CHAPTER 3
PHYSICAL HEALTH

CHAPTER 3

PHYSICAL HEALTH

Physical health is a critical prerequisite for good development. It is determined by genetic inheritance and the social and environmental circumstances influencing the course of the mother's pregnancy, delivery and patterns of care of infants and children. When illness, injury or disability occurs, their severity and persistence threatens functional adaptation, growth and development and can place a burden on carers, other family members, the wider community and service agencies. This chapter details the findings on the physical health and levels of disability of Western Australian Aboriginal and Torres Strait Islander children and young people. These findings include health information gathered on children from carers who were interviewed during the survey. Where carers consented to allow data from the Western Australian Data Linkage System to be linked to their interview data, these data are also described.

SUMMARY

This chapter describes the distribution of several health issues found among Western Australian Aboriginal infants, children and young people together with some of the social, environmental and behavioural determinants behind these health issues.

The principal findings of this chapter are:

- *Encouragingly high rates of breastfeeding during infancy and early childhood*
  The mothers of Aboriginal children, particularly those living in more isolated areas, were both more likely to initiate breast feeding and to breast feed for longer than mothers in the general population. This offers a positive basis from which to build health promotion programs in the post-natal period.

- *High rates of maternal tobacco use*
  The proportion of mothers of Aboriginal infants who used tobacco during their pregnancy is twice that of mothers in the general population across all levels of relative isolation, despite more than a decade of anti-smoking campaigns. The use of tobacco by virtually half of all women giving birth to Aboriginal children is in urgent need of concerted attention.

- *High rates of early teenage pregnancy*
  Almost one in eight Aboriginal infants were born to mothers aged 17 years or less. This is more than six times the rate found in the general population. The care of children born to early teenaged mothers was more likely to be transferred, and to be transferred earlier, to a person other than the birth mother, which may pose long term risks for poorer outcomes later in life.

- *High rates of premature birth and low birth weight were confirmed*
  The rate of low birth weight (<2500g) was almost double that of the total population, the result of higher rates of both premature birth and poor intrauterine growth.

- *Inadequate consumption of fresh vegetables throughout the State*
  While consumption of fresh vegetables tended to vary a little by level of relative

isolation, it was inadequate for a high proportion of children in all areas of the state, particularly for older children.

- *High rates of recurrent infections in Aboriginal children*
  There was substantial co-morbidity of recurrent skin, ear, chest and gastrointestinal infection, particularly in areas of extreme isolation. The co-existence of different types of recurrent infections was associated with financial strain. Recurrent and discharging ear infections, which affected one in eight Aboriginal children, had a very significant impact on rates of hearing loss and of speech, language and learning problems.

- *Low prevalence of asthma in children living in extremely isolated localities*
  The four-fold reduction in the prevalence of asthma in extremely isolated Aboriginal children confirms other reports observing this effect. The basis for this reduction, if better understood, may suggest strategies for prevention of this burdensome condition.

- *Rate of functional disability, as measured by a limitation in self care, is comparable to that found in the total population*
  Higher rates of disability were observed in more urban areas, which may reflect the movement of families with disabled children into areas with better access to specialised services.

UNDERSTANDING WAACHS DATA

The data published here are derived from either the WAACHS survey reports or administrative data sets linked to the WAACHS data. These are then used to estimate data at the population level for Aboriginal children and their carers in Western Australia. Other supporting data are also used for comparison purposes and are taken from a variety of different sources.

CARER REPORTED DATA

The data from the WAACHS survey reports used in this volume of findings were provided by carers of Aboriginal children. Information was obtained during household interviews via questions asked by an individual trained by the WAACHS administration team to conduct such an interview. Carers provided information regarding themselves and those Aboriginal children under 18 years of age who were in their care at the time of the survey.

Although the interviewers were trained to assist the carer in understanding each question, they were not in a position to validate responses. Carers' responses were accepted as given. Trained medical practitioners were not involved at any stage to either diagnose conditions or validate carer reports of existing conditions.

With this knowledge in mind, where WAACHS data have been used to estimate either the prevalence, severity or lifetime occurrence of a health related problem, a discrepancy may exist between the reported value and the actual value. This can occur for a number of reasons:

- The carer did not understand the question, possibly due to difficulty with terminology and/or English not being the first language (although interpreters were used where necessary).
- The carer was unaware that they or the children in their care suffered from a particular condition.
- The carer had not looked after the child continually since birth and therefore was not aware of the child's complete history.
- The carer did not remember, for either themselves or the child, that an event or condition had occurred. This may be more likely to occur where 'lifetime occurrence' was requested for older children.

As linkage to the WA Record Linkage System was possible for 87 percent of the children (see Chapter one), it was possible to investigate the effects of some of these issues first hand. It was found that discrepancies did exist between what carers reported and what was recorded by the WA hospital system. While there will always be differences between diagnoses made by medical professionals according to the International Classification of Diseases and carer reports based on common language names of diseases and conditions, there were several items from the survey that should have had a strong correlation between the two data sources. It was clear that carers were much more likely to report a condition or event if it had occurred within the last five years than if it had taken place more than five years prior to the survey.

AGE GROUP PRESENTATION

WAACHS data are often divided into separate age groupings for more meaningful analysis of certain data. For children, these groupings are typically 0–3 years, 4–11 years and 12–17 years, but may be different depending on the subject or population being investigated.

Where age groupings such as these are used, it is important to note that they refer to different individual children in each age group at the time of the survey interview for each child. Each household was the subject of only one interview, and each child is represented within the age range that corresponds to their age at time of interview. This is known as a cross-sectional survey.

This is in contrast to a longitudinal survey of a cohort, where the *same* group of children may be followed through time and interviewed at different points (e.g. once per year for 10 years) as they grow older. In this arrangement results for the same children are compared at different points in their lives. The WAACHS is a cross-sectional survey, *not* a longitudinal survey.

CHARACTERISTICS OF CHILDREN AT BIRTH

A healthy start to life is an important predictor of later health, well-being and development. Good maternal health leading to a full term pregnancy and the delivery of an infant that is of optimal weight and vigour is a desirable beginning to healthy development. The survey used data linkage methods to permit the assessment of some of the characteristics of Aboriginal children at birth.

MCHRDB LINKAGE

The Maternal and Child Health Research Data Base (See Chapter 1 for more detail) is based on the Western Australian Midwives Notification of Births database for births since 1980. For every midwife-attended birth in Western Australia, the midwife submits a completed form indicating the characteristics of the infant, its condition at birth, details of the pregnancy and delivery together with some demographic details. This database is linked to several other databases, including the WA Registrar General's registrations of births and deaths and hospital discharge notifications, which detail morbidity that resulted in a hospital admission.

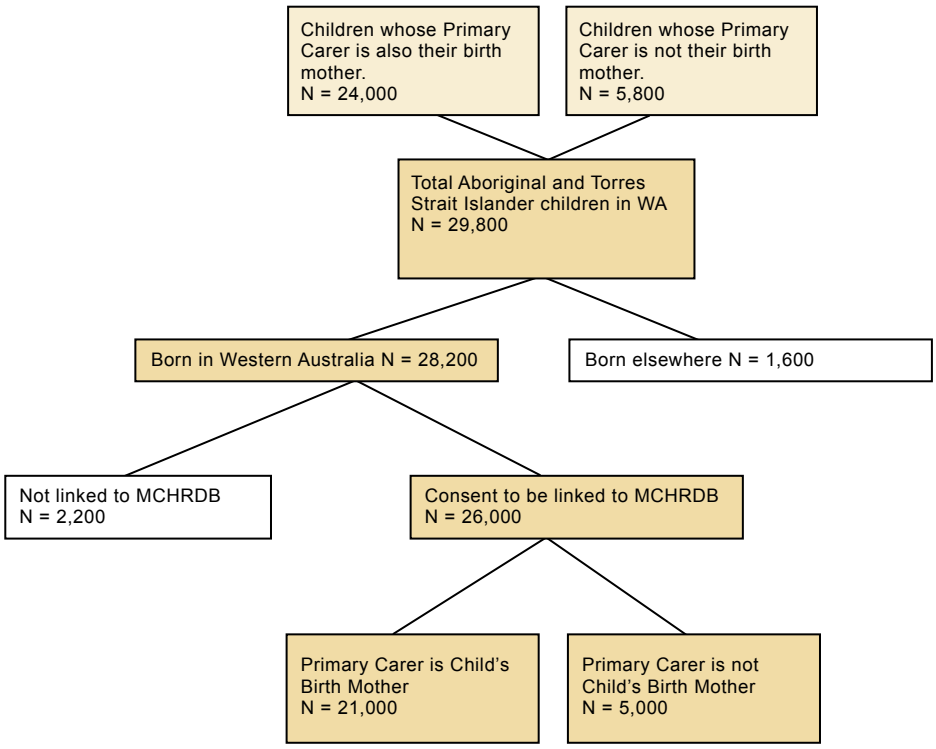
Of the estimated 29,800 Aboriginal children under the age of 18 living in Western Australia in 2001, about 28,200 were born in this state (CI: 27,900–28,500). The birth records for approximately 87 per cent of the survey children were linked to the survey interview data (*see Chapter 1)* representing a population of 26,000 (CI: 25,400–26,400) Aboriginal children. (Figure 3.1)

Birth records contain extensive information about the characteristics of the infant and mother at the time of the birth including:

- type of delivery and time to spontaneous respiration
- Apgar score at 5 minutes (indicating condition at birth)
- infant birth weight
- gestational age
- maternal height, age and parity.

From these characteristics, the proportions of children born prematurely (less than 37 completed weeks gestation) and poorly grown (less than 85% of optimal birth weight) were estimated.

FIGURE 3.1: SIZE OF GROUPS REFERRED TO IN THIS CHAPTER, ESTIMATED BY WEIGHTED EXTRAPOLATION OF THE SURVEY DATA



Where appropriate, data describing the entire Western Australian population of births (Aboriginal and non-Aboriginal) for the period 1982–2001 (N = 496,286) are provided for comparison.

LINKED DATA — BIRTH WEIGHT AND GESTATIONAL AGE

The mean birth weight of the 26,000 children was 3,170g (CI: 3,140g–3,200g).

About 13.3 per cent (CI: 12.0%–14.7%) of all Aboriginal infants were premature – that is, they were born at less than 37 weeks gestation. This is significantly higher than the proportion of premature births in the total population of 8.2 per cent (Table 3.1).

Premature birth is one possible cause of low birth weight (<2,500 g) that affects 11.4 per cent (CI: 10.0%–12.8%) of Aboriginal children, almost twice the proportion observed in the total population of 6.6 per cent (Table 3.1).

Low birth weight infants are more likely to have health problems early in life than infants of normal birth weight and more likely to develop chronic diseases in adult life. Birth weight depends not only on the conditions experienced during the pregnancy but also on the mother's own intrauterine and childhood environments. Thus birth weight is a sentinel indicator of human development and the population proportion of infants that are of low birth weight is a reliable indicator of human poverty.[1]

STRATEGIES TO IMPROVE BIRTH WEIGHT

While the provision of health care and antenatal services are vital to the reduction of low birth weight outcomes, strategies that reduce the proportion of low birth weight infants are inevitably tied to changes in human and social capital – that is, changes in the economic and educational capacities of parents (particularly mothers) and improvements in social and environmental circumstances directly affecting them. Health services alone cannot tackle the burden of low birth weight in Australian Aboriginal children. The responsibilities for this span many jurisdictions and government portfolios.

An example of a program set up to improve the birth weight of Aboriginal babies is the *Strong Women, Strong Babies, Strong Culture* program. This program was initially established in 1993 as a pilot project in three communities in the Northern Territory. The program had specific goals to increase infant birth weight by earlier maternal attendance for antenatal care and improved maternal weight status.

The program relies on, and supports, senior women in participating communities to provide direct support to pregnant women and their families. The senior women (Strong Women Workers) encourage attendance at antenatal care clinics and provide advice on nutrition. Support for involvement in cultural events is an important part of the program.

Data from the Northern Territory Perinatal Data Collection show that, for those communities that participated in the pilot, the mean birth weight of infants of Aboriginal women increased by 171g between 1990/91and 1994/95 and by 92g in the surrounding three rural regions.[1]

In a more recent study of the program it was found that improvements in birth weight had been maintained in the original groups.[2] Analysis of an intervention group covering the period 1988–93 (pre-intervention) to 2001 found that the mean birth weight increased by 135g from 2,979g (CI: 2,925g–3,032g) to 3,114g (CI: 3,075g–3,154g). However, increases in birth weight in a second group of communities with more recent implementation were less convincing. The program has also been implemented in the Pilbara region in Western Australia, funded for three years by the St John of God Health Care group. Additional sites are proposed in the Kimberley, Gascoyne and Midwest regions.[3]

It is important not to rely exclusively on birth weight as a measure of well-being. Birth weight is pathologically increased by maternal diabetes, a condition to which Aboriginal people are particularly prone, which is detrimental to the foetus.[4] An increase in the incidence of maternal diabetes would also cause a rise in the mean birth weight.

1 Mackerras D, (2001). Birthweight changes in the pilot phase of the Strong Women Strong Babies Strong Culture Program in the Northern Territory. *Aust NZ J Public Health* 25; 34–40.

2 D'Espaignet ET, Measey ML, Carnegie MA, and Mackerras D, (2003). Monitoring the 'Strong Women, Strong Babies, Strong Culture Program': The first eight years, *J Paediatr Child Health* 39; 668–672.

3 Kim Snowball, CEO, St John of God Health Care Group, Geraldton. Personal Communication. January 2004.

4 Jolly MC, Seibre NJ, Harris JP, Regan L, Robinson S, (2003). Risk factors for macrosomia and its clinical consequences: a study of 350,311 pregnancies. *European Journal of Obstetrics, Gynecology, & Reproductive Biology*. 111; 9–14.

PROPORTION OF OPTIMAL BIRTH WEIGHT (POBW)

Of the estimated 26,000 Aboriginal births where linked birth records were available. for data linkage, there were complete data for about 24,800 (CI: 24,600–25,000) births to allow the calculation of their percentage of optimal birth weight (POBW).

About 20.9 per cent (CI: 19.2%–22.6%) of Aboriginal infants were considered to have sub-optimal foetal growth compared with 12.9 per cent of births in the total population (Table 3.1).

PROPORTION OF OPTIMAL BIRTH WEIGHT (POBW)

An infant's weight at birth depends both on the length of gestation and the rate at which it has grown before birth. Not all foetuses should grow at the same rate. Boys grow faster than girls, children of tall mothers faster than those of small mothers and a woman's first child grows more slowly than her subsequent children. However growth rate is also affected by a number of pathological conditions, most of which decrease growth rate: the exception being maternal diabetes, which increases growth rate. In order to assess whether a newborn is appropriately grown, an estimation has been made of how median birth weight varies with the non-pathological determinants of birth weight (gestational duration, infant gender and maternal height and parity) in a population based cohort of Western Australian Caucasian births who had no risk factors for inappropriate foetal growth (including smoking) and were thus considered to represent optimal intrauterine growth rates. The appropriateness of an infant's growth can then be estimated as the ratio of the infant's observed birth weight to the median estimated for an infant of the same non-pathological characteristics and without pathological determinants of birth weight (i.e. this infant's optimal birth weight). Infants that have grown normally have a proportion (POBW) close to 1 and in these analyses ratios below 0.85 are taken to infer suboptimal intrauterine growth. POBW for Aboriginal infants is consistently lower than in Caucasian infants, but the difference is almost entirely accounted for by the increased burden of reported growth-restricting pathology.[1] It is therefore considered that optimal intrauterine growth rates do not differ between Australian Aboriginal and Caucasian births.

1 Blair E, (1996). Why do Aboriginal neonates weigh less? II. Determinants of birthweight for gestation. *Journal of Pediatrics and Child Health* 32; 498–503.

TIME TO SPONTANEOUS BREATHING AND INTUBATION

An estimated 13.5 per cent (CI: 12.2%–14.8%) of Aboriginal infants failed to establish spontaneous breathing within 2 minutes of birth compared with 10.8 per cent of the total population. Furthermore, 2.5 per cent (CI: 1.8%–3.3%) of Aboriginal infants required intubation for ventilation compared with 1.7 per cent of the total population (Table 3.1).

TIME TO SPONTANEOUS BREATHING AND INTUBATION

Traditionally, a child has to start breathing very soon after birth if it is to survive. A healthy newborn will spontaneously commence regular breathing before it is two minutes of age. However, premature infants, particularly very premature infants (less than 32 weeks gestation) and infants in poor condition, may take two minutes or longer, or may fail to satisfactorily establish or even attempt respiration. These infants can now be assisted artificially by intubation (introducing a tube into the trachea) and ventilation (mechanically assisting the intake of air). Thus intubation suggests either extreme prematurity or a seriously compromised condition at birth.

APGAR SCORE AT FIVE MINUTES

About 2.2 per cent (CI: 1.7%–2.9%) of Aboriginal newborns have five minute Apgar scores below 7 compared with 2.4 per cent in the total population (Table 3.1).

APGAR SCORE AT FIVE MINUTES

Published in 1953 by Dr. Virginia Apgar, this score seeks to identify newborns that would benefit from resuscitation. The test assigns a score of 0, 1 or 2 for each of 5 characteristics of the newborn: colour, muscle tone, heart rate, respiration and reflex activity. These sub-scores are summed for a maximum total score of 10. Infants are scored at 1 minute and 5 minutes after delivery for all deliveries attended by a midwife. In healthy newborns, the total score may be slightly depressed at 1 minute but increases to 7 or more by 5 minutes. Thus an Apgar score below 7 at 5 minutes denotes an infant in a relatively compromised condition at birth and is associated with, but a poor predictor of, developmental abnormalities.

MATERNAL AGE

Although all children in the survey were identified as Aboriginal by their carers, not all birth mothers identified as Aboriginal (*see Chapter 2*). About 27.8 per cent (CI: 26.3%–29.4%) of Aboriginal infants were born to mothers aged 19 years or less compared with 6.3 per cent of the total population (Table 3.1). An estimated 13.1 per cent (CI: 12.0%–14.3%) of Aboriginal children were born to mothers aged 17 years or less, compared with 2.1 per cent of the total population (Table 3.2).

TYPE OF DELIVERY

Almost three–quarters (74.5 per cent; CI: 72.6%–76.3%) of Aboriginal infants were born via normal vaginal delivery. About 9.2 per cent (CI: 8.0%–10.6%) of infants were born following emergency caesarean section and 6.4 per cent (CI: 5.5%–7.4%) following elective caesarean section. This compares with 62.5 per cent, 9.1 per cent and 10.4 per cent respectively in the total population (Table 3.3).

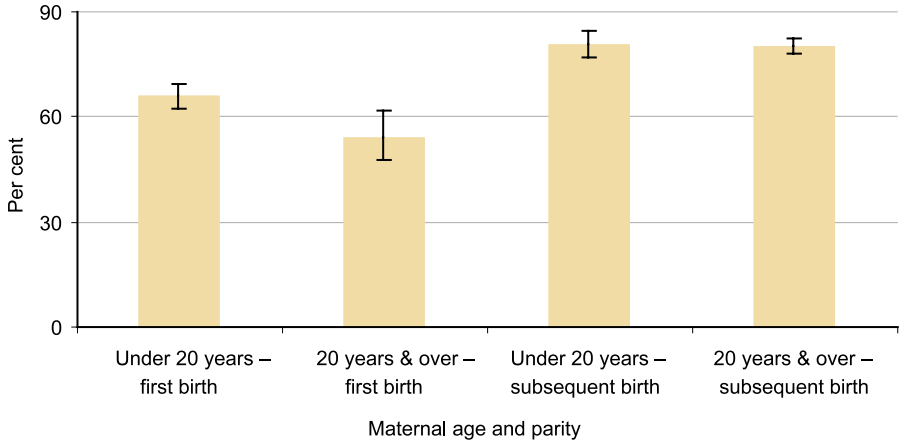
For biological reasons, the distribution of type of delivery differs markedly between first and subsequent births. First births are more likely to require mechanical assistance, and since a previous caesarean section is the most frequent indication for an elective section, elective sections are performed less frequently for first births. The type of delivery is also determined by the physical fitness of the mother, which tends to correlate with maternal age. Since younger mothers tend to be fitter, they are therefore less likely to require operative assistance for delivery.

In Table 3.4 the distribution of type of delivery is given separately for first and subsequent births to teenaged and older mothers in both Aboriginal births and the total population. There was no significant difference in the rate of operative delivery between teenaged mothers of Aboriginal children and teenaged mothers in the total population. Of all Aboriginal first births to women aged less than 20 years, 65.9 per cent (CI: 62.2%–69.5%) had a normal (non-operative) delivery compared with 66.1 per cent of all first births. The proportion of unassisted births to teenaged mothers for subsequent Aboriginal births was 81.0 per cent (CI: 77.1%–84.6%) compared with 82.9 per cent of subsequent births to all teenaged mothers (Table 3.4).

Aboriginal women aged 20 years or more also tend to give birth at younger ages and to be of higher parity than women in the total population because they tend to have a larger completed family size. It is therefore biologically appropriate that Aboriginal women experience a smaller proportion of operative deliveries. Thus, at least some part of the lower rate of operative delivery reflects demographic differences between Aboriginal and non-Aboriginal mothers.[2]

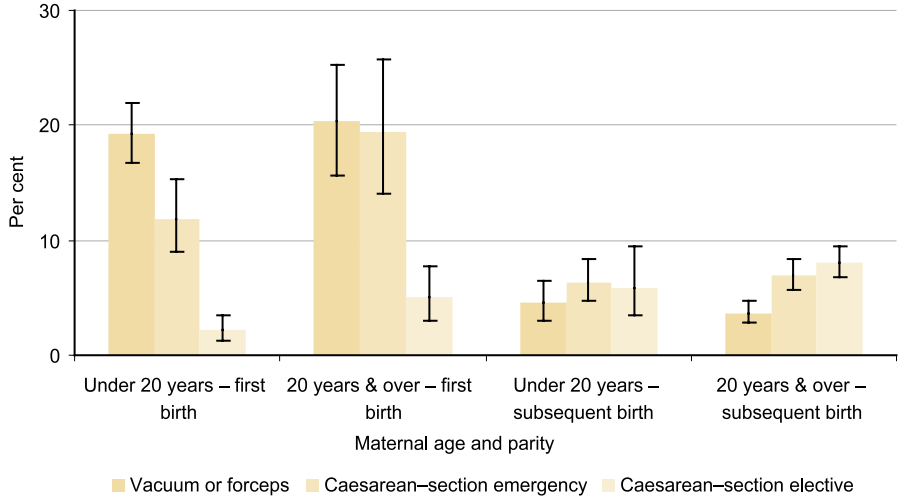
Teenaged mothers of Aboriginal children are more likely to be delivering their first baby (68.2 per cent; CI: 65.7%–70.6%) than are mothers over the age of 20 (15.5 per cent; CI: 13.7%–17.5%) (Table 3.5). Figure 3.2 shows that women delivering their first child were more likely to have a normal delivery (without operative assistance) if they were under 20 years of age (65.9 per cent; CI: 62.2%–69.5%) than if they were 20 years or older (54.4 per cent; CI: 47.5%–61.4%) while Figure 3.3 shows a tendency to less emergency sections. The distribution of type of delivery for teenaged mothers delivering subsequent children did not differ from that of older women.

FIGURE 3.2: BIRTHS — PERCENTAGE OF NORMAL BIRTHS, BY AGE AND PARITY



Source: Table 3.4

FIGURE 3.3: BIRTHS — SELECTED DELIVERY TYPES, BY AGE AND PARITY



Source: Table 3.4

Furthermore, there is no difference either in the appropriateness of intrauterine growth or in the condition of birth of children born to mothers aged less than 20 years, compared with those born to older mothers (Figure 3.4). Thus any disadvantages of teenaged birth must be social rather than biological.

FIGURE 3.4: GROWTH AND CONDITION AT BIRTH BY MATERNAL AGE

Birth characteristics	Less than 20 years		20 years or more	
Growth				
Mean POBW	95.6	(94.0 – 96.5)	95.3	(94.6 – 96.0)
POBW < 85% (%)	18.6	(15.9 –21.7)	21.8	(19.7 – 23.9)
Condition at birth				
Mean Apgar score at 5 minutes	8.93	(8.88 – 8.98)	8.99	(8.94 – 9.03)
Apgar score at 5 minutes < 7 (%)	2.1	(1.3 – 3.2)	2.3	(1.6 – 3.1)

Source: Tables 3.6, 3.7, 3.8 and 3.9

BIRTH CHARACTERISTICS AND CARER STATUS

Of the estimated 26,000 children for whom birth data were available, 21,200 (CI: 20,600–21,800) were estimated to be cared for by their birth mother. A person who was not the birth mother cared for an estimated 4,750 (CI: 4,290–5,240) children (Table 3.10).

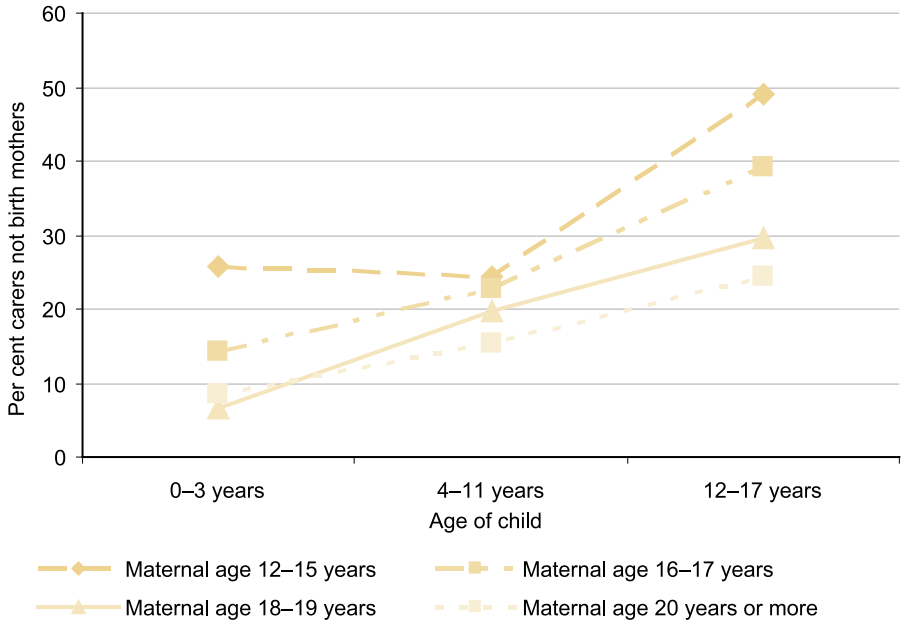
Table 3.11 compares the neonatal characteristics of children whose primary carers were their birth mothers at the time of the survey and those who were not. Although children not being cared for by their birth mother were more likely to be born prematurely, less well grown, of lower mean birth weight and more likely to weigh less than 2500g, their condition at birth was similar to those that were cared for by their birth mothers.

Of those children whose birth mothers were not their primary carer at the time of their interview, 20.0 per cent (CI: 16.9%–23.5%) were born to mothers aged less than 18 years. This compares with 11.6 per cent (CI: 10.5%–12.8%) of children whose primary carer was their birth mother at the time of the interview (Table 3.10). The age at which mothers gave up the care of their children was not collected in the survey. The age of the child at the time of the survey is the best available proxy measure.

Not surprisingly, older children were less likely to be cared for by their birth mother (Figure 3.5) and the proportion of teenaged motherhood increased slightly with child's age, creating the possibility of confounding by a cohort effect. Furthermore, the social and biological implications of motherhood vary throughout the teenaged years. Motherhood under 16 years is less socially and biologically desirable than motherhood at 18 years or 19 years because both education and physical growth are interrupted.

Figure 3.5 therefore stratifies by both child age and maternal age at delivery within the teenaged category and shows that 18–19 year old mothers were as likely as older women to be caring for their children, particularly for children under 3 years. Mothers delivering before 18 years of age were less likely to be caring for their children at the time of the interview, particularly mothers under 16 years of whom 25.8 per cent (CI: 12.9%–44.4%) were not caring for their 0–3 year olds at the time of the survey interview.

FIGURE 3.5: CARER STATUS BY AGE OF CHILD AND AGE OF MOTHER(a)



(a) The confidence intervals of all point estimates are given in Table 3.12

Source: Table 3.12

TEENAGE PREGNANCY AND CONTINUITY OF MATERNAL CARE

Children whose primary carer was not their birth mother were significantly more likely to have been born to mothers under the age of 18 years. Reducing early teenage pregnancy could increase the likelihood of an infant or child being cared for in the long term by their birth mother.

BIRTH CHARACTERISTICS AND MATERNAL ABORIGINAL STATUS

All of the children in the survey were identified by their carers to be of Aboriginal and/or Torres Strait Islander origin. With respect to the mother's Aboriginal status, two sources of information were potentially available. First, the attending midwife recorded the Aboriginal status of the birth mother on the Midwives Notification Form (see *Glossary*) at the time of the birth of child. Second, when the birth mother was the child's primary carer, her Aboriginal status was established by direct interview at the time of the survey.

Table 3.13 shows the relationship between the midwife's report of the birth mother's Aboriginal status and the survey interview response. For children whose mothers were reported to be of Aboriginal and/or Torres Strait Islander origin at the time of the birth of their child, 98.7 per cent (CI: 98.1%–99.2%) reported that they were of Aboriginal and/or Torres Strait Islander origin at the time of the interview.

Of those mothers of Aboriginal children who were recorded as non-Aboriginal on the Midwives Notification Form at the time of the child's birth, 37.8 per cent (CI: 31.9%–44.0%) identified as Aboriginal at the time of the survey.

Table 3.14 compares the neonatal characteristics of Aboriginal children derived from information obtained from linked birth records where the birth mother was a primary

carer at the time of the interview, by Aboriginal status of the mother. While the infants of Aboriginal mothers tended to be born earlier, lighter and in less optimal condition, none of these differences were statistically significant.

CONSISTENCY IN REPORTING AND RECORDING ABORIGINAL STATUS

Consistency in reporting Aboriginal status reflects the circumstances and the manner in which the information is gathered as well as personal awareness and motivation that may lead to self-identification.

Despite promotional efforts to improve data quality and reminders that it is not possible to determine who is an Aboriginal or Torres Strait Islander without asking the person, mothers of newborns may not be directly asked about their own racial identity and data may be based on the perceptions of others.

Similarly, self-identification as an Aboriginal person or a Torres Strait Islander may be based upon perception of the need for this information and upon perceptions about the manner of service delivery that may follow disclosure.

TOBACCO, ALCOHOL AND DRUG USE DURING PREGNANCY

Mothers of Aboriginal and Torres Strait Islander children often have multiple risk factors that contribute to low birth weight and impaired growth of their babies. Among these are cigarette smoking, alcohol consumption and other drug use during pregnancy. To maximise the reliability of reporting of tobacco, alcohol, marijuana (gunjah) and/or other drug use during pregnancy, the following analyses have been confined to the 80.5 per cent of children in the survey for whom information was provided by their birth mother at the time of the household interview. The corresponding estimate of the number of Western Australian Aboriginal and Torres Strait Islander children who would meet this criterion is 24,000.

TOBACCO SMOKING

The mothers of 46.5 per cent (CI: 43.9%–49.0%) of Aboriginal children (whose primary carer was also their birth mother) had smoked tobacco during pregnancy. In comparison, 22 per cent of infants were born to mothers in the total population who had smoked during pregnancy.[3] There was a tendency for the prevalence of smoking to decrease with increasing isolation (Table 3.15).

CHEWING TOBACCO

Birth mothers (who were also primary carers) of 3.5 per cent (CI: 2.7%–4.6%) of children reported chewing tobacco during pregnancy. There was a strong association between the prevalence of chewing tobacco during pregnancy and levels of relative isolation. In the Perth metropolitan area, 0.6 per cent (CI: 0.1%–1.5%) of children had mothers who had chewed tobacco compared with 21.0 per cent (CI: 13.9%–30.0%) in extremely isolated areas (Table 3.15). This perhaps reflects traditional usage as well as the fact that cigarettes are not as readily available in areas of extreme isolation.

ALL TOBACCO PRODUCTS COMBINED

Table 3.15 also shows the use of all tobacco products (smoking and chewing tobacco) by birth mothers during their pregnancy. The mothers of almost half (49.3

per cent; CI: 46.9%–51.8%) of the children (whose primary carer was also their birth mother) reported using tobacco during pregnancy. There was no significant difference in the proportion of women who reported using tobacco during their pregnancy by level of relative isolation.

ABORIGINAL TOBACCO USE AND ITS EFFECTS

Contemporary use of tobacco by Aboriginal and Torres Strait Islander people is the outcome of many historical and social circumstances. Long before European contact, and in addition to the traditional use of native tobaccos, Aboriginal and Torres Strait Islander people had contact with tobacco through trade with the Macassans. Following European settlement, tobacco was regularly used in 'rations' for Aboriginal people by both the government and on missions. Today, tobacco is widely available and consumed.[1]

In Australia, pregnant Aboriginal and Torres Strait Islander women smoke cigarettes at twice the rate of their non-Aboriginal counterparts. While there has been some evidence that links traditional Aboriginal lifestyle to higher rates of tobacco use[2], the data here show consistently high rates of tobacco use regardless of levels of relative isolation. Notably, as cigarette use declines with increasing levels of isolation, the rates of chewing tobacco increase.

About 80 per cent of Western Australian Aboriginal infants in a metropolitan sample were exposed to environmental tobacco smoke.[3] Direct and passive exposure to smoke poses risks to pregnant mothers, babies and young children. These risks include complications of pregnancy, sudden infant death syndrome, premature birth, low birth weight, asthma, middle ear disease and lower respiratory tract infections. Western Australian epidemiologists recently noted that life expectancy for Aboriginal men would increase from 58.5 to 61 years and for women from 65.3 to 67 years if tobacco related deaths were eliminated[4], an effect considerably greater than that estimated for the elimination of all infectious disease.

In the WA Aboriginal Child Health Survey, the rate of tobacco smoking by Aboriginal women during pregnancy was 46.5 per cent (CI: 43.9%–49.0%). The 1994 National Aboriginal and Torres Strait Islander Survey showed rates of tobacco smoking for Western Australian women aged 13 years and over to be 45.4 per cent (CI: 40.5%–50.2%) and for men, 51.1 per cent (CI: 46.1%–56.1%).[5] These findings would suggest that rates of tobacco smoking have remained persistently high for the past decade.

Evidence of specific interventions for reducing tobacco use in pregnant Aboriginal women is scant. A systematic review of smoking cessation programs for pregnant women in the general population concluded that they were effective in reducing smoking, low birth weight and pre-term birth.[6] However, demonstrations of their effectiveness in Australian Aboriginal populations are yet to be undertaken.

1 Ivers R, (2001). Indigenous Australians and tobacco: A literature review. Menzies School of Health Research and the Cooperative Research Centre for Aboriginal and Tropical Health, Darwin.

2 Cunningham J, (1994). Cigarette smoking among Indigenous Australians. Australian Bureau of Statistics, (Catalogue 4701.0) Canberra.

3 Eades S, and Read A, (1999). Infant care practices in a metropolitan Aboriginal population: Bibbulung Gnarneep Team. *Journal of Paediatric Child Health* 35(6); 541–544.

4 Arnold-Reed DE, Holman CD, Codde J, and Unwin E, (1998). Effects of smoking and unsafe alcohol consumption on Aboriginal life expectancy [letter]. *Medical Journal of Australia* 168(2); 95.

5 Australian Bureau of Statistics, (1996). National Aboriginal and Torres Strait Islander Survey 1994 Western Australia. (Catalogue 4190.5) Canberra.

6 Lumley J, Oliver S, Waters E, (2003). Interventions for promoting smoking cessation during pregnancy (Cochrane Review). *The Cochrane Library*, Issue 3. Oxford: Update Software.

ALCOHOL CONSUMPTION

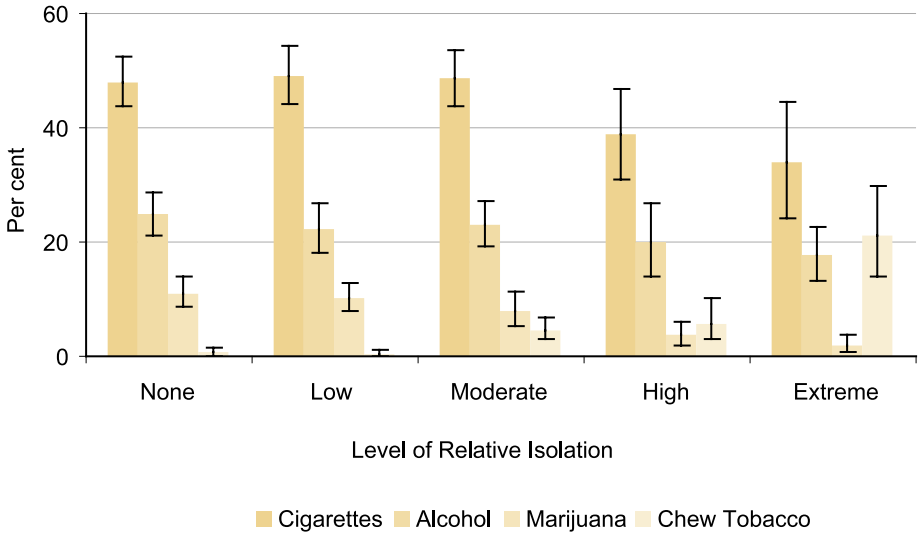
The birth mothers of an estimated 22.8 per cent (CI: 20.8%–24.9%) of Aboriginal children drank alcohol during their pregnancy (Table 3.15). This is very significantly lower than estimates of the proportion of pregnant women that drink alcohol in the total population; 40–50 per cent[4] and 75 per cent.[5]

Across levels of relative isolation there were no significant differences in the prevalence of alcohol use during pregnancy.

No measures of frequency or quantity of alcohol intake were available, as these may be unreliable from questionnaire data without further validation, so the proportion of mothers of Aboriginal infants who abused alcohol cannot be estimated. However it is known that although Aboriginal women are less likely to consume any alcohol than are other Australian women, those that do consume alcohol are more likely to do so at hazardous levels, particularly women of child bearing age.[6,7,8]

Consuming alcohol at hazardous levels is associated with adverse perinatal outcomes such as foetal alcohol syndrome, alcohol withdrawal in the newborn, and increased risk of perinatal mortality.[9]

FIGURE 3.6: CHILDREN(a) — SUBSTANCE USE BY MOTHER DURING PREGNANCY, BY LEVEL OF RELATIVE ISOLATION



(a) Children whose primary carer was also their birth mother

Source: Table 3.15

MARIJUANA AND OTHER DRUG USE

Mothers of 8.8 per cent (CI: 7.5%–10.2%) of children (whose primary carer was also their birth mother) reported having used marijuana (gunjah) during pregnancy. Marijuana usage declined with level of isolation: from 11.1 per cent (CI: 8.7%–14.0%) in metropolitan areas to 1.8 per cent (CI: 0.8%–3.7%) in areas of extreme isolation (Table 3.15).

The mothers of less than 1.0 per cent (CI: 0.3%–1.3%) of children whose primary carer was their birth mother reported using other drugs during pregnancy.

NATIONAL DRUG STRATEGY

The National Drug Strategy Aboriginal and Torres Strait Islander Peoples' Complementary Action Plan 2003–2006[1] was endorsed by the Ministerial Council on Drug Strategy in August 2003 to help provide a nationally co-ordinated and integrated approach to reduce drug-related harm among Aboriginal and Torres Strait Islander People. The complementary action plan has six key result areas:

- Enhanced capacity to address issues of substance misuse
- Whole of government effort in collaboration
- Improved access to services
- Provision of holistic services
- Workforce initiatives to enhance capacity to provide services
- Increased Aboriginal ownership of research, monitoring, evaluation and dissemination of information.

The action plan also identifies some issues that are especially significant in the remote and isolated communities such as traditional practices, the level of local services, and the use of harmful substances such as kava and petrol sniffing.

Examples of actions include:

- encouraging health services to implement home visit schemes as part of early childhood development programs
- establishing a youth website that includes messages relating to the use of alcohol, tobacco and other drugs
- running blue light discos and film nights and other alternatives to drug usage
- the Strong Mothers, Strong Babies, Strong Culture Program
- developing and disseminating community-targeted materials on foetal alcohol syndrome (FAS) and foetal alcohol effects (FAE).

1 Ministerial Council on Drug Strategy, (2003). National Drug Strategy. Aboriginal and Torres Strait Peoples Complementary Action Plan 2003-2006. National Drug Strategy Unit. Canberra.

USE OF MULTIPLE SUBSTANCES

Women who use one substance may also use others. In order to understand the effects of substance use on birth weight, it is necessary to consider substances together, so that isolated and combined usage can be differentiated.

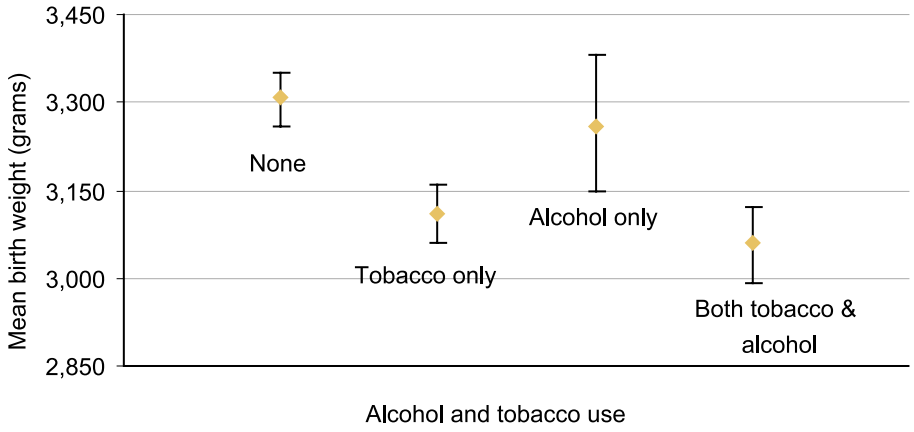
EFFECT ON BIRTH WEIGHT OF SUBSTANCE USE IN PREGNANCY

The effects on birth weight of tobacco, alcohol and marijuana use during pregnancy were examined by linking survey data to birth records on the Maternal and Child Health Research Data Base (MCHRDB). This linkage resulted in estimates for 21,200 (CI: 20,700–21,700) Aboriginal and Torres Strait Islander children whose primary carer was their birth mother.

TOBACCO AND ALCOHOL USE

Table 3.16 shows mean birth weight and proportion of low birth weight by alcohol and tobacco use. It can be seen, as in other studies, that tobacco use was associated with a significant 200g reduction in mean birth weight.[3] The effect of alcohol use on mean birth weight was much smaller at an estimated reduction of 40g and was not statistically significant. The effect on mean birth weight of combined usage appears additive (Figure 3.7).

FIGURE 3.7: CHILDREN(a)— MEAN BIRTH WEIGHTS, BY ALCOHOL AND TOBACCO USE BY MOTHER DURING PREGNANCY

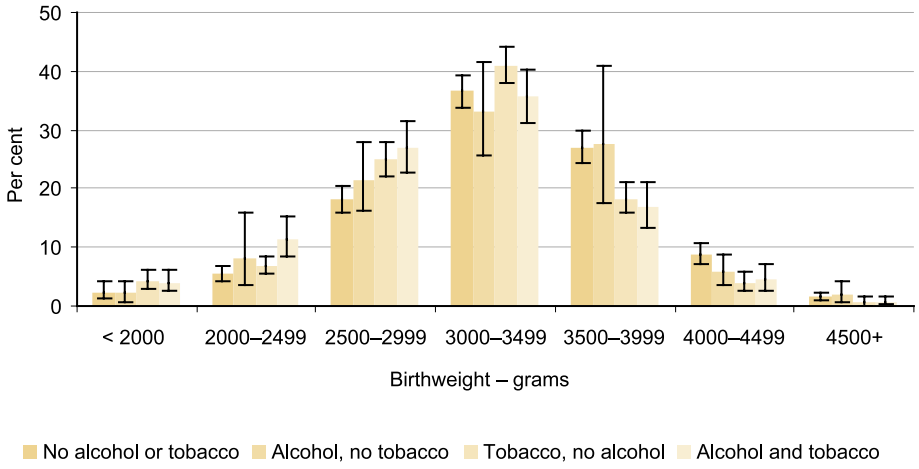


(a) Children whose birth mother is also their primary carer

Source: Table 3.16

The effect of substance use on proportion of low birth weight babies differs from the effect on mean birth weight. Mothers who used both alcohol and tobacco during pregnancy were almost twice as likely to have a low birth weight baby (15.4 per cent; CI: 11.9%–19.3%) compared to mothers who did not use tobacco or alcohol (7.8 per cent; CI: 6.1%–9.8%). There were no significant differences for mothers who used only alcohol or tobacco, but not both (Table 3.16). These differences occur because maternal tobacco use tends to reduce the birth weight of all exposed infants shifting their whole birth weight distribution by 200g, significantly increasing the proportion with a birth weight of 2,500–2,999g and decreasing the proportion with a birth weight of 3,500g–3,999g (Figure 3.8). In contrast, the effect of alcohol use is found primarily in those who abuse alcohol, but this smaller proportion of affected infants is likely to have a much larger reduction in birth weight, whereas birth weight is little affected in low and moderate alcohol users. Thus, Figure 3.8 shows that there was an increased proportion of infants in the 2,000–2,499g birth weight category among alcohol users.

FIGURE 3.8: BIRTH WEIGHT DISTRIBUTION(a), BY MATERNAL TOBACCO AND ALCOHOL USE DURING PREGNANCY



Source: Table 3.17

CHEWING AND SMOKING TOBACCO

It was not previously known whether chewing tobacco has the same effect on birth weight as smoking tobacco. Since the great majority of mothers chewing tobacco lived in more isolated areas, where birth weights tended to be lower, this analysis was limited to infants born in LORI areas moderate to extreme. Table 3.18 shows the mean birth weight and proportion of low birth weight infants, by type of tobacco use. The small numbers of women who chewed tobacco only or both chewed and smoked tobacco result in wide confidence intervals, however estimated mean values suggest that there is no important difference in effect on birth weight between chewing and smoking tobacco.

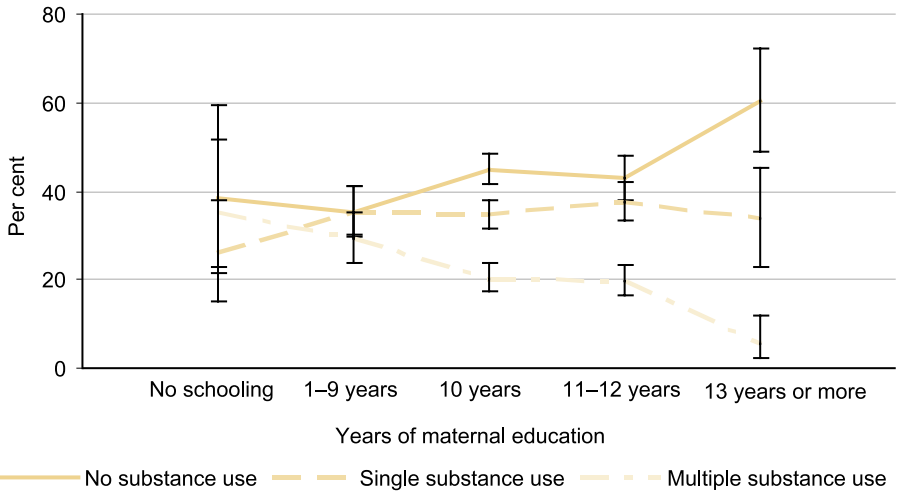
MARIJUANA USE

Table 3.19 isolates the effect of marijuana use on birth weight. The number of marijuana users is small, so again confidence intervals are wide, but the central estimates of mean birth weight suggest that infants exposed to marijuana alone weigh 210g less than those not exposed to any maternal alcohol, tobacco or marijuana, supporting previously published data.[9] This is similar to the effect of tobacco use alone. Table 3.19 suggests that the effects on birth weight of marijuana, tobacco and alcohol use may be additive.

SUBSTANCE USE BY DURATION OF MATERNAL EDUCATION

The distribution of single and multiple substance use, by duration of maternal education is shown in Figure 3.9. The Figure shows that duration of maternal education has a strong negative correlation with the proportion of mothers using multiple substances, a strong positive correlation with the proportion of mothers using no substances but little correlation with the proportion of mothers using a single substance.

FIGURE 3.9: CHILDREN(a) — SUBSTANCE USE BY DURATION OF MATERNAL EDUCATION



(a) Children whose birth mothers were also their carers

Source: Table 3.21

Table 3.22 shows that women who use multiple substances during pregnancy are more likely to experience financial strain — spending more money than they receive. They are also less likely to save than those who use no substances or who use a single substance during pregnancy. This may be largely due to prospects for employment and remuneration being highly correlated with educational duration that is in turn correlated with substance use.

