

CHAPTER 4

USE OF HEALTH SERVICES

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CHAPTER 4

USE OF HEALTH SERVICES

Maintaining good physical health requires a wide range of health care services. For Aboriginal and Torres Strait Islander children and their carers, the types of health care services available and their accessibility and affordability vary greatly over the geographic diversity of the state. There are substantial barriers to providing adequate health services for Aboriginal children. These barriers include the location of services, low Medicare enrolments among Aboriginal and Torres Strait Islander people, financial barriers such as up-front costs, culturally inappropriate services and poor linkages between the various health sectors.¹

The WAACHS collected information from carers about their children's use of a range of health services, as well as seeking consent from carers to access the hospital records of their children. These two data sources are combined to describe the health services experience of the children, a picture that is markedly different from that seen in the 1993 WA Child Health Survey of the mainstream population. This chapter also includes an overview of the major components of primary health care in Western Australia, in particular, the medical labour force and Aboriginal Medical Services (also known as Aboriginal Community Controlled Health Services).

SUMMARY

The main findings in this chapter indicate the problems of access to services faced by children and carers, particularly in areas of higher relative isolation. The findings show:

- *Poor access to doctors*
Aboriginal children have fewer contacts with doctors when compared with children in the general population. This level of contact is particularly low in areas of high and extreme isolation and is supported by the fact that there are relatively lower numbers of doctors in remote areas. Only 4.1 per cent of all doctors and specialists in WA are located in the ARIA localities of remote and very remote, even though 45.2 per cent of the Aboriginal population and 8.3 per cent of the total population live in these areas. This shortage is compounded by the low number of doctors in culturally appropriate settings, for instance Aboriginal Medical Services (AMSs). Of the five AMSs located in areas of high and extreme isolation in Western Australia there was a total of 5.8 full time equivalent (FTE) doctors. Despite initiatives under Commonwealth and State government programmes there are still low numbers of doctors in remote areas. Cultural, locational and financial barriers still need to be addressed to enable more Aboriginal people access to mainstream General Practices.
- *Location of health services*
Children in isolated areas are significantly disadvantaged in their access to health services. They are more likely to see a nurse or Aboriginal Health Worker, and much less likely to see a doctor than children in less isolated parts of the state.
- *Low number of contacts with dentists*
Aboriginal children showed a low rate of dental attendances in the previous six months, suggesting that many are not seeing a dentist at the recommended intervals.



- *Aboriginal children's use of hospital emergency services is comparable with the general population*
The same findings suggest that, regardless of location, most Aboriginal children have access to emergency hospital treatment if required. However some children may need to travel long distances to access these services.
- *Aboriginal children are more likely to be admitted to hospital*
While hospital admission rates are higher for Aboriginal children than for non-Aboriginal children, the main causes of hospitalisation are similar. The most common causes of hospitalisation for all children are respiratory illnesses, other infections and injuries.
- *Social and cultural factors affect service use*
Children of carers with higher levels of education are more likely to see a doctor or a dentist. Children living in areas with greatest relative socio-economic disadvantage or in families reporting high levels of financial strain are more likely to see a nurse or an Aboriginal Health Worker.



CONTACTS WITH HEALTH PROFESSIONALS

This section describes the frequency and type of contact that children had with health services. Carers were asked how many times in the previous six months they or their partner had had any contact with a range of health professionals in relation to each child. These included doctors, dentists, specialists, nurses, Aboriginal Health Workers and speech pathologists. In addition, carers were asked if each child had attended a hospital emergency department or outpatients clinic, or an Aboriginal Medical Service (AMS).

The survey did not ask about where the health professional was seen and therefore does not differentiate between whether a doctor was seen in an AMS, a private practice, a government funded clinic or a hospital. In light of this, it should be noted that the health professionals seen are not necessarily mutually exclusive of the health services attended.

CONTACTS WITH DOCTORS

Just under half (48.7 per cent; CI: 46.7%–50.7%) of all Aboriginal and Torres Strait Islander children had contact with a doctor in the six months prior to the survey. The rate of contact was lower for each successive age group, with 69.2 per cent (CI: 66.3%–72.1%) of 0–3 year olds, 44.9 per cent (CI: 42.2%–47.6%) of 4–11 year olds and 39.0 per cent (CI: 35.5%–42.5%) of 12–17 year olds having seen a doctor in the last six months (Table 4.1).

The proportion of Aboriginal and Torres Strait Islander children aged 4–17 years who had seen a doctor in the previous six months was significantly below that reported for the total population in the 1993 WA Child Health Survey which found that 58.8 per cent (CI: 56.1%–61.6%) of all children aged 4–16 years had contact with a doctor during the six months prior to the survey.²

There was an inverse relationship between the number of contacts with a doctor and the level of relative isolation. The number of children who had at least one contact with a doctor in the last six months decreased from 56.6 per cent (CI: 52.9%–60.2%) for children in areas of no isolation to 37.1 per cent (CI: 30.0%–45.2%) for children in areas of extreme isolation (Figure 4.1).

Carers were asked how far away they lived from the nearest doctor or Aboriginal Medical Service (AMS). Children were more likely to have seen a doctor in the last six months if they were located close to a doctor or AMS. Some 51.4 per cent (CI: 49.0%–53.8%) of children located less than 5 kilometres from a doctor or AMS had seen a doctor in the last six months compared with 34.5 per cent (CI: 27.5%–42.0%) of children who were located more than 100 kilometres from a doctor or AMS (Table 4.3).

Children whose primary carer was Aboriginal were less likely to have had contact with a doctor as compared with those children whose primary carer was non-Aboriginal, 46.6 per cent (CI: 44.5%–48.8%) and 62.0 per cent (CI: 55.5%–68.4%) respectively (Figure 4.5).

Children with primary carers who had 13 or more years of education (i.e. carers who had gone on to further study beyond year 12 or who had completed a postgraduate qualification) were more likely to have seen a doctor in the past six months (60.3 per cent; CI: 48.9%–70.8%) than children whose carers had 1–9 years of education (41.2 per cent; CI: 37.6%–45.0%) (Figure 4.4).



DISTRIBUTION OF THE MEDICAL LABOUR FORCE IN WESTERN AUSTRALIA

There are well-identified shortages of practitioners in rural and remote parts of Australia as well as shortages of Aboriginal and Torres Strait Islander doctors and of all doctors working in Aboriginal health care. The shortage of doctors means that people often have to travel great distances to get treatment. In Western Australia, for example, 17 per cent of all discrete Aboriginal and Torres Strait Islander communities were located more than 100 kilometres from the nearest community health centre.¹ Access is often further complicated by road conditions as dirt roads can become impassable at certain times of the year.

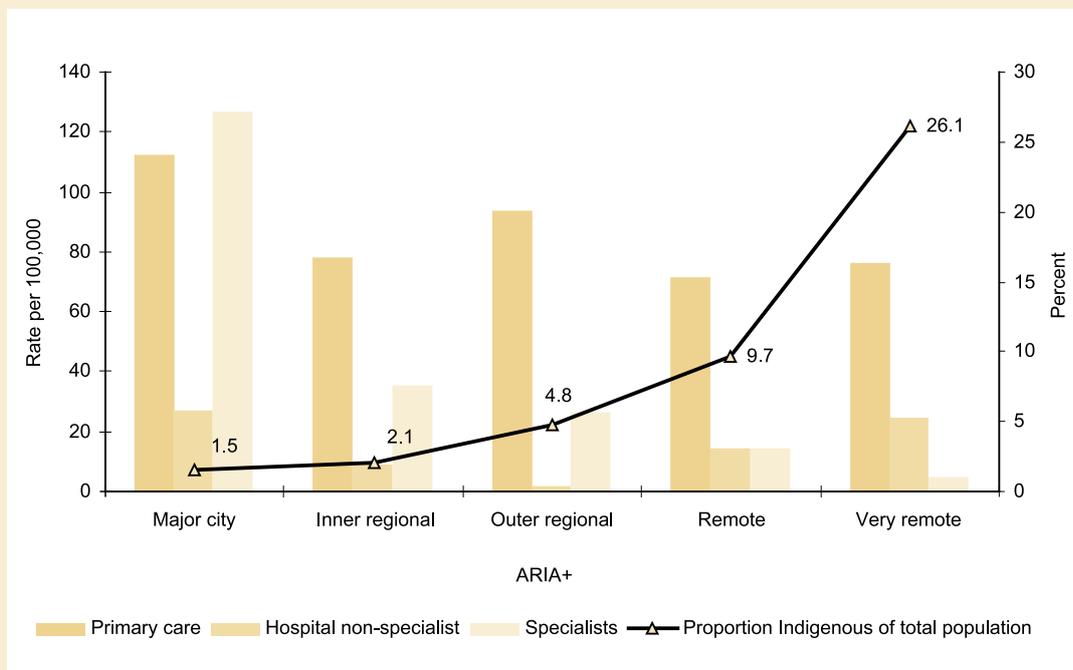
A recent AIHW publication, *Medical Labour Force 2001*², analysed the distribution of medical practitioners by ARIA+, an index of remoteness. Note that ARIA+ differs from the ARIA++ used in this survey (see Chapter 1). ARIA+ does not have the same degree of discrimination of very remote areas as does ARIA++, and a much larger proportion of WA is classified as 'very remote' under ARIA+. Nonetheless the data show that there is a decrease in the number of practitioners per capita from areas of low to high remoteness. The rate of practitioners per 100,000 people in Western Australia was lowest in the ARIA+ category of 'very remote'. Other findings included:

- There were an estimated 53,384 registered medical practitioners currently working in medicine in Australia in 2001, with 4,529 (8.5 per cent) in Western Australia.
- Of the Western Australian medical practitioners, 4,215 (93.1 per cent) were clinicians, of whom 1,957 (46.4 per cent) were primary care practitioners, 1,412 (33.5 per cent) were specialists, and the remainder were either specialists-in-training or hospital non-specialists (10.2 per cent and 9.8 per cent respectively).
- Western Australia, along with Queensland, has the lowest full-time equivalent (FTE) rate of medical practitioners in Australia (305 per 100,000 people based on a 35 hour week). The Australian average was 357 per 100,000 people.
- The FTE rate for primary care practitioners in Western Australia was 121 per 100,000 people. The Australian average was 134 per 100,000 people.



DISTRIBUTION OF THE MEDICAL LABOUR FORCE IN WESTERN AUSTRALIA (Continued)

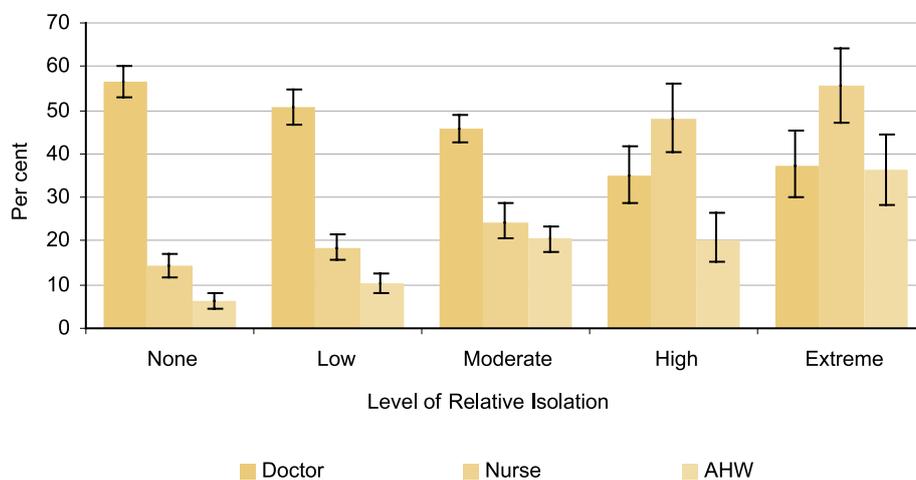
DISTRIBUTION OF SELECTED MEDICAL PRACTITIONERS,
ABORIGINAL POPULATION AS A PROPORTION OF THE TOTAL
POPULATION BY ARIA+ ^{2,3,4}



- 1 Steering Committee for the Review of Government Service Provision, (2003). Overcoming Indigenous Disadvantage: Key Indicators 2003, Productivity Commission: Canberra.
- 2 Australian Institute of Health and Welfare, (2003). Medical Labour Force 2001. AIHW cat. no. HWL 28. (National Health Labour Force Series No. 28). AIHW. Canberra.
- 3 Australian Institute of Health and Welfare, (2003). Medical Labour Force 2001. Unpublished data.
- 4 Australian Bureau of Statistics. 2001 Census of Population and Housing. Unpublished data.



FIGURE 4.1: CHILDREN — PROPORTION ACCESSING A DOCTOR, NURSE OR ABORIGINAL HEALTH WORKER AT LEAST ONCE IN THE LAST SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION (LORI)



Source: Table 4.2

CONTACTS WITH NURSES

In the six months prior to the survey, 24.9 per cent (CI: 22.9%–27.1%) of children had at least one contact with a nurse. The percentage of children having one or more contacts with a nurse decreased with age: from 41.8 per cent (CI: 38.0%–45.7%) of children aged 0–3 years to 17.4 per cent (CI: 14.8%–20.2%) of children aged 12–17 years (Table 4.1).

Contacts increased with the level of relative isolation. The proportion of children who had one or more contacts with a nurse increased from 14.2 per cent (CI: 11.7%–16.9%) in areas of no isolation to 55.8 per cent (CI: 47.1%–64.0%) in areas of extreme isolation (Figure 4.1).

PROFILE OF NURSING IN REMOTE COMMUNITIES IN THE KIMBERLEY REGION

The major focus of population health is primary prevention health care (incorporating strategies to protect, promote and restore people’s health). However, in remote Aboriginal communities, where the residents have multiple and chronic health problems, Community Health staff (administered by the Population Health Unit of the WA Department of Health) generally also deliver acute medical services. As many of these communities do not have easy access to an Aboriginal Medical Service (AMS) or hospital, Community Health staff are often their only contact with health services.

