

6 Utilisation of health services

Introduction

Aggregate rates of health service usage provide an important 'proxy' indicator of population health status. For example, the extent of the population's use of general medical practitioner (GP) services, or of episodes of hospitalisation, is likely to be indicative of overall levels of illness in the community. As discussed in Chapter 1, it has been known for some time that the most

disadvantaged groups make the most use of primary and secondary health services (especially when there is universal access to services) and make the least use of preventative services. It is also clear that their poorer health status largely explains their greater use. Details of some of the differentials evident in the Australian data are in **Table 6.1**.

Table 6.1: Health service use by socioeconomic disadvantage of area and sex, Australia, late 1980s
Note: First quintile is high socioeconomic status and fifth quintile is low socioeconomic status

Age group (years) health status, health service use and risk measures	Rate/ratio for quintile of socioeconomic disadvantage of area			
	Males		Females	
	1st quintile	5th quintile	1st quintile	5th quintile
Children (0 to 14 years)				
hospital episodes	1.00	0.89	1.00	2.21
doctor visits	1.00	1.02	1.00	1.16*
dental visits	1.00	0.80**	1.00	0.59***
Youth (15 to 24 years)				
hospital episodes	1.00	1.30	1.00	1.16
doctor visits	1.00	1.25**	1.00	1.18**
dental visits	1.00	0.70***	1.00	1.01
Adults (25 to 64 years)				
hospital episodes	1.00	0.97	1.00	0.95
doctor visits	1.00	1.24***	1.00	1.04
dental visits	1.00	1.02	1.00	0.85**
Older people (65 years & over)				
hospital episodes	1.00	1.22	1.00	1.26
doctor visits	1.00	0.88*	1.00	1.28***
dental visits	1.00	1.36**	1.00	0.57***
All ages				
hospital episodes	1.00	1.05	1.00	1.16
doctor visits	1.00	1.10***	1.00	1.12***
dental visits	1.00	0.96	1.00	0.79***

Statistical significance: the greater the number of * the higher the level of significance: * p < 0.05: ** p < 0.01: * p < 0.001**
Source: Mathers, C. Health Monitoring Series Nos. 1 to 4, Australian Institute of Health & Welfare, AGPS, Canberra, 1994

It is possible, however, that despite higher rates of use, health or service needs are not fully met. This means that variations in rates between sub groups of the population (eg. for women, children, the aged, or for Indigenous Australians) may be indicating inequality of access, either physical access (which can be limited by factors such as lack of transport and cost, particularly the cost of services not covered by Medicare), or the quality of care provided (such as the level and quality of information provided as to the options for treatment, and alternatives which might otherwise reduce use of services).

Data mapped

The health services described include the use of public and private hospitals, services provided by GPs and rates of immunisation of children at the age of 12 months. These are services for which data necessary for analysis at a small area level can be obtained: such data include the age, sex and postcode or Statistical Local Area (SLA) of usual residence of the patient.

Measure mapped

Age-sex standardised ratios have been calculated and mapped for admissions to hospital and services provided by GPs by place

of usual residence of the patient or client, to illustrate the extent of variation in health service use between the populations of these areas. A brief description of the technique of standardisation, its purposes, and method of calculation, is in Appendix 1.3.

Variables mapped

The variables mapped represent only a selection of the full range of variables that could potentially be mapped from each dataset. For example, admissions to hospital (see box on page 185 for the definition of admission) of patients with any type of cancer and those with lung cancer specifically are mapped, but admissions resulting from cancer of the prostate are not mapped, as there were too few cases at the small area level from which to calculate reliable rates. The number of variables analysed and mapped was also constrained by the size of the atlas. The variables mapped, therefore, are those that represent a significant proportion of the activity for the topic; are known to be more prevalent among a particular population group; or are known to have a distribution which varies regionally.

A comparison of the mapped distribution of these measures of health service use with the maps in the other chapters indicates

the extent of association at the small area level between health service use and socioeconomic status and health status. The extent of association is also indicated by the results of the correlation analysis in Chapter 8.