EFFECTS OF TOBACCO, ALCOHOL AND DRUG USAGE ON BIRTH WEIGHTS

The use of tobacco and alcohol during pregnancy is one of a number of factors that increase the likelihood of low birth weight babies (i.e. birth weight of less than 2,500 grams), and lower the mean birth weight of babies born. Low birth weight babies are more susceptible to infections and other adverse developmental outcomes. Other factors influencing low birth weight include socioeconomic disadvantage, size and age of the mother, the number of babies previously borne, mother's nutritional status, illness during pregnancy, presence of a multiple birth and duration of pregnancy.[1,2]

1 Alberman E, (1994) Low birth weight and prematurity, in *The Epidemiology of Childhood Disorders*, ed. Pless IB, Oxford University Press. New York.

2 Barmer DJP, and Clark PM, (1997). Fetal undernutrition and disease in later life. *Reviews of Reproduction 2;* 105–112.

BREASTFEEDING

RECOMMENDATIONS FOR BREASTFEEDING

Although the health benefits of breastfeeding are widely acknowledged, opinions and recommendations have been strongly divided on the optimal duration of exclusive breastfeeding. The current World Health Organisation guidelines based on a review of over 3,000 scientific studies recommended exclusive breastfeeding to the age of six months before the introduction of nutritionally safe and appropriate complementary foods in conjunction with continued breastfeeding.[1] Exclusive breastfeeding to six months is also recommended by the National Health and Medical Research Council.[2] These Australian guidelines recommend that breastfeeding be continued well beyond the age of 12 months because of the benefits to both infant and mother. They also recommend that, where for any reason breast-milk is discontinued before 12 months of age, a commercial infant formula should be used in preference to cow's milk as the main source of milk.

1 World Health Organisation, (2001). Expert consultation on the optimal duration of exclusive breastfeeding. WHO. Geneva.

2 NHMRC, (2003). Dietary Guidelines for Children and Adolescents in Australia – Incorporating the Infant Feeding Guidelines for Health Workers. NHMRC. Canberra.

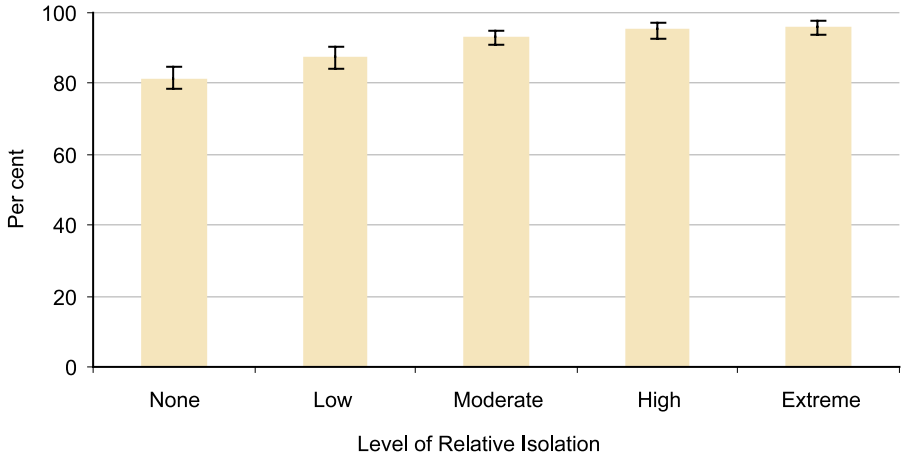
To maximise the reliability of reporting of breastfeeding history, the following analyses have been confined to the 80.5 per cent of children in the survey for whom information was provided by their birth mother at the time of the household interview. The corresponding estimate of the number of Western Australian Aboriginal and Torres Strait Islander children who would meet the criteria is 24,000 (Figure 3.1).

PROPORTION OF CHILDREN EVER BREASTFED (CHILDREN 0–17 YEARS)

At the time of the survey, 88.0 per cent (CI: 86.5%–89.4%) of Aboriginal children were reported ever to have been breastfed. This compares favourably with 84 per cent (CI: 82.2%–85.8%) of 4–16 year olds reported ever to have been breastfed for the total population by the 1993 WA Child Health Survey.[10]

Figure 3.10 shows that the proportion of children who had ever been breastfed increased steadily with isolation from 81.5 per cent (CI: 78.3%–84.6%) for children in the Perth metropolitan area to 96.3 per cent (CI: 94.0%–97.8%) in areas of extreme isolation.

FIGURE 3.10: CHILDREN AGED 0–17 YEARS(a) — PROPORTION EVER BREASTFED BY LEVEL OF RELATIVE ISOLATION



(a) Children whose birth mother is also their primary carer

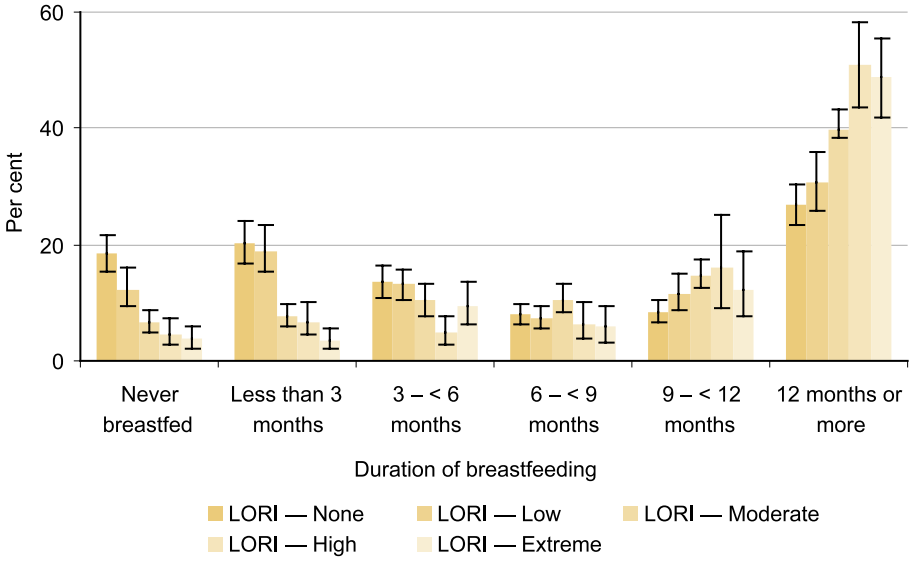
Source: Table 3.23

DURATION OF BREASTFEEDING (CHILDREN 0–17 YEARS)

An estimated 12.0 per cent (CI: 10.6%–13.5%) of Aboriginal children had never been breastfed, 14.7 per cent (CI: 13.1%–16.5%) were breastfed for up to three months, 11.6 per cent (CI: 10.3% –13.0%) were breastfed for three to six months, 8.0 per cent (CI: 7.0%–9.0%) were breastfed for six to nine months, 11.5 per cent (CI: 10.2%–13.0%) were breastfed for nine to twelve months and 34.5 per cent (CI: 32.3%–36.7%) were reported to have been breastfed for 12 months or more. This was significantly higher than the comparable figure for the total Western Australian population where 20 per cent (CI: 17.6%–22.4%) of children aged 4–16 years were reported to have been breastfed for 12 months or more.[10] The remaining 7.8 per cent (CI: 7.0%–8.7%) were still being breastfed at the time of the survey (Table 3.24).

Children living in more remote areas also tended to be breastfed for longer than those in more urbanised settings (Figure 3.11). Around one in four or 26.8 per cent (CI: 23.3%–30.5%) of all children in the Perth metropolitan area had been breastfed for a period of 12 months or more, compared with 48.7 per cent of children (CI: 41.9%–55.4%) living in areas of extreme isolation.

FIGURE 3.11: CHILDREN AGED 0–17 YEARS(a) — DURATION OF BREASTFEEDING BY LEVEL OF RELATIVE ISOLATION



(a) Children whose birth mother is also their primary carer

Source: Table 3.24

BREASTFEEDING HISTORY (CHILDREN AGED 0–3 YEARS)

More detailed information on breastfeeding was collected about children aged 0–3 years. The following analyses are confined to the estimated 6,210 Western Australian Aboriginal and Torres Strait Islander children within this age range who were still in the care of their natural mother. At the time of the survey, 29.3 per cent (CI: 26.4%–32.4%) of children aged 0–3 years were still receiving breast milk (Table 3.26).

Figure 3.12 shows the breast feeding status by age for Aboriginal children in Western Australia and compares this with figures from the 2001 National Health Survey relating to the total population. The key finding here relates to children aged 12 months or older, with Aboriginal children almost 5 times more likely to still be breastfeeding (19.6 per cent; CI: 16.2%–23.3%) at that age compared with 4.0 per cent (CI: 2.6%–5.4%) of children in the total Australian population.

FIGURE 3.12: CURRENT BREAST-FEEDING(a) STATUS, BY AGE

	2001 WAACHS		2001 National Health Survey(b)	
	%	95% CI	%	95% CI
Currently breast feeding				
Less than 6 months old	65.0	(57.2–72.1)	64.5	(56.3–72.7)
6 months to 11 months old	48.3	(39.7–56.8)	36.7	(28.3–45.2)
12 months to less than 4 years old	19.6	(16.2–23.3)	4.0	(2.6–5.4)
Never breast fed (Less than 4 years old)	12.6	(10.5–15.0)	13.2	(11.1–15.4)

(a) Any level of breastfeeding including partial, complementary and full breastfeeding.
(b) ABS (2001) National Health Survey, Summary of Results. Catalogue 4364.0

Source: Tables 3.25 and 3.26

Breastfeeding beyond 12 months varied considerably by levels of relative isolation. For example, 47.4 per cent (CI: 30.2%–66.9%) of Aboriginal children, aged more than 12 months and under four years, living in areas of extreme isolation were still being breastfed, compared with 11.6 per cent (CI: 7.4%–17.0%) of children in the same age group living in areas of low relative isolation (Table 3.26). This lower rate, however, was still significantly higher than the 4.0 per cent (CI: 2.6%–5.4%) measured by the 2001 National Health Survey for children in the same age group in the total Australian population (Figure 3.12).

EXCLUSIVE BREASTFEEDING (CHILDREN 0–3 YEARS)

An estimated 10.4 per cent (CI: 8.6%–12.4%) of Aboriginal children aged 0–3 years were currently being breastfed exclusively i.e. were not being given any other types of food such as cows milk, formula milk, baby food or cereals (Table 3.27).

When considered by age group, 53.0 per cent (CI: 45.5%–60.7%) of Aboriginal children aged less than six months were being exclusively breastfed, dropping to 7.0 per cent (CI: 3.8%–10.9%) for children aged six to eleven months and 3.1 per cent (CI: 1.7%–4.9%) for those who were 12 months and older (Table 3.27).

While there were statistically significant differences in the proportion of children still receiving any breast milk across the different levels of relative isolation within each age group, the same did not apply to the proportions of children still being exclusively breastfed, perhaps on account of the small numbers involved. However, similar trends were still discernible and children in remote areas are more likely to be exclusively breastfed for longer than those in Perth (Table 3.28).

INTRODUCTION OF SOLID FOODS (CHILDREN AGED 0–3 YEARS)

For the 5,380 children aged 0–3 years who had started on solid foods, the most common points for the introduction of these into the diets of Aboriginal children were four months (29.8 per cent; CI: 26.5%–33.1%) and six months (18.5 per cent; CI: 15.7%–21.6%). A further 16.1 per cent (CI: 13.5%–18.9%) had commenced solid foods at 3 months, whilst 3.7 per cent (CI: 2.3%–5.8%) started at one month of age (Table 3.29).

BENEFITS OF BREASTFEEDING

Several studies show the benefits of breastfeeding on children's growth, cognitive development and immunological functioning.[1,2,3]

While it is generally accepted that breast milk from a well-nourished mother is adequate as the sole source of nutrients for full-term infants until about six months, there has been considerable debate over whether to recommend exclusive breastfeeding for 'four to six months' versus 'about six months'. The debate has centred on the choice between the known protective effect of exclusive breastfeeding against infectious morbidity and the (theoretical) insufficiency of breast milk alone to satisfy the infant's energy and micronutrient requirements beyond four months of age. This issue has recently been examined by a Cochrane Collaboration systematic review.[4]

This review concluded that 'Infants who are exclusively breastfed for six months experience less morbidity from gastrointestinal infection than those who are mixed breastfed as of three or four months, and no deficits have been demonstrated in growth among infants from either developing or developed countries who are exclusively breastfed for six months or longer. Moreover, the mothers of such infants have more prolonged lactational amenorrhea. Although infants should still be managed individually so that insufficient growth or other adverse outcomes are not ignored and appropriate interventions are provided, the available evidence demonstrates no apparent risks in recommending, as a general policy, exclusive breastfeeding for the first six months of life in both developing and developed country settings'.

1 Kramer MS, (2001). Health benefits of breastfeeding promotion. *Journal of the American Medical Association*, 285: 2446–2447.

2 Oddy WE, Kendall GE, Blair E, deKlerk N, Stanley FJ, Landau LI, Silburn S, and Zubrick S, (2003). Breast feeding and cognitive development in childhood: a prospective birth cohort study. *Paediatric and Perinatal Epidemiology* 17; 81–90.

3 Lawton JW, and Shortridge KF, (1997). Protective factors in human breastmilk and colostrum, *Lancet* I; 253–255.

4 Kramer MS, and Kakuma R. (2003). Optimal duration of exclusive breastfeeding (Cochrane Review). The Cochrane Library, Issue 4. John Wiley & Sons, Ltd. Chichester. UK.

DIET AND NUTRITION

Aboriginal and Torres Strait Islander families face considerable challenges in providing their children access to a healthy diet. Those living in isolated areas may not have the same opportunities as people living in metropolitan areas to obtain affordable, nutritious food on a regular basis.

METHODOLOGICAL ISSUES IN ASSESSING DIETARY INTAKE

Accurate, quantitative assessment of dietary intake is notoriously difficult in any population. For example, two common approaches are the 24 hour recall and weighed dietary intake, but both have problems arising from the tendency of respondents to give more 'socially desirable' responses.[1] Furthermore, one fifth of Aboriginal children in this survey lived in areas of high or extreme isolation, where variability in food availability may render a 24–hour recall of limited value in assessing dietary intake. While 'store turnover' assessment has been successfully used to measure intake of entire isolated communities [1], it cannot differentiate child and youth intake, nor take into account the use of bush foods not obtained through the store. With these considerations in mind, the WA Aboriginal Child Health Survey collected a very limited amount of dietary information from carers of children aged from 4–17 years and from young people aged 12–17 years using questions developed for the 2001 National Health Survey.[2]

INDICATORS OF DIETARY QUALITY

The available data allowed some indicators of dietary quality to be devised. These indicators did not measure dietary intake, but were designed to reflect whether the principles of a healthy diet were being observed. It must be re-iterated that these indicators are based on interview responses, which were not further validated.

Indicator 1: met if water was usually drunk when thirsty.

Indicator 2: met if some form of unsweetened and unflavoured cow or soy milk was regularly consumed.

Indicator 3: met if fresh fruit was usually consumed on 6 or 7 days of the week.

Indicator 4: met if at least half a cup of a variety of at least 3 fresh vegetables, other than potato, were usually consumed on 6 or 7 days of the week.

The number of these indicators that were met was considered an overall indicator of dietary quality.

1 Lee A, Bonson A, Yarmirr D, O'Dea K and Matthews J, (1995). Sustainability of a successful health and nutrition program in a remote Aboriginal community, *Medical Journal of Australia* 162; 632–635.

2 Australian Bureau of Statistics, (2003). National Health Survey 2001. User Guide. (Catalogue 4363.0.55.001) Canberra.

THE SAMPLE CONTRIBUTING TO THE ASSESSMENT OF DIETARY INTAKE IN THIS SURVEY

For this section on Diet and Nutrition only, a somewhat different sample was used. While the carers of all children aged 4–17 years were asked the dietary questions at interview, the same questions were also asked of the children themselves if they were aged 12–17 years. On account of the increasing independence of teenagers, it was considered that these older children were better placed to accurately respond to questions concerning their diet than were their primary carers. However not all children of responding carers completed the youth self report questionnaire (YSR), thus these dietary data were missing for a proportion of 12–17 year old children. In order to generalise observations to the entire population of WA Aboriginal children, YSR respondents were weighted by age distribution to the same population (*see Sample Design, Appendix B).* However the distribution of variables other than age among the YSR respondents may not be the same as those distributions among all carer reports. The population totals by factors other than age that are reported in this section may therefore not be the same as those reported elsewhere in this volume.

While the most accurate responses were sought, it must be borne in mind that the questions elicited only unvalidated *recall* of dietary intake which, for children aged 4–11 years, was by a third party. The aim of this part of the survey was therefore limited to obtaining an indication, rather than a measure, of dietary quality. Four criteria were selected as indicators of attempting to achieve a healthy diet: (1) drinking water when thirsty, (2) drinking some form of unflavoured and unsweetened milk, (3) eating more than half a cup of a variety of fresh vegetables on at least 6 days a week and (4) eating fresh fruit on at least 6 days a week, (*see commentary box 'Indicators of Dietary Quality'*).

SIGNIFICANCE OF DIET, NUTRITION AND HEALTH

The relationship between diet, nutrition and health is of particular significance to Aboriginal and Torres Strait Islander people for a number of important reasons.

First, the age profile of this population includes a larger proportion of mothers, babies and children than the general Australian population. Access to good nutrition is especially important for these groups as a key determinant of physical growth, cognitive and emotional development and staying healthy.

Second, there has been profound change in the diet of many Aboriginal and Torres Strait Islander people in a short period of time. The traditional Aboriginal diet was rich in fibre, high in protein and low in saturated fat. However, this has changed rapidly to a diet high in refined carbohydrates and saturated fats. This kind of diet is known to create a predisposition to obesity, Type 2 (adult-onset) diabetes, cardiovascular disease and renal disease.[1]

Third, the adequacy of nutrition during pregnancy and childhood is important for preventing a number of chronic diseases which may emerge later in life.Given the weight of evidence showing the importance of diet and nutrition for children's growth, resistance to infection and the prevention of chronic diseases, there is surprisingly little population data available to monitor changes in the dietary intake of Aboriginal and Torres Strait Islander children. This survey provides some of the first such data against which the progress of systematic efforts to improve children's nutritional status may be judged.

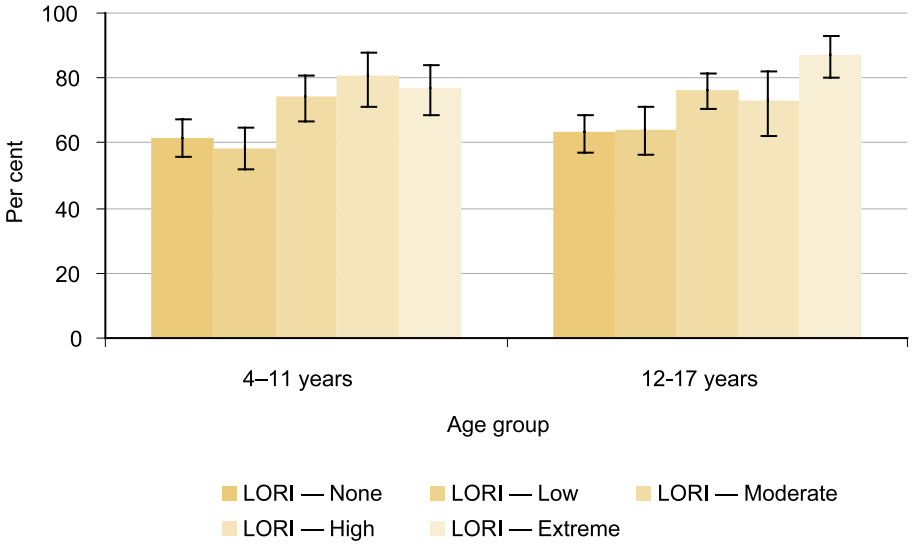
1 Leonard D, McDermott R, O'Dea K, Rowley KG, Pensio P, Sambo E, Twist A, Toolis R, Lowson S, Best JD, (2002). Obesity, diabetes and associated cardiovascular risk factors among Torres Strait Islander people. *Australian and New Zealand Journal of Public Health*, 26(2); 144-149.

Compared with their traditional diets, the contemporary Aboriginal diet primarily consists of the now more readily available fatty meats and refined sugars and starches. Thus macronutrient requirements tend to be met or exceeded, with the attendant risks of adiposity, insulin resistance, diabetes and heart disease, while micronutrients tend to be lacking.[11] These chosen indicators of dietary quality therefore focus on fruit and vegetable intake, as providers of many important micro-nutrients, and milk, as the primary source of calcium.

CHOOSING WATER AS A DRINK WHEN THIRSTY

The dietary guidelines for Australian children and adolescents recommend choosing water as a drink.[12] Respondents were asked to select which drink was usually consumed when thirsty from a list of options: water, soft drink, fruit juice, cordial or other. Two thirds of all children (68.0 per cent; CI: 65.7%–70.2%) aged 4–17 years were reported to drink water, 15.3 per cent (CI: 13.6%–17.0%) were reported to drink cordial, 9.7 per cent (CI: 8.2%–11.3%) soft drinks, 4.4 per cent (CI: 3.5%–5.4%) fruit juice, and 2.7 per cent (CI: 1.9%–3.7%) some other drink. Children resident in areas of high or extreme isolation were significantly more likely to drink water when thirsty than children in the Perth metropolitan area or areas of low isolation (Figure 3.13). Older children (aged 12–17 years) were not significantly more likely to drink water than younger children: 69.4 per cent (CI: 66.1%–72.5%) compared with 67.1 per cent (CI: 63.9%–70.0%) (Table 3.30). There were no significant differences in the proportion of children drinking water by carer's educational attainment. The most frequently selected reason for not drinking water when thirsty was that the taste of other drinks was preferred.

FIGURE 3.13: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) USUALLY DRINKING WATER WHEN THIRSTY, BY AGE GROUP



Source: Tables 3.32 and 3.33

TYPE OF MILK USUALLY CONSUMED

In Australia, cow's milk is the child's usual dietary source of calcium, which is an important component of a healthy diet, particularly for growing children. However, sweetened and flavoured milks are not recommended and, when consumed on a regular basis, do not suggest adherence to the principles of a healthy diet. Only a small proportion, 3.6 per cent (CI: 2.7%–4.5%), usually drank flavoured or sweetened milk. The majority usually drank some form of unflavoured and unsweetened cow's or soy milk, 92.7 per cent (CI: 91.5%–93.8%). A small proportion of children were reported to drink other forms of milk, 1.0 per cent (CI: 0.7%–1.3%), or no milk, 2.8 per cent (CI: 2.1%–3.6%) (Table 3.34).

There are healthy alternative sources of calcium which are important for children with intolerance to lactose (e.g. yoghurt or cheese), or cow's milk protein (e.g. goat milk, fish or almonds), and it is possible that those reported to be drinking other milks or no milk were doing so for such indications. However those drinking no milk tended to fail to meet other indicators of a healthy diet and the number drinking other types of milk was too small to reliably identify such associations. Somewhat arbitrarily therefore, the milk related indicator of a healthy diet was restricted to those who usually drank some form of unsweetened and unflavoured cow or soy milk.

A somewhat greater proportion of children aged 4–11 years met the milk indicator of dietary quality than of older children: 94.2 per cent (CI: 92.4%–95.7%) compared with 90.5 per cent (CI: 88.8%–91.9%). There was no difference in the proportion of children aged 4–11 years meeting the milk indicator by level of relative isolation, but there was a tendency for an increasing proportion of children aged 12–17 years to meet the milk indicator with increasing level of relative isolation (Tables 3.32 and 3.33).

There was a trend for an increasing proportion of children aged 4–11 years to meet the milk indicator with increasing carer's educational attainment, but there was no similar trend for children aged 12–17 years (Tables 3.36 and 3.37).

FRESH VEGETABLE CONSUMPTION

Frequency

Nearly two thirds of all children self-reported or were reported by carers to usually eat vegetables every day, 64.8 per cent (CI: 62.2%–67.3%) (Table 3.31). A greater proportion of children aged 12–17 years (73.8 per cent; CI: 70.4%–76.9%) than children aged 4–11 years (58.8 per cent; CI: 55.3%–62.2%) reported daily fresh vegetable consumption. There were no significant differences in the proportions of children meeting this criterion by level of relative isolation (Tables 3.32 and 3.33).

Quantity

Of the estimated 14,800 children who usually ate vegetables daily, 90.0 per cent (CI: 88.7%–91.3%) reportedly ate at least half a cup. Children aged 4–11 years were more likely to eat at least half a cup of vegetables daily (97.5 per cent; CI: 96.7%–98.2%) than children aged 12–17 years (81.0 per cent; CI: 78.2%–83.5%) (Table 3.38).

Variety

When measuring the variety of vegetables regularly consumed, potatoes, which were regularly eaten by almost 90 per cent of Aboriginal children, were not included. Potatoes provide primarily a healthy form of complex carbohydrate that includes fibre and vitamin C, but weight for weight potatoes are not as rich in other vitamins and minerals as are less starchy vegetables. Of the children who usually ate vegetables every day, only 39.2 per cent (CI: 36.4%–42.2%), reported regularly eating five or more different varieties of vegetable (other than potatoes) (Table 3.39). A greater proportion (71.0 per cent; CI: 66.9%–74.7%) of children aged 4–11 years were reported to regularly consume more than three types of vegetables (other than potatoes) than children of 12–17 years (43.6 per cent; CI: 40.0%–47.3%) (Table 3.40).

Thus although children aged 12–17 years reported that they ate fresh vegetables more regularly, they tended to eat both a smaller variety and smaller quantities.

Vegetable indicator of dietary quality

A composite criterion for vegetable intake was constructed as the vegetable indicator of dietary quality. This criterion was met if the child usually ate at least half a cup of more than three types of fresh vegetables (other than potato) on 6 or 7 days a week. This compares with the NHMRC recommendations for fresh vegetable intake for children which are to eat a variety of fresh vegetables daily, with quantities of more than 1 cup for children aged 4–7 years and more than 1.5 cups for older children.[12] Thus the quantity component of our vegetable indicator of dietary quality is much less stringent than NHMRC recommendations.

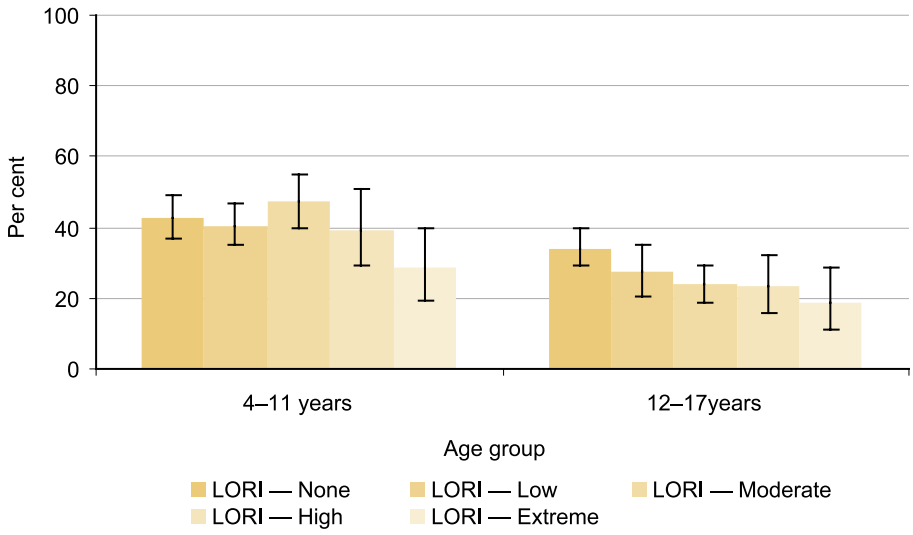
Children aged 4–11 years were significantly more likely to be reported to meet our composite vegetable criterion satisfactorily, (41.3 per cent; CI: 38.0%–44.7%), than were children aged 12–17 years (27.8 per cent; CI: 24.9%–30.9%) (Tables 3.32 and 3.33).

Thus most Aboriginal children were not even approaching the recommended vegetable intake, and for the majority this is not a result of fresh vegetables being unavailable. However, this is not a problem confined to Aboriginal children. The National Health Survey indicated that, compared with Aboriginal children, a greater proportion of non-Aboriginal children consumed no fresh vegetables and no fresh fruit at all.[13]

Vegetable indicator of dietary quality by level of relation isolation

The age of the child was more closely related to meeting the vegetable indicator of diet quality than was the level of relative isolation (Tables 3.31–3.33). In each LORI area, compared with children aged 4–11 years, there was a substantial reduction in the proportion of children aged 12–17 years meeting the vegetable indicator. Combining all ages, significantly more children in the metropolitan area (39.2 per cent; CI: 35.0%– 43.4%) met the criterion than children in extremely isolated areas (24.5 per cent; CI: 17.4%–33.5%) (Figure 3.14).

FIGURE 3.14: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) MEETING VEGETABLE INDICATOR OF DIETARY QUALITY, BY AGE GROUP



Source: Tables 3.32 and 3.33

Vegetable indicator of dietary quality by carer's educational attainment

There was a trend to an increasing proportion of children meeting the fresh vegetable indicator with increasing carer's educational attainment (Table 3.35). When the child's age was considered, it was apparent that children aged 12–17 years were less likely to meet the vegetable indicator of quality in each stratum of carer's educational attainment (Tables 3.36 and 3.37).

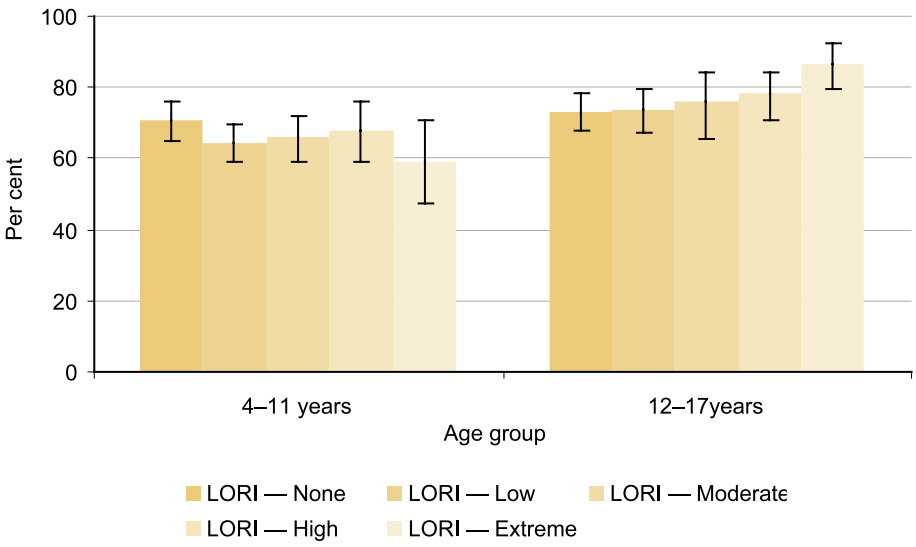
FRESH FRUIT CONSUMPTION

An estimated 70.3 per cent (CI: 68.1%–72.5%) of Aboriginal children were reported to usually eat fresh fruit every day (Table 3.31). Although children usually eating fruit daily were significantly more likely to meet the vegetable indicator of dietary quality, significantly less than half (40.7 per cent; CI: 37.9%– 43.6%) of daily fruit eaters did so. This compared with 24.6 per cent (CI: 21.0%–28.5%) of those eating fruit on less than six days a week (Table 3.41). Children aged 4–11 years were less likely to usually eat fruit every day, (66.8 per cent; CI: 63.7%–69.7%), than were children aged 12–17 years (75.6 per cent; CI: 72.4%–78.5%) (Tables 3.32 and 3.33).

Although the proportion of all Aboriginal children usually eating fresh fruit daily did not vary with level of relative isolation, the difference in proportion between the two child age groups increased with increasing level of relative isolation. In the

metropolitan area the proportions in the two age groups were very similar, but in extremely isolated areas 59.2 per cent (CI: 47.4%–70.7%) of children aged 4–11 years were reported to usually eat fruit on 6 or 7 days a week and 86.3 per cent (CI: 79.3%–92.2%) of children aged 12–17 years reported that they usually ate fruit every day (Figure 3.15).

FIGURE 3.15: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION (LORI) HAVING AN ADEQUATE INTAKE OF FRUIT, BY AGE GROUP



Source: Tables 3.32 and 3.33

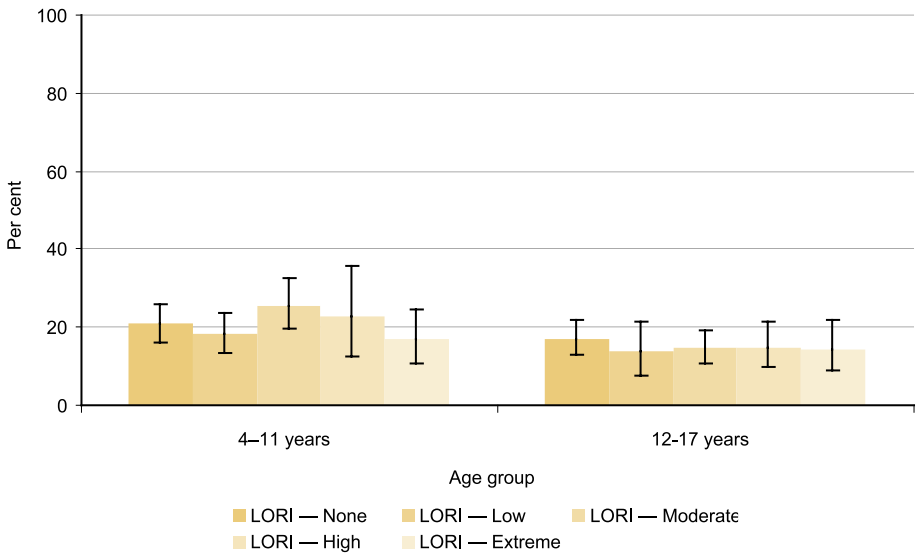
COMBINED INDICATORS OF DIETARY QUALITY AND RELATIVE ISOLATION

Only 18.7 per cent (CI: 16.7%–20.8%) of children met all four indicators of dietary quality, 40.0 per cent (CI: 37.8%–42.2%) met three and 31.7 per cent (CI: 29.5%–33.9%) met two indicators (Table 3.42).

Children aged 4–11 years were significantly more likely to meet all four indicators (21.0 per cent; CI: 18.3%–23.9%) than children aged 12–17 years (15.3 per cent; CI: 12.9%–17.9%). However, this difference was largely balanced by those meeting three indicators — 37.4 per cent (CI: 34.6%–40.3%) of children aged 4–11 years, compared with 43.9 per cent (CI: 40.7%–47.1%) of children aged 12–17 years (Tables 3.43 and 3.44).

All four indicators were more likely to be met by children aged 4–11 years living in areas of moderate or high isolation and one or fewer indicators were more likely to be met in the metropolitan area or areas of low isolation. However, within each age group there were no significant differences in the proportions of children meeting all four indicators of dietary quality between areas of different levels of relative isolation (Figure 3.16).

FIGURE 3.16: CHILDREN AGED 4–17 YEARS — PROPORTION IN EACH LEVEL OF RELATIVE ISOLATION MEETING ALL FOUR INDICATORS OF DIETARY QUALITY, BY AGE GROUP

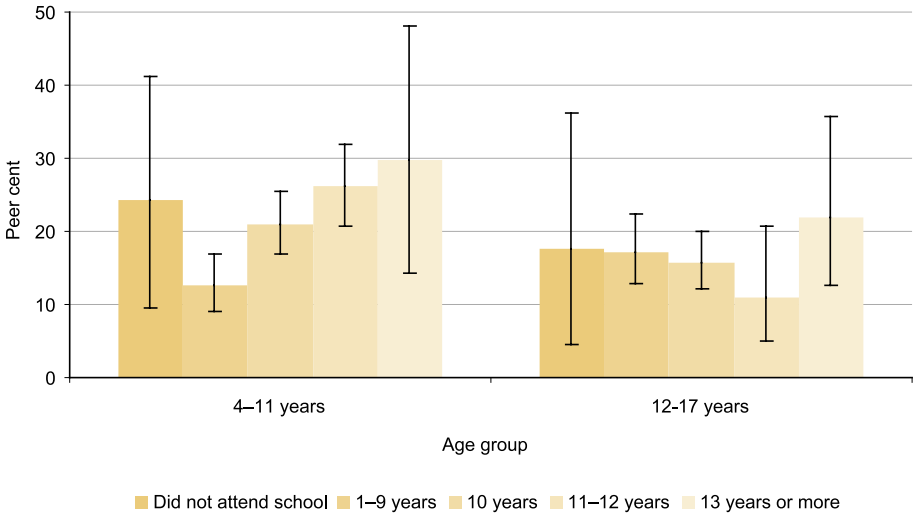


Source: Tables 3.43 and 3.43

COMBINED INDICATORS OF DIETARY QUALITY AND CARER'S EDUCATIONAL ATTAINMENT

It should be noted that carer's educational attainment is associated with available income and location of residence, both of which may be independent determinants of quality of diet. When all children are considered, there was only a weak correlation between carer's educational attainment and the number of indicators of dietary quality that were met (Table 3.45). Considering children aged 4–11 years and those aged 12–17 years separately, it can be seen that the correlation between meeting three or four indicators of dietary quality and carer's educational attainment is much stronger in children aged 4–11 years. For children aged 12–17 years the trend disappears, with a tendency for children of carers attaining less than the year 10 education level being more likely to meet three or four indicators of dietary quality than those with carers with greater educational attainments (Tables 3.48 and 3.49). Teenaged children have much greater control over what they eat. What they choose may be determined by factors such as their own nutritional education obtained outside the family, the value they assign to good health and their desire to demonstrate independence in addition to family customs, palatability and availability.

FIGURE 3.17: CHILDREN AGED 4–17 YEARS — PROPORTION MEETING ALL FOUR INDICATORS OF DIETARY QUALITY, BY CARER'S EDUCATIONAL ATTAINMENT AND AGE GROUP



Source: Tables 3.46 and 3.47

These indicators of quality of diet are simplistic, but they do suggest that there may be cause for concern. Compared with the NHMRC recommendations for children, the majority of Aboriginal children are not consuming sufficient fresh vegetables. The combinations of meeting each of the four indicators of dietary quality were examined. If an indicator is met primarily with the aim of achieving a healthy diet, it would be expected that those with the desire and knowledge to achieve a healthy diet would meet most or all of them, while those without such desire or knowledge would meet none or a few, for other reasons. If this were the case there would be a tendency to meet either all (or most) or none (or only a few) of the indicators. The proportion meeting each possible combination of indicators differed very little from what would be expected by chance alone, given the proportions of children meeting each of the individual indicators. This suggests that the primary impetus of meeting these indicators is unlikely to be the knowledge or desire to achieve a healthy diet on the part of many of the carers of children aged 4–11 years or on the part of children aged 12–17 years themselves.

ABORIGINAL CHILD AND YOUTH NUTRITION

There have been few well-conducted controlled intervention trials to examine the effectiveness of programs developed to improve the nutritional status of Aboriginal children.[1] An example of a successful community-based nutrition project was implemented at Kintore (Walungurru) in the Northern Territory during 1998–2001.[2] This project stemmed from a needs analysis study conducted in 1988, which identified a need to address the high hospitalisation rates of children under 2 years (principally a result of gastroenteritis and failure to thrive). The objectives of the Kintore project included decreasing the number of childhood nutrition-related hospital admissions, decreasing the number of underweight children and evaluating the cost effectiveness of the nutrition program.

The project had three components:

- Two meals were provided – breakfast and lunch, with parents paying costs
- Education sessions related to the children's growth were conducted for mothers
- A health clinic undertook monitoring and evaluation of children's growth.

Positive outcomes included:

Reduction in incidence of low birth weights (<2,500 grams). The incidence of low birth weight was 35 per cent between July 1995 June 1998 and dropped to 8 per cent for the period July 1998 to June 2001;

A reduction of 70 per cent in hospitalisation related to gastroenteritis and nutrition problems recorded over the project period;

The cost effectiveness of the program indicated that there were significant savings to be made. The study found that a reduction of 35 per cent in hospitalisation rates for a population of similar size and similar pattern of hospitalisation would result in a break-even point in relation to cost savings.

1 National Health and Medical Research Council (NHMRC), (2000). Nutrition in Aboriginal and Torres Strait Islander Peoples: NHMRC. Canberra.

2 Warchivker I, (2003). An analysis of a community response to child nutrition problems at Kintore (Walungurru) 1998–2001. Centre for Remote Health. Northern Territory.

ASTHMA

ASTHMA DEFINITION

Asthma has been defined by the *National Asthma Education and Prevention Prog*ram[1] as '… a chronic inflammatory disorder of the airways which causes recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning. …These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an increase in bronchial hyper-responsiveness to a variety of stimuli.'

1 National Institutes of Health, (1997). National Asthma Education and Prevention Program. NIH Publication No. 97–4051. Atlanta.

The occurrence of asthma and associated respiratory symptoms was measured in the WA Aboriginal Child Health Survey using survey questions that were developed for the International Study of Asthma and Allergies in Childhood (ISAAC). Using these standard questions allows comparisons with other population-based surveys conducted within Australia and other countries.[14] Asthma is more simply understood as repeated episodes of wheezing. The ISAAC questions selected for the survey were:

- whether the child has ever had asthma
- whether the child sounded wheezy during or after exercise or running around in the past 12 months
- whether the child has ever had wheezing or whistling in the chest
- whether the child has ever had hayfever
- whether the child has had a dry cough at night, apart from a cough associated with a cold or chest infection, in the past 12 months.

Additional non-ISAAC questions were asked about the use of asthma medications.

Note that a single occurrence of wheezing would not constitute having had asthma. Additionally, some children may have asthma symptoms without a diagnosis ever having been made by a medical professional, in which case the carer may not report asthma.

Most children who develop asthma have a family history of asthma, hayfever or eczema. Asthma and hayfever are allergic responses, and a dry cough can also be an allergic response and a possible indicator of more severe forms of asthma.

OCCURRENCE OF ASTHMA

The lifetime occurrence of asthma in Aboriginal children aged 0–17 years was found to be 23.2 per cent (CI: 21.6%–24.9%) (Table 3.50), with no significant differences observed between males and females. The proportion of children with asthma was lowest for younger children, with 16.8 per cent (CI: 14.3%–19.5%) of children aged 0–3 years reported to have had asthma compared with 25.6 per cent (CI: 23.2%–28.0%) of children 4–11 years and 24.4 per cent (CI: 21.4%–27.6%) of children aged 12–17 years (Tables 3.50–3.53).

The 1993 WA Child Health Survey found that 21.0 per cent (CI: 19.0%–23.0%) of children aged 4–11 years and 17.3 per cent (CI: 14.6%–20.0%) of children aged 12–16 years had asthma at the time of the survey.[10] Whilst the scope of the questions is not strictly comparable — the 1993 survey asked whether the child currently had asthma and the WAACHS asked for lifetime occurrence of asthma — asthma is usually a chronic condition. More recently, the ABS National Health Survey 2001 found that 15 per cent (CI: 10.9%–19.1%) of Australian Aboriginal and Torres Strait Islander children aged 0–14 years had asthma at the time of the survey which is similar to the 13 per cent (CI: 11.7%–14.3%) of non-Indigenous children of the same age who have asthma.[13]

Where people live is a factor influencing the occurrence of asthma. Asthma was found to be four times more common among Aboriginal and Torres Strait Islander children in the Perth metropolitan area than in extremely isolated areas of the state. An estimated 30.5 per cent (CI: 27.3%–33.8%) of children living in Perth were reported to have suffered the disease in contrast to 7.3 per cent (CI: 5.3%–9.7%) in areas of extreme isolation (Table 3.50). While children aged 0–3, 4–11 and 12–17 years had different rates of asthma, the distribution of asthma occurrence by age was spread across levels of relative isolation in the same way (Tables 3.51–3.53).

The Perth component of the ISAAC study, conducted in 1994, included a sample of 3,650 school children aged 13 or 14 years from the Perth metropolitan area. The study found 30.2 per cent of children had ever had asthma.[15] This was very similar to the 33.0 per cent (CI: 27.2%–39.1%) of Aboriginal children aged 12–17 years in the Perth metropolitan area who were reported by their carers to have ever had asthma (Table 3.53).

Children with recurring chest infections were much more likely to have a history of asthma — 52.3 per cent (CI: 47.4%–57.1%) compared with 19.1 per cent (CI: 17.5%–20.9%) of children with no recurring chest infection (Table 3.54). Conversely, children reported to have ever had asthma were much more likely to have recurring chest infections (27.7 per cent; CI: 24.1%–31.4%) than non-asthmatic children (7.6 per cent; CI: 6.7%–8.7%) (Table 3.55). Children who suffered allergies also were more likely to have ever had asthma compared to children who do not have allergies — 44.9 per cent (CI: 37.6%–52.6%) compared with 21.4 per cent (CI: 19.8%–23.1%) (Table 3.56).

WHEEZING

Carers were asked if their children had ever had wheezing or whistling in the chest. Based on these reports, 28.0 per cent (CI: 26.2%–29.9%) of Aboriginal and Torres Strait Islander children have suffered wheezing at some point in their lives. This was found to be greater for younger than older children, with 32.5 per cent (CI: 29.5%–35.8%) of children aged 0–3 years, 28.4 per cent (CI: 25.9%–31.1%) of children aged 4–11 years and 24.0 per cent (CI: 21.0%–27.3%) of children aged 12–17 years having had wheezing or whistling in the chest (Tables 3.50–3.53).

The occurrence of wheezing was also found to be much lower in the most remote and isolated areas of the state. These geographical differences were evident among all age groups. For example, in the Perth metropolitan region 32.7 per cent (CI: 29.3%–36.2%) reported a history of wheezing. This proportion reduced to 15.1 per cent (CI: 11.4%–19.2%) in areas of extreme isolation (Table 3.50).

EXERCISE-INDUCED WHEEZING

Carers were asked if their children had experienced wheezing during exercise within the last 12 months. Although these proportions were lower than for wheezing reported above, they exhibited a similar pattern by level of relative isolation. Overall, 15.9 per cent (CI: 14.7%–17.3%) of Aboriginal children were reported to have suffered exercise-induced wheezing in the last 12 months. Within the Perth metropolitan area this was reported at 21.0 per cent (CI: 18.3%–23.9%), reducing to 8.3 per cent (CI: 5.7%–11.5%) for areas of extreme relative isolation (Table 3.50). No significant differences in exercise-induced wheezing were observed by age (Tables 3.51–3.53).

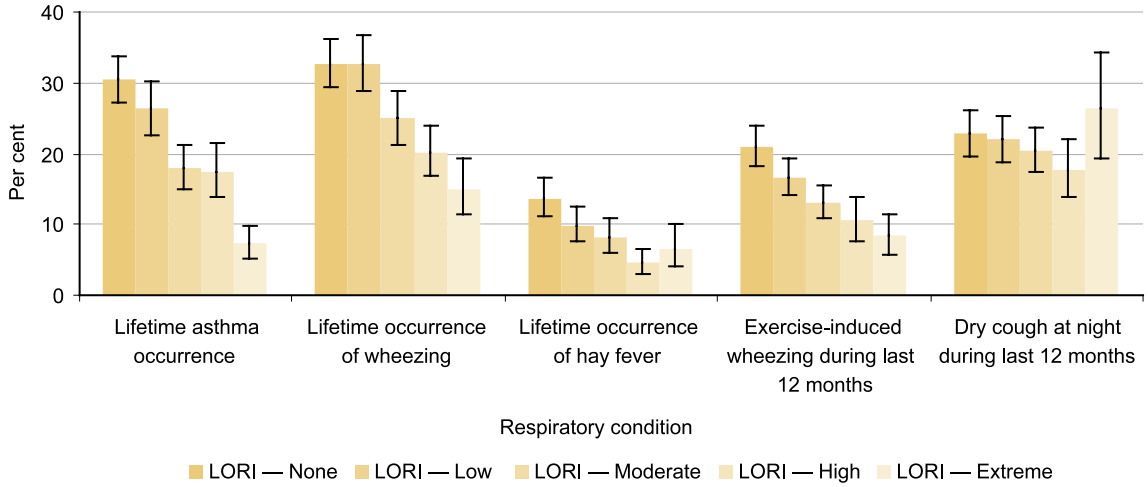
HAY FEVER

Carers were asked if their children had ever had hay fever. Overall, 9.9 per cent (CI: 8.7%–11.3%) of Aboriginal children were reported to have experienced hay fever at some time in their lives (Table 3.50). More than one in five or 21.1 per cent (CI: 16.5%–26.6%) of children aged 12–17 years living in the Perth metropolitan area were reported as having had hay fever. This is more than double the corresponding proportions observed in areas of high and extreme relative isolation where the proportions were 7.7 per cent (CI: 4.5%–11.8%) and 7.3 per cent (CI: 3.9%–12.2%) respectively (Table 3.53).