The work of Community Health staff complements the activities of AMSs and the Royal Flying Doctor Service. The following provides a profile of Community Health staff (Remote Area Nurses (RANs) and Aboriginal Health Workers (AHWs)) primarily of state government funded Community Health services provided to remote Kimberley communities.¹

- Six remote communities have both a resident RAN and an AHW (One Arm Point, Lombadina, Looma, Warmun, Oombulgurri, Kalumburu) and one community has an AHW (Noonkanbah).



PROFILE OF NURSING IN REMOTE COMMUNITIES IN THE KIMBERLEY REGION (Continued)

- Eight remote communities (Beagle Bay, Bidadanga, Mowanjum, Noonkanbah, Bayulu, Wungatjungka, Yiyili, Koonjie Park) are regularly visited by nurses based in towns. School Health nurses visit the Beagle Bay and Bidadanga communities.
- Four remote communities in the Kutjungka (Balgo) region have 24-hour clinics run by Mercy Community Health RANs and AHWs.
- Four remote communities have clinics served by resident AMS nurses (Beagle Bay, Bidadanga, Jarlmadangah, Ringers Soak).
- Community Health provides child health services to all 0–5 year olds and school aged children in the region.

There are approximately 30 remote Aboriginal communities in the Fitzroy Valley (see *Appendix F, Map 2*). Most of these communities are not served regularly by any health service. People from these communities visit Fitzroy Crossing Hospital (which has eight beds) for health care. At the hospital, the Community Health Child Health Nurse and Community Midwife see children and infants when possible.

In the Fitzroy Valley, an alliance has been developed between the state funded Kimberley Health Service and the Western Australian Aboriginal Community Controlled Health Organisation (WAACCHO) affiliated Nindillingarri Cultural Health Service through Fitzroy Crossing Hospital service. One current issue is the shortage of AHWs in the region in both state government and community-controlled services.²

1 Anne Mahony, Kimberley Population Health Unit, Department of Health WA. (Personal communication).

2 Kevin Cox, Senior Aboriginal Health Consultant, Kimberley. (Personal communication).

CONTACTS WITH DENTISTS

An estimated 20.9 per cent (CI: 19.0%–22.8%) of children in the survey had visited a dentist in the six months prior to the survey. As expected, the level of contact with dentists was particularly low for younger children with attendance for children aged 0–3 years, 4–11 years and 12–17 years being 2.8 per cent (CI: 1.7%–4.2%), 32.4 per cent (CI: 29.5%–35.4%) and 17.1 per cent (CI: 14.5%–19.8%) respectively (Table 4.1). In the 1993 WA Child Health Survey, 56.3 per cent (CI: 53.0%–59.6%) of all children aged 4–16 years had seen a dentist in the six months prior to the survey.²

Contact with dentists was most common in areas of high relative isolation, where 31.7 per cent (CI: 23.8%–41.0%) of children had seen a dentist in the previous six months, and lowest in areas of extreme isolation where only 14.2 per cent (CI: 9.8%–19.6%) of children had contact with a dentist (Figure 4.2).

The proportion of children who had seen a dentist in the previous six months increased with the level of education of primary carers. The proportion of children who had seen a dentist in the previous six months whose primary carers had at least 13 years of education was nearly twice that of children whose primary carers had 1–9 years of education (36.8 per cent; CI: 25.4%–49.3% compared with 18.8 per cent; CI: 15.6%–22.3%) (Table 4.5).



DENTAL SERVICES

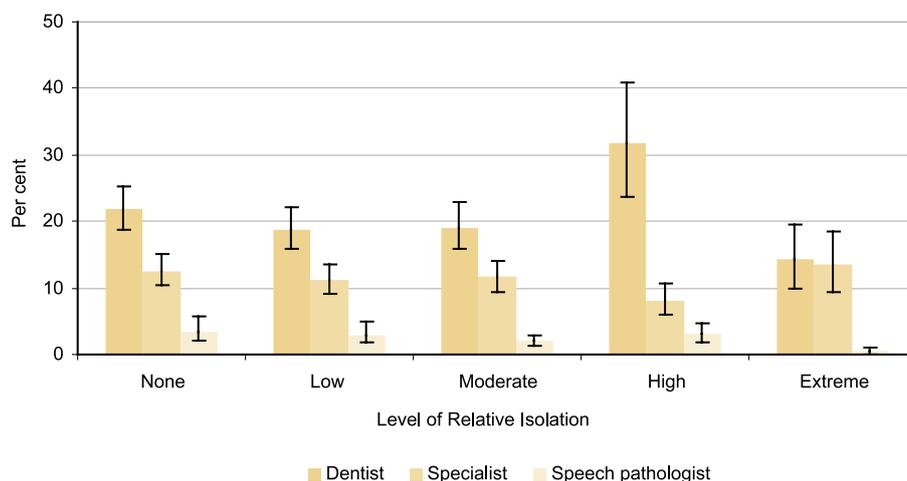
Free basic dental care is provided to all school children from pre-primary to year 11 (year 12 in remote localities) through services provided in schools. Care is provided by dental therapists under the supervision of dental officers from fixed and mobile School Dental Therapy Clinics located throughout the state. Dental care is provided by approximately 140 full time equivalent dental therapists and a similar number of dental clinic assistants under the supervision of about 30 dental officers. To be eligible, a child must attend a school and the parent/guardian give consent and enrol the child. Around 90 per cent of primary school children and 65 per cent of high school children use these services.

The higher rate of dental contacts in areas of high relative isolation reflects the use of the mobile Dental Therapy Centres. However, the much lower rate in areas of extreme isolation suggests that these mobile centres are not as effective in reaching the most isolated communities in the state.

The large difference in rates of seeing a dentist between the survey results and the findings in the general community from the 1993 WA Child Health Survey, suggests there are significant barriers to be overcome in providing regular dental care to Aboriginal children. The number of contacts with a dentist for Aboriginal children also appears low when considering the frequency of School Dental Service examinations. The service undertakes examinations in the Perth metropolitan area on a 15-month interval and in the country on a 12-month interval basis.¹

¹ Martin Glick, Department of Health WA. (Personal communication).

FIGURE 4.2: CHILDREN — PROPORTION ACCESSING DENTIST, SPECIALIST OR SPEECH PATHOLOGIST AT LEAST ONCE IN THE LAST SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 4.2

CONTACTS WITH SPECIALISTS

Just over one in ten (11.7 per cent; CI: 10.5%–12.9%) children had seen a specialist in the 6 months prior to the survey. There was an age-associated decline for contacts with a specialist and the proportion of children aged 0–3 years, 4–11 years and 12–17 years who had contact with a specialist was 14.6 per cent (CI: 12.3%–17.2%), 11.8 per cent (CI: 10.2%–13.6%) and 9.3 per cent (CI: 7.2%–11.7%) respectively (Table 4.1).



CONTACTS WITH SPEECH PATHOLOGISTS

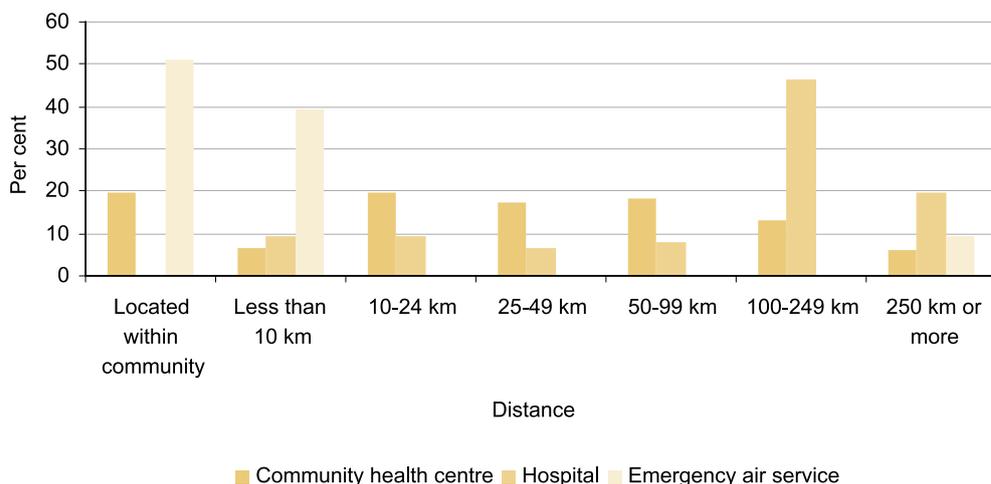
A total of 2.7 per cent (CI: 2.0%–3.5%) of children had seen a speech pathologist in the six months prior to the survey. Low level of contacts was particularly pronounced in areas of extreme isolation where just 0.4 per cent (CI: 0.1%–1.1%) of children had contact with a speech pathologist compared with 3.5 per cent (CI: 2.0%–5.7%) in the Perth metropolitan area (Table 4.2).

DISTANCE TO HEALTH SERVICES — 2001 COMMUNITY HOUSING INFRASTRUCTURE NEEDS SURVEY

The following data on service utilisation and access comes from the 2001 Community Housing and Infrastructure Needs Survey (CHINS).¹ This survey was conducted by ABS on behalf of ATSIC. CHINS was a survey of discrete Aboriginal communities. CHINS data was linked with survey data (*See Chapter 1 — record linkage*) and it was found that only 20 per cent of the WAACHS children lived in CHINS communities. These communities are predominantly located in areas of high and extreme LORI.

CHINS data reveal that there are strong locational disadvantages for Aboriginal communities in Western Australia. Two-thirds (66.4 per cent) of all discrete Aboriginal communities in WA are located more than 100 kilometres from the nearest hospital and over half (54.3 per cent) of all communities are located more than 25 kilometres from the nearest community health centre. However it should be noted that over 90 per cent of communities reported having access to medical emergency air services within 10 kilometres of their community.

WESTERN AUSTRALIAN DISCRETE ABORIGINAL COMMUNITIES — DISTANCE TO NEAREST HOSPITAL, COMMUNITY HEALTH CENTRE OR MEDICAL EMERGENCY AIR SERVICE

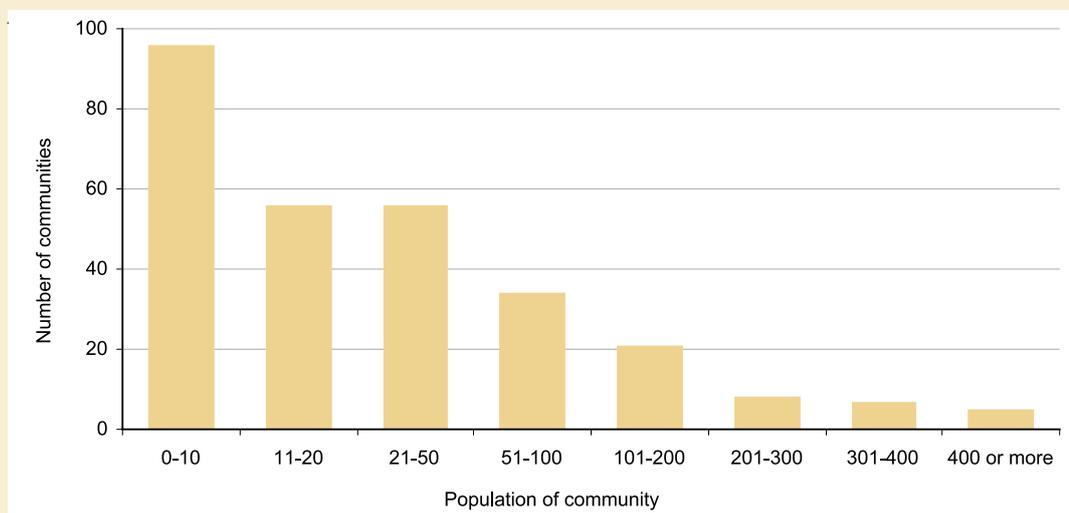


The CHINS data highlight the small size of many of the communities in WA. Of the 283 discrete communities in WA, just under half (46 per cent) had a reported usual population of less than 20 people (some of these communities are seasonal). While it is not certain what proportion of children aged 0–17 years are represented in these communities, it is clear that there are little economies of scale available to communities of such size to ensure adequate health services. Even in larger communities there may still be inadequate levels of health service infrastructure.



DISTANCE TO HEALTH SERVICES — 2001 COMMUNITY HOUSING INFRASTRUCTURE NEEDS SURVEY (Continued)

WESTERN AUSTRALIAN DISCRETE ABORIGINAL COMMUNITIES — REPORTED USUAL POPULATION 2001



1 Australian Bureau of Statistics, 2001 Community Housing and Infrastructure Needs Survey, Unpublished data, ABS, Canberra.

CONTACTS WITH ABORIGINAL MEDICAL SERVICES

The Aboriginal Medical Services (AMSs), also known as Aboriginal Community Controlled Health Services, are a major means of health service delivery for Aboriginal and Torres Strait Islander communities, particularly in more isolated areas of Western Australia. They deliver holistic and culturally appropriate primary health services and health-related activities that include general health, screening services (sexual health, hearing and eye tests), substance misuse services, emotional and social wellbeing, and transport.

An AMS was attended by 15.1 per cent (CI: 13.5%–16.9%) of children in the six months prior to the survey. There was an age-associated decline for contacts with an AMS. Rates of attendance for 0–3, 4–11 and 12–17 year olds were 20.1 per cent (CI: 17.3%–23.3%), 14.9 per cent (CI: 12.9%–17.0%) and 11.7 per cent (CI: 9.8%–13.9%) respectively (Table 4.1).

The proportion of children who have had contact with an AMS was highest in areas of moderate and high isolation (25.9 per cent; CI: 21.6%–30.6% and 17.5 per cent; CI: 10.9%–24.9% respectively). The Perth metropolitan area had the lowest proportion of children using an AMS (9.0 per cent; CI: 7.0%–11.3%) (Figure 4.3). The majority of AMSs also provide outreach clinic services such as health care at outstation visits, park clinics, and satellite clinics.

