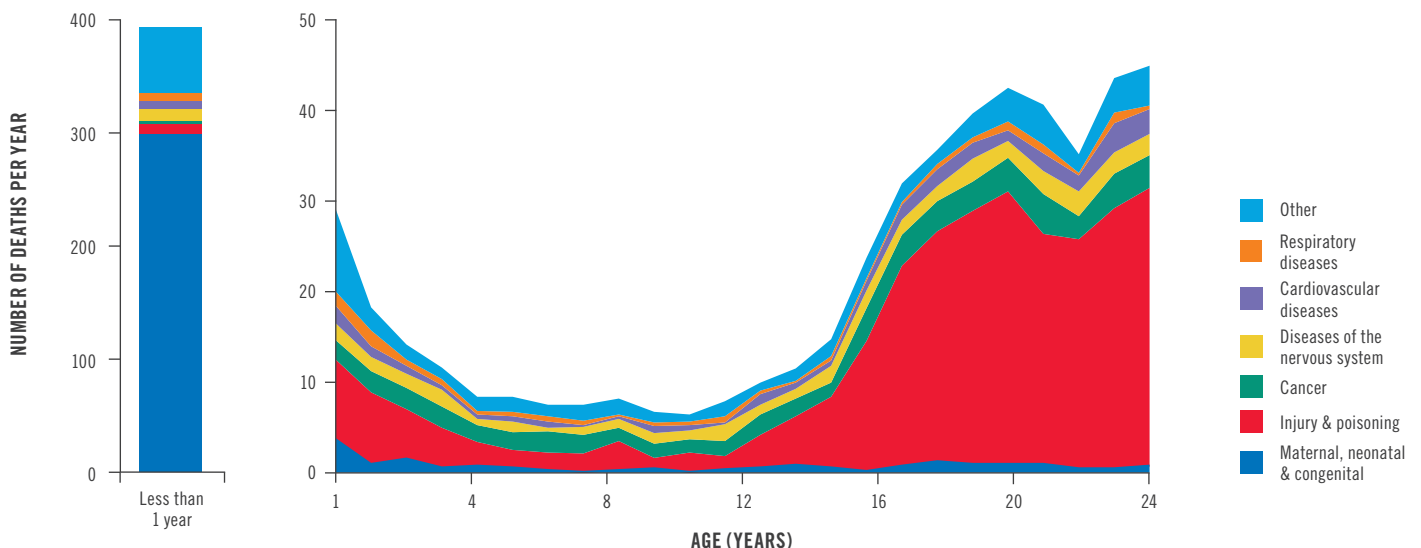
## LEADING CAUSES OF DEATH

In NSW, approximately 920 children and young people aged 0–24 years died each year between 2002 and 2011. Most deaths (42.7%) occurred in the 1st year of life, of which the vast majority (76.1%) were caused by factors related to birth, complications in the neonatal period, or congenital disease. Injuries and poisoning were the leading cause of death in children aged 1–14 years (33.5%) and young people aged 15–24 years (67.3%). Following this, cancers were the second leading cause of death in children and young people aged 0–24 years, accounting for 7.0% of all deaths (Figure 3.9). However, the nature of the injury and poisoning leading to death differs markedly depending on age (see *Chapter 3: Injury*). The number of deaths rapidly increases in late adolescence and early adulthood. This is mostly due to sharp rises in deaths due to motor vehicle accidents and other injuries and poisonings, as age increases, including suicides (see *Chapter 3: Mental health*).

## POPULATION HEALTH INITIATIVES

Declines in infant deaths observed across Australia reflect improvements in access and quality of health care, reductions in risk behaviours, and population health interventions such as the *National Immunisation Program* and *Universal Health Home Visiting*.<sup>1,78</sup> Other targeted public health initiatives are presented throughout this chapter.

**FIGURE 3.9:** Leading causes of death, NSW, 2002–2011



Source: Australian Coordinating Registry Cause of Death Unit Record File

# ASTHMA

## Asthma is a leading cause of serious illness among younger children

### KEY POINTS:



In NSW, 1 in 7 children aged 2–15 years currently has asthma



Children aged 2–4 years, especially males, were most likely to visit an emergency department for asthma



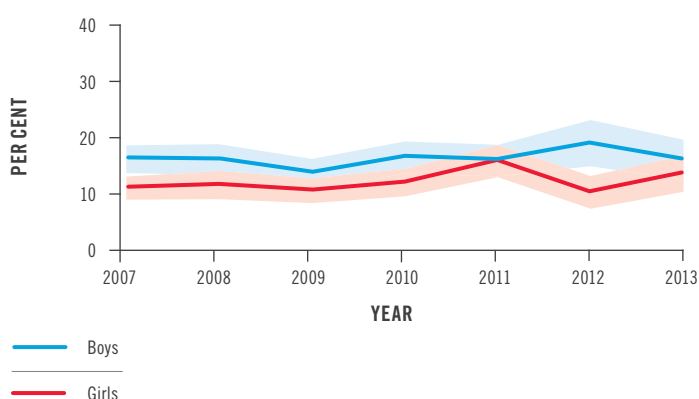
The rate of hospitalisation for asthma among those aged 2–24 years is decreasing substantially

Asthma is a leading cause of serious illness among children aged 0–14 years.<sup>79,80</sup> Good management, including regular GP reviews, asthma management plans, and appropriate asthma medication, can help people with asthma control their symptoms and have improved quality of life.<sup>81</sup>

In 2013, 16.1% of boys aged 2–15 years and 13.7% of girls of the same age had current asthma (Figure 3.10). The overall rate remained steady between 2007 and 2013, with a consistently higher percentage of boys reporting asthma than girls during this period.

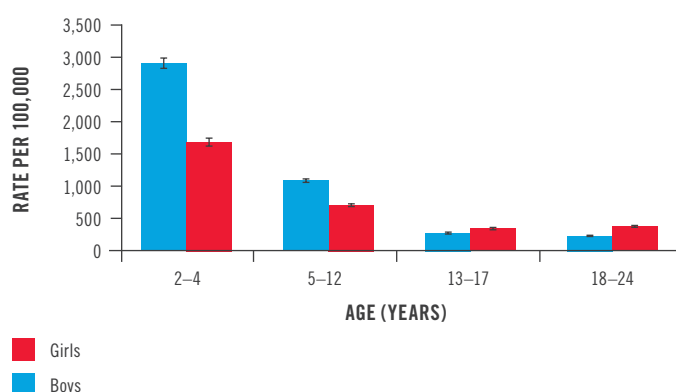
Emergency department presentations indicate the level of severe or poorly controlled asthma. Presentation rates may vary over time, in response to patterns in environmental triggers (for example, air quality, environmental tobacco smoke, and exposure to allergens) and viral infections, and these rates may be reduced by interventions to improve asthma management.<sup>82</sup> In 2013, the rate of asthma related emergency department visits in children aged 2–4 years was much higher than for older children. Rates were also substantially higher in boys than in girls; however, this difference diminished after age 12 years (Figure 3.11).

**FIGURE 3.10:** Prevalence of current asthma, children aged 2–15 years, NSW



Source: NSW Population Health Survey

**FIGURE 3.11:** Emergency department visits for asthma, NSW, 2013



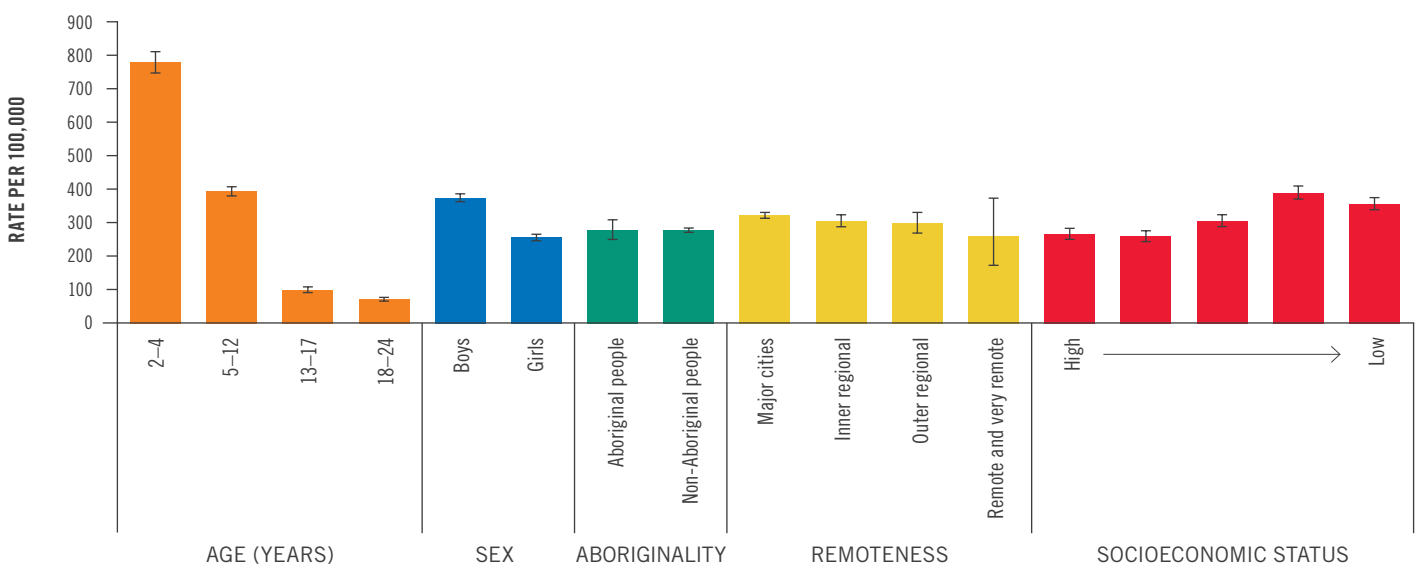
Source: NSW Emergency Department Data Collection

Hospitalisation rates for asthma among those aged 2–24 years decreased by one-quarter from 415 in 2000–01 to 317 per 100,000 persons in 2012–13. Children aged 2–4 years had the highest hospitalisation rate for asthma. This is likely to be due to high prevalence rates in early childhood and a low threshold for doctors to admit younger children to hospital.<sup>83</sup> Rates of hospitalisation for asthma were higher among boys than girls, and children and young people living in low socioeconomic status areas compared with those living in high socioeconomic status areas (Figure 3.12). There was no difference in the hospitalisation rate for asthma between Aboriginal children and young people and non-Aboriginal children and young people.

## POPULATION HEALTH INITIATIVES

Population health initiatives for asthma include education to manage the condition. One example is written Asthma Action Plans, which provide caregivers of children with outlines of medication regimes, aids in monitoring improvements or worsening of symptoms, and instructions on what to do if an asthma attack occurs.<sup>81</sup> These action plans have been shown to be beneficial in reducing adverse outcomes from asthma, including death.<sup>84</sup>

**FIGURE 3.12:** Hospitalisations for asthma in children aged 2–24 years, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

# DIABETES

**While Type 2 diabetes accounts for a minority of diabetes cases in children and young people, it is preventable**

## KEY POINTS:



The rate of hospitalisation for diabetes was higher in young people aged 15–24 years than children



Young Aboriginal people are 36.2% more likely to be hospitalised for diabetes than young non-Aboriginal people



Most (95%) of all diabetes hospitalisations for children and young people were for Type 1 diabetes

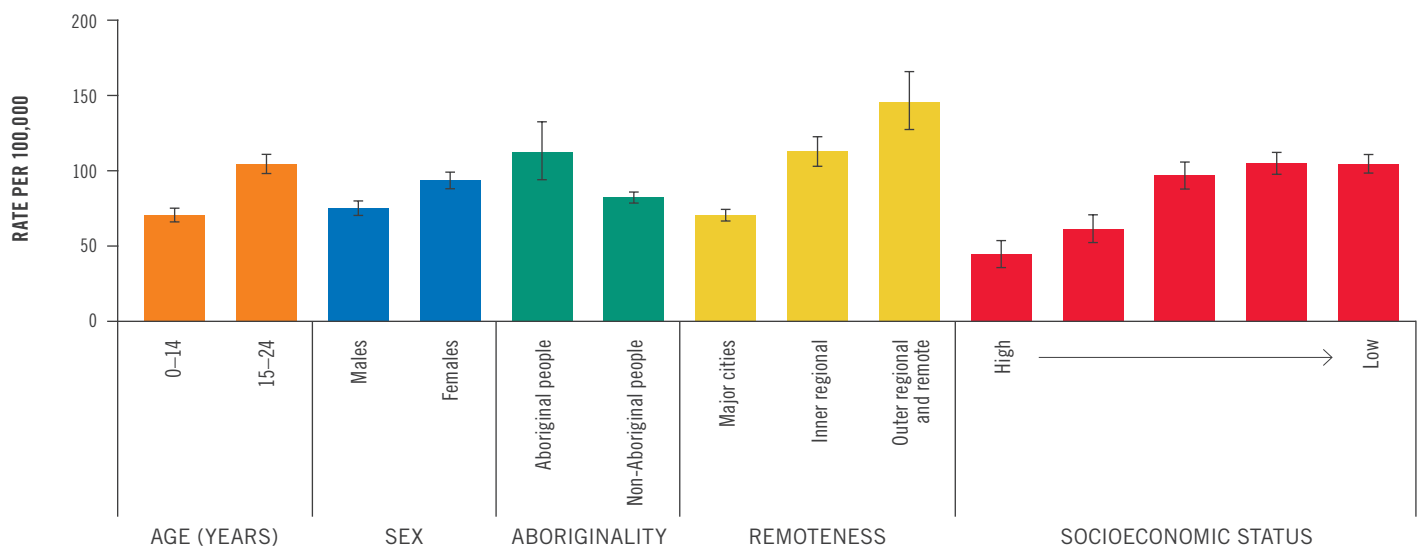
Diabetes is a chronic disease and a major cause of health problems in the long term, including cardiovascular disease, blindness, kidney failure and lower limb amputations.<sup>85</sup> Although 85–90% of adult cases have type 2 diabetes, the most common type of diabetes in children and young people is type 1.<sup>85</sup> Type 1 diabetes is not preventable; however, managing this chronic, autoimmune disease during childhood and adolescence is vital to prevent or delay health complications.<sup>86</sup> Type 2 diabetes may be prevented through the reduction of health risks such as poor diet, lack of exercise and obesity.

While the rate of hospitalisation for diabetes does not equate to prevalence, it provides an indicator of the occurrence of disease complications as well as the level of access to quality hospital care. In 2012–13, 1,954 people aged 0–24 years (84.3 per 100,000 people) in NSW were hospitalised for diabetes. Almost all (95%) were type 1. The rate of hospitalisation was higher in people aged 15–24 years than in children, and in females compared with males. Rates of diabetes hospitalisation were also higher in NSW children and young people living in more remote areas, or areas with a lower socioeconomic status, than in those living elsewhere (Figure 3.13).

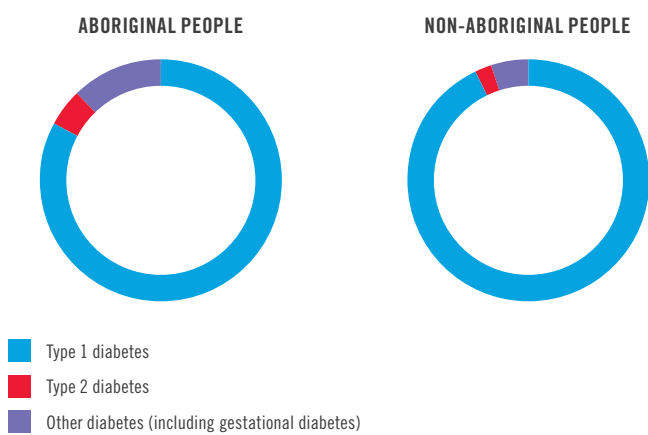
The rate of hospitalisation for all types of diabetes was 36.2% higher in Aboriginal than non-Aboriginal children and young people (Figure 3.13). There were also slight differences in the type of diabetes leading to hospitalisation between these populations; with a higher percentage of diabetes hospitalisations of Aboriginal young people aged 15–24 years being for type 2 or other diabetes (including gestational), than non-Aboriginal people of the same age (Figure 3.14).

## POPULATION HEALTH INITIATIVES

Population health initiatives focus on preventing type 2 diabetes through promoting healthy eating and physical activity such as the *Healthy Kids website* ([www.healthykids.nsw.gov.au](http://www.healthykids.nsw.gov.au)), the *Healthy Eating and Active Living Strategy 2013–2018* and the *NSW Knockout Health Challenge* ([www.aci.health.nsw.gov.au/networks/chronic-care/nsw-knockout](http://www.aci.health.nsw.gov.au/networks/chronic-care/nsw-knockout)) (see also *Chapter 2: NSW Healthy Children Initiative*).

**FIGURE 3.13:** All diabetes hospitalisations in children and young people, NSW, 2012–13

Source: NSW Admitted Patient Data Collection

**FIGURE 3.14:** Type of diabetes leading to hospitalisation in young people aged 15–24 years (%), NSW, 2012–13

Source: NSW Admitted Patient Data Collection

# CANCER

Rates of new cancer cases have remained steady over time, while the rate of cancer deaths has declined

## KEY POINTS:



Early diagnosis and treatment of cancers results in better survival



While childhood cancer is relatively uncommon, it is the second leading cause of death in children and young people



Leukemia is the most common type of early childhood cancer

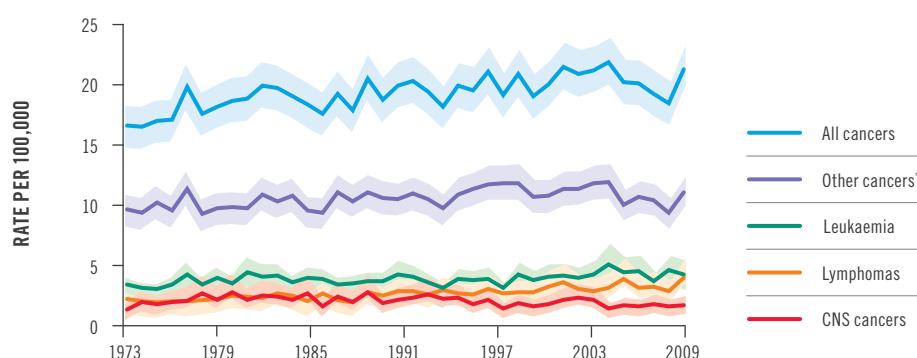
Both benign and malignant cancers can have severe impacts on health.<sup>1</sup> Although most types of cancer are relatively uncommon in children and young people, compared with adults,<sup>87</sup> they represent a significant burden to the individual, their family and the health care system, and are a leading cause of death in this population group.<sup>88</sup>

## CANCER INCIDENCE

The rate of new cases of cancer in persons aged 0–24 years has remained relatively steady over time (Figure 3.15). During the period 2005–2009, there were 2,302 new cancer cases reported in NSW children and young people aged 0–24 years (21.5 per 100,000 males and 18.1 per 100,000 females). Rates were slightly lower in children aged 0–14 years (14.5 per 100,000 males and 12.9 per 100,000 females). In contrast with some types of cancer in adults (for example, lung cancer or melanoma), which show considerable variation in incidence by remoteness of area of residence and socioeconomic status, there were no apparent disparities in childhood cancers for these factors, although such analyses are limited by the small number of cases.