Gaps and deficiencies in the data

Data collections

The coverage and availability of data from nation-wide statistical collections describing health service provision *at the small area level* have changed little since the first edition of the atlas was published in 1992.

An important development is that hospital inpatient data at the small area level are now largely available from a single source (the Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database). This contrasts with the situation in producing the first edition of the atlas, when hospital data were collected directly from State and Territory health authorities. Further, only New South Wales, Queensland, South Australia and Western Australia had complete collections at that time¹. There are, however, relatively small but significant deficiencies in the database. These deficiencies are described under *Deficiencies in the admissions data* (page 193).

As was the case in 1992, only the age and sex of the patients of GPs are available to be mapped. There is, for example, no information at a small area level of consultations with GPs which includes other client characteristics, such as reason for attendance (e.g. patient is unwell and nature of illness, has an injury, or is seeking advice), type of services provided (e.g. patient referred to other health practitioner, pharmaceutical drugs prescribed) or outcome (eg. patient referred to other health practitioner, course of treatment established). The lack of information on GP services represents a major gap in our ability to describe the work of these important primary health care providers, or to understand the appropriateness of the services provided or to assess the outcomes achieved.

Other major gaps in the availability of service usage data at the small area level are data describing:

- services provided to those using public hospital outpatient departments and accident and emergency clinics (a majority of these services are specialist medical consultations);
- services provided by specialist public psychiatric hospitals and other specialist mental health services; and
- services provided through community based care (e.g. community health services, including community mental health services), domiciliary care services and home based nursing and care services;
- health promotion and other public health programs, as well as information on community knowledge, attitudes and behaviours as to health, health status and health risks;
- the dispensing of prescribed pharmaceutical items, especially by type of medication; and
- terminations of pregnancy (see additional comments below).

¹The data for the private hospital in the Northern Territory was not available for the year of analysis (1989), but data for 1987 (before the private hospital was established) was available and used.

Some of these issues are discussed elsewhere in this chapter and details on statistics for cancer incidence and screening are included. As regards the data for termination of pregnancy, terminations are undertaken both in hospitals and in clinics which are not hospitals. These clinics are not, therefore, included in the State and Territory hospital data collections. In an attempt to obtain a complete dataset, details of the age and area of residence of women undergoing a pregnancy termination other than in a hospital were obtained from Health Insurance Commission data and added to the hospitals dataset. This combined dataset was compared with the data from States with complete coverage in their hospital collections, to see if it provided an accurate picture. Unfortunately the combined dataset was inconsistent with data from the other sources and this variable was not, therefore, mapped.

Other data issues

Similarly, due to inadequate identification of Indigenous Australians in hospital inpatient collections, admissions to hospital of Indigenous Australians remain understated and have not been mapped separately.

As discussed in Chapter 2, the lack of data items, such as income or education, in health statistics collections and the consequent inability to identify and analyse socioeconomic status directly is a major deficiency in the Australian data. Therefore the socioeconomic status of the area of usual residence of the client or patient is used as a proxy for the socioeconomic status of the client or patient. The limitations of this approach are discussed in Chapter 2, Methods under the heading *Usual residence*.

An over-riding deficiency in the hospital inpatient data is the lack of a unique identifier to allow for the analysis of data for individuals rather than admissions. This is discussed in more detail under *Deficiencies in the admission data* (page 193).

Admissions to hospitals

Introduction

There were almost 4.8 million admissions (see the box below) to hospitals in Australia in 1995/96 (43 thousand admissions in the Northern Territory), providing a major database of information for examining the more serious health problems faced by Australians, subject to the qualifications discussed below (*Deficiencies in the admissions data*, page 193)

Information available for admissions includes the age, sex, diagnoses and surgical and other procedures, as recorded in the patient's case notes at the time of discharge, transfer or death. Importantly for spatial analysis, the postcode or SLA of the address of usual residence of the patient is also recorded.

Recording details for a hospital episode (admissions)

The technical term describing a completed hospital episode (i.e. the discharge, death or transfer of a patient) is a 'separation'.