Carers of 82.1 per cent (CI: 78.4%–85.4%) of the estimated 4,510 children who accessed the services of AMSs reported that they were happy with the service (Table 4.6).

Children whose primary carer was Aboriginal were more likely to have had a contact with an AMS than children whose primary carer was non-Aboriginal (16.5 per cent; CI: 14.7%–18.5% and 6.5 per cent; CI: 4.3%–9.9% respectively) (Figure 4.5).



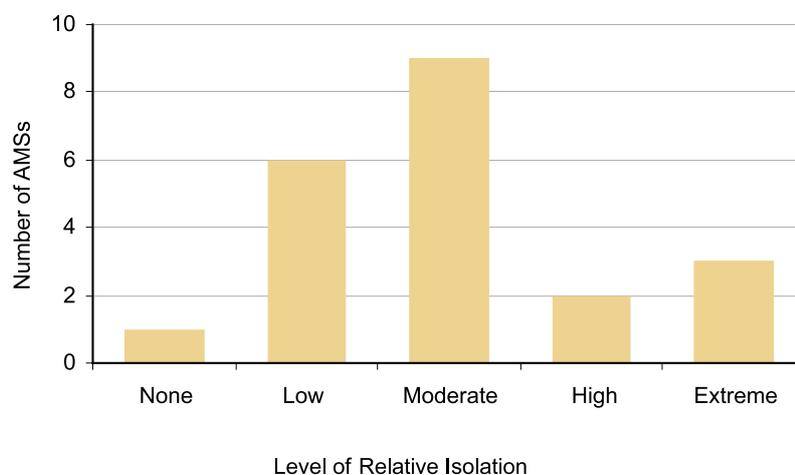
Nearly two-thirds of children lived within 5 kilometres of their nearest doctor or AMS (64.0 per cent; CI: 60.4%–67.4%). Some 12.2 per cent (CI: 9.5%–15.3%) of all children lived over 100 kilometres from their local doctor or AMS. In areas of extreme isolation, 66.2 per cent (CI: 52.1%–79.2%) of children were more than 100 kilometres from the nearest doctor or AMS (Table 4.7). There was no significant difference in the proportion of children who had seen an AMS in the last six months by distance from the nearest doctor or AMS (Table 4.8).

SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01

Aboriginal Medical Services (AMS) are an important source of primary health care provision for Aboriginal Australians. The following data come from the Service Activity Report (SAR) questionnaire for 2000-01 provided by all AMSs funded by the Australian Government.¹ The data pertain to all age groups and not just children. Key findings were:

- There were 129 Commonwealth funded AMSs in Australia in 2001 of which 21 were in Western Australia. In Western Australia, 7 AMSs were located in areas where the levels of relative isolation were none or low, 9 were in areas of moderate relative isolation and 5 in areas of high or extreme relative isolation.

NUMBER OF ABORIGINAL MEDICAL SERVICES IN WESTERN AUSTRALIA, BY LEVEL OF RELATIVE ISOLATION

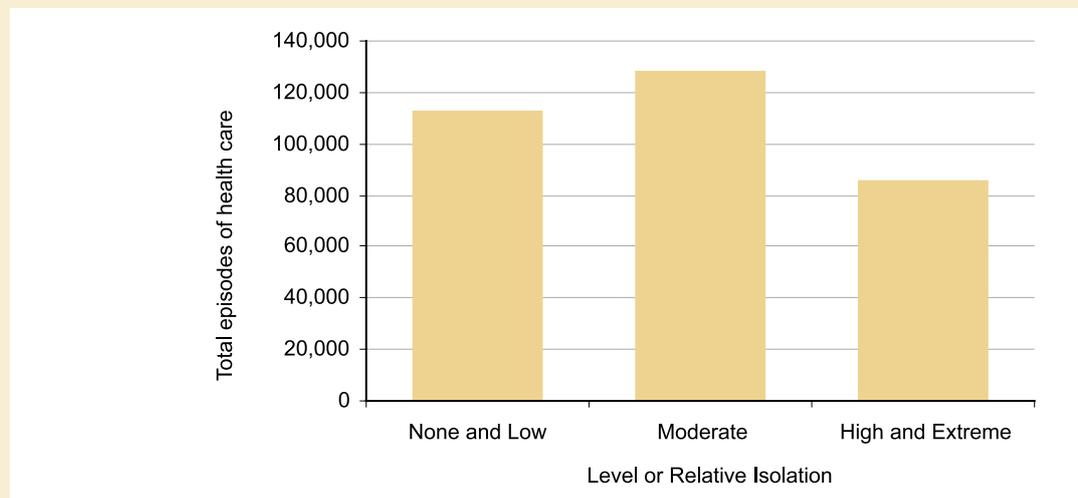


- Nationally there were a total of 1,340,000 episodes of care (defined as contact with an individual client by one or more staff to provide health care) provided in 2000–01, of which 59 per cent were for female clients. There were a total of 326,700 episodes of care in Western Australia. These were concentrated in areas of moderate relative isolation, representing 128,200 or 39 per cent of the state total. A total of 10 per cent of all episodes in WA were from people who normally resided outside the designated catchment area for that health service.



SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01 (Continued)

ABORIGINAL MEDICAL SERVICES — NUMBER OF EPISODES OF CARE 2001, BY LEVEL OF RELATIVE ISOLATION

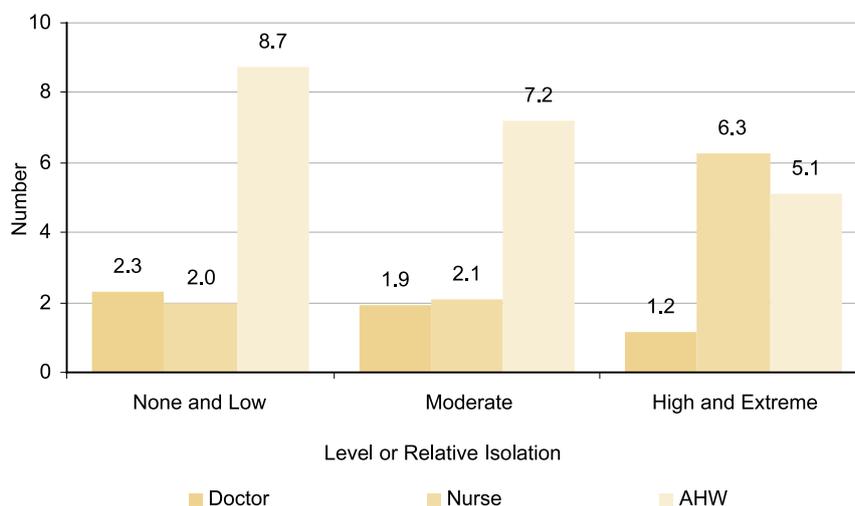


- The median Aboriginal and Torres Strait Islander population of the health service areas in Western Australia was 3,000. This ranged from 569 in areas where the levels of relative isolation were high and extreme to 5,500 in areas of where the levels of relative isolation were low and none.
- There were a total 2,300 full time equivalent staff employed by the Australian Government funded AMSs of whom 624 (27 per cent) were Aboriginal Health Workers (AHWs). In Western Australia there were a total of 39 doctors, 64 nurses and 152 AHWs.
- Most AMSs in Western Australia undertake preventative care and screening which includes monitoring child growth, providing eye health screening and hearing screening, and providing child immunisation.
- Most AMSs provide strong advocacy and community roles, roles that are not normally provided by general practice. Services provided by various AMSs include school-based activities, parenting programmes, support for public housing, homelessness support, services for people with disabilities, welfare services and food provision.
- Clinical health care was provided by most AMSs in Western Australia. Of 21 AMSs, 19 provided diagnosis and treatment of illnesses, 8 provided dental care, 11 provided audiology services, 10 provided optometry services, and 17 provided clinical consultations in the home.
- All AMSs in Western Australia refer and/or admit patients to hospitals and 60 per cent liaise with Aboriginal Liaison Officers at hospitals. Effective shared antenatal care arrangements between the hospital(s) and the AMSs are conducted by 30 per cent of the AMSs.
- The average number of staff per AMS varied by the level of relative isolation. In the case of doctors, it decreased from an average 2.3 doctors per AMS in areas where the level of relative isolation was none and low to 1.2 in areas of high and extreme isolation. In contrast, nurse numbers rose from an average of 2 per AMS in areas where the level of relative isolation was none and low to 6.3 per AMS in areas of high and extreme isolation.



SERVICES PROVIDED BY ABORIGINAL MEDICAL SERVICES IN 2000-01 (Continued)

ABORIGINAL MEDICAL SERVICES — AVERAGE NUMBER OF DOCTORS, AHWS AND NURSES, BY LEVEL OF RELATIVE ISOLATION



1 Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000-01. Unpublished data.

CONTACTS WITH ABORIGINAL HEALTH WORKERS

Aboriginal Health Workers (AHWs) are usually the first point of contact for a client at an AMS. AHWs liaise on behalf of clients and other health workers. They provide various services to clients in a variety of settings including health education and health promotion, community involvement and support counselling, and referral for clients with crisis problems. They also maintain health records and statistics.

About 14.7 per cent (CI: 13.2%–16.2%) of all children had at least one contact with an Aboriginal Health Worker (AHW) in the six month period prior to the survey. As with visits to doctors and nurses, the percentage of children having one or more contacts with an AHW decreased with increasing age: from 21.7 per cent (CI: 18.9%–24.8%) for children aged 0–3 years, to 9.4 per cent (CI: 8.1%–11.0%) for children aged 12–17 years (Table 4.1).

The percentage of children who had seen an AHW in the preceding six months increased with the level of relative isolation: from 6.4 per cent (CI: 4.7%–8.3%) in areas of no isolation to 36.4 per cent (CI: 28.3%–44.5%) in areas of extreme isolation (Figure 4.1).

The higher level of contact with AHWs in more isolated areas is reflected in the lower availability of doctors in these areas. A total of 152 full-time equivalent AHWs worked in Aboriginal Medical Services in Western Australia in 2000-01. There were 61 AHWs in areas where the level of relative isolation was none or low, 65 in areas where the level was moderate and 26 in areas of high or extreme relative isolation.³

Children whose primary carer was Aboriginal were much more likely to have had a contact with an AHW than children whose primary carer was non-Aboriginal: 16.2 per cent (CI: 14.6%–18.0%) and 4.8 per cent (CI: 3.5%–6.7%) respectively (Figure 4.5).



TRADITIONAL BUSH MEDICINE

Before European colonisation, Australian Aboriginal and Torres Strait Islander people had their own sophisticated medical system based on thousands of years of learning and interaction with the flora, fauna and lands of their region. Cultural practices dictated how a remedy or treatment would be administered. For minor ailments, such as a headache or an insect sting, individuals would be able to locate and apply an appropriate remedy. For a more serious medical condition the traditional healer would be consulted. The traditional healer was somebody who had been initiated into the role over some years by an elder who had held the role himself, and to whom all the secrets of medicine and the spiritual world were passed.¹

Bush medicine is still practiced by Aboriginal people today, especially in the more isolated regions where traditional culture remains strong. It is not uncommon for community members to receive a combination of traditional and contemporary treatments for various ailments in these regions. Aboriginal Medical Services (AMSs) that cater to these regions now support bush medicine programmes alongside western medicine, and this helps to assure a more culturally appropriate service.²

The Northern Territory Government has taken a pro-active role in ensuring the survival of bush medicine knowledge across northern and central Australia by sponsoring a community assisted record of bush medicines and remedies across the region. This helps preserve and spread knowledge that would otherwise fade like it has in areas with fewer traditional cultural ties.³

1 Devanesen D, (2000). Traditional Aboriginal Medicine Practice in the Northern Territory. International Symposium on Traditional Medicine. Awaji Island, Japan. 11–13 September 2000.

2 Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000–01. Unpublished data.

3 Conservation Commission of the Northern Territory, (1993). Traditional Aboriginal medicines in the Northern Territory of Australia. CCNT. Darwin.