Almost half (47.4%) of these newly diagnosed cancer cases in children and young people were blood and bone marrow cancers (lymphomas or leukaemia), or cancers of the brain and central nervous system. Leukaemia is more commonly diagnosed in infants and younger children, while the rate of new cases of lymphomas and other cancers (for example, melanoma or testicular cancers) increased with age (Figure 3.16).

**FIGURE 3.15:** Trends in new cancer cases in children and young people aged 0–24 years, NSW



Note: \* "Other cancers" include all other types of cancers excluding leukaemia, lymphomas and CNS cancer morphology and topography codes

Source: NSW Cancer Registry

## CANCER DEATHS AND SURVIVAL

Improvements in diagnosis and treatment have resulted in improved survival from certain cancers and a substantial decline in death rates in children.<sup>1</sup> Between 1987 and 2011, cancer death rates decreased by 42.3% in females and 59.3% in males. Nevertheless, cancer was a leading cause of death in children aged 1–24 years during 2002–2011, accounting for 11.8% (approximately 62 deaths per year) of all deaths in this age group (see also *Chapter 3: Deaths*).

Survival from cancer reflects the effectiveness of early detection and the timeliness and appropriateness of treatment interventions. Overall, national 5-year survival rates among children aged 0–14 years have increased from 68% in 1983–1989 to 81% in 2004–2010.<sup>1</sup> In NSW, 5-year relative survival for 0–24 year olds over the period 1972–2006 improved from 63.8% to 84.5%.<sup>89</sup> This has largely been due to improvements in early recognition and treatment of cancers such as certain types of leukaemia; however, there have been no substantial changes in survival for other cancers (for example, brain cancers) over this period.<sup>1</sup> Age at diagnosis is also related to 5-year survival, with 5-year survival rates higher in children and young people, than older people. Some disparity continues to exist, however, in cancer survival among Aboriginal children. Nationally, between 1997–2007, overall 5-year survival rates were substantially lower in Aboriginal children (75.0%) compared with non-Aboriginal children (82.3%), which is only partially explained by differences in place of residence and socioeconomic disadvantage.<sup>90</sup>

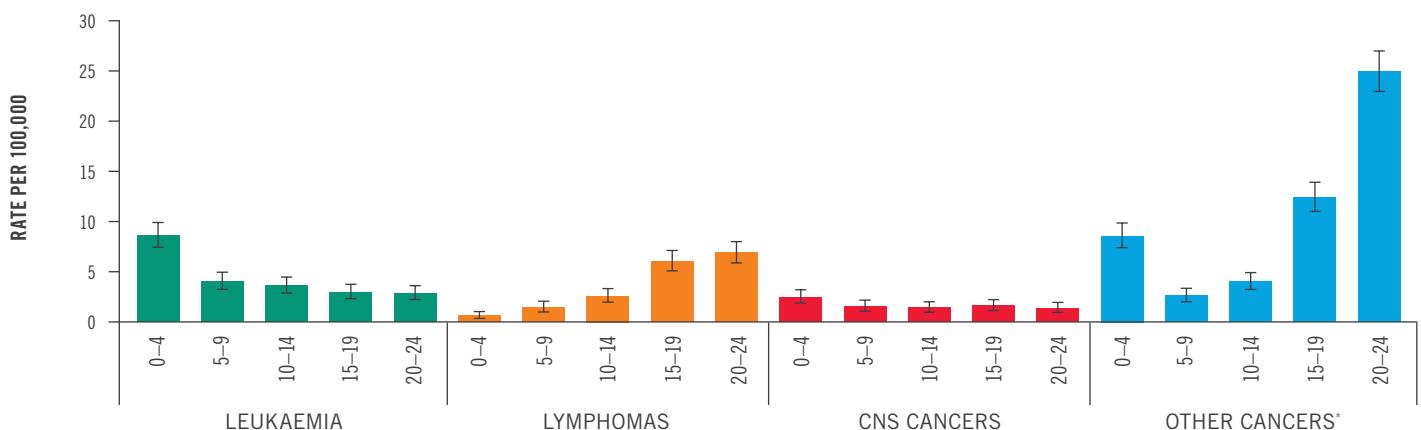
Child and adolescent cancer and related treatments can lead to long-term health problems. The types of problems differ depending on the type of treatment. Research suggests that childhood cancer survivors may be at greater risk of developing cancer later in life, neurocognitive problems including poor language development and attention span, problems with cardiovascular, lung or thyroid functioning, stunted growth, and reproductive problems.<sup>91</sup>

## POPULATION HEALTH INITIATIVES

The *NSW Cancer Plan 2011–15* provides a blueprint for stakeholders to work together to reduce the incidence of cancer, increase survival, and improve the quality of life for people with cancer and their caregivers.<sup>88</sup> In children and young people, the main focus is on:

- Human Papillomavirus (HPV) school based vaccination
- Tobacco control through strong mass media campaigns such as *No Smoking in Cars with Children* and *iCanQuit* (see also *Chapter 2: Smoking*)
- Reducing over-exposure to the sun by promoting behaviour modification through initiatives highlighted in the *NSW Skin Cancer Prevention Strategy 2012–15*,<sup>92</sup> and mass media campaigns such as *Pretty Shady*, *Wes Bonny Testimonial* and *Dark Side of Tanning*
- *Healthy Eating and Active Living Strategy 2013–2018* ([www.health.nsw.gov.au/obesity/Pages/nsw-healthy-eating-strategy.aspx](http://www.health.nsw.gov.au/obesity/Pages/nsw-healthy-eating-strategy.aspx)) to promote and support healthy eating and active living and to reduce the impact of lifestyle-related chronic disease (see also *Chapter 2: NSW Healthy Children Initiative*).

**FIGURE 3.16:** Age distribution of leading types of new cancer cases in children and young people, 2005–2009, NSW



Note: \* "Other cancers" include all other types of cancers excluding leukaemia, lymphomas and central nervous system (CNS) cancer morphology and topography codes

Source: NSW Cancer Registry

# COMMUNICABLE DISEASES

Vaccine preventable diseases such as pertussis (whooping cough) and influenza continue to affect many children each year

## KEY POINTS:



Childhood immunisation remains essential for protecting children from severe disease



Washing hands, cough etiquette, and keeping children at home when unwell can reduce the high burden of influenza and prevent gastroenteritis outbreaks in childcare centres



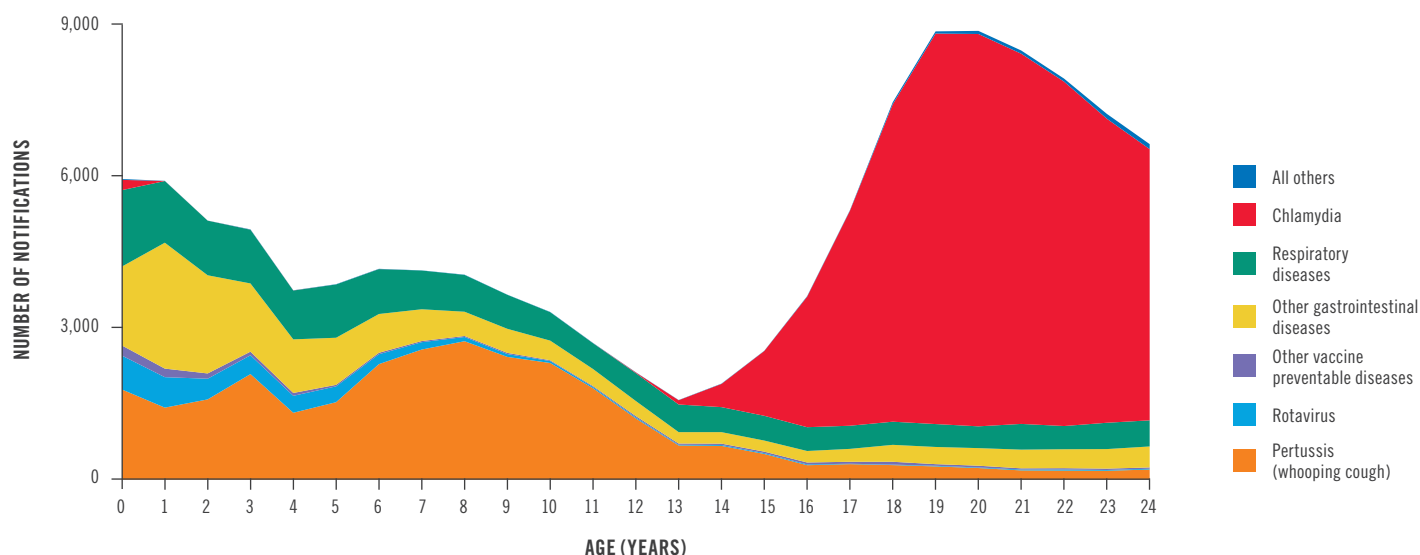
In 2013, almost 43,400 occasions of service in public sexual health clinics were recorded for young people aged 16–24 years

In NSW, the prevention and control of communicable diseases remains a public health priority. Selected communicable diseases must be notified to public health units, triggering a public health response and providing valuable information for planning and evaluating prevention programs. Without robust immunisation and other control programs, NSW children and young people would be at risk of severe communicable disease outbreaks, with potential life-threatening consequences.

## LEADING COMMUNICABLE DISEASE NOTIFICATIONS

The pattern of communicable disease notifications varies markedly by age (Figure 3.17). Over the period 2009–2013, the number of notifiable vaccine preventable, gastrointestinal and respiratory diseases decreased with age. Sexually transmitted infection due to *Chlamydia* was the predominant notifiable condition in late adolescence and early adulthood.

**FIGURE 3.17:** Leading communicable disease notifications by age, NSW, 2009–2013



Source: NSW Notifiable Conditions Information Management System

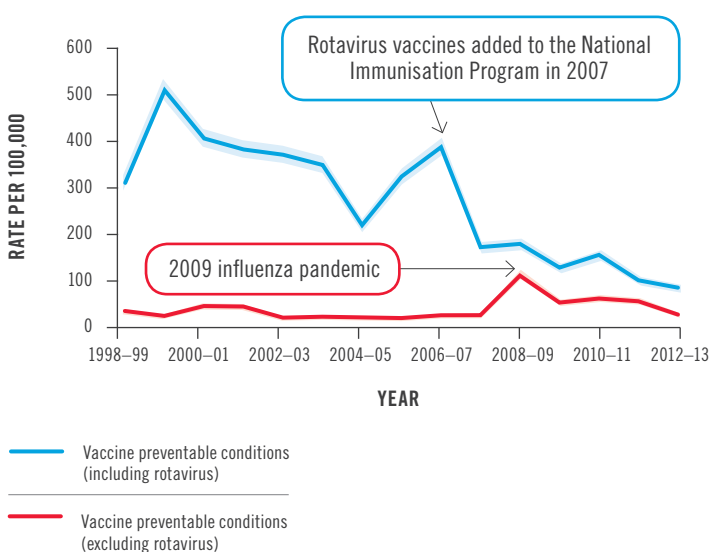


## VACCINE PREVENTABLE DISEASES

Hospitalisations for vaccine preventable diseases have declined by over 61% in the last 20 years. The introduction of rotavirus vaccination to the National Immunisation Program in 2007 resulted in a substantial reduction in gastroenteritis hospitalisations due to rotavirus infection in children (see also *Chapter 3: Preventable and leading causes of hospitalisation*).<sup>93–95</sup> With the addition of rotavirus infection to the definition of potentially preventable hospitalisations, there was a 55.7% decline in the rate of hospitalisation for vaccine preventable conditions for infants and children aged 0–4 years between 2006–07 and 2007–08 (Figure 3.18).

Pertussis (whooping cough) epidemics have occurred in the last 10 years, with the highest notification rates among infants, toddlers and school-aged children (Figure 3.19). The occurrence of these outbreaks, in the presence of relatively high vaccination rates, is thought to be due to a combination of relatively low vaccine efficacy (compared with other vaccines) and waning immunity over time.<sup>95</sup> Babies are at the highest risk of complications and death from pertussis.<sup>96</sup> In response to these outbreaks, NSW Health has promoted the importance of timely vaccination of babies (from 6 weeks of age) and protecting them from exposure to pertussis by promoting vaccination of their siblings and adult carers.

**FIGURE 3.18:** Vaccine preventable hospitalisations, with and without rotavirus vaccine, infants and children aged 0–4 years, NSW

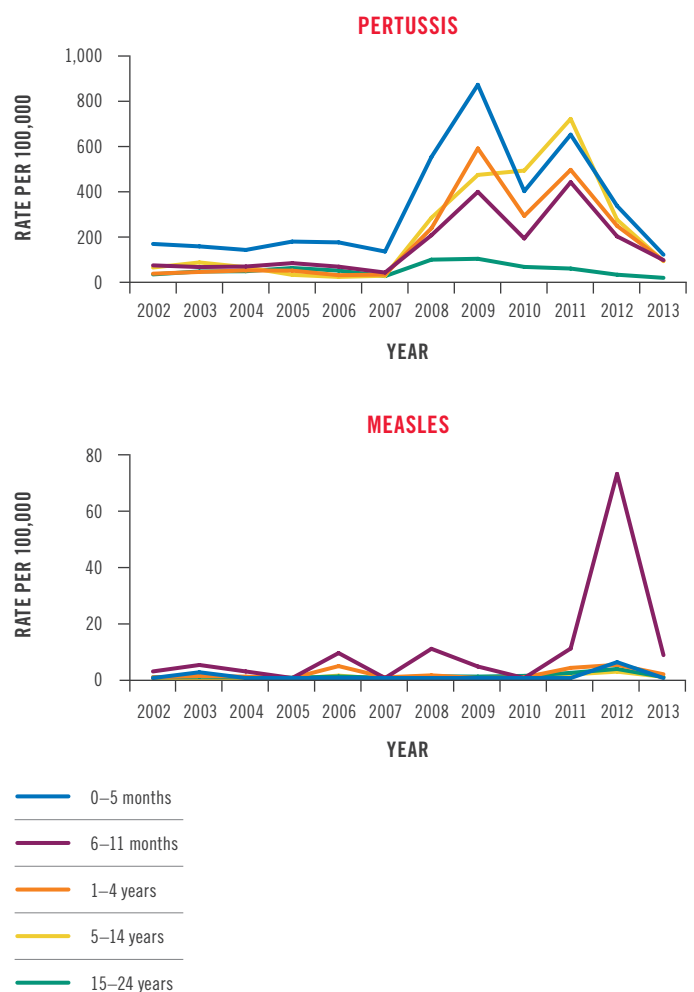


Source: NSW Admitted Patient Data Collection

Endemic measles has been eliminated in Australia; however, outbreaks do occur in association with overseas travel. In 2012, the largest outbreak of measles in more than a decade was reported (Figure 3.19). The outbreak particularly affected infants too young to be vaccinated and under-vaccinated high school aged children, with teenagers of Pacific Island ancestry disproportionately affected.

Notifications of meningococcal disease have declined substantially since the introduction of the National Meningococcal C Vaccine Program (2003–2004); however, cases due to other strains continue to occur, mainly in children and young people.

**FIGURE 3.19:** Trends in pertussis and measles notifications, NSW



Source: NSW Notifiable Conditions Information Management System

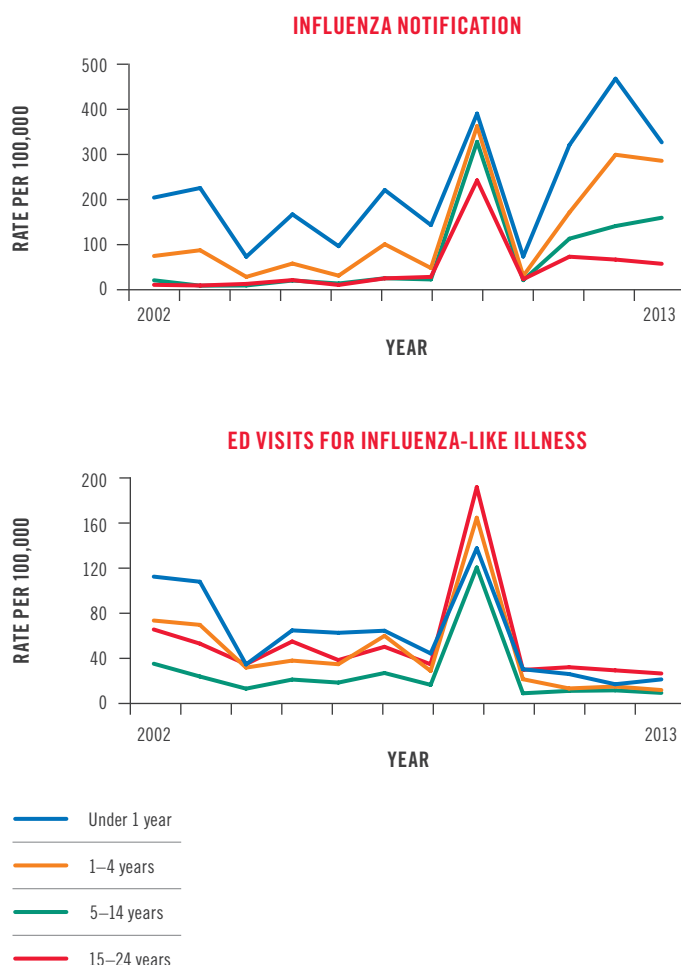
## INFLUENZA

Seasonal and pandemic influenza accounts for a substantial burden of disease across all age groups, including in children and young people. Rates of infection and hospitalisation are typically highest among children under 5 years of age and the elderly.<sup>95</sup> A new influenza virus emerged in 2009, which disproportionately affected young adults. In 2009, the highest rates of emergency department visits for influenza-like illness occurred in the 15–24 year age group (Figure 3.20). The notification rate of laboratory-confirmed influenza cases has remained highest in the under 1 year age group, even during the 2009 pandemic year (Figure 3.20). This reflects the susceptibility of young infants to influenza due to low immunity. Influenza notification rates also vary due to testing practices by doctors and varying virulence of influenza strains.

## GASTROENTERITIS OUTBREAKS

Outbreaks of gastroenteritis (leading to diarrhoea and/or vomiting), including 2 or more cases, are notifiable from childcare centres, so public health action can be taken. Between 2009 and 2013, there were over 1,000 outbreaks affecting almost 11,000 children in childcare centres. On average, each of these outbreaks affected 10 children and 2 to 3 staff members. Outbreaks occurred seasonally, with peaks at the beginning of each year, with the intake of new children to centres and in late winter–early spring, when norovirus (a common cause of gastroenteritis) is commonly circulating in the community. Of outbreaks with stool samples collected (18%), rotavirus was the most commonly detected causative agent (20%).