At the time of admission, the age, sex, address of usual residence and other personal details of the patient are recorded. At the end of the episode, at the time of separation from hospital, details of the episode itself are recorded, including the principal diagnosis (and other diagnoses), principal procedure (and other procedures), and the date, time and method (discharge, transfer or death) of separation. Consequently, hospital inpatient data collections are based on separations. In this atlas the more commonly used term of 'admission' has been used. In an analysis such as this, which excludes long stay patients (other than the few long stay acute patients), there is little difference between the number of admissions and the number of separations in a year. Also, 'admission' is a much more familiar term to many people who will use this atlas.

The maps in this chapter show the spatial patterns of admissions for a range of conditions, diseases and procedures. The following text describes some of the differences evident in the data in hospitalisation rates for specific population groups. Where available, comparisons are made with the data from the first edition of the atlas.

Differences in admission rates for specific population groups

Differences related to socioeconomic status

Those who are socioeconomically disadvantaged have higher admission rates than the population in general. Esterman et al. (1990) examined admissions by postcode of usual residence, and compared standardised admission rates of residents of postcodes categorised as low, medium and high income (based on household income). They found that when **Adelaide** postcodes were divided into three categories according to household income, hospital admissions were found to be 34 per cent more frequent for residents of the poorest than for the most affluent category. No condition showed a consistent upward trend in admission rates with increasing affluence, whereas the poorer areas had higher rates for a wide range of diseases and conditions, including ischaemic heart disease; infectious diseases; stroke; digestive system disorders; hypertension;

cancer; skin diseases; respiratory diseases; genito-urinary conditions; injuries; musculoskeletal conditions; diabetes mellitus; nutritional, immunity and other endocrine disorders; perinatal disorders; and metabolic disorders.

Summary results of the analysis of the 1989-90 National Health Survey (noted above in **Table 6.1**) show variations in hospitalisation rates by socioeconomic status. A study by The Centre for South Australian Economic Studies (1993) estimated that the variation in admission rates between postcodes can be linked to socioeconomic effects was as high as 47 per cent.

Differences for Aboriginal people

The Australian Bureau of Statistics and the Australian Institute of Health and Welfare have published age-standardised admission ratios for admissions of Indigenous Australians (ABS/AIHW 1999), highlighting the higher rates of admission of Indigenous people, both overall and for most specific causes (**Table 6.2**). For both men and women, the age-standardised admission rates were 1.7 times higher for Indigenous people than they were for other Australians (1.4 times when admissions for dialysis were excluded). The largest differentials in the rates for Indigenous Australians and other Australians were for admissions for dialysis (10.2 times higher for Indigenous females and 6.1 times higher for Indigenous males); diseases of the skin and subcutaneous tissue (3.2; 2.8); endocrine, nutritional and metabolic diseases and immunity disorders (both 2.8); infectious and parasitic diseases (2.2; 2.0); injury and poisoning (2.2; 1.7); and respiratory system diseases (2.3; 2.0). For Indigenous males, mental disorders were also recorded as a major cause of admission (2.5 times higher). It is likely that, given the low rate of identification of Indigenous people in the hospital admissions data, these statistics understate the extent of differentials in admission rates.

The higher admission rates of Indigenous Australians for individual causes are discussed in the introduction to each topic.

Table 6.2: Admissions of Indigenous Australians to public acute and private hospitals¹, by cause, Australia, 1996/97