DRY COUGH AT NIGHT

A dry cough at night (not associated with a cold or chest infection) is a potential indicator of airway hyper-responsiveness to environmental irritants. These irritants include changes in air temperature and the higher levels of airborne pollen that occur at night. Disturbance of sleep because of dry coughing at night is generally associated with more severe and persistent forms of asthma.[16] Carers were asked if their children had experienced such coughing in the last 12 months. Over one in five or 21.9 per cent (CI: 20.3%–23.7%) of Aboriginal children had experienced a dry cough at night within the last 12 months (Table 3.50). This symptom was found to be lowest in the 12–17 years age group, at 16.2 per cent (CI: 13.9%–18.7%), possibly due to carers being less aware or able to report for this age group, and highest among 0–3 year olds at 26.5 per cent (CI: 23.2%–30.1%). However, in contrast to the other asthma symptoms reported above, no significant differences were found in proportions of children having a dry cough at night between each of the five categories of levels of relative isolation (Tables 3.51, 3,52 and 3.53).

FIGURE 3.18: CHILDREN — RESPIRATORY CONDITIONS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.50

FACTORS ASSOCIATED WITH THE OCCURRENCE OF ASTHMA

The causes of asthma are not yet fully understood. The survey data were used to examine the relationship between the occurrence of asthma and a variety of child, family and community factors that have been hypothesised as potentially related to asthma in some way. Logistic regression models were used to explore factors that may be related to the occurrence of asthma. As described in Chapter 1, the modelling techniques used account for the use of survey weights and the hierarchical structure of the data with selection of children within families and communities.

Factors included in the model, apart from adjusting for age and sex of the child, were:

- level of relative isolation
- maternal substance use during pregnancy
- whether the primary carer of the child is the child's birth mother
- whether the primary carer currently smokes
- duration of breastfeeding for the child
- whether the family was affected by forced removal from family or forced relocation from traditional lands
- level of relative socio-economic disadvantage of the community where the child currently lives (measured using census collection districts) *(see Glossary)*.

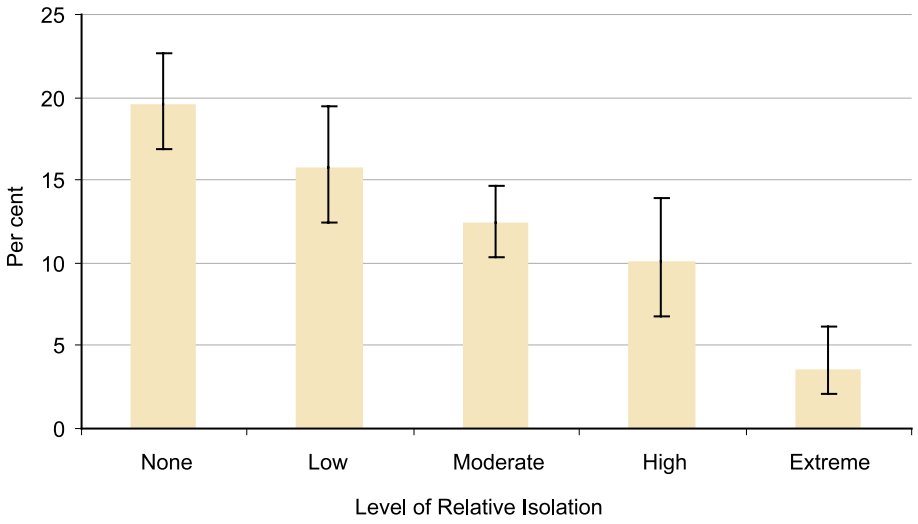
The lifetime occurrence of asthma was higher for older children, and strongly decreased with increasing levels of relative isolation.

However, no associations were found between asthma and duration of breastfeeding, whether the carers or their parents had been forcibly separated from their families or relocated from traditional lands, maternal substance use during pregnancy, whether the primary carer currently smokes or level of relative socio-economic disadvantage (Table 3.57).

USE OF ASTHMA MEDICATION

The proportion of all Western Australian Aboriginal and Torres Strait Islander children aged 0–17 years who took asthma medication in the past 12 months was 14.6 per cent (CI: 13.2%–16.1%). Significant differences were observed in the use of asthma medication by level of relative isolation. In the Perth metropolitan area, 19.6 per cent (CI: 16.9%–22.6%) of children had used asthma medication in the last 12 months. This proportion dropped steadily with increasing level of relative isolation to 3.6 per cent (CI: 2.1%–6.1%) in areas of extreme isolation (Table 3.58). No differences in the use of asthma medication were found by age and sex.

FIGURE 3.19: USE OF ASTHMA MEDICATION IN THE PAST 12 MONTHS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.58

Of the estimated 6,910 Aboriginal children in WA who had asthma, 42.0 per cent (CI: 37.6%–46.3%) manage without medication. There was little variation across levels of relative isolation ranging from 39.1 per cent (CI: 32.4%–45.9%) in the Perth metropolitan area to 53.5 per cent (CI: 30.6%–73.2%) in areas of extreme isolation. The lack of significant difference between the levels of relative isolation suggests that the higher levels of asthma medication used in more urbanised settings more likely reflects the actual pattern of disease occurrence than differences in the way asthma is diagnosed and treated across these settings (Table 3.59).

TYPES OF ASTHMA MEDICATION USED

Details were collected on up to three asthma medications that had been used in the past year *(see commentary box)*. Around 3,510 or 11.8 per cent (CI: 10.5%–13.2%) of Aboriginal children under the age of 18 years were estimated to have used 'reliever' asthma medications in the past 12 months. A further 780 or 2.6 per cent

(CI: 2.1%–3.3%) had used 'preventer' medications and too few children had used 'controller' medications to allow reliable estimation (Table 3.60). The proportion of children having used each of these asthma medication types did not vary significantly by the age groups 0–3, 4–11 and 12–17 years (Table 3.60).

ASTHMA MEDICATIONS

The particular asthma medications which children had used during the past 12 months were identified by showing the carers a set of prompt cards with full-colour illustrations of the most commonly prescribed asthma medications in their usual dispensing formats for inhalation (i.e. aerosol, spinhaler, rotahaler and nebuliser). As the dispensers are colour-coded, it was also possible to classify each medication by its general class of action as a 'reliever', 'preventer' or 'controller'. When the asthma medication was available in the household to be viewed directly by the interviewer, details of the medication were also recorded from the label.

The medications shown on the 'relievers' prompt card included the bronchodilators Asmol, Bricanyl, Respolin, Atrovent, Airomir and Ventolin. These 'relievers' are used for relaxing the muscles lining the airways to allow the airways to expand to their normal size. The 'preventers' prompt card depicted the anti-inflammatory medications Respocort, Pulmicort, Becotide, Becloforte, Flixotide, Tilade and Intal. The 'controllers' prompt card included newer asthma medications Serevent, Oxis and Foradile, which have long-acting bronchodilatory and/or anti-inflammatory effects.

PATTERN OF MEDICATION USE

Information was sought regarding the survey children's usual pattern of asthma medication use (Table 3.61). Carers were asked whether these medications were used *only* when the child was wheezing (i.e. as a 'reliever') or whether they were used regularly to prevent the onset or persistence of asthma symptoms (i.e. as a 'preventer' or 'controller').

Of those children who used 'reliever' medications, 73.2 per cent (CI: 67.9%–78.2%) used these medications only when wheezing and 16.8 per cent (CI: 12.5%–21.6%) used them regularly. 'Preventer' medications were equally likely to have been used 'when wheezing' (47.4 per cent; CI: 36.4%–58.9%) or 'regularly' (45.8 per cent; CI: 33.8%–57.3%). Meaningful analysis of the patterns of use of 'controller' medications was not possible because too few children had used these medications.

A small proportion of children had used more than one asthma medication in the past year (Table 3.62). Most commonly this involved use of a 'preventer and a reliever' (3.5 per cent; CI: 2.8%–4.3%). Other combinations included 'two or more relievers', 'two preventers and a reliever', and a 'preventer and two relievers' and occurred too infrequently to report reliably.

ASTHMA IN ABORIGINAL CHILDREN

The prevalence of asthma is believed to have increased among all Australian children over the past few decades.[1] This parallels worldwide trends reported by the International Study of Asthma and Allergies in Childhood (ISAAC) which show a rise in the proportion of children with asthma symptoms measured by objective tests such as spirometry, airway responsiveness by histamine inhalation tests, and atopy by skin prick tests.[2] While this may, in part, be due to changing definitions of asthma, it is now generally accepted that the reported increases in prevalence reflect

ASTHMA IN ABORIGINAL CHILDREN (Continued)

real differences.[3] Among the most likely reasons cited for these increases are gene interactions with changes in environmental and/or lifestyle factors. Current theories include the effects on the immune system of exposure to parasitic and other infection in early life, breastfeeding and diet, and the increased risks associated with exposure to indoor and outdoor pollutants and airborne allergens.[2]

The Western Australian Aboriginal Child Health Survey provides representative population level asthma prevalence estimates for Aboriginal and Torres Strait Islander children and youth. The relatively low prevalence of asthma in remote Aboriginal children is comparable to findings recently reported from a clinical and genetic study undertaken in two Western Australian Aboriginal communities (Warakurna and Kalumburu). [4] Of particular note was the survey finding that remote Aboriginal children exhibiting asthma symptoms were equally likely to have received a medical diagnosis and treatment for asthma as those living in urban areas. This suggests that the observed lower rates of asthma in remote communities genuinely reflect lower incidence and are not an artefact of non-diagnosis of the condition in these areas.

The difference in asthma prevalence between Aboriginal children in urban and remote areas of Western Australia are similar to those observed in earlier studies of Indigenous populations in Australia and countries such as Africa.[3, 5] However, the reasons for the increase in asthma which accompanies increasing urbanisation remain speculative. Asthma is now considered to be a classic example of gene-environment interaction with a host of environmental triggers, from cigarette smoke to house dust mites known to be implicated. At least five genes have been identified as playing a role in the development of asthma and related disorders such as eczema.[6, 7] Lifestyle changes in children's exposure to asthma-triggering factors and changes in protective factors such as breastfeeding have been suggested as key determinants of when and how genetic vulnerability might be expressed. One theory gaining support from evidence from several sources suggests that the immune system genes involved in asthma were originally evolved to fend off parasitic infections but are now being triggered by new environmental exposures. This hypothesis was tested in a gene-environment study in a remote Western Australian Aboriginal population heavily infected with hookworm and a stronger genetic effect was found among those individuals having this parasite.[8] This suggests that children raised in settings where there is less exposure to parasite infection are now susceptible to having these genes triggered by other allergens such as house-dust mites and airborne pollutants, and it is this which is contributing to the observed increases in asthma in urbanised settings.[8]

1 Peat JK, Van Den Berg RH, Green WF, Mellis CM, Leeder SR, Woolcock AJ, (1994). Changing prevalence of Asthma in Australian children. *British Medical Journal* 308; 1591–1596.

2 ISAAC Steering Committee, (1998). Worldwide variations in the prevalence of asthma symptoms: The International Study of Asthma and Allergies in Childhood (ISAAC). *European Respiratory Journal* 12; 315–335.

3 Veale AJ, Peat JK, Tovey ER, Salome CM, Thompson JE, Woolcock AJ, (1996). Asthma and Atopy in four rural Australian Aboriginal Communities. *Medical Journal of Australia* 165; 192–196.

4 Verheijden MW, Ton A, James AL, Wood M, Musk AW, (2002). Respiratory morbidity and lung function in two Aboriginal communities in Western Australia. *Respirology* 7; 247–53.

5 Yemaneberhan H, Bekele Z, Venn A, Lewis S, Parry E, Britton J, (1997) Prevalence of wheeze and asthma and relation to atopy in urban and rural Ethiopia. *Lancet* 350; 85–90.

6 Palmer LJ, Cookson WO, (2000). Genomic Approaches to Understanding Asthma. *Genome Research* 10; 1280–87.

7 Zhang Y, Leaves NI, Anderson GG *et al*, (2003). Positional cloning of a quantitative trait locus on Chromosome 13q14 that influences immunoglobulin E levels and asthma. *Nature Genetics* 34; 181–86.

8 Moffatt MF, Faux JA, Lester S, Pare P, McCluskey J, Spargo R, James A, Musk AW, Cookson WO, (2003). Atopy, respiratory function and HLA-DR genes in Aboriginal Australians. *Human Molecular Genetics*. 12; 625–30.

CHRONIC HEALTH CONDITIONS

Carers were asked if the children in their care suffered from any of a range of chronic health problems. The prevalence of selected health conditions was examined with reference to the child's age, sex, levels of relative isolation, levels of carer education and financial strain. Only statistically significant associations are reported here. Conditions of low prevalence, which include cerebral palsy, muscle stiffness or deformity, arthritis, rheumatism, missing limbs or digits, spina bifida, kidney/renal disease, diabetes, cancer or leukaemia and muscular dystrophy are not described in this section, but are the source of some of the disability described in a following section.

RECURRING INFECTIONS

Infections were the most common source of chronic health problems. Carers were asked if their child had any of a number of recurring infections.

Recurring chest infections

Recurring chest infections affected 12.3 per cent (CI: 11.1%–13.5%) of Aboriginal and Torres Strait Islander children aged 0–17 years. The prevalence of recurring chest infections tended to reduce with increasing age. For children aged 0–3 years the prevalence was 19.4 per cent (CI: 16.6%–22.7%) compared with 8.0 per cent (CI: 6.4%–9.7%) for children aged 12–17 years (Figure 3.20). There were no significant associations between prevalence of recurring chest infections and level of relative isolation (Figure 3.21).

Recurring skin infections

Carers were asked if their children had 'recurring skin infections, such as school sores or scabies', and were prompted that eczema is not an infection. An estimated 8.5 per cent (CI: 7.4%–9.7%) of all Aboriginal children aged 0–17 years were reported by their carers to have recurring skin infections. Children aged 4–11 years were more likely to have recurring skin infections (10.3 per cent; CI: 8.8%–11.9%) than 12–17 year olds (6.1 per cent; CI: 4.4%–8.1%) (Figure 3.20).

There was little variation in prevalence by level of relative isolation, with the exception that prevalence was doubled in extremely isolated areas, which had a reported prevalence of 17.6 per cent (CI: 12.4%–23.5%), significantly more prevalent than in any other LORI category (Figure 3.21).

Recurring gastrointestinal infections

An estimated 5.6 per cent (CI: 4.7%–6.6%) of Aboriginal and Torres Strait Islander children were reported by their carers to suffer from recurring gastrointestinal infections. Prevalence decreased significantly after 12 years of age (Figure 3.20). Again, there was little variation in prevalence by degree of relative isolation, with the exception that prevalence doubled in extremely isolated areas (Figure 3.21).

Recurring ear infections

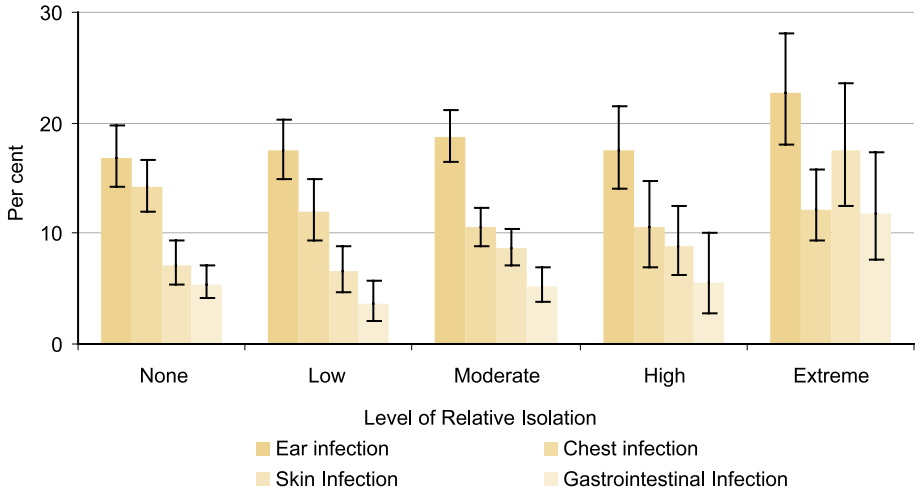
An estimated 18.1 per cent (CI: 16.8%–19.5%) of Aboriginal and Torres Strait Islander children aged 0–17 years were reported by their carers to have recurring ear infections. Older children aged 12–17 years were significantly less likely to have recurring ear infections (13.6 per cent; CI: 11.4%–16.0%) than children aged 0–3 years (20.4 per cent; CI: 17.6%–23.5%) and children aged 4–11 years (19.9 per

cent; CI: 18.1%–21.9%) (Figure 3.20). Again, prevalence varied little by degree of relative isolation, with the exception that prevalence was somewhat, but not significantly, higher in extremely isolated areas (Figure 3.21).

FIGURE 3.20: CHILDREN — PREVALENCE OF RECURRING INFECTIONS, BY AGE

Source: Table 3.63

FIGURE 3.21: CHILDREN — PREVALENCE OF RECURRING INFECTIONS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.64

Ear infections with discharge

In addition to recurring ear infections, carers were asked whether their child had ever had 'runny ears'. Naturally the responses to these questions partially overlap. Of those children with recurring ear infections, 69.3 per cent (CI: 65.7%–72.9%) had had at least one instance in which the infection had been sufficiently severe to rupture the ear drum causing ear discharge (Table 3.65). Conversely 57.5 per cent (CI: 53.9%–61.0%) of children who have ever had discharging ears experienced recurring ear infections (Table 3.66).

For this survey, ear infections were classified as those that were:

- recurring, but never discharging
- a single episode of discharging ear(s)
- both recurring ear infections and at least one episode of discharging ear(s).

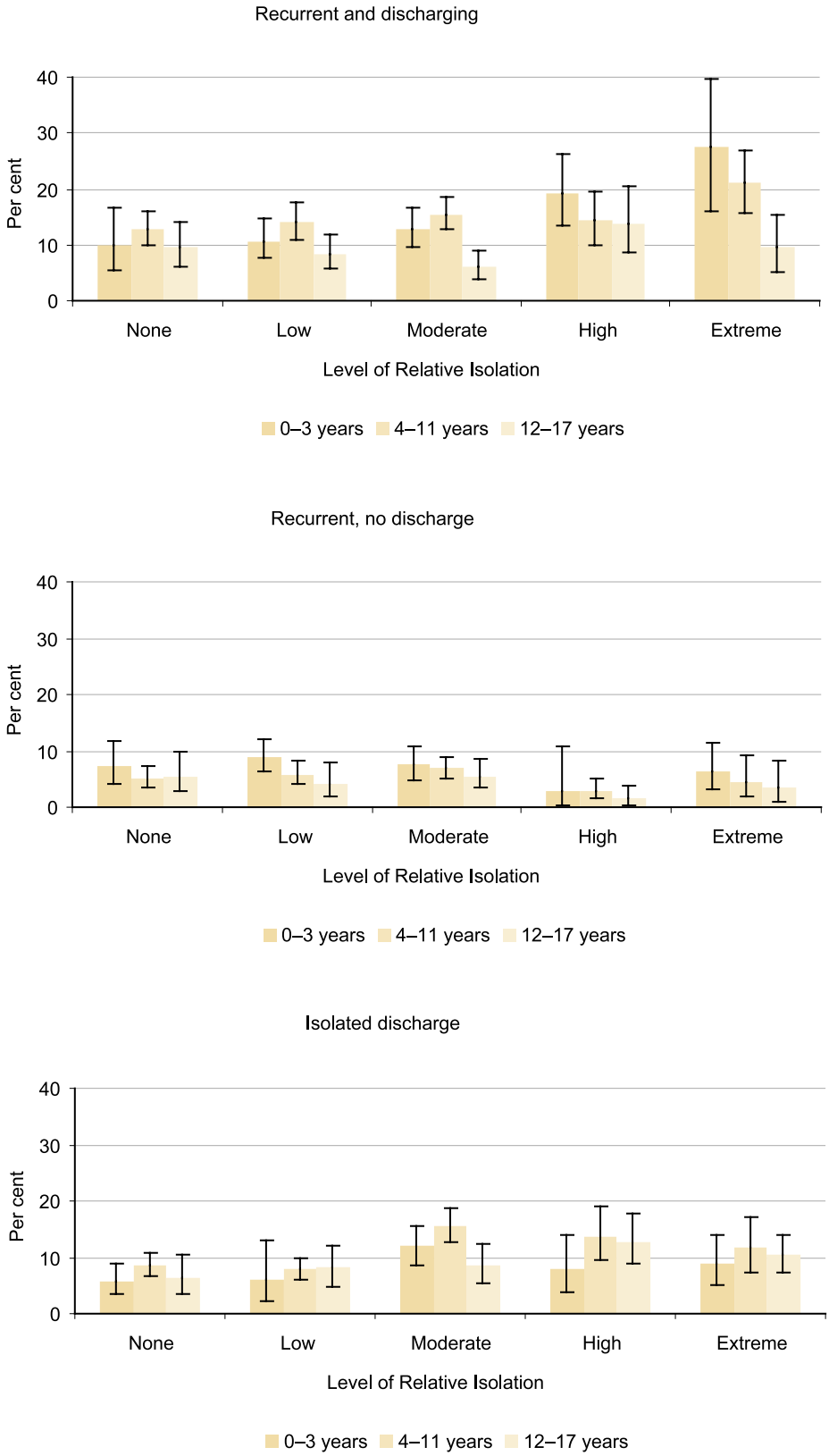
One in eight Aboriginal children (12.5 per cent; CI: 11.4%–13.7%) had recurring ear infections with at least one episode of discharging ears, a further 9.3 per cent (CI: 8.4%–10.3%) had had an isolated case of discharging ears, and a further 5.6 per cent (CI: 4.8%–6.4%) had recurring ear infections without drum rupture (Table 3.68). Figure 3.22 shows that the prevalence of the combined condition increases with increasing isolation and decreases with increasing age (bearing in mind that these data are likely to refer to approximately the last 5 years of a child's life). This is not true of the isolated conditions, and the prevalence of recurring infection without rupture tends to decrease with increasing isolation.

OTITIS MEDIA

Otitis media is an infection of the middle ear. It may occur in one or both ears and is the most common ear problem in children. The symptoms of otitis media vary. Mild cases may exhibit only irritability due to earache resulting from increased pressure in the middle ear. There may occasionally be cold and flu like symptoms with coughing and a runny nose accompanying the earache. If the pressure becomes too great, the ear drum may rupture which impairs hearing temporarily and results in a discharge from the ear. Thus 'runny ears' represent more severe forms of otitis media. The duration of infection also varies: if infection persists for longer than two weeks, it is referred to as *chronic*, and if an infectious discharge persists for more than two weeks it is referred to as *chronic suppurative otitis media*. The eardrum usually repairs itself once the infection has passed, but if infection and discharge occurs repeatedly, the ear drum loses its ability to repair itself and permanent hearing loss results.

Otitis media frequently occurs early in life and may persist through the lengthy developmental period that encompasses the acquisition of speech and language, school enrolment and engagement in learning.

FIGURE 3.22: CHILDREN — RECURRING AND DISCHARGING EAR INFECTIONS BY CHILD'S AGE AND LEVEL OF RELATIVE ISOLATION



Source: Tables 3.68, 3.69 and 3.70

The risk of discharging ears in children with recurring ear infections increases significantly in the most isolated areas, from 65.4 per cent (CI: 61.1%–69.6%) in areas of no, low or moderate isolation to 83.0 per cent (CI: 76.4%–88.3%) in areas of high and extreme isolation (Table 3.72). This risk remains the same across age groups in the more isolated areas, but peaks in the 4–11 year age group in less isolated areas. It can also be seen from Figure 3.22 that children in more isolated areas not only have a higher rate of ear infections, but acquire them earlier, with the combined infection having the highest prevalence in the 0–3 year age group in the most isolated areas, but in the 4–11 year age group in less isolated areas.

The occurrence of isolated eardrum rupture shows a rather different pattern, with prevalence peaking in all areas in the 4–11 year age group and being highest in areas of moderate isolation (Tables 3.68–3.70).

Associations with birth weight and gestation

Having more than one recurring infection tended to be associated with lower birth weight resulting from both poorer intrauterine growth and shorter gestation, but none reached statistical significance. Recurring and discharging ear infections were more strongly associated with preterm birth: 69.5 per cent (CI: 65.6%–73.3%) born at term compared with 75.6 per cent (CI: 73.4%–77.8%) of those without ear infections (Table 3.73). This shorter gestation was primarily responsible for the lower mean birth weight of 3,090 grams (CI: 3,030g–3,140g) compared with 3,190 grams (CI: 3,160g–3,220g) of those without ear infections (Table 3.74), though there was also a tendency to poorer intrauterine growth that did not reach statistical significance. Children with an isolated event of discharging ears were similar in birth weight and gestation to those without ear infections, while children with recurring ear infections without discharge were more likely to be born at term but have grown less well before birth than those whose recurring ear infections resulted in rupture (Tables 3.72 and 3.73).

Co-occurrence of recurring infections and discharging ears

Two thirds of the children, (68.6 per cent; CI: 66.7%–70.4%) reported none of the four types of recurring infections enquired about, while 21.7 percent (CI: 20.3%–23.1%) reported only one type of recurring infection. The remaining 9.7 per cent (CI: 8.6%–10.9%) reported more than one of the types of recurring infection. The majority (6.9 per cent; CI: 6.0%–7.9%) suffered from two types, 2.3 per cent (CI: 1.9%–2.8%) suffered from three types and 0.5 per cent (CI: 0.3%–0.9%) suffered from all four types of recurring infection. Multiple recurring infections were found in all age groups, but prevalence decreased with age: 36.0 per cent (CI: 30.4%–42.2%) of children aged 0–3 years had more than one recurring infection, compared with 24.1 per cent (CI: 18.9%–29.9%) of children aged 12–17 years. Significantly more children in areas of extreme isolation had more than one type of recurring infection, 17.9 per cent (CI: 12.3%–23.9%), than seen in less isolated areas (Tables 3.74—3.77).

When the individual combinations of recurring infections were examined, all types were found to occur more often in combination with other recurring infections than expected by chance. The strength of association between one type of infection and another can be described by the relative risk. For example, Figure 3.23 shows that the relative risk of recurring gastrointestinal infections in children with recurring ear infections is 3.6 (CI: 2.7–4.8). This means that children with recurring ear infections are 3.6 times more likely to have recurring gastrointestinal infections than are children who do not have recurring ear infections. Figure 3.23 shows that the risk of any recurring infection is significantly increased in the presence of any other recurring infection, although some are more strongly associated than others.

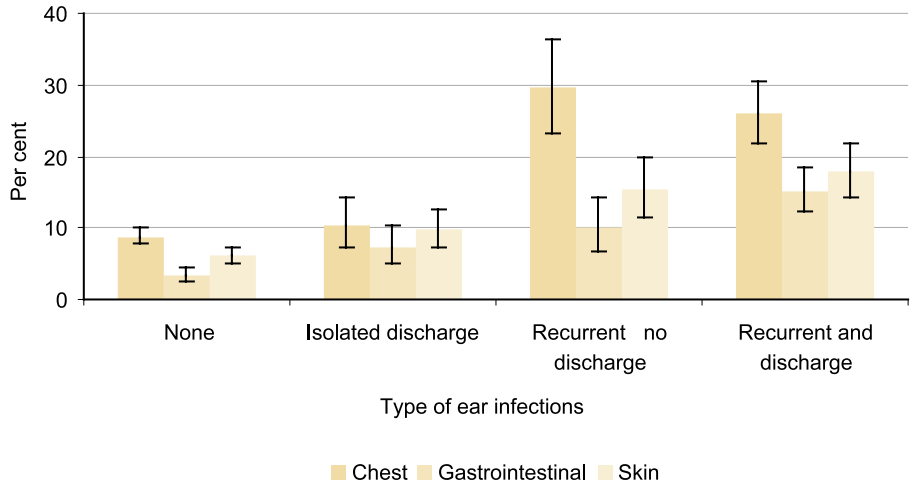
FIGURE 3.23: RELATIVE RISK (CONFIDENCE INTERVAL) OF ANOTHER RECURRING INFECTION, GIVEN THE PRESENCE OF EXISTING.RECURRING INFECTION

Current recurring infection	Relative risk of another recurring infection			
	Chest	Gastrointestinal	Skin	Ear
Chest		4.8 (3.6–6.4)	3.0 (2.3–3.8)	2.7 (2.3–3.1)
Gastrointestinal	3.8 (3.1–4.6)		4.0 (3.1–5.2)	2.6 (2.2–3.2)
Skin	2.8 (2.2–3.4)	4.4 (3.2–6.1)		2.2 (1.9–2.7)
Ear	3.0 (2.5–3.6)	3.6 (2.7–4.8)	2.6 (2.1–3.3)	

Source: Table 3.79

The additional effect of discharging ears is shown in Figure 3.24. Recurring ear infections with or without discharge have similarly strong associations with gastrointestinal, skin and particularly chest infections, but an isolated occasion of discharging ears has a much smaller effect on the risk of gastrointestinal and skin infections and does not significantly change the risk of recurring chest infections from that observed in children without recurring or discharging ear infections.

FIGURE 3.24: CHILDREN — PROPORTION WITH CHEST, GASTROINTESTINAL OR SKIN INFECTIONS BY TYPE OF EAR INFECTION.



Source: Table 3.80

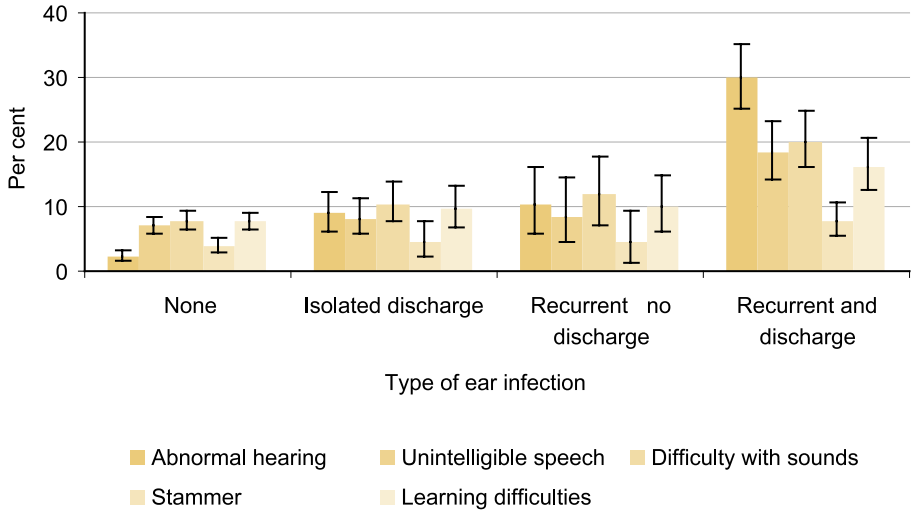
Functional impact of ear infections

Carers of children aged 4–17 years were asked whether their child's hearing was normal. The prevalence of abnormal hearing was 6.8 per cent (CI: 5.9%–7.8%) and did not differ by age group or by level of relative isolation. There was a very significant association between abnormal hearing and recurring ear infections with discharge (Table 3.81). Of children aged 4–11 years with recurring ear infections with discharge, 28.3 per cent (CI: 22.8%–34.3%) had abnormal hearing compared with 1.4 per cent (CI: 0.7%–2.4%) of those without ear infections (Table 3.82). The associations between abnormal hearing and either an isolated occasion of ear discharge or recurring infection without discharge were weaker although still very

significant: 11.1 per cent (CI: 7.7%–15.7%) and 9.3 per cent (CI: 5.0%–15.9%) respectively. In children aged 12–17 years, there were similar associations but the prevalence of abnormal hearing was higher in all categories, including children with no reported ear infections (Table 3.83). This may have been because carers reported primarily ear infections that were considered current or recent and, simply because they are older, older children have a greater chance of having had earlier ear infections not reported at interview that may have damaged their hearing.

Loss of hearing has repercussions for language development and learning. It can be seen in Figure 3.25 that those with recurring ear infections with discharge not only had increased risk of abnormal hearing, but also a significantly greater risk of language problems and learning difficulties.

FIGURE 3.25: CHILDREN WITH EAR INFECTIONS — FUNCTIONAL IMPACT OF THE EAR INFECTION



Source: Table 3.81

OTITIS MEDIA – GLOBAL PERSPECTIVE

Chronic suppurative otitis media is a condition that occurs at frequencies in excess of two per cent in developing countries compared with less than one per cent in developed countries. However in some ethnic groups, notably Canadian Inuit and Australian Aboriginal people, rates in excess of 12 per cent have been observed.[1] For reference, the World Health Organisation regards a prevalence of chronic suppurative otitis media of greater than one per cent to present an avoidable health burden and rates of greater than four per cent to indicate a massive public health problem needing urgent attention. The additional risk in Inuit and Aboriginal people may be attributable to a slightly different architecture of the Eustachian tube that renders the middle ear more accessible to infections in the nose and throat[1], thereby increasing their need for effective primary preventive health care.

A survey of Aboriginal people living in the Pilbara region of Western Australia observed signs of otitis media (of unspecified duration or severity) in 25.6 per cent of children aged 10 years or less compared with 3.2 per cent in non-Aboriginal children of the same age.[2] These rates are distressingly high and compatible with the rates of ear infection observed in this survey.

1 World Health Organisation, (2002). Prevention of hearing impairment from chronic otitis media. Report of a WHO/CIBA foundation workshop,London, (19–21 November 1996). WHO. Geneva, <http://www.who.int/pbd/pdh/Docs/COMREP-8A.pdf >.

2 Torzillo PJ, Waterford JE, Hollows FC, Jones DL, (1983). Respiratory disease amongst Aborigines in the Pilbara. International. *Journal of Epidemiology* 12 (1); 105–106.

Associations with primary carer financial strain and educational attainment

An estimated 16.3 per cent (CI: 11.7%–22.0%) of children in households where the primary carer reported that they were ‘spending more money than we get’ suffered from more than one type of recurring infection. This is significantly higher than the prevalence in children in households where the primary carer reported that they ‘can save a bit now and again’ (8.4 per cent; CI: 6.7%–10.3%), or ‘can save a lot’ (7.2 per cent; CI: 3.7%–12.0%) (Table 3.84).

There was no association between either recurring infections or ear infections and the primary carer’s educational attainment (Table 3.85).

RECURRING INFECTIONS

Recurring infections are the dominant illnesses faced by Aboriginal and Torres Strait Islander children. Some of these infections are also associated with the occurrence of other acute and chronic illnesses through the life course. For example, recurring ear infection (e.g. otitis media) and recurring skin infection (e.g. pyoderma) are particularly burdensome with the latter in some Aboriginal communities being associated with the highest worldwide rates of acute rheumatic fever[1]. The major pathogen of skin infection, group A streptococcus, is also associated with chronic renal failure – a prevalent and highly burdensome condition of Aboriginal adults.

While levels of relative isolation have been shown to be associated with rates of recurring infection, this is particularly true for areas of extreme isolation.

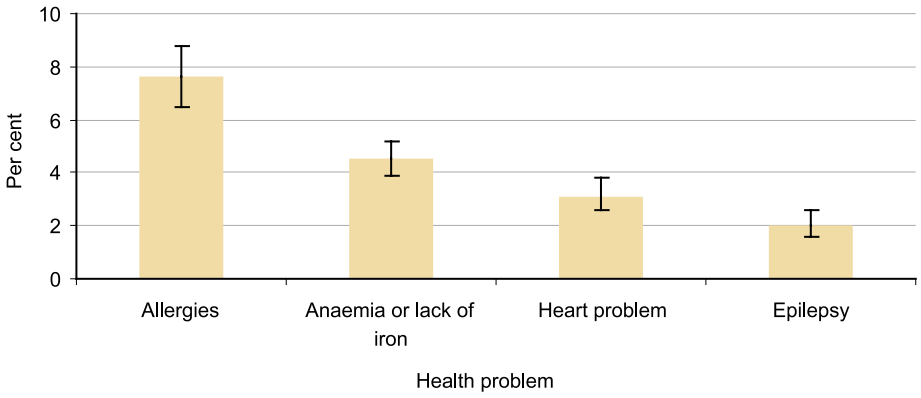
The reduction of the level of recurring infections in children is a principal performance indicator of progress in Aboriginal health. These high levels of recurring infections are related to the broad spectrum of disadvantage that Aboriginal people experience. Provision of basic public health, sanitation, nutrition, as well as access to health care and education, remain central to the effective reduction of these illnesses.

1 Currie BJ, Carapetis JR, (2000). Skin infection and infestations in Aboriginal communities in northern Australia. *Australasian Journal of Dermatology* 41; 139–145.

OTHER CHRONIC HEALTH CONDITIONS — CHILDREN AGED 0–17 YEARS

All carers were asked whether their children had ‘allergies’, ‘anaemia or lack of iron (thin blood)’, a ‘heart problem’ and ‘epilepsy’. Of these conditions, the most prevalent was allergies, reported by carers of 7.6 per cent (CI: 6.5%–8.8%) of children. Anaemia or lack of iron was the next most prevalent of these health conditions with a reported rate of 4.5 per cent (CI: 3.9%–5.2%), followed respectively by heart problems (3.1 per cent; CI: 2.6%–3.8%) and epilepsy (2.0 per cent; CI: 1.6%–2.6%) (Table 3.86).

FIGURE 3.26: CHILDREN 0–17 YEARS — OTHER CHRONIC HEALTH CONDITIONS



Source: Table 3.86

OTHER CHRONIC HEALTH CONDITIONS — CHILDREN AGED 4–17 YEARS

Carers of children aged 4–17 years were also asked whether their children had 'migraines or severe headaches' and 'developmental delay or lag (difficulty in learning)', hereafter referred to as *learning difficulties* (Table 3.87). An estimated 12.4 per cent (CI: 11.1%–13.8%) of these children were reported by their carers to have had migraines or severe headaches, while 9.0 per cent (CI: 7.8%–10.4%) were reported as having learning difficulties.

As stated previously, children with recurring and discharging ear infections had a significantly greater risk of learning difficulties (Figure 3.25).

CHILDHOOD INJURY

Children of all ages participate in activities that involve rigorous play and risk behaviour that occasionally results in injuries being sustained. This section details carer reported prevalence of broken bones, head injuries resulting in loss of consciousness, accidental burns and accidental poisonings. The distribution of these injuries was examined with respect to age, sex, levels of relative isolation, and to levels of carer education and financial strain. Since lifetime occurrence was requested and, for more serious injuries such as broken bones and head injuries with loss of consciousness, likely to be remembered and reported, it is to be expected that older children would report higher rates as they had had more time to acquire an injury (Tables 3.87 and 3.88).

BROKEN BONES

These were the most commonly occurring type of injury. The proportion of children aged 12–17 years who had experienced at least one bone fracture was 18.3 per cent (CI: 15.7%–21.1%), almost one child in five (Table 3.88). This was lower than the proportion of 12–16 year olds who had ever broken a bone as reported in the 1993 WA Child Health Survey of the total population where the proportion was 25.6 per cent (CI: 22.2%–29.0%), just over one in four children.[10]

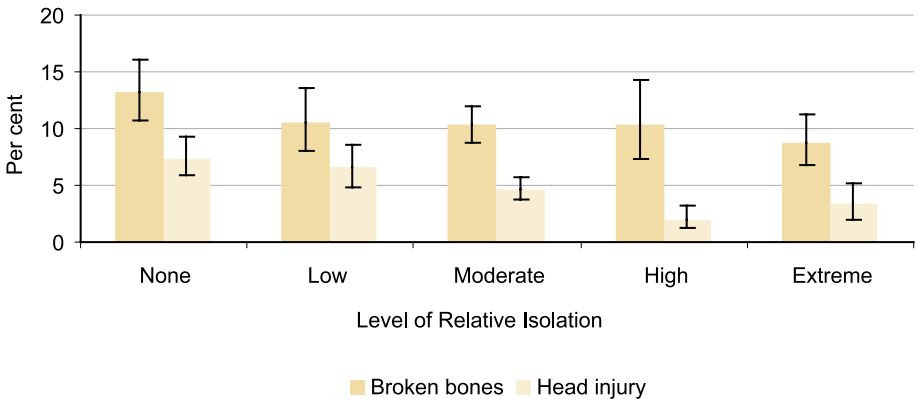
There was no significant association between reported bone fractures and levels of relative isolation, nor were there statistically significant differences between males and females.

HEAD INJURIES

Almost one tenth of Aboriginal and Torres Strait Islander children aged 12–17 years had suffered head injuries that rendered them unconscious (9.7 per cent; CI: 7.9%–11.7%), compared with 4.5 per cent (CI: 3.7%–5.5%) of those aged 4–11 years (Table 3.88). These figures are similar to those reported for the general population in the 1993 WA Child Health Survey, 8 per cent for adolescents and 3 per cent for 4–11 year olds.[10]

As shown in Figure 3.27, Aboriginal and Torres Strait Islander children in areas where the levels of relative isolation were moderate, high and extreme were significantly less likely to be reported to have sustained a head injury with loss of consciousness than their counterparts in the Perth metropolitan area. For example, in areas of extreme relative isolation, 3.4 per cent (CI: 2.0%–5.1%) of children had sustained a head injury with loss of consciousness compared with children living in Perth where the proportion was 7.4 per cent (CI: 5.9%–9.3%).

FIGURE 3.27: CHILDREN — INJURIES SUSTAINED, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.89

BURNS

Carers were asked whether any of their 4–17 year old children had ever been admitted to hospital due to a burn. An estimated 3.5 per cent (CI: 3.0%–4.1%) of Aboriginal and Torres Strait Islander children and adolescents were reported to have suffered such burns (Table 3.90). This is significantly more than the 2.0 per cent (CI: 1.5%–2.6%) reported for 4–16 year olds in the WA Child Health Survey.[10] There was no variation in proportion by level of relative isolation (Table 3.91).

POISONING

Approximately 2.2 per cent (CI: 1.7%–2.9%) of Aboriginal and Torres Strait Islander children and adolescents aged 4–17 years were admitted to hospital due to an accidental poisoning (Table 3.90). This rate is slightly, but not significantly, lower than the 2.9 per cent (CI: 2.3%–3.7%) reported for 4–16 year olds in the WA Child Health Survey.[10] There was no variation in proportion by level of relative isolation (Table 3.91).

ORAL HEALTH

Carers were asked whether their child currently has holes in their teeth (cavities), has ever had teeth removed because they were bad, has had dental fillings or ever had a problem with sore or bleeding gums.

FIGURE 3.28: ALL CHILDREN — SELECTED ORAL HEALTH PROBLEMS, BY AGE

Source: Table 3.93

PREVALENCE OF TOOTH CAVITIES IN CHILDREN

An estimated 18.6 per cent (CI: 17.1%–20.2%) of Aboriginal and Torres Strait Islander children were reported by their carers to have holes in their teeth.

As expected, the prevalence of cavities was lowest for children aged 0–3 years at 8.2 per cent (CI: 6.4%–10.2%), and highest for children aged 4–7 years at 30.6 per cent (CI: 27.8%–33.6%). Prevalence was lower for older children with 24.0 per cent (CI: 20.7%–27.6%) of 8–11 year olds and 13.3 per cent (CI: 11.1%–15.9%) of 12–17 year olds having holes in their teeth (Table 3.93).

As displayed in Figure 3.29 there was no difference in the proportion of children who had holes in their teeth in areas where the levels of relative isolation were None, Low or Moderate. However, the prevalence of cavities was significantly less in areas of extreme isolation. In the Perth metropolitan area the prevalence was 19.3 per cent (CI: 16.6%–22.2%) compared with 12.3 per cent (CI: 9.6%–15.4%) in areas of extreme isolation (Table 3.92).

TOOTH EXTRACTIONS

Almost one in ten (9.3 per cent; CI: 8.3%–10.4%) Aboriginal and Torres Strait Islander children were reported to have ever had a tooth removed because if was bad. Obviously, very young children (aged 0–3 years) were far less likely to have had a tooth extraction for dental decay, but the proportion of children who had ever had a tooth extraction for decay was approximately constant for children aged 4–7 years, 8–11 years and 12–17 years (Table 3.93).

DENTAL FILLINGS

Carers reported that 27.5 per cent (CI: 25.7%–29.4%) of children have ever had a tooth filled.

As might be expected a greater proportion of older children than younger children were reported by their carers to have ever had a dental filling. Less than 1 per cent (CI: 0.4%–1.3%) of 0–3 year olds were reported to have a filling while among 8–11 year olds and 12–17 year olds the proportions were 42.2 per cent (CI: 38.5%–46.0%) and 40.0 per cent (CI: 36.4%–43.8%) respectively (Table 3.93).

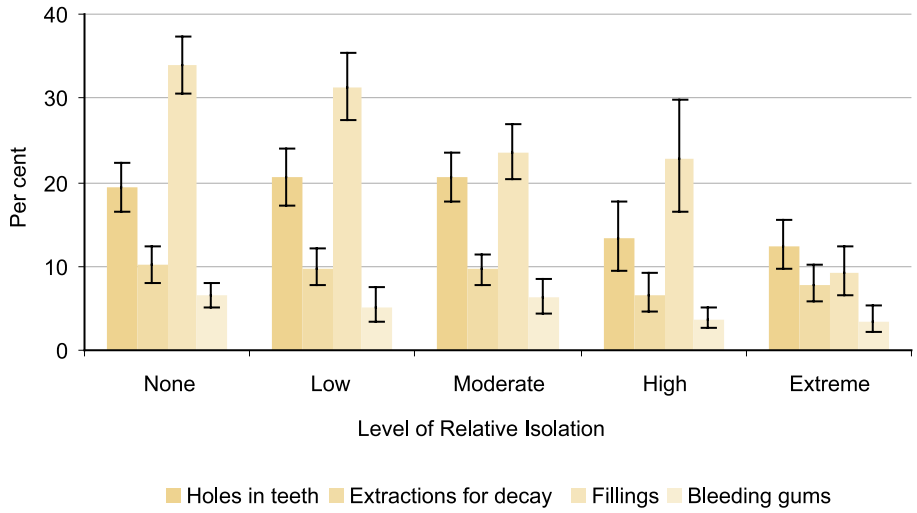
There was also a significant decrease in lifetime occurrence of fillings by level of relative isolation – from 33.9 per cent (CI: 30.6%–37.4%) in the Perth metropolitan areas to 9.2 per cent (CI: 6.6%–2.4%) in areas of extreme isolation (Table 3.92).

SORE OR BLEEDING GUMS

An estimated 5.5 per cent (CI: 4.7%–6.4%) of all children have had a problem with sore or bleeding gums. As shown in Figure 3.29, the prevalence of sore or bleeding gums was significantly higher among children aged 12–17 years (8.0 per cent; CI: 6.5%–9.7%) than in children aged 0–3 years and 4–7 years where the proportions of children with lifetime occurrence of sore or bleeding gums were 1.5 per cent (CI: 0.8%–2.9%) and 4.9 per cent (CI: 3.6%–6.2%) respectively (Table 3.93).

There was no significant difference in the lifetime occurrence of sore or bleeding gums according to the level of relative isolation in which the children live.

FIGURE 3.29: CHILDREN — SELECTED ORAL HEALTH PROBLEMS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.92

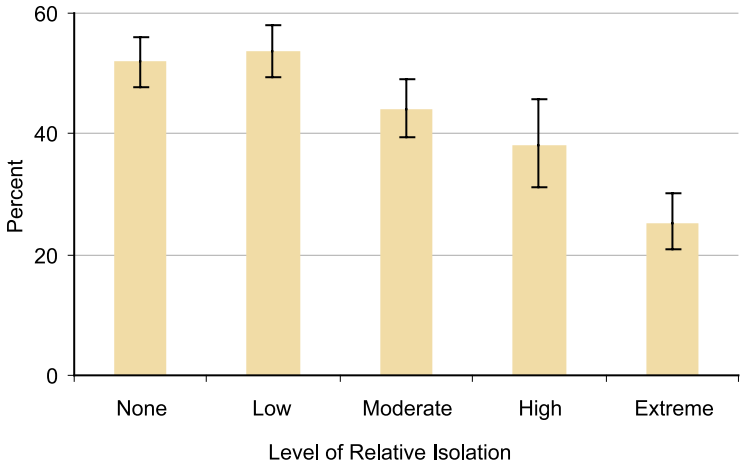
OVERALL OCCURRENCE OF DENTAL PROBLEMS

Data on holes in teeth, tooth removal for decay and fillings were combined to determine the overall occurrence of one or more of the dental problems. The problem of sore or bleeding gums was excluded from this analysis as it is symptomatic of periodontal (gum) disease. Overall, 37.8 per cent (CI: 35.9%–39.8%) of children had experienced tooth decay, tooth removals or fillings. As expected, very few children

under 4 years of age had experienced these problems (8.7 per cent; CI: 6.9%–10.9%) (Table 3.94). Almost half of children aged 4–17 years have had at least one dental problem (46.6 per cent; CI: 44.3%–48.9%) (Table 3.95).