**FIGURE 3.20:** Trends in influenza notifications and emergency department visits for influenza-like illness, NSW



Source: NSW Notifiable Conditions Information Management System (top) and NSW Emergency Department Data Collection (bottom)

## SEXUALLY TRANSMISSIBLE INFECTIONS

Sexually transmissible infections (STIs) may be prevented by encouraging safe sex, particularly the consistent use of condoms, and sexual health seeking behaviours among young people.<sup>97</sup> A range of surveys over the last 10 years indicate that the majority of young people are sexually active before leaving school and many do not practice safe sex.<sup>98-100</sup>

Chlamydia is the predominant notifiable STI in NSW young people. Both notification and hospitalisation rates for chlamydia have increased over the last 10 years, with notification rates more than 2 times higher in young women than young men (Figure 3.21). Nationally, the number of tests for chlamydia has increased considerably in the last 10 years, which explains much of the increase seen in chlamydia notifications. The NSW Denominator Data Project (see *Appendix 2: Statistical methods*) found that, in 2012 and 2013, 5.7% and 5.3% respectively of chlamydia tests performed in NSW were positive.<sup>101</sup>

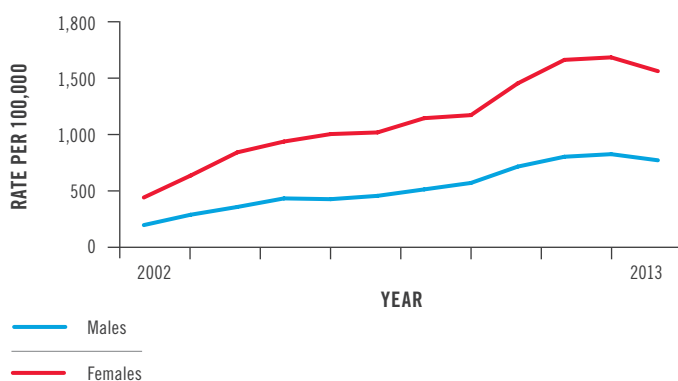
Publicly-funded sexual health services are available for those at greatest risk of HIV and STI infection, including gay and other homosexually active men, people who inject drugs, sex workers, Aboriginal people, and some culturally and linguistically diverse communities. During 2013, almost 43,400 (4,968 per 100,000 population) occasions of service in public sexual health clinics were recorded for young people aged 16–24 years in NSW (Figure 3.22). For males aged 16–24 years, a substantial increase in occasions of service was observed between 2008 and 2013.

## POPULATION HEALTH INITIATIVES

A number of national and NSW Health driven initiatives exist for the prevention of communicable disease infections and to reduce their impact on children and young people. Examples include:

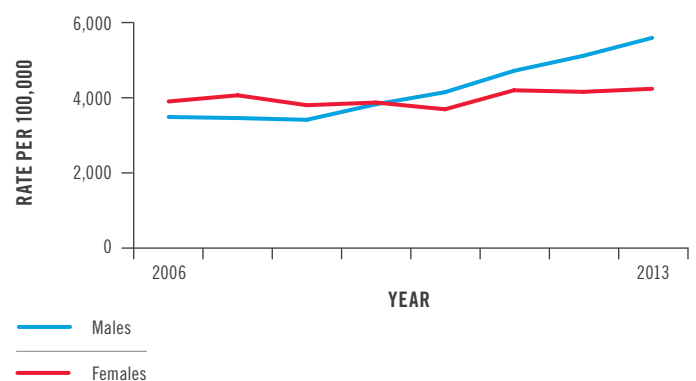
- *Immunise Australia Program* describes childhood immunisation and school-based vaccination programs
- *NSW Health Whooping Cough Campaign* promotes awareness of pertussis and vaccination
- *Save the Date to Vaccinate Campaign* promotes awareness of on-time vaccination
- NHMRC publication *Staying Healthy: Preventing infectious diseases in early childhood education and care services* (5th Edition) provides educators with simple and effective methods of minimising the spread of disease
- *Play Safe website* provides an online platform to enable young people access to sexual health education and services
- *NSW Sexual Health Infoline* is an information and referral service staffed by experienced sexual health nurses
- *NSW Festivals Initiative* is a social marketing strategy to promote sexual health messages to young people attending music festivals

**FIGURE 3.21:** Trends in chlamydia notifications, young people aged 16–24 years, NSW



Source: NSW Notifiable Conditions Information Management System

**FIGURE 3.22:** Occasions of service, publicly-funded sexual health services, young people aged 16–24 years, NSW



Source: HIV–STI Minimum Data Set database, HIV and STI Branch, Centre for Population Health

# INJURY

## Injuries and poisonings are the leading cause of death for children and young people

### KEY POINTS:



Hospitalisation rates for injury and poisoning were highest in young people aged 15–24 years, particularly males, Aboriginal young people, and young people living in regional and remote areas



Falls are a substantial cause of injury across all age groups



Motor vehicle accidents and suicides contribute to over half of all injury deaths in young people

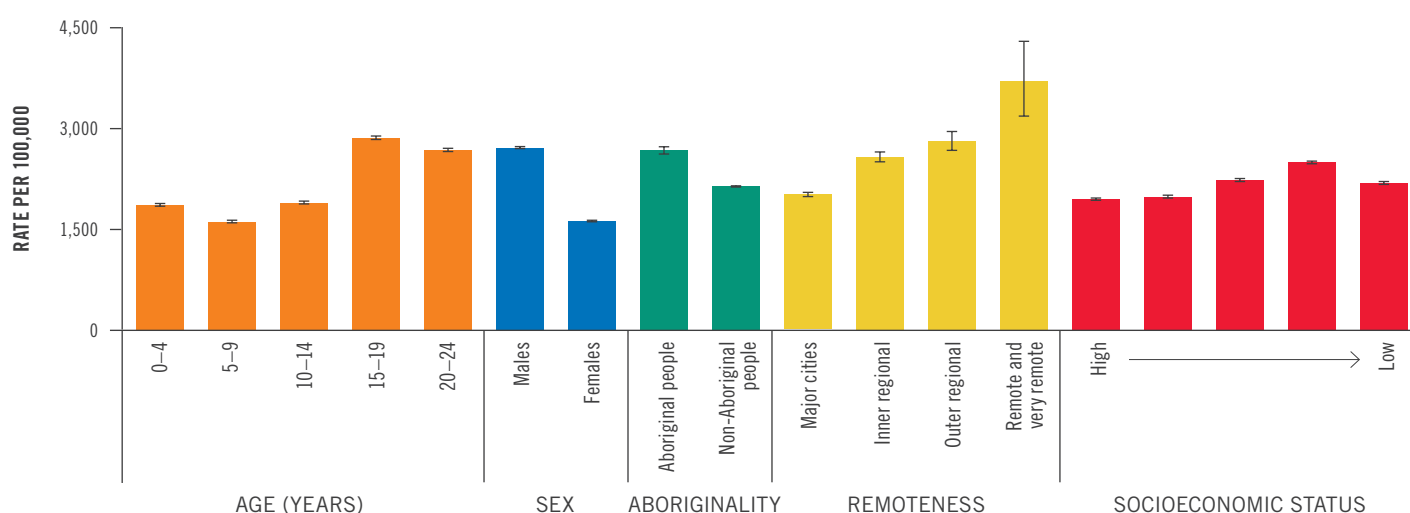
Unintentional and intentional injuries and poisonings are major causes of hospitalisation and death among children and young people. Serious injuries and poisonings may result in long term disability and represent a substantial burden on the individual, families and the health care system.<sup>102</sup> Injury and poisoning is also the leading cause of death in children and young people aged 1–24 years (see *Chapter 3: Deaths*).

For the period 2010–11 to 2012–13, there were about 51,000 hospitalisations of children and young people due to injury and poisonings each year (2,172 per 100,000 population or 10.5% of all hospitalisations). Rates of hospitalisation for injury and poisoning were considerably higher in people aged 15–24 years, males, and Aboriginal children and young people, than in others (Figure 3.23). Rates were also elevated in children and young people living in more remote areas.

Between 2002 and 2011, 3,091 children and young people died due to injury and poisoning. Over three-quarters of these were aged 15–24 years (79.4%) and almost three-quarters were males (74.3%).

The type of injury leading to hospitalisation and death differs by age and sex (Figures 3.24 and 3.25). In children aged 0–4 years, falls contributed to almost one-third of injury and poisoning hospitalisations (30.8%) and drowning contributed to almost one-third of injury and poisoning deaths (30.4%). In 15–24 year olds, the leading

**FIGURE 3.23:** Hospitalisations for injury and poisoning, 2010–11 to 2012–13



Source: NSW Admitted Patient Data Collection

causes of injury hospitalisation were falls (14.7%) and motor vehicle crashes (14.3%) for males, and self-harm (19.3%) and motor vehicle crashes (12.2%) for females (further information about self-harm can be found in *Chapter 3: Mental health*). Motor vehicle crashes were the leading cause of death due to injury in males and females aged 15–24 years (38.7%).

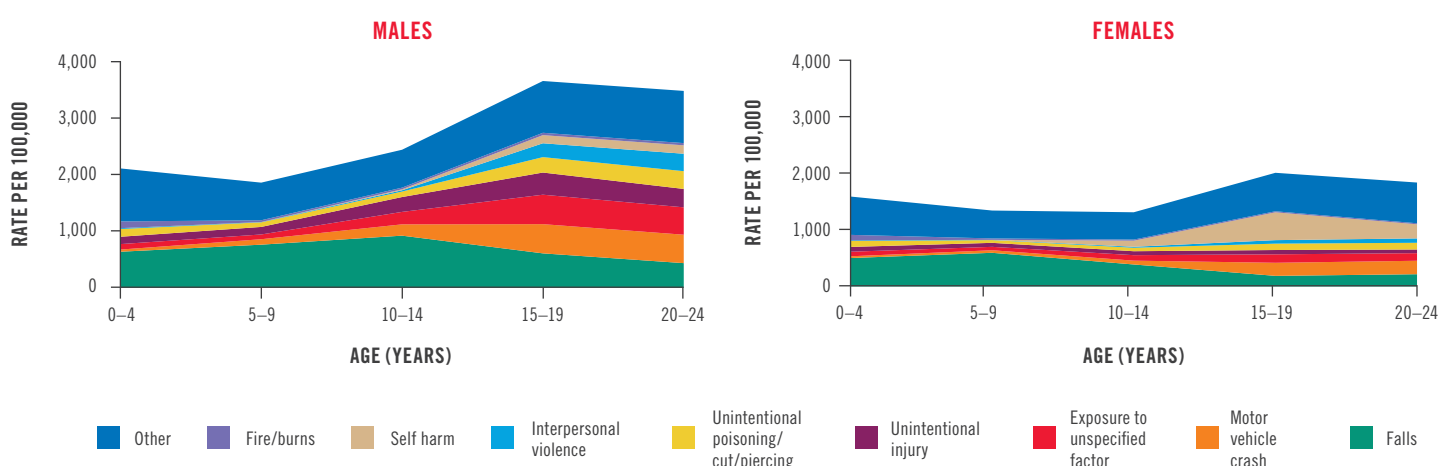
## POPULATION HEALTH INITIATIVES

Preventing injuries and poisoning in children and young people requires a multi-sectoral approach. Examples of current health promotion campaigns and initiatives include:

- *My Personal Health Record* (The Blue Book), distributed to all new parents, includes child safety guidance

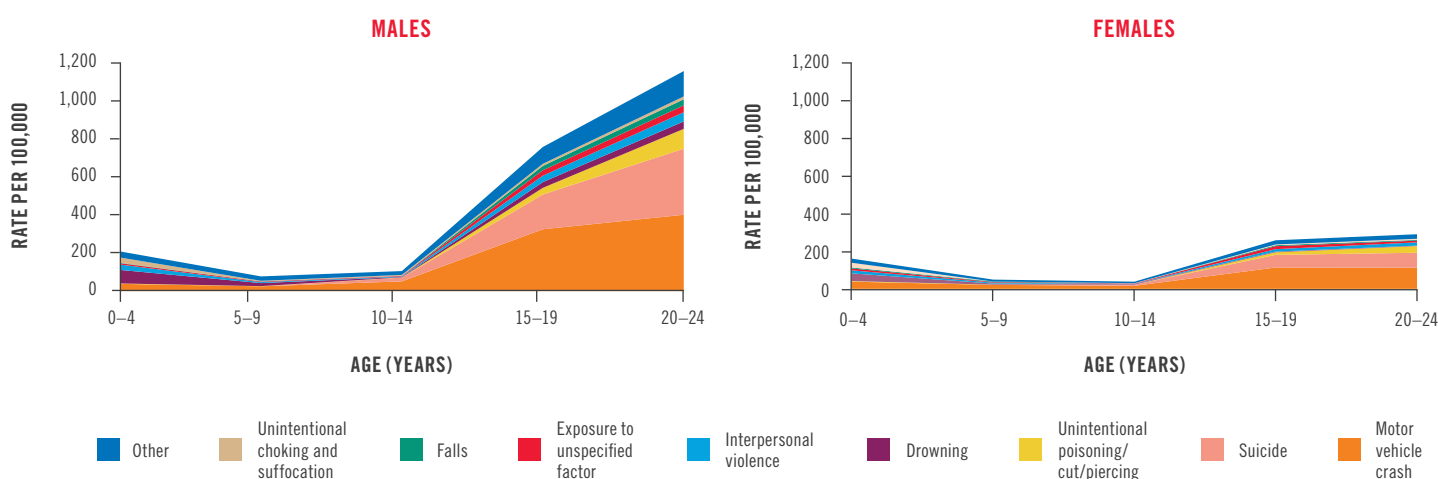
- *Kids Don't Fly website* provides advice on increasing window and balcony safety to prevent falls
- *Bstreetsmart* is a web based road trauma prevention forum promoting students to be responsible drivers and passengers
- *Poison Safety website* provides resources to parents, carers and child-care centres to promote poison safety
- *Learn to stop burns!* is an online interactive game educating children about potential burn dangers in everyday life
- *Kids Can Drown Without a Sound!* website raises community awareness of the dangers of swimming pools

**FIGURE 3.24:** Types of injury and poisoning leading to hospitalisations, people aged 0–24 years, NSW, 2010–11 to 2012–13



Source: NSW Admitted Patient Data Collection

**FIGURE 3.25:** Leading causes of death due to injury and poisoning, people aged 0–24 years, NSW, 2002–2011



Source: Australian Coordinating Registry Cause of Death Unit Record File

# HEALTHY DEVELOPMENT

The percentage of children considered developmentally vulnerable has declined

## KEY POINTS:



In 2012, 1 in 5 children were developmentally vulnerable when they started school

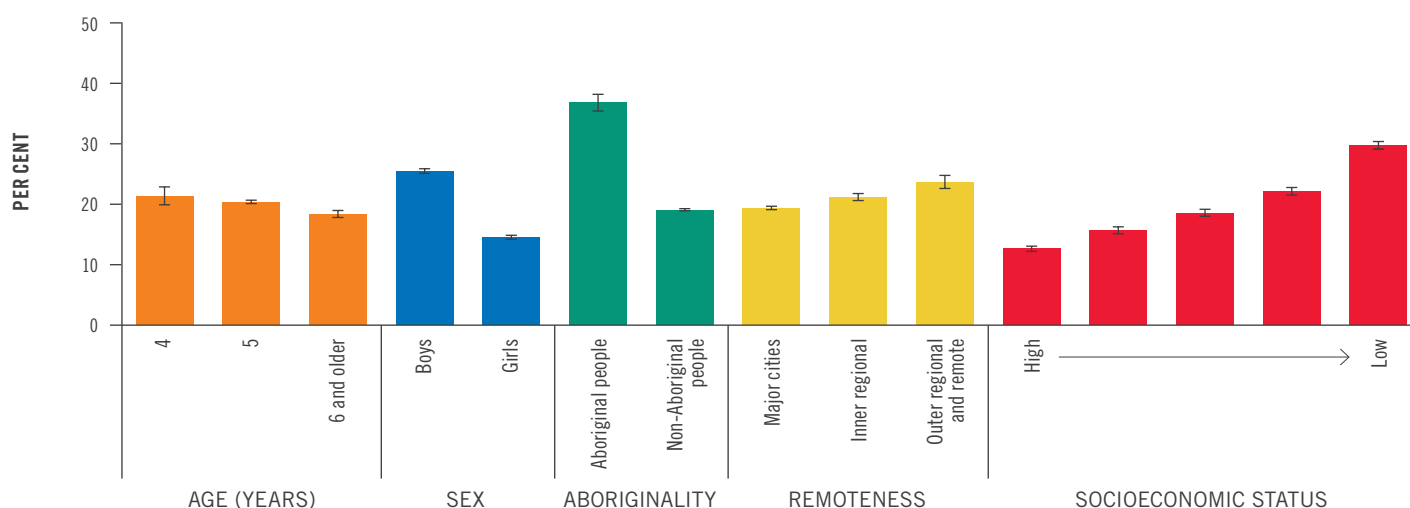


Boys and Aboriginal children were more likely to be developmentally vulnerable than girls and non-Aboriginal children

The early years are crucial for the healthy development of children and their future health, learning and wellbeing.<sup>103</sup> Children were considered developmentally vulnerable, as measured by the Australian Early Development Census (AEDC), if they scored within the lowest 10 per cent on 1 or more developmental domains.<sup>103</sup> Aboriginal children are known to be at greater risk of developmental vulnerability than non-Aboriginal children.<sup>104</sup> Once vulnerabilities are identified, additional support (such as behavioural or occupational therapy) can be provided to help children improve their functional skills and longer term wellbeing.

In 2012, of NSW children screened in their 1st year of full-time school, 19.9% were considered developmentally vulnerable in at least 1 domain in the AEDC; a decrease since 2009 (21.3%). Children with special needs were not included because of the already identified substantial developmental needs of this group (see *Chapter 3 Disability* for further details).<sup>103</sup> Boys (25.4%), Aboriginal children (36.7%), and children living in outer regional or remote areas or lower socioeconomic status areas, were more likely to be developmentally vulnerable than other children (Figure 3.26). Aboriginal boys were more likely to be developmentally vulnerable in all domains of the AEDC than other children (Figure 3.27).