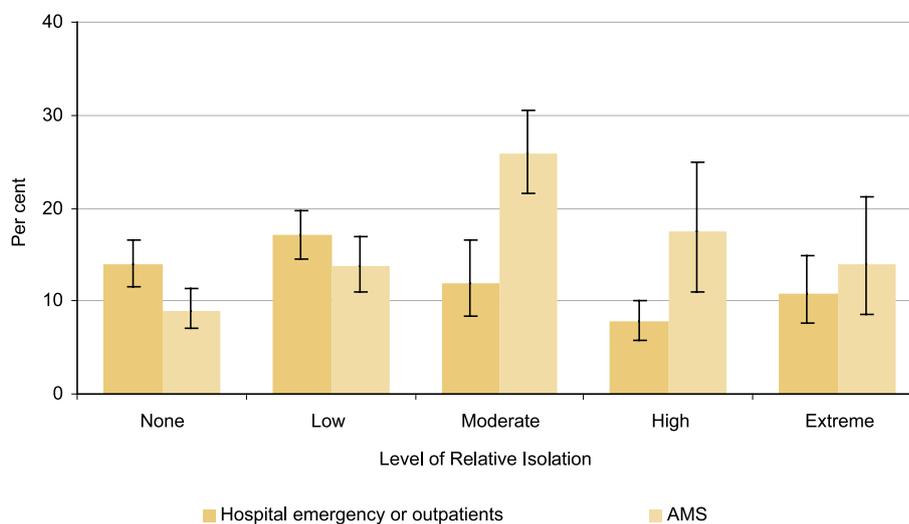
HOSPITAL SERVICES

CONTACTS WITH HOSPITAL EMERGENCY DEPARTMENT OR OUTPATIENTS CLINIC

In the six months prior to the survey, 13.3 per cent (CI: 11.9%–14.7%) of children had attended a hospital emergency department or outpatients clinic. Contacts with a hospital emergency department were higher for younger children. The proportion of children who had attended a hospital emergency department or outpatients clinic in the previous six months was 22.5 per cent (CI: 19.6%–25.5%) for children aged 0–3 years, 11.2 per cent (CI: 9.6%–12.9%) for children aged 4–11 years and 9.3 per cent (CI: 6.5%–12.7%) for children aged 12–17 years (Table 4.1). By way of comparison 16.5 per cent (CI: 14.5%–18.6%) of 4–11 year old children and 11.2 per cent (CI: 9.1%–13.6%) of 12–16 year old children in the general population had attended a hospital emergency department or outpatient clinic in the six months prior to the 1993 WA Child Health Survey.²



FIGURE 4.3: CHILDREN — PROPORTION ACCESSING HOSPITAL EMERGENCY OR OUTPATIENTS SERVICES AND ABORIGINAL MEDICAL SERVICES IN THE PREVIOUS SIX MONTHS, BY LEVEL OF RELATIVE ISOLATION



Source: Table 4.2

HOSPITAL SERVICES

In 2001-02 there were 37,000 separations of Aboriginal people (all age groups) from private and public hospitals in WA, representing 6.0 per cent of all separations in WA and 19.6 per cent of all Aboriginal separations in Australia. Overall, 14.3 per cent of the Aboriginal population of Australia live in WA.^{1,2}

There are nine major regional hospitals in Western Australia: Albany, Narrogin, Bunbury, Northam, Kalgoorlie, Geraldton, Carnarvon, Port Hedland and Derby, and sixty-eight smaller hospitals located in country areas. These public hospitals provide a broad range of services including emergency, medical, surgical, paediatric, obstetric and rehabilitation services, but do not provide tertiary level or super-speciality services (i.e. specialities within specialities such as neo-natal intensive care).³

1 Australian Institute for Health and Welfare, (2003). Australian Hospital Statistics 2001-02, AIHW Cat. No. HSE 25. AIHW. Canberra

2 Australian Bureau of Statistics, (2002). Population Distribution. Aboriginal and Torres Strait Islander Australians 2001. ABS Cat. No. 4705.0. Canberra.

3 WA Department of Health website <<http://www.health.wa.gov.au/about/hospitals.cfm>>

ADMISSIONS TO HOSPITAL

Carers were asked for their consent to access their children's hospital records. It was possible to link the hospital records for 87 per cent of the survey children, resulting in estimates for 26,000 children (See Chapter 1). Hospitalisations in the year prior to the survey interview were extracted. For children born in hospital, the birth was not regarded as a hospital admission unless complications of the birth required the infant to be admitted in its own right. Overall, 16.3 per cent of (CI: 15.0%–17.6%)



children had been hospitalised in the year prior to the survey. There was no variation in hospitalisation rates by level of relative isolation (Table 4.10). Children aged 0–3 years were most likely to be hospitalised, with 29.8 per cent (CI: 26.6%–33.1%) of young children being hospitalised in the previous year, compared with 12.1 per cent (CI: 10.5%–13.8%) of 4–11 year olds and 11.7 per cent (CI: 9.5%–14.0%) of 12–17 year olds (Table 4.9).

Most children who were admitted to hospital had one admission in the previous year. Of those who had been admitted to hospital, 20.0 per cent (CI: 17.0%–23.3%) had been admitted twice and 9.6 per cent (CI: 7.5%–12.1%) had been admitted three or more times (Table 4.11). Lengths of stay in hospital were generally short. Of those children admitted to hospital in the previous year, 53.3 per cent (CI: 49.2%–57.2%) spent a total of 1–2 days in hospital, 24.4 per cent (CI: 21.2%–27.9%) spent 3–5 days in hospital and 22.4 per cent (CI: 19.3%–25.6%) spent a total of 6 days or more in hospital in the previous year (Table 4.12).

Almost one quarter (23.5 per cent; CI: 20.5%–26.7%) of children were admitted to hospital for respiratory conditions, with 16.0 per cent (CI: 13.2%–19.2%) of children admitted for injuries and 12.2 per cent (CI: 9.8%–15.1%) admitted with infectious diseases (Table 4.13). Note that the ICD-10 chapter on Infectious Diseases includes conditions that are generally recognised as communicable or transmissible, but excludes influenza and other acute respiratory infections, and localised infections, such as otitis media, that are classified to body system-related chapters (Table 4.13).

No directly comparable information on hospitalisations is available for non-Aboriginal children that take into account the possibility of multiple admissions per child. Figures are available for all hospital separations (Table 4.14). However, these do not take account of the fact that some children may be admitted to hospital more than once in a 12 month period. For 2001–02, there were 250 hospital separations per 1,000 children aged 0–4 in Western Australia, and 88 separations per 1,000 children aged 5–14.⁴ Equivalent figures were calculated from the WAACHS, based on the total number of hospital admissions in the year prior to the survey, rather than the number of children admitted. From the survey, there were 404 hospital separations per 1,000 children aged 0–4 years (CI: 357–452), 136 separations per 1,000 children aged 5–14 years (CI: 117–155) and 213 separations per 1,000 children aged 15–17 years (CI: 171–255). These rates are significantly higher than the corresponding rates in the general population (Table 4.14). The rate of hospital separations rises in the 15–17 year age group because of obstetric-related admissions for teenage girls. Excluding obstetric admissions, the rate of separations per 1,000 children aged 15–17 years was 149 (CI: 114–184).

USE OF HOSPITAL SERVICES BY ABORIGINAL CHILDREN

Compared with the 1993 WA Child Health Survey, where these data were collected by the same method, rates of attendance at a hospital emergency department or outpatients clinic were lower for Aboriginal children aged 4–11 years and similar for Aboriginal children aged 12–17 years. As primary care doctors are less available for Aboriginal children, it might be expected that Aboriginal children would be more likely, in cases of need, to go directly to a hospital emergency department or outpatient clinic. However, the survey did not find this to be the case. The percentage of children attending outpatient and emergency departments did not vary by level of relative isolation. This suggests that for children living in areas of extreme isolation, the larger distance to hospitals cannot explain the lower rates of attendance at hospital emergency departments. In contrast, Aboriginal children were more likely to be admitted to hospital than non-Aboriginal children.



USE OF HOSPITAL SERVICES BY ABORIGINAL CHILDREN (Continued)

Rates of hospital admissions and emergency department attendance did not vary significantly by level of relative isolation. This suggests that wherever children are located they have access to emergency medical treatment if it is required. However, children living in more remote areas may have to travel long distances to receive hospital care. This may place additional burdens upon the family in supporting a child during a hospital stay.

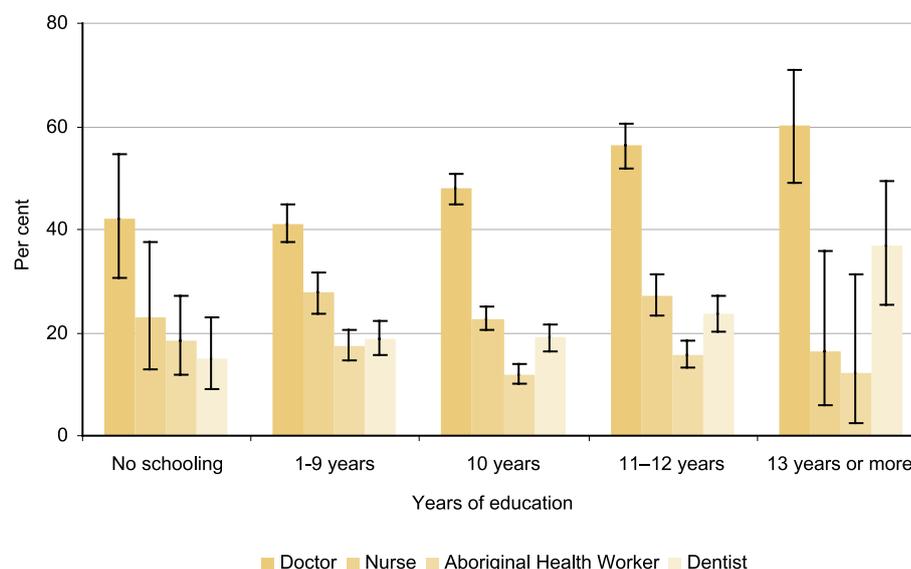
The hospital admissions data used here are based on linkage to hospital records, while the information on attendance at outpatient and emergency units was collected from interviews with the primary carers. It was only possible to link 87 per cent of the survey children to birth and hospital records (see Chapter 1). Some carers did not give consent for record linkage to occur, some children were born outside of WA and some children's records were not found during the record linkage process. No evidence was found of any systematic bias among the 13 per cent of children whose records could not be linked, and there is no reason to believe the 87 per cent of survey children do not represent a random sample of Aboriginal children in WA.

While there are no directly comparable data on hospitalisations for non-Aboriginal children, data based on hospital separations suggest that the main reasons for hospitalisation were broadly similar between Aboriginal and non-Aboriginal children, with respiratory illnesses, injuries and other infections representing the most common causes of hospitalisation.¹

The burden of otitis media is unacceptably high among Aboriginal and Torres Strait Islander children. Some 5.1 per cent of Aboriginal children (CI: 3.1%–7.8%) had been hospitalised with a primary diagnosis of otitis media in the year prior to the survey.

1 Al-Yaman F, Bryant M, and Sargeant H, (2002). Australia's Children: Their health and wellbeing 2002. AIHW Cat. No. PHE 36. AIHW. Canberra.

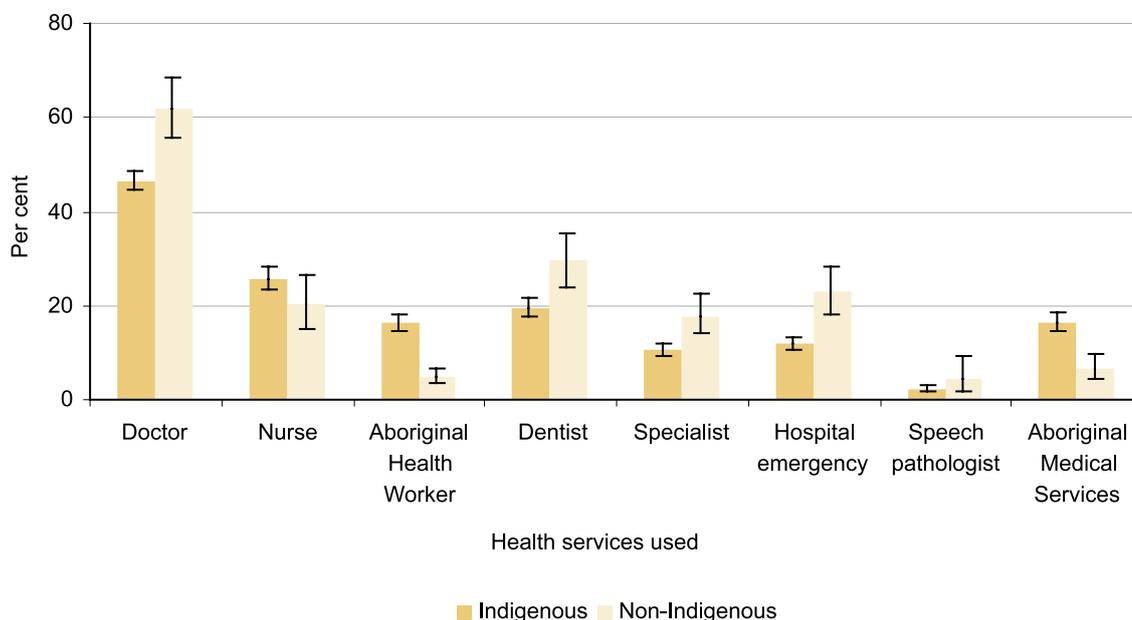
FIGURE 4.4: CHILDREN — CONTACT WITH SELECTED HEALTH SERVICES, BY YEARS OF EDUCATION OF PRIMARY CARER



Source: Table 4.5



FIGURE 4.5: CHILDREN — CONTACT WITH SELECTED HEALTH SERVICES, BY INDIGENOUS STATUS OF PRIMARY CARER



Source: Table 4.4

ROYAL FLYING DOCTOR SERVICE

In the most isolated areas, the Royal Flying Doctor Service (RFDS) provides regular primary health care clinics conducted by RFDS doctors, flight nurses and other specialised health professionals. Services include immunisations, child health care, dental, eye and ear care. The service reaches into many remote Aboriginal communities from bases in Perth, Derby, Kalgoorlie, Meekatharra and Port Hedland.

The RFDS also assists in the Rural Women’s General Practice (GP) Service. The service, funded by the Australian Government Department of Health and Ageing, aims to improve access to primary and secondary health care services for women in rural Australia who currently have little or no access to a female GP. This is of particular concern for those Aboriginal communities in which it is considered to be culturally inappropriate for women to be examined by male doctors. The services offered include cervical cancer screening, breast and skin examinations, preventive health care and self-help information. The RFDS reported that this service provided 1,838 patient consultations with female doctors throughout rural and remote WA in 2000-01. This increased to 4,878 consultations in 2002-03.¹

In total, over 36,000 patients were attended by RFDS services in Western Australia in 2000-01.

¹ Royal Flying Doctor Service Annual Report 2000-01 and 2002-03 <<http://www.rfds.org.au>>

Carers were asked if their community had an airstrip that was both long enough and in good enough condition for the Flying Doctor to land their plane. In areas of moderate, high or extreme relative isolation, 6.6 per cent (CI: 4.4%–9.3%) of children lived in communities where there was no airstrip suitable for the plane to land. This proportion varied from 2.6 per cent (CI: 1.3%–5.0%) of children living in



areas of moderate relative isolation to 15.3 per cent (CI: 7.8%–25.4%) of children living in areas of extreme relative isolation (Table 4.15).