Cause	Admissions identified as Indigenous		Age-standardised admission ratio ²		Proportion of total separations (%)	
	Males	Females	Males	Females	Males	Females
Infectious & parasitic diseases	2,286	2,253	2.0	2.2	3.6	2.8
Malignant neoplasms	1,040	1,396	0.7	0.7	1.7	1.7
Endocrine, nutritional & metabolic diseases & immunity disorders	1,259	1,531	2.8	2.8	2.0	1.9
Diseases of the blood & blood-forming organs	269	455	0.6	1.1	0.4	0.6
Mental Disorders	4,045	2,867	2.5	1.6	6.4	3.5
Diseases of the nervous system	3,197	2,695	1.4	1.3	5.1	3.3
Diseases of the circulatory system	3,143	2,742	1.7	2.0	5.0	3.4
Diseases of the respiratory system	7,665	7,073	2.0	2.3	12.2	8.7
Diseases of the digestive system	5,052	4,943	1.1	1.0	8.0	6.1
Diseases of the genitourinary system	1,558	4,548	1.1	1.2	2.5	5.6
Complications of pregnancy, childbirth and the puerperium	..	13,937	..	1.4	..	17.1
Diseases of the skin & subcutaneous tissue	2,382	2,303	2.8	3.2	3.8	2.8
Diseases of the musculoskeletal system & connective tissue	1,721	1,649	0.8	0.9	2.7	2.0
Congenital anomalies	338	300	0.5	0.6	0.5	0.4
Certain conditions originating in the perinatal period	980	850	0.8	0.9	1.6	1.0
Symptoms, signs & ill-defined conditions	3,459	3,879	1.5	1.5	5.5	4.8
Injury and poisoning	7,888	6,211	1.7	2.2	12.6	7.6
Other reasons for contact						
Dialysis	13,545	18,172	6.1	10.2	21.6	22.3
Other	2,876	3,755	0.8	0.9	4.6	4.6
Total	16,421	21,927	2.9	3.7	26.1	26.9
All causes (excluding dialysis)	49,293	63,454	1.4	1.4	78.4	77.7
All causes (including dialysis)	62,838	81,626	1.7	1.7	100.0	100.0

¹Excludes admissions to the Darwin Private Hospital

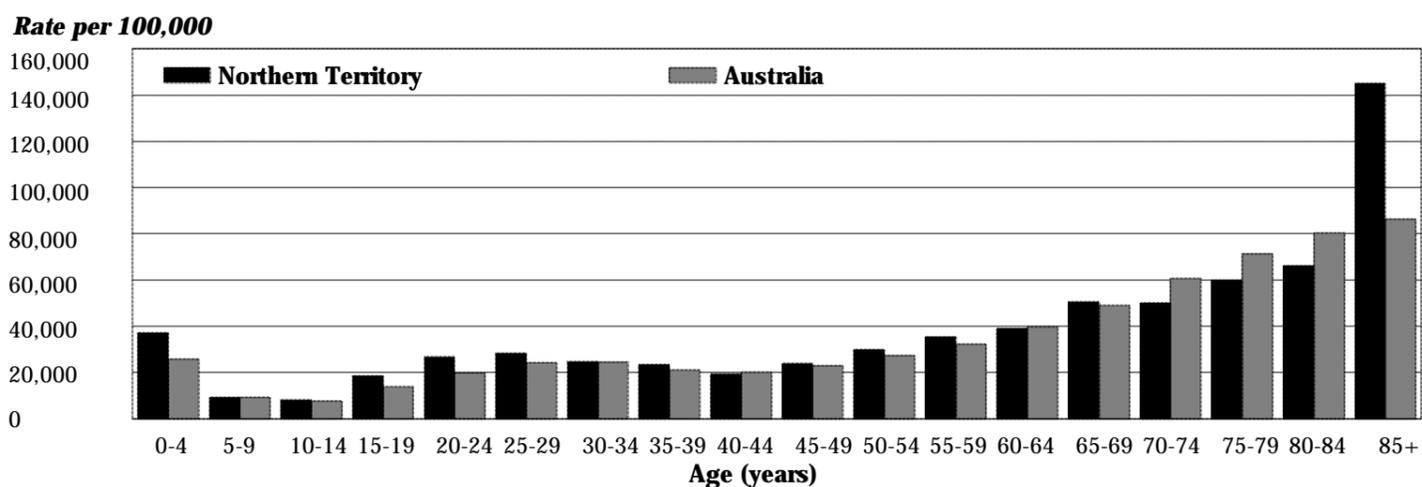
²Age-standardised hospital admission ratio is equal to hospital admissions identified as being of Indigenous people, divided by expected admissions, based on all-Australian rates

Source: ABS/AIHW, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, Table 7.19, p 112, 1999.