**FIGURE 3.26:** Percentage of children who were developmentally vulnerable, NSW, 2012



Source: Australian Early Development Census

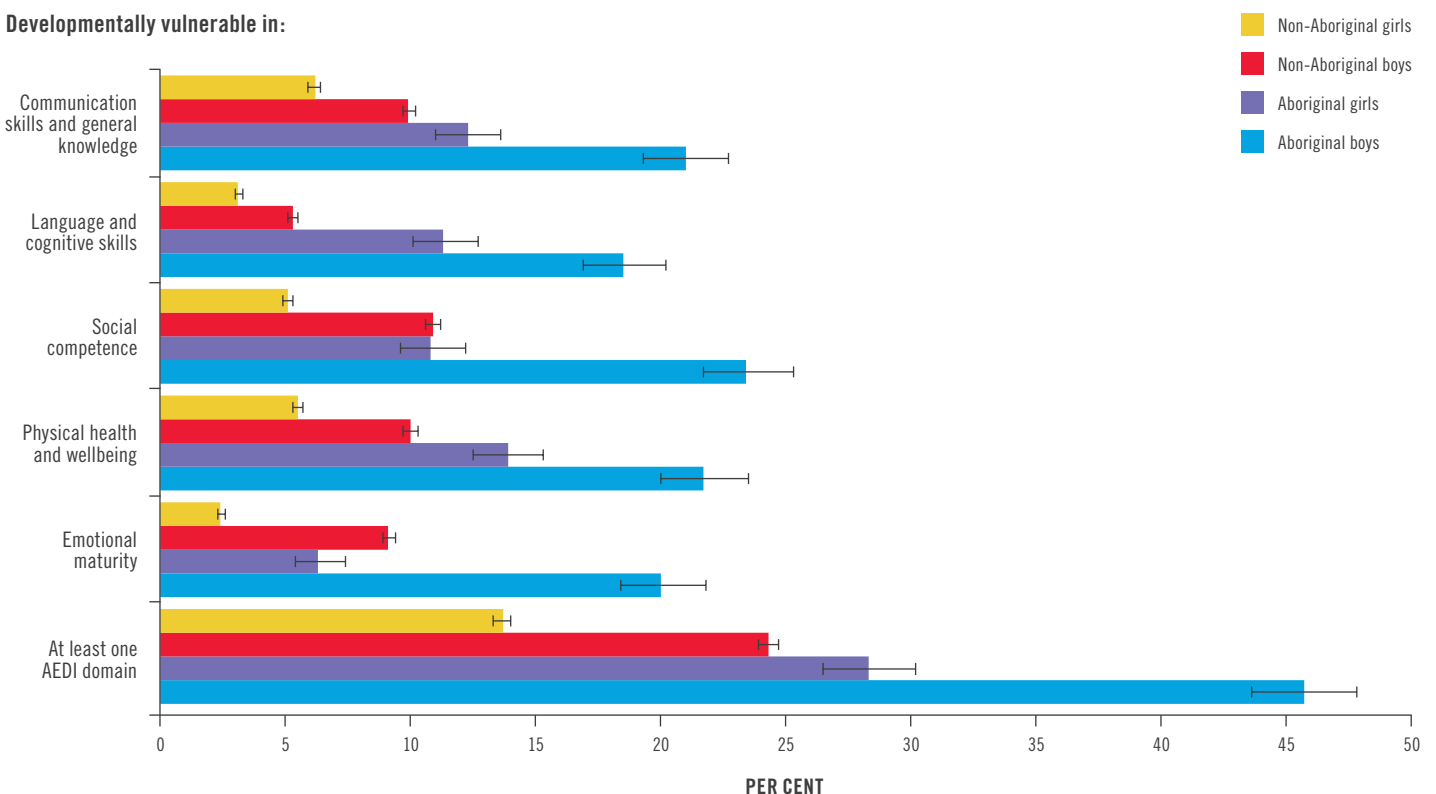
## POPULATION HEALTH INITIATIVES

Supporting the healthy development of infants and children requires a multi-sectoral approach. Population health initiatives include:

- *My Personal Health Record* (The Blue Book), distributed to all new parents, includes a tool for parents to record recommended child health and development checks
- *Love, Talk, Sing, Read, Play* is a child development flipchart for parents which provides advice and information on the social and emotional development of their child
- *Connected Communities* aims to improve education outcomes, including readiness for school, in Aboriginal children and young people in living in disadvantaged communities
- *Building Strong Foundations for Aboriginal Children, Families and Communities* provides child and family health services for Aboriginal families
- *Supporting Children with Additional Needs* helps preschools develop inclusion strategies for children with delayed development, specific types of disabilities, or severe chronic health conditions

**FIGURE 3.27:** Percentage of children aged 4–7 years who were developmentally vulnerable in each domain, NSW, 2012

Developmentally vulnerable in:



Source: Australian Early Development Census

# DISABILITY

Children and young people with severe or profound disability are vulnerable to poor health outcomes

## KEY POINTS:



In 2012, about 3% of NSW children and young people had a severe or profound disability



More boys (4.1%) had a severe or profound disability than girls (2.6%)

Disability is an umbrella term for impairments, activity limitations, and participation restrictions resulting from the interaction between a person's health condition and environmental and personal factors (such as access to services, transportation and social supports).<sup>105</sup> A person with disability may need help with the core activities of daily living (that is, self-care, mobility or communication), education or employment.<sup>106</sup> The term disability encompasses physical, intellectual, psychiatric, sensory and neurological conditions, learning difficulties, physical disfigurement, and the presence of a long term disease or condition.<sup>106</sup> The *National Disability Strategy NSW Implementation Plan* outlines strategies to help people with disability attain the highest possible health and wellbeing throughout their lives. These principles are mirrored in the NSW Ministry of Health's *Disability Action Plan 2009–2014*. A number of LHDs and other NSW Health organisations also have their own disability action plans.

## PREVALENCE OF DISABILITY

According to the 2012 ABS Survey of Disability, Ageing and Carers, 3.3% or 77,800 NSW children and young people aged 0–24 years had a disability where they were unable to do, or sometimes or always needed help with, or used aids or equipment for core activities (that is, self-care, mobility or communication). Young people aged 5–14 years (5.0%) were more likely to have this level of disability than those aged 0–4 years (2.6%) or 15–24 years (2.0%). Males aged 0–24 years were more likely to have this level of disability compared with females of the same age (4.1% and 2.6% respectively).<sup>107</sup>

From the 2011 Census of Population and Housing, 41,139 NSW people (184.8 per 10,000 persons) aged 0–24 years reported a need for assistance with core activities due to severe or profound disability. Need for assistance was higher in children aged 5–14 years, boys, young Aboriginal people, and young people living in regional and lower socioeconomic areas (Figure 3.28).



## HEALTH AND DISABILITY

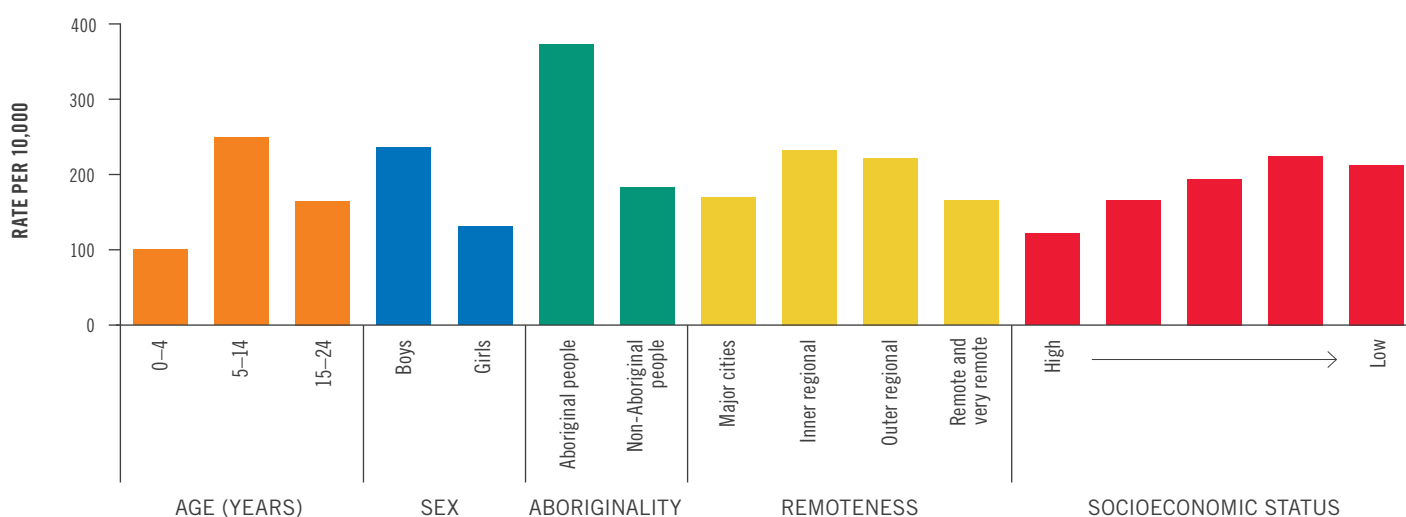
The relationship between health and disability is complex. It cannot be assumed that a person's disability causes adverse health outcomes or vice versa.<sup>108</sup> Although reliable data on the health of NSW children and young people living with severe or profound disability is limited, Australia-wide data, and data from the adult population, shows people with disability are vulnerable to poor health outcomes and adverse health behaviours.<sup>108</sup> These poor health outcomes and adverse health behaviours may be related directly to a disability, or they may be the result of barriers such as a lack of accessible health information, services or support. In 2011–12, 47.3% of people aged 18–64 years who had a disability and always or sometimes required help with core activities or used aids reported poor or fair health, compared with 5.8% of the overall adult population.<sup>109</sup> Sedentary behaviours or low levels of exercise (88.2%) and overweight and obesity (81.8%) were also more common in adults aged 18 years or over who had a disability and always or sometimes required help with core activities or used aids than the overall adult population (68.8% and 42.5% respectively).<sup>110</sup>

## POPULATION HEALTH INITIATIVES

Population health initiatives for children and young people with disability focus on improving access, quality and the range of available services, and is inclusive of both mainstream services (for example, early childhood screening services) and specialist clinical services (for example, NSW Paediatric Spinal Outreach Service). A multi-sectoral approach is used to achieve these improvements, examples of which include:

- *Service Framework to Improve the Health Care of People with Intellectual Disability* by improving health service access, quality, range, consistency and accessibility to people with disability<sup>111</sup>
- *Intellectual Disability Health Network* by working with consumers, carers, clinicians and other government and non-government agencies to improve health outcomes for people with intellectual disability
- *DisAbility* webpage by helping parents and carers navigate the disability and health care system
- The 1st stage of the *National Disability Insurance Scheme* has been launched and the Hunter area of NSW is a trial site. The NDIS will progressively be rolled out across the state from 2016. It aims to increase choice and participation for eligible people (including children and young people) with disability and their family or carers by providing individualised funded supports. NSW Health is committed to supporting roll-out of the scheme and is working with the National Disability Insurance Agency to ensure seamless interaction with health services.

**FIGURE 3.28:** Characteristics of children and young people who needed assistance with core activities, NSW, 2011



Source: ABS Census 2011 Tablebuilder (custom table)

# MENTAL HEALTH

## Hospitalisations for mental health problems are increasing in young people, particularly females

### KEY POINTS:



Young females are more likely to report high levels of psychological distress than males



Hospitalisation rates for intentional self-harm are increasing in females aged 15–24 years



Suicide rates in males aged 15–24 years have declined over the last 15 years

Poor mental health in childhood and adolescence can lead to disrupted relationships, poor educational and vocational outcomes, increased contact with the juvenile justice system, and increased risk of family conflict, homelessness and substance abuse in adulthood.<sup>112</sup> Self-harm (with intent of injuring rather than killing oneself) and suicide (self-harm with the intent of taking one's life) are both associated with mental health problems such as depression, anxiety, psychoses and personality disorders, especially when drug and alcohol problems are present. Factors that protect children and young people against mental health problems include secure relationships with adults, positive school environments, a sense of connectedness, and positive peer groups, achievements and temperament.<sup>112–115</sup>

## MENTAL HEALTH PROBLEMS

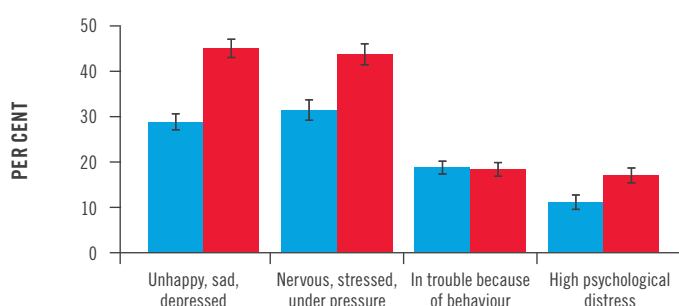
### Prevalence

In 2012–2013, in the NSW Population Health Survey, 8.8% of children aged 4–15 years were identified as being at risk of developing a clinically significant behaviour problem and may require further assessment for possible mental health disorders.

In 2011, in the NSW School Students Health Behaviours Survey, 14.0% of students aged 12–17 years reported high or very high psychological distress, with rates higher in girls (17.0%) than boys (11.0%). Girls were also more likely to feel unhappy, depressed, nervous or stressed than boys of the same age (Figure 3.29), and more likely to speak about these feelings (68.5%) than boys (50.4%).

**FIGURE 3.29:** Types of psychological distress in students, NSW, 2011

■ Girls  
■ Boys



Source: NSW School Students Health Behaviours Survey

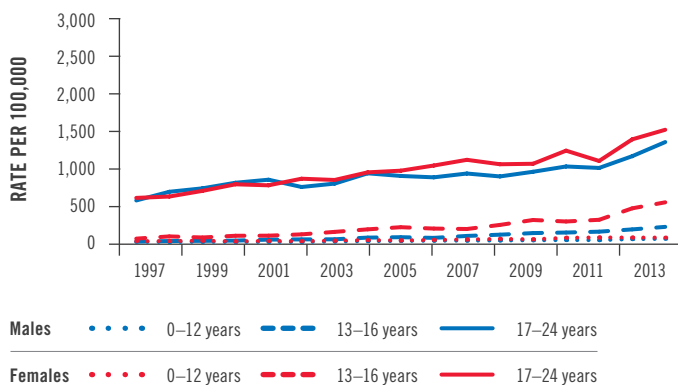
In 2013, among people aged 16–24 years, 11.1% reported high or very high psychological distress, remaining relatively steady since 2002. A higher percentage of females (14.3%) reported high or very high psychological distress than males (9.3%). Similarly, in the 2011–12 Australian Health Survey, 9.6% of people aged 18–24 years in NSW reported high or very high psychological distress.<sup>110</sup>

At 1 December 2012, the treated prevalence of Attention Deficit Hyperactivity Disorder (ADHD), identified by the percentage of children aged 2–17 years prescribed psychostimulant medication for ADHD, was 1.1%. The percentage of boys receiving psychostimulant treatment for ADHD (1.6%) was 3 times higher than girls (0.5%).

### Emergency department visits and hospitalisations

Since 1997, the rate of emergency department visits for mental health problems has steadily increased for young people aged 13–24 years (Figure 3.30). Higher rates of emergency department visits occur in females than males.

**FIGURE 3.30:** Emergency department visits for mental health problems, NSW

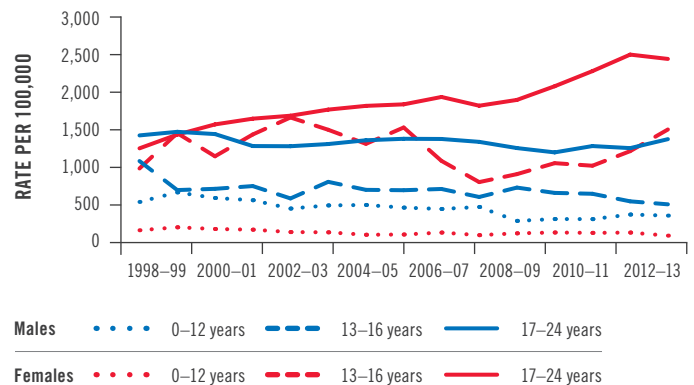


Source: NSW Emergency Department Data Collection

In 2012–13, the hospitalisation rate for mental health problems in children and young people was 886 per 100,000 people. The rate in females aged 17–24 years sharply increased between 2007–08 and 2011–12; however, there are now early indications of the rate stabilising (Figure 3.31). Hospitalisation rates for mental health problems were higher for Aboriginal children and young people compared with non-Aboriginal children and young people, and lower for males than females (Figure 3.32). Rates were also higher in children and young people living in major cities and higher socioeconomic status areas.

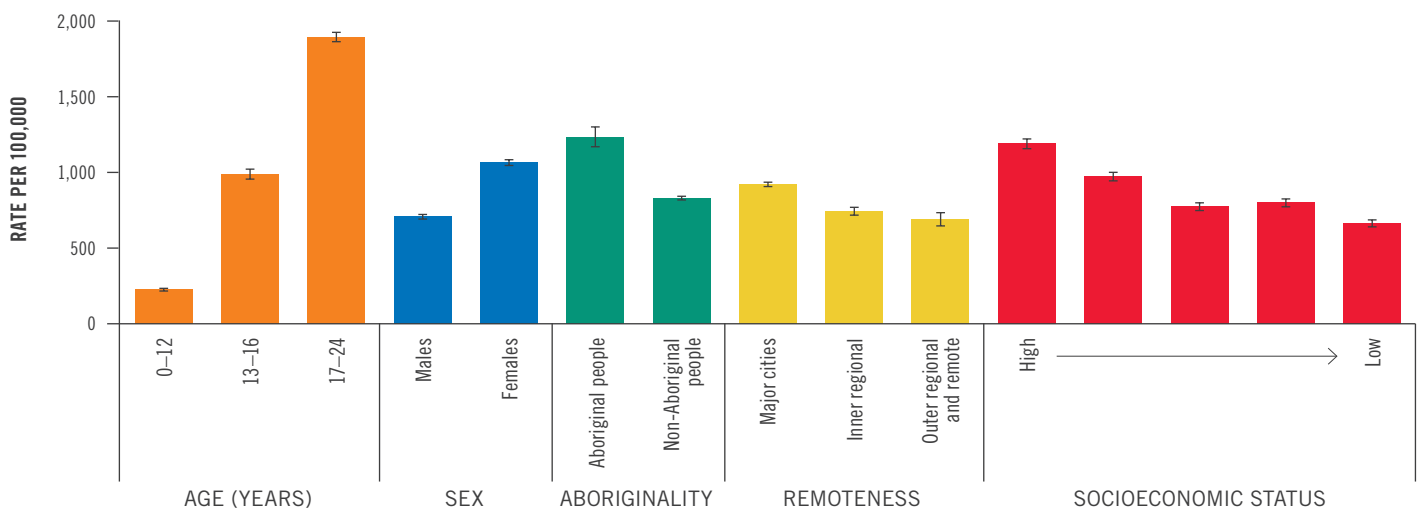
Mood disorders were the leading mental health problem for hospitalisation in females aged 13–16 years (38.3%) and 17–24 years (29.2%). In males, the leading problems were neurosis, stress and somatic symptom disorders in those aged 13–16 years (31.2%) and mental and behavioural disorders due to psychoactive substances in those aged 17–24 years (34.3%).