FUNDING OF HEALTH SERVICES FOR ABORIGINAL PEOPLE

An individual's level of health service utilisation is determined in part by the adequacy and availability of services. These factors in turn are dependent on the level of resources available to support a service. Estimated per capita funding by Australian governments on health services to Aboriginal and Torres Strait Islander people in the 1998-99 financial year was \$3,065 per person compared with \$2,518 per person for non-Aboriginal people.¹ Some 48 per cent of expenditure on Indigenous health is through State-based programmes with Commonwealth funding to states providing a further 25 per cent. Commonwealth programmes make up 23 per cent of funding, local governments provide 0.5 per cent, and 5 per cent is provided through private sector programmes. In contrast, 36 per cent of funding of health services for non-Aboriginal people comes from State based programmes, 37 per cent from Commonwealth programmes and 26 per cent from private sector programmes. However when considering these differences it is necessary to take into account the relative income and health status of Aboriginal and Torres Strait people. Funding per person is similar when comparing Aboriginal and non-Aboriginal persons of similar income status.¹

Aboriginal and Torres Strait Islander people's use of Medicare and the Pharmaceutical Benefits Scheme was less than half that of non-Aboriginal people and also showed great variation by region.¹ For example, in the combined ARIA regions of remote and very remote the average Medicare benefit paid was \$84 per Aboriginal and Torres Strait Islander person. In contrast the non-Indigenous benefit was 2.3 times higher at \$197 per person. Note these data were not available by ARIA++, although the categories of remote and very remote include most areas classified to moderate, high and extreme relative isolation in ARIA++ (*see Chapter 1*).

It is estimated that only 15 per cent of Aboriginal Australians in urban areas and 38 per cent of Aboriginal Australians in more remote areas have an effective Medicare number or card. A significant number of people have either never been enrolled, or their enrolment has expired.²

1 Australian Institute of Health and Welfare, (2001). Expenditures on health services for Aboriginal and Torres Strait Islander people, 1998-99. AIHW Cat. No. IHW 7. Australian Institute of Health and Welfare and Commonwealth Department of Health and Aged Care. Canberra.

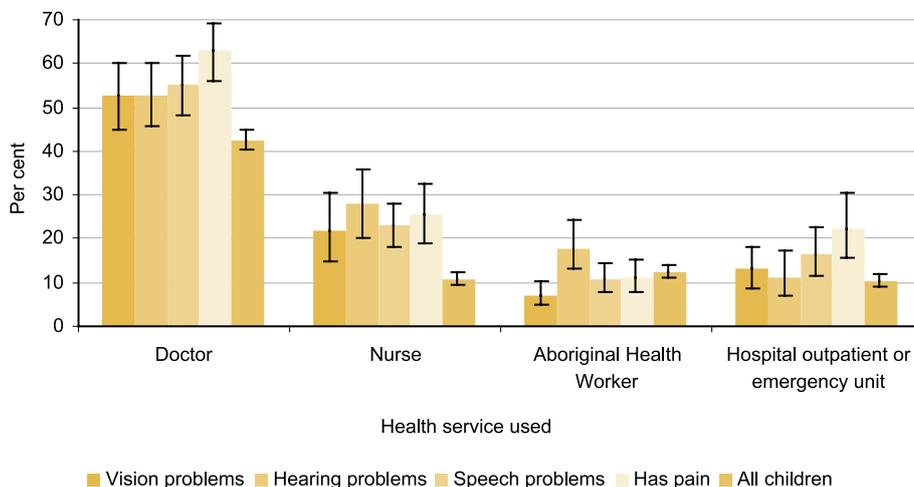
2 House of Representatives Standing Committee on Family and Community Affairs, (2000). Health is Life. Report on the Inquiry into Indigenous Health. Canberra.

USE OF HEALTH SERVICES BY PEOPLE WITH DISABILITIES

Figure 4.6 illustrates the proportion of 4–17 year olds with specific disabilities who had utilised hospital and other services during the preceding six months. In general, there was a higher level of use of health services as a result of problems with vision, hearing, speech and pain.



FIGURE 4.6: CHILDREN 4–17 YEARS WITH SELECTED SENSORY AND MOTOR FUNCTION PROBLEMS — PROPORTION WHO HAVE USED SELECTED HEALTH SERVICES IN THE PREVIOUS SIX MONTHS



Source: Table 4.16

FACTORS INFLUENCING CONTACTS WITH HEALTH SERVICES

In addition to physical illness, a range of factors can influence children’s use of health services. These include availability and accessibility of services, and financial and cultural issues. Four models were fitted to describe each child’s contacts with a doctor, a nurse, an Aboriginal Health Worker (AHW) or a dentist in the six months prior to the survey. Each model adjusts for the age and sex of the child. Factors considered in each model included Level of Relative Isolation, family structure, financial strain, education level of the primary carer, distance to nearest doctor or Aboriginal Medical Service, the SEIFA score for the area (*see Glossary*) which measures socio-economic disadvantage at the community level, and whether the child’s primary carer identified as being an Aboriginal or Torres Strait Islander person.

As few children under 4 years of age had visited a dentist, the model for dental care was restricted to children in the age range 4–17 years.

EXPLORING RELATIONSHIPS WITH MODELLING

Previous sections have explored the relationship between use of health services and various factors such as level of relative isolation or primary carer education level, where each factor is considered separately. As seen in Chapter Two, there are relationships between many of the factors. For instance, the proportion of carers who have a level of education beyond year 12 fell with increasing isolation. It is possible, therefore, that a relationship between education level of the primary carer and use of a health service may merely reflect the relationship between education and isolation, and between isolation and health service use.

This issue can be addressed using statistical modelling. Models can be used to determine the individual effects of several factors. For example, a model can be used to test if the relationship between education level and service use is a result of the relationship with relative isolation, or is an important factor in addition to relative isolation.



EXPLORING RELATIONSHIPS WITH MODELLING (Continued)

Logistic regression models (*see Glossary*) were used to explore factors other than illness that may be related to children's use of health services. 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.

The results of the models are expressed in terms of odds ratios (*see Glossary*). The odds ratios are calculated relative to an index category for each variable. For instance, in the model describing contacts with a doctor, for primary carer education level the category 1–9 years of education has been used as the index category. Where the primary carer has 13 or more years of education the odds ratio is 2.4 (CI: 1.5–3.9). This can be interpreted as saying that children whose carers have 13 or more years of education were 2.4 times more likely to have seen a doctor in the preceding six months than children whose primary carers have only 1–9 years of formal education. The statistical significance of an odds ratio can be judged by whether the confidence interval includes the reference value of one (*see Appendix D – Reliability of Estimates, for more information on confidence intervals*).

Each model adjusts for the independent effects of the other variables in the model so that, for example, the association between education level of the primary carer and visits to the doctor by the child is not an artifact of different education levels in areas of different levels of relative isolation. The results in earlier sections show the relationship between service use and each characteristic considered separately. The modelling results shown below adjust for the effects of all characteristics considered simultaneously and thus shed more light on the interaction between characteristics.



FIGURE 4.7: ALL CHILDREN — PREDICTED LIKELIHOOD OF USING SELECTED HEALTH SERVICES IN PREVIOUS SIX MONTHS, ASSOCIATED WITH SELECTED FAMILY AND COMMUNITY VARIABLES (a)

Parameter	Doctor		Nurse		AHW		Dentist	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
Level of relative isolation—								
None	1.00		1.00		1.00		1.00	
Low	0.61	(0.5 – 0.8)	1.94	(1.3 – 3.0)	2.01	(1.3 – 3.1)	0.77	(0.6 – 1.0)
Moderate	0.56	(0.4 – 0.8)	3.96	(2.6 – 6.1)	4.27	(2.8 – 6.5)	0.85	(0.6 – 1.2)
High	0.34	(0.2 – 0.5)	4.82	(2.9 – 7.9)	6.95	(4.1 – 11.9)	1.43	(0.9 – 2.4)
Extreme	0.34	(0.2 – 0.5)	6.73	(3.6 – 12.7)	11.40	(5.8 – 22.6)	0.50	(0.3 – 0.8)
Primary carer education level—								
1 – 9 years	1.00						1.00	
10 years	1.14	(0.9 – 1.5)					0.95	(0.7 – 1.3)
11 – 12 years	1.67	(1.2 – 2.3)					1.28	(0.9 – 1.7)
13+ years	2.38	(1.5 – 3.9)					1.95	(1.2 – 3.1)
No schooling	1.42	(0.8 – 2.4)					0.58	(0.3 – 1.0)
Not stated	1.00	(0.4 – 2.5)					1.44	(0.7 – 2.9)
Use of a vehicle—								
No			1.00				1.00	
Yes			0.66	(0.5 – 0.9)			1.82	(1.4 – 2.4)
Categories of SEIFA—								
Bottom 5%			1.00		1.00			
5% – 10%			0.64	(0.4 – 1.1)	0.65	(0.4 – 1.1)		
10% – 25%			0.63	(0.4 – 1.0)	0.61	(0.4 – 1.0)		
25% – 50%			0.62	(0.4 – 1.0)	0.60	(0.4 – 0.9)		
Top 50%			0.39	(0.2 – 0.7)	0.37	(0.2 – 0.7)		
Distance to doctor/AMS—								
0 – 5 kms					1.00			
6 – 20 kms					1.28	(0.9 – 1.9)		
21 – 50 kms					0.58	(0.4 – 0.9)		
> 50 kms					0.60	(0.4 – 1.0)		
Family's financial strain—								
Spending more money than we get					1.00			
Have just enough to get through to next pay					0.57	(0.4 – 0.9)		
Some money left over each week but spend it					0.57	(0.3 – 1.0)		
Can save a bit now and again					0.62	(0.4 – 1.0)		
Can save a lot					0.37	(0.2 – 0.9)		
Indigenous status of primary carer—								
Non-indigenous	1.71	(1.3 – 2.2)	0.47	(0.3 – 0.8)	0.43	(0.3 – 0.7)	1.85	(1.3 – 2.6)
Aboriginal or Torres Strait Islander	1.00		1.00		1.00		1.00	

(a) Model adjusts for age and sex of child. Results are left blank where there is no association between parameters and selected services.

Source: Tables 4.17–4.20



CONTACTS WITH DOCTORS

Having seen a doctor in the preceding six months is strongly linked with remoteness, with children living in areas of high or extreme relative isolation only one third as likely to have seen a doctor than children living in metropolitan Perth. Beyond the effect of isolation, no further association was found with distance from the nearest doctor or AMS, or whether the carer had access to a vehicle. Neither reported financial strain, or the socio-economic index value of the area was linked with visits to the doctor. However, the education level of the primary carer was associated with doctor's visits. Children whose carers have 13 or more years of education were 2.4 times (CI: 1.5–3.9) more likely to have seen a doctor in the preceding six months than children whose primary carers have only 1–9 years of formal education. Whether the primary carer of the child was Aboriginal or Torres Strait Islander was also found to be associated with children seeing a doctor, independently of the effect of relative isolation, education or financial strain. Children whose primary carers were non-Indigenous were 1.7 times (CI: 1.3–2.2) more likely to have seen a doctor than children whose primary carers were Aboriginal or Torres Strait Islander (Figure 4.7). It should be noted that most non-Indigenous primary carers were the natural mother of the child (see Chapter 2).

CONTACTS WITH NURSES

Contacts with a nurse in the preceding six months showed the reverse pattern to that seen with contacts with a doctor. As level of relative isolation increases, children are much more likely to have seen a nurse. Children in areas of extreme isolation were 6.7 times (CI: 3.6–12.7) more likely to have seen a nurse in the preceding six months than children in metropolitan Perth. Also, children whose primary carers were non-Indigenous were less than half as likely to have seen a nurse (odds ratio 0.47; CI: 0.3–0.8).

No association was found with the education level of the primary carer or the reported level of financial strain in the family. However, children living in areas classified in the bottom 5 per cent of the index of relative socio-economic disadvantage (*see Glossary*) were the most likely to have seen a nurse. Children living in areas classified in the top 50 per cent on the index of relative socio-economic disadvantage were less than half as likely to have seen a nurse (odds ratio 0.39; CI: 0.22–0.69) compared to children in the bottom 5 per cent. Children whose primary carers had access to a vehicle were also less likely to have seen a nurse (odds ratio 0.66; CI: 0.46–0.94) (Figure 4.7).

CONTACTS WITH ABORIGINAL HEALTH WORKERS

The association between contacts with an AHW and relative isolation was even stronger than with contacts with a nurse. Children living in areas of extreme relative isolation were more than 10 times more likely to have seen an AHW in the previous six months (odds ratio 11.4; CI: 5.8–22.6). There were significant associations with both the index of relative socio-economic disadvantage and the family's reported level of financial strain, with children living in areas of lower socio-economic status and children living in families reporting high levels of financial strain being most likely to have seen an AHW. Also, children whose primary carers were non-Indigenous were less than half as likely to have seen an AHW (odds ratio 0.43; CI: 0.3–0.7). No association was found between family structure or vehicle access and contacts with AHWs (Figure 4.7).



CONTACTS WITH DENTISTS

In addition to relative isolation, the education level of the primary carer, whether the carer had use of a vehicle and whether the primary carer was Aboriginal or Torres Strait Islander were the factors found to be associated with children seeing a dentist in the six months prior to the survey. Family structure, family financial strain and socio-economic status were not associated with dental visits. Children whose carers had 13 or more years of education were almost twice as likely to see a dentist as children of carers with only 1–9 years of education (odds ratio 1.9; CI: 1.2–3.1). In addition, when the carer had access to a vehicle the child was almost twice as likely to have seen a dentist (odds ratio 1.8; CI: 1.4–2.4). Children whose primary carers were non-Indigenous were also almost twice as likely to see a dentist (odds ratio 1.9; CI: 1.3–2.6) (Figure 4.7).