Among children aged 4–17 years, there was a substantial decrease in the proportion of children who had experienced one or more of these dental problems by level of relative isolation. Of children living in the Perth metropolitan area, 52.0 per cent (CI: 47.9%–56.1%) had experienced one or more dental problems. In areas of high and extreme relative isolation the figures were 38.2 per cent (CI: 31.3%–45.8%) and 25.2 per cent (CI: 20.8%–30.3%) (Table 3.95).

FIGURE 3.30: CHILDREN AGED 4–17 YEARS — PROPORTION WITH AT LEAST ONE DENTAL PROBLEM, BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.95

DENTAL CARE

Aboriginal and Torres Strait Islanders are more likely than non–Indigenous Australians to have lost all their teeth or have gum disease but are less likely to receive caries treatment. The incidence of decayed, missing and filled teeth in Aboriginal children is almost double that of non–Aboriginal children.

Diet is an important determinant of poor oral health. The main risk factors for caries include frequency of carbohydrate intake, the number of meals and snacks per day, oral hygiene practices, fluoride intake, regularity of checkups and socio–economic status.[1]

The data reported here are based upon carer reports rather than administrative data documenting actual dental care provided to Aboriginal children under the age of 18 years. For this reason they must be regarded with some caution – it is not the case that carers are necessarily knowledgeable about the condition of their child's teeth. With these limitations in mind there are several features of the current data that merit comment.

Sore and bleeding gums can be symptomatic of periodontal (gum) disease. This is most often due to build-up of plaque along the gum line, which encourages the growth of bacteria. Periodontal disease, if untreated, can result in loss of teeth. It can be prevented by regular brushing and flossing of teeth, a balanced diet and abstinence from tobacco products. Regular dental checkups can detect early indicators of periodontal disease and advise on treatment before the disease progresses. The fact that five per cent of Aboriginal children have had sore or bleeding gums suggests a lack of proper oral hygiene among some Aboriginal children. This could be due to dental health promotion programmes not effectively reaching all Aboriginal children and their carers.

Historically, it is believed that Aboriginal children and adults enjoyed excellent dental health, with rates of dental caries among the lowest in the world.[2,3] In the 1950s, Aboriginal children had much better dental health than non-Aboriginal children.[2] The rise in the occurrence of tooth decay is directly related to loss of traditional lifestyles and diets and the increasing adoption of western style diets that include refined carbohydrates and sugars.[4]

The low level of dental problems in areas of extreme isolation where traditional Aboriginal culture remains strongest reflects a greater reliance on bush tucker and less reliance on diets high in energy derived from refined carbohydrates and saturated fats. Traditional diets are generally low in energy density but high in nutrient density, being high in protein, low in sugars, high in complex carbohydrate of low glycaemic index and high in micronutrients.[1]

While dental health has improved for non-Aboriginal children with improvements in dental health promotion and dental health service delivery, it appears that dental health of Aboriginal children has been deteriorating. This is most notable in areas where non-traditional lifestyles and diets are dominant.[5]

1 National Health and Medical Research Council, (2000) Nutrition in Aboriginal and Torres Strait Islander Peoples: An information paper; 183-188. NHMRC. Canberra.

2 Barrett MJ, (1953). Dental observations on Australian Aborigines: Yuendumu, Central Australia, 1951-52. *Australian Dental Journal* 57; 127–138.

3 Mattingly HV, (1915). *Community Dental Review* 12; 388-94.

4 Campbell TD, (1939). Food, food values and food habits of the Australian Aborigines in relation to their dental conditions. Part 1. *Australian Journal of Dentistry* 43; 1–15.

5 Davies MJ, Spencer AJ, Westwater A, Simmons B, (1997). Dental caries among Australian Aboriginal, non-Aboriginal Australian-born, and overseas-born children. *Bulletin of the World Health Organisation* 75; 197–203.

DISABILITY

Historically, disabilities were defined in terms of specific conditions, illnesses and injuries. Over recent decades the view of disability has evolved and the emphasis is now on functional impacts. Disabilities are defined in terms of functional limitations, or restrictions in participation in activities. The causes of disabilities are diverse. Disabilities impact on children's development by reducing the capacity of the individual for communication, learning and social interaction. Disabilities are often permanent and consequently there is a need for ongoing support services. This section describes the prevalence of disabilities within Aboriginal children and the burden disabilities place on carers.

There are limited data available relating to the prevalence of disability amongst Aboriginal and Torres Strait Islander peoples. Even where data are available, there are often issues with its quality – principally the lack of an adequate sample size for Aboriginal populations in mainstream surveys and the fact that the surveys are often not sensitive to cultural needs.[17]

The Western Australian Aboriginal Child Health Survey included questions about any restrictions to children's core activities that included self-care, mobility and communication.

LIMITATION OF INDEPENDENT FUNCTION

Self care

Carers of children aged 4–17 years were asked if children in their care needed physical help with activities of daily living such as eating, dressing, bathing and going to the toilet. An estimated 380 children, or 1.7 per cent (CI: 1.2%–2.2%) of children between the ages of 4 and 17 years required help with these basic activities. There was a higher reported prevalence of children needing this type of help in areas with little or no level of relative isolation (2.3 per cent; CI: 1.5%–3.3%), than in areas with moderate or greater levels of relative isolation (0.8 per cent; CI: 0.5%–1.1%). (Table 3.96)

There were no statistically significant differences found by sex or age (Table 3.97).

Mobility

The survey identified so few cases of children who were unable to walk or needed help to get around that meaningful analysis of this specific group was not possible.

OTHER LIMITATIONS

Vigorous activity

Carers were asked if there were any games or sports involving strong exercise that the children in their care could not do because of an illness or disability. Limitations were experienced by approximately 4.1 per cent of children aged 4–17 years (CI: 3.3%–5.0%) (Table 3.96). Limitations in active games or sports were reported more frequently in areas of little or no relative isolation (5.5 per cent; CI: 4.1%–7.0%) compared to areas of moderate or greater relative isolation (2.2 per cent; CI: 1.5%–3.0%). There were no statistically significant differences found by age or sex (Table 3.97).

The 1993 WA Child Health Survey of the general population found that 8 per cent

(CI: 6.3%–8.7%) of children aged 4–16 years experienced limitations in active games and sports.[10]

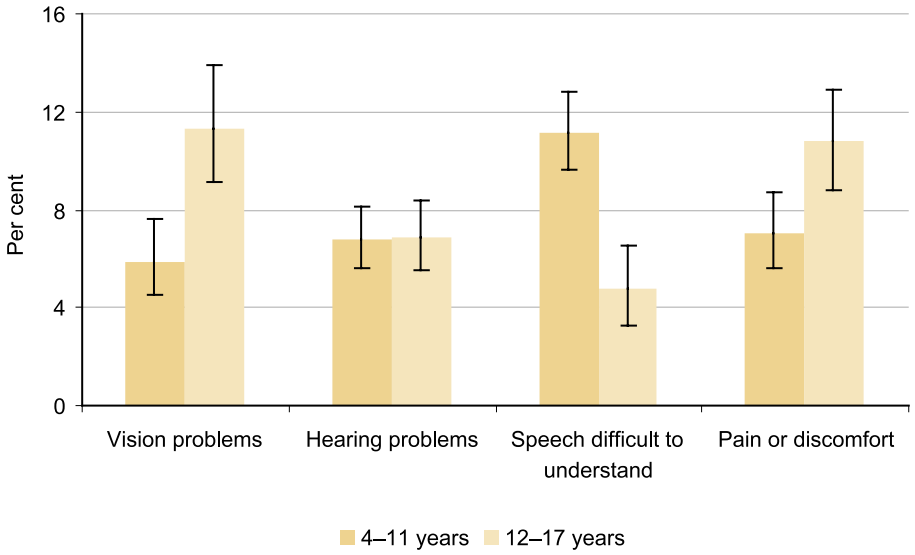
Schoolwork

Only 4.4 per cent (CI: 3.6%–5.4%) of children were reported by their carers to need special help at school because of illness or disability (Table 3.97). Most commonly, this special help took the form of a special class (26.7 per cent; CI: 18.5%–36.2%) or a teacher's aide (20.2 per cent; CI: 12.4%–29.2%) (Table 3.98).

SENSORY FUNCTIONS PROBLEMS AND PAIN

Over one in four (26.9 per cent; CI: 25.0%–28.9%) Aboriginal children in Western Australia aged 4–17 years were limited in one or more sensory functions or experienced pain (Tables 3.99, 3.100). The prevalence of selected problems is shown in Figure 3.31.

FIGURE 3.31: PREVALENCE OF INDIVIDUAL SENSORY FUNCTION PROBLEMS AND PAIN, BY AGE



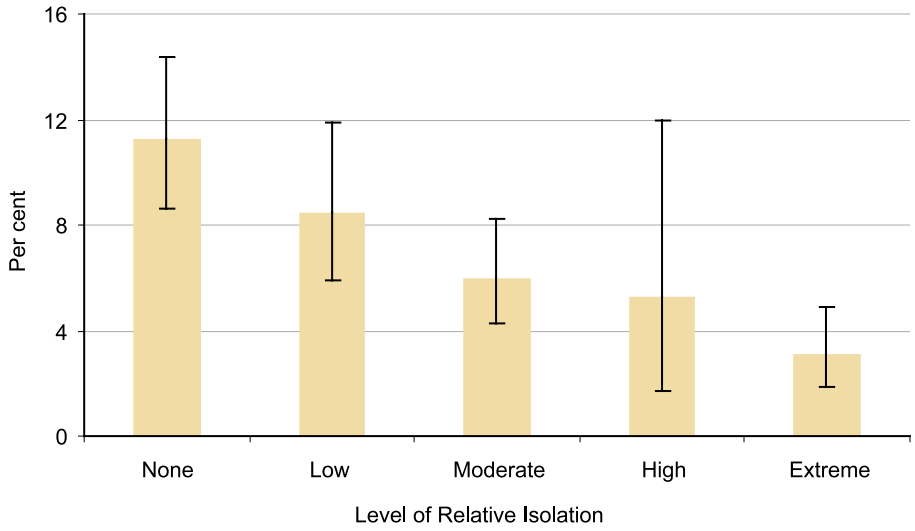
Source: Table 3.102

Vision

Some 8.1 per cent (CI: 6.8%–9.6%) of Aboriginal children aged 4–17 years did not have normal vision in both eyes (Table 3.101), This is significantly lower than the 14 per cent (CI: 12.4%–15.6%) of children aged 4–16 years in the general population found in the 1993 WA Child Health Survey not to have normal vision in both eyes.[10]

Impairment in vision was more common in older children, with 5.9 per cent (CI: 4.5%–7.6%) of 4–11 year-old Aboriginal children having some degree of visual impairment compared with 11.3 per cent of 12–17 year-olds (CI: 9.1%–13.9%). No statistically significant difference was found by sex (Table 3.102).

FIGURE 3.32: CHILDREN 4–17 YEARS — VISION PROBLEMS BY LEVEL OF RELATIVE ISOLATION



Source: Table 3.101

Figure 3.32 shows the reported prevalence of vision problems by level of relative isolation. The proportion decreased from 11.3 per cent (CI: 8.6%–14.4%) in the Perth Metropolitan area, where the level of relative isolation is none to 3.1 per cent (CI: 1.9%–4.9%) in the parts of Western Australia where the level of relative isolation is extreme.

At the time of the survey, 4.7 per cent (CI: 3.8%–5.6%) of 4–17 year-old children used prescribed glasses or contact lenses (Table 3.101) representing 58 per cent (CI: 48%–67%) of those children who did not have normal vision in both eyes. Usage increased with age with 2.6 per cent (CI: 1.9%–3.4%) of 4–11 year olds and 7.8 per cent (CI: 6.0%–9.9%) of 12–17 year olds wearing glasses or contact lenses (Table 3.102).

The proportion of children using prescribed glasses or contact lenses declined by level of relative isolation, falling from 6.2 per cent (CI: 4.3%–8.4%) in the Perth Metropolitan area to 1.1 per cent (CI: 0.5%–2.1%) in the parts of Western Australia with extreme level of relative isolation (Table 3.101).

IMPAIRMENTS OF VISION

The prevalence of carer reported visual impairment in Aboriginal children (8 per cent) is significantly lower than that reported by carers of non-Indigenous children (14 per cent).[1] The proportion of Aboriginal children with visual impairment declined significantly with increasing level of relative isolation. It is generally accepted that the development of myopia, the most commonly occurring visual impairment in children, is associated with the amount of close work undertaken. Myopia is less common in rural and remote areas, most likely because of lifestyles and the type of schooling undertaken.[2]

Australia is the only developed country that still has trachoma, an easily spread infection of the eye with symptoms resembling conjunctivitis. Repeated occurrences scar the upper eyelid, eventually turning it inward. The eyelashes then scratch the cornea, which can ultimately lead to blindness. The disease is easily spread by hands, clothing or flies that have come in contact with discharge from the eyes or nose of an infected person. The disease generally occurs in poor countries where people have limited access to water and health care. The prevalence of trachoma is high in Northern Australia. Reported rates of trachoma in children range from 26 per cent (CI: 17%–38%) in 7 communities in East Arnhem, 55 per cent in the Pilbara and 40 per cent (CI: 32%–46%) in Central Australia.[3,4,5]

In the Kimberley region, the Kimberley Public Health Unit has coordinated a school-based trachoma control program since 1989. The program has reduced the prevalence of trachoma among school–aged children. In 2002, 1,552 children were screened from 29 schools. The prevalence of trachoma has decreased from 16.9 per cent in 2000 to 10.5 per cent in 2002.[6]

The National Aboriginal and Torres Strait Islander Eye Health Program, through OATSIH, promotes the World Health Organisation's Surgery, Antibiotics, Facial cleanliness and Environmental Hygiene (SAFE) strategy for trachoma control. Major components of the program include the establishment of Eye Health Coordinator positions nationally within Aboriginal primary health care settings and the provision of ophthalmic equipment and training for coordinators and workers in identified Aboriginal Community Controlled Health Services. Nationally, six regional eye health program service areas have been selected, with one being the Kimberley region of WA.

1 Zubrick SR, Silburn SR, Garton A, Burton P, Dalby R, Carlton J, Shepherd C, Lawrence D, (1995). Western Australian Child Health Survey: Developing Health and Well being in the Nineties. Australian Bureau of Statistics and the Institute for Child Health Research. Perth, Western Australia.

2 Weale RA, (2003). Epidemiology of refractive errors and presbyopia. *Survey of Ophthalmology* 48; 515–543.

3 Paterson B, (2002). Trachoma: New problem or old dilemma? *Northern Territory disease Control Bulletin* 9.

4 Thomson N, Paterson B, (1998). Eye health of Aboriginal and Torres Strait Islander people, National Aboriginal and Torres Strait Islander Health Clearinghouse.

5 Ewald D, Hall G, Franks C, (2003). An evaluation of a SAFE-style trachoma control program in Central Australia. *Medical Journal of Australia* 178; 65–68.

6 Mahony A, (2003). Kimberley trachoma control program 2002. *Kimberley Public Health Bulletin* 18.

Hearing

Almost 6.8 per cent (CI: 5.9%–7.8%) of Aboriginal children aged 4–17 years did not have normal hearing in both ears (Table 3.101).

Rates did not appear to vary by age, sex or level of relative isolation, and were similar to those found in the 1993 WA Child Health Survey.[10] Almost half of these children were deaf or partially unable to hear in one ear only (49 per cent; CI: 42%–56%), and almost one quarter were deaf or partially unable to hear in both ears (24

per cent; CI: 18%–30%), while in 25 per cent of cases the type of hearing problem was not stated (Table 3.103). In the 1993 WA Child Health Survey, 53 per cent (CI: 40%–66%) of children were reported to be deaf or partially deaf in one ear only, and 34 per cent (CI: 23%–49%) were deaf or partially deaf in both ears.

SPECIALISED HEARING TRAINING AND EQUIPMENT

The Australian Government Department of Health and Ageing currently funds specialised hearing training and audiometric equipment for Aboriginal Community Controlled Health Services (ACCHS). Training is provided to at least two Aboriginal Health Workers from each of the participating ACCHS.

The training covers individual case management, screening using the audiometric equipment provided, program management, and community education. A review of hearing services provided to Aboriginal peoples found that this component of the national Aboriginal and Torres Strait Islander Hearing Strategy delivered sustained and consistent access to training, with 360 Aboriginal Health Workers successfully completing the training modules.[1]

1 Department of Health and Ageing, (2002). Report on Commonwealth funded hearing services to Aboriginal and Torres Strait Islander Peoples: Strategies for future action.

Speech and language

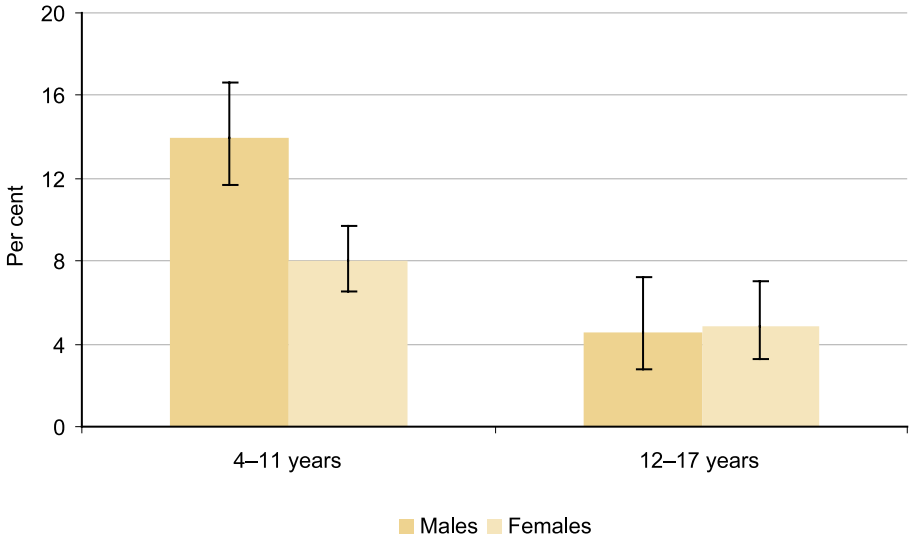
Approximately one in ten children were reported to have trouble saying certain sounds (9.8 per cent; CI: 8.6%–11.0%). As shown in table 3.101 this problem was experienced by 13.4 per cent (CI: 11.6%–15.2%) of 4–11 year-olds, but decreased to only 4.3 (CI: 3.4%–5.5%) per cent of the 12–17 year-olds (Table 3.102). Results were similar to the 1993 Child Health Survey.[10]

Males aged 4–11 years were more likely to have difficulty saying certain sounds (16.5 per cent; CI: 14.0%–19.4%), than females in this age group (9.9 per cent; CI: 7.7%–12.6%). At older ages no difference was observed between males and females (Table 3.102).

Stuttering was reported among 4.5 per cent of children aged 4–17 years (CI: 3.7%–5.4%) and was more common among males (6.4 per cent; CI: 5.3%–7.7%), than females (2.6 per cent; CI: 1.5%–4.0%) (Table 3.104).

There were functional consequences in some children who were reported to have these speech difficulties. For 8.5 per cent (CI: 7.5%–9.9%) of children, caregivers reported that people needed help to understand what the children were saying. As illustrated in Figure 3.33, carers reported that other people needed help to understand the speech of 4–11 year old males more frequently than females in the same age group.

FIGURE 3.33: CHILDREN AGED 4–17 YEARS — SPEECH WAS DIFFICULT TO UNDERSTAND



Source: Table 3.104

SPEECH AND LANGUAGE IMPAIRMENT

Speech and language are one of the principal developmental skills that infants and young children acquire. Once learned, these are skills that are built upon and used for the rest of life.

The data reported here provide a rare glimpse of carer reported perceptions of Aboriginal children with speech problems. These rates generally conform to those reported in the mainstream population where similar methods have been used.[1]

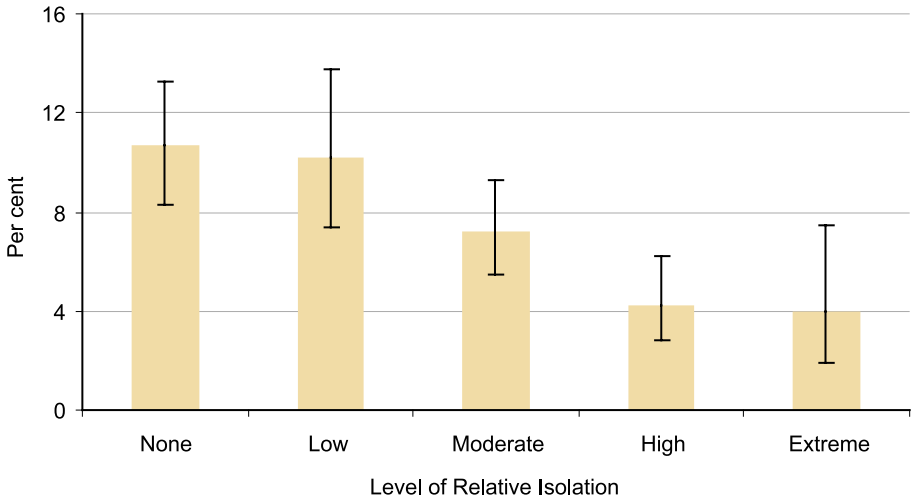
While carer-reported rates for Aboriginal children might be similar to those reported for non-Indigenous children, it is important to recognise that the underlying causes of these problems may differ in their onset, intensity and duration. Hearing difficulties for example, particularly those related to chronic middle ear infections, are strongly associated with speech and language problems.

1 Zubrick SR, Silburn SR, Garton A, Burton P, Dalby R, Carlton J, Shepherd C, Lawrence D, (1995). Western Australian Child Health Survey: Developing Health and Well being in the Nineties. Australian Bureau of Statistics and the Institute for Child Health Research. Perth, Western Australia.

Pain

Carers reported that physical pain or discomfort was experienced by 8.5 per cent (CI: 7.3%–9.8%) of 4–17 year–olds. Figure 3.34 illustrates that the reported prevalence of pain varied by level of relative isolation.

FIGURE 3.34: CHILDREN 4–17 YEARS — EXPERIENCE OF PAIN OR DISCOMFORT, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 3.101

A significantly higher proportion of children aged 12–17 years experienced pain or discomfort, with 10.8 per cent (CI: 8.8%–12.9%) of these children experiencing some level of pain or discomfort compared with 7.0 per cent (CI: 5.6%–8.7%) of younger children (Table 3.101).

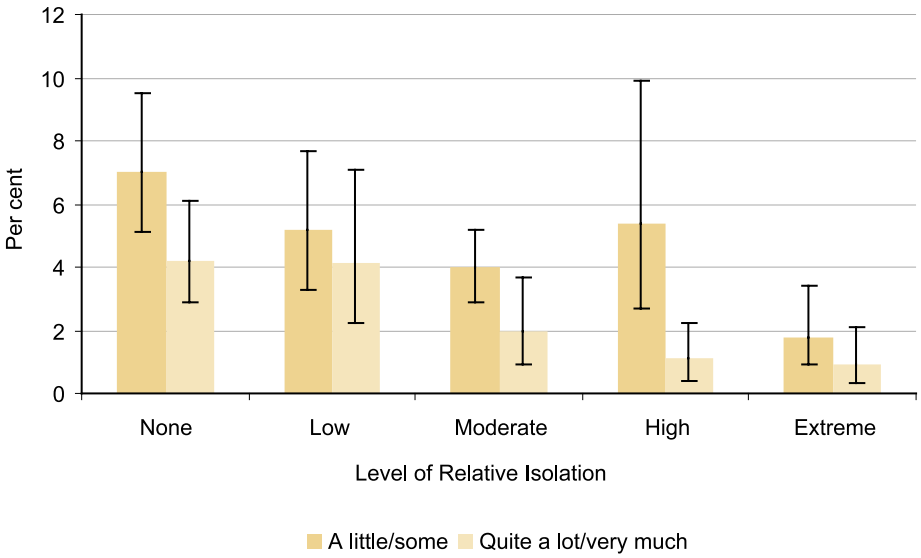
Figures were similar to the 1993 Child Health Survey.[10]

Among children with pain, equivalent proportions were reported to suffer 'a little', 'some', or 'a lot' of pain (Tables 3.105, 3.106).

BURDEN OF DISABILITY

Disabilities have the potential to place a significant burden on the carers and families of children with disabilities. Carers were asked if each child placed a burden on them and the family as a result of any disability, chronic illness or pain. Some 5.2 per cent (CI: 4.3%–6.3%) of children placed a 'little or some' burden on their carers and families, while 3.0 per cent (CI: 2.3%–3.9%) of children placed 'quite a lot or very much' burden on their carers and families. The experience of burden on carers and families declined with increasing level of relative isolation as illustrated in Figure 3.35.

FIGURE 3.35: CHILDREN 4–17 YEARS — BURDEN ON FAMILY AS A RESULT OF DISABILITY, CHRONIC ILLNESS OR PAIN



Source: Table 3.107

Burden was reported to be particularly high in families where children were reported to have impairments in self-care (e.g. activities of daily living). For example, just over half of the carers of the 380 (CI: 270–510) children who needed special help with eating, dressing, bathing or toileting reported that this placed 'quite a lot or very much' burden on the family (54 per cent; CI: 37%–68%) while another 23.3 per cent (CI: 11%–42%) reported a little or some level of burden.

DISABILITY IN ABORIGINAL CHILDREN

Good quality data about the level of disability in the Aboriginal population, and for Aboriginal children specifically, remains scarce and disability within this population is poorly described.[1] The data reported here provide some insights into aspects of disability in the Aboriginal population of children and young people. However, they have their limitations.

These data are based upon parental reports in response to structured questions about the presence or absence of impairment and, where present, on questions that probed general impact on function. Direct examination of children by qualified professionals enabling a more objective assessment of disability was not used. Additionally, carers may differ in their ability to report the presence or absence of disability particularly where functional impairment is mild. In more remote regions there may be cultural differences affecting the reporting of a child's levels of impairment of, for example, pain.

Notwithstanding these qualifications, in general the findings suggest that the reported rates of disability associated with significant impairment in activities of daily living for Aboriginal children are similar to those reported in the mainstream population, as too are rates of reported speech problems. In other areas, such as impairment of vision, reported prevalence rates are lower than those found in mainstream populations.

There was a general trend for disabilities to be less frequent in more isolated areas. While this may reflect a reduced incidence of disabilities, for example visual impairments, it may also suggest that children with special needs and their families move to areas where those needs can be best addressed, such as the metropolitan area or major regional centres.

1 Australian Institute of Health and Welfare, (2003). Disability prevalence and trends. Disability Series. AIHW Catalogue DIS 34. AIHW, Canberra.

ENDNOTES

1 United Nations Development Program, (2003). Human Development Report 2003.United Nations, Oxford University Press, New York.

2 Cunningham J, (2002). Diagnostic and therapeutic procedures among Australian hospital patients identified as Indigenous. *Medical Journal of Australia* 176 (2): 58-62.

3 English DR, Knuiman MW, Kurinczuk JJ, Lewin GF, Ryan GA, Holman CDJ, Milne E, Winter MG, Hulse GK, Codde JP, Bower CI, Corti B, and De Klerk N. (1995). The quantification of drug caused morbidity and mortality in Australia, Australian Government Publishing Service. Canberra.

4 Henry A and Crowther C, (2000). Patterns of medication use during and prior to pregnancy: the M A P study. *Aust NZ J Obstet Gynaeocol* 40(2):165-172.

5 Walpole I, Zubrick S, Pontre J, (1990). Is there a fetal effect with low to moderate alcohol use before or during pregnancy? *Journal of Epidemiology and Community Health* 44; 297-301.

6 Roche AM, and Deehan A, (2002). Women's alcohol consumption: emerging patterns, problems and public health implications. *Drug and Alcohol Review* 21; 169-178.

7 Hunter EM, Hall WD, Spargo RM. (1992). Pattern of alcohol consumption in the Kimberley Aboriginal population. *Medical Journal of Australia* 156; 764-768.

8 Australian Bureau of Statistics and Austalian Institute for Health and Welfare, (1999). The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples. (Catalogue 4704.0). ABS and AIHW. Canberra.

9 Walker A, Rosenberg M and Balaban-Gil K, (1999). Neurodevelopmental and neurobehavioural sequelae of selected substances of abuse and psychiatric medications in utero. *Child and Adolescent Psychiatric Clinics of North America*. 8(4); 845-867.

10 Zubrick SR, Silburn SR, Garton A, Burton P, Dalby R, Carlton J, Shepherd C, Lawrence D. (1995). Western Australian Child Health Survey: Developing Health and Well-being in the Nineties. Australian Bureau of Statistics and the Institute for Child Health Research. Perth. Western Australia.

11 National Health and Medical Research Council, (2000). Nutrition in Aboriginal and Torres Strait Islander Peoples. NHMRC. Canberra.

12 National Health and Medical Research Council, (2003). Dietary Guidelines for Children and Adolescents in Australia incorporating the Infant Feeding Guidelines for Healthworkers. NHMRC. Canberrra.

13 Australian Bureau of Statistics, (2002). National Health Survey 2001: Aboriginal and Torres Strait Islander Results, Australia. Australian Bureau of Statistics. Catalogue 4715.0 and 4363.0.55.001. Canberra.

14 Asher MI, Keil U, Anderson HR, Beasley R, Crane J, Martinez F, Mitchell EA, Pearce N, Sibbald B, Stewart AW, Strachan D, Weiland SK, Williams HC, (1995). International Study of Asthma and Allergies in Childhood (ISAAC): rationale and methods. *European Respiratory Journal*. 8: 483-91.

15 International Study of Asthma and Allergies in Childhood (ISAAC), (2003). Phase One data. Perth. Australia. <http://isaac.auckland.ac.nz/PhaseOne/ Data/Data.php?centre=Perth>.

16 Woolcock AJ, Bastiampillai SA, Marks GB, Keena VA, (2001). The burden of asthma in Australia. *Medical Journal of Australia* 175; 141–145.

17 Australian Bureau of Statistics and Australian Institute for Health and Welfare, (2003). The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples. (Catalogue 4704.0). ABS and AIHW. Canberra.

Table 3.1: Births linked to MCHRDB — Birth weight, gestational age, time to spontaneous respiration, Apgar score and maternal age

	Aboriginal births				Total population(a)
					(N = 496,286)
Birth characteristics	Number	95% CI	%	95% CI	%
Gestational age					
Less than 37 weeks	3 460	(3 110 – 3 830)	13.3	(12.0 – 14.7)	*8.2*
37 weeks or more	22 400	(21 800 – 23 000)	86.4	(85.0 – 87.7)	*91.6*
Not stated	80	(50 – 110)	0.3	(0.2 – 0.4)	*0.2*
Total	26 000	(25 400 – 26 400)	100.0		100.0
Birthweight					
Less than 2500 grams	2 950	(2 600 – 3 320)	11.4	(10.0 – 12.8)	*6.6*
2500 grams or more	23 000	(22 400 – 23 600)	88.6	(87.2 – 90.0)	*93.4*
Total	26 000	(25 400 – 26 400)	100.0		100.0
Percent of optimal birthweight (POBW)					
Less than 85%	5 420	(4 970 – 5 880)	20.9	(19.2 – 22.6)	*12.9*
85% or more	19 400	(18 800 – 20 000)	74.8	(73.0 – 76.5)	*84.8*
Not stated	1 120	(960 – 1 290)	4.3	(3.7 – 5.0)	2.3
Total	26 000	(25 400 – 26 400)	100.0		
Time to spontaneous respiration					
Less than 2 minutes	21 700	(21 100 – 22 300)	83.6	(82.1 – 85.0)	*87.3*
2 minutes or more	3 490	(3 170 – 3 830)	13.5	(12.2 – 14.8)	*10.8*
Intubation	640	(470 – 850)	2.5	(1.8 – 3.3)	*1.7*
Not stated	120	(80 – 170)	0.4	(0.3 – 0.6)	*0.2*
Total	26 000	(25 400 – 26 400)	100.0		100.0
Five minute APGAR score					
Less than 7	570	(440 – 750)	2.2	(1.7 – 2.9)	*2.4*
7 or more	25 200	(24 700 – 25 700)	97.1	(96.5 – 97.7)	*97.3*
Not stated	170	(120 – 220)	0.6	(0.5 – 0.9)	*0.3*
Total	26 000	(25 400 – 26 400)	100.0		100.0
Maternal age					
19 years or less	7 220	(6 800 – 7 660)	27.8	(26.3 – 29.4)	*6.3*
20–34 years	17 700	(17 100 – 18 300)	68.2	(66.5 – 69.9)	*82.9*
35 years or more	990	(800 – 1 300)	3.8	(3.1 – 4.7)	*10.8*
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)	*0.1*
Total	26 000	(25 400 – 26 400)	100.0		100.0

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.2: Births linked to MCHRDB — Maternal age

	Aboriginal births				*Total population(a)*
					(N = 496,286)
Maternal age	Number	95% CI	%	95% CI	*%*
Less than 18 years	3 410	(3 120 – 3 720)	13.1	(12.0 – 14.3)	*2.1*
18 years or more	22 500	(22 000 – 23 000)	86.7	(85.5– 87.8)	*97.8*
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)	*0.1*
Total	26 000	(25 400 – 26 400)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.3: Births linked to MCHRDB — Mode of delivery

	Aboriginal births				*Total population(a)*
					(N = 496,286)
Delivery type	Number	95% CI	%	95% CI	*%*
Normal	19 300	(18 700 – 19 900)	74.5	(72.6 – 76.3)	*62.5*
Vacuum	1 070	(920 – 1 230)	4.1	(3.5 – 4.7)	*8.7*
Breech	290	(220 – 370)	1.1	(0.9 – 1.4)	*1.1*
Caesarian section:					
– emergency	2 390	(2 070 – 2 730)	9.2	(8.0 – 10.6)	*9.1*
–elective	1 660	(1 420 – 1 920)	6.4	(5.5 – 7.4)	*10.4*
Forceps	1 150	(960 – 1 350)	4.4	(3.7 – 5.2)	*7.8*
Other	20	(10 – 30)	0.1	(0.0 – 0.1)	*0.1*
Not stated	60	(30 – 100)	0.2	(0.1 – 0.4)	*0.3*
Total	26 000	(25 400 – 26 400)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.4: Births linked to MCHRDB — Mode of delivery, by age of mother and parity

Delivery type	Number	95% CI	%	95% CI	*Total population 1982—2001(a)*
First births – mother aged less than 20 years					
Normal	3 250	(2 970 – 3 540)	65.9	(62.2 – 69.5)	*66.1*
Vacuum	450	(370 – 550)	9.2	(7.5 – 11.1)	*9.6*
Breech	40	(20 – 70)	0.8	(0.4 – 1.5)	*1.1*
Caesarian section:					
– emergency	590	(440 – 770)	11.9	(9.0 – 15.3)	*9.3*
–elective	110	(60 – 180)	2.2	(1.2 – 3.5)	*3.2*
Forceps	500	(400 – 610)	10.1	(8.2 – 12.3)	*10.5*
Other	0	(0 – 60)	0.0	(0.0 – 1.1)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 1.1)	*0.0*
Total	4 930	(4 600 – 5 260)	100.0		*100.0*
First births – mother aged 20 years or more					
Normal	1 580	(1 300 – 1 890)	54.4	(47.5 – 61.4)	*45.3*
Vacuum	270	(190 – 390)	9.3	(6.5 – 13.0)	*15.8*
Breech	30	(0 – 110)	0.9	(0.1 – 3.7)	*1.0*
Caesarian section:					
– emergency	560	(400 – 790)	19.4	(14.0 – 25.7)	*14.7*
–elective	150	(90 – 230)	5.0	(3.0 – 7.8)	*7.5*
Forceps	320	(220 – 430)	10.9	(7.6 – 14.7)	*15.1*
Other	0	(0 – 60)	0.0	(0.0 – 1.9)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 1.9)	*0.0*
Total	2 900	(2 550 – 3 300)	100.0		*100.0*
First births – total					
Normal	4 820	(4 450 – 5 210)	61.6	(58.0 – 65.0)	*48.0*
Vacuum	720	(600 – 870)	9.2	(7.6 – 11.0)	*15.0*
Breech	70	(30 – 130)	0.8	(0.4 – 1.6)	*1.0*
Caesarian section:					
– emergency	1 150	(930 – 1 420)	14.7	(11.9 – 17.8)	*14.1*
–elective	250	(170 – 350)	3.2	(2.2 – 4.5)	*7.0*
Forceps	810	(680 – 970)	10.4	(8.7 – 12.3)	*14.7*
Other	0	(0 – 60)	0.0	(0.0 – 0.7)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.7)	*0.0*
Total	7 830	(7 410 – 8 260)	100.0		*100.0*

Table 3.4: Births linked to MCHRDB — Mode of delivery, by age of mother and parity (Continued)

Delivery type	Number	95% CI	%	95% CI	*Total population 1982—2001 (a)*
	Subsequent births – mother aged less than 20 years				
Normal	1 850	(1 650 – 2 060)	81.0	(77.1 – 84.6)	*82.9*
Vacuum	50	(30 – 90)	2.4	(1.3 – 3.9)	*2.0*
Breech	30	(20 – 50)	1.4	(0.8 – 2.3)	*1.8*
Caesarian section:					
– emergency	140	(110 – 190)	6.3	(4.7 – 8.4)	*5.2*
–elective	140	(80 – 220)	5.9	(3.5 – 9.5)	*6.0*
Forceps	50	(30 – 80)	2.2	(1.2 – 3.8)	*2.1*
Other	20	(10 – 30)	0.7	(0.3 – 1.4)	*0.1*
Not stated	0	(0 – 60)	0.0	(0.0 – 2.4)	*0.0*
Total	2 280	(2 060 – 2 510)	100.0		*100.0*
	Subsequent births – mother aged 20 years or more				
Normal	12 700	(12 100 – 13 200)	80.2	(78.0 – 82.2)	*72.0*
Vacuum	290	(220 – 370)	1.9	(1.4 – 2.4)	*4.7*
Breech	190	(140 – 250)	1.2	(0.9 – 1.6)	*1.2*
Caesarian section:					
– emergency	1 090	(890 – 1 330)	6.9	(5.7 – 8.4)	*5.9*
–elective	1 270	(1 070 – 1 490)	8.0	(6.8 – 9.4)	*12.9*
Forceps	280	(170 – 430)	1.8	(1.1 – 2.7)	*3.3*
Other	0	(0 – 10)	0.0	(0.0 – 0.1)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.4)	*0.0*
Total	15 800	(15 200 – 16 300)	100.0		*100.0*
	Subsequent births – total				
Normal	14 500	(14 000 – 15 100)	80.3	(78.3 – 82.2)	*72.2*
Vacuum	350	(270 – 440)	1.9	(1.5 – 2.4)	*4.6*
Breech	220	(170 – 280)	1.2	(1.0 – 1.6)	*1.2*
Caesarian section:					
– emergency	1 240	(1 030 – 1 470)	6.8	(5.7 – 8.1)	*5.9*
–elective	1 400	(1 190 – 1 640)	7.8	(6.6 – 9.1)	*12.7*
Forceps	330	(220 – 480)	1.8	(1.2 – 2.7)	*3.3*
Other	20	(10 – 30)	0.1	(0.0 – 0.2)	*0.0*
Not stated	0	(0 – 60)	0.0	(0.0 – 0.3)	*0.0*
Total	18 100	(17 500 – 18 600)	100.0		*100.0*

(a) All Western Australian births from 1982 to 2001 inclusive.

Table 3.5: Children linked to MCHRDB — Parity, by age of mother

Parity	Number	95% CI	%	95% CI
		Less than 20 years		
First birth	4 930	(4 600 – 5 260)	68.2	(65.7 – 70.6)
Subsequent birth	2 280	(2 060 – 2 510)	31.6	(29.2 – 34.0)
Not stated	10	(10 – 30)	0.2	(0.1 – 0.4)
Total	7 220	(6 800 – 7 660)	100.0	
		20 years or more		
First birth	2 900	(2 550 – 3 300)	15.5	(13.7 – 17.5)
Subsequent birth	15 800	(15 200 – 16 300)	84.4	(82.5 – 86.3)
Not stated	10	(0 – 20)	0.0	(0.0 – 0.1)
Total	18 700	(18 100 – 19 200)	100.0	
		Not stated		
First birth	0	(0 – 60)	0.0	(0.0 – 70.8)
Subsequent birth	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
		Total		
First birth	7 830	(7 410 – 8 260)	30.2	(28.6 – 31.7)
Subsequent birth	18 100	(17 500 – 18 600)	69.6	(68.0 – 71.1)
Not stated	60	(30 – 100)	0.2	(0.1 – 0.4)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.6: Births linked to MCHRDB — Mean proportion of optimal birth weight (POBW) and age of mother

Age of mother	Mean	95% CI
Less than 20 years	95.6	(94.6 – 96.5)
20 years or more	95.3	(94.6 – 96.0)
Total	95.4	(94.8 – 96.0)

Table 3.7: Births linked to MCHRDB — Proportion of optimal birth weight (POBW), by maternal age

POBW	Number	95% CI	%	95% CI
		Less than 20 years		
Less than 85%	1 350	(1 130 – 1 610)	18.6	(15.9 – 21.7)
85% or more	5 490	(5 140 – 5 840)	75.9	(72.9 – 78.9)
Not stated	390	(300 – 510)	5.4	(4.1 – 7.0)
Total	7 220	(6 800 – 7 660)	100.0	
		20 years or more		
Less than 85%	4 070	(3 680 – 4 500)	21.8	(19.7 – 23.9)
85% or more	13 900	(13 400 – 14 500)	74.5	(72.3 – 76.6)
Not stated	690	(580 – 830)	3.7	(3.1 – 4.4)
Total	18 700	(18 100 – 19 200)	100.0	
		Not stated		
Less than 85%	0	(0 – 60)	0.0	(0.0 – 70.8)
85% or more	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
		Total		
Less than 85%	5 420	(4 970 – 5 880)	20.9	(19.2 – 22.6)
85% or more	19 400	(18 800 – 20 000)	74.8	(73.0 – 76.5)
Not stated	1 120	(960 – 1 290)	4.3	(3.7 – 5.0)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.8: Births linked to MCHRDB — Mean Apgar score at five minutes, by age of mother

Age of mother	Mean	95% CI
Less than 20 years	8.93	(8.88 – 8.98)
20 years or more	8.99	(8.94 – 9.03)
Total	8.97	(8.93 – 9.01)

Table 3.9: Births linked to MCHRDB — Apgar score at five minutes, by age of mother

Apgar score	Number	95% CI	%	95% CI
		Mother aged less than 20 years		
Less than 7	150	(90 – 230)	2.1	(1.3 – 3.2)
7 or above	7 020	(6 610 – 7 440)	97.2	(96.1 – 98.0)
Not stated	50	(30 – 80)	0.7	(0.5 – 1.1)
Total	7 220	(6 800 – 7 660)	100.0	
		Mother aged 20 years or more		
Less than 7	420	(300 – 590)	2.3	(1.6 – 3.1)
7 or above	18 200	(17 600 – 18 700)	97.3	(96.5 – 98.0)
Not stated	80	(50 – 110)	0.4	(0.3 – 0.6)
Total	18 700	(18 100 – 19 200)	100.0	
		Mother's age not stated		
Less than 7	0	(0 – 60)	0	(0.0 – 70.8)
7 or above	0	(0 – 60)	0.0	(0.0 – 70.8)
Not stated	40	(10 – 90)	100.0	(29.2 – 100.0)
Total	40	(10 – 90)	100.0	
		Total		
Less than 7	570	(440 – 750)	2.2	(1.7 – 2.9)
7 or above	25 200	(24 700 – 25 700)	97.1	(96.5 – 97.7)
Not stated	170	(120 – 220)	0.6	(0.5 – 0.9)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.10: Children linked to MCHRDB — Maternal age, by birth mother status

Maternal age	Number	95% CI	%	95% CI
		Child's carer is not birth mother		
Less than 18 years	950	(790 – 1 140)	20.0	(16.9 – 23.5)
18 years and over	3 790	(3 390 – 4 230)	79.8	(76.4 – 83.0)
Not stated	10	(0 – 20)	0.2	(0.1 – 0.5)
Total	4 750	(4 290 – 5 240)	100.0	
		Child's carer is birth mother		
Less than 18 years	2 460	(2 210 – 2 720)	11.6	(10.5 – 12.8)
18 years and over	18 700	(18 100 – 19 300)	88.3	(87.1 – 89.4)
Not stated	30	(10 – 70)	0.1	(0.0 – 0.3)
Total	21 200	(20 600 – 21 800)	100.0	
		Total		
Less than 18 years	3 410	(3 120 – 3 720)	13.1	(12.0 – 14.3)
18 years and over	22 500	(22 000 – 23 000)	86.7	(85.5 – 87.8)
Not stated	40	(10 – 90)	0.1	(0.1 – 0.3)
Total	26 000	(25 400 – 26 400)	100.0	

Table 3.11: Births linked to MCHRDB — Birth characteristics(a), by Carer status

Birth characteristics	%	95% CI	%	95% CI
	Carer is Birth Mother (N = 21 200)		Carer is not Birth mother (N = 4 750)	
Gestation and growth				
Less than 37 weeks gestation	12.8	(11.5 – 14.2)	17.5	(13.3 – 22.3)
Less than 2,500 g birth weight	10.3	(9.0 – 11.7)	16.2	(12.1 – 20.6)
POBW < 85%	19.9	(18.1 – 21.8)	25.1	(21.0 – 29.7)
Condition at birth				
Time to spontaneous respiration more than > 2 minutes	13.2	(11.9 – 14.6)	14.5	(11.5 – 17.9)
Intubated	2.5	(1.8 – 3.4)	2.2	(1.0 – 4.3)
Still born	0.1	(0.1 – 0.2)	0.2	(0.1 – 0.6)
Apgar at 5 minutes less than 7	2.2	(1.6 – 3.0)	2.2	(1.5 – 2.9)
Maternal age				
Less than 20 years	26.0	(24.2 – 27.7)	36.1	(32.1 – 40.2)
20–34 years	69.7	(67.9 – 71.5)	61.5	(57.2 – 65.6)
35 years or more	4.2	(3.4 – 5.1)	2.2	(0.8 – 5.3)
	Mean (g)	95% CI	Mean (g)	95% CI
Birthweight	3 200	(3 170 – 3 230)	3 060	(2 990– 3 120)

(a) See Chapter 3 for terminology explanations

Table 3.12: Children linked to MCHRDB — Proportion whose carer is not their birth mother, by maternal age of birth mother, by age of child

Maternal age of birth mother	Number	95% CI	%	95% CI
	Age of child — 0–3 years			
12 – 15 years	40	(20 – 80)	25.8	(12.9 – 44.4)
16 – 17 years	80	(50 – 110)	14.3	(9.2 – 21.3)
18 – 19 years	50	(30 – 100)	6.5	(3.5 – 11.5)
20 years or more	410	(290 – 580)	8.6	(5.9 – 11.6)
Total	580	(440 – 750)	9.2	(7.1 – 11.9)
	Age of child — 4–11 years			
12 – 15 years	90	(50 – 140)	24.3	(13.3 – 38.9)
16 – 17 years	280	(180 – 400)	22.7	(15.4 – 30.7)
18 – 19 years	330	(260 – 400)	19.6	(15.9 – 24.1)
20 years or more	1 350	(1 140 – 1 590)	15.4	(13.0 – 18.1)
Total	2 040	(1 770 – 2 340)	17.0	(14.8 – 19.3)
	Age of child — 12–17 years			
12 – 15 years	100	(60 – 150)	49.1	(32.4 – 65.2)
16 – 17 years	370	(270 – 500)	39.2	(30.6 – 48.3)
18 – 19 years	390	(270 – 530)	29.5	(22.2 – 37.6)
20 years or more	1 280	(1 010 – 1 580)	24.4	(20.0 – 29.2)
Total	2 130	(1 820 – 2 470)	27.7	(24.2 – 31.4)
	All children			
12 – 15 years	220	(170 – 300)	31.4	(23.3 – 40.9)
16 – 17 years	730	(570 – 900)	26.9	(22.0 – 32.1)
18 – 19 years	770	(620 – 930)	20.1	(16.7 – 24.0)
20 years or more	3 030	(2 660 – 3 430)	16.2	(14.3 – 18.3)
Total	4 750	(4 290 – 5 240)	18.3	(16.6 – 20.1)

Table 3.13: Children whose primary carer is their birth mother, births linked to MCHRDB — Aboriginal status of the birth mother at the time of interview, by Aboriginal status on Midwives Notification form