**FIGURE 3.31:** Hospitalisations due to mental health problems, NSW



Source: NSW Admitted Patient Data Collection

**FIGURE 3.32:** Hospitalisations due to mental health problems, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

## INTENTIONAL SELF-HARM

Hospitalisation rates for intentional self-harm among young females aged 15–24 years have increased since 1993–94 (259 per 100,000 population), with peak rates observed in 2004–05 (489 per 100,000 population) and 2012–13 (466 per 100,000 population). The rate for males has remained steady over the same period (183 per 100,000 population in 2012–13). Rates of hospitalisation due to self-harm were higher in young people aged 15–24 compared with the overall adult population (Figure 3.33). Rates were also higher in Aboriginal young people and young people living in regional and remote areas compared with others. Across all categories, rates were substantially higher in females compared with males. Poisoning was the most common mechanism of self-harm for both males and females aged 15–24 years.

## SUICIDE

In 2011, the suicide rate in NSW young people aged 15–24 years was 6 per 100,000 population, with the rate in males (9 per 100,000) being more than double that of females (4 per 100,000). Suicide rates declined among NSW young people between 1997 and 2005, particularly in males (Figure 3.34). In 2011, the most common methods of suicide for NSW males and females of all ages were hanging,

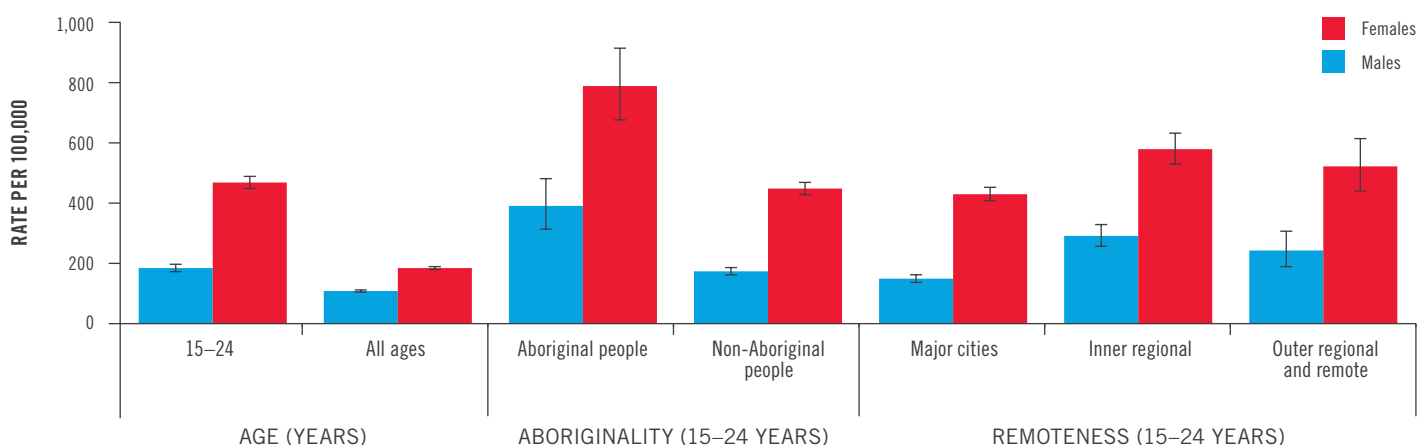
strangulation and suffocation, followed by jumping from a high place (for males) and intentional self-poisoning by exposure to narcotics and hallucinogens (for females).<sup>74</sup>

## POPULATION HEALTH INITIATIVES

Mental health initiatives in NSW aim to increase awareness and knowledge, and provide support. Examples include:

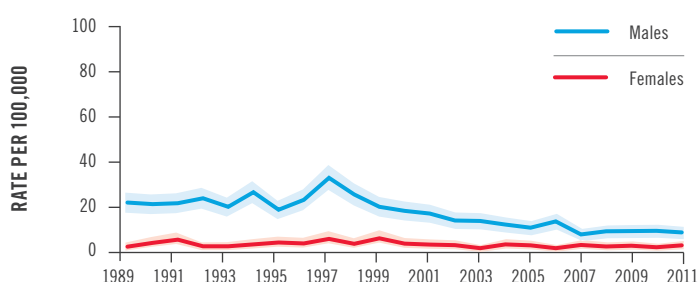
- *NSW Suicide Prevention Strategy 2010–2015* aims to reduce suicide and suicidal behaviour in NSW<sup>116</sup>
- *Child and Adolescent Mental Health Services* provide specialist mental health services for children and adolescents up to the age of 18 years and their families
- *NSW Children of Parents with a Mental Illness Program* supports adult mental health services to include consumers' parenting roles in family-focussed and recovery-oriented service delivery
- *Mental Health Association NSW* run a mental health information service and the *Facing Anxiety* program
- *headspace* provides a national youth mental health service
- *Mental Health Line* and *Lifeline* provide 24 hour telephone mental health and crisis support

**FIGURE 3.33:** Intentional self-harm hospitalisations, people aged 15 years and older, NSW, 2012–13



Source: NSW Admitted Patient Data Collection

**FIGURE 3.34:** Suicide rate in young people aged 15–24 years, NSW



Source: Australian Coordinating Registry Cause of Death Unit Record File

# APPENDICES

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# APPENDIX 1: GUIDE TO INTERPRETING FIGURES AND DATA

## SNAPSHOT (POINT-IN-TIME) COMPARISONS BETWEEN GROUPS

Throughout this report, snapshots of certain health conditions or behaviours are presented by selected characteristics (example Figure i). This type of figure helps to identify variation between groups and may highlight potential risk or protective factors for each indicator. Any variation should be interpreted as an association between the characteristic and the indicator, not a causal relationship, as there are often a number of factors which contribute to higher rates of illness and health service use in certain populations.

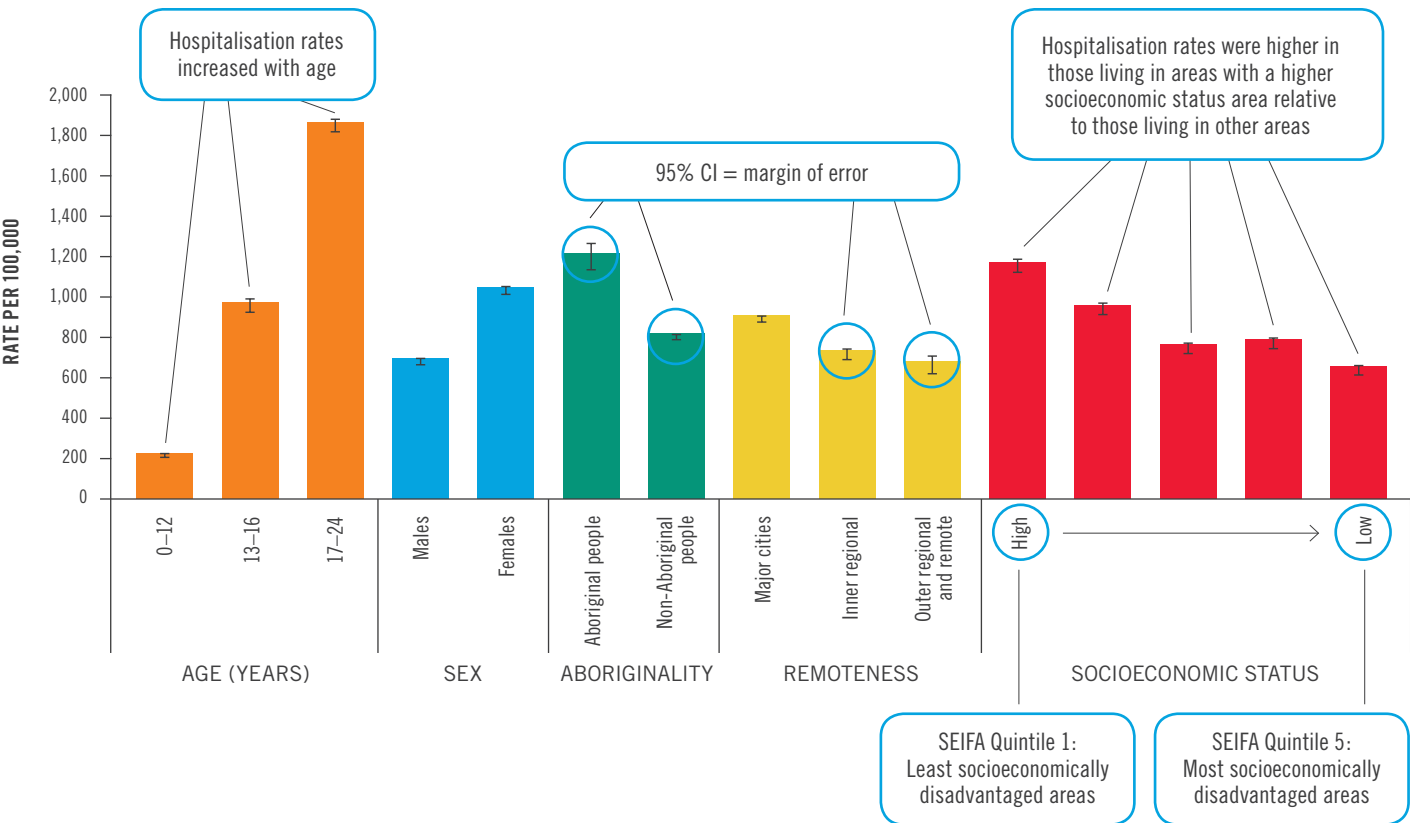
The example provided measures hospitalisation rates due to mental health problems in children and young people. Higher bars suggest higher hospitalisation rates in the specified population group, and/or the condition more

frequently resulting in hospitalisation in that group. The line through the top of each bar represents the margin of error (95% confidence interval) around each point estimate. See *Appendix 2: Statistical methods* for further information.

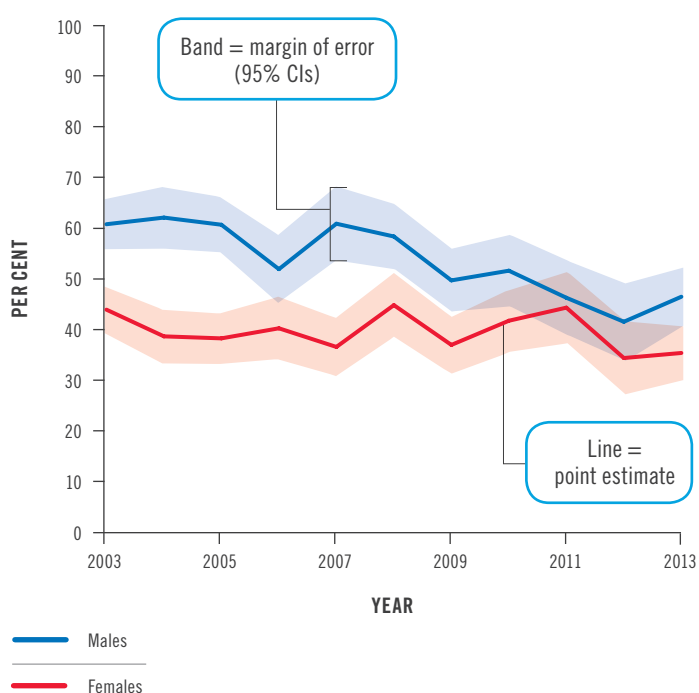
## TRENDS OVER TIME

Trend graphs show changes in the rate of a health condition over time by a selected characteristic (example Figure ii). This type of figure allows for tracking of particular health outcomes or behaviours over time, and/or comparing how these may change between population groups. Solid lines connect the series of point estimates from each year, whereas the shaded band around each line represents the margin of error (95% confidence intervals) See *Appendix 2: Statistical methods* for further information.

FIGURE i: Interpreting snapshot (point-in-time graphs), hospitalisations due to mental health problems, NSW



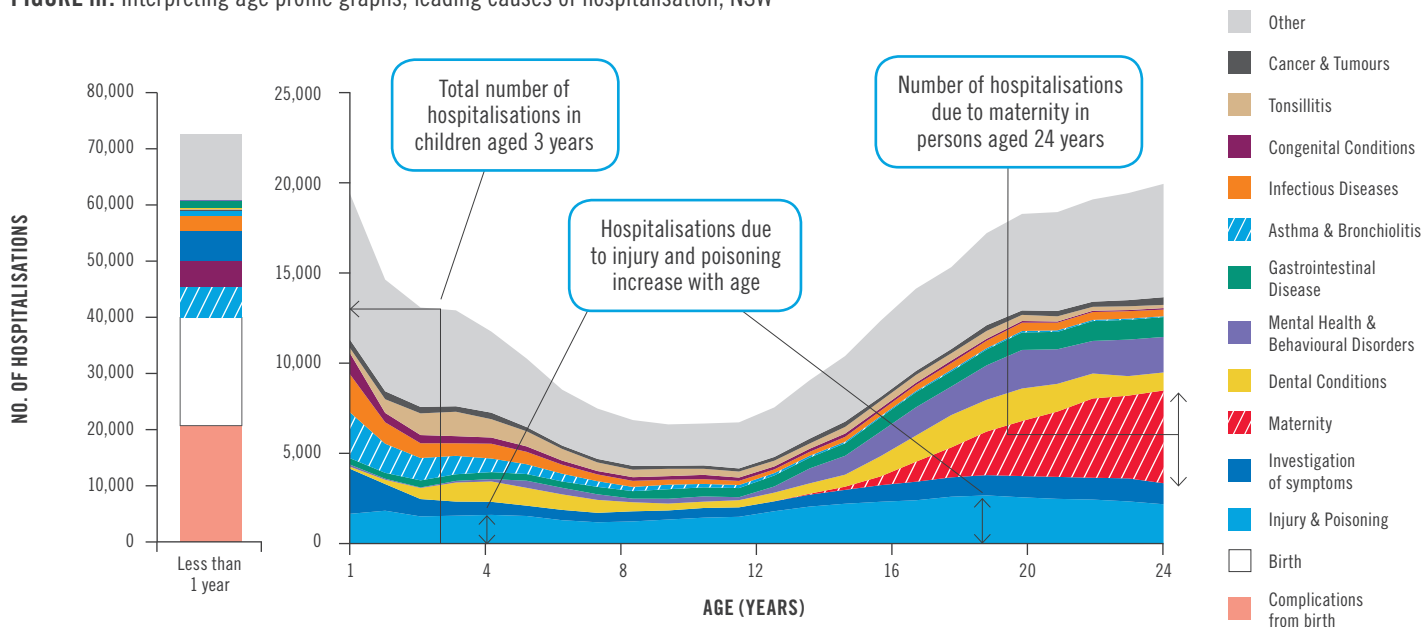
**FIGURE ii:** Interpreting trend graphs, young people aged 16–24 years who had more than 2 standard drinks on any day, NSW



## AGE PROFILES OF LEADING CAUSES OF EVENTS

In age profile graphs (example Figure iii), age (in single years) is presented across the horizontal axis and the number of events (in this case the number of hospitalisations) across the vertical axis. Colour bands differentiate conditions or groups of conditions. These bands are stacked such that the overall area of the graph equals the total magnitude (total number) of events which occurred at that age within the specified period. This type of figure, therefore, provides a high level overview of the age distribution of disease, the proportional contribution that each disease has on the total number of events, and how the overall number of events changes with age. Caution is advised when comparing the magnitude of health conditions between ages as counts (as opposed to rates) are presented. In the example provided, hospitalisations of children under 1 year of age are separated from other age groups due to the substantial differences in the overall magnitude of health service use in this age group.

**FIGURE iii:** Interpreting age profile graphs, leading causes of hospitalisation, NSW



## ABORIGINALITY

In this report, Aboriginal and Torres Strait Islander people are referred to as Aboriginal people, in recognition that Aboriginal people are the original inhabitants of NSW. Reliable data on the health of Aboriginal people are essential for measuring the effectiveness of health services in meeting the health needs of Aboriginal people and achieving equitable health outcomes. Correct and consistent reporting of Aboriginal people in administrative data sets is required to meet these outcomes. Under-reporting occurs when information about Aboriginal origin is not correctly recorded for all clients. In NSW, Aboriginal people are known to be under-reported in population based data collections.

Under-reporting of Aboriginal people in NSW health data sets impacts on many aspects of reporting the health of Aboriginal people. It creates uncertainty about the size and composition of the Aboriginal population in NSW, the estimated size of health issues reported, and the size of the difference between Aboriginal and non-Aboriginal people in terms of health service use and health status.

NSW Health is working to improve the quality of data collected on, and information reported on, the health of Aboriginal people, and health services delivered to Aboriginal people. In NSW Health administrative data sets, the estimated levels of correct reporting for Aboriginal people have increased over time but varies between data sets. For example, in the Perinatal Data Collection, the estimated level of correct reporting for Aboriginal people increased from 67.9% in 2001 to 81.5% in 2011, while in the NSW Admitted Patient Data Collection, the estimated level of correct reporting for Aboriginal people increased from 72.8% in 2005–06 to 87.1% in 2012–13.

## AGE GROUPS

Different age groups are used in this report, depending on the indicator and available data source. Nevertheless, a common format for age groups is applied throughout. Persons aged 0–15 years is inclusive of the 1st year of life (infants aged <1 year) and the last day of a person's 15th year (up to, but not including, the 16th birthday). Persons aged 0–15 years are generally referred to as "children". Those aged 16–24 years begins on the 16th birthday and ends on the last day of the person's 24th year (up to but not including the 25th birthday), and are generally referred to as "young people".

## REMOTENESS

Throughout this report, comparisons of the rate or prevalence of health conditions, behaviours and risk factors by remoteness categories are made. These categories were derived from the Accessibility/Remoteness Index of Australia Plus (ARIA+), which groups areas into 5 remoteness categories: major cities, inner regional, outer regional, remote, and very remote.<sup>117</sup> Events, patients and cases in each health data source are assigned to 1 of these 5 remoteness categories based on their geocoded place of residence (Figure iv). In some instances, outer regional, remote and very remote categories are grouped to give sufficient counts for analyses. See *Appendix 2: Statistical methods* for further information.