UNDERSTANDING ACCESS TO AND USE OF HEALTH SERVICES USING MODELLING TECHNIQUES

Modelling is a powerful tool that allows for the effects of multiple factors to be disentangled. The modelling results shown in this section adjust for the effects of all factors considered simultaneously. It highlights the independent effect of each factor. The models provide an integrated description of the interplay between a range of descriptive factors and the types of health services that Aboriginal children use.

Isolation is strongly related to service use, as location of services is affected by level of relative isolation. As previously noted, doctors are concentrated in the Perth metropolitan area and areas of low relative isolation. Despite programmes such as the General Practice Registrars Rural Incentive Payment Scheme and the Rural Retention Program administered by the Australian Government Department of Health and Ageing, at the time of the survey, children in remote and isolated areas had limited access to general practitioners. Instead, children in remote and isolated areas were much more likely to be seen by a nurse or an Aboriginal Health Worker. Community nursing posts and AMSs provide the first point of contact for the families of many Aboriginal children, particularly in remote areas.

Even in areas of none or low relative isolation, Aboriginal children were less likely to see a doctor than reported in the 1993 WA Child Health Survey for the general population. Cultural and financial barriers limit children's access to medical care in addition to the effects of physical isolation.

Access to dental care was least strongly related to remoteness, with only children in areas of extreme isolation being disadvantaged. For children of school age, free dental care is provided through the school dental service that operates both fixed and mobile dental health clinics. The mobile clinics appear to be effective in reaching all but the most isolated communities. However, it must be noted that the rate of dental visits is significantly lower than found in the general population in the 1993 WA Child Health Survey. The school dental service aims to see children every 15 months, or every 12 months in remote areas. With only 32 per cent of children aged 4–11 years and 17 per cent of children aged 12–17 years having seen a dentist in the last six months this suggests that these rates are not being achieved for Aboriginal children.

Throughout this chapter, comparisons have been made between rates of service use for Aboriginal children and rates for non-Aboriginal children, often using the 1993 WA Child Health Survey as a source of comparative data. It should be noted that 7–8 years elapsed between the data collection for the 1993 WA Child Health



UNDERSTANDING ACCESS TO AND USE OF HEALTH SERVICES USING MODELLING TECHNIQUES (Continued)

Survey and this survey. Patterns of service use can change over time, with changes in policy and service delivery.

Although comparisons with service use by non-Aboriginal children have been made, the rate of services use by non-Aboriginal children should not be regarded as the appropriate standard to which Aboriginal children should be compared. Service use should be in proportion to need. The higher rate of many physical illnesses among Aboriginal children would suggest that higher service use, as seen in the higher rate of hospital admissions, is appropriate. In this context, the lower rate of contacts with other services, such as doctors and dentists, is suggestive of unmet demand.

Indigenous status of the primary carer was associated with contacts with doctors, nurses, AHWs and dentists, independently of the effects of relative isolation, family finances, socio-economic status, education level, vehicle access or distance from services. Children whose primary carer was Aboriginal or Torres Strait Islander were more likely to have seen a nurse or an AHW, while children whose primary carer was non-Aboriginal were more likely to have seen a doctor or a dentist. This raises the question of whether general practice and dental services are being provided that Aboriginal carers find culturally appropriate, affordable and accessible.

ENDNOTES

- 1 National Aboriginal and Torres Strait Islander Health Council, (2003). National Strategic Framework for Aboriginal and Torres Strait Islander Health: Framework for action by Governments. NATSIHC. Canberra,
- 2 Zubrick SR, Silburn SR, Garton A, Burton P, Carlton J, Dalby R, Shepherd C, Lawrence D (1995). Western Australian Child Health Survey: Developing Health and Well-being in the Nineties. Australian Bureau of Statistics and Telethon Institute for Child Health Research. Perth.
- 3 Department of Health and Ageing, OATSIH Central Office, Service Activity Report 2000-01 (Unpublished data).
- 4 Australian Institute for Health and Welfare, (2003). Australian Hospital Statistics 2001-02, AIHW Cat. No. HSE 25. AIHW. Canberra.



Table 4.1: Children — Health services used at least once in previous six months, by age

Health service	Number	95% CI	%	95% CI
0–3 years (N = 6 910)				
Doctor	4 790	(4 420 – 5 170)	69.2	(66.3 – 72.1)
Nurse	2 890	(2 580 – 3 210)	41.8	(38.0 – 45.7)
Dentist	190	(120 – 290)	2.8	(1.7 – 4.2)
Specialist	1 010	(850 – 1 200)	14.6	(12.3 – 17.2)
Speech pathologist	120	(50 – 230)	1.7	(0.7 – 3.3)
Aboriginal Medical Service	1 390	(1 180 – 1 620)	20.1	(17.3 – 23.3)
Aboriginal Health Worker	1 500	(1 300 – 1 720)	21.7	(18.9 – 24.8)
Hospital emergency department or outpatient clinic	1 560	(1 340 – 1 780)	22.5	(19.6 – 25.5)
4–11 years (N = 13 800)				
Doctor	6 190	(5 760 – 6 650)	44.9	(42.2 – 47.6)
Nurse	2 970	(2 630 – 3 350)	21.5	(19.1 – 24.1)
Dentist	4 470	(4 040 – 4 940)	32.4	(29.5 – 35.4)
Specialist	1 630	(1 400 – 1 880)	11.8	(10.2 – 13.6)
Speech pathologist	610	(450 – 820)	4.5	(3.3 – 5.9)
Aboriginal Medical Service	2 060	(1 780 – 2 350)	14.9	(12.9 – 17.0)
Aboriginal Health Worker	2 020	(1 760 – 2 300)	14.6	(12.7 – 16.6)
Hospital emergency department or outpatient clinic	1 550	(1 330 – 1 790)	11.2	(9.6 – 12.9)
12–17 years (N = 9 100)				
Doctor	3 550	(3 160 – 3 960)	39.0	(35.5 – 42.5)
Nurse	1 580	(1 340 – 1 850)	17.4	(14.8 – 20.2)
Dentist	1 560	(1 320 – 1 830)	17.1	(14.5 – 19.8)
Specialist	840	(650 – 1 090)	9.3	(7.2 – 11.7)
Speech pathologist	70	(20 – 230)	0.8	(0.2 – 2.5)
Aboriginal Medical Service	1 070	(900 – 1 260)	11.7	(9.8 – 13.9)
Aboriginal Health Worker	860	(740 – 990)	9.4	(8.1 – 11.0)
Hospital emergency department or outpatient clinic	850	(580 – 1 180)	9.3	(6.5 – 12.7)
Total children (N = 29 800)				
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)



Table 4.2: Children — Health services used at least once in previous six months, by Level of Relative Isolation (LORI)

Health service	Number	95% CI	%	95% CI
LORI — None (N = 10 200)				
Doctor	5 760	(5 380 – 6 150)	56.6	(52.9 – 60.2)
Nurse	1 440	(1 190 – 1 730)	14.2	(11.7 – 16.9)
Dentist	2 230	(1 900 – 2 570)	21.9	(18.8 – 25.3)
Specialist	1 290	(1 060 – 1 550)	12.6	(10.4 – 15.1)
Speech pathologist	360	(200 – 570)	3.5	(2.0 – 5.7)
Aboriginal Medical Service	910	(710 – 1 150)	9.0	(7.0 – 11.3)
Aboriginal Health Worker	650	(480 – 840)	6.4	(4.7 – 8.3)
Hospital emergency department or outpatient clinic	1 410	(1 170 – 1 690)	13.9	(11.5 – 16.6)
LORI — Low (N = 7 270)				
Doctor	3 700	(3 290 – 4 150)	50.9	(46.7 – 54.9)
Nurse	1 330	(1 110 – 1 580)	18.4	(15.6 – 21.4)
Dentist	1 370	(1 140 – 1 620)	18.8	(15.8 – 22.1)
Specialist	820	(650 – 1 020)	11.3	(9.1 – 13.6)
Speech pathologist	210	(120 – 360)	2.9	(1.7 – 4.9)
Aboriginal Medical Service	1 000	(780 – 1 270)	13.8	(10.9 – 17.0)
Aboriginal Health Worker	740	(580 – 930)	10.2	(8.1 – 12.6)
Hospital emergency department or outpatient clinic	1 240	(1 040 – 1 470)	17.0	(14.6 – 19.7)
LORI — Moderate (N = 6 390)				
Doctor	2 910	(2 430 – 3 460)	45.6	(42.5 – 48.8)
Nurse	1 560	(1 220 – 1 950)	24.4	(20.6 – 28.6)
Dentist	1 220	(950 – 1 520)	19.1	(15.8 – 22.9)
Specialist	740	(560 – 950)	11.6	(9.3 – 14.1)
Speech pathologist	130	(80 – 200)	2.0	(1.3 – 2.9)
Aboriginal Medical Service	1 650	(1 300 – 2 050)	25.9	(21.6 – 30.6)
Aboriginal Health Worker	1 310	(1 070 – 1 590)	20.5	(17.7 – 23.3)
Hospital emergency department or outpatient clinic	760	(500 – 1 100)	11.9	(8.4 – 16.5)
LORI — High (N = 3 170)				
Doctor	1 110	(790 – 1 510)	35.1	(28.7 – 41.8)
Nurse	1 520	(1 080 – 2 100)	48.2	(40.4 – 56.1)
Dentist	1 000	(660 – 1 480)	31.7	(23.8 – 41.0)
Specialist	260	(170 – 380)	8.1	(6.0 – 10.7)
Speech pathologist	90	(50 – 160)	3.0	(1.8 – 4.6)
Aboriginal Medical Service	550	(340 – 890)	17.5	(10.9 – 24.9)
Aboriginal Health Worker	640	(420 – 920)	20.4	(15.4 – 26.4)
Hospital emergency department or outpatient clinic	240	(160 – 360)	7.7	(5.7 – 10.0)
LORI — Extreme (N = 2 830)				
Doctor	1 050	(700 – 1 530)	37.1	(30.0 – 45.2)
Nurse	1 580	(1 100 – 2 250)	55.8	(47.1 – 64.0)
Dentist	400	(250 – 610)	14.2	(9.8 – 19.6)
Specialist	380	(230 – 590)	13.5	(9.5 – 18.4)
Speech pathologist	10	(0 – 30)	0.4	(0.1 – 1.1)
Aboriginal Medical Service	400	(220 – 630)	14.0	(8.6 – 21.3)
Aboriginal Health Worker	1 030	(650 – 1 500)	36.4	(28.3 – 44.5)
Hospital emergency department or outpatient clinic	300	(190 – 450)	10.7	(7.6 – 14.8)



Table 4.2: Children — Health services used at least once in previous six months, by Level of Relative Isolation (LORI) (Continued)

Health service	Number	95% CI	%	95% CI
Total WA (N = 29 800)				
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)

Table 4.3: Children — Number of times seen a doctor in last six months, by distance from nearest doctor or AMS

Times doctor seen	Number	95% CI	%	95% CI
0–5 kilometres				
None	9 280	(8 610 – 9 980)	48.6	(46.2 – 51.0)
Once or more	9 810	(9 100 – 10 500)	51.4	(49.0 – 53.8)
Total	19 100	(18 000 – 20 100)	100.0	
6–20 kilometres				
None	1 970	(1 590 – 2 390)	47.0	(41.5 – 52.4)
Once or more	2 220	(1 820 – 2 660)	53.0	(47.6 – 58.5)
Total	4 180	(3 520 – 4 890)	100.0	
21–100 kilometres				
None	1 160	(820 – 1 630)	55.7	(49.1 – 62.5)
Once or more	930	(680 – 1 240)	44.3	(37.5 – 50.9)
Total	2 090	(1 530 – 2 770)	100.0	
Over 100 kilometres				
None	2 390	(1 830 – 3 030)	65.5	(58.0 – 72.5)
Once or more	1 260	(890 – 1 730)	34.5	(27.5 – 42.0)
Total	3 650	(2 840 – 4 570)	100.0	
Distance not stated				
None	480	(320 – 690)	59.8	(46.9 – 71.1)
Once or more	320	(220 – 450)	40.2	(28.9 – 53.1)
Total	810	(590 – 1 050)	100.0	
Total				
None	15 300	(14 700 – 15 900)	51.3	(49.3 – 53.3)
Once or more	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Total	29 800	(29 800 – 29 800)	100.0	



Table 4.4: Children — Health services used at least once in previous six months, by Indigenous status of primary carer

Health service	Number	95% CI	%	95% CI
Primary carer – Indigenous (N = 25 500)				
Doctor	11 900	(11 300 – 12 500)	46.6	(44.5 – 48.8)
Nurse	6 560	(5 950 – 7 180)	25.7	(23.4 – 28.1)
Dentist	5 000	(4 490 – 5 530)	19.6	(17.7 – 21.6)
Specialist	2 730	(2 430 – 3 080)	10.7	(9.5 – 12.0)
Speech pathologist	620	(470 – 800)	2.4	(1.9 – 3.2)
Aboriginal Medical Service	4 220	(3 750 – 4 720)	16.5	(14.7 – 18.5)
Aboriginal Health Worker	4 150	(3 710 – 4 610)	16.2	(14.6 – 18.0)
Hospital emergency department or outpatient clinic	3 000	(2 640 – 3 390)	11.8	(10.4 – 13.3)
Primary carer – Non-Indigenous (N = 4 070)				
Doctor	2 520	(2 120 – 2 980)	62.0	(55.5 – 68.4)
Nurse	830	(590 – 1 110)	20.3	(15.1 – 26.3)
Dentist	1 200	(940 – 1 510)	29.5	(24.0 – 35.4)
Specialist	730	(550 – 940)	17.8	(14.0 – 22.4)
Speech pathologist	180	(70 – 410)	4.4	(1.6 – 9.4)
Aboriginal Medical Service	270	(170 – 400)	6.5	(4.3 – 9.9)
Aboriginal Health Worker	200	(140 – 270)	4.8	(3.5 – 6.7)
Hospital emergency department or outpatient clinic	930	(710 – 1 180)	22.8	(18.1 – 28.3)
Primary carer – Indigenous status not stated (N = 200)				
Doctor	90	(60 – 160)	46.8	(25.7 – 70.2)
Nurse	50	(20 – 90)	25.5	(11.6 – 47.8)
Dentist	20	(10 – 40)	9.8	(3.8 – 20.5)
Specialist	20	(10 – 70)	10.7	(1.1 – 28.0)
Speech pathologist	0	(0 – 10)	1.9	(0.5 – 4.2)
Aboriginal Medical Service	30	(10 – 70)	14.5	(3.6 – 41.4)
Aboriginal Health Worker	30	(10 – 80)	15.8	(4.7 – 37.4)
Hospital emergency department or outpatient clinic	20	(10 – 40)	9.7	(2.9 – 24.2)
Total children (N = 29 800)				
Doctor	14 500	(13 900 – 15 100)	48.7	(46.7 – 50.7)
Nurse	7 440	(6 830 – 8 070)	24.9	(22.9 – 27.1)
Dentist	6 220	(5 680 – 6 800)	20.9	(19.0 – 22.8)
Specialist	3 480	(3 140 – 3 850)	11.7	(10.5 – 12.9)
Speech pathologist	810	(610 – 1 060)	2.7	(2.0 – 3.5)
Aboriginal Medical Service	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Aboriginal Health Worker	4 370	(3 940 – 4 840)	14.7	(13.2 – 16.2)
Hospital emergency department or outpatient clinic	3 950	(3 550 – 4 390)	13.3	(11.9 – 14.7)