Aboriginal status of birth mother at time of interview	Number	95% CI	%	95% CI
	Not Aboriginal or Torres Strait Islander on Midwives Notification form			
Not Aboriginal	2 940	(2 460 – 3 460)	61.6	(55.2 – 67.5)
Aboriginal	1 810	(1 500 – 2 140)	37.8	(31.9 – 44.2)
Not stated	30	(0 – 130)	0.6	(0.1 – 2.8)
Total	4 780	(4 240 – 5 340)	100.0	
	Aboriginal and Torres Strait Islander on Midwives Notification form			
Not Aboriginal	90	(40 – 170)	0.5	(0.2 – 1.0)
Aboriginal	16 200	(15 500 – 16 900)	98.7	(98.1 – 99.2)
Not stated	130	(70 – 210)	0.8	(0.4 – 1.3)
Total	16 400	(15 700 – 17 100)	100.0	
	Aboriginal status – not stated on Midwives Notification form			
Not Aboriginal	0	(0 – 60)	0.0	(0.0 – 84.2)
Aboriginal	30	(10 – 70)	100.0	(15.8 – 100.0)
Not stated	0	(0 – 60)	0.0	(0.0 – 84.2)
Total	30	(10 – 70)	100.0	
	Total			
Not Aboriginal	3 030	(2 560 – 3 570)	14.3	(12.1 – 16.7)
Aboriginal	18 000	(17 300 – 18 700)	85.0	(82.4 – 87.2)
Not stated	160	(80 – 270)	0.7	(0.4 – 1.3)
Total	21 200	(20 600 – 21 800)	100.0	

Table 3.14: Births linked to MCHRDB, birth mothers also carers — Birth characteristics, by Aboriginal status

	%	95% CI	%	95% CI
	Aboriginal		Non–Aboriginal	
Birth characteristics	N = 18 000		N = 3 030	
Gestation < 37 weeks	13.2	(11.8 – 14.8)	10.0	(6.9 – 13.7)
Birth weight < 2 500 g	10.9	(9.4 – 12.4)	7.1	(4.6 – 10.2)
POBW < 85%	20.5	(18.5 – 22.6)	16.8	(12.3 – 21.7
Time to Spontaneous Respiration > 2 minutes	13.5	(12.2 – 14.9)	11.3	(7.2 – 16.3)
5 minute Apgar score < 7	2.3	(1.7 – 3.1)	2.1	(0.2 – 6.4)
Maternal age < 20 years	26.1	(24.3 – 28.0)	25.3	(20.2 – 31.1)

Table 3.15: Children whose primary carer is their birth mother — Substances consumed by birth mother during pregnancy

Substance used	Number	95% CI	%	95% CI
		LORI — None (N = 8 780)		
Smoked cigarettes	4 230	(3 820 – 4 660)	48.1	(43.8 – 52.5)
Chewed tobacco	50	(10 – 130)	0.6	(0.1 – 1.5)
All tobacco products	4 240	(3 830 – 4 670)	48.2	(43.9 – 52.7)
Alcohol	2 180	(1 860 – 2 550)	24.9	(21.2 – 28.7)
Marijuana	980	(750 – 1 230)	11.1	(8.7 – 14.0)
		LORI — Low (N = 6 050)		
Smoked cigarettes	2 970	(2 580 – 3 400)	49.1	(44.0 – 54.2)
Chewed tobacco	20	(10 – 60)	0.4	(0.1 – 1.0)
All tobacco products	2 980	(2 590 – 3 420)	49.4	(44.2 – 54.5)
Alcohol	1 350	(1 070 – 1 670)	22.3	(18.1 – 26.9)
Marijuana	620	(470 – 790)	10.2	(7.9 – 13.0)
		LORI — Moderate (N = 4 920)		
Smoked cigarettes	2 400	(1 980 – 2 880)	48.7	(43.6 – 53.6)
Chewed tobacco	220	(140 – 330)	4.5	(2.9 – 6.8)
All tobacco products	2 610	(2 180 – 3 100)	52.9	(48.3 – 57.5)
Alcohol	1 130	(890 – 1 410)	23.0	(19.2 – 27.3)
Marijuana	400	(250 – 580)	8.1	(5.3 – 11.5)
		LORI — High (N = 2 240)		
Smoked cigarettes	870	(600 – 1 200)	38.8	(30.5 – 47.4)
Chewed tobacco	130	(60 – 250)	5.8	(3.0 – 10.3)
All tobacco products	980	(680 – 1 330)	43.6	(35.5 – 52.5)
Alcohol	450	(280 – 670)	20.0	(14.0 – 26.9)
Marijuana	90	(40 – 140)	3.8	(2.0 – 6.2)
		LORI — Extreme (N = 1 970)		
Smoked cigarettes	670	(440 – 990)	33.9	(24.7 – 43.6)
Chewed tobacco	410	(250 – 660)	21.0	(13.9 – 30.0)
All tobacco products	1 010	(710 – 1 390)	51.3	(43.5 – 58.7)
Alcohol	350	(240 – 490)	17.7	(13.1 – 22.8)
Marijuana	40	(20 – 70)	1.8	(0.8 – 3.7)
		Total WA (N = 24 000)		
Smoked cigarettes	11 100	(10 500 – 11 800)	46.5	(43.9 – 49.0)
Chewed tobacco	840	(630 – 1 100)	3.5	(2.7 – 4.6)
All tobacco products	11 800	(11 200 – 12 500)	49.3	(46.9 – 51.8)
Alcohol	5 460	(4 970 – 5 980)	22.8	(20.8 – 24.9)
Marijuana	2 110	(1 800 – 2 450)	8.8	(7.5 – 10.2)

Table 3.16: Children whose primary carer is their birth mother, linked to MCHRDB — Mean birth weight (grams) and proportion of low birth weight babies, by substance use during pregnancy

Substance used	Mean birth weight (grams)	95% CI	% less than 2,500 grams	95% CI
No alcohol or tobacco	3 310	(3 260 – 3 350)	7.8	(6.1 – 9.8)
Alcohol, no tobacco	3 270	(3 150 – 3 380)	10.2	(5.5 – 17.5)
Tobacco, no alcohol	3 110	(3 060 – 3 160)	11.1	(8.8 – 13.7)
Both tobacco & alcohol	3 060	(2 990 – 3 120)	15.4	(11.9 – 19.4)
Total	3 200	(3 170 – 3 230)	10.3	(9.0 – 11.7)

Table 3.17: Linked births where carer is birth mother – Birth weight distribution, by use of alcohol or tobacco during pregnancy

Birth weight	Number	95% CI	%	95% CI
		No alcohol or tobacco		
Less than 2,000 grams	230	(120 – 410)	2.4	(1.3 – 4.2)
2,000 – 2,499 grams	510	(400 – 650)	5.4	(4.2 – 6.7)
2,500 – 2,999 grams	1 720	(1 480 – 1 980)	18.1	(15.8 – 20.6)
3,000 – 3,499 grams	3 460	(3 130 – 3 830)	36.6	(33.8 – 39.4)
3,500 – 3,999 grams	2 560	(2 260 – 2 880)	27.0	(24.2 – 30.0)
4,000 – 4,499 grams	840	(680 – 1 020)	8.9	(7.3 – 10.7)
4,500 grams and over	150	(100 – 210)	1.6	(1.1 – 2.3)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.6)
Total	9 460	(8 900 – 10 100)	100.0	
		Alcohol, no tobacco		
Less than 2,000 grams	30	(10 – 60)	2.2	(0.7 – 4.3)
2,000 – 2,499 grams	100	(50 – 210)	8.0	(3.7 – 15.8)
2,500 – 2,999 grams	270	(200 – 360)	21.5	(16.2 – 27.9)
3,000 – 3,499 grams	420	(310 – 560)	33.1	(25.7 – 41.7)
3,500 – 3,999 grams	350	(200 – 580)	27.7	(17.6 – 40.8)
4,000 – 4,499 grams	70	(40 – 110)	5.7	(3.5 – 8.7)
4,500 grams and over	20	(10 – 60)	1.9	(0.7 – 4.1)
Not stated	0	(0 – 60)	0.0	(0.0 – 4.3)
Total	1 270	(1 020 – 1 570)	100.0	
		Tobacco, no alcohol		
Less than 2,000 grams	290	(190 – 430)	4.2	(2.8 – 6.3)
2,000 – 2,499 grams	470	(360 – 590)	6.8	(5.4 – 8.6)
2,500 – 2,999 grams	1 710	(1 490 – 1 950)	25.0	(22.2 – 28.0)
3,000 – 3,499 grams	2 800	(2 500 – 3 100)	41.0	(38.0 – 44.1)
3,500 – 3,999 grams	1 250	(1 040 – 1 480)	18.3	(15.8 – 21.1)
4,000 – 4,499 grams	270	(170 – 400)	4.0	(2.6 – 5.9)
4,500 grams and over	40	(10 – 100)	0.6	(0.1 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.8)
Total	6 810	(6 290 – 7 360)	100.0	
		Alcohol and tobacco		
Less than 2,000 grams	150	(90 – 230)	4.0	(2.6 – 6.2)
2,000 – 2,499 grams	420	(300 – 550)	11.4	(8.5 – 15.1)
2,500 – 2,999 grams	990	(810 – 1 200)	27.0	(22.7 – 31.5)
3,000 – 3,499 grams	1 310	(1 100 – 1 540)	35.7	(31.1 – 40.4)
3,500 – 3,999 grams	620	(470 – 790)	16.9	(13.2 – 21.0)
4,000 – 4,499 grams	160	(90 – 270)	4.5	(2.6 – 7.2)
4,500 grams and over	20	(10 – 60)	0.5	(0.2 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 1.5)
Total	3 660	(3 260 – 4 100)	100.0	
		Total		
Less than 2,000 grams	690	(520 – 900)	3.3	(2.5 – 4.2)
2,000 – 2,499 grams	1 490	(1 290 – 1 710)	7.0	(6.1 – 8.1)
2,500 – 2,999 grams	4 690	(4 330 – 5 050)	22.1	(20.5 – 23.8)
3,000 – 3,499 grams	7 990	(7 540 – 8 450)	37.7	(35.8 – 39.5)
3,500 – 3,999 grams	4 770	(4 370 – 5 200)	22.5	(20.7 – 24.4)
4,000 – 4,499 grams	1 350	(1 150 – 1 580)	6.4	(5.4 – 7.4)
4,500 grams and over	230	(170 – 330)	1.1	(0.8 – 1.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.3)
Total	21 200	(20 600 – 21 800)	100.0	

Table 3.18: Children whose primary carer is their birth mother living in areas of moderate, high and extreme levels of relative isolation, linked to MCHRDB — Tobacco use during pregnancy and mean birthweight (grams)

Substance usage during pregnancy	Mean birthweight (grams)	95% CI
No tobacco	3 260	(3 210 – 3 320)
Smoked tobacco only	3 110	(3 050 – 3 160)
Chewed tobacco only	3 050	(2 920 – 3 180)
Smoked and chewed tobacco	3 130	(2 910 – 3 340)
Total	3 180	(3 140 – 3 220)

Table 3.19: Children whose primary carer is their birth mother, linked to MCHRDB — Mean birthweight (grams), by maternal substance use during pregnancy

Substance usage during pregnancy	Mean birthweight (grams)	95% CI
No marijuana, alcohol or tobacco	3 310	(3 260 – 3 360)
Marijuana only	3 100	(2 910 – 3 290)
Marijuana and alcohol	3 130	(2 960 – 3 300)
Marijuana and tobacco	3 000	(2 770 – 3 220)
Marijuana, alcohol and tobacco	2 940	(2 800 – 3 070)
Alchol and/or tobacco, no marijuana	3 130	(3 100 – 3 170)
Total	3 200	(3 170 – 3 230)

Table 3.20: Children whose primary carer is their birth mother — Use of tobacco and alcohol during pregnancy

Tobacco or alcohol use during pregnancy	Number	95% CI	%	95% CI
No alcohol or tobacco	10 700	(10 100 – 11 400)	44.8	(42.2 – 47.3)
Alcohol, no tobacco	1 420	(1 150 – 1 720)	5.9	(4.8 – 7.2)
Tobacco, no alcohol	7 770	(7 210 – 8 340)	32.4	(30.2 – 34.7)
Both tobacco & alcohol	4 040	(3 620 – 4 500)	16.9	(15.1 – 18.8)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.21: Birth mothers — Multiple substance use during pregnancy, by years of maternal formal education

Substance use	Number	95% CI	%	95% CI
		Did not attend		
None	130	(60 – 230)	38.5	(21.5 – 59.4)
Single substance use	90	(50 – 150)	26.1	(15.3 – 37.9)
Multiple substance use	120	(70 – 190)	35.4	(22.7 – 51.5)
Total	340	(230 – 500)	100.0	
		1 – 9 years		
None	1 520	(1 250 – 1 810)	35.4	(30.1 – 41.2)
Single substance use	1 510	(1 220 – 1 850)	35.4	(29.8 – 41.1)
Multiple substance use	1 250	(990 – 1 560)	29.2	(23.9 – 35.3)
Total	4 280	(3 800 – 4 800)	100.0	
		10 years		
None	4 990	(4 500 – 5 510)	45.0	(41.6 – 48.5)
Single substance use	3 840	(3 460 – 4 240)	34.6	(31.6 – 37.8)
Multiple substance use	2 250	(1 910 – 2 650)	20.3	(17.3 – 23.6)
Total	11 100	(10 400 – 11 700)	100.0	
		11 – 12 years		
None	2 760	(2 360 – 3 190)	42.9	(38.1 – 47.8)
Single substance use	2 410	(2 070 – 2 790)	37.5	(33.2 – 42.0)
Multiple substance use	1 260	(1 050 – 1 510)	19.6	(16.5 – 23.2)
Total	6 430	(5 880 – 7 010)	100.0	
		13 years or more		
None	800	(560 – 1 120)	60.5	(48.9 – 72.4)
Single substance use	450	(290 – 670)	33.8	(22.7 – 45.4)
Multiple substance use	80	(30 – 170)	5.7	(2.1 – 11.8)
Total	1 330	(1 000 – 1 700)	100.0	
		Not stated		
None	200	(130 – 290)	39.8	(26.5 – 53.2)
Single substance use	210	(110 – 370)	42.0	(27.0 – 59.1)
Multiple substance use	90	(60 – 140)	18.2	(10.6 – 27.5)
Total	500	(350 – 680)	100.0	
		Total birth mothers		
None	10 400	(9 800 – 11 000)	43.4	(41.0 – 45.9)
Single substance use	8 510	(7 950 – 9 090)	35.5	(33.3 – 37.8)
Multiple substance use	5 050	(4 580 – 5 550)	21.1	(19.1 – 23.1)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.22: All birth mothers – Multiple substance use during pregnancy, by financial strain

Substance use	Number	95% CI	%	95% CI
		Spending more money than we get		
None	730	(550 – 970)	35.8	(27.8 – 44.2)
Single substance use	780	(580 – 1 000)	38.1	(30.6 – 46.1)
Multiple substance use	530	(370 – 720)	26.1	(19.2 – 33.2)
Total	2 040	(1 700 – 2 420)	100.0	
		Have just enough to get through to next pay		
None	4 320	(3 880 – 4 800)	40.4	(36.9 – 43.9)
Single substance use	3 980	(3 570 – 4 440)	37.2	(33.9 – 40.6)
Multiple substance use	2 400	(2 070 – 2 780)	22.4	(19.6 – 25.5)
Total	10 700	(10 100 – 11 400)	100.0	
		Some money left over each week but spend it		
None	1 280	(1 010 – 1 580)	39.9	(33.1 – 46.8)
Single substance use	1 060	(810 – 1 340)	33.0	(26.7 – 40.1)
Multiple substance use	860	(650 – 1 130)	27.1	(21.0 – 33.4)
Total	3 190	(2 750 – 3 690)	100.0	
		Can save a bit now and again		
None	3 220	(2 780 – 3 700)	49.9	(44.9 – 55.1)
Single substance use	2 200	(1 890 – 2 530)	34.1	(29.8 – 38.5)
Multiple substance use	1 030	(790 – 1 310)	16.0	(12.5 – 20.0)
Total	6 440	(5 870 – 7 040)	100.0	
		Can save a lot		
None	650	(460 – 900)	60.4	(48.0 – 71.1)
Single substance use	290	(200 – 390)	26.7	(18.8 – 36.2)
Multiple substance use	140	(50 – 270)	12.9	(5.8 – 24.2)
Total	1 080	(830 – 1 370)	100.0	
		Financial strain not stated		
None	200	(130 – 290)	39.8	(26.5 – 53.2)
Single substance use	210	(110 – 370)	42.0	(27.0 – 59.1)
Multiple substance use	90	(60 – 140)	18.2	(10.6 – 27.5)
Total	500	(350 – 680)	100.0	
		Total		
None	10 400	(9 800 – 11 000)	43.4	(41.0 – 45.9)
Single substance use	8 510	(7 950 – 9 090)	35.5	(33.3 – 37.8)
Multiple substance use	5 050	(4 580 – 5 550)	21.1	(19.1 – 23.1)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.23: Children aged 0–17 years, for whom primary carer is birth mother — Proportion within each Level of Relative Isolation (LORI) ever breastfed

Whether ever breastfed	Number	95% CI	%	95% CI
		LORI — None		
Never breastfed	1 620	(1 360 – 1 920)	18.5	(15.4 – 21.7)
Breastfed	7 160	(6 780 – 7 560)	81.5	(78.3 – 84.6)
Total	8 780	(8 450 – 9 120)	100.0	
		LORI — Low		
Never breastfed	740	(540 – 980)	12.3	(9.4 – 16.0)
Breastfed	5 300	(4 790 – 5 860)	87.7	(84.0 – 90.6)
Total	6 050	(5 460 – 6 650)	100.0	
		LORI — Moderate		
Never breastfed	330	(230 – 440)	6.7	(5.0 – 8.8)
Breastfed	4 600	(3 880 – 5 400)	93.3	(91.2 – 95.0)
Total	4 920	(4 170 – 5 780)	100.0	
		LORI — High		
Never breastfed	100	(60 – 180)	4.7	(2.7 – 7.3)
Breastfed	2 130	(1 560 – 2 800)	95.3	(92.7 – 97.3)
Total	2 240	(1 670 – 2 980)	100.0	
		LORI — Extreme		
Never breastfed	70	(40 – 120)	3.7	(2.2 – 6.0)
Breastfed	1 890	(1 370 – 2 570)	96.3	(94.0 – 97.8)
Total	1 970	(1 420 – 2 670)	100.0	
		Total		
Never breastfed	2 870	(2 520 – 3 240)	12.0	(10.6 – 13.5)
Breastfed	21 100	(20 500 – 21 600)	88.0	(86.5 – 89.4)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.24: Children aged 0–17 years, for whom primary carer is birth mother — Duration of breastfeeding, by Level of Relative Isolation (LORI)

Months child breastfed	Number	95% CI	%	95% CI
		LORI — None		
Never breastfed	1 620	(1 360 – 1 920)	18.5	(15.4 – 21.7)
0 – less than 3 months	1 770	(1 460 – 2 130)	20.2	(16.7 – 24.0)
3 – less than 6 months	1 180	(940 – 1 450)	13.5	(10.8 – 16.5)
6 – less than 9 months	700	(560 – 860)	8.0	(6.4 – 9.7)
9 – less than 12 months	730	(590 – 920)	8.4	(6.7 – 10.4)
12 months or more	2 350	(2 040 – 2 690)	26.8	(23.3 – 30.5)
Still being breastfed	420	(310 – 550)	4.8	(3.6 – 6.3)
Total	8 780	(8 450 – 9 120)	100.0	
		LORI — Low		
Never breastfed	740	(540 – 980)	12.3	(9.4 – 16.0)
0 – less than 3 months	1 150	(910 – 1 420)	19.0	(15.5 – 23.2)
3 – less than 6 months	790	(640 – 970)	13.1	(10.6 – 15.8)
6 – less than 9 months	440	(330 – 570)	7.2	(5.5 – 9.4)
9 – less than 12 months	700	(510 – 920)	11.6	(8.8 – 15.1)
12 months or more	1 850	(1 510 – 2 230)	30.6	(25.7 – 36.0)
Still being breastfed	370	(290 – 470)	6.1	(4.8 – 7.6)
Total	6 050	(5 460 – 6 650)	100.0	
		LORI — Moderate		
Never breastfed	330	(230 – 440)	6.7	(5.0 – 8.8)
0 – less than 3 months	380	(280 – 500)	7.6	(5.8 – 9.7)
3 – less than 6 months	510	(350 – 690)	10.3	(7.6 – 13.2)
6 – less than 9 months	520	(390 – 680)	10.6	(8.3 – 13.3)
9 – less than 12 months	730	(580 – 910)	14.8	(12.4 – 17.4)
12 months or more	1 950	(1 600 – 2 360)	39.7	(36.2 – 43.3)
Still being breastfed	510	(380 – 660)	10.3	(8.2 – 12.8)
Total	4 920	(4 170 – 5 780)	100.0	
		LORI — High		
Never breastfed	100	(60 – 180)	4.7	(2.7 – 7.3)
0 – less than 3 months	150	(100 – 230)	6.8	(4.4 – 10.0)
3 – less than 6 months	110	(60 – 180)	4.9	(2.8 – 7.6)
6 – less than 9 months	140	(70 – 240)	6.2	(3.7 – 10.2)
9 – less than 12 months	360	(190 – 630)	16.0	(9.2 – 25.0)
12 months or more	1 140	(810 – 1 530)	51.0	(43.7 – 58.4)
Still being breastfed	230	(160 – 320)	10.4	(8.3 – 12.7)
Total	2 240	(1 670 – 2 980)	100.0	
		LORI — Extreme		
Never breastfed	70	(40 – 120)	3.7	(2.2 – 6.0)
0 – less than 3 months	70	(40 – 110)	3.4	(2.0 – 5.6)
3 – less than 6 months	190	(110 – 280)	9.4	(6.4 – 13.6)
6 – less than 9 months	110	(60 – 190)	5.8	(3.3 – 9.3)
9 – less than 12 months	240	(140 – 400)	12.1	(7.6 – 18.7)
12 months or more	960	(660 – 1 360)	48.7	(41.9 – 55.4)
Still being breastfed	330	(220 – 480)	16.9	(13.6 – 20.4)
Total	1 970	(1 420 – 2 670)	100.0	
		Total		
Never breastfed	2 870	(2 520 – 3 240)	12.0	(10.6 – 13.5)
0 – less than 3 months	3 520	(3 110 – 3 950)	14.7	(13.1 – 16.5)
3 – less than 6 months	2 780	(2 440 – 3 130)	11.6	(10.3 – 13.0)
6 – less than 9 months	1 910	(1 680 – 2 160)	8.0	(7.0 – 9.0)
9 – less than 12 months	2 760	(2 430 – 3 120)	11.5	(10.2 – 13.0)
12 months or more	8 250	(7 710 – 8 810)	34.5	(32.3 – 36.7)
Still being breastfed	1 860	(1 670 – 2 070)	7.8	(7.0 – 8.7)
Total	24 000	(23 400 – 24 500)	100.0	

Table 3.25: Children aged 0–3 years, for whom primary carer is birth mother — Proportion ever breastfed

Whether ever breastfed	Number	95% CI	%	95% CI
Never breastfed	780	(650 – 930)	12.6	(10.5 – 15.0)
Been breastfed	5 430	(5 240 – 5 610)	87.4	(85.0 – 89.5)
Total	6 210	(6 060 – 6 350)	100.0	

Table 3.26: Children aged 0–3 years for whom primary carer is birth–mother — Proportion still being breastfed, by Level of Relative Isolation (LORI), by child's age

LORI	Number	95% CI	%	95% CI
		Less than 6 months old		
None	120	(80 – 190)	44.9	(31.4 – 60.8)
Low	150	(100 – 200)	63.3	(47.2 – 78.8)
Moderate	130	(90 – 190)	74.4	(63.7 – 84.2)
High	50	(30 – 100)	76.7	(44.4 – 97.5)
Extreme	100	(50 – 190)	100.0	(59.0 – 100.0)
Total WA	550	(450 – 660)	65.0	(57.2 – 72.1)
		6 months to 11 months old		
None	70	(30 – 130)	25.0	(11.5 – 43.4)
Low	80	(40 – 130)	49.0	(32.4 – 67.6)
Moderate	130	(90 – 190)	59.3	(43.2 – 73.7)
High	20	(10 – 60)	89.9	(64.0 – 99.8)
Extreme	60	(30 – 110)	81.7	(61.2 – 95.0)
Total WA	360	(280 – 450)	48.3	(39.7 – 56.8)
		12 months or older		
None	220	(150 – 320)	14.2	(9.2 – 19.9)
Low	140	(80 – 200)	11.6	(7.4 – 17.0)
Moderate	230	(160 – 320)	21.7	(16.5 – 27.4)
High	150	(60 – 300)	33.5	(17.9 – 54.3)
Extreme	170	(80 – 300)	47.4	(30.2 – 66.9)
Total WA	910	(740 – 1 090)	19.6	(16.2 – 23.3)
		Total 0–3 year olds		
None	410	(320 – 530)	19.5	(14.8 – 24.7)
Low	360	(280 – 450)	23.0	(18.4 – 28.1)
Moderate	490	(390 – 620)	33.8	(28.9 – 39.0)
High	230	(120 – 380)	42.1	(27.7 – 57.8)
Extreme	330	(200 – 500)	62.1	(50.7 – 72.3)
Total WA	1 820	(1 630 – 2 020)	29.3	(26.4 – 32.4)

Table 3.27: Children aged 0–3 years for whom primary carer is birth mother — Age still exclusively being breastfed

Age	Number	95% CI	%	95% CI
Less than 6 months	450	(360 – 550)	53.0	(45.5 – 60.7)
6 months to 11 months	50	(30 – 80)	7.0	(3.8 – 10.9)
12 months or older	140	(80 – 230)	3.1	(1.7 – 4.9)
Total 0–3 year olds	650	(540 – 770)	10.4	(8.6 – 12.4)

Table 3.28: Children 0–3 years, for whom primary carer is birth mother — Length of time child exclusively breastfed, by Level of Relative Isolation (LORI)

Period exclusively breastfed	Number	95% CI	%	95% CI
		LORI — None		
Never breastfed	480	(380 – 600)	22.6	(17.7 – 28.2)
1 month	270	(180 – 370)	12.5	(8.5 – 17.2)
2 months	160	(100 – 260)	7.6	(4.6 – 11.9)
3 months	250	(170 – 340)	11.6	(8.2 – 16.0)
4 months	330	(250 – 410)	15.3	(11.8 – 19.3)
5 months	170	(90 – 270)	7.8	(4.2 – 12.4)
6 months	240	(160 – 320)	11.1	(7.9 – 15.3)
7 months or longer	90	(50 – 140)	4.2	(2.6 – 6.6)
Still being breastfed	150	(100 – 220)	7.3	(4.6 – 10.5)
Total	2 130	(2 020 – 2 230)	100.0	
		LORI — Low		
Never breastfed	170	(110 – 240)	10.6	(7.3 – 15.2)
1 month	190	(130 – 260)	12.0	(8.6 – 16.4)
2 months	110	(60 – 170)	6.9	(4.0 – 10.7)
3 months	270	(200 – 350)	17.1	(12.8 – 22.1)
4 months	360	(280 – 450)	22.9	(17.9 – 28.3)
5 months	90	(50 – 170)	5.9	(3.0 – 10.9)
6 months	140	(90 – 230)	9.2	(5.7 – 14.4)
7 months and longer	100	(60 – 140)	6.4	(4.1 – 9.2)
Still being breastfed	140	(100 – 190)	9.0	(6.5 – 11.9)
Total	1 560	(1 410 – 1 720)	100.0	
		LORI — Moderate		
Never breastfed	110	(70 – 180)	7.8	(4.5 – 12.0)
1 month	110	(50 – 200)	7.6	(3.8 – 13.7)
2 months	80	(20 – 160)	5.2	(1.6 – 10.8)
3 months	290	(220 – 370)	19.7	(15.7 – 24.2)
4 months	250	(170 – 370)	17.3	(12.1 – 24.0)
5 months	140	(90 – 210)	9.5	(6.6 – 13.6)
6 months	210	(150 – 270)	14.1	(10.6 – 18.4)
7 months and longer	120	(70 – 180)	8.0	(4.9 – 12.0)
Still being breastfed	160	(120 – 210)	10.8	(8.1 – 14.0)
Total	1 470	(1 240 – 1 710)	100.0	
		LORI — High		
Never breastfed	10	(0 – 50)	1.7	(0.0 – 8.7)
1 month	60	(30 – 90)	10.7	(6.1 – 17.7)
2 months	40	(0 – 100)	6.6	(1.6 – 20.9)
3 months	70	(30 – 120)	12.4	(6.4 – 22.6)
4 months	100	(40 – 210)	19.2	(9.1 – 35.6)
5 months	30	(0 – 100)	6.4	(1.5 – 19.9)
6 months	100	(50 – 170)	17.9	(10.5 – 28.0)
7 months and longer	50	(10 – 160)	9.0	(1.0 – 26.0)
Still being breastfed	90	(40 – 170)	16.3	(7.9 – 27.3)
Total	530	(350 – 770)	100.0	

Table 3.28: Children 0–3 years, for whom primary carer is birth mother — Length of time child exclusively breastfed, by Level of Relative Isolation (LORI) (Continued)

Period exclusively breastfed	Number	95% CI	%	95% CI
	LORI — Extreme			
Never breastfed	10	(10 – 30)	2.6	(0.8 – 5.7)
1 month	20	(0 – 50)	3.1	(0.3 – 9.4)
2 months	20	(10 – 50)	4.0	(1.4 – 9.8)
3 months	60	(20 – 140)	11.1	(4.1 – 26.2)
4 months	70	(40 – 120)	13.2	(7.7 – 20.4)
5 months	50	(20 – 110)	9.0	(3.6 – 19.9)
6 months	100	(40 – 180)	18.5	(8.8 – 32.0)
7 months and longer	100	(40 – 170)	18.3	(9.2 – 29.5)
Still being breastfed	110	(50 – 210)	20.2	(10.0 – 31.9)
Total	520	(350 – 770)	100.0	
	Total WA			
Never breastfed	780	(650 – 930)	12.6	(10.5 – 15.0)
1 month	640	(510 – 780)	10.3	(8.3 – 12.6)
2 months	400	(290 – 540)	6.5	(4.7 – 8.6)
3 months	930	(790 – 1 080)	14.9	(12.7 – 17.2)
4 months	1 110	(950 – 1 280)	17.9	(15.4 – 20.5)
5 months	480	(360 – 610)	7.7	(5.8 – 9.9)
6 months	780	(650 – 920)	12.5	(10.5 – 14.8)
7 months and longer	450	(350 – 570)	7.2	(5.6 – 9.1)
Still being breastfed	650	(540 – 770)	10.4	(8.6 – 12.4)
Total	6 210	(6 060 – 6 350)	100.0	

Table 3.29: Children 0–3 years, for whom primary carer is birth mother, and who have started on solid food — Age child first given solid food, by Level of Relative Isolation (LORI)

Age child first given solid food	Number	95% CI	%	95% CI
		LORI — None		
1 month	80	(30 – 160)	4.2	(1.8 – 8.7)
2 months	130	(70 – 210)	6.8	(3.8 – 10.9)
3 months	270	(180 – 380)	14.4	(10.0 – 20.5)
4 months	600	(490 – 730)	32.2	(26.5 – 38.7)
5 months	300	(210 – 410)	16.0	(11.2 – 21.4)
6 months	320	(230 – 430)	17.1	(12.6 – 22.6)
7 months or older	170	(120 – 240)	9.3	(6.5 – 12.9)
Total	1 870	(1 760 – 1 990)	100.0	
		LORI — Low		
1 month	60	(40 – 100)	4.6	(2.7 – 7.4)
2 months	70	(30 – 120)	4.7	(2.3 – 8.5)
3 months	300	(230 – 400)	21.7	(16.6 – 27.7)
4 months	440	(350 – 530)	31.6	(25.7 – 37.6)
5 months	130	(60 – 210)	9.0	(4.6 – 14.9)
6 months	210	(140 – 290)	15.2	(10.6 – 21.0)
7 months or older	180	(130 – 240)	13.1	(9.4 – 17.3)
Total	1 390	(1 240 – 1 540)	100.0	
		LORI — Moderate		
1 month	50	(10 – 160)	4.0	(0.9 – 12.4)
2 months	60	(30 – 110)	4.9	(2.4 – 8.4)
3 months	210	(150 – 280)	16.5	(12.3 – 21.7)
4 months	350	(260 – 460)	27.0	(21.3 – 33.4)
5 months	150	(100 – 220)	11.5	(7.4 – 16.5)
6 months	250	(180 – 360)	19.7	(13.8 – 26.3)
7 months or older	210	(150 – 290)	16.3	(12.1 – 21.7)
Total	1 280	(1 080 – 1 510)	100.0	
		LORI — High		
1 month	0	(0 – 10)	0.9	(0.3 – 2.6)
2 months	20	(0 – 70)	5.5	(0.6 – 15.5)
3 months	50	(20 – 100)	12.0	(4.4 – 23.9)
4 months	120	(60 – 230)	26.9	(12.9 – 44.4)
5 months	50	(10 – 140)	12.2	(3.8 – 30.7)
6 months	100	(50 – 180)	22.8	(13.2 – 37.0)
7 months or older	80	(30 – 190)	19.7	(7.2 – 36.4)
Total	430	(280 – 630)	100.0	
		LORI — Extreme		
1 month	0	(0 – 10)	0.7	(0.1 – 2.1)
2 months	20	(10 – 50)	5.2	(1.3 – 11.4)
3 months	30	(10 – 80)	7.1	(2.1 – 18.2)
4 months	100	(50 – 170)	23.6	(13.1 – 38.2)
5 months	40	(10 – 110)	9.9	(2.5 – 21.7)
6 months	110	(60 – 210)	28.2	(15.4 – 45.9)
7 months or older	100	(50 – 180)	25.3	(12.9 – 39.5)
Total	400	(260 – 590)	100.0	
		Total WA		
1 month	200	(120 – 310)	3.7	(2.3 – 5.8)
2 months	300	(220 – 400)	5.6	(4.0 – 7.4)
3 months	860	(720 – 1 020)	16.1	(13.5 – 18.9)
4 months	1 600	(1 420 – 1 790)	29.8	(26.5 – 33.1)
5 months	670	(530 – 820)	12.4	(9.9 – 15.3)
6 months	1 000	(840 – 1 160)	18.5	(15.7 – 21.6)
7 months or older	750	(630 – 890)	14.0	(11.7 – 16.5)
Total	5 380	(5 200 – 5 540)	100.0	

Table 3.30: Children aged 4–17 years — Drink usually drunk to quench thirst, by age group

Drink	Number	95% CI	%	95% CI
		4–11 years		
Water only	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)
Soft drink	1 030	(770 – 1 320)	7.4	(5.6 – 9.5)
Fruit juice	610	(430 – 850)	4.4	(3.1 – 6.1)
Cordial	2 560	(2 250 – 2 900)	18.6	(16.3 – 21.0)
Other	350	(210 – 530)	2.5	(1.5 – 3.8)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
Water only	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)
Soft drink	1 200	(990 – 1 450)	13.2	(10.9 – 15.7)
Fruit juice	390	(300 – 510)	4.3	(3.3 – 5.5)
Cordial	930	(740 – 1 170)	10.3	(8.2 – 12.8)
Other	260	(140 – 410)	2.8	(1.7 – 4.7)
Total	9 100	(8 620 – 9 590)	100.0	
		Total		
Water only	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)
Soft drink	2 230	(1 890 – 2 590)	9.7	(8.2 – 11.3)
Fruit juice	1 000	(790 – 1 250)	4.4	(3.5 – 5.4)
Cordial	3 500	(3 120 – 3 900)	15.3	(13.6 – 17.0)
Other	610	(430 – 850)	2.7	(1.9 – 3.7)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.31: All children aged 4–17 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
		LORI — None (N = 7 830)		
Unsweetened milk	7 200	(6 980 – 7 420)	91.9	(89.5 – 94.0)
Daily vegetable intake	5 050	(4 700 – 5 410)	64.5	(60.0 – 68.7)
Adequate vegetable intake	3 070	(2 740 – 3 400)	39.2	(35.0 – 43.4)
Adequate fruit intake	5 610	(5 290 – 5 940)	71.6	(67.4 – 75.4)
Drinks water when thirsty	4 880	(4 550 – 5 230)	62.3	(57.9 – 66.4)
		LORI — Low (N = 5 740)		
Unsweetened milk	5 330	(4 850 – 5 830)	92.7	(90.5 – 94.5)
Daily vegetable intake	3 680	(3 280 – 4 110)	64.1	(59.6 – 68.5)
Adequate vegetable intake	2 030	(1 730 – 2 380)	35.4	(30.9 – 40.2)
Adequate fruit intake	3 920	(3 530 – 4 330)	68.2	(64.0 – 72.1)
Drinks water when thirsty	3 480	(3 100 – 3 900)	60.6	(56.0 – 65.1)
		LORI — Moderate (N = 4 630)		
Unsweetened milk	4 310	(3 600 – 5 060)	93.1	(91.1 – 94.7)
Daily vegetable intake	3 140	(2 590 – 3 750)	67.8	(61.4 – 73.7)
Adequate vegetable intake	1 750	(1 390 – 2 190)	37.9	(32.4 – 44.0)
Adequate fruit intake	3 230	(2 680 – 3 840)	69.8	(64.7 – 74.6)
Drinks water when thirsty	3 480	(2 870 – 4 130)	75.1	(70.2 – 79.7)
		LORI — High (N = 2 530)		
Unsweetened milk	2 340	(1 780 – 3 060)	92.5	(85.1 – 96.9)
Daily vegetable intake	1 710	(1 270 – 2 240)	67.6	(60.3 – 74.7)
Adequate vegetable intake	850	(580 – 1 200)	33.4	(25.9 – 41.9)
Adequate fruit intake	1 820	(1 370 – 2 380)	71.8	(64.8 – 78.0)
Drinks water when thirsty	1 970	(1 490 – 2 590)	77.9	(69.6 – 84.4)
		LORI — Extreme (N = 2 170)		
Unsweetened milk	2 060	(1 510 – 2 790)	95.1	(91.6 – 97.6)
Daily vegetable intake	1 250	(910 – 1 730)	57.8	(47.7 – 67.8)
Adequate vegetable intake	530	(350 – 800)	24.5	(17.4 – 33.5)
Adequate fruit intake	1 530	(1 090 – 2 030)	70.4	(62.2 – 78.4)
Drinks water when thirsty	1 770	(1 250 – 2 360)	81.4	(76.4 – 86.0)
		Total WA (N = 22 900)		
Unsweetened milk	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Daily vegetable intake	14 800	(14 200 – 15 400)	64.8	(62.2 – 67.3)
Adequate vegetable intake	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Adequate fruit intake	16 100	(15 600 – 16 600)	70.3	(68.1 – 72.5)
Drinks water when thirsty	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)

Table 3.32: Children aged 4–11 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
		LORI — None (N = 4 670)		
Unsweetened milk	4 390	(4 060 – 4 740)	94.0	(89.8 – 96.7)
Daily vegetable intake	2 700	(2 380 – 3 050)	57.9	(51.7 – 64.0)
Adequate vegetable intake	1 990	(1 690 – 2 330)	42.6	(36.7 – 48.9)
Adequate fruit intake	3 300	(2 970 – 3 650)	70.7	(64.7 – 76.1)
Drinks water when thirsty	2 880	(2 540 – 3 230)	61.6	(55.5 – 67.3)
		LORI — Low (N = 3 460)		
Unsweetened milk	3 300	(2 930 – 3 680)	95.3	(92.8 – 97.2)
Daily vegetable intake	1 990	(1 710 – 2 290)	57.4	(51.6 – 63.0)
Adequate vegetable intake	1 400	(1 160 – 1 680)	40.6	(34.9 – 46.5)
Adequate fruit intake	2 230	(1 940 – 2 560)	64.5	(59.2 – 69.6)
Drinks water when thirsty	2 020	(1 730 – 2 340)	58.4	(52.2 – 64.5)
		LORI — Moderate (N = 2 800)		
Unsweetened milk	2 650	(2 160 – 3 190)	94.3	(91.6 – 96.6)
Daily vegetable intake	1 810	(1 440 – 2 260)	64.4	(56.0 – 71.6)
Adequate vegetable intake	1 320	(1 020 – 1 680)	47.1	(39.5 – 55.2)
Adequate fruit intake	1 850	(1 460 – 2 300)	65.9	(59.3 – 71.9)
Drinks water when thirsty	2 080	(1 680 – 2 530)	74.3	(66.6 – 80.6)
		LORI — High (N = 1 600)		
Unsweetened milk	1 470	(1 060 – 1 970)	92.1	(78.8 – 97.5)
Daily vegetable intake	1 000	(700 – 1 420)	62.5	(51.7 – 71.5)
Adequate vegetable intake	630	(410 – 940)	39.2	(29.2 – 51.1)
Adequate fruit intake	1 090	(780 – 1 480)	67.9	(59.1 – 76.1)
Drinks water when thirsty	1 290	(930 – 1 750)	80.8	(71.1 – 88.1)
		LORI — Extreme (N = 1 270)		
Unsweetened milk	1 200	(850 – 1 660)	94.3	(90.0 – 97.3)
Daily vegetable intake	630	(400 – 930)	49.3	(34.8 – 63.4)
Adequate vegetable intake	360	(220–560)	28.5	(19.2–40.0)
Adequate fruit intake	750	(510 – 1 060)	59.2	(47.4 – 70.7
Drinks water when thirsty	980	(660 – 1 360)	77.2	(68.8 – 83.7)
		Total WA (N = 13 800)		
Unsweetened milk	13 000	(12 500 – 13 500)	94.2	(92.4 – 95.7)
Daily vegetable intake	8 120	(7 570 – 8 690)	58.8	(55.3 – 62.2)
Adequate vegetable intake	5 700	(5 210 – 6 230)	41.3	(38.0 – 44.7)
Adequate fruit intake	9 220	(8 680 – 9 760)	66.8	(63.7 – 69.7)
Drinks water when thirsty	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)

Table 3.33: Children aged 12–17 years — Dietary indicators, by LORI

Dietary Indicators	Number	95% CI	%	95% CI
		LORI — None (N = 3 160)		
Unsweetened milk	2 810	(2 510 – 3 130)	88.8	(85.9 – 91.3)
Daily vegetable intake	2 350	(2 080 – 2 640)	74.3	(68.3 – 79.7)
Adequate vegetable intake	1 080	(900 – 1 290)	34.1	(29.1 – 39.7)
Adequate fruit intake	2 310	(2 040 – 2 600)	73.0	(67.7 – 78.1)
Drinks water when thirsty	2 000	(1 760 – 2 270)	63.3	(57.3 – 68.9)
		LORI — Low (N = 2 280)		
Unsweetened milk	2 030	(1 750 – 2 340)	88.8	(84.6 – 92.2)
Daily vegetable intake	1 700	(1 430 – 1 990)	74.2	(67.8 – 80.1)
Adequate vegetable intake	630	(450 – 850)	27.4	(20.7 – 35.1)
Adequate fruit intake	1 690	(1 430 – 1 970)	73.8	(67.5 – 79.3)
Drinks water when thirsty	1 460	(1 230 – 1 720)	63.8	(56.4 – 70.9)
		LORI — Moderate (N = 1 820)		
Unsweetened milk	1 660	(1 340 – 2 040)	91.1	(88.1 – 93.4)
Daily vegetable intake	1 330	(1 080 – 1 630)	73.0	(62.6 – 81.6)
Adequate vegetable intake	430	(320 – 560)	23.7	(18.9 – 29.0)
Adequate fruit intake	1 380	(1 130 – 1 680)	75.8	(65.4 – 84.0)
Drinks water when thirsty	1 390	(1 100 – 1 730)	76.3	(70.8 – 81.4)
		LORI — High (N = 930)		
Unsweetened milk	870	(640 – 1 140)	93.3	(84.7 – 97.7)
Daily vegetable intake	710	(530 – 940)	76.4	(68.6 – 82.6)
Adequate vegetable intake	220	(130 – 340)	23.5	(15.6 – 32.2)
Adequate fruit intake	730	(550 – 970)	78.3	(70.5 – 84.5)
Drinks water when thirsty	680	(500 – 910)	73.0	(62.2 – 82.0)
		LORI — Extreme (N = 900)		
Unsweetened milk	870	(620 – 1 190)	96.4	(90.8 – 99.3)
Daily vegetable intake	630	(440 – 870)	69.9	(59.2 – 78.5)
Adequate vegetable intake	170	(100 – 280)	19.0	(11.4 – 28.5)
Adequate fruit intake	780	(540 – 1 070)	86.3	(79.3 – 92.2)
Drinks water when thirsty	790	(540 – 1 090)	87.4	(80.4 – 92.9)
		Total WA (N = 9 100)		
Unsweetened milk	8 230	(7 760 – 8 710)	90.5	(88.8 – 91.9)
Daily vegetable intake	6 720	(6 290 – 7 160)	73.8	(70.4 – 76.9)
Adequate vegetable intake	2 530	(2 230 – 2 840)	27.8	(24.9 – 30.9)
Adequate fruit intake	6 880	(6 450 – 7 320)	75.6	(72.4 – 78.5)
Drinks water when thirsty	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)

Table 3.34: Children aged 4–17 years — Types of milk drunk

Type of milk	Number	95% CI	%	95% CI
Unsweetened, unflavoured cow or soy	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Sweetened &/or flavoured	810	(620 – 1 040)	3.6	(2.7 – 4.5)
Other	220	(160 – 310)	1.0	(0.7 – 1.3)
None	630	(480 – 810)	2.8	(2.1 – 3.6)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.35: Children aged 4–17 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
		Did not attend school (N = 670)		
Unsweetened milk	610	(410 – 890)	91.6	(78.8 – 97.5)
Adequate vegetable intake	180	(100 – 300)	27.6	(13.4 – 43.1)
Adequate fruit intake	380	(240 – 560)	56.1	(43.3 – 67.9)
Drinks water when thirsty	570	(390 – 810)	84.3	(67.3 – 96.0)
		1–9 years (N = 5 180)		
Unsweetened milk	4 780	(4 320 – 5 280)	92.4	(89.9 – 94.5)
Adequate vegetable intake	1 560	(1 350 – 1 810)	30.2	(26.3 – 34.3)
Adequate fruit intake	3 400	(3 010 – 3 820)	65.7	(61.2 – 70.1)
Drinks water when thirsty	3 660	(3 280 – 4 070)	70.7	(66.5 – 74.5)
		10 years (N = 9 840)		
Unsweetened milk	9 060	(8 460 – 9 680)	92.0	(90.4 – 93.4)
Adequate vegetable intake	3 680	(3 260 – 4 130)	37.4	(33.7 – 41.0)
Adequate fruit intake	7 080	(6 540 – 7 640)	71.9	(68.5 – 75.4)
Drinks water when thirsty	6 400	(5 870 – 6 950)	65.1	(61.4 – 68.6)
		11–12 years (N = 5 010)		
Unsweetened milk	4 720	(4 250 – 5 230)	94.0	(91.0 – 96.3)
Adequate vegetable intake	1 990	(1 700 – 2 330)	39.7	(34.8 – 45.0)
Adequate fruit intake	3 630	(3 220 – 4 090)	72.4	(67.7 – 76.7)
Drinks water when thirsty	3 400	(3 010 – 3 820)	67.8	(63.0 – 72.4)
		13 years or more (N = 1 380)		
Unsweetened milk	1 270	(960 – 1 650)	91.8	(83.8 – 96.2)
Adequate vegetable intake	590	(400 – 830)	42.5	(30.7 – 55.2)
Adequate fruit intake	1 000	(750 – 1 280)	72.4	(63.1 – 80.4)
Drinks water when thirsty	990	(700 – 1 310)	71.3	(59.6 – 80.3)
		Not stated (N = 810)		
Unsweetened milk	790	(590 – 1 060)	97.2	(89.8 – 99.6)
Adequate vegetable intake	230	(110 – 410)	27.7	(14.6 – 43.9)
Adequate fruit intake	600	(420 – 840)	74.1	(61.4 – 83.5)
Drinks water when thirsty	560	(380 – 810)	68.7	(56.1 – 80.8)
		Total (N = 22 900)		
Unsweetened milk	21 200	(21 000 – 21 500)	92.7	(91.5 – 93.8)
Adequate vegetable intake	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Adequate fruit intake	16 100	(15 600 – 16 600)	70.3	(68.1 – 72.5)
Drinks water when thirsty	15 600	(15 000 – 16 100)	68.0	(65.7 – 70.2)