## SOCIOECONOMIC STATUS

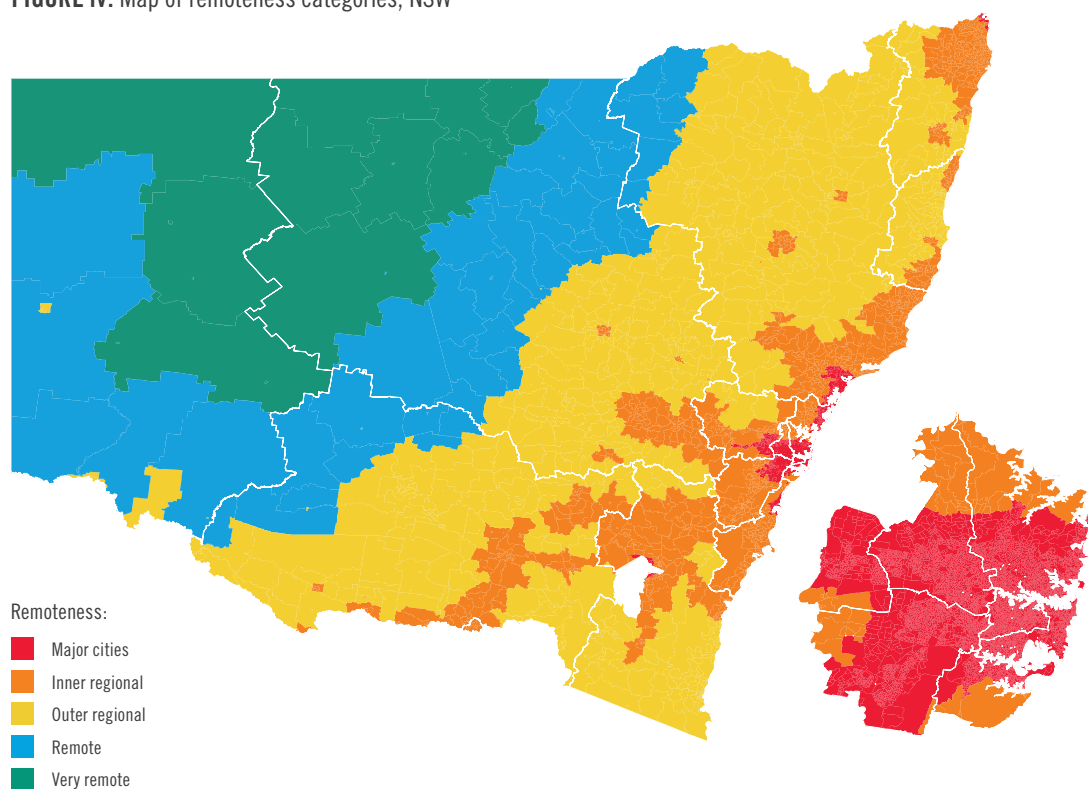
Throughout this report, comparisons by socioeconomic status are based on the Socioeconomic Indexes for Areas (SEIFA) Index of Relative Socioeconomic Disadvantage (IRSD), which assigns a score to each Statistical Local Area in NSW.<sup>118</sup> As this score is used as a proxy for the socioeconomic status of all individuals living in that area, it does not necessarily reflect the true socioeconomic status of an individual or family. Scores were grouped into quintiles. Events, patients or cases in each health data source were assigned to 1 of these 5 quintiles based on their reported place of residence geocoded to a Statistical Local Area (Figure v). The lowest scores indicate lower average socioeconomic status of residents of an area relative to other areas in NSW and vice versa. Quintile 5 represents areas with the most socioeconomic disadvantage in NSW, labelled "low" for ease of interpretation. Quintile 1 represents areas with the least socioeconomic disadvantage in NSW, labelled "high". See *Appendix 2: Statistical methods* for further information.

## YEAR OF DATA

Data from various sources are reported differently throughout the report to maintain consistency with existing reporting conventions in other publications and in alignment with the frequency and availability of updated data. The following rules have been applied:

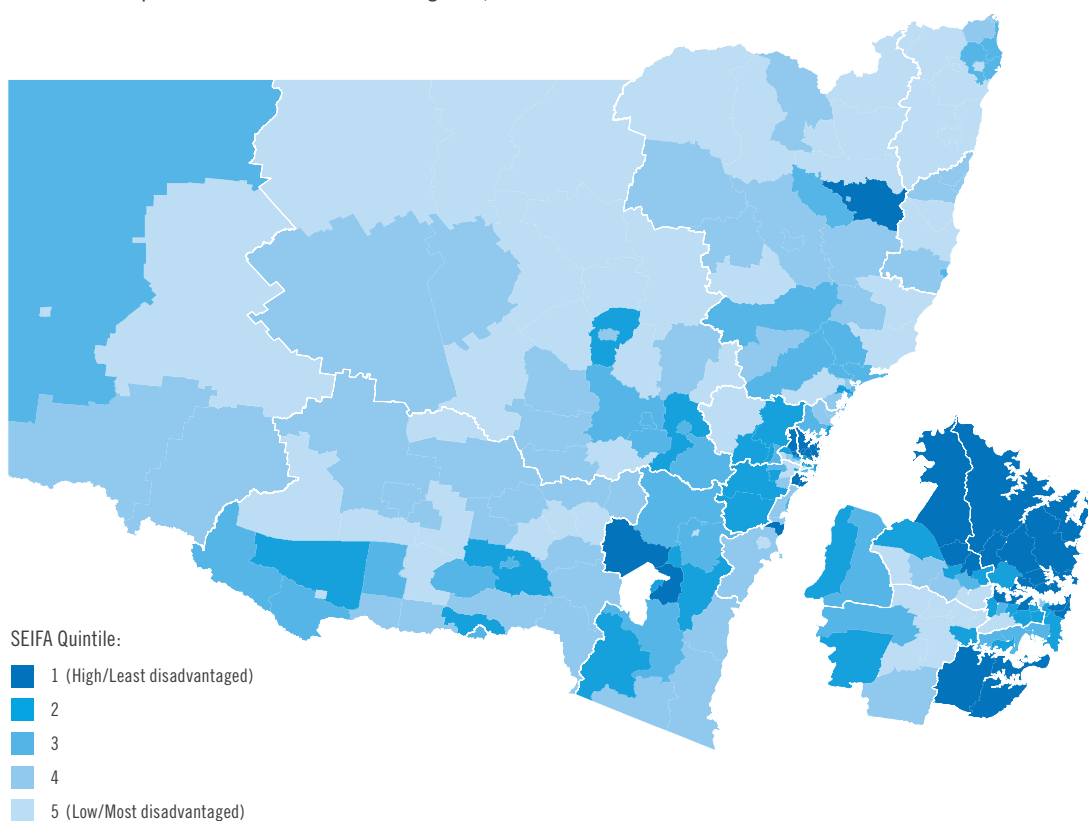
- Single calendar year data are reported as "2013"
- Combined calendar year data are reported as "2012–2013"
- Single financial year data are reported as "2012–13"
- Combined financial year data are reported as "2011–12 to 2012–13"



**FIGURE iv:** Map of remoteness categories, NSW

Note: The coloured areas represent Statistical Local Areas (Level 1) and the white lines represent Local Health Districts

Source: Australian Bureau of Statistics<sup>117</sup>

**FIGURE v:** Map of socioeconomic status categories, NSW

Note: The coloured areas represent quintiles of SEIFA-IRSD scores mapped to Statistical Local Areas (Level 1) and the white lines represent Local Health Districts

Source: Australian Bureau of Statistics<sup>118</sup>

## APPENDIX 2: STATISTICAL METHODS

This section describes the statistical methods used in this report. For further information about data sources, data limitations and statistical methods related to each indicator please refer to Appendix 3 and Health Statistics NSW ([www.healthstats.nsw.gov.au](http://www.healthstats.nsw.gov.au)).

### STATISTICAL METHODS

#### Attributable fraction

Attributable fractions measure the amount of disease associated with an exposure within a specified population. Estimates of the numbers and rates of deaths and hospitalisations attributable to certain exposures (for example, alcohol) used age and sex-specific attributable fractions developed by the School of Population Health, University of Queensland and the Australian Institute of Health and Welfare and published in *The burden of disease and injury in Australia, 2003* report.<sup>70</sup>

#### Age-adjusted rate

Age-adjustment of rates uses direct age-standardisation to adjust for effects of differences in the age composition of populations across time or between different sub-groups. The 2001 Australian Standard Population was used as the standard population.

#### Age-specific rate

Rate for a specified age group. Both numerator and denominator refer to the specified age range.

#### Analysis of survey data

All survey samples and indicators were weighted to adjust for differences in the probability of selection among respondents and benchmarked to the estimated residential population, to bring the sample into line with the population distribution.

#### Classification and grouping of disease and procedures

Administrative data (that is, hospitalisation and death data) from 1998 onwards were classified and grouped using the International Classification of Disease, version 10, Australian Modification (ICD-10-AM). Emergency department visits were classified using 1 of 3 classifications, depending on the information system used in the emergency department at a point in time: ICD-9, ICD-10-AM or the Systematised Nomenclature of Medicine–Clinical Terms (SNOMED-CT). Grouping definitions are available on Health Statistics NSW ([www.healthstats.nsw.gov.au](http://www.healthstats.nsw.gov.au)).

#### Crude rates

Crude rates represent an estimate of the percentage of a population that experiences an outcome during a specified period. Rates are calculated by dividing the number of times an outcome (cases, events, hospital separations, etcetera) is observed in a specified period by the population at risk during that period (typically per year).

#### Estimated residential population projections

Population projections for 2016, 2021, 2026 and 2031 have been produced by the NSW Department of Planning and Environment (DPE). These projections are based on the 2011 estimated resident population published by the Australian Bureau of Statistics. The projections result from assumptions about future trends in fertility, death and migration and incorporate information about current trends from DPE Metropolitan Development Program, the Australian Bureau of Statistics, Federal Department of Immigration and Citizenship, and NSW Ministry of Health. The year-to-year projections of populations to 2031 have been produced by the Centre for Epidemiology and Evidence, NSW Ministry for Health, using as starting points projections produced by DPE. These projections have been used to calculate rates for all administrative data set-based indicators, unless stated otherwise. Populations by single years of age were obtained by interpolation using Beer's ordinary formula.<sup>119</sup> Population estimates as at 30 June were used for calendar years, while estimates as at 30 December were used for financial years. Aboriginal and non-Aboriginal estimated resident population projections are based on 2011 census data released by the ABS in August 2013.

#### Incidence

The rate at which new cases of a disorder occur in the population: that is, the number of new cases in a specified period, divided by the population at risk of the disorder in that period.

## Margin of error (confidence intervals)

Margins of error (or confidence intervals) are presented throughout this report to indicate the reliability of an estimate. A 95% level of confidence was selected to reflect the range of values that should contain the actual value 95% of the time. The width of the interval relates to the differing sample sizes for each indicator, and in general, a wider interval reflects less certainty in the estimate for that indicator. Margins of error are presented on bar graphs (as an error bar) and on trend graphs (as a shaded band), where appropriate (see also *Appendix 1: Guide to Interpreting Figures and Data*). Confidence intervals were generally omitted when reviewing administrative data sources due to the large sample size (that is, the total, age- or area-specific NSW population). Methods applied for calculating confidence intervals were dependent upon the type of indicator:

- Crude rates: based on the inverse of the chi-squared distribution function
- Age standardised rates: Dobson's method for age-standardised rates
- Percentages from surveys: The Taylor expansion method was used to estimate sampling error of estimates, taking into account the complex survey design
- Other percentages: based on the Clopper-Pearson method

## Mean

The mean is also known as the arithmetic average: the sum of values recorded for all observations divided by the number of observations.

## Prevalence

The number of people with a disease at a given time (point prevalence) or in a specified period (period prevalence), divided by the number of people at risk from that disease.

## Rate ratio

The ratio of 2 rates: for example, the rate of disease in 1 population group divided by the rate in another population group.

## Remoteness

Remoteness categories were derived from the Accessibility/Remoteness Index of Australia Plus (ARIA+), which groups areas into 5 remoteness categories: major cities, inner regional, outer regional, remote and very remote.<sup>117</sup> See *Appendix 1: Guide to interpreting figures and data*.

## Socioeconomic status

Socioeconomic groups were constructed using the Index of Relative Socioeconomic Disadvantage (IRSD), from the Socio-Economic Indexes for Areas (SEIFA).<sup>118</sup> See *Appendix 1: Guide to interpreting figures and data*.

## DATA SOURCES

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. SAPHaRI replaced HOIST in 2012.

### NSW HEALTH DATA SOURCES

#### Ambulance Service of NSW Dispatch Database

The Centre for Epidemiology and Evidence receives a regular feed of selected information from the NSW Ambulance Service's triple zero emergency call centre and ambulance dispatch database. The problem described by the caller is categorised using dispatch priority system. This allows calls to be classified into broad chief complaints.

#### Broken Hill Child and Family Centre, Lead Program

All children 1–4 years residing in Broken Hill have been annually offered free blood lead testing since 1991. This testing is voluntary and offered by the Broken Hill Child and Family Health Centre Service and Maari Ma Primary Health Service. Population based blood lead screening is a tool to measure the impact of lead in childhood development, orientate the delivery of health services and guide research questions. See the *Lead: It's In Our Hands* ([www.leadnsw.com.au](http://www.leadnsw.com.au)) website for more information.

#### Burden of disease data

Electronic files of the attributable fractions developed by Begg and colleagues were obtained directly from the School of Population Health,<sup>70</sup> University of Queensland by the Centre for Epidemiology and Evidence. The disease and injury groupings used in these files were defined using coding developed for *The burden of disease study* (BOD),<sup>70</sup> but a mapping to ICD-10-AM codes was also provided.

#### Healthy Children Initiative (PHIMS Interim Solution data monitoring and management)

Data on program practices is collected from participating *Munch & Move*<sup>®</sup> early childhood services and *Live Life Well @ School* primary schools by Local Health Districts to support implementation of the NSW Healthy Children Initiative. Local Health District health promotion teams and the NSW Ministry of Health use the collected de-identified aggregated data to support local program delivery and to monitor the adoption of these programs across the state. This includes regular reporting of program achievements within the Local Health Districts and the NSW Ministry of Health.

## HIV-STI Minimum Data Set Database

The HIV-STI Minimum Data Set (Human Immunodeficiency Virus-Sexually Transmissible Infections) is a subset of the non-admitted patient occasions of service database, with the Minimum Data Set providing additional demographic and service related information of individuals who sought treatment from publicly-funded HIV and sexual health services. Reported data included HIV-STI testing, treatment and management, and excluded health education and health promotion related activities.

## Notifiable Conditions Information Management System (NCIMS)

NCIMS is an internet based system used by public health units located across NSW to register communicable disease notifications. Notification is certification in an approved form of a disease listed in Schedule 1 of the *NSW Public Health Act 2010*. Under authority of the Act, NSW Health receives notifications of communicable diseases from pathology laboratories, doctors, and hospitals.

## NSW Admitted Patient Data Collection (APDC)

The NSW APDC is a census of all services for admitted patients provided by public hospitals, public psychiatric hospitals, public multi-purpose services, private hospitals and private day procedure centres. Data from institutions for people with a developmental disability and private nursing homes are not included. It is a financial year collection from 1 July through to 30 June of the following year. Information in this data set is provided by patients, health service providers and the hospital's administration. The number or rate of hospitalisation reflects a count of hospitalisation separations (that is, discharge, death or transfer). Multiple hospitalisations may, therefore, be counted for a single individual, and may overestimate the true burden of a health problem in the community. However, only a small percentage (most severe) of persons with a health problem result in hospital admission; therefore, hospitalisations underestimate the magnitude of health problems at a population level. For this report, figures for hospitalisations up to 2012-13 include an estimate of the small number of interstate hospitalisations in public hospitals of NSW residents.

## NSW Congenital Conditions Register

Under the *NSW Public Health Act 2010*, doctors, hospitals, and laboratories are required to notify certain congenital conditions detected during pregnancy (regardless of the outcome), at birth, or up to 1 year of life. This may include 3 types of conditions: (2) conditions that affect the growth, development and health of the baby present before birth such as cleft lip, dislocated hip and problems with the development of the heart, lungs or other organs; (2) conditions due to changes in the number of the baby's chromosomes, such as Down Syndrome; (3) an inherited condition (cystic fibrosis, phenylketonuria, congenital hypothyroidism or thalassemia major).

## NSW Central Cancer Registry (CCR)

The CCR is a population-based registry of all new diagnoses of cancer in NSW residents and all deaths from cancer. A case of cancer is the occurrence of a primary malignant neoplasm in 1 organ of a particular person (for example, a case of malignant melanoma in a particular person counts as 1 case). If the same person subsequently develops leukemia, the leukemia counts as a 2nd case. The CCR records new cancer cases and does not capture cancer recurrences.<sup>120</sup>

## NSW Denominator Data Project

In 2012, NSW Health commenced the NSW Denominator Data Project to collect the total number of tests performed per month (the denominator data) for 10 selected notifiable conditions for which the testing rate might impact the notification rate. The 10 conditions were: chlamydia, gonorrhoea, HIV, Ross River virus infection, Barmah Forest virus infection, pertussis, salmonellosis, shigellosis, cryptosporidiosis and giardiasis. Data were requested from 14 public and private laboratories in NSW. The data were collated to give monthly aggregated data per condition. No demographic information was provided.

## NSW Emergency department data collection (EDDC)

The NSW EDDC provides information about patient presentations to emergency departments (EDs) of public hospitals in NSW. It is derived from computer databases used for managing patients in EDs. The number of participating EDs has increased over time from around 46 EDs in 1996 to around 90 in 2010. There are 185 public hospital EDs in NSW, including EDs attached to multipurpose services. Trend analyses include continuous data from 1997 to date for 39 NSW EDs, which accounts for 57% of NSW ED activity. Snapshot analyses include data for 2013 only and cover 95% of NSW ED activity. Analyses based on ED diagnoses should be considered indicative only. Levels of ED activity may vary according to the availability of alternative primary care services such as general practice services.

## NSW Newborn Screening Program

The NSW Newborn Screening Program offers free screening to all babies born in NSW and the ACT, via a blood sample collected from the heel of babies usually at 48 hours to 72 hours. Collection occurs at maternity unit, early childhood and community health centre or by midwives attending home births. For more information see *NSW Newborn Screening Program*.

## NSW Statewide Infant Screening-Hearing (SWIS-H) Program

The NSW Statewide Infant Screening-Hearing (SWIS-H) Program aims to identify all babies born in NSW with significant permanent bilateral hearing loss by 3 months of age, and for those children to be able to access appropriate intervention by 6 months of age. Identification of significant hearing loss is achieved through universal hearing screening of all newborns. Data are collected on a financial year basis, on the number of babies screened or directly referred to diagnostic audiology, and the number

of children who were referred to diagnostic audiology as a result of the screening program. For more information see the *SWIS-H Program*.

### NSW Statewide Eyesight Preschooler Program (StEPS)

The StEPS program is an initiative of NSW Health, and targets preschools and child care centres to offer all 4-year old children free vision screening. Data are collected on the number of screening offers made in a financial year and the number of screening offers accepted and screened. Information about the number of children referred for specialist testing based on the screening process is also collected. For more information see the *StEPS Program*.