Table 4.5: Children — Health services used at least once in previous six months, by primary carer years of education

Health Service	Number	95% CI	%	95% CI
Children whose carer did not attend school (N = 740)				
Doctor	310	(200 – 470)	42.1	(30.6 – 54.6)
Nurse	170	(80 – 300)	22.8	(12.8 – 37.5)
Dentist	110	(70 – 170)	15.0	(8.9 – 22.8)
Specialist	120	(50 – 240)	16.8	(8.2 – 30.3)
Speech pathologist	20	(0 – 250)	2.6	(0.0 – 28.5)
Aboriginal Medical Service	120	(60 – 200)	16.1	(9.3 – 25.2)
Aboriginal Health Worker	140	(80 – 220)	18.5	(12.0 – 27.2)
Hospital emergency department or outpatient clinic	80	(20 – 200)	11.3	(2.9 – 24.8)
Children whose carer had 1–9 years of education (N = 6,630)				
Doctor	2 730	(2 400 – 3 080)	41.2	(37.6 – 45.0)
Nurse	1 840	(1 540 – 2 170)	27.7	(23.8 – 31.7)
Dentist	1 240	(1 010 – 1 510)	18.8	(15.6 – 22.3)
Specialist	640	(500 – 810)	9.7	(7.7 – 12.0)
Speech pathologist	120	(90 – 170)	1.9	(1.3 – 2.5)
Aboriginal Medical Service	1 030	(850 – 1 250)	15.6	(12.8 – 18.6)
Aboriginal Health Worker	1 160	(950 – 1 390)	17.4	(14.6 – 20.5)
Hospital emergency department or outpatient clinic	750	(620 – 890)	11.2	(9.5 – 13.3)
Children whose carer had 10 years of education (N = 12,800)				
Doctor	6 130	(5 640 – 6 650)	47.9	(44.9 – 50.8)
Nurse	2 910	(2 590 – 3 250)	22.7	(20.4 – 25.2)
Dentist	2 430	(2 090 – 2 820)	19.0	(16.5 – 21.6)
Specialist	1 360	(1 140 – 1 590)	10.6	(9.0 – 12.3)
Speech pathologist	370	(220 – 600)	2.9	(1.7 – 4.6)
Aboriginal Medical Service	1 750	(1 480 – 2 040)	13.6	(11.6 – 15.8)
Aboriginal Health Worker	1 510	(1 270 – 1 790)	11.8	(10.0 – 13.9)
Hospital emergency department or outpatient clinic	1 590	(1 350 – 1 870)	12.4	(10.6 – 14.4)
Children whose carer had 11–12 years of education (N = 7,240)				
Doctor	4 070	(3 610 – 4 590)	56.2	(51.8 – 60.5)
Nurse	1 960	(1 650 – 2 290)	27.0	(23.2 – 31.2)
Dentist	1 710	(1 450 – 2 020)	23.6	(20.3 – 27.3)
Specialist	1 000	(780 – 1 270)	13.9	(11.1 – 17.0)
Speech pathologist	200	(140 – 290)	2.8	(1.9 – 4.0)
Aboriginal Medical Service	1 230	(980 – 1 540)	17.0	(13.6 – 20.8)
Aboriginal Health Worker	1 130	(950 – 1 350)	15.7	(13.1 – 18.6)
Hospital emergency department or outpatient clinic	1 210	(940 – 1 510)	16.6	(13.3 – 20.2)
Children whose carer had 13 or more years of education (N = 1,600)				
Doctor	970	(660 – 1 380)	60.3	(48.9 – 70.8)
Nurse	260	(70 – 630)	16.3	(5.8 – 35.8)
Dentist	590	(380 – 850)	36.8	(25.4 – 49.3)
Specialist	260	(160 – 420)	16.3	(10.3 – 23.1)
Speech pathologist	70	(20 – 160)	4.5	(1.1 – 10.1)
Aboriginal Medical Service	250	(170 – 370)	15.6	(9.7 – 22.9)
Aboriginal Health Worker	200	(40 – 600)	12.2	(2.5 – 31.2)
Hospital emergency department or outpatient clinic	260	(160 – 410)	16.4	(10.2 – 24.4)



Table 4.5: Children — Health services used at least once in previous six months, by primary carer years of education (Continued)

Health Service	Number	95% CI	%	95% CI
Children whose carer's education not stated (N = 810)				
Doctor	320	(220 – 450)	40.2	(28.9 – 53.1)
Nurse	300	(180 – 520)	37.7	(24.4 – 54.5)
Dentist	130	(50 – 330)	16.3	(5.5 – 33.7)
Specialist	90	(50 – 160)	11.3	(6.7 – 17.3)
Speech pathologist	10	(0 – 30)	1.5	(0.5 – 4.2)
Aboriginal Medical Service	130	(70 – 210)	16.5	(8.8 – 25.9)
Aboriginal Health Worker	240	(160 – 340)	29.6	(20.3 – 39.3)
Hospital emergency department or outpatient clinic	60	(30 – 110)	7.7	(4.1 – 12.6)

Table 4.6: Children whose carers needed to contact AMS in last six months — Whether carer is happy with the service provided for each child

AMS service satisfaction	Number	95% CI	%	95% CI
Not happy with AMS service	810	(650 – 990)	17.9	(14.6 – 21.6)
Happy with AMS	3 700	(3 260 – 4 190)	82.1	(78.4 – 85.4)
Total	4 510	(4 030 – 5 040)	100	



Table 4.7: All children — Distance from nearest doctor or AMS, by Level of Relative Isolation (LORI)

Distance to nearest Doctor/AMS – kilometres	Number	95% CI	%	95% CI
LORI — None				
0 – 5	7 630	(7 210 – 8 050)	75.0	(70.9 – 78.7)
6 – 20	2 000	(1 660 – 2 400)	19.7	(16.1 – 23.4)
21 – 100	320	(170 – 540)	3.2	(1.7 – 5.3)
101 and over	0	(0 – 60)	0.0	(0.0 – 0.5)
Not stated	220	(150 – 310)	2.2	(1.5 – 3.1)
Total	10 200	(10 000 – 10 400)	100.0	
LORI — Low				
0 – 5	5 490	(4 890 – 6 140)	75.5	(69.4 – 80.8)
6 – 20	1 070	(750 – 1 460)	14.8	(10.8 – 20.1)
21 – 100	520	(310 – 840)	7.1	(4.1 – 11.3)
101 and over	50	(0 – 540)	0.7	(0.0 – 7.2)
Not stated	140	(50 – 270)	1.9	(0.7 – 3.7)
Total	7 270	(6 640 – 7 930)	100.0	
LORI — Moderate				
0 – 5	4 870	(4 040 – 5 790)	76.2	(67.7 – 83.1)
6 – 20	1 050	(660 – 1 630)	16.5	(10.5 – 24.6)
21 – 100	150	(20 – 500)	2.4	(0.3 – 7.6)
101 and over	70	(10 – 210)	1.1	(0.2 – 3.3)
Not stated	240	(150 – 380)	3.8	(2.3 – 5.7)
Total	6 390	(5 400 – 7 420)	100.0	
LORI — High				
0 – 5	780	(430 – 1 290)	24.5	(14.4 – 38.4)
6 – 20	40	(0 – 220)	1.2	(0.0 – 7.0)
21 – 100	610	(270 – 1 100)	19.3	(8.4 – 33.4)
101 and over	1 660	(1 100 – 2 420)	52.3	(37.8 – 65.7)
Not stated	80	(10 – 390)	2.6	(0.4 – 11.7)
Total	3 170	(2 360 – 4 160)	100.0	
LORI — Extreme				
0 – 5	330	(80 – 740)	11.6	(3.0 – 25.4)
6 – 20	20	(0 – 70)	0.7	(0.1 – 2.7)
21 – 100	480	(210 – 870)	17.1	(8.6 – 31.4)
101 and over	1 870	(1 280 – 2 680)	66.2	(52.1 – 79.2)
Not stated	120	(50 – 270)	4.4	(1.8 – 8.8)
Total	2 830	(2 040 – 3 800)	100.0	
Total				
0 – 5	19 100	(18 000 – 20 100)	64.0	(60.4 – 67.4)
6 – 20	4 180	(3 520 – 4 890)	14.0	(11.8 – 16.4)
21 – 100	2 090	(1 530 – 2 770)	7.0	(5.1 – 9.3)
101 and over	3 650	(2 840 – 4 570)	12.2	(9.5 – 15.3)
Not stated	810	(590 – 1 050)	2.7	(2.0 – 3.5)
Total	29 800	(29 800 – 29 800)	100.0	



Table 4.8: All children — Number of times seen AMS in last six months, by distance from nearest doctor or AMS

Times seen AMS	Number	95% CI	%	95% CI
0–5 kilometres				
None	16 100	(15 200 – 17 000)	84.3	(82.0 – 86.3)
Once or more	3 010	(2 550 – 3 510)	15.7	(13.7 – 18.0)
Total	19 100	(18 000 – 20 100)	100.0	
6–20 kilometres				
None	3 470	(2 890 – 4 100)	83.0	(78.2 – 86.9)
Once or more	710	(520 – 940)	17.0	(13.1 – 21.8)
Total	4 180	(3 520 – 4 890)	100.0	
21–100 kilometres				
None	1 830	(1 340 – 2 440)	87.6	(82.1 – 91.6)
Once or more	260	(160 – 410)	12.4	(8.4 – 17.9)
Total	2 090	(1 530 – 2 770)	100.0	
101 kilometres and over				
None	3 240	(2 530 – 4 110)	88.9	(84.0 – 92.6)
Once or more	410	(250 – 610)	11.1	(7.4 – 16.0)
Total	3 650	(2 840 – 4 570)	100.0	
Distance not stated				
None	670	(480 – 920)	83.5	(74.1 – 91.2)
Once or more	130	(70 – 210)	16.5	(8.8 – 25.9)
Total	810	(590 – 1 050)	100.0	
Total				
None	25 300	(24 800 – 25 800)	84.9	(83.1 – 86.5)
Once or more	4 510	(4 030 – 5 040)	15.1	(13.5 – 16.9)
Total	29 800	(29 800 – 29 800)	100.0	



Table 4.9: All Children — whether admitted to hospital in previous year, by age and sex

Admitted to hospital in last year	Number	95% CI	%	95% CI
Males 0–3 years				
No	2 320	(2 040 – 2 610)	69.8	(65.1 – 74.0)
Yes	1 000	(850 – 1 170)	30.2	(26.0 – 34.9)
Total	3 320	(3 010 – 3 640)	100.0	
Males 4–11 years				
No	5 460	(5 110 – 5 810)	86.8	(84.4 – 89.0)
Yes	830	(690 – 990)	13.2	(11.0 – 15.6)
Total	6 280	(5 920 – 6 660)	100.0	
Males 12–17 years				
No	3 390	(3 010 – 3 800)	90.5	(86.3 – 93.6)
Yes	360	(230 – 510)	9.5	(6.4 – 13.7)
Total	3 750	(3 350 – 4 170)	100.0	
Total Males				
No	11 200	(10 700 – 11 700)	83.6	(81.7 – 85.4)
Yes	2 190	(1 950 – 2 460)	16.4	(14.6 – 18.3)
Total	13 400	(12 800 – 13 900)	100.0	
Females 0–3 years				
No	2 110	(1 850 – 2 400)	70.7	(66.0 – 74.9)
Yes	870	(740 – 1 030)	29.3	(25.1 – 34.0)
Total	2 990	(2 680 – 3 300)	100.0	
Females 4–11 years				
No	5 060	(4 690 – 5 450)	89.1	(86.7 – 91.3)
Yes	620	(490 – 760)	10.9	(8.7 – 13.3)
Total	5 690	(5 310 – 6 090)	100.0	
Females 12–17 years				
No	3 390	(3 080 – 3 730)	86.3	(83.4 – 88.9)
Yes	540	(430 – 660)	13.7	(11.1 – 16.6)
Total	3 930	(3 590 – 4 290)	100.0	
Total Females				
No	10 600	(10 100 – 11 100)	83.9	(82.0 – 85.6)
Yes	2 040	(1 810 – 2 280)	16.1	(14.4 – 18.0)
Total	12 600	(12 100 – 13 100)	100.0	
Total 0–3 years				
No	4 430	(4 050 – 4 830)	70.2	(66.9 – 73.4)
Yes	1 880	(1 660 – 2 130)	29.8	(26.6 – 33.1)
Total	6 310	(5 880 – 6 770)	100.0	
Total 4–11 years				
No	10 500	(10 000 – 11 000)	87.9	(86.2 – 89.5)
Yes	1 450	(1 250 – 1 670)	12.1	(10.5 – 13.8)
Total	12 000	(11 500 – 12 500)	100.0	
Total 12–17 years				
No	6 790	(6 290 – 7 290)	88.3	(86.0 – 90.5)
Yes	900	(730 – 1 080)	11.7	(9.5 – 14.0)
Total	7 680	(7 170 – 8 210)	100.0	
Total children				
No	21 700	(21 200 – 22 300)	83.7	(82.4 – 85.0)
Yes	4 220	(3 890 – 4 590)	16.3	(15.0 – 17.6)
Total	26 000	(25 400 – 26 400)	100.0	