Table 3.36: Children aged 4–11 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
		Did not attend school (N = 360)		
Unsweetened milk	330	(220 – 470)	90.9	(66.9 – 98.7)
Adequate vegetable intake	120	(60 – 200)	33.0	(18.6 – 53.2)
Adequate fruit intake	140	(80 – 250)	39.7	(21.8 – 57.8)
Drinks water when thirsty	310	(210 – 420)	84.4	(51.6 – 97.9)
		1–9 years (N = 2 850)		
Unsweetened milk	2 660	(2 340 – 3 000)	93.1	(89.1 – 95.8)
Adequate vegetable intake	960	(800 – 1 140)	33.6	(28.0 – 39.2)
Adequate fruit intake	1 570	(1 330 – 1 840)	55.0	(48.8 – 60.9)
Drinks water when thirsty	1 890	(1 620 – 2 180)	66.3	(60.2 – 72.0)
		10 years (N = 6 050)		
Unsweetened milk	5 700	(5 230 – 6 190)	94.2	(92.0 – 96.1)
Adequate vegetable intake	2 550	(2 200 – 2 950)	42.1	(37.1 – 47.1)
Adequate fruit intake	4 290	(3 830 – 4 750)	70.9	(66.3 – 75.0)
Drinks water when thirsty	3 870	(3 480 – 4 300)	64.1	(58.8 – 68.9)
		11–12 years (N = 3 490)		
Unsweetened milk	3 300	(2 930 – 3 710)	94.4	(90.0 – 97.5)
Adequate vegetable intake	1 620	(1 360 – 1 920)	46.5	(40.1 – 52.8)
Adequate fruit intake	2 520	(2 170 – 2 890)	72.1	(65.8 – 77.6)
Drinks water when thirsty	2 410	(2 090 – 2 780)	69.1	(63.6 – 74.2)
		13 years or more (N = 720)		
Unsweetened milk	700	(490 – 950)	96.3	(77.2 – 99.9)
Adequate vegetable intake	340	(180 – 560)	46.6	(28.1 – 63.6)
Adequate fruit intake	470	(310 – 690)	64.4	(46.9 – 77.9)
Drinks water when thirsty	560	(370 – 810)	77.4	(65.0 – 88.2)
		Not stated (N = 330)		
Unsweetened milk	330	(180 – 530)	100.0	(84.6 – 100.0)
Adequate vegetable intake	120	(20 – 310)	36.3	(12.2 – 73.8)
Adequate fruit intake	230	(110 – 430)	72.2	(47.6 – 92.7)
Drinks water when thirsty	210	(90 – 400)	65.5	(38.3 – 85.8)
		Total (N = 13 800)		
Unsweetened milk	13 000	(12 500 – 13 500)	94.2	(92.4 – 95.7)
Adequate vegetable intake	5 700	(5 210 – 6 230)	41.3	(38.0 – 44.7)
Adequate fruit intake	9 220	(8 680 – 9 760)	66.8	(63.7 – 69.7)
Drinks water when thirsty	9 260	(8 730 – 9 790)	67.1	(63.9 – 70.0)

Table 3.37: Children aged 12–17 years — Dietary indicators, by carer education

Dietary Indicators	Number	95% CI	%	95% CI
		Did not attend school (N = 310)		
Unsweetened milk	290	(150 – 470)	92.5	(76.3 – 98.1)
Adequate vegetable intake	70	(20 – 130)	21.2	(7.8 – 45.4)
Adequate fruit intake	230	(110 – 400)	75.3	(58.8 – 89.3)
Drinks water when thirsty	260	(140 – 420)	84.1	(67.2 – 94.7)
		1–9 years (N = 2 320)		
Unsweetened milk	2 130	(1 840 – 2 460)	91.5	(87.7 – 94.2)
Adequate vegetable intake	600	(470 – 760)	26.0	(20.8 – 31.5)
Adequate fruit intake	1 840	(1 570 – 2 140)	79.0	(73.5 – 83.8)
Drinks water when thirsty	1 770	(1 510 – 2 050)	76.1	(70.0 – 81.5)
		10 years (N = 3 800)		
Unsweetened milk	3 360	(2 990 – 3 760)	88.5	(86.1 – 90.8)
Adequate vegetable intake	1 130	(930 – 1 370)	29.8	(25.1 – 34.9)
Adequate fruit intake	2 790	(2 500 – 3 110)	73.6	(67.7 – 79.1)
Drinks water when thirsty	2 530	(2 200 – 2 880)	66.7	(61.8 – 71.1)
		11–12 years (N = 1 520)		
Unsweetened milk	1 420	(1 160 – 1 720)	93.2	(90.4 – 95.5)
Adequate vegetable intake	370	(230 – 540)	24.2	(16.8 – 32.8)
Adequate fruit intake	1 120	(890 – 1 390)	73.2	(66.1 – 79.7)
Drinks water when thirsty	990	(800 – 1 210)	64.8	(55.0 – 73.8)
		13 years or more (N = 660)		
Unsweetened milk	570	(400 – 790)	87.0	(77.6 – 94.1)
Adequate vegetable intake	250	(160 – 370)	38.0	(24.1 – 51.9)
Adequate fruit intake	540	(380 – 760)	81.1	(66.7 – 90.9)
Drinks water when thirsty	430	(280 – 610)	64.6	(48.0 – 78.4)
		Not stated (N = 490)		
Unsweetened milk	470	(330 – 640)	95.4	(83.5 – 99.4)
Adequate vegetable intake	110	(60 – 190)	22.0	(11.9 – 33.7)
Adequate fruit intake	370	(250 – 520)	75.4	(65.0 – 84.9)
Drinks water when thirsty	350	(220 – 510)	70.9	(54.8 – 83.2)
		Total (N = 9 100)		
Unsweetened milk	8 230	(7 760 – 8 710)	90.5	(88.8 – 91.9)
Adequate vegetable intake	2 530	(2 230 – 2 840)	27.8	(24.9 – 30.9)
Adequate fruit intake	6 880	(6 450 – 7 320)	75.6	(72.4 – 78.5)
Drinks water when thirsty	6 320	(5 890 – 6 760)	69.4	(66.1 – 72.5)

Table 3.38: Children aged 4–17 years who eat fresh vegetables daily — Whether quantity exceeds half a cup

Exceeds half cup	Number	95% CI	%	95% CI
		4–11 years		
No	200	(140 – 270)	2.5	(1.8 – 3.3)
Yes	7 920	(7 360 – 8 470)	97.5	(96.7 – 98.2)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.7)
Total	8 120	(7 570 – 8 690)	100.0	
		12–17 years		
No	1 280	(1 100 – 1 480)	19.0	(16.5 – 21.8)
Yes	5 440	(5 040 – 5 860)	81.0	(78.2 – 83.5)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.8)
Total	6 720	(6 290 – 7 160)	100.0	
		Total children 4–17 years		
No	1 480	(1 290 – 1 680)	10.0	(8.7 – 11.3)
Yes	13 400	(12 800 – 13 900)	90.0	(88.7 – 91.3)
Not stated	0	(0 – 60)	0.0	(0.0 – 0.4)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.39: Children aged 4–17 who usually ate fresh vegetables daily — Number of types of vegetables consumed regularly (excluding potatoes) by age

Number of vegetables excluding potatoes consumed regularly	Number	95% CI	%	95% CI
		4–11 years		
None	120	(70 – 190)	1.4	(0.8 – 2.4)
One	220	(150 – 330)	2.7	(1.8 – 4.0)
Two	630	(480 – 820)	7.8	(5.9 – 10.0)
Three	1 390	(1 110 – 1 700)	17.1	(13.8 – 20.7)
Four	1 740	(1 460 – 2 070)	21.5	(18.2 – 25.0)
Five or more	4 020	(3 580 – 4 490)	49.5	(45.2 – 53.9)
Total	8 120	(7 570 – 8 690)	100.0	
		12–17 years		
None	170	(120 – 220)	2.5	(1.8 – 3.3)
One	1 400	(1 180 – 1 650)	20.8	(17.8 – 24.2)
Two	830	(670 – 1 000)	12.3	(10.1 – 14.8)
Three	1 400	(1 220 – 1 600)	20.8	(18.3 – 23.5)
Four	1 130	(950 – 1 330)	16.8	(14.3 – 19.6)
Five or more	1 800	(1 550 – 2 090)	26.8	(23.5 – 30.4)
Total	6 720	(6 290 – 7 160)	100.0	
		Total children 4–17 years		
None	280	(210 – 370)	1.9	(1.4 – 2.5)
One	1 620	(1 390 – 1 880)	10.9	(9.3 – 12.6)
Two	1 460	(1 230 – 1 700)	9.8	(8.3 – 11.5)
Three	2 790	(2 470 – 3 140)	18.8	(16.7 – 21.1)
Four	2 870	(2 530 – 3 240)	19.4	(17.2 – 21.6)
Five or more	5 820	(5 330 – 6 340)	39.2	(36.4 – 42.2)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.40: Children aged 4–17 years who eat fresh vegetables daily — Number of different types other than potato

Number of different types	Number	95% CI	%	95% CI
		4–11 years		
Three or less	2 360	(2 030 – 2 730)	29.0	(25.3 – 33.1)
More than three	5 760	(5 260 – 6 290)	71.0	(66.9 – 74.7)
Total	8 120	(7 570 – 8 690)	100.0	
		12–17 years		
Three or less	3 790	(3 460 – 4 120)	56.4	(52.7 – 60.0)
More than three	2 930	(2 620 – 3 260)	43.6	(40.0 – 47.3)
Total	6 720	(6 290 – 7 160)	100.0	
		Total children 4–17 years		
Three or less	6 150	(5 700 – 6 610)	41.4	(38.6 – 44.3)
More than three	8 690	(8 120 – 9 260)	58.6	(55.7 – 61.4)
Total	14 800	(14 200 – 15 400)	100.0	

Table 3.41: Children aged 4–17 years — Adequacy of vegetable intake, by adequacy of fruit intake

Adequacy of vegetable intake	Number	95% CI	%	95% CI
		Inadequate fruit intake		
Inadequate	5 130	(4 670 – 5 620)	75.4	(71.5 – 79.0)
Adequate	1 680	(1 420 – 1 960)	24.6	(21.0 – 28.5)
Total	6 810	(6 300 – 7 310)	100.0	
		Adequate fruit intake		
Inadequate	9 540	(9 000 – 10 100)	59.3	(56.4 – 62.1)
Adequate	6 550	(6 040 – 7 090)	40.7	(37.9 – 43.6)
Total	16 100	(15 600 – 16 600)	100.0	
		Total		
Inadequate	14 700	(14 100 – 15 200)	64.1	(61.6 – 66.5)
Adequate	8 230	(7 680 – 8 800)	35.9	(33.5 – 38.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.42: Children aged 4–17 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		LORI — None		
None	70	(20 – 180)	0.8	(0.2 – 2.3)
One	760	(560 – 1 020)	9.7	(7.1 – 12.9)
Two	2 540	(2 250 – 2 850)	32.4	(28.7 – 36.2)
Three	2 960	(2 660 – 3 270)	37.8	(34.0 – 41.8)
Four	1 510	(1 260 – 1 800)	19.3	(16.1 – 23.0)
Total	7 830	(7 680 – 7 980)	100.0	
		LORI — Low		
None	70	(30 – 140)	1.3	(0.5 – 2.4)
One	670	(540 – 840)	11.7	(9.5 – 14.3)
Two	1 860	(1 570 – 2 190)	32.3	(28.3 – 36.6)
Three	2 190	(1 920 – 2 480)	38.1	(34.0 – 42.3)
Four	950	(720 – 1 220)	16.5	(12.7 – 20.9)
Total	5 740	(5 240 – 6 250)	100.0	
		LORI — Moderate		
None	10	(0 – 30)	0.3	(0.1 – 0.7)
One	310	(220 – 430)	6.7	(4.8 – 8.8)
Two	1 450	(1 130 – 1 850)	31.3	(26.1 – 37.1)
Three	1 870	(1 530 – 2 250)	40.4	(36.1 – 44.9)
Four	990	(740 – 1 290)	21.3	(17.0 – 26.3)
Total	4 630	(3 910 – 5 450)	100.0	
		LORI — High		
None	30	(0 – 160)	1.3	(0.0 – 6.2)
One	150	(70 – 300)	6.0	(2.8 – 11.1)
Two	710	(490 – 990)	28.2	(22.4 – 34.4)
Three	1 130	(820 – 1 520)	44.7	(36.4 – 52.7)
Four	500	(310 – 790)	19.8	(12.7 – 28.2)
Total	2 530	(1 890 – 3 260)	100.0	
		LORI — Extreme		
None	30	(0 – 100)	1.3	(0.2 – 4.6)
One	90	(30 – 200)	4.1	(1.4 – 8.3)
Two	700	(450 – 1 020)	32.1	(25.5 – 39.3)
Three	1 010	(720 – 1 380)	46.6	(39.4 – 53.9)
Four	340	(210 – 520)	15.8	(10.7 – 22.5)
Total	2 170	(1 550 – 2 890)	100.0	
		Total WA		
None	210	(110 – 350)	0.9	(0.5 – 1.5)
One	1 980	(1 690 – 2 300)	8.7	(7.4 – 10.1)
Two	7 250	(6 770 – 7 760)	31.7	(29.5 – 33.9)
Three	9 170	(8 670 – 9 670)	40.0	(37.8 – 42.2)
Four	4 290	(3 830 – 4 770)	18.7	(16.7 – 20.8)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.43: Children aged 4–11 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		LORI — None		
None	30	(0 – 170)	0.6	(0.0 – 3.6)
One	400	(240 – 640)	8.6	(5.0 – 13.1)
Two	1 520	(1 270 – 1 800)	32.6	(27.6 – 38.2)
Three	1 740	(1 470 – 2 030)	37.3	(32.0 – 42.9)
Four	970	(750 – 1 240)	20.8	(16.0 – 25.9)
Total	4 670	(4 340 – 5 010)	100.0	
		LORI — Low		
None	40	(20 – 70)	1.1	(0.6 – 2.3)
One	430	(310 – 580)	12.4	(9.1 – 16.4)
Two	1 080	(860 – 1 340)	31.1	(25.5 – 37.0)
Three	1 280	(1 080 – 1 500)	37.1	(31.9 – 42.7)
Four	630	(460 – 860)	18.2	(13.3 – 23.7)
Total	3 460	(3 090 – 3 860)	100.0	
		LORI — Moderate		
None	10	(0 – 30)	0.2	(0.0 – 0.9)
One	170	(110 – 240)	5.9	(4.1 – 8.4)
Two	890	(640 – 1 180)	31.6	(24.8 – 39.1)
Three	1 030	(810 – 1 270)	36.7	(31.2 – 42.3)
Four	720	(500 – 970)	25.6	(19.8 – 32.4)
Total	2 800	(2 300 – 3 360)	100.0	
		LORI — High		
None	20	(0 – 190)	1.1	(0.0 – 11.2)
One	100	(50 – 190)	6.0	(3.0 – 11.0)
Two	440	(300 – 620)	27.4	(21.2 – 33.8)
Three	690	(470 – 990)	42.9	(32.9 – 53.3)
Four	360	(190 – 620)	22.7	(12.7 – 35.8)
Total	1 600	(1 150 – 2 120)	100.0	
		LORI — Extreme		
None	20	(0 – 120)	1.2	(0.0 – 9.2)
One	80	(30 – 150)	6.1	(2.4 – 11.6)
Two	530	(320 – 810)	41.9	(31.5 – 52.6)
Three	430	(290 – 620)	33.9	(25.6 – 43.7)
Four	210	(120 – 350)	16.9	(10.5 – 24.6)
Total	1 270	(900 – 1 760)	100.0	
		Total WA		
None	110	(40 – 260)	0.8	(0.3 – 1.8)
One	1 170	(940 – 1 430)	8.5	(6.9 – 10.4)
Two	4 460	(4 030 – 4 900)	32.3	(29.4 – 35.3)
Three	5 170	(4 750 – 5 600)	37.4	(34.6 – 40.3)
Four	2 900	(2 500 – 3 320)	21.0	(18.3 – 23.9)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.44: Children aged 12–17 years — Number of dietary quality indicators met, by Level of Relative Isolation (LORI)

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		LORI — None		
None	40	(10 – 80)	1.1	(0.4 – 2.5)
One	360	(230 – 510)	11.2	(7.6 – 16.1)
Two	1 010	(830 – 1 210)	32.0	(27.0 – 37.3)
Three	1 220	(1 020 – 1 440)	38.6	(33.1 – 44.2)
Four	540	(410 – 700)	17.1	(13.1 – 21.8)
Total	3 160	(2 850 – 3 490)	100.0	
		LORI — Low		
None	40	(10 – 120)	1.5	(0.4 – 5.2)
One	240	(180 – 320)	10.6	(8.0 – 13.8)
Two	780	(600 – 990)	34.2	(28.0 – 41.0)
Three	910	(760 – 1 080)	39.8	(33.9 – 46.0)
Four	320	(180 – 530)	13.9	(7.8 – 21.5)
Total	2 280	(1 990 – 2 600)	100.0	
		LORI — Moderate		
None	10	(0 – 20)	0.4	(0.1 – 1.0)
One	140	(70 – 240)	7.9	(4.4 – 13.4)
Two	560	(380 – 820)	30.8	(22.6 – 40.4)
Three	840	(660 – 1 060)	46.2	(38.8 – 53.7)
Four	270	(190 – 360)	14.7	(10.8 – 19.3)
Total	1 820	(1 490 – 2 230)	100.0	
		LORI — High		
None	10	(10 – 30)	1.6	(0.5 – 3.3)
One	60	(20 – 140)	6.1	(1.7 – 14.8)
Two	280	(170 – 450)	29.6	(19.7 – 41.5)
Three	450	(320 – 610)	47.9	(38.0 – 58.2)
Four	140	(80 – 210)	14.8	(9.9 – 21.6)
Total	930	(690 – 1 230)	100.0	
		LORI — Extreme		
None	10	(0 – 40)	1.4	(0.3 – 4.5)
One	10	(0 – 90)	1.4	(0.0 – 9.6)
Two	160	(110 – 240)	18.3	(12.1 – 25.3)
Three	580	(390 – 830)	64.6	(55.4 – 73.6)
Four	130	(70 – 210)	14.3	(9.0 – 21.7)
Total	900	(640 – 1 230)	100.0	
		Total WA		
None	110	(60 – 180)	1.2	(0.6 – 2.0)
One	810	(640 – 1 010)	8.9	(7.1 – 11.0)
Two	2 800	(2 460 – 3 160)	30.7	(27.6 – 34.1)
Three	4 000	(3 670 – 4 350)	43.9	(40.7 – 47.1)
Four	1 390	(1 170 – 1 650)	15.3	(12.9 – 17.9)
Total	9 100	(8 620 – 9 590)	100.0	

Table 3.45: Children aged 4–17 years — Number of dietary quality indicators met, by age group, education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		Did not attend school		
None	20	(0 – 120)	3.3	(0.1 – 16.2)
One	40	(0 – 230)	6.1	(0.1 – 28.7)
Two	270	(180 – 370)	39.5	(28.0 – 52.3)
Three	200	(100 – 370)	29.9	(17.9 – 44.6)
Four	140	(80 – 240)	21.2	(10.5 – 35.0)
Total	670	(440 – 950)	100.0	
		1–9 years		
None	40	(20 – 70)	0.8	(0.4 – 1.3)
One	480	(330 – 660)	9.4	(6.8 – 12.7)
Two	1 790	(1 530 – 2 080)	34.6	(30.9 – 38.6)
Three	2 100	(1 820 – 2 400)	40.5	(36.5 – 44.7)
Four	760	(610 – 940)	14.7	(11.8 – 17.9)
Total	5 180	(4 690 – 5 690)	100.0	
		10 years		
None	90	(60 – 130)	0.9	(0.6 – 1.4)
One	940	(760 – 1 160)	9.6	(7.7 – 11.6)
Two	3 010	(2 630 – 3 440)	30.6	(27.2 – 34.1)
Three	3 940	(3 540 – 4 360)	40.0	(36.5 – 43.7)
Four	1 860	(1 550 – 2 210)	18.9	(16.0 – 22.1)
Total	9 840	(9 200 – 10 500)	100.0	
		11–12 years		
None	40	(0 – 230)	0.9	(0.0 – 4.4)
One	350	(240 – 490)	6.9	(4.8 – 9.7)
Two	1 560	(1 290 – 1 850)	31.1	(26.6 – 36.0)
Three	1 980	(1 700 – 2 290)	39.6	(35.1 – 44.2)
Four	1 080	(850 – 1 360)	21.6	(17.4 – 26.2)
Total	5 010	(4 520 – 5 520)	100.0	
		13 years or more		
None	20	(0 – 150)	1.3	(0.0 – 10.3)
One	110	(50 – 230)	7.8	(3.0 – 14.4)
Two	400	(240 – 600)	28.6	(19.1 – 38.6)
Three	500	(350 – 680)	36.2	(27.5 – 45.4)
Four	360	(220 – 580)	26.1	(16.0 – 37.6)
Total	1 380	(1 060 – 1 770)	100.0	
		Not stated		
None	0	(0 – 60)	0.0	(0.0 – 6.6)
One	60	(20 – 170)	7.6	(2.4 – 20.4)
Two	220	(150 – 330)	27.7	(18.1 – 38.6)
Three	440	(310 – 620)	54.2	(40.4 – 68.4)
Four	90	(10 – 340)	10.6	(1.4 – 34.7)
Total	810	(600 – 1 070)	100.0	
		Total		
None	210	(110 – 350)	0.9	(0.5 – 1.5)
One	1 980	(1 690 – 2 300)	8.7	(7.4 – 10.1)
Two	7 250	(6 770 – 7 760)	31.7	(29.5 – 33.9)
Three	9 170	(8 670 – 9 670)	40.0	(37.8 – 42.2)
Four	4 290	(3 830 – 4 770)	18.7	(16.7 – 20.8)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.46: Children aged 4–11 years — Number of dietary quality indicators met, education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		Did not attend school		
None	20	(0 – 120)	4.3	(0.1 – 28.7)
One	30	(0 – 300)	7.8	(0.4 – 57.9)
Two	170	(110 – 270)	47.8	(27.8 – 68.7)
Three	60	(30 – 110)	16.0	(6.8 – 30.7)
Four	90	(40 – 180)	24.2	(9.6 – 41.1)
Total	360	(240 – 530)	100.0	
		1–9 years		
None	20	(10 – 40)	0.7	(0.3 – 1.5)
One	300	(190 – 480)	10.6	(6.5 – 16.0)
Two	1 180	(970 – 1 420)	41.4	(35.8 – 47.2)
Three	990	(810 – 1 190)	34.6	(29.4 – 40.1)
Four	360	(260 – 490)	12.7	(9.1 – 16.9)
Total	2 850	(2 530 – 3 210)	100.0	
		10 years		
None	40	(20 – 80)	0.6	(0.3 – 1.3)
One	520	(390 – 670)	8.6	(6.5 – 11.0)
Two	1 840	(1 520 – 2 200)	30.5	(25.9 – 35.3)
Three	2 380	(2 080 – 2 720)	39.4	(34.8 – 44.2)
Four	1 260	(1 010 – 1 580)	20.9	(16.8 – 25.4)
Total	6 050	(5 570 – 6 550)	100.0	
		11–12 years		
None	40	(0 – 280)	1.0	(0.0 – 7.8)
One	230	(140 – 350)	6.6	(4.3 – 10.1)
Two	970	(770 – 1 210)	27.8	(22.5 – 33.6)
Three	1 340	(1 100 – 1 610)	38.4	(32.8 – 44.2)
Four	920	(710 – 1 150)	26.2	(20.8 – 31.9)
Total	3 490	(3 110 – 3 910)	100.0	
		13 years or more		
None	0	(0 – 60)	0.0	(0.0 – 7.4)
One	70	(20 – 170)	9.1	(2.7 – 23.1)
Two	190	(90 – 350)	26.8	(13.8 – 44.1)
Three	250	(160 – 370)	34.3	(22.7 – 49.4)
Four	220	(100 – 430)	29.8	(14.2 – 48.0)
Total	720	(510 – 990)	100.0	
		Not stated		
None	0	(0 – 60)	0.0	(0.0 – 15.4)
One	20	(0 – 160)	6.7	(0.0 – 41.0)
Two	100	(50 – 170)	29.5	(10.7 – 50.2)
Three	150	(90 – 240)	47.0	(23.0 – 77.0)
Four	50	(0 – 400)	16.8	(0.6 – 80.6)
Total	330	(180 – 530)	100.0	
		Total		
None	110	(40 – 260)	0.8	(0.3 – 1.8)
One	1 170	(940 – 1 430)	8.5	(6.9 – 10.4)
Two	4 460	(4 030 – 4 900)	32.3	(29.4 – 35.3)
Three	5 170	(4 750 – 5 600)	37.4	(34.6 – 40.3)
Four	2 900	(2 500 – 3 320)	21.0	(18.3 – 23.9)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.47: Children aged 12–17 years — Number of dietary quality indicators met, by education level of primary carer

Number of dietary quality indicators met	Number	95% CI	%	95% CI
		Did not attend school		
None	10	(0 – 70)	2.1	(0.0 – 20.6)
One	10	(0 – 90)	4.1	(0.1 – 27.3)
Two	90	(50 – 150)	29.9	(13.9 – 54.9)
Three	140	(40 – 310)	46.2	(24.4 – 71.1)
Four	50	(20 – 110)	17.7	(4.5 – 36.1)
Total	310	(170 – 510)	100.0	
		1–9 years		
None	20	(10 – 40)	0.9	(0.4 – 1.8)
One	180	(110 – 280)	7.8	(4.9 – 12.0)
Two	610	(460 – 790)	26.3	(20.8 – 32.3)
Three	1 110	(910 – 1 330)	47.8	(41.4 – 54.0)
Four	400	(290 – 530)	17.2	(12.8 – 22.3)
Total	2 320	(2 020 – 2 660)	100.0	
		10 years		
None	50	(30 – 80)	1.4	(0.8 – 2.2)
One	420	(290 – 580)	11.1	(7.9 – 14.9)
Two	1 170	(930 – 1 440)	30.9	(26.0 – 36.3)
Three	1 560	(1 340 – 1 790)	41.0	(36.1 – 46.0)
Four	600	(450 – 770)	15.7	(12.2 – 20.0)
Total	3 800	(3 410 – 4 220)	100.0	
		11–12 years		
None	10	(10 – 10)	0.6	(0.3 – 0.9)
One	120	(60 – 220)	7.6	(3.7 – 13.5)
Two	590	(430 – 770)	38.6	(30.3 – 47.1)
Three	640	(510 – 790)	42.3	(35.0 – 50.0)
Four	170	(60 – 330)	10.9	(4.9 – 20.7)
Total	1 520	(1 260 – 1 830)	100.0	
		13 years or more		
None	20	(0 – 150)	2.7	(0.1 – 20.4)
One	40	(10 – 100)	6.3	(1.8 – 15.7)
Two	200	(110 – 340)	30.6	(18.2 – 46.6)
Three	250	(150 – 410)	38.4	(23.8 – 53.5)
Four	140	(80 – 250)	21.9	(12.7 – 35.8)
Total	660	(480 – 900)	100.0	
		Not stated		
None	0	(0 – 60)	0.0	(0.0 – 10.9)
One	40	(20 – 70)	8.1	(4.0 – 13.7)
Two	130	(70 – 210)	26.4	(16.6 – 39.7)
Three	290	(180 – 430)	59.0	(46.1 – 69.8)
Four	30	(20 – 50)	6.4	(3.1 – 11.3)
Total	490	(350 – 670)	100.0	
		Total		
None	110	(60 – 180)	1.2	(0.6 – 2.0)
One	810	(640 – 1 010)	8.9	(7.1 – 11.0)
Two	2 800	(2 460 – 3 160)	30.7	(27.6 – 34.1)
Three	4 000	(3 670 – 4 350)	43.9	(40.7 – 47.1)
Four	1 390	(1 170 – 1 650)	15.3	(12.9 – 17.9)
Total	9 100	(8 620 – 9 590)	100.0	

Table 3.48: Children aged 4–17 years — Proportion meeting three or more indicators of dietary quality, by age group of child, by Level of Relative Isolation (LORI)

Age of child	Number	95% CI	%	95% CI
		LORI — None		
4–11 years	2 710	(2 390 – 3 060)	58.1	(52.0 – 63.8)
12–17 years	1 760	(1 520 – 2 010)	55.6	(50.0 – 61.2)
Total	4 470	(4 140 – 4 810)	57.1	(52.9 – 61.2)
		LORI — Low		
4–11 years	1 910	(1 630 – 2 220)	55.3	(48.8 – 61.4)
12–17 years	1 230	(1 020 – 1 470)	53.6	(46.8 – 60.1)
Total	3 140	(2 790 – 3 520)	54.6	(49.9 – 59.2)
		LORI — Moderate		
4–11 years	1 750	(1 400 – 2 150)	62.3	(54.8 – 68.9)
12–17 years	1 110	(890 – 1 380)	60.9	(52.0 – 69.0)
Total	2 860	(2 370 – 3 430)	61.7	(56.3 – 66.8)
		LORI — High		
4–11 years	1 050	(740 – 1 420)	65.6	(57.2 – 73.9)
12–17 years	590	(430 – 770)	62.7	(52.0 – 72.9)
Total	1 630	(1 210 – 2 130)	64.5	(56.5 – 71.5)
		LORI — Extreme		
4–11 years	640	(440 – 920)	50.8	(39.7 – 62.8)
12–17 years	710	(490 – 990)	78.9	(71.4 – 85.0)
Total	1 350	(980 – 1 830)	62.4	(55.0 – 70.0)
		Total		
4–11 years	8 060	(7 540 – 8 600)	58.4	(55.2 – 61.7)
12–17 years	5 390	(5 000 – 5 790)	59.2	(55.9 – 62.5)
Total	13 500	(12 900 – 14 000)	58.7	(56.3 – 61.1)

Table 3.49: Children aged 4–17 years — Proportion meeting three or more indicators of dietary quality, by age group of child, by education level of primary carer

Age of child	Number	95% CI	%	95% CI
		Did not attend school		
4–11 years	150	(80 – 230)	40.2	(24.6 – 59.3)
12–17 years	200	(90 – 370)	63.9	(45.4 – 80.8)
Total	340	(220 – 530)	51.1	(38.7 – 62.6)
		1–9 years		
4–11 years	1 350	(1 140 – 1 570)	47.3	(41.5 – 53.0)
12–17 years	1 510	(1 280 – 1 770)	65.0	(58.7 – 70.8)
Total	2 860	(2 540 – 3 210)	55.2	(50.9 – 59.4)
		10 years		
4–11 years	3 650	(3 250 – 4 060)	60.3	(55.2 – 65.2)
12–17 years	2 150	(1 890 – 2 440)	56.7	(51.3 – 61.7)
Total	5 800	(5 310 – 6 320)	58.9	(55.2 – 62.6)
		11–12 years		
4–11 years	2 250	(1 930 – 2 610)	64.6	(58.4 – 70.6)
12–17 years	810	(640 – 1 030)	53.2	(45.0 – 61.7)
Total	3 060	(2 690 – 3 470)	61.1	(56.0 – 65.8)
		13 years or more		
4–11 years	460	(290 – 690)	64.1	(46.2 – 79.2)
12–17 years	400	(260 – 580)	60.4	(44.3 – 74.3)
Total	860	(630 – 1 130)	62.3	(51.9 – 72.6)
		Not stated		
4–11 years	210	(90 – 400)	63.8	(35.4 – 84.8)
12–17 years	320	(210 – 470)	65.4	(52.5 – 75.8)
Total	530	(350 – 750)	64.8	(52.4 – 76.5)
		Total		
4–11 years	8 060	(7 540 – 8 600)	58.4	(55.2 – 61.7)
12–17 years	5 390	(5 000 – 5 790)	59.2	(55.9 – 62.5)
Total	13 500	(12 900 – 14 000)	58.7	(56.3 – 61.1)

Table 3.50: All Children — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
		LORI — None (N = 10 200)		
Ever had asthma	3 100	(2 780 – 3 450)	30.5	(27.3 – 33.8)
Ever had wheezing or whistling in chest	3 330	(2 980 – 3 690)	32.7	(29.3 – 36.2)
Ever had hayfever	1 390	(1 130 – 1 700)	13.7	(11.1 – 16.6)
In past 12 months has :				
Sounded wheezy after exercise	2 140	(1 860 – 2 450)	21.0	(18.3 – 23.9)
Had medication for wheezing/asthma	2 000	(1 710 – 2 300)	19.6	(16.9 – 22.6)
Had dry cough at night	2 320	(2 000 – 2 670)	22.9	(19.6 – 26.2)
		LORI — Low (N = 7 270)		
Ever had asthma	1 910	(1 610 – 2 260)	26.3	(22.7 – 30.2)
Ever had wheezing or whistling in chest	2 370	(2 030 – 2 740)	32.6	(28.8 – 36.6)
Ever had hayfever	720	(540 – 930)	9.9	(7.6 – 12.6)
In past 12 months has :				
Sounded wheezy after exercise	1 220	(1 010 – 1 450)	16.7	(14.2 – 19.4)
Had medication for wheezing/asthma	1 150	(890 – 1 450)	15.8	(12.4 – 19.5)
Had dry cough at night	1 600	(1 330 – 1 900)	22.1	(18.9 – 25.4)
		LORI — Moderate (N = 6 390)		
Ever had asthma	1 140	(890 – 1 460)	17.9	(14.9 – 21.1)
Ever had wheezing or whistling in chest	1 590	(1 240 – 1 980)	24.9	(21.3 – 28.9)
Ever had hayfever	530	(370 – 720)	8.2	(6.1 – 10.8)
In past 12 months has :				
Sounded wheezy after exercise	830	(650 – 1 050)	13.0	(10.8 – 15.4)
Had medication for wheezing/asthma	790	(620 – 1 000)	12.4	(10.3 – 14.7)
Had dry cough at night	1 310	(1 040 – 1 630)	20.4	(17.5 – 23.7)
		LORI — High (N = 3 170)		
Ever had asthma	550	(390 – 750)	17.4	(14.0 – 21.4)
Ever had wheezing or whistling in chest	640	(460 – 870)	20.2	(16.9 – 23.9)
Ever had hayfever	140	(90 – 220)	4.5	(3.0 – 6.5)
In past 12 months has :				
Sounded wheezy after exercise	330	(220 – 490)	10.5	(7.7 – 13.8)
Had medication for wheezing/asthma	320	(200 – 490)	10.1	(6.8 – 13.9)
Had dry cough at night	560	(380 – 790)	17.7	(13.8 – 22.1)
		LORI — Extreme (N = 2 830)		
Ever had asthma	210	(130 – 320)	7.3	(5.3 – 9.7)
Ever had wheezing or whistling in chest	430	(280 – 640)	15.1	(11.4 – 19.2)
Ever had hayfever	190	(100 – 310)	6.6	(4.0 – 10.0)
In past 12 months has :				
Sounded wheezy after exercise	240	(140 – 360)	8.3	(5.7 – 11.5)
Had medication for wheezing/asthma	100	(50 – 190)	3.6	(2.1 – 6.1)
Had dry cough at night	750	(470 – 1 100)	26.4	(19.4 – 34.4)
		Total (N = 29 800)		
Ever had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Ever had wheezing or whistling in chest	8 350	(7 810 – 8 900)	28.0	(26.2 – 29.9)
Ever had hayfever	2 960	(2 600 – 3 360)	9.9	(8.7 – 11.3)
In past 12 months has :				
Sounded wheezy after exercise	4 760	(4 370 – 5 160)	15.9	(14.7 – 17.3)
Had medication for wheezing/asthma	4 360	(3 930 – 4 800)	14.6	(13.2 – 16.1)
Had dry cough at night	6 540	(6 040 – 7 060)	21.9	(20.3 – 23.7)

Table 3.51: Children aged 0–3 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
		LORI — None (N = 2 340)		
Ever had asthma	510	(380 – 660)	21.8	(16.9 – 27.6)
Ever had wheezing or whistling in chest	850	(680 – 1 030)	36.1	(29.7 – 42.6)
Ever had hayfever	200	(90 – 390)	8.4	(4.0 – 15.8)
In past 12 months has :				
Sounded wheezy after exercise	530	(400 – 690)	22.5	(17.0 – 28.6)
Had medication for wheezing/asthma	420	(300 – 570)	18.0	(13.1 – 24.0)
Had dry cough at night	570	(390 – 800)	24.3	(17.7 – 32.4)
		LORI — Low (N = 1 680)		
Ever had asthma	290	(190 – 420)	17.4	(11.9 – 24.1)
Ever had wheezing or whistling in chest	630	(500 – 790)	37.7	(31.4 – 44.1)
Ever had hayfever	140	(60 – 260)	8.4	(4.2 – 15.3)
In past 12 months has :				
Sounded wheezy after exercise	310	(220 – 420)	18.3	(13.6 – 24.1)
Had medication for wheezing/asthma	240	(140 – 380)	14.5	(8.7 – 21.6)
Had dry cough at night	420	(300 – 570)	24.9	(18.9 – 31.9)
		LORI — Moderate (N = 1710)		
Ever had asthma	250	(160 – 350)	14.4	(10.8 – 18.9)
Ever had wheezing or whistling in chest	520	(380 – 690)	30.7	(25.2 – 36.4)
Ever had hayfever	140	(80 – 220)	8.2	(4.8 – 12.7)
In past 12 months has :				
Sounded wheezy after exercise	220	(150 – 310)	12.7	(9.2 – 16.9)
Had medication for wheezing/asthma	290	(200 – 410)	17.0	(13.1 – 21.6)
Had dry cough at night	520	(390 – 680)	30.3	(24.2 – 37.2)
		LORI — High (N = 610)		
Ever had asthma	70	(30 – 140)	11.6	(5.9 – 20.8)
Ever had wheezing or whistling in chest	140	(80 – 230)	23.0	(15.0 – 32.6)
Ever had hayfever	20	(10 – 40)	3.3	(1.5 – 6.8)
In past 12 months has :				
Sounded wheezy after exercise	60	(20 – 110)	9.3	(4.6 – 17.8)
Had medication for wheezing/asthma	50	(30 – 100)	9.0	(4.6 – 15.7)
Had dry cough at night	100	(50 – 160)	15.6	(10.0 – 23.4)
		LORI — Extreme (N = 580)		
Ever had asthma	40	(10 – 90)	7.5	(2.9 – 14.0)
Ever had wheezing or whistling in chest	110	(60 – 190)	18.6	(11.4 – 27.1)
Ever had hayfever	40	(20 – 90)	7.3	(3.3 – 14.5)
In past 12 months has :				
Sounded wheezy after exercise	60	(20 – 150)	11.1	(4.4 – 20.6)
Had medication for wheezing/asthma	30	(10 – 80)	5.7	(1.5 – 13.1)
Had dry cough at night	230	(130 – 380)	40.3	(29.9 – 51.3)
		Total 0–3 year olds (N = 6 910)		
Ever had asthma	1 160	(970 – 1 380)	16.8	(14.3 – 19.5)
Ever had wheezing or whistling in chest	2 250	(1 990 – 2 520)	32.5	(29.5 – 35.8)
Ever had hayfever	540	(380 – 750)	7.8	(5.5 – 10.5)
In past 12 months has :				
Sounded wheezy after exercise	1 170	(990 – 1 380)	17.0	(14.5 – 19.7)
Had medication for wheezing/asthma	1 040	(850 – 1 260)	15.1	(12.5 – 17.9)
Had dry cough at night	1 830	(1 570 – 2 130)	26.5	(23.2 – 30.1)

Table 3.52: Children aged 4–11 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
		LORI — None (N = 4 670)		
Ever had asthma	1 550	(1 310 – 1 830)	33.2	(28.4 – 38.4)
Ever had wheezing or whistling in chest	1 580	(1 320 – 1 870)	33.8	(28.8 – 39.2)
Ever had hayfever	530	(360 – 750)	11.3	(7.7 – 15.5)
In past 12 months has :				
Sounded wheezy after exercise	980	(800 – 1 200)	21.0	(17.0 – 25.3)
Had medication for wheezing/asthma	970	(790 – 1 200)	20.9	(17.0 – 25.4)
Had dry cough at night	1 130	(930 – 1 370)	24.2	(19.9 – 28.8)
		LORI — Low (N = 3 460)		
Ever had asthma	960	(740 – 1 230)	27.9	(22.9 – 33.6)
Ever had wheezing or whistling in chest	1 070	(840 – 1 340)	31.0	(25.7 – 36.5)
Ever had hayfever	260	(160 – 390)	7.4	(4.7 – 11.0)
In past 12 months has :				
Sounded wheezy after exercise	560	(420 – 730)	16.1	(12.7 – 20.0)
Had medication for wheezing/asthma	600	(400 – 840)	17.3	(12.4 – 23.3)
Had dry cough at night	810	(630 – 1 010)	23.4	(19.0 – 28.4)
		LORI — Moderate (N = 2 800)		
Ever had asthma	570	(430 – 720)	20.2	(17.0 – 23.9)
Ever had wheezing or whistling in chest	670	(510 – 870)	23.9	(19.4 – 28.8)
Ever had hayfever	190	(120 – 290)	6.8	(4.4 – 9.9)
In past 12 months has :				
Sounded wheezy after exercise	350	(270 – 460)	12.6	(10.0 – 15.7)
Had medication for wheezing/asthma	330	(240 – 430)	11.6	(8.9 – 14.5)
Had dry cough at night	600	(470 – 750)	21.4	(18.0 – 25.0)
		LORI — High (N = 1 600)		
Ever had asthma	340	(230 – 480)	21.5	(16.5 – 27.3)
Ever had wheezing or whistling in chest	370	(230 – 540)	22.9	(17.1 – 29.7)
Ever had hayfever	50	(20 – 100)	3.1	(1.6 – 5.9)
In past 12 months has :				
Sounded wheezy after exercise	190	(90 – 330)	11.9	(6.6 – 18.3)
Had medication for wheezing/asthma	190	(90 – 350)	11.7	(6.1 – 19.3)
Had dry cough at night	360	(220 – 560)	22.2	(15.1 – 30.5)
		LORI — Extreme (N = 1 270)		
Ever had asthma	100	(50 – 210)	8.2	(4.0 – 14.7)
Ever had wheezing or whistling in chest	240	(140 – 370)	18.7	(13.0 – 25.9)
Ever had hayfever	70	(30 – 130)	5.6	(2.8 – 9.6)
In past 12 months has :				
Sounded wheezy after exercise	80	(40 – 150)	6.7	(3.6 – 11.7)
Had medication for wheezing/asthma	60	(30 – 110)	4.6	(2.3 – 7.6)
Had dry cough at night	340	(210 – 510)	26.5	(18.4 – 35.6)
		Total 4–11 year olds (N = 13 800)		
Ever had asthma	3 530	(3 170 – 3 920)	25.6	(23.2 – 28.0)
Ever had wheezing or whistling in chest	3 920	(3 540 – 4 340)	28.4	(25.9 – 31.1)
Ever had hayfever	1 100	(880 – 1 360)	7.9	(6.4 – 9.7)
In past 12 months has :				
Sounded wheezy after exercise	2 170	(1 910 – 2 460)	15.7	(13.9 – 17.7)
Had medication for wheezing/asthma	2 140	(1 840 – 2 490)	15.5	(13.4 – 17.8)
Had dry cough at night	3 230	(2 910 – 3 580)	23.4	(21.2 – 25.8)

Table 3 53: Children aged 12–17 years — Respiratory conditions, by Level of Relative Isolation (LORI)

Respiratory condition	Number	95% CI	%	95% CI
		LORI — None (N = 3 160)		
Ever had asthma	1 040	(820 – 1 290)	33.0	(27.2 – 39.1)
Ever had wheezing or whistling in chest	900	(700 – 1 150)	28.6	(22.6 – 34.8)
Ever had hayfever	670	(510 – 850)	21.1	(16.5 – 26.6)
In past 12 months has :				
Sounded wheezy after exercise	630	(450 – 840)	20.0	(14.9 – 25.7)
Had medication for wheezing/asthma	600	(440 – 800)	19.0	(14.1 – 24.4)
Had dry cough at night	630	(470 – 810)	19.8	(15.2 – 25.4)
		LORI — Low (N = 2 130)		
Ever had asthma	650	(510 – 810)	30.7	(24.4 – 37.8)
Ever had wheezing or whistling in chest	660	(540 – 820)	31.2	(24.7 – 37.9)
Ever had hayfever	320	(220 – 440)	15.0	(10.4 – 20.5)
In past 12 months has :				
Sounded wheezy after exercise	350	(280 – 430)	16.5	(12.8 – 20.9)
Had medication for wheezing/asthma	310	(230 – 410)	14.4	(10.6 – 19.4)
Had dry cough at night	380	(290 – 480)	17.6	(13.4 – 22.9)
		LORI — Moderate (N = 1 870)		
Ever had asthma	330	(170 – 550)	17.6	(10.7 – 26.8)
Ever had wheezing or whistling in chest	390	(230 – 660)	21.1	(13.8 – 30.9)
Ever had hayfever	200	(100 – 340)	10.4	(6.0 – 16.7)
In past 12 months has :				
Sounded wheezy after exercise	260	(170 – 380)	13.9	(9.4 – 20.0)
Had medication for wheezing/asthma	180	(110 – 270)	9.4	(5.8 – 14.1)
Had dry cough at night	190	(120 – 290)	9.9	(6.4 – 15.0)
		LORI — High (N = 960)		
Ever had asthma	140	(80 – 210)	14.3	(9.6 – 20.7)
Ever had wheezing or whistling in chest	130	(90 – 200)	14.1	(10.3 – 18.4)
Ever had hayfever	70	(40 – 120)	7.7	(4.5 – 11.8)
In past 12 months has :				
Sounded wheezy after exercise	80	(50 – 120)	8.8	(6.2 – 11.8)
Had medication for wheezing/asthma	80	(50 – 120)	8.0	(5.4 – 11.3)
Had dry cough at night	110	(70 – 170)	11.5	(7.7 – 16.2)
		LORI — Extreme (N = 990)		
Ever had asthma	60	(30 – 110)	6.1	(3.6 – 10.0)
Ever had wheezing or whistling in chest	80	(50 – 140)	8.4	(5.3 – 12.3)
Ever had hayfever	70	(40 – 130)	7.3	(3.9 – 12.2)
In past 12 months has :				
Sounded wheezy after exercise	90	(50 – 140)	8.8	(5.8 – 13.1)
Had medication for wheezing/asthma	10	(0 – 30)	1.3	(0.4 – 3.1)
Had dry cough at night	180	(110 – 290)	18.1	(11.0 – 27.6)
		Total 12–17 year olds (N = 9 100)		
Ever had asthma	2 220	(1 910 – 2 560)	24.4	(21.4 – 27.6)
Ever had wheezing or whistling in chest	2 180	(1 880 – 2 530)	24.0	(21.0 – 27.3)
Ever had hayfever	1 330	(1 100 – 1 570)	14.6	(12.3 – 17.0)
In past 12 months has :				
Sounded wheezy after exercise	1 410	(1 200 – 1 650)	15.5	(13.2 – 18.0)
Had medication for wheezing/asthma	1 170	(970 – 1 400)	12.9	(10.8 – 15.3)
Had dry cough at night	1 480	(1 260 – 1 710)	16.2	(13.9 – 18.7)

Table 3.54: Children — Ever had asthma, by ever had recurring chest infection

Ever had asthma	Number	95% CI	%	95% CI
		No recurring chest infection		
Never had asthma	21 200	(20 600 – 21 700)	80.9	(79.1 – 82.5)
Has had asthma	5 000	(4 550 – 5 470)	19.1	(17.5 – 20.9)
Total	26 200	(25 800 – 26 500)	100.0	
		Has recurring chest infection		
Never had asthma	1 750	(1 520 – 1 990)	47.7	(42.9 – 52.6)
Has had asthma	1 910	(1 650 – 2 190)	52.3	(47.4 – 57.1)
Total	3 660	(3 310 – 4 030)	100.0	
		Total		
Never had asthma	22 900	(22 400 – 23 400)	76.8	(75.1 – 78.4)
Has had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.55: Children — Child has recurring chest infections, by whether ever had asthma

Whether has recurring chest infection	Number	95% CI	%	95% CI
		Child has never had asthma		
No recurring chest infection	21 200	(20 600 – 21 700)	92.4	(91.3 – 93.3)
Has recurring chest infection	1 750	(1 520 – 1 990)	7.6	(6.7 – 8.7)
Total	22 900	(22 400 – 23 400)	100.0	
		Child has had asthma		
No recurring chest infection	5 000	(4 550 – 5 470)	72.3	(68.6 – 75.9)
Has recurring chest infection	1 910	(1 650 – 2 190)	27.7	(24.1 – 31.4)
Total	6 910	(6 430 – 7 420)	100.0	
		Total		
No recurring chest infection	26 200	(25 800 – 26 500)	87.7	(86.5 – 88.9)
Has recurring chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.56: Children — Ever had asthma, by whether suffers allergies