### NSW Perinatal Data Collection (PDC)

The NSW 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*. It has operated continuously since 1990 and covers all live births, and stillbirths of at least 20 weeks gestation or at least 400 grams birth weight. Prior to 2006 the PDC encompassed all births of at least 20 weeks gestation or at least 400 grams birth weight. The PDC includes notifications of births which occur in NSW (including women whose usual place of residence is outside NSW and who give birth in NSW). It does not receive notifications of interstate births where the mother is resident in NSW. One record is reported for each baby, even in the case of a multiple birth. The collection is based on the date of birth of the baby and is reported by calendar year. For more information on recent changes to the data collection please refer to Health Statistics NSW and the *NSW Mothers and Babies Report 2010*.<sup>121</sup> Maternal Aboriginality is under-reported on the Perinatal Data Collection, therefore it is likely that the true numbers of Aboriginal babies are substantially higher than reported.

### NSW Pharmaceutical Drugs of Addiction System (PHDAS)

The Pharmaceutical Drugs of Addiction System (PHDAS) is an administrative database used by the Pharmaceutical Services Unit of the NSW Ministry of Health to facilitate the authorisation of medical practitioners to prescribe drugs of addiction, including opioids for the treatment of chronic pain and psychostimulants for the treatment of attention deficit hyperactivity disorder (ADHD).

### NSW Population Health Survey

The NSW Ministry of Health has conducted the Adult Population Health Survey (since 1997) and the Child Population Health Survey (since 2001) through the NSW Population Health Survey; an ongoing survey using computer-assisted telephone interviewing (CATI). The instrument is translated into 5 languages: Arabic, Chinese, Greek, Italian and Vietnamese. The target population for the survey is all state residents living in private households; approximately 1,000 persons in each of the health administrative areas, with a total sample size of 8,000–16,000 depending on the number of administrative

areas included. Since 1997, a random digit dialling (RDD) landline sampling frame has been used to reach the target population, which has been refined over time. In 2012 an overlapping dual-frame design was introduced to capture both landline and mobile users. Due to this change, estimates from the 2012 and 2013 Population Health Surveys reflect both changes that have occurred in the population over time and changes due to improved survey design. For more information, see *Population Health Surveys* [www.health.nsw.gov.au/surveys/Pages/default.aspx](http://www.health.nsw.gov.au/surveys/Pages/default.aspx)

### NSW Schools Physical Activity and Nutrition Survey (SPANS)

SPANS 2010 was conducted by the Physical Activity Nutrition Obesity Research Group (PANORG) at the School of Public Health, University of Sydney on behalf of NSW Ministry of Health. SPANS 2010 was a representative population survey of 8,100 NSW school students covering ages 5–17 years. Students were attending school Years K (ages 5–6 years), 2 (ages 7–8 years), 4 (ages 9–10 years), 6 (ages 11–12 years), 8 (ages 13–14 years) and 10 (ages 15–16 years). Students from 101 schools in each educational sector (government, Catholic and independent) in urban and rural areas were invited to participate. All students were measured for height, weight, and waist circumference. Further information was collected by questionnaires completed by parents or self-administered by students. The school and student response rates were 71% and 57%, respectively. Characteristics of the SPANS sample were demographically similar to the NSW population.

### NSW School Students Health Behaviours (SSHB) Survey

The NSW Ministry of Health last conducted the NSW SSHB Survey in 2011. The target population was all students in Years 7–12 enrolled during the period Feb–Dec 2011. Schools with fewer than 100 students and Language Schools were not included. The survey used a 2-stage probability sampling procedure: schools were selected first; students within schools were selected second. Schools were stratified by the 3 sectors (government, Catholic, and independent) and randomly selected within each sector. The sampling procedure ensured the distribution of schools among the 3 sectors was reflected in the sample. Two samples were drawn: junior secondary (to Year 10); and senior secondary (Years 11 and 12). The target school sample was 126 secondary schools in 2008 and 2011, with an overall school response rate of 51.1%.

### NSW School Vaccination Program Register

Data are collected by Public Health Units located at Local Health Districts, who implement the NSW School Vaccination Program in NSW. Data on vaccinations and data on enrolment provided by Public Health Units and high schools respectively are then supplied to the Immunisation Unit of Health Protection NSW at the end of each school term.



## NON-NSW HEALTH DATA SOURCES

### Australian Childhood Immunisation Register (ACIR)

The ACIR is a national register administered by Medicare that records details of vaccinations given to children up to the age of 7 years who live in Australia. Children who are enrolled in Medicare are automatically included on the ACIR. Children who are not eligible to enrol in Medicare can be added to the ACIR when details of a vaccination are received from a doctor or immunisation provider. For more information, see the Australian Childhood Immunisation Register ([www.humanservices.gov.au/customer/services/medicare/australian-childhood-immunisation-register](http://www.humanservices.gov.au/customer/services/medicare/australian-childhood-immunisation-register)).

### Australian Coordinating Registry Cause of Death Unit Record File (COD URF)

The COD URF contains all deaths registered in NSW and cause of death information between 2006 and 2011. In 2013, these data were provided by the Australian Coordinating Registry based at the Queensland Government Department of Justice and Attorney-General to the Centre for Epidemiology and Evidence, NSW Ministry of Health. Prior to 2006, deaths data were provided to the NSW Ministry of Health by the Australian Bureau of Statistics. Analyses using deaths data in this report include an estimate of deaths to NSW residents that occurred interstate and deaths occurring before 2011 but were registered after 2011.

### Australian Health Survey 2011-13, Australian Bureau of Statistics

The Australian Health Survey collects information on health status, risk factors, actions and socioeconomic circumstances. It consists of 2 components: the National Health Survey (NHS) and the National Nutrition and Physical Activity Survey (NNPAS). The survey was conducted using a stratified multistage area sample of private dwellings, and the final core sample (combined NHS and NNPAS) comprised 31,837 participants. For more information, see the *Australian Health Survey: Users' Guide, 2011-13* ([www.abs.gov.au/ausstats/abs@.nsf/mf/4363.0.55.001](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4363.0.55.001)).

### Census of Population and Housing 2011, Australian Bureau of Statistics (TableBuilder)

The objective of the Census is to accurately measure the number and key characteristics of people who are in Australia on Census night, and of the dwellings and families in which they live. Analyses presented throughout this report are based on custom tables created using *ABS TableBuilder*. Minor variation in results generated using TableBuilder may occur as all microdata have undergone a process of confidentialisation including perturbation of counts generated. For more information, see *Census of Population and Housing* ([www.abs.gov.au/census](http://www.abs.gov.au/census)).

### Survey of Disability, Ageing and Carers, Australian Bureau of Statistics

The Survey of Disability, Ageing and Carers aims to collect information about 3 population groups: people with a disability, older people (aged 60 years and over), and people who provide assistance to these individuals. As such, it is the primary measure of prevalence of disability in Australia. The survey consisted of multi-stage sampling techniques to select the sample, and after exclusions due to scope and coverage, the final sample comprised 68,802 persons for the household component and 10,362 persons for the cared-accommodation component. For more information, see *Disability, Ageing and Carers, Australia: Summary of Findings, 2012* ([www.abs.gov.au/ausstats/abs@.nsf/mf/4430.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/4430.0)).

### 2011 Children's Guardian Case Files Audit

In 2011, the Children's Guardian Case File Audit Program focussed on the health needs of children in Out Of Home Care (OOHC). The Audit collected data from case files on a representative sample of children and young people in OOHC from government and non-government organisations. The case files that were audited related to children and young people in OOHC on either interim or final orders.

## APPENDIX 3:

# INDICATOR DEFINITIONS, EXPLANATORY NOTES AND DATA SOURCES

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
CHAPTER 1: Who are NSW children and young people, and where do they live?			
Population			
Population estimates and projections	See Appendix 2: Statistical methods		
Births			
Live births	Number of live births	<i>Live birth</i> : The birth of a child who after delivery, breathes or shows any other evidence of life, such as heartbeat. Includes live births occurring in NSW.	NSW Perinatal Data Collection 2012
Fertility rate	Numerator: number of live births Denominator: age-specific mid-year female population	Includes live births occurring in NSW. Teenage mothers are those aged under 20 years.	NSW Perinatal Data Collection 2012
Where children and young people live			
Families with dependent children	Number of families with a child under 15 years of age, or a dependent student aged 15–24 years	Definitions per ABS Census Dictionary, 2011: <sup>122</sup> <i>Family</i> : 2 or more persons, 1 of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who are usually resident in the same household. <i>Aboriginal family</i> : A family household with at least 1 Aboriginal person who is a usual resident and who was present on Census night. <i>Dependent child</i> : A person who is either a child under 15 years of age or a dependent student. <i>Dependent student</i> : Dependent child aged 15–24 years reported as temporarily absent from the family household.	ABS 2011 Census TableBuilder (Custom Table)
Jobless families with dependent children	Numerator: number of jobless families with at least 1 dependent child Denominator: total number of families with dependent children in NSW	<i>Jobless family</i> : A family with 1 or more dependent children with a labour force status of parents–partners in families as being unemployed or not in the labour force. Families with a parent–partner where a labour force status was not stated were excluded unless the other parent was identified as being employed.	ABS 2011 Census TableBuilder (Custom Table)
Out-of-home care (aged 0–17 years)	Numerator: number of children in out-of-home care Denominator: estimated resident population projections	<i>Out-of-home care</i> : Overnight care of children aged 0–17 years, where the state offers a financial payment.	AIHW Child Protection Australia 2011–12 <sup>6</sup>

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Where children and young people live</b> cont.			
Medical, behavioural and risk factor information on children and young people in out-of-home care	Numerator: Number of children and young people identified as having a pre-existing medical condition Denominator: Total number of children and young people whose out-of-home care files were examined	Data on pre-existing medical conditions was reported from an audit of Children's Guardian Case Files.	2011 Children's Guardian Case Files Audit
Homelessness	Numerator: number of children and young people classified as homeless Denominator: estimated resident population projections	See <i>ABS 2012</i> for detailed methods and definitions on estimating homelessness and youth homelessness. <sup>8</sup>	ABS Census 2011 <sup>8</sup>
Unemployment rate (aged 15–24 years)	Numerator: number of young people who were unemployed Denominator: number of young people who were in the labour force	See <i>ABS 2014</i> for detailed methods and definitions on estimating unemployment. <sup>9</sup>	ABS, Labour Force, Australia May 2014 <sup>9</sup>
Overseas born	Numerator: number of children and young people born overseas Denominator: total number of children and young people		ABS 2011 Census of Population and Housing
<b>CHAPTER 2: What factors affect the health of children and young people?</b>			
<b>Infant health</b>			
First comprehensive antenatal care visit before 14 weeks (and 20 weeks) gestation	Numerator: number of women who attended at least 1 antenatal visit in the first 14 (and 20) weeks of pregnancy and gave birth to at least 1 live-born or stillborn baby Denominator: Total number of women who gave birth to at least 1 live-born or stillborn baby	Up to 2010, the question asked at data collection was 'Duration of pregnancy at first antenatal visit'. From 2011, the question asked is: 'Duration of pregnancy at first comprehensive booking or assessment by clinician'. The new question has more specifically defined the type of visit to be reported and resulted in a substantial decrease in the reported proportion of mothers who commenced pre-natal care before 14 weeks gestation between 2010 and 2011.	NSW Perinatal Data Collection 2012
Folate supplementation	Numerator: number of mothers of infants aged 0–11 months who took folate supplements daily in the month immediately before and during the first 3 months of pregnancy Denominator: Total number of mothers who responded	Since 2008, folate supplementation is specified as "at least 0.5mg of folate daily".	NSW Population Health Survey 2012–2013
Neural tube defects	Number of babies born with neural tube defects		NSW Register of Congenital Conditions 2011
Smoking during pregnancy	Numerator: number of mothers who reported any smoking during pregnancy Denominator: All mothers who gave birth (stillbirth or live birth)	Since 2011, a change in the question asked has provided more opportunity for women to report their smoking history, and is likely to produce a more reliable measure of smoking rates in pregnancy than the original question.	NSW Perinatal Data Collection 2012



INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Infant health</b> cont.			
Low birth weight	Numerator: number of babies born with a birth weight less than 2,500 grams Denominator: total number of births	Includes all births (live and stillbirths) that occurred in NSW. Birth weight is the newborn infant's first bare weight in grams.	NSW Perinatal Data Collection 2012
Exclusively breastfed at 6 months	Numerator: number of mothers reporting that their child was exclusively breastfed at 6 months Denominator: total number of respondent mothers with a child less than 2 years of age	Estimates were derived using survival analysis, with the length of time infants received any breastfeeding, full breastfeeding, and exclusive breastfeeding modelled. Non-parametric estimates of the survival distribution function were estimated using the life table method. The percentage of mothers who exclusively breastfed their children to 6 months of age was estimated from the survival distribution function. Exclusively breastfed includes babies receiving breast milk and no other liquids or solids.	NSW Population Health Survey 2012-2013
Breastfeeding duration	Numerator: number of mothers reporting the duration for children who received any, full or exclusive breastfeeding Denominator: total number of respondent mothers with a child less than two years of age	Estimates were derived using survival analysis, with the length of time infants received any breastfeeding, full breastfeeding, and exclusive breastfeeding modelled. Non-parametric estimates of the survival distribution function were estimated using the life table method.	NSW Population Health Survey 2012-2013
Infant feeding at hospital discharge	Numerator: number of infants who received full breastfeeding, or any breastfeeding, or infant formula only Denominator: All live births that occurred in NSW		NSW Perinatal Data Collection 2012
<b>Newborn, infant and childhood screening</b>			
Newborn Screening Program	Numerator: number of babies with a confirmed diagnosis of a screened condition Denominator: number of babies who received a newborn screening test		NSW Newborn Screening Program, The Children's Hospital Westmead 2012
Statewide Infant Screening-Hearing (SWIS-H) Program	Numerator: number of babies directly referred to specialist diagnostic and treatment services Denominator: number of babies eligible for the SWIS-H program		Statewide Infant Screening-Hearing Program 2011-12
Statewide Eyesight Preschooler Screening (StEPS) Program (aged 4 years)	Numerator: number of preschool children referred for specialist testing Denominator: number of preschool children accepted and screened		Statewide Eyesight Preschooler Screening Program 2012-13

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Immunisation</b>			
Childhood vaccination coverage (aged 1 year and 4 years)	Numerator: number of children who are fully vaccinated Denominator: children enrolled with Medicare		Australian Childhood Immunisation Register 2013
School-based vaccination coverage	Numerator: number of Year 7 students vaccinated against Human Papilloma virus (girls only) and Diphtheria-tetanus-pertussis (children) Denominator: school enrolment data	2012 data include HPV catch-up doses given in 2013 to girls who commenced the vaccine course in 2012. 2013 data include catch-up doses given in Terms 1 and 2 of 2014 to girls who commenced the vaccine course in 2013.	NSW School Vaccination Program Register
<b>Overweight, obesity and underweight</b>			
Overweight, obese or underweight (aged 5-16 years)	Numerator: number of children whose height and weight indicated overweight, obese or underweight Denominator: total number of respondents	Overweight or obese was classified using BMI (body mass index; calculated by the weight in kilograms divided by height in metres squared). Height and weight was reported by parents of children in the NSW Population Health Survey and measured in the NSW Schools Physical Activity and Nutrition Survey. International standards of age- and sex-specific BMI cut-offs were used. <sup>123</sup>	NSW Population Health Survey 2012-2013 and 2013 (single year), NSW Schools Physical Activity and Nutrition Survey 2010
<b>Healthy eating</b>			
Recommended fruit consumption and vegetable (aged 2-15 years)	Numerator: number of children who indicated they ate the recommended amount of fruit or vegetables daily Denominator: total number of respondent children	Parent-reported data. Fruit recommendations are at least 1 medium piece for children aged 2-11 years and 3 medium pieces for children aged 12-15 years daily. Vegetable recommendations are at least 1 cup of cooked vegetables or 2 cups of salad vegetables for children aged 2-11 years and 1.5 cups of cooked vegetables or 3 cups of salad vegetables for children aged 12-15 years daily. <sup>16,17</sup>	NSW Population Health Survey 2012-2013
Fast food consumption (aged 2-15 years)	Numerator: number of children reporting each frequency (none, less than weekly, weekly, more than once but less than daily, daily or more) of fast food consumption Denominator: total number of respondent children	Fast food includes meals or snacks such as burgers, pizza, chicken or chips.	NSW Population Health Survey 2012-2013
High energy drink consumption (aged 2-15 years)	Numerator: number of children reporting each frequency (none, 1 cup, 2 cups, 3-5 cups, 6-10 cups, 11 or more cups) of high energy soft drink per day Denominator: number of respondent children	High energy drinks include soft drinks and cordials or sports drinks.	NSW Population Health Survey 2012-2013
Food insecurity (aged 0-24 years)	Numerator: number of children and young people who reported times in the last 12 months when they ran out of food and couldn't afford to buy more Denominator: total number of respondent children and young people	The NSW Population Health Survey used parent-reported data for children aged 0-15 years and self-reported data for young people aged 16-24 years. The Australian Health Survey data were based on self-report.	NSW Population Health Survey 2012, ABS Australian Health Survey 2011-12

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Active living</b>			
Adequate physical activity and appropriate sedentary behaviour (aged 5–15 years)	Numerator: number of children who participated in adequate amounts of physical activity each day, appropriate amounts of sedentary behaviours each day, or both. Denominator: total number of respondent children	Parent-reported data. Adequate physical activity is 60 minutes or more each day. Sedentary behaviour is 2 hours or less each day. Sedentary behaviours include small screen activity such as watching TV, videos or DVDs at home, and playing video or computer games or work on the computer.	NSW Population Health Survey 2012–2013
Cardiorespiratory fitness (school-aged)	Numerator: number of children considered to have adequate cardiorespiratory fitness Denominator: number of children who participated in the 20m shuttle run test	<i>Adequate cardiorespiratory fitness</i> : the completion of a 20m shuttle run test of at least 23 laps for boys and 15 laps for girls.	NSW Schools Physical Activity and Nutrition Survey 2010
<b>NSW Healthy Children Initiative</b>			
Healthy Children Initiative	Numerator: number of early childhood centres and primary schools participating in NSW Healthy Children Initiatives Denominator: total number of early childhood centres and primary schools in NSW	Data presented for March 2014.	PHIMS Interim Solution data monitoring and management 2013
Healthy practices	Numerator: number of early childhood centres and primary schools adopting healthy practices Denominator: total number of early childhood centres and primary schools in NSW	Data presented for March 2014.	PHIMS Interim Solution data monitoring and management 2013
<b>Oral health</b>			
Dental professional visits (aged 5–15 years)	Numerator: number of children who visited a dentist, dental specialist, dental hygienist, dental technician, dental mechanic, denturist, orthodontist or dental therapist Denominator: total number of children	Parent-reported data.	NSW Population Health Survey 2012–2013
Hospitalisations for removals and restoration of teeth (0–4 years)	Numerator: number of hospitalisations for removals and restoration of teeth due to dental decay Denominator: ABS estimated resident population		NSW Admitted Patient Data Collection 2012–13
Decayed, missing or filled teeth (DMFT) (aged 14–15 years)	Mean number of permanent teeth that are decayed, missing or filled because of dental decay in respondents	Dental examination conducted at school.	NSW Teen Dental Health Survey 2010
Decay free (aged 14–15 years)	Numerator: number of teenagers with no evidence of dental decay (DMFT=0) Denominator: total number of teenagers who had an oral examination	Dental examination conducted at school.	NSW Teen Dental Health Survey 2010