Table 4.10: All Children — whether admitted to hospital in previous year, by Level of Relative Isolation (LORI)

Admitted to hospital in last year	Number	95% CI	%	95% CI
LORI — None				
No	7 690	(7 360 – 8 030)	85.7	(82.9 – 88.1)
Yes	1 280	(1 070 – 1 540)	14.3	(11.9 – 17.1)
Total	8 970	(8 680 – 9 270)	100.0	
LORI — Low				
No	5 600	(5 070 – 6 170)	84.3	(81.9 – 86.6)
Yes	1 040	(870 – 1 240)	15.7	(13.4 – 18.1)
Total	6 640	(6 030 – 7 290)	100.0	
LORI — Moderate				
No	4 620	(3 880 – 5 430)	82.7	(79.9 – 85.2)
Yes	970	(770 – 1 200)	17.3	(14.8 – 20.1)
Total	5 590	(4 700 – 6 530)	100.0	
LORI — High				
No	2 100	(1 560 – 2 760)	80.3	(75.6 – 84.3)
Yes	520	(350 – 730)	19.7	(15.7 – 24.4)
Total	2 610	(1 960 – 3 460)	100.0	
LORI — Extreme				
No	1 730	(1 190 – 2 360)	80.6	(75.9 – 84.9)
Yes	420	(280 – 600)	19.4	(15.1 – 24.1)
Total	2 150	(1 530 – 2 950)	100.0	
Total				
No	21 700	(21 200 – 22 300)	83.7	(82.4 – 85.0)
Yes	4 220	(3 890 – 4 590)	16.3	(15.0 – 17.6)
Total	26 000	(25 400 – 26 400)	100.0	

Table 4.11: Children admitted to hospital in last year — Number of admissions in last year

Number of admissions	Number	95% CI	%	95% CI
One	2 970	(2 690 – 3 290)	70.4	(66.8 – 73.8)
Two	850	(720 – 1 000)	20.0	(17.0 – 23.3)
Three or more	400	(310 – 520)	9.6	(7.5 – 12.1)
Total	4 220	(3 890 – 4 590)	100.0	

Table 4.12: Children admitted to hospital in last year — Total length of stay in hospital

Total length of stay	Number	95% CI	%	95% CI
1 – 2 days	2 250	(2 000 – 2 510)	53.3	(49.2 – 57.2)
3 – 5 days	1 030	(880 – 1 210)	24.4	(21.2 – 27.9)
6 days or more	940	(800 – 1 110)	22.4	(19.3 – 25.6)
Total	4 220	(3 890 – 4 590)	100.0	



Table 4.13: Children admitted to hospital in last year — Principal diagnosis on most recent admission

Principal diagnosis	Number	95% CI	%	95% CI
Respiratory system diseases	990	(850 – 1 150)	23.5	(20.5 – 26.7)
Influenza and pneumonia	280	(230 – 360)	6.7	(5.4 – 8.4)
Acute respiratory infections	490	(380 – 610)	11.5	(9.2 – 14.1)
Asthma	110	(70 – 170)	2.6	(1.6 – 4.0)
Injuries	670	(550 – 830)	16.0	(13.2 – 19.2)
Head injuries	180	(130 – 250)	4.3	(3.1 – 5.7)
Fractures	110	(60 – 170)	2.6	(1.5 – 4.1)
Infectious diseases	520	(400 – 650)	12.2	(9.8 – 15.1)
Ear disorders	280	(190 – 400)	6.7	(4.6 – 9.5)
Otitis media	220	(130 – 340)	5.1	(3.1 – 7.8)
Skin diseases	310	(220 – 430)	7.4	(5.4 – 9.9)
Digestive system diseases	270	(170 – 410)	6.4	(4.1 – 9.5)
Other signs and symptoms	200	(140 – 270)	4.6	(3.2 – 6.3)
Perinatal conditions	200	(150 – 260)	4.7	(3.6 – 6.1)
Urinary system diseases	100	(60 – 150)	2.3	(1.4 – 3.6)
Other	690	(550 – 860)	16.3	(13.2 – 19.9)
Total	4 220	(3 890 – 4 590)	100.0	

Table 4.14: Children linked to birth records — Rate of hospital admissions, by age group and sex

Sex	WAACHS Children		All WA Children 2001–02 (a)
	Rate per 1,000	95% CI	Rate per 1,000
0 – 4 years			
Male	408	(347 – 469)	287
Female	400	(333 – 468)	212
Total	404	(357 – 452)	250
5 – 14 years			
Male	149	(120 – 177)	96
Female	122	(97 – 147)	80
Total	136	(117 – 155)	88
15 – 17 years			
Male	123	(73 – 174)	na
Female	299	(232 – 366)	na
Total	213	(171 – 255)	na
Total			
Male	224	(199 – 250)	na
Female	229	(200 – 257)	na
Total	226	(207 – 246)	na

(a) Source: Australian Institute for Health and Welfare. Australian Hospital Statistics 2001–02. AIHW Cat. No. HSE 25. Canberra: AIHW.



Table 4.15: Children in areas of moderate, high or extreme relative isolation — whether landing strip long enough and in suitable condition for flying doctor to land plane

Flying doctor able to land plane	Number	95% CI	%	95% CI
LORI — Moderate				
No	170	(70 – 310)	2.6	(1.3 – 5.0)
Yes	5 490	(4 600 – 6 430)	86.0	(81.5 – 89.8)
Not applicable	480	(280 – 770)	7.5	(4.4 – 11.6)
Not stated	240	(150 – 380)	3.8	(2.3 – 5.7)
Total	6 390	(5 400 – 7 420)	100.0	
LORI — High				
No	220	(110 – 400)	6.8	(3.4 – 11.8)
Yes	2 570	(1 860 – 3 370)	81.1	(71.4 – 88.2)
Not applicable	300	(140 – 570)	9.4	(4.4 – 17.1)
Not stated	80	(10 – 390)	2.6	(0.4 – 11.7)
Total	3 170	(2 360 – 4 160)	100.0	
LORI — Extreme				
No	430	(210 – 740)	15.3	(7.8 – 25.4)
Yes	2 220	(1 540 – 3 030)	78.6	(67.8 – 86.9)
Not applicable	50	(20 – 100)	1.7	(0.6 – 3.5)
Not stated	120	(50 – 270)	4.4	(1.8 – 8.8)
Total	2 830	(2 040 – 3 800)	100.0	
Total				
No	820	(550 – 1 150)	6.6	(4.4 – 9.3)
Yes	10 300	(9 600 – 11 000)	83.1	(79.2 – 86.4)
Not applicable	830	(570 – 1 170)	6.7	(4.6 – 9.5)
Not stated	450	(290 – 680)	3.6	(2.3 – 5.4)
Total	12 400	(11 800 – 13 000)	100.0	

Table 4.16: Children with selected sensory and motor function problems — Use of services in previous six months

Sensory and motor function problems	Number	95% CI	%	95% CI
Hospital emergency department or outpatient clinic				
Vision problems	240	(160 – 340)	13.0	(8.7 – 18.3)
Hearing problems	180	(110 – 280)	11.2	(7.0 – 17.3)
Speech problems	370	(250 – 530)	16.4	(11.7 – 22.5)
Has pain	430	(290 – 630)	22.1	(15.6 – 30.4)
All children	2 400	(2 090 – 2 740)	10.5	(9.1 – 12.0)
Doctor				
Vision problems	970	(760 – 1 220)	52.7	(44.9 – 60.2)
Hearing problems	830	(670 – 1 020)	52.9	(45.6 – 60.0)
Speech problems	1 230	(1 040 – 1 460)	55.1	(48.3 – 61.7)
Has pain	1 220	(980 – 1 500)	63.0	(56.2 – 69.3)
All children	9 740	(9 200 – 10 300)	42.5	(40.3 – 44.8)
Nurse				
Vision problems	410	(250 – 600)	22.0	(14.9 – 30.6)
Hearing problems	440	(310 – 610)	28.0	(20.2 – 36.0)
Speech problems	510	(400 – 650)	23.0	(18.3 – 28.1)
Has pain	490	(350 – 660)	25.4	(18.8 – 32.7)
All children	2 470	(2 190 – 2 790)	10.8	(9.6 – 12.2)
Aboriginal Health Worker				
Vision problems	130	(90 – 190)	7.2	(4.8 – 10.3)
Hearing problems	280	(200 – 380)	17.9	(13.0 – 24.2)
Speech problems	240	(170 – 320)	10.7	(7.7 – 14.5)
Has pain	220	(160 – 300)	11.2	(7.8 – 15.1)
All children	2 870	(2 540 – 3 230)	12.5	(11.1 – 14.1)



Table 4.17: All children — Predicted likelihood of having seen a doctor in previous six months, associated with selected family and community variables (a)

Child has seen a doctor in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	<0.001	0.61	(0.47 – 0.79)
Moderate	<0.001	0.56	(0.41 – 0.76)
High	<0.001	0.34	(0.22 – 0.54)
Extreme	<0.001	0.34	(0.22 – 0.53)
Primary carer education level			
1– 9 years		1.00	
10 years	0.348	1.14	(0.87 – 1.49)
11–12 years	0.002	1.67	(1.22 – 2.31)
13 years or more	<0.001	2.38	(1.47 – 3.88)
No schooling	0.187	1.42	(0.84 – 2.38)
Not stated	0.998	1.00	(0.41 – 2.45)
Indigenous status of primary carer			
Non-indigenous	<0.001	1.71	(1.30 – 2.24)
Aboriginal or Torres Strait Islander		1.00	

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

Table 4.18: All children — Predicted likelihood of having seen a nurse in previous six months, associated with selected family and community variables (a)

Child has seen a nurse in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.002	1.94	(1.27 – 2.96)
Moderate	<0.001	3.96	(2.57 – 6.10)
High	<0.001	4.82	(2.94 – 7.89)
Extreme	<0.001	6.73	(3.60 – 12.70)
Access to vehicle			
No		1.00	
Yes	0.023	0.66	(0.46 – 0.94)
Indigenous status of primary carer			
Non-indigenous	0.002	0.47	(0.29 – 0.76)
Aboriginal or Torres Strait Islander		1.00	(1.32 – 3.40)
Categories of Socio-economic disadvantage			
Bottom 5%		1.00	
5% – 10%	0.102	0.64	(0.37 – 1.09)
10% – 25%	0.043	0.63	(0.41 – 0.99)
25% – 50%	0.039	0.62	(0.40 – 0.98)
Top 50%	0.001	0.39	(0.22 – 0.69)

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



Table 4.19: All children — Predicted likelihood of having seen an Aboriginal Health Worker in previous six months, associated with selected family and community variables (a)

Child has seen an Aboriginal Health Worker in previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.001	2.01	(1.33 – 3.05)
Moderate	<0.001	4.27	(2.81 – 6.48)
High	<0.001	6.95	(4.10 – 11.90)
Extreme	<0.001	11.40	(5.80 – 22.60)
Indigenous status of primary carer			
Non-Indigenous	<0.001	0.43	(0.27 – 0.69)
Aboriginal or Torres Strait Islander		1.00	
Categories of Socio-economic disadvantage			
Bottom 5%		1.00	
5% – 10%	0.112	0.65	(0.38 – 1.10)
10% – 25%	0.035	0.61	(0.39 – 0.97)
25% – 50%	0.027	0.60	(0.38 – 0.94)
Top 50%	<0.001	0.37	(0.21 – 0.65)
Distance to local doctor or AMS			
0–5 kms		1.00	
6–20 kms	0.237	1.28	(0.85 – 1.91)
21–50 kms	0.018	0.58	(0.36 – 0.91)
> 50 kms	0.038	0.60	(0.37 – 0.97)
Family's financial strain			
Spending more money than we get		1.00	
Have just enough to get through to next pay	0.016	0.57	(0.36 – 0.90)
Some money left over each week but spend it	0.041	0.57	(0.34 – 0.98)
Can save a bit now and again	0.042	0.62	(0.39 – 0.98)
Can save a lot	0.022	0.37	(0.16 – 0.87)

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



Table 4.20: Children 4–17 years — Predicted likelihood of having seen a dentist in previous six months, associated with selected family and community variables (a)

Child has seen a dentist in the previous six months			
Parameter	Significance (p value)	Odds Ratio	95% CI
Level of Relative Isolation			
None		1.00	
Low	0.052	0.77	(0.59 – 1.00)
Moderate	0.304	0.85	(0.62 – 1.16)
High	0.173	1.43	(0.86 – 2.38)
Extreme	0.008	0.50	(0.30 – 0.83)
Primary carer education level			
1– 9 years		1.00	
10 years	0.745	0.95	(0.70 – 1.29)
11–12 years	0.11	1.28	(0.95 – 1.73)
13 years or more	0.005	1.95	(1.23 – 3.08)
No schooling	0.034	0.58	(0.35 – 0.96)
Not stated	0.31	1.44	(0.71 – 2.92)
Access to vehicle			
No		1.00	
Yes	<0.001	1.82	(1.39 – 2.38)
Indigenous status of primary carer			
Non-Indigenous	<0.001	1.85	(1.33 – 2.57)
Aboriginal or Torres Strait Islander		1.00	

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