Whether has asthma	Number	95% CI	%	95% CI
		Child does not have allergies		
Never had asthma	21 700	(21 100 – 22 200)	78.6	(76.9 – 80.2)
Has had asthma	5 900	(5 460 – 6 350)	21.4	(19.8 – 23.1)
Total	27 600	(27 200 – 27 900)	100.0	
		Child has allergies		
Never had asthma	1 250	(1 050 – 1 470)	55.1	(47.4 – 62.4)
Has had asthma	1 020	(780 – 1 300)	44.9	(37.6 – 52.6)
Total	2 260	(1 950 – 2 620)	100.0	
		Total		
Never had asthma	22 900	(22 400 – 23 400)	76.8	(75.1 – 78.4)
Has had asthma	6 910	(6 430 – 7 420)	23.2	(21.6 – 24.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.57: All children — Predicted likelihood of ever having had asthma, associated with selected family and community variables (a)

Lifetime occurrence of asthma			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of relative isolation—			
None		1	
Low	0.0132	0.74	(0.58 – 0.94)
Moderate	<.0001	0.49	(0.35 – 0.68)
High	0.0016	0.44	(0.27 – 0.73)
Extreme	<.0001	0.21	(0.11 – 0.39)
Primary carer is birth mother?—	0.8585	1.03	(0.76 – 1.39)
No			
Yes		1	
Mother smoked cigarettes during pregnancy—			
No		1	
Yes	0.7936	0.97	(0.78 – 1.21)
Mother chewed tobacco during pregnancy—			
No		1	
Yes	0.0829	0.4	(0.14 – 1.13)
Mother smoked marijuana during pregnancy—			
No		1	
Yes	0.3771	1.18	(0.82 – 1.70)
Mother drank alcohol during pregnancy—			
No		1	
Yes	0.9196	0.99	(0.77 – 1.27)
Mother used other drugs during pregnancy—			
No		1	
Yes	0.2256	1.73	(0.71 – 4.18)
Primary carer currently smokes?—			
No		1	
Yes	0.6145	0.94	(0.74 – 1.20)
Duration of breastfeeding—			
Not breastfed		1	
< 6 months	0.2828	1.15	(0.89 – 1.50)
6 months or more	0.9186	1.01	(0.77 – 1.34)
Not stated	0.0038	0.48	(0.29 – 0.79)
Family affected by forced removal from family or relocation from lands—			
No		1	
Yes	0.2404	1.13	(0.92 – 1.40)
Not known	0.589	0.9	(0.62 – 1.31)
Not applicable	0.0045	1.68	(1.17 – 2.40)
Categories of Socio-economic disadvantage—			
Bottom 5%		1	
5% - 10%	0.5198	1.14	(0.77 – 1.68)
10% - 25%	0.6806	1.08	(0.76 – 1.53)
25% - 50%	0.1284	1.3	(0.93 – 1.83)
Top 50%	0.2055	1.32	(0.86 – 2.02)

(a) Model also adjusts for age and sex of the child

Table 3.58: Children —Used medication for wheezing or asthma in past 12 months, by Level of Relative Isolation (LORI)

Whether had medication in past 12 months	Number	95% CI	%	95% CI
		LORI — None		
No medication	8 170	(7 850 – 8 500)	80.4	(77.4 – 83.1)
Has used medication	2 000	(1 710 – 2 300)	19.6	(16.9 – 22.6)
Total	10 200	(10 000 – 10 400)	100.0	
		LORI — Low		
No medication	6 120	(5 540 – 6 720)	84.2	(80.5 – 87.6)
Has used medication	1 150	(890 – 1 450)	15.8	(12.4 – 19.5)
Total	7 270	(6 640 – 7 930)	100.0	
		LORI — Moderate		
No medication	5 600	(4 740 – 6 510)	87.6	(85.3 – 89.7)
Has used medication	790	(620 – 1 000)	12.4	(10.3 – 14.7)
Total	6 390	(5 400 – 7 420)	100.0	
		LORI — High		
No medication	2 850	(2 090 – 3 720)	89.9	(86.1 – 93.2)
Has used medication	320	(200 – 490)	10.1	(6.8 – 13.9)
Total	3 170	(2 360 – 4 160)	100.0	
		LORI — Extreme		
No medication	2 730	(1 940 – 3 630)	96.4	(93.9 – 97.9)
Has used medication	100	(50 – 190)	3.6	(2.1 – 6.1)
Total	2 830	(2 040 – 3 800)	100.0	
		Total WA		
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Has used medication	4 360	(3 930 – 4 800)	14.6	(13.2 – 16.1)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.59: Children who ever had asthma — Whether used medication for wheezing or asthma in past 12 months, by Level of Relative Isolation (LORI)

Whether had medication in past 12 months	Number	95% CI	%	95% CI
		LORI — None		
No medication	1 210	(980 – 1 490)	39.1	(32.4 – 45.9)
Has had medication	1 890	(1 630 – 2 190)	60.9	(54.1 – 67.6)
Total	3 100	(2 780 – 3 450)	100.0	
		LORI — Low		
No medication	860	(680 – 1 070)	44.9	(36.3 – 54.0)
Has had medication	1 050	(810 – 1 360)	55.1	(46.0 – 63.7)
Total	1 910	(1 610 – 2 260)	100.0	
		LORI — Moderate		
No medication	450	(290 – 690)	39.4	(28.5 – 51.9)
Has had medication	690	(520 – 890)	60.6	(48.1 – 71.5)
Total	1 140	(890 – 1 460)	100.0	
		LORI — High		
No medication	270	(180 – 390)	49.5	(39.8 – 59.3)
Has had medication	280	(190 – 390)	50.5	(40.7 – 60.2)
Total	550	(390 – 750)	100.0	
		LORI — Extreme		
No medication	110	(50 – 210)	53.5	(30.6 – 73.2)
Has had medication	100	(50 – 170)	46.5	(26.8 – 69.4)
Total	210	(130 – 320)	100.0	
		Total WA		
No medication	2 900	(2 550 – 3 290)	42.0	(37.6 – 46.3)
Has had medication	4 010	(3 610 – 4 440)	58.0	(53.7 – 62.4)
Total	6 910	(6 430 – 7 420)	100.0	

Table 3.60: Children — Primary asthma medication type, by age group

Asthma medication type	Number	95% CI	%	95% CI
		0–3 years		
Preventer	110	(40 – 270)	1.6	(0.5 – 3.8)
Reliever	920	(750 – 1 120)	13.3	(11.0 – 15.8)
Controller	20	(10 – 30)	0.2	(0.1 – 0.5)
No medication	5 870	(5 480 – 6 270)	84.9	(82.1 – 87.5)
Total	6 910	(6 470 – 7 360)	100.0	
		4–11 years		
Preventer	480	(370 – 610)	3.5	(2.7 – 4.4)
Reliever	1 630	(1 350 – 1 950)	11.8	(9.9 – 14.0)
Controller	30	(10 – 50)	0.2	(0.1 – 0.4)
No medication	11 700	(11 200 – 12 200)	84.5	(82.2 – 86.6)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
Preventer	190	(140 – 260)	2.1	(1.5 – 2.9)
Reliever	960	(780 – 1 160)	10.5	(8.6 – 12.7)
Controller	20	(0 – 230)	0.2	(0.0 – 2.5)
No medication	7 930	(7 430 – 8 450)	87.1	(84.7 – 89.2)
Total	9 100	(8 580 – 9 630)	100.0	
		All children		
Preventer	780	(620 – 970)	2.6	(2.1 – 3.3)
Reliever	3 510	(3 120 – 3 930)	11.8	(10.5 – 13.2)
Controller	70	(10 – 200)	0.2	(0.0 – 0.7)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.61: Children — Usage of primary asthma medication, by medication type

When medication used	Number	95% CI	%	95% CI
		As a Preventer		
When wheezing	370	(270 – 480)	47.4	(36.4 – 58.9)
Regularly	360	(240 – 520)	45.8	(33.8 – 57.3)
Usage not stated	50	(20 – 110)	6.8	(2.8 – 13.5)
No medication	0	(0 – 60)	0.0	(0.0 – 7.0)
Total	780	(620 – 970)	100.0	
		As a Reliever		
When wheezing	2 570	(2 220 – 2 960)	73.2	(67.9 – 78.2)
Regularly	590	(440 – 780)	16.8	(12.5 – 21.6)
Usage not stated	350	(250 – 480)	10.0	(7.1 – 13.4)
No medication	0	(0 – 60)	0.0	(0.0 – 1.6)
Total	3 510	(3 120 – 3 930)	100.0	
		As a Controller		
When wheezing	30	(20 – 60)	49.5	(1.3 – 98.7)
Regularly	30	(0 – 270)	43.2	(1.3 – 98.7)
Usage not stated	0	(0 – 20)	7.3	(0.2 – 30.2)
No medication	0	(0 – 60)	0.0	(0.0 – 60.2)
Total	70	(10 – 200)	100.0	
No medication		No medication		
	25 500	(25 000 – 25 900)	100.0	
		Total		
When wheezing	2 970	(2 610 – 3 360)	10.0	(8.7 – 11.3)
Regularly	970	(770 – 1 220)	3.3	(2.6 – 4.1)
Usage not stated	410	(290 – 540)	1.4	(1.0 – 1.8)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.62: Asthma medications — Single and multiple types per child, by age group

Medication types used	Number	95% CI	%	95% CI
		0–3 years		
Preventer & reliever	180	(80 – 330)	2.6	(1.2 – 4.7)
Two preventers & a reliever	10	(0 – 20)	0.2	(0.1 – 0.4)
Preventer & two relievers	0	(0 – 60)	0.0	(0.0 – 0.8)
Two or more preventers	0	(0 – 60)	0.0	(0.0 – 0.8)
One preventer	50	(0 – 150)	0.7	(0.1 – 2.1)
Two or more relievers	70	(40 – 120)	1.0	(0.5 – 1.7)
One reliever	720	(570 – 890)	10.4	(8.4 – 12.6)
Other	20	(10 – 30)	0.2	(0.1 – 0.5)
No medication	5 870	(5 480 – 6 270)	84.9	(82.1 – 87.5)
Total	6 910	(6 470 – 7 360)	100.0	
		4–11 years		
Preventer & reliever	570	(430 – 730)	4.1	(3.2 – 5.3)
Two preventers & a reliever	50	(30 – 90)	0.4	(0.2 – 0.6)
Preventer & two relievers	70	(40 – 110)	0.5	(0.3 – 0.8)
Two or more preventers	30	(20 – 50)	0.2	(0.1 – 0.4)
One preventer	140	(90 – 220)	1.0	(0.6 – 1.5)
Two or more relievers	160	(80 – 280)	1.2	(0.6 – 2.0)
One reliever	1 090	(840 – 1 390)	7.9	(6.2 – 10.0)
Other	20	(10 – 40)	0.1	(0.1 – 0.3)
No medication	11 700	(11 200 – 12 200)	84.5	(82.2 – 86.6)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
Preventer & reliever	290	(220 – 380)	3.2	(2.4 – 4.1)
Two preventers & a reliever	40	(20 – 70)	0.4	(0.2 – 0.7)
Preventer & two relievers	30	(10 – 80)	0.4	(0.1 – 0.9)
Two or more preventers	10	(0 – 30)	0.1	(0.0 – 0.4)
One preventer	40	(20 – 50)	0.4	(0.2 – 0.6)
Two or more relievers	80	(40 – 140)	0.9	(0.4 – 1.5)
One reliever	670	(510 – 870)	7.4	(5.6 – 9.4)
Other	10	(0 – 350)	0.1	(0.0 – 3.8)
No medication	7 930	(7 430 – 8 450)	87.1	(84.7 – 89.2)
Total	9 100	(8 580 – 9 630)	100.0	
		All children		
Preventer & reliever	1 040	(850 – 1 280)	3.5	(2.8 – 4.3)
Two preventers & a reliever	100	(70 – 150)	0.3	(0.2 – 0.5)
Preventer & two relievers	110	(70 – 160)	0.4	(0.2 – 0.5)
Two or more preventers	40	(20 – 70)	0.1	(0.1 – 0.2)
One preventer	220	(140 – 330)	0.7	(0.5 – 1.1)
Two or more relievers	310	(210 – 460)	1.1	(0.7 – 1.5)
One reliever	2 480	(2 150 – 2 870)	8.3	(7.2 – 9.6)
Other	50	(10 – 210)	0.2	(0.0 – 0.7)
No medication	25 500	(25 000 – 25 900)	85.4	(83.9 – 86.8)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.63: Children — Recurring infections, by age group

Recurring infection type	Number	95% CI	%	95% CI
		0–3 years (N = 6 910)		
Chest infection	1 340	(1 130 – 1 590)	19.4	(16.6 – 22.7)
Gastrointestinal infection	500	(390 – 630)	7.2	(5.6 – 9.0)
Skin infection	550	(410 – 740)	8.0	(5.9 – 10.4)
Ear infection	1 410	(1 200 – 1 640)	20.4	(17.6 – 23.5)
		4–11 years (N = 13 800)		
Chest infection	1 590	(1 360 – 1 840)	11.5	(9.9 – 13.3)
Gastrointestinal infection	850	(660 – 1 080)	6.1	(4.8 – 7.7)
Skin infection	1 420	(1 200 – 1 650)	10.3	(8.8 – 11.9)
Ear infection	2 750	(2 490 – 3 030)	19.9	(18.1 – 21.9)
		12–17 years (N = 9 100)		
Chest infection	730	(580 – 890)	8.0	(6.4 – 9.7)
Gastrointestinal infection	320	(230 – 430)	3.5	(2.6 – 4.8)
Skin infection	560	(400 – 740)	6.1	(4.5 – 8.1)
Ear infection	1 240	(1 040 – 1 460)	13.6	(11.4 – 16.0)
		All children (N = 29 800)		
Chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal infection	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)
Ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)

Table 3.64: Children — Recurring infections, by Level of Relative Isolation (LORI)

Recurring Infection type	Number	95% CI	%	95% CI
		LORI — None (N = 10 200)		
Chest infection	1 450	(1 220 – 1 710)	14.2	(11.9 – 16.7)
Gastrointestinal infection	550	(420 – 720)	5.4	(4.1 – 7.1)
Skin infection	720	(530 – 960)	7.1	(5.3 – 9.4)
Ear infection	1 720	(1 460 – 2 010)	16.9	(14.3 – 19.7)
		LORI — Low (N = 7 270)		
Chest infection	860	(670 – 1 100)	11.9	(9.4 – 14.9)
Gastrointestinal infection	270	(160 – 420)	3.7	(2.1 – 5.8)
Skin infection	480	(330 – 660)	6.6	(4.6 – 8.9)
Ear infection	1 280	(1 070 – 1 510)	17.6	(15.0 – 20.3)
		LORI — Moderate (N = 6 390)		
Chest infection	670	(540 – 830)	10.5	(8.9 – 12.3)
Gastrointestinal infection	330	(240 – 450)	5.2	(3.9 – 6.9)
Skin infection	550	(430 – 690)	8.6	(7.1 – 10.4)
Ear infection	1 190	(980 – 1 440)	18.7	(16.5 – 21.1)
		LORI — High (N = 3 170)		
Chest infection	330	(210 – 520)	10.5	(6.9 – 14.7)
Gastrointestinal infection	180	(80 – 330)	5.6	(2.7 – 10.1)
Skin infection	280	(180 – 430)	8.9	(6.3 – 12.4)
Ear infection	550	(390 – 770)	17.5	(14.0 – 21.5)
		LORI — Extreme (N = 2 830)		
Chest infection	350	(230 – 510)	12.2	(9.3 – 15.7)
Gastrointestinal infection	330	(190 – 540)	11.8	(7.6 – 17.4)
Skin infection	500	(310 – 770)	17.6	(12.4 – 23.5)
Ear infection	650	(420 – 920)	22.8	(18.1 – 28.1)
		Total WA (N = 29 800)		
Chest infection	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal infection	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)
Ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)

Table 3.65: Children — Relationship between recurring ear infections and runny ears

Whether ever had discharging ears	Number	95% CI	%	95% CI
		No recurring ear infection		
No	21 600	(21 100 – 22 100)	88.5	(87.3 – 89.7)
Yes	2 770	(2 490 – 3 060)	11.3	(10.2 – 12.5)
Not stated	30	(20 – 60)	0.1	(0.1 – 0.3)
Total	24 400	(24 000 – 24 800)	100.0	
		Has recurring ear infection		
No	1 650	(1 430 – 1 890)	30.6	(27.1 – 34.3)
Yes	3 740	(3 410 – 4 090)	69.3	(65.7 – 72.9)
Not stated	10	(0 – 40)	0.1	(0.0 – 0.7)
Total	5 400	(5 000 – 5 810)	100.0	
		Total		
No	23 300	(22 800 – 23 700)	78.0	(76.6 – 79.4)
Yes	6 510	(6 090 – 6 940)	21.8	(20.4 – 23.3)
Not stated	40	(20 – 70)	0.1	(0.1 – 0.2)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.66: Children — Child suffers from recurring ear infections, by ever had discharging ears

Whether has recurring ear infection	Number	95% CI	%	95% CI
		Never had discharging ears		
No recurring ear infection	21 600	(21 100 – 22 100)	92.9	(91.9 – 93.9)
Has recurring ear infection	1 650	(1 430 – 1 890)	7.1	(6.1 – 8.1)
Total	23 300	(22 800 – 23 700)	100.0	
		Has had discharging ears		
No recurring ear infection	2 770	(2 490 – 3 060)	42.5	(39.0 – 46.1)
Has recurring ear infection	3 740	(3 410 – 4 090)	57.5	(53.9 – 61.0)
Total	6 510	(6 090 – 6 940)	100.0	
		Total		
No recurring ear infection	24 400	(24 000 – 24 800)	81.9	(80.5 – 83.2)
Has recurring ear infection	5 400	(5 000 – 5 810)	18.1	(16.8 – 19.5)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.67: Children — Type of ear infection, by age group

Type of ear infection	Number	95% CI	%	95% CI
		0–3 years		
None	4 960	(4 560 – 5 370)	71.8	(68.5 – 74.8)
Recurrent, no discharge	510	(390 – 630)	7.3	(5.7 – 9.1)
Isolated discharge	540	(430 – 680)	7.8	(6.2 – 9.7)
Recurrent and discharging	910	(740 – 1 100)	13.1	(10.8 – 15.8)
Total	6 910	(6 470 – 7 360)	100.0	
		4–11 years		
None	9 580	(9 100 – 10 100)	69.4	(67.2 – 71.5)
Recurrent, no discharge	740	(610 – 880)	5.3	(4.4 – 6.4)
Isolated discharge	1 470	(1 310 – 1 660)	10.7	(9.5 – 12.0)
Recurrent and discharging	2 010	(1 790 – 2 250)	14.6	(13.0 – 16.2)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
None	7 110	(6 610 – 7 620)	78.1	(75.3 – 80.7)
Recurrent, no discharge	410	(290 – 560)	4.6	(3.2 – 6.2)
Isolated discharge	750	(610 – 930)	8.3	(6.7 – 10.1)
Recurrent and discharging	820	(670 – 1 000)	9.0	(7.4 – 11.0)
Total	9 100	(8 580 – 9 630)	100.0	
		Total		
None	21 700	(21 200 – 22 100)	72.6	(71.0 – 74.2)
Recurrent, no discharge	1 660	(1 440 – 1 900)	5.6	(4.8 – 6.4)
Isolated discharge	2 770	(2 490 – 3 060)	9.3	(8.4 – 10.3)
Recurrent and discharging	3 740	(3 410 – 4 090)	12.5	(11.4 – 13.7)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.68: Children aged 0–17 years — Type of ear infection experienced by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
		LORI — None		
None	7 720	(7 390 – 8 050)	75.9	(72.9 – 78.7)
Recurrent, no discharge	590	(430 – 780)	5.8	(4.3 – 7.7)
Isolated discharge	730	(580 – 910)	7.2	(5.7 – 8.9)
Recurrent and discharging	1 130	(920 – 1 370)	11.2	(9.1 – 13.6)
Total	10 200	(10 000 – 10 400)	100.0	
		LORI — Low		
None	5 440	(4 920 – 5 980)	74.9	(71.9 – 77.7)
Recurrent, no discharge	440	(340 – 570)	6.0	(4.6 – 7.6)
Isolated discharge	550	(420 – 700)	7.5	(5.9 – 9.5)
Recurrent and discharging	840	(680 – 1 020)	11.6	(9.6 – 13.9)
Total	7 270	(6 640 – 7 930)	100.0	
		LORI — Moderate		
None	4 390	(3 680 – 5 150)	68.8	(65.5 – 71.9)
Recurrent, no discharge	430	(330 – 530)	6.7	(5.4 – 8.1)
Isolated discharge	800	(620 – 1 010)	12.5	(10.3 – 15.0)
Recurrent and discharging	770	(620 – 950)	12.0	(10.4 – 13.9)
Total	6 390	(5 400 – 7 420)	100.0	
		LORI — High		
None	2 220	(1 640 – 2 980)	70.1	(65.1 – 74.7)
Recurrent, no discharge	80	(50 – 130)	2.5	(1.5 – 3.9)
Isolated discharge	390	(270 – 550)	12.4	(9.5 – 15.8)
Recurrent and discharging	480	(320 – 660)	15.1	(11.8 – 18.9)
Total	3 170	(2 360 – 4 160)	100.0	
		LORI — Extreme		
None	1 880	(1 360 – 2 580)	66.5	(60.7 – 71.8)
Recurrent, no discharge	130	(60 – 220)	4.5	(2.4 – 7.5)
Isolated discharge	300	(200 – 440)	10.6	(7.8 – 14.0)
Recurrent and discharging	520	(340 – 760)	18.4	(14.3 – 22.8)
Total	2 830	(2 040 – 3 800)	100.0	
		Total		
None	21 700	(21 200 – 22 100)	72.6	(71.0 – 74.2)
Recurrent, no discharge	1 660	(1 440 – 1 900)	5.6	(4.8 – 6.4)
Isolated discharge	2 770	(2 490 – 3 060)	9.3	(8.4 – 10.3)
Recurrent and discharging	3 740	(3 410 – 4 090)	12.5	(11.4 – 13.7)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.69: Children aged 0–3 years — Type of ear infection experienced by Level of Relative Isolation (LORI) `

Type of ear infection	Number	95% CI	%	95% CI
		LORI — None		
None	1 800	(1 540 – 2 080)	76.8	(69.9 – 82.8)
Recurrent, no discharge	170	(100 – 290)	7.4	(4.0 – 11.9)
Isolated discharge	130	(80 – 210)	5.8	(3.6 – 9.0)
Recurrent and discharging	230	(130 – 410)	10.0	(5.5 – 16.6)
Total	2 340	(2 050 – 2 650)	100.0	
		LORI — Low		
None	1 250	(1 050 – 1 470)	74.4	(68.2 – 80.0)
Recurrent, no discharge	150	(110 – 210)	8.9	(6.5 – 12.1)
Isolated discharge	100	(40 – 230)	5.9	(2.3 – 13.1)
Recurrent and discharging	180	(120 – 250)	10.7	(7.6 – 14.8)
Total	1 680	(1 430 – 1 940)	100.0	
		LORI — Moderate		
None	1 160	(910 – 1 480)	67.9	(61.8 – 73.4)
Recurrent, no discharge	130	(90 – 190)	7.5	(4.9 – 10.8)
Isolated discharge	210	(150 – 280)	12.0	(8.7 – 15.7)
Recurrent and discharging	220	(160 – 290)	12.7	(9.6 – 16.5)
Total	1 710	(1 390 – 2 090)	100.0	
		LORI — High		
None	430	(290 – 600)	69.9	(61.9 – 77.6)
Recurrent, no discharge	20	(0 – 70)	2.8	(0.4 – 10.8)
Isolated discharge	50	(20 – 90)	8.0	(3.8 – 14.0)
Recurrent and discharging	120	(70 – 180)	19.2	(13.3 – 26.1)
Total	610	(440 – 830)	100.0	
		LORI — Extreme		
None	330	(200 – 510)	57.2	(44.1 – 70.9)
Recurrent, no discharge	40	(20 – 70)	6.5	(3.1 – 11.4)
Isolated discharge	50	(30 – 90)	8.9	(5.0 – 14.1)
Recurrent and discharging	160	(80 – 280)	27.4	(16.1 – 39.7)
Total	580	(370 – 840)	100.0	
		Total		
None	4 960	(4 560 – 5 370)	71.8	(68.5 – 74.8)
Recurrent, no discharge	510	(390 – 630)	7.3	(5.7 – 9.1)
Isolated discharge	540	(430 – 680)	7.8	(6.2 – 9.7)
Recurrent and discharging	910	(740 – 1 100)	13.1	(10.8 – 15.8)
Total	6 910	(6 470 – 7 360)	100.0	

Table 3.70: Children aged 4–11 years — Type of ear infection experienced, by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
		LORI — None		
None	3 430	(3 110 – 3 780)	73.6	(69.6 – 77.4)
Recurrent, no discharge	240	(160 – 350)	5.2	(3.4 – 7.4)
Isolated discharge	400	(310 – 500)	8.5	(6.7 – 10.7)
Recurrent and discharging	600	(470 – 750)	12.7	(10.0 – 15.9)
Total	4 670	(4 330 – 5 030)	100.0	
		LORI — Low		
None	2 500	(2 200 – 2 820)	72.4	(68.1 – 76.3)
Recurrent, no discharge	200	(130 – 290)	5.8	(4.0 – 8.3)
Isolated discharge	270	(210 – 350)	7.9	(6.1 – 10.0)
Recurrent and discharging	480	(370 – 630)	14.0	(10.9 – 17.5)
Total	3 460	(3 080 – 3 860)	100.0	
		LORI — Moderate		
None	1 740	(1 440 – 2 070)	62.0	(57.7 – 66.2)
Recurrent, no discharge	190	(140 – 260)	6.9	(5.2 – 9.0)
Isolated discharge	440	(330 – 560)	15.5	(12.7 – 18.8)
Recurrent and discharging	440	(340 – 560)	15.5	(12.8 – 18.6)
Total	2 800	(2 370 – 3 290)	100.0	
		LORI — High		
None	1 100	(770 – 1 530)	69.1	(62.0 – 75.6)
Recurrent, no discharge	50	(20 – 80)	2.9	(1.6 – 5.0)
Isolated discharge	220	(130 – 340)	13.8	(9.5 – 19.1)
Recurrent and discharging	230	(150 – 340)	14.3	(9.8 – 19.4)
Total	1 600	(1 150 – 2 140)	100.0	
		LORI — Extreme		
None	800	(550 – 1 110)	62.9	(55.3 – 70.2)
Recurrent, no discharge	60	(20 – 120)	4.4	(1.9 – 9.3)
Isolated discharge	150	(80 – 230)	11.6	(7.2 – 17.0)
Recurrent and discharging	270	(180 – 400)	21.1	(15.6 – 27.0)
Total	1 270	(910 – 1 740)	100.0	
		Total		
None	9 580	(9 100 – 10 100)	69.4	(67.2 – 71.5)
Recurrent, no discharge	740	(610 – 880)	5.3	(4.4 – 6.4)
Isolated discharge	1 470	(1 310 – 1 660)	10.7	(9.5 – 12.0)
Recurrent and discharging	2 010	(1 790 – 2 250)	14.6	(13.0 – 16.2)
Total	13 800	(13 300 – 14 300)	100.0	

Table 3.71: Children aged 12–17 years — Type of ear infection experienced, by Level of Relative Isolation (LORI)

Type of ear infection	Number	95% CI	%	95% CI
		LORI — None		
None	2 480	(2 170 – 2 820)	78.6	(72.5 – 83.8)
Recurrent, no discharge	170	(90 – 320)	5.5	(2.8 – 9.9)
Isolated discharge	200	(100 – 330)	6.2	(3.4 – 10.5)
Recurrent and discharging	300	(190 – 450)	9.6	(6.2 – 14.1)
Total	3 160	(2 820 – 3 530)	100.0	
		LORI — Low		
None	1 690	(1 390 – 2 030)	79.3	(73.7 – 84.0)
Recurrent, no discharge	90	(40 – 170)	4.2	(2.0 – 7.9)
Isolated discharge	170	(110 – 270)	8.1	(4.9 – 12.2)
Recurrent and discharging	180	(130 – 250)	8.3	(5.8 – 11.7)
Total	2 130	(1 810 – 2 480)	100.0	
		LORI — Moderate		
None	1 490	(1 160 – 1 860)	79.8	(74.2 – 84.7)
Recurrent, no discharge	100	(60 – 160)	5.5	(3.5 – 8.6)
Isolated discharge	160	(100 – 240)	8.5	(5.3 – 12.4)
Recurrent and discharging	120	(70 – 170)	6.2	(4.0 – 9.1)
Total	1 870	(1 510 – 2 280)	100.0	
		LORI — High		
None	690	(490 – 930)	72.0	(64.7 – 79.0)
Recurrent, no discharge	10	(0 – 40)	1.5	(0.4 – 3.7)
Isolated discharge	120	(80 – 180)	12.8	(8.9 – 17.8)
Recurrent and discharging	130	(70 – 210)	13.7	(8.7 – 20.6)
Total	960	(700 – 1 290)	100.0	
		LORI — Extreme		
None	760	(540 – 1 060)	76.7	(69.6 – 82.5)
Recurrent, no discharge	30	(10 – 90)	3.4	(0.9 – 8.1)
Isolated discharge	100	(60 – 150)	10.4	(7.2 – 14.1)
Recurrent and discharging	90	(50 – 170)	9.5	(5.0 – 15.3)
Total	990	(700 – 1 350)	100.0	
		Total		
None	7 110	(6 610 – 7 620)	78.1	(75.3 – 80.7)
Recurrent, no discharge	410	(290 – 560)	4.6	(3.2 – 6.2)
Isolated discharge	750	(610 – 930)	8.3	(6.7 – 10.1)
Recurrent and discharging	820	(670 – 1 000)	9.0	(7.4 – 11.0)
Total	9 100	(8 580 – 9 630)	100.0	

Table 3.72: Children — Proportion with recurrent and discharging ear infections, by child's age and Level of Relative Isolation (LORI)

Child's Age (years)	Number	95% CI	%	95% CI
		LORI — None, Low and Moderate		
0–3	630	(490 – 810)	58.3	(49.3 – 66.5)
4–11	1 510	(1 310 – 1 740)	70.4	(65.4 – 75.4)
12–17	600	(460 – 750)	62.0	(51.4 – 72.2)
Total	2 740	(2 440 – 3 070)	65.4	(61.1 – 69.6)
		LORI — High and Extreme		
0–3	280	(180 – 390)	83.4	(72.0 – 90.8)
4–11	500	(380 – 640)	82.9	(73.8 – 89.3)
12–17	230	(150 – 320)	82.4	(69.8 – 92.5)
Total	1 000	(780 – 1 250)	83.0	(76.4 – 88.3)
		Total		
0–3	910	(740 – 1 100)	64.2	(57.0 – 71.0)
4–11	2 010	(1 790 – 2 250)	73.2	(68.8 – 77.3)
12–17	820	(670 – 1 000)	66.5	(57.4 – 74.6)
Total	3 740	(3 410 – 4 090)	69.3	(65.7 – 72.9)

Table 3.73: Children — Gestational age, by type of ear infection

Gestational age	Number	95% CI	%	95% CI
		No ear infections		
<32 weeks	350	(230 – 510)	1.6	(1.1 – 2.4)
32–36 weeks	2 040	(1 780 – 2 340)	9.4	(8.2 – 10.8)
>=37 weeks	16 400	(15 800 – 17 000)	75.6	(73.4 – 77.8)
Not stated	2 880	(2 480 – 3 330)	13.3	(11.4 – 15.3)
Total	21 700	(21 200 – 22 100)	100.0	
		Recurrent, no discharge		
<32 weeks	30	(0 – 270)	1.6	(0.1 – 15.3)
32–36 weeks	110	(50 – 200)	6.5	(3.1 – 11.5)
>=37 weeks	1 370	(1 170 – 1 580)	82.5	(75.5 – 88.1)
Not stated	150	(100 – 220)	9.3	(6.2 – 13.3)
Total	1 660	(1 440 – 1 900)	100.0	
		Isolated discharge		
<32 weeks	10	(0 – 30)	0.5	(0.2 – 1.1)
32–36 weeks	300	(230 – 400)	10.9	(8.2 – 14.0)
>=37 weeks	2 080	(1 850 – 2 320)	75.2	(70.5 – 79.4)
Not stated	370	(270 – 510)	13.5	(9.9 – 18.1)
Total	2 770	(2 490 – 3 060)	100.0	
		Recurrent and discharging		
<32 weeks	80	(50 – 130)	2.2	(1.4 – 3.4)
32–36 weeks	530	(430 – 660)	14.3	(11.6 – 17.3)
>=37 weeks	2 600	(2 330 – 2 880)	69.5	(65.6 – 73.3)
Not stated	520	(400 – 680)	14.0	(10.8 – 17.8)
Total	3 740	(3 410 – 4 090)	100.0	
		Total		
<32 weeks	470	(330 – 660)	1.6	(1.1 – 2.2)
32–36 weeks	2 990	(2 680 – 3 320)	10.0	(9.0 – 11.1)
>=37 weeks	22 400	(21 800 – 23 000)	75.2	(73.3 – 77.1)
Not stated	3 930	(3 450 – 4 440)	13.2	(11.6 – 14.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.74: All children — Mean birth weight, by type of ear infection

Type of ear infection	Mean birth weight (grams)	95% CI
None	3 190	(3 160 – 3 220)
Isolated discharge	3 190	(3 120 – 3 250)
Recurrent, no discharge	3 150	(3 020 – 3 290)
Recurrent and discharging	3 090	(3 030 – 3 140)
Total	3 170	(3 140 – 3 200)

Table 3.75: All children — Number of types of recurrent infections, by Level of Relative Isolation (LORI)

Number of types of recurrent infections	Number	95% CI	%	95% CI
		LORI — None		
None	6 940	(6 580 – 7 320)	68.3	(64.7 – 71.7)
One	2 330	(2 050 – 2 650)	22.9	(20.0 – 25.9)
More than one	900	(700 – 1 120)	8.8	(6.9 – 11.0)
Total	10 200	(10 000 – 10 400)	100.0	
		LORI — Low		
None	5 100	(4 600 – 5 630)	70.2	(66.5 – 73.7)
One	1 630	(1 380 – 1 910)	22.4	(19.5 – 25.6)
More than one	540	(400 – 720)	7.4	(5.5 – 9.8)
Total	7 270	(6 640 – 7 930)	100.0	
		LORI — Moderate		
None	4 500	(3 790 – 5 300)	70.4	(67.2 – 73.4)
One	1 250	(1 030 – 1 510)	19.6	(17.5 – 22.0)
More than one	630	(500 – 800)	9.9	(8.2 – 12.0)
Total	6 390	(5 400 – 7 420)	100.0	
		LORI — High		
None	2 190	(1 600 – 2 930)	69.3	(62.9 – 75.1)
One	650	(470 – 890)	20.5	(16.9 – 24.2)
More than one	320	(200 – 500)	10.3	(6.9 – 14.7)
Total	3 170	(2 360 – 4 160)	100.0	
		LORI — Extreme		
None	1 720	(1 240 – 2 350)	60.6	(54.0 – 66.7)
One	610	(410 – 860)	21.5	(17.8 – 25.7)
More than one	510	(320 – 790)	17.9	(12.3 – 23.9)
Total	2 830	(2 040 – 3 800)	100.0	
		Total		
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.76: Children with recurrent infections — Number of types of recurrent infections, by Level of Relative Isolation (LORI)

Number of types of recurrent infections	Number	95% CI	%	95% CI
		LORI — None		
One	2 330	(2 050 – 2 650)	72.3	(66.4 – 77.4)
Two	610	(450 – 810)	19.0	(14.3 – 24.2)
Three	250	(180 – 330)	7.6	(5.5 – 10.3)
Four	40	(10 – 90)	1.1	(0.3 – 2.6)
Total	3 230	(2 890 – 3 600)	100.0	
		LORI — Low		
One	1 630	(1 380 – 1 910)	75.2	(68.8 – 81.0)
Two	390	(280 – 530)	18.0	(13.6 – 23.3)
Three	110	(50 – 190)	4.9	(2.2 – 8.7)
Four	40	(10 – 160)	1.9	(0.2 – 7.1)
Total	2 170	(1 850 – 2 510)	100.0	
		LORI — Moderate		
One	1 250	(1 030 – 1 510)	66.4	(61.6 – 71.0)
Two	440	(340 – 570)	23.6	(19.7 – 27.7)
Three	150	(100 – 220)	8.1	(5.6 – 11.3)
Four	40	(20 – 60)	1.9	(1.1 – 3.2)
Total	1 890	(1 560 – 2 250)	100.0	
		LORI — High		
One	650	(470 – 890)	66.6	(58.1 – 74.1)
Two	280	(160 – 430)	28.8	(20.7 – 37.3)
Three	40	(10 – 80)	4.1	(1.6 – 8.0)
Four	10	(0 – 20)	0.6	(0.1 – 2.3)
Total	970	(690 – 1 340)	100.0	
		LORI — Extreme		
One	610	(410 – 860)	54.7	(44.7 – 65.0)
Two	330	(210 – 510)	29.9	(23.9 – 36.1)
Three	140	(80 – 240)	12.6	(7.8 – 18.6)
Four	30	(10 – 100)	2.8	(0.6 – 8.5)
Total	1 110	(760 – 1 570)	100.0	
		Total		
One	6 470	(6 050 – 6 900)	69.1	(66.1 – 72.0)
Two	2 060	(1 790 – 2 350)	22.0	(19.7 – 24.5)
Three	690	(560 – 840)	7.3	(6.0 – 8.9)
Four	150	(80 – 260)	1.6	(0.9 – 2.7)
Total	9 370	(8 820 – 9 920)	100.0	

Table 3.77: All children — Number of types of recurrent infections, by age

Number of types of recurrent infections	Number	95% CI	%	95% CI
		0–3 years		
None	4 330	(3 970 – 4 730)	62.7	(58.8 – 66.3)
One	1 650	(1 410 – 1 910)	23.9	(20.8 – 27.3)
Two	680	(520 – 860)	9.9	(7.7 – 12.5)
Three	190	(140 – 260)	2.8	(2.1 – 3.7)
Four	50	(20 – 110)	0.8	(0.3 – 1.6)
Total	6 910	(6 470 – 7 360)	100.0	
		4–11 years		
None	9 160	(8 670 – 9 660)	66.4	(63.8 – 68.9)
One	3 190	(2 920 – 3 490)	23.1	(21.2 – 25.1)
Two	1 020	(850 – 1 210)	7.4	(6.2 – 8.8)
Three	350	(260 – 450)	2.5	(1.9 – 3.3)
Four	80	(20 – 170)	0.6	(0.2 – 1.2)
Total	13 800	(13 300 – 14 300)	100.0	
		12–17 years		
None	6 950	(6 450 – 7 470)	76.4	(73.4 – 79.3)
One	1 630	(1 400 – 1 880)	17.9	(15.5 – 20.6)
Two	360	(250 – 490)	3.9	(2.8 – 5.3)
Three	140	(80 – 220)	1.5	(0.9 – 2.4)
Four	20	(10 – 40)	0.2	(0.1 – 0.5)
Total	9 100	(8 580 – 9 630)	100.0	
		Total		
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
Two	2 060	(1 790 – 2 350)	6.9	(6.0 – 7.9)
Three	690	(560 – 840)	2.3	(1.9 – 2.8)
Four	150	(80 – 260)	0.5	(0.3 – 0.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.78: Children with recurrent infections — Number of types, by age group

Number of types of recurrent infections	Number	95% CI	%	95% CI
		0–3 years		
One	1 650	(1 410 – 1 910)	64.0	(57.8 – 69.6)
More than one	930	(760 – 1 130)	36.0	(30.4 – 42.2)
Total	2 580	(2 280 – 2 900)	100.0	
		4– 11 years		
One	3 190	(2 920 – 3 490)	68.8	(64.8 – 72.6)
More than one	1 450	(1 220 – 1 700)	31.2	(27.4 – 35.2)
Total	4 640	(4 270 – 5 030)	100.0	
		12–17 years		
One	1 630	(1 400 – 1 880)	75.9	(70.1 – 81.1)
More than one	520	(390 – 670)	24.1	(18.9 – 29.9)
Total	2 150	(1 880 – 2 440)	100.0	
		Total		
One	6 470	(6 050 – 6 900)	69.1	(66.1 – 72.0)
More than one	2 900	(2 560 – 3 250)	30.9	(28.0 – 33.9)
Total	9 370	(8 820 – 9 920)	100.0	

Table 3.79: All children — Relative risk of each recurring infection, given presence of another

	Numerator rate	Denominator rate	Relative risk	95% CI
		Has chest infection		
Likelihood of –				
gastrointestinal infection	18.3	3.8	4.8	(3.6 – 6.4)
skin infection	20.4	6.8	3.0	(2.3 – 3.8)
ear infection	40.0	15.0	2.7	(2.3 – 3.1)
		Has gastrointestinal infection		
Likelihood of –				
chest infection	40.0	10.6	3.8	(3.1– 4.6)
skin infection	29.1	7.3	4.0	(3.1 – 5.2)
ear infection	43.9	16.6	2.6	(2.2 – 3.2)
		Has skin infection		
Likelihood of –				
chest infection	29.5	10.7	2.8	(2.2 – 3.4)
gastrointestinal infection	19.2	4.3	4.4	(3.2 – 6.1)
ear infection	36.6	16.4	2.2	(1.9 – 2.7)
		Has ear infection		
Likelihood of –				
chest infection	27.1	9.0	3.0	(2.5 – 3.6)
gastrointestinal infection	13.6	3.8	3.6	(2.7 – 4.8)
skin infection	17.1	6.6	2.6	(2.1 – 3.3)

Table 3.80: All children — Recurring infections, by type of ear infection

Type of recurring infection	Number	95% CI	%	95% CI
		No ear infections (N = 21 700)		
Chest	1 910	(1 670 – 2 180)	8.8	(7.7 – 10.0)
Gastrointestinal	730	(560 – 940)	3.4	(2.6 – 4.4)
Skin infection	1 330	(1 100 – 1 620)	6.2	(5.1 – 7.4)
		Isolated discharge (N = 2 770)		
Chest	290	(200 – 400)	10.4	(7.3 – 14.4)
Gastrointestinal	200	(140 – 290)	7.4	(4.9 – 10.3)
Skin infection	270	(210 – 350)	9.8	(7.4 – 12.6)
		Recurrent, no discharge (N = 1 660)		
Chest	490	(370 – 640)	29.6	(23.2 – 36.3)
Gastrointestinal	170	(110 – 240)	10.1	(6.8 – 14.3)
Skin infection	260	(190 – 340)	15.5	(11.4 – 20.0)
		Recurrent and discharging (N = 3 740)		
Chest	970	(790 – 1 180)	26.0	(21.9 – 30.5)
Gastrointestinal	570	(440 – 700)	15.1	(12.2 – 18.5)
Skin infection	670	(530 – 830)	17.9	(14.4 – 21.8)
		Total (N = 29 800)		
Chest	3 660	(3 310 – 4 030)	12.3	(11.1 – 13.5)
Gastrointestinal	1 670	(1 410 – 1 970)	5.6	(4.7 – 6.6)
Skin infection	2 530	(2 210 – 2 890)	8.5	(7.4 – 9.7)

Table 3.81: Children aged 4–17 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
		No ear infections (N = 16 700)		
Abnormal hearing	390	(270 – 530)	2.3	(1.6 – 3.2)
Speech unintelligible	1 170	(960 – 1 400)	7.0	(5.8 – 8.4)
Difficulty with sounds	1 300	(1 080 – 1 540)	7.8	(6.5 – 9.3)
Stammer	660	(510 – 860)	4.0	(3.0 – 5.1)
Learning difficulties	1 280	(1 050 – 1 530)	7.6	(6.3 – 9.1)
		Isolated discharge (N = 2 230)		
Abnormal hearing	200	(130 – 280)	9.0	(6.2 – 12.4)
Speech unintelligible	180	(130 – 260)	8.2	(5.8 – 11.2)
Difficulty with sounds	230	(170 – 310)	10.4	(7.8 – 13.8)
Stammer	100	(50 – 170)	4.6	(2.4 – 7.6)
Learning difficulties	220	(150 – 300)	9.8	(6.8 – 13.2)
		Recurrent, no discharge (N = 1 150)		
Abnormal hearing	120	(70 – 190)	10.4	(5.9 – 16.0)
Speech unintelligible	100	(50 – 170)	8.5	(4.5 – 14.5)
Difficulty with sounds	140	(80 – 210)	11.9	(7.2 – 17.6)
Stammer	50	(20 – 110)	4.5	(1.4 – 9.5)
Learning difficulties	120	(70 – 180)	10.0	(6.1 – 14.7)
		Recurrent and discharging (N = 2 830)		
Abnormal hearing	850	(700 – 1 020)	30.0	(25.1 – 35.2)
Speech unintelligible	520	(390 – 680)	18.4	(14.3 – 23.3)
Difficulty with sounds	570	(440 – 720)	20.1	(16.1 – 24.7)
Stammer	220	(150 – 310)	7.9	(5.6 – 10.7)
Learning difficulties	460	(350 – 590)	16.2	(12.6 – 20.5)
		Total (N = 22 900)		
Abnormal hearing	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Speech unintelligible	1 970	(1 710 – 2 260)	8.6	(7.5 – 9.9)
Difficulty with sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Stammer	1 040	(850 – 1 250)	4.5	(3.7 – 5.4)
Learning difficulties	2 070	(1 800 – 2 370)	9.0	(7.8 – 10.4)

Table 3.82: Children aged 4–11 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
		No ear infections (N = 9 580)		
Abnormal hearing	130	(60 – 230)	1.4	(0.7 – 2.4)
Speech unintelligible	880	(730 – 1 060)	9.2	(7.7 – 11.0)
Difficulty with sounds	1 060	(860 – 1 300)	11.1	(9.1 – 13.4)
Stammer	460	(310 – 630)	4.8	(3.3 – 6.6)
Learning difficulties	660	(510 – 830)	6.9	(5.4 – 8.7)
		Isolated discharge (N = 1 470)		
Abnormal hearing	160	(110 – 240)	11.1	(7.7 – 15.7)
Speech unintelligible	150	(100 – 210)	10.2	(7.2 – 14.2)
Difficulty with sounds	210	(150 – 280)	14.0	(10.3 – 18.4)
Stammer	100	(50 – 170)	6.9	(3.6 – 11.2)
Learning difficulties	140	(80 – 200)	9.2	(6.2 – 13.5)
		Recurrent, no discharge (N =740)		
Abnormal hearing	70	(40 – 120)	9.3	(5.0 – 15.9)
Speech unintelligible	80	(30 – 140)	10.6	(5.3 – 18.9)
Difficulty with sounds	120	(70 – 200)	16.2	(9.2 – 24.2)
Stammer	40	(10 – 100)	5.0	(1.0 – 13.3)
Learning difficulties	90	(50 – 150)	11.6	(6.3 – 19.0)
		Recurrent and discharging (N = 2 010)		
Abnormal hearing	570	(440 – 720)	28.3	(22.8 – 34.3)
Speech unintelligible	420	(310 – 570)	21.1	(16.0 – 27.0)
Difficulty with sounds	450	(340 – 600)	22.6	(17.4 – 28.3)
Stammer	160	(100 – 230)	7.7	(5.1 – 10.9)
Learning difficulties	310	(220 – 430)	15.5	(11.2 – 20.7)
		Total (N = 13 800)		
Abnormal hearing	930	(780 – 1 110)	6.8	(5.6 – 8.1)
Speech unintelligible	1 540	(1 320 – 1 770)	11.1	(9.6 – 12.8)
Difficulty with sounds	1 840	(1 600 – 2 110)	13.4	(11.6 – 15.2)
Stammer	750	(590 – 940)	5.4	(4.3 – 6.8)
Learning difficulties	1 190	(990 – 1 410)	8.7	(7.3 – 10.3)

Table 3.83: Children aged 12–17 years — Impact of ear infections, by type of infection