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Smoking</b>			
Current smoker (aged 12–17 years and 16–24 years)	Numerator: number of students or young people who reported smoking Denominator: total number of respondents in relevant age group	Self-reported data. Current smoking in students is heavy, light or occasional smoking. Current smoking in young people is daily or occasional smoking.	NSW School Students Health Behaviours Survey 2011, NSW Population Health Survey 2013
Lesson about smoking (aged 12–17 years)	Numerator: number of students who had a lesson or part of a lesson about smoking Denominator: number of respondents	Self-reported data.	NSW School Students Health Behaviours Survey 2011
<b>Alcohol consumption</b>			
Recent alcohol consumption in school students (aged 12–17 years)	Numerator: number of students who have ever had even part of an alcoholic drink ever or in the last 7 days Denominator: total number of respondents	Self-reported data.	NSW School Students Health Behaviours Survey 2011
4 or more standard drinks on a day when drinking (aged 12–17 years)	Numerator: number of students who reported drinking 4 or more standard drinks a day within the 7 days prior to the interview Denominator: total number of respondents	Self-reported data.	NSW School Students Health Behaviours Survey 2011
School lesson about drinking (aged 12–17 years)	Numerator: number of students who had a lesson or part of a lesson about drinking alcohol Denominator: total number of respondents	Self-reported data.	NSW School Students Health Behaviours Survey 2011
More than 2 standard drinks on a day when drinking (aged 16–24 years)	Numerator: number of young people who reported they drank more than 2 standard drinks on a day when drinking Denominator: total number of respondents	Self-reported data.	NSW Population Health Survey 2013
Emergency department visits for acute alcohol problems (aged 15–24 years)	Numerator: number of young people who presented at an emergency department for an acute alcohol problem Denominator: ABS estimated resident population	Acute alcohol problems include intoxication, harmful use, dependence, withdrawal, toxic effects, or accidental or intentional poisoning. Includes data from 57% of NSW public emergency departments for which continuous electronic reporting of presentation and diagnosis information was available from 1997 and later.	NSW Emergency Department Data Collection 2013
Hospitalisations (and injury hospitalisations attributed to alcohol) (aged 15–24 years)	Numerator: number of hospitalisations (and injury hospitalisations) attributed to alcohol Denominator: ABS estimated resident population	Calculated using age- and sex-specific attributable fractions from the School of Population Health, University of Queensland and AIHW 2007.	NSW Admitted Patient Data Collection 2012–13

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Substance abuse</b>			
Illicit drug use (12–17 years)	Numerator: number of students who had used illicit drugs Denominator: total number of respondents	Self-reported data. Illicit drugs include those used for non-medicinal purposes: speed, cocaine, sleeping pills or tranquilisers, marijuana, analgesics, heroin, petrol sniffing, other inhalants, hallucinogens, designer drugs, and injecting of any illegal drug.	NSW School Students Health Behaviours Survey 2011
Hospitalisations attributed to drug use	Numerator: number of hospitalisations attributed to drug use Denominator: ABS estimated resident population for the relevant age group	Calculated using age- and sex-specific attributable fractions from the School of Population Health, University of Queensland and AIHW 2007.	NSW Admitted Patient Data Collection 2012–13
Ambulance calls for overdose, ingestion, poisoning or alcohol problems	Numerator: number of triple zero calls for overdose, ingestion, poisoning or alcohol problems Denominator: ABS estimated resident population for the relevant age group		Ambulance Service of NSW Dispatch Database 2013
Emergency department attendances for illicit drug use	Numerator: number of emergency department visits for illicit drug use Denominator: ABS estimated resident population for the relevant age group	Includes data from 57% of NSW public emergency departments for which continuous electronic reporting of presentation and diagnosis information was available from 1997 onwards.	NSW Emergency Department Data Collection 2013
<b>Environmental exposure</b>			
Sun protection behaviours (aged 12–17 years)	Numerator: number of students who practised sun protection behaviours Denominator: total number of respondents	Self-reported data.	NSW School Students Health Behaviours Survey 2011
Smoke-free car (aged 16–24 years)	Numerator: number of young car owners who reported driving a smoke-free car Denominator: number of young people surveyed who owned a car	Self-reported data.	NSW Population Health Survey 2012
Smoke-free household (aged 16–24 years)	Numerator: number of young people who reported a smoke-free household Denominator: total number of respondents	Self-reported data.	NSW Population Health Survey 2012
Infringement notices	Number of infringement notices issued to people seen to be smoking in banned areas	Banned areas defined by the <i>Smoke-free environment Act 2000</i> and the <i>Passenger Transport Regulation 2007</i> .	State Debt Recovery Office
Compliance with Smoke free legislation	Numerator: number of people smoking in a banned area Denominator: number of people present	Compliance estimated by NSW Health Authorised Inspectors between 16 May 2014 and 30 June 2014.	NSW Ministry of Health
Blood lead level (aged 1–4 years)	Numerator: number of children whose blood lead level falls within in each category level Denominator: ABS estimated resident population	Includes children in Broken Hill only.	Broken Hill Child and Family Centre, Lead Program 2012

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
CHAPTER 2: How healthy are children and young people?			
<b>Health service utilisation</b>			
Health service utilisation	Numerator: number of children and young people who reported using a health service Denominator: total number of children and young people in the survey		NSW Population Health Survey 2012-2013
Number of emergency department visits in an average day	Numerator: number of visits in 2013 by children and young people Denominator: 365 (average number of days in a year)	Includes data from all hospitals currently in the data collection and represents 95% of all emergency department visits.	NSW Emergency Department Data Collection 2013
Rate of emergency department visits	Numerator: total number of visits Denominator: estimated resident population projections	Includes data from 57% of NSW's emergency departments for which continuous data are available from 1997 to date.	NSW Emergency Department Data Collection 2013
Emergency department triage category	Numerator: number of visits in each triage category Denominator: total number of visits	Includes data from all hospitals currently in the data collection and represents 95% of all emergency department visits.	NSW Emergency Department Data Collection 2013
Hospitalisations	Numerator: total number of hospitalisations (regardless of cause) Denominator: estimated resident population projections	Analysis excludes unqualified neonates (uncomplicated births). Data by age, sex, Aboriginality and remoteness have been imputed for interstate hospitalisations. Data by hospital site and by hospital status have not been imputed for interstate hospitalisations.	NSW Admitted Patient Data Collection 2012-13
<b>Preventable and leading causes of hospitalisation</b>			
Leading causes	Numerator: primary diagnosis for hospital admission Denominator: estimated resident population projections	Leading primary diagnoses classified using ICD-9-CM up to 1997-98 and ICD-10-AM from 1998-99 onwards. See Health Statistics NSW ( <a href="http://www.healthstats.nsw.gov.au">www.healthstats.nsw.gov.au</a> ) for full definitions of causes and codes included.	NSW Admitted Patient Data Collection 2012-13
Potentially preventable hospitalisations (PPHs)	Numerator: hospital admissions where a diagnosis was potentially preventable Denominator: estimated resident population projections	Potentially Preventable Hospitalisations (PPH) are those conditions for which hospitalisation is considered potentially avoidable through preventive care and early disease management, usually delivered in an ambulatory setting, such as primary health care (for example, by general practitioners or community health centres). Some examples of conditions where hospitalisation is considered potentially preventable include diabetes, asthma, gastroenteritis and pneumonia. See Health Statistics NSW ( <a href="http://www.healthstats.nsw.gov.au">www.healthstats.nsw.gov.au</a> ) for full definitions of PPH classifications and codes included.	NSW Admitted Patient Data Collection 2012-13

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Preventable and leading causes of hospitalisation</b> cont.			
Leading PPH conditions	Numerator: age-specific number of hospitalisations for each PPH condition Denominator: estimated resident population projections	As per Potentially preventable hospitalisations (PPHs).	NSW Admitted Patient Data Collection 2012–13
<b>Deaths</b>			
Infant death rate	Numerator: number of deaths in children aged less than 1 year Denominator: total number of live births		ABS Deaths, Australia, 2012
Perinatal death rate	Numerator: number of perinatal deaths (stillbirths and neonatal deaths) Denominator: total births in a year (live births and stillbirths combined)	<i>Stillbirth</i> : complete expulsion or extraction from its mother of a product of conception of at least 20 weeks gestation or 400 grams birth weight who did not, at any time after birth, breathe, or show any evidence of life such as a heartbeat. <i>Neonatal death</i> : death of a live born infant within 28 days of birth.	NSW Perinatal Data Collection 2012
Child death rate (aged under 5 years)	Numerator: number of deaths of children Denominator: Estimated resident population projections		Australian Coordinating Register Cause of Death Unit Record File 2011
Leading causes of death	Number of deaths between 2002–2011	Classified using ICD-9 up to 1996 and ICD-10 from 1997 onwards. Deaths data are based on the year of occurrence of the death. Estimates of missing deaths for the latest year due to delayed registration were imputed for each cause and included in the count. See Health Statistics NSW ( <a href="http://www.healthstats.nsw.gov.au">www.healthstats.nsw.gov.au</a> ) for full definitions of causes and codes included.	Australian Coordinating Register Cause of Death Unit Record File 2011
<b>Asthma</b>			
Current asthma	Numerator: number of children and young people with current asthma Denominator: total number of children surveyed	An individual with symptoms of asthma or who had treatment for asthma in the last 12 months.	NSW Population Health Survey 2013
Emergency department attendances for asthma	Numerator: number of visits for asthma Denominator: estimated resident population projections	Includes data from all hospitals currently in the data collection and represents 95% of all emergency department visits.	NSW Emergency Department Data Collection 2013
Hospitalisations for asthma	Numerator: number of hospitalisations for asthma Denominator: estimated resident population projections		NSW Admitted Patient Data Collection 2012–13

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Diabetes</b>			
Hospitalisations for diabetes	Numerator: number of children and young people hospitalised for all diabetes Denominator: estimated resident population projections	<i>Type 1 diabetes</i> : previously insulin-dependent or juvenile-onset diabetes mellitus. <i>Type 2 diabetes</i> : previously non-insulin dependent diabetes mellitus <i>Other diabetes</i> : examples include malnutrition-related diabetes, other specified diabetes, unspecified diabetes.	NSW Admitted Patient Data Collection 2012–13
Type of diabetes leading to hospitalisation	Numerator: number of young people with each type of diabetes (type 1, type 2, other including gestational) Denominator: total number of young people with diabetes	See above for definitions of different types of diabetes.	NSW Admitted Patient Data Collection 2012–13
<b>Cancer</b>			
Rate of new cases (incidence)	Numerator: number of new cases of cancer in a specified period Denominator: estimated resident population projections	Childhood cancer groupings correspond to those reported in the CINSW 2009 Cancer Incidence Report and are based on the <i>International Classification of Childhood Cancer, IARC Technical Report</i> . <sup>124</sup> Age-standardised rates are presented where appropriate.	NSW Central Cancer Registry Incidence Data 2009
Cancer deaths	Numerator: number of deaths caused by cancer Denominator: total deaths of children and young people		Australian Coordinating Registry Cause of Death Unit Record File 2011
5-year survival rate	Numerator: number of children and young people with cancer who survived at least 5 years after being diagnosed Denominator: total number of children and young people with cancer	National rates presented.	A Picture of Australia's Children <sup>1</sup>
<b>Communicable diseases</b>			
Notifications (influenza, pertussis, measles, chlamydia)	Numerator: number of notifications Denominator: estimated resident population projections		NSW Notifiable Conditions Information Management System 2013
Vaccine potentially preventable hospitalisations (aged 0–4 years)	Numerator: number of vaccine potentially preventable hospitalisations in children Denominator: estimated resident population projections		NSW Admitted Patient Data Collection 2012–13
Emergency department visits for influenza-like illness	Numerator: number of emergency department visits for influenza-like illness Denominator: estimated resident population projections	Includes data from 57% of NSW public emergency departments for which continuous electronic reporting of presentation and diagnosis information was available from 1997 and later.	NSW Emergency Department Data Collection 2013



INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Communicable diseases</b> cont.			
Gastroenteritis outbreaks	Number of outbreaks of gastroenteritis in childcare centres with 2 or more cases.		NSW Notifiable Conditions Information Management System 2013
Hospitalisations for chlamydia	Numerator: number of hospitalisations for chlamydia Denominator: estimated resident population projections		NSW Admitted Patient Data Collection 2012-13
Occasions of service by Public sexual health and HIV services	Number of occasions of service from publically funded HIV and Sexual Health Services by young people aged 16-24 years		HIV-STI Minimum Data Set 2013
<b>Injury</b>			
Hospitalisations due to injury and poisonings	Numerator: number of hospitalisations due to injury and poisonings Denominator: estimated resident population projections		NSW Admitted Patient Data Collection 2012-13
Leading causes of death due to injury and poisonings	Number of deaths due to injury and poisonings stratified by external cause		Australian Coordinating Registry Cause of Death Unit Record File 2011
<b>Healthy development</b>			
Developmentally vulnerable	Numerator: children in their first year of school in the lowest decile for 1 or more AEDI domains Denominator: children in their first year of school with a score recorded for 1 or more AEDI domains		Australian Early Development Index 2012 <sup>103</sup>
<b>Disability</b>			
Prevalence of severe or profound core activity limitation	Numerator: number of children and young people who reported a severe or profound core activity limitation Denominator: number of children and young people who participated in the survey	<i>Severe or profound core activity limitation:</i> person is unable to do, or sometimes or always needs help with, or uses aids or equipment, for core activities (that is, self-care, mobility or communication).	ABS Survey of Disability, Ageing and Carers 2012 <sup>106</sup>
Need for assistance	Numerator: number of children and young people who reported a need for assistance with core activities Denominator: total number of children and young people who responded	A measure used in the 2011 Census to identify people needing help or assistance in 1 or more of the 3 core activity areas (self-care, mobility and communication), because of a long-term health condition or disability (lasting 6 months or more), or old age.	ABS 2011 Census TableBuilder (Custom Table)

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Disability</b> cont.			
Health status of people with severe or profound core activity limitation (18-64 years)	Numerator: number of people with severe or profound core activity limitation who reported poor or fair health Denominator: number of people with severe or profound core activity limitation		ABS National Health Survey 2011-12 TableBuilder (Custom Table)
Sedentary-low levels of exercise in people with severe or profound core activity limitation (18 years and over)	Numerator: number of people with severe or profound core activity limitation who reported sedentary-low levels of exercise Denominator: total number of people with a severe or profound core activity limitation		ABS Australian Health Survey: First Results, 2011-12 <sup>110</sup>
Overweight or obese in people with severe or profound core activity limitation (18 years and over)	Numerator: number of people with severe or profound core activity limitation who were overweight or obese Denominator: total number of people with a severe or profound core activity limitation	Overweight or obese was classified using BMI. International standards of age- and sex-specific BMI cut-offs were used. Height and weight were measured by trained interviewers.	ABS Australian Health Survey: First Results, 2011-12 <sup>110</sup>
<b>Mental Health</b>			
Substantial risk of developing a clinically significant behaviour problem (aged 4-15 years)	Numerator: number of children who score in the abnormal band of the Strengths and Difficulties Questionnaire Denominator: total number of parents and carer respondents	The questionnaire was asked of parents and carers and concerned behaviours in the last 6 months.	NSW Population Health Survey 2012-2013
Attention deficit hyperactivity disorder with stimulant medication (aged 2-17 years)	Numerator: Number of notifications of prescriptions written for children and young people Denominator: estimated resident population projections	Data based on authorities issued to specialist doctors for individual patients and prescriptions written by specialist doctors granted a general authority to prescribe to patients who meet specific criteria.	Pharmaceutical Drugs of Addiction System 2012
Psychological distress (NSW Population Health Survey and ABS Australian Health Survey)	Numerator: number of young people who scored high or very high on the K10+ measure of psychological distress Denominator: total number of young people surveyed	The Kessler 10 Plus (K10+ is a 10-item questionnaire that measures anxiety, depression, agitation, and psychological fatigue in the most recent 4-week period).	NSW Population Health Survey 2013, and ABS Australian Health Survey: First Results, 2011-12 <sup>110</sup>
Psychological distress (NSW School Students Health Behaviours Survey)	Numerator: number of students who responded "almost more than I can take" to 1 or more of 3 questions adapted from a single question in the WA Child Health Survey Denominator: total number of students surveyed	The 3 questions used to define the indicator were: When you were feeling unhappy, sad or depressed how bad was it for you? When you were feeling nervous, stressed or under pressure how bad was it for you? When you were in trouble because of your behaviour how bad was it for you?	NSW School Students Health Behaviours Survey 2011 <sup>44</sup>
Emergency department attendances for mental health problems	Numerator: number of visits for mental health problems Denominator: estimated resident population projections	Includes data from 57% of NSW public emergency departments for which continuous electronic reporting of presentation and diagnosis information was available from 1997 onwards.	NSW Emergency Department Data Collection 2013

INDICATOR/TERM	INDICATOR	EXPLANATORY NOTES	DATA SOURCE
<b>Mental Health</b> cont.			
Hospitalisations for mental health problems	Numerator: number of hospitalisations for mental health problems Denominator: estimated resident population projections	Numbers for the 2 latest years include an estimate of the small number of hospitalisations of NSW residents in interstate public hospitals, data for which were unavailable at the time of production.	NSW Admitted Patient Data Collection 2012-13
Hospitalisations for intentional self-harm	Numerator: number of hospitalisations for intentional self-harm Denominator: estimated resident population projections	Includes attempted suicide and purposely self-inflicted poisoning or injury. Numbers for the 2 latest years include an estimate of the small number of hospitalisations of NSW residents in interstate public hospitals, data for which were unavailable at the time of production.	NSW Admitted Patient Data Collection 2012-13
Suicide	Numerator: number of suicides Denominator: estimated resident population projections	Any intentional self-harm with fatal result. Numbers for the 2 latest years include an estimate of the small number of deaths of NSW residents interstate and deaths registered after 2011 but which occurred before 2011.	Australian Coordinating Registry Cause of Death Unit Record File 2011

## Notes:

1. Only NSW residents are included. Non-NSW residents who received service in NSW have been excluded unless stated otherwise.

2. All hospitalisation, cancer and death rates are age-adjusted, unless stated otherwise.

# CONTRIBUTORS AND ACKNOWLEDGEMENTS

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