Impact of ear infections	Number	95% CI	%	95% CI
		No ear infections (N = 7 110)		
Abnormal hearing	260	(180 – 360)	3.6	(2.6 – 5.1)
Speech unintelligible	280	(170 – 440)	4.0	(2.5 – 6.1)
Difficulty with sounds	230	(160 – 330)	3.3	(2.3 – 4.6)
Stammer	210	(130 – 300)	2.9	(1.9 – 4.3)
Learning difficulties	620	(450 – 810)	8.7	(6.4 – 11.2)
		Isolated discharge (N = 750)		
Abnormal hearing	40	(10 – 90)	4.8	(1.3 – 11.4)
Speech unintelligible	30	(10 – 80)	4.2	(1.4 – 9.8)
Difficulty with sounds	30	(0 – 70)	3.5	(0.6 – 8.8)
Stammer	0	(0 – 60)	0.0	(0.0 – 7.1)
Learning difficulties	80	(40 – 150)	10.9	(5.8 – 19.4)
		Recurrent, no discharge (N = 410)		
Abnormal hearing	50	(20 – 120)	12.5	(3.8 – 24.6)
Speech unintelligible	20	(0 – 60)	4.8	(0.5 – 14.3)
Difficulty with sounds	20	(0 – 40)	4.4	(1.3 – 11.4)
Stammer	10	(0 – 40)	3.6	(0.6 – 8.9)
Learning difficulties	30	(20 – 50)	7.1	(3.5 – 11.9)
		Recurrent and discharging (N = 820)		
Abnormal hearing	280	(200 – 380)	34.2	(24.3 – 45.0)
Speech unintelligible	100	(50 – 160)	11.9	(6.8 – 19.4)
Difficulty with sounds	110	(80 – 170)	13.9	(8.8 – 20.3)
Stammer	70	(30 – 130)	8.4	(3.9 – 15.4)
Learning difficulties	150	(100 – 220)	18.0	(11.4 – 25.9)
		Total (N = 9 100)		
Abnormal hearing	630	(500 – 770)	6.9	(5.5 – 8.4)
Speech unintelligible	430	(310 – 600)	4.8	(3.3 – 6.5)
Difficulty with sounds	390	(300 – 500)	4.3	(3.4 – 5.5)
Stammer	290	(210 – 400)	3.2	(2.3 – 4.4)
Learning difficulties	870	(690 – 1 080)	9.6	(7.7 – 11.9)

Table 3.84: All children — Number of types of recurrent infection, by family financial strain

Number of types of recurrent infection	Number	95% CI	%	95% CI
		Spending more money than we get		
None	1 660	(1 340 – 2 030)	63.2	(56.9 – 69.3)
One	540	(430 – 670)	20.5	(16.7 – 24.6)
More than one	430	(300 – 590)	16.3	(11.7 – 22.0)
Total	2 630	(2 230 – 3 090)	100.0	
		Have just enough to get through to next pay		
None	8 940	(8 350 – 9 550)	67.4	(64.8 – 70.0)
One	3 090	(2 790 – 3 400)	23.3	(21.3 – 25.4)
More than one	1 240	(1 020 – 1 480)	9.3	(7.8 – 11.1)
Total	13 300	(12 600 – 14 000)	100.0	
		Some money left over each week but spend it		
None	2 830	(2 410 – 3 280)	70.5	(65.4 – 75.1)
One	830	(660 – 1 050)	20.8	(17.1 – 24.9)
More than one	350	(230 – 520)	8.8	(5.8 – 12.6)
Total	4 010	(3 490 – 4 570)	100.0	
		Can save a bit now and again		
None	5 480	(4 960 – 6 030)	71.3	(68.0 – 74.7)
One	1 550	(1 310 – 1 830)	20.2	(17.3 – 23.4)
More than one	650	(510 – 800)	8.4	(6.7 – 10.3)
Total	7 680	(7 070 – 8 330)	100.0	
		Can save a lot		
None	980	(760 – 1 240)	68.9	(59.8 – 76.9)
One	340	(210 – 500)	23.9	(17.7 – 31.4)
More than one	100	(50 – 190)	7.2	(3.7 – 12.0)
Total	1 420	(1 100 – 1 820)	100.0	
		Not stated		
None	560	(390 – 770)	69.3	(56.6 – 80.1)
One	120	(50 – 230)	14.9	(7.5 – 27.9)
More than one	130	(70 – 210)	15.8	(9.0 – 25.2)
Total	810	(590 – 1 050)	100.0	
		Total		
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.85: All children — Number of types of recurrent infection, by level of education of primary carer

Number of types of recurrent infection	Number	95% CI	%	95% CI
		Did not attend school		
None	450	(300 – 650)	60.6	(49.6 – 71.6)
One	190	(110 – 300)	25.6	(15.8 – 36.3)
More than one	100	(50 – 190)	13.9	(7.1 – 22.1)
Total	740	(520 – 1 030)	100.0	
		1–9 years		
None	4 510	(4 030 – 5 010)	68.0	(64.4 – 71.6)
One	1 430	(1 200 – 1 670)	21.5	(18.7 – 24.6)
More than one	690	(570 – 850)	10.5	(8.6 – 12.6)
Total	6 630	(6 040 – 7 230)	100.0	
		10 years		
None	9 010	(8 420 – 9 620)	70.4	(67.8 – 72.9)
One	2 660	(2 390 – 2 960)	20.8	(18.9 – 22.8)
More than one	1 130	(920 – 1 380)	8.8	(7.3 – 10.7)
Total	12 800	(12 100 – 13 500)	100.0	
		11–12 years		
None	4 810	(4 320 – 5 340)	66.4	(62.6 – 70.0)
One	1 710	(1 460 – 1 970)	23.5	(20.6 – 26.7)
More than one	730	(560 – 940)	10.1	(7.8 – 12.7)
Total	7 240	(6 650 – 7 880)	100.0	
		13 years or more		
None	1 120	(820 – 1 450)	69.7	(59.6 – 78.7)
One	370	(240 – 580)	23.4	(15.9 – 32.0)
More than one	110	(40 – 220)	7.0	(3.3 – 13.1)
Total	1 600	(1 200 – 2 060)	100.0	
		Not stated		
None	560	(390 – 770)	69.3	(56.6 – 80.1)
One	120	(50 – 230)	14.9	(7.5 – 27.9)
More than one	130	(70 – 210)	15.8	(9.0 – 25.2)
Total	810	(590 – 1 050)	100.0	
		Total		
None	20 400	(19 900 – 21 000)	68.6	(66.7 – 70.4)
One	6 470	(6 050 – 6 900)	21.7	(20.3 – 23.1)
More than one	2 900	(2 560 – 3 250)	9.7	(8.6 – 10.9)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.86: Children — Health conditions, by age group

Health condition	Number	95% CI	%	95% CI
		0–3 years (N = 6 910)		
Heart problem	190	(120 – 280)	2.8	(1.8 – 4.1)
Epilepsy	80	(60 – 120)	1.2	(0.8 – 1.8)
Anaemia or lack of iron	370	(270 – 480)	5.4	(4.0 – 7.0)
Allergies	390	(290 – 510)	5.7	(4.3 – 7.5)
		4–11 years (N = 13 800)		
Heart problem	410	(300 – 550)	3.0	(2.2 – 4.0)
Epilepsy	300	(210 – 430)	2.2	(1.5 – 3.1)
Anaemia or lack of iron	520	(400 – 660)	3.8	(2.9 – 4.8)
Allergies	1 060	(830 – 1 320)	7.7	(6.0 – 9.5)
		12–17 years (N = 9 100)		
Heart problem	330	(260 – 430)	3.7	(2.8 – 4.7)
Epilepsy	220	(160 – 320)	2.5	(1.7 – 3.5)
Anaemia or lack of iron	450	(350 – 570)	4.9	(3.8 – 6.1)
Allergies	810	(640 – 1 020)	8.9	(7.1 – 11.1)
		All children (N = 29 800)		
Heart problem	940	(780 – 1 120)	3.1	(2.6 – 3.8)
Epilepsy	610	(470 – 770)	2.0	(1.6 – 2.6)
Anaemia or lack of iron	1 340	(1 150 – 1 560)	4.5	(3.9 – 5.2)
Allergies	2 260	(1 950 – 2 620)	7.6	(6.5 – 8.8)

Table 3.87: Children aged 4–17 years — Health conditions, by age group

Health condition	Number	95% CI	%	95% CI
		4–11 years (N = 13 800)		
Migraine or severe headache	1 230	(1 040 – 1 430)	8.9	(7.6 – 10.4)
Learning difficulties	1 190	(990 – 1 410)	8.7	(7.3 – 10.3)
		12–17 years (N = 9 100)		
Migraine or severe headache	1 600	(1 370 – 1 850)	17.6	(15.2 – 20.3)
Learning difficulties	870	(690 – 1 080)	9.6	(7.7 – 11.9)
		Total years (N = 22 900)		
Migraine or severe headache	2 830	(2 530 – 3 170)	12.4	(11.1 – 13.8)
Learning difficulties	2 070	(1 800 – 2 370)	9.0	(7.8 – 10.4)

Table 3.88: Children — Broken bones and head injuries, by age group

Type of Injury	Number	95% CI	%	95% CI
		0–3 years (N = 6 910)		
Broken bones	190	(140 – 250)	2.7	(2.0 – 3.6)
Head injury/knocked out	180	(100 – 310)	2.6	(1.4 – 4.4)
		4–11 years (N = 13 800)		
Broken bones	1 490	(1 240 – 1 770)	10.8	(9.1 – 12.7)
Head injury/knocked out	620	(510 – 750)	4.5	(3.7 – 5.5)
		12–17 years (N = 9 100)		
Broken bones	1 660	(1 410 – 1 950)	18.3	(15.7 – 21.1)
Head injury/knocked out	880	(720 – 1 070)	9.7	(7.9 – 11.7)
		Total (N = 29 800)		
Broken bones	3 350	(3 000 – 3 730)	11.2	(10.1 – 12.5)
Head injury/knocked out	1 690	(1 460 – 1 930)	5.7	(4.9 – 6.5)

Table 3.89: Children — Broken bones and head injuries, by Level of Relative Isolation (LORI)

Type of injury	Number	95% CI	%	95% CI
		LORI — None (N = 10 200)		
Broken bones	1 340	(1 090 – 1 630)	13.2	(10.7 – 16.0)
Head injury/knocked out	750	(600 – 940)	7.4	(5.9 – 9.3)
		LORI — Low (N = 7 270)		
Broken bones	770	(580 – 1 010)	10.6	(8.1 – 13.5)
Head injury/knocked out	480	(350 – 640)	6.6	(4.9 – 8.6)
		LORI — Moderate (N = 6 390)		
Broken bones	660	(520 – 810)	10.3	(8.8 – 12.0)
Head injury/knocked out	300	(220 – 380)	4.6	(3.7 – 5.7)
		LORI — High (N = 3 170)		
Broken bones	330	(210 – 500)	10.3	(7.4 – 14.2)
Head injury/knocked out	60	(40 – 100)	2.0	(1.2 – 3.2)
		LORI — Extreme (N = 2 830)		
Broken bones	250	(170 – 350)	8.8	(6.7 – 11.3)
Head injury/knocked out	100	(50 – 160)	3.4	(2.0 – 5.1)
		Total WA (N = 29 800)		
Broken bones	3 350	(3 000 – 3 730)	11.2	(10.1 – 12.5)
Head injury/knocked out	1 690	(1 460 – 1 930)	5.7	(4.9 – 6.5)

Table 3.90: Children aged 4–17 years — Ever hospitalised for burns or poisoning, by age group

Reason for hospitalisation	Number	95% CI	%	95% CI
		4–11 years (N = 13 800)		
Accidental burns	470	(390 – 570)	3.4	(2.8 – 4.1)
Accidental poisoning	300	(210 – 440)	2.2	(1.5 – 3.2)
		12–17 years (N = 9 100)		
Accidental burns	340	(260 – 420)	3.7	(2.9 – 4.6)
Accidental poisoning	200	(120 – 320)	2.2	(1.4 – 3.5)
		Total (N = 22 900)		
Accidental burns	810	(690 – 930)	3.5	(3.0 – 4.1)
Accidental poisoning	510	(380 – 670)	2.2	(1.7 – 2.9)

Table 3.91: Children aged 4–17 years — Ever hospitalised for burns or poisoning, by Level of Relative Isolation (LORI)

Reason for hospitalisation	Number	95% CI	%	95% CI
		LORI — None (N = 7 830)		
Accidental burns	300	(230 – 400)	3.9	(2.9 – 5.1)
Accidental poisoning	230	(140 – 370)	2.9	(1.6 – 4.6)
		LORI — Low (N = 5 590)		
Accidental burns	220	(160 – 290)	4.0	(2.9 – 5.2)
Accidental poisoning	120	(70 – 190)	2.2	(1.4 – 3.4)
		LORI — Moderate (N = 4 680)		
Accidental burns	150	(110 – 210)	3.2	(2.4 – 4.3)
Accidental poisoning	90	(50 – 150)	2.0	(1.2 – 3.1)
		LORI — High (N = 2 550)		
Accidental burns	50	(30 – 100)	2.1	(1.0 – 3.7)
Accidental poisoning	20	(10 – 50)	0.8	(0.3 – 2.0)
		LORI — Extreme (N = 2 260)		
Accidental burns	80	(50 – 120)	3.5	(2.3 – 5.0)
Accidental poisoning	40	(10 – 160)	1.9	(0.2 – 6.4)
		Total WA (N = 22 900)		
Accidental burns	810	(690 – 930)	3.5	(3.0 – 4.1)
Accidental poisoning	510	(380 – 670)	2.2	(1.7 – 2.9)

Table 3.92: Children — Carer reports of dental health, by Level of Relative Isolation (LORI)

Dental health	Number	95% CI	%	95% CI
		LORI — None (N = 10 200)		
Holes in teeth	1 970	(1 690 – 2 270)	19.3	(16.6 – 22.2)
Teeth removed	1 030	(830 – 1 270)	10.1	(8.1 – 12.4)
Dental fillings	3 450	(3 110 – 3 810)	33.9	(30.6 – 37.4)
Sore and bleeding gums	660	(520 – 810)	6.5	(5.1 – 8.0)
		LORI — Low (N = 7 270)		
Holes in teeth	1 490	(1 230 – 1 800)	20.6	(17.3 – 24.1)
Teeth removed	710	(560 – 890)	9.8	(7.8 – 12.1)
Dental fillings	2 270	(1 950 – 2 640)	31.3	(27.5 – 35.3)
Sore and bleeding gums	370	(250 – 550)	5.1	(3.4 – 7.4)
		LORI — Moderate (N = 6 390)		
Holes in teeth	1 320	(1 070 – 1 620)	20.6	(17.8 – 23.6)
Teeth removed	610	(480 – 770)	9.6	(7.8 – 11.5)
Dental fillings	1 510	(1 210 – 1 860)	23.6	(20.4 – 27.0)
Sore and bleeding gums	390	(270 – 550)	6.2	(4.4 – 8.4)
		LORI — High (N = 3 170)		
Holes in teeth	420	(260 – 610)	13.3	(9.4 – 17.7)
Teeth removed	210	(130 – 310)	6.6	(4.6 – 9.3)
Dental fillings	720	(450 – 1 060)	22.7	(16.5 – 29.9)
Sore and bleeding gums	120	(70 – 170)	3.7	(2.6 – 5.1)
		LORI — Extreme (N = 2 830)		
Holes in teeth	350	(240 – 500)	12.3	(9.6 – 15.4)
Teeth removed	220	(140 – 330)	7.7	(5.8 – 10.2)
Dental fillings	260	(160 – 400)	9.2	(6.6 – 12.4)
Sore and bleeding gums	100	(60 – 160)	3.5	(2.2 – 5.4)
		Total WA (N = 29 800)		
Holes in teeth	5 550	(5 110 – 6 010)	18.6	(17.1 – 20.2)
Teeth removed	2 780	(2 480 – 3 090)	9.3	(8.3 – 10.4)
Dental fillings	8 210	(7 670 – 8 770)	27.5	(25.7 – 29.4)
Sore and bleeding gums	1 640	(1 410 – 1 900)	5.5	(4.7 – 6.4)

Table 3.93: Children — Carer reports of dental health, by age group

Dental health	Number	95% CI	%	95% CI
		0–3 years (N = 6 910)		
Holes in teeth	560	(430 – 710)	8.2	(6.4 – 10.2)
Teeth removed	40	(10 – 120)	0.5	(0.1 – 1.7)
Dental fillings	50	(30 – 90)	0.8	(0.4 – 1.3)
Sore and bleeding gums	110	(50 – 200)	1.5	(0.8 – 2.9)
		4–7 years (N = 6 920)		
Holes in teeth	2120	(1 900 – 2 350)	30.6	(27.8 – 33.6)
Teeth removed	790	(660 – 940)	11.4	(9.7 – 13.4)
Dental fillings	1 610	(1 420 – 1 820)	23.2	(20.7 – 25.9)
Sore and bleeding gums	340	(250 – 430)	4.9	(3.6 – 6.2)
		8–11 years (N = 6 880)		
Holes in teeth	1650	(1 410 – 1 930)	24.0	(20.7 – 27.6)
Teeth removed	940	(780 – 1 130)	13.7	(11.4 – 16.2)
Dental fillings	2 900	(2 600 – 3 210)	42.2	(38.5 – 46.0)
Sore and bleeding gums	470	(350 – 610)	6.8	(5.0 – 8.7)
		12–17 years (N = 9 100)		
Holes in teeth	1210	(1 000 – 1 460)	13.3	(11.1 – 15.9)
Teeth removed	1 010	(820 – 1 220)	11.1	(9.2 – 13.3)
Dental fillings	3 640	(3 250 – 4 080)	40.0	(36.4 – 43.8)
Sore and bleeding gums	730	(600 – 890)	8.0	(6.5 – 9.7)
		All children (N = 29 800)		
Holes in teeth	5550	(5 110 – 6 010)	18.6	(17.1 – 20.2)
Teeth removed	2 780	(2 480 – 3 090)	9.3	(8.3 – 10.4)
Dental fillings	8 210	(7 670 – 8 770)	27.5	(25.7 – 29.4)
Sore and bleeding gums	1 640	(1 410 – 1 900)	5.5	(4.7 – 6.4)

Table 3.94: All children — Occurrence of one or more dental problems (dental decay, tooth removal, dental fillings), by age group

Any tooth problem	Number	95% CI	%	95% CI
		0–3 years		
None	6 070	(5 660 – 6 500)	87.8	(85.6 – 89.8)
One or more	600	(460 – 750)	8.7	(6.9 – 10.9)
Too young	240	(190 – 310)	3.5	(2.7 – 4.5)
Total	6 910	(6 470 – 7 360)	100.0	
		4–7 years		
None	3 940	(3 620 – 4 280)	56.9	(53.6 – 60.1)
One or more	2 980	(2 720 – 3 250)	43.1	(39.9 – 46.4)
Total	6 920	(6 540 – 7 310)	100.0	
		8–11 years		
None	3 340	(3 030 – 3 680)	48.6	(44.8 – 52.3)
One or more	3 540	(3 210 – 3 880)	51.4	(47.7 – 55.2)
Total	6 880	(6 480 – 7 290)	100.0	
		12–17 years		
None	4 950	(4 550 – 5 370)	54.4	(50.8 – 57.9)
One or more	4 150	(3 750 – 4 590)	45.6	(42.1 – 49.2)
Total	9 100	(8 580 – 9 630)	100.0	
		Total		
None	18 300	(17 700 – 18 900)	61.4	(59.4 – 63.3)
One or more	11 300	(10 700 – 11 900)	37.8	(35.9 – 39.8)
Too young	240	(190 – 310)	0.8	(0.6 – 1.0)
Total	29 800	(29 800 – 29 800)	100.0	

Table 3.95: Children 4–17 years — Occurrence of one or more dental problems (dental decay, tooth removal, dental fillings), by Level of Relative Isolation (LORI)

Any tooth problem	Number	95% CI	%	95% CI
		LORI — None		
None	3 760	(3 440 – 4 090)	48.0	(43.9 – 52.1)
One or more	4 070	(3 750 – 4 410)	52.0	(47.9 – 56.1)
Total	7 830	(7 680 – 7 980)	100.0	
		LORI — Low		
None	2 590	(2 270 – 2 950)	46.4	(42.0 – 50.7)
One or more	2 990	(2 640 – 3 370)	53.6	(49.3 – 58.0)
Total	5 590	(5 100 – 6 100)	100.0	
		LORI — Moderate		
None	2 620	(2 150 – 3 130)	56.0	(51.1 – 60.6)
One or more	2 060	(1 690 – 2 490)	44.0	(39.4 – 48.9)
Total	4 680	(3 940 – 5 480)	100.0	
		LORI — High		
None	1 580	(1 180 – 2 100)	61.8	(54.2 – 68.7)
One or more	980	(700 – 1 340)	38.2	(31.3 – 45.8)
Total	2 550	(1 910 – 3 270)	100.0	
		LORI — Extreme		
None	1 690	(1 250 – 2 270)	74.8	(69.7 – 79.2)
One or more	570	(390 – 800)	25.2	(20.8 – 30.3)
Total	2 260	(1 670 – 3 020)	100.0	
		Total		
None	12 200	(11 700 – 12 700)	53.4	(51.1 – 55.7)
One or more	10 700	(10 200 – 11 200)	46.6	(44.3 – 48.9)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.96: Children aged 4–17 years — Functional difficulties due to illness or disability, by Level of Relative Isolation (LORI)

Functional difficulties	Number	95% CI	%	95% CI
		LORI — None or Low (N = 13 400)		
Need help in activities of daily living	300	(200 – 440)	2.3	(1.5 – 3.3)
Can't do sporting activities involving strong exercise	730	(560 – 950)	5.5	(4.1 – 7.0)
		LORI — Moderate, High or Extreme (N = 9 490)		
Need help in activities of daily living	80	(50 – 110)	0.8	(0.5 – 1.1)
Can't do sporting activities involving strong exercise	210	(140 – 280)	2.2	(1.5 – 3.0)
		Total WA (N = 22 900)		
Need help in activities of daily living	380	(270 – 510)	1.7	(1.2 – 2.2)
Can't do sporting activities involving strong exercise	940	(750 – 1 160)	4.1	(3.3 – 5.0)

Table 3.97: Children aged 4–17 years — Functional difficulties due to illness or disability, by age and sex

Functional difficulties	Number	95% CI	%	95% CI
		Males 4–11 years (N = 7 190)		
Need help in activities of daily living	190	(110 – 290)	2.7	(1.6 – 4.1)
Can't do sporting activities involving strong exercise	290	(190 – 430)	4.0	(2.6 – 5.9)
Need special help at school	420	(300 – 570)	5.8	(4.2 – 7.9)
		Males 12–17 years (N = 4 540)		
Need help in activities of daily living	30	(13 – 61)	0.7	(0.3 – 1.4)
Can't do sporting activities involving strong exercise	240	(170 – 340)	5.4	(3.7 – 7.6)
Need special help at school	200	(120 – 320)	4.4	(2.6 – 6.8)
		Total Males (N = 11 700)		
Need help in activities of daily living	220	(140 – 320)	1.9	(1.2 – 2.7)
Can't do sporting activities involving strong exercise	530	(400 – 690)	4.5	(3.4 – 5.9)
Need special help at school	620	(460 – 810)	5.3	(4.0 – 6.9)
		Females 4–11 years (N = 6 610		
Need help in activities of daily living	110	(80 – 170)	1.7	(1.2 – 2.5)
Can't do sporting activities involving strong exercise	180	(120 – 260)	2.7	(1.7 – 3.9)
Need special help at school	270	(200 – 350)	4.1	(3.1 – 5.4)
		Females 12–17 years (N = 4 560)		
Need help in activities of daily living	40	(0 – 150)	1.0	(0.1 – 3.1)
Can't do sporting activities involving strong exercise	230	(140 – 370)	5.0	(3.0 – 8.0)
Need special help at school	130	(80 – 190)	2.8	(1.8 – 4.1)
		Total females (N = 11 200)		
Need help in activities of daily living	160	(90 – 250)	1.4	(0.8 – 2.2)
Can't do sporting activities involving strong exercise	410	(290 – 560)	3.6	(2.6 – 5.0)
Need special help at school	400	(310 – 490)	3.6	(2.8 – 4.4)
		Total 4–11 years (N = 13 800)		
Need help in activities of daily living	300	(210 – 420)	2.2	(1.5 – 3.0)
Limited in strong exercise	470	(350 – 620)	3.4	(2.5 – 4.4)
Need special help at school	690	(540 – 870)	5.0	(3.9 – 6.3)
		Total 12–17 years (N = 9 100)		
Need help in activities of daily living	70	(20 – 160)	0.8	(0.2 – 1.7)
Can't do sporting activities involving strong exercise	470	(340 – 630)	5.2	(3.8 – 7.0)
Need special help at school	330	(230 – 440)	3.6	(2.6 – 4.9)
		Total (N = 22 900)		
Need help in activities of daily living	380	(270 – 510)	1.7	(1.2 – 2.2)
Can't do sporting activities involving strong exercise	940	(750 – 1 160)	4.1	(3.3 – 5.0)
Need special help at school	1 010	(820 – 1 240)	4.4	(3.6 – 5.4)

Table 3.98: Children aged 4–17 years who need special help at school due to illness or disability — Type of help required

Type of help required at school	Number	95% CI	%	95% CI
Special teacher	120	(70 – 200)	12.2	(7.5 – 19.3)
Special class	270	(180 – 390)	26.7	(18.5 – 36.2)
Help doing homework	30	(10 – 70)	3.2	(1.4 – 6.8)
Special programmes at school	90	(20 – 200)	8.7	(3.1 – 20.3)
Teacher aide	200	(130 – 320)	20.2	(12.4 – 29.2)
Special furniture	0	(0 – 80)	0.4	(0.0 – 8.0)
Speech pathology	20	(0 – 60)	1.7	(0.2 – 5.5)
Don't know	90	(40 – 180)	8.9	(4.1 – 17.3)
Other	80	(50 – 130)	8.1	(4.6 – 12.7)
Not stated	100	(50 – 190)	9.9	(5.1 – 18.3)
Total	1 010	(820 – 1240)	100.0	

Table 3.99: Children aged 4–17 years — Number of sensory and motor function problems, by Level of Relative Isolation (LORI)

Number of problems	Number	95% CI	%	95% CI
		LORI — None		
None	5 330	(5 040 – 5 630)	68.1	(64.4 – 71.6)
One	1 970	(1 730 – 2 230)	25.1	(22.1 – 28.4)
Two or more	530	(390 – 720)	6.8	(4.9 – 9.1)
Total	7 830	(7 680 – 7 980)	100.0	
		LORI — Low		
None	3 950	(3 560 – 4 380)	70.7	(66.7 – 74.7)
One	1 300	(1 090 – 1 560)	23.3	(19.8 – 27.0)
Two or more	330	(210 – 490)	6.0	(3.9 – 8.7)
Total	5 590	(5 100 – 6 100)	100.0	
		LORI — Moderate		
None	3 550	(2 980 – 4 200)	76.0	(71.0 – 80.7)
One	920	(680 – 1 220)	19.7	(15.4 – 24.3)
Two or more	200	(130 – 290)	4.3	(2.8 – 6.1)
Total	4 680	(3 940 – 5 480)	100.0	
		LORI — High		
None	2 030	(1 530 – 2 610)	79.6	(74.6 – 84.0)
One	430	(290 – 600)	16.6	(13.2 – 20.5)
Two or more	90	(50 – 160)	3.7	(2.2 – 5.6)
Total	2 550	(1 910 – 3 270)	100.0	
		LORI — Extreme		
None	1 860	(1 360 – 2 470)	82.7	(79.2 – 85.9)
One	330	(220 – 460)	14.7	(12.0 – 17.7)
Two or more	60	(30 – 110)	2.7	(1.4 – 4.7)
Total	2 260	(1 670 – 3 020)	100.0	
		Total WA		
None	16 700	(16 300 – 17 200)	73.1	(71.1 – 75.0)
One	4 950	(4 560 – 5 350)	21.6	(19.9 – 23.3)
Two or more	1 220	(1 010 – 1 460)	5.3	(4.4 – 6.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.100: Children aged 4–17 years — Number of sensory and motor function problems, by sex and age

Number of problems	Number	95% CI	%	95% CI
		Males 4–11 years		
None	5 130	(4 780 – 5 490)	71.4	(67.8 – 74.8)
One	1 650	(1 400 – 1 920)	23.0	(19.9 – 26.4)
Two or more	400	(280 – 580)	5.6	(3.9 – 8.0)
Total	7 190	(6 790 – 7 590)	100.0	
		Males 12–17 years		
None	3 390	(3 050 – 3 730)	74.6	(70.4 – 78.6)
One	920	(750 – 1 100)	20.2	(16.7 – 23.9)
Two or more	240	(140 – 360)	5.2	(3.1 – 7.9)
Total	4 540	(4 180 – 4 920)	100.0	
		Total males		
None	8 520	(8 080 – 8 950)	72.6	(69.8 – 75.3)
One	2 570	(2 270 – 2 880)	21.9	(19.5 – 24.4)
Two or more	640	(480 – 850)	5.5	(4.1 – 7.2)
Total	11 700	(11 300 – 12 200)	100.0	
		Females 4–11 years		
None	4 920	(4 590 – 5 270)	74.4	(71.2 – 77.5)
One	1 380	(1 170 – 1 630)	20.9	(18.0 – 24.2)
Two or more	310	(240 – 390)	4.7	(3.6 – 5.9)
Total	6 610	(6 220 – 7 010)	100.0	
		Females 12–17 years		
None	3 300	(3 000 – 3 630)	72.3	(68.2 – 76.2)
One	990	(820 – 1 180)	21.8	(18.3 – 25.6)
Two or more	270	(190 – 390)	6.0	(4.2 – 8.5)
Total	4 560	(4 230 – 4 910)	100.0	
		Total females		
None	8 220	(7 810 – 8 630)	73.5	(70.9 – 75.9)
One	2 380	(2 110 – 2 670)	21.3	(19.0 – 23.6)
Two or more	580	(460 – 730)	5.2	(4.1 – 6.5)
Total	11 200	(10 800 – 11 600)	100.0	
		Total 4–11 years		
None	10 100	(9 600 – 10 500)	72.8	(70.4 – 75.1)
One	3 040	(2 720 – 3 380)	22.0	(19.9 – 24.3)
Two or more	710	(560 – 900)	5.2	(4.1 – 6.5)
Total	13 800	(13 300 – 14 200)	100.0	
		Total 12–17 years		
None	6 680	(6 260 – 7 120)	73.4	(70.4 – 76.4)
One	1 910	(1 670 – 2 180)	21.0	(18.5 – 23.7)
Two or more	510	(380 – 680)	5.6	(4.2 – 7.4)
Total	9 100	(8 660 – 9 560)	100.0	
		Total		
None	16 700	(16 300 – 17 200)	73.1	(71.1 – 75.0)
One	4 950	(4 560 – 5 350)	21.6	(19.9 – 23.3)
Two or more	1 220	(1 010 – 1 460)	5.3	(4.4 – 6.4)
Total	22 900	(22 800 – 22 900)	100.0	

Table 3.101: Children aged 4–17 years — Sensory and motor problems, by Level of Relative Isolation (LORI)

Sensory or motor problem	Number	95% CI	%	95% CI
		LORI — None (N = 7 830)		
Does not have normal vision in both eyes	890	(680 – 1 140)	11.3	(8.6 – 14.4)
Wears glasses or contact lenses	480	(340 – 670)	6.2	(4.3 – 8.4)
Does not have normal hearing in both ears	540	(400 – 710)	6.9	(5.1 – 9.1)
Has difficulty saying certain sounds	860	(690 – 1 040)	10.9	(8.8 – 13.3)
Has pain or discomfort	840	(660 – 1 050)	10.7	(8.3 – 13.3)
		LORI — Low (N = 5 590)		
Does not have normal vision	470	(320 – 670)	8.5	(5.9 – 11.9)
Wears glasses or contact lenses	310	(210 – 440)	5.6	(3.7 – 7.8)
Does not have normal hearing in both ears	320	(230 – 430)	5.8	(4.2 – 7.6)
Has difficulty saying certain sounds	660	(520 – 830)	11.9	(9.5 – 14.6)
Has pain or discomfort	570	(410 – 790)	10.2	(7.4 – 13.8)
		LORI — Moderate (N = 4 680)		
Does not have normal vision	280	(190 – 390)	6.0	(4.3 – 8.2)
Wears glasses or contact lenses	200	(130 – 300)	4.2	(2.7 – 6.1)
Does not have normal hearing in both ears	360	(260 – 490)	7.7	(5.8 – 10.0)
Has difficulty saying certain sounds	390	(240 – 600)	8.4	(5.6 – 12.3)
Has pain or discomfort	340	(250 – 460)	7.2	(5.5 – 9.3)
		LORI — High (N = 2 550)		
Does not have normal vision	130	(50 – 320)	5.3	(1.7 – 12.0)
Wears glasses or contact lenses	50	(30 – 80)	2.0	(1.1 – 3.1)
Does not have normal hearing in both ears	160	(100 – 240)	6.4	(4.6 – 8.7)
Has difficulty saying certain sounds	210	(140 – 300)	8.2	(6.3 – 10.6)
Has pain or discomfort	110	(60 – 170)	4.2	(2.8 – 6.2)
		LORI — Extreme (N = 2 260)		
Does not have normal vision	70	(40 – 110)	3.1	(1.9 – 4.9)
Wears glasses or contact lenses	20	(10 – 50)	1.1	(0.5 – 2.1)
Does not have normal hearing in both ears	180	(100 – 280)	7.8	(5.0 – 11.7)
Has difficulty saying certain sounds	120	(70 – 170)	5.1	(3.3 – 7.3)
Has pain or discomfort	90	(30 – 180)	4.0	(1.9 – 7.5)
		Total WA (N = 22 900)		
Does not have normal vision	1 850	(1 550 – 2 190)	8.1	(6.8 – 9.6)
Wears glasses or contact lenses	1 070	(860 – 1 290)	4.7	(3.8 – 5.6)
Does not have normal hearing in both ears	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Has difficulty saying certain sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Has pain or discomfort	1 940	(1 670 – 2 240)	8.5	(7.3 – 9.8)

Table 3.102: Children aged 4–17 years — Sensory and motor problems, by age group and sex

Sensory or motor problem	Number	95% CI	%	95% CI
		Males 4–11 years (N = 7 190)		
Does not have normal vision	380	(240 – 550)	5.2	(3.4 – 7.7)
Wears glasses or contact lenses	190	(110 – 300)	2.7	(1.6 – 4.1)
Does not have normal hearing in both ears	500	(360 – 670)	7.0	(5.1 – 9.3)
Has difficulty saying certain sounds	1 190	(1 000 – 1 410)	16.5	(14.0 – 19.4)
Has pain or discomfort	460	(300 – 670)	6.4	(4.3 – 9.3)
		Males 12–17 years (N = 4 540)		
Does not have normal vision	430	(290 – 610)	9.5	(6.4 – 13.2)
Wears glasses or contact lenses	300	(180 – 470)	6.7	(4.0 – 10.1)
Does not have normal hearing in both ears	300	(200 – 420)	6.6	(4.6 – 9.4)
Has difficulty saying certain sounds	240	(170 – 340)	5.3	(3.7 – 7.5)
Has pain or discomfort	450	(330 – 610)	10.0	(7.3 – 13.2)
		Total Males (N = 11 700)		
Does not have normal vision	810	(610 – 1 060)	6.9	(5.1 – 8.9)
Wears glasses or contact lenses	500	(340 – 690)	4.2	(2.9 – 5.8)
Does not have normal hearing in both ears	800	(640 – 1 000)	6.9	(5.4 – 8.5)
Has difficulty saying certain sounds	1 430	(1 210 – 1 670)	12.2	(10.4 – 14.1)
Has pain or discomfort	910	(710 – 1 160)	7.8	(6.1 – 9.8)
		Females 4–11 years (N = 6 610)		
Does not have normal vision	440	(320 – 580)	6.7	(4.9 – 8.8)
Wears glasses or contact lenses	170	(120 – 220)	2.5	(1.9 – 3.3)
Does not have normal hearing in both ears	430	(350 – 520)	6.5	(5.4 – 7.8)
Has difficulty saying certain sounds	660	(500 – 850)	9.9	(7.7 – 12.6)
Has pain or discomfort	500	(400 – 630)	7.6	(6.0 – 9.4)
		Females 12–17 years (N = 4 560)		
Does not have normal vision	600	(460 – 760)	13.2	(10.4 – 16.6)
Wears glasses or contact lenses	400	(290 – 530)	8.8	(6.6 – 11.6)
Does not have normal hearing in both ears	330	(250 – 410)	7.2	(5.6 – 9.0)
Has difficulty saying certain sounds	150	(110 – 200)	3.3	(2.3 – 4.5)
Has pain or discomfort	530	(400 – 670)	11.5	(8.9 – 14.5)
		Total females (N = 11 200)		
Does not have normal vision	1 040	(860 – 1 260)	9.3	(7.7 – 11.2)
Wears glasses or contact lenses	570	(450 – 710)	5.1	(4.1 – 6.3)
Does not have normal hearing in both ears	760	(640 – 880)	6.8	(5.7 – 7.9)
Has difficulty saying certain sounds	810	(640 – 1 000)	7.2	(5.8 – 8.9)
Has pain or discomfort	1 030	(860 – 1 220)	9.2	(7.7 – 10.8)
		Total 4–11 years (N = 13 800)		
Does not have normal vision	820	(620 – 1 050)	5.9	(4.5 – 7.6)
Wears glasses or contact lenses	360	(260 – 470)	2.6	(1.9 – 3.4)
Does not have normal hearing in both ears	930	(780 – 1 110)	6.8	(5.6 – 8.1)
Has difficulty saying certain sounds	1 840	(1 600 – 2 110)	13.4	(11.6 – 15.2)
Has pain or discomfort	960	(760 – 1 190)	7.0	(5.6 – 8.7)
		Total 12–17 years (N = 9 100)		
Does not have normal vision	1 030	(810 – 1 280)	11.3	(9.1 – 13.9)
Wears glasses or contact lenses	710	(540 – 910)	7.8	(6.0 – 9.9)
Does not have normal hearing in both ears	630	(500 – 770)	6.9	(5.5 – 8.4)
Has difficulty saying certain sounds	390	(300 – 500)	4.3	(3.4 – 5.5)
Has pain or discomfort	980	(800 – 1 180)	10.8	(8.8 – 12.9)
		Total (N = 22900)		
Does not have normal vision	1 850	(1 550 – 2 190)	8.1	(6.8 – 9.6)
Wears glasses or contact lenses	1 070	(860 – 1 290)	4.7	(3.8 – 5.6)
Does not have normal hearing in both ears	1 560	(1 350 – 1 790)	6.8	(5.9 – 7.8)
Has difficulty saying certain sounds	2 240	(1 970 – 2 520)	9.8	(8.6 – 11.0)
Has pain or discomfort	1 940	(1 670 – 2 240)	8.5	(7.3 – 9.8)

Table 3.103: Children aged 4–17 years who do not have normal hearing — Type of hearing problem

Type of hearing problem	Number	95% CI	%	95% CI
Deaf in both ears	370	(270 – 480)	24	(18 – 30)
Deaf in one ear	760	(620 – 910)	49	(42 – 56)
Other	40	(20 – 90)	3	(1 – 5)
Not stated	390	(270 – 550)	25	(18 – 33)
Total	1 560	(1 350 – 1 790)	100	

Table 3.104: Children aged 4–17 years — Speech problems, by age group and sex

Type of speech problem	Number	95% CI	%	95% CI
		Males 4–11 years (N = 7 190)		
Speech difficult to understand	1 010	(830 – 1 220)	14.0	(11.7 – 16.6)
Stutters or stammers	560	(450 – 690)	7.8	(6.3 – 9.5)
		Males 12–17 years (N = 4 540)		
Speech difficult to understand	210	(120 – 330)	4.6	(2.8 – 7.2)
Stutters or stammers	190	(120 – 300)	4.2	(2.6 – 6.4)
		Total Males (N = 11 700)		
Speech difficult to understand	1 220	(1 020 – 1 450)	10.4	(8.7 – 12.3)
Stutters or stammers	750	(630 – 910)	6.4	(5.3 – 7.7)
		Females 4–11 years (N = 6 610)		
Speech difficult to understand	530	(430 – 650)	8.0	(6.5 – 9.7)
Stutters or stammers	190	(90 – 370)	2.9	(1.4 – 5.5)
		Females 12–17 years (N = 4 560)		
Speech difficult to understand	220	(150 – 320)	4.9	(3.3 – 7.0)
Stutters or stammers	100	(60 – 150)	2.1	(1.3 – 3.4)
		Total females (N = 11 200)		
Speech difficult to understand	750	(620 – 900)	6.7	(5.6 – 8.0)
Stutters or stammers	290	(170 – 450)	2.6	(1.5 – 4.0)
		Total 4–11 years (N = 13 800)		
Speech difficult to understand	1 540	(1 320 – 1 770)	11.1	(9.6 – 12.8)
Stutters or stammers	750	(590 – 940)	5.4	(4.3 – 6.8)
		Total 12–17 years (N = 9 100)		
Speech difficult to understand	430	(310 – 600)	4.8	(3.3 – 6.5)
Stutters or stammers	290	(210 – 400)	3.2	(2.3 – 4.4)
		Total (N = 22,900)		
Speech difficult to understand	1 970	(1 710 – 2 260)	8.6	(7.5 – 9.9)
Stutters or stammers	1 040	(850 – 1 250)	4.5	(3.7 – 5.4)

Table 3.105: Children aged 4–17 years who have physical pain or discomfort — Severity of pain, by Level of Relative Isolation (LORI)

Severity of pain	Number	95% CI	%	95% CI
		LORI — None		
A little pain or discomfort	270	(170 – 430)	32.7	(20.9 – 45.3)
Some pain or discomfort	280	(200 – 390)	33.7	(24.0 – 45.4)
A lot of pain or discomfort	280	(170 – 430)	33.5	(22.8 – 46.3)
Total	840	(660 – 1 050)	100.0	
		LORI — Low		
A little pain or discomfort	150	(50 – 360)	26.9	(10.7 – 50.2)
Some pain or discomfort	200	(120 – 310)	35.6	(21.9 – 51.2)
A lot of pain or discomfort	210	(140 – 310)	37.5	(23.8 – 53.5)
Total	570	(410 – 790)	100.0	
		LORI — Moderate		
A little pain or discomfort	130	(90 – 180)	38.6	(28.1 – 50.3)
Some pain or discomfort	90	(40 – 160)	25.6	(12.1 – 42.2)
A lot of pain or discomfort	120	(80 – 190)	35.8	(24.3 – 48.9)
Total	340	(250 – 460)	100.0	
		LORI — High		
A little pain or discomfort	50	(30 – 90)	49.0	(24.7 – 75.3)
Some pain or discomfort	30	(10 – 100)	29.9	(6.7 – 65.2)
A lot of pain or discomfort	20	(10 – 40)	21.1	(9.0 – 38.9)
Total	110	(60 – 170)	100.0	
		LORI — Extreme		
A little pain or discomfort	60	(20 – 110)	63.4	(31.6 – 86.1)
Some pain or discomfort	20	(0 – 60)	20.2	(3.8 – 43.4)
A lot of pain or discomfort	10	(0 – 80)	16.4	(0.4 – 64.1)
Total	90	(30 – 180)	100.0	
		Total WA		
A little pain or discomfort	670	(490 – 890)	34.4	(26.9 – 42.6)
Some pain or discomfort	620	(490 – 780)	32.0	(25.4 – 39.1)
A lot of pain or discomfort	650	(510 – 830)	33.6	(26.8 – 40.7)
Total	1 940	(1 670 – 2 240)	100.0	

Table 3.106: Children aged 4–17 years who have physical pain or discomfort — Severity of pain, by age and sex

Severity of pain	Number	95% CI	%	95% CI
		Males 4–11 years		
A little pain or discomfort	180	(50 – 390)	38.1	(16.3 – 61.6)
Some pain or discomfort	130	(60 – 230)	28.8	(14.2 – 48.0)
A lot of pain or discomfort	150	(100 – 220)	33.1	(19.6 – 51.4)
Total	460	(300 – 670)	100.0	
		Males 12–17 years		
A little pain or discomfort	120	(70 – 210)	26.6	(15.3 – 41.8)
Some pain or discomfort	190	(120 – 300)	42.5	(28.8 – 57.8)
A lot of pain or discomfort	140	(70 – 240)	30.9	(18.6 – 47.6)
Total	450	(330 – 610)	100.0	
		Total males		
A little pain or discomfort	300	(160 – 510)	32.4	(20.4 – 48.4)
Some pain or discomfort	330	(220 – 460)	35.6	(25.3 – 47.6)
A lot of pain or discomfort	290	(200 – 400)	32.0	(22.8 – 43.5)
Total	910	(710 – 1 160)	100.0	
		Females 4–11 years		
A little pain or discomfort	180	(140 – 240)	36.5	(26.8 – 47.5)
Some pain or discomfort	140	(90 – 210)	27.7	(18.6 – 39.5)
A lot of pain or discomfort	180	(110 – 290)	35.8	(24.0 – 49.9)
Total	500	(400 – 630)	100.0	
		Females 12–17 years		
A little pain or discomfort	190	(120 – 290)	35.6	(23.7 – 48.7)
Some pain or discomfort	160	(100 – 230)	30.0	(19.6 – 42.1)
A lot of pain or discomfort	180	(110 – 290)	34.3	(22.2 – 48.6)
Total	530	(400 – 670)	100.0	
		Total females		
A little pain or discomfort	370	(280 – 480)	36.1	(28.5 – 45.0)
Some pain or discomfort	300	(220 – 400)	28.9	(21.6 – 37.1)
A lot of pain or discomfort	360	(250 – 500)	35.1	(26.4 – 44.6)
Total	1 030	(860 – 1 220)	100.0	
		Total 4–11 years		
A little pain or discomfort	360	(220 – 560)	37.3	(26.2 – 50.7)
Some pain or discomfort	270	(180 – 390)	28.2	(19.1 – 38.6)
A lot of pain or discomfort	330	(230 – 450)	34.5	(25.0 – 45.7)
Total	960	(760 – 1 190)	100.0	
		Total 12–17 years		
A little pain or discomfort	310	(210 – 420)	31.5	(23.1 – 41.5)
Some pain or discomfort	350	(250 – 470)	35.8	(27.0 – 46.1)
A lot of pain or discomfort	320	(220 – 460)	32.7	(23.8 – 43.3)
Total	980	(800 – 1 180)	100.0	
		Total		
A little pain or discomfort	670	(490 – 890)	34.4	(26.9 – 42.6)
Some pain or discomfort	620	(490 – 780)	32.0	(25.4 – 39.1)
A lot of pain or discomfort	650	(510 – 830)	33.6	(26.8 – 40.7)
Total	1 940	(1 670 – 2 240)	100.0	

Table 3.107: Children aged 4–17 years — Level of burden placed on family due to chronic illness, disability or pain, by Level of Relative Isolation (LORI)

Level of burden	Number	95% CI	%	95% CI
		LORI — None		
None	6 950	(6 720 – 7 190)	88.8	(86.1 – 91.3)
A little or some	550	(400 – 750)	7.0	(5.1 – 9.5)
Quite a lot or very much	330	(220 – 460)	4.2	(2.9 – 6.1)
Total	7 830	(7 680 – 7 980)	100.0	(99.3 – 100.0)
		LORI — Low		
None	5 070	(4 600 – 5 560)	90.8	(87.4 – 93.7)
A little or some	290	(180 – 430)	5.2	(3.3 – 7.7)
Quite a lot or very much	230	(120 – 400)	4.1	(2.2 – 7.1)
Total	5 590	(5 100 – 6 100)	100.0	(99.0 – 100.0)
		LORI — Moderate		
None	4 400	(3 700 – 5 160)	94.0	(92.2 – 95.5)
A little or some	180	(130 – 250)	4.0	(2.9 – 5.2)
Quite a lot or very much	90	(40 – 180)	2.0	(0.9 – 3.7)
Total	4 680	(3 940 – 5 480)	100.0	(. – 100.0)
		LORI — High		
None	2 390	(1 780 – 3 070)	93.5	(88.2 – 96.8)
A little or some	140	(60 – 260)	5.4	(2.7 – 9.9)
Quite a lot or very much	30	(10 – 60)	1.1	(0.4 – 2.2)
Total	2 550	(1 910 – 3 270)	100.0	(97.8 – 100.0)
		LORI — Extreme		
None	2 190	(1 600 – 2 920)	97.3	(95.6 – 98.4)
A little or some	40	(20 – 80)	1.8	(0.9 – 3.4)
Quite a lot or very much	20	(10 – 40)	0.9	(0.3 – 2.1)
Total	2 260	(1 670 – 3 020)	100.0	(97.6 – 100.0)
		Total WA		
None	21 000	(20 700 – 21 300)	91.7	(90.4 – 92.9)
A little or some	1 200	(990 – 1 450)	5.2	(4.3 – 6.3)
Quite a lot or very much	700	(520 – 900)	3.0	(2.3 – 3.9)
Total	22 900	(22 800 – 22 900)	100.0	(99.8 – 100.0)

Table 3.108: Children aged 4–17 years with impairments in activities of dailing living — Level of family burden associated with impairment

Level of burden	Number	95% CI	%	95% CI
None	90	(50 – 130)	22.8	(13.5 – 34.0)
A little or some	90	(40 – 180)	23.3	(11.1 – 42.3)
Quite a lot or very much	200	(120 – 310)	54.0	(37.7 – 68.8)
Total	380	(270 – 510)	100.0