Differences between the Northern Territory and Australia

Figure 6.1 shows the rates of admission per 100,000 population for residents of the Northern Territory and Australia for each five year age group. Admission rates for the Northern Territory were generally higher than Australia, with the exception of people age 70 to 84 years.

Figure 6.1: Admissions to public acute and private hospitals, by age, Northern Territory and Australia, 1995/96



Source: See Data sources, Appendix 1.3

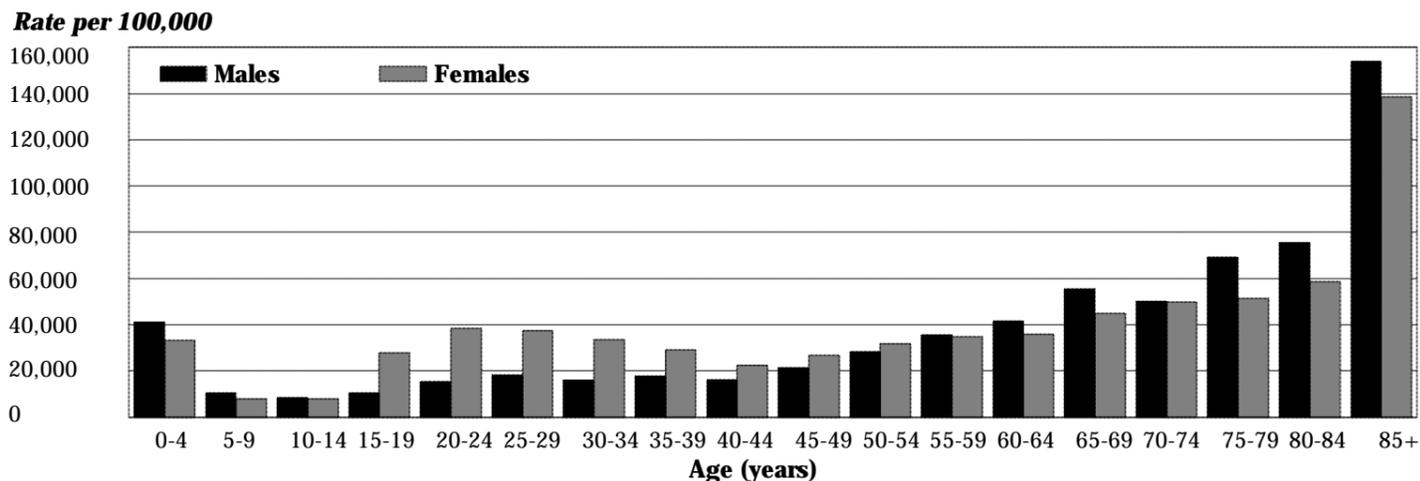
Differences related to age, sex and hospital type

Figures 6.2 to 6.10 show, for a selection of the variables mapped, the rates of admission for each five year age group per 100,000 population for residents of the Northern Territory admitted to a hospital.

Females accounted for 56.0 per cent of admissions, 21.5 per cent more than males in 1995/96 (Figure 6.2). This pattern is not consistent across all age groups. The largest divergence in admission rates (admissions per 100,000 population) for males and females occurs in the 15 to 19 year age group, with the

female rate 2.7 times that for males. Female rates in the 20 to 24 (2.5 times), 25 to 29 (2.1 times) and 30 to 34 (2.1 times) year age groups were still well above those for males. These higher rates largely reflect episodes of hospitalisation for childbirth and associated admissions. The rates for males were higher than for females among those aged from 0 to 4, 5 to 9 and 10 to 14 years, and from age 55 (the greatest disparity being the rates for 60 to 64 and 65 to 69 year old males) 1.2 times higher than the corresponding female rates.

Figure 6.2: Admissions to public acute and private hospitals, by age and sex, Northern Territory, 1995/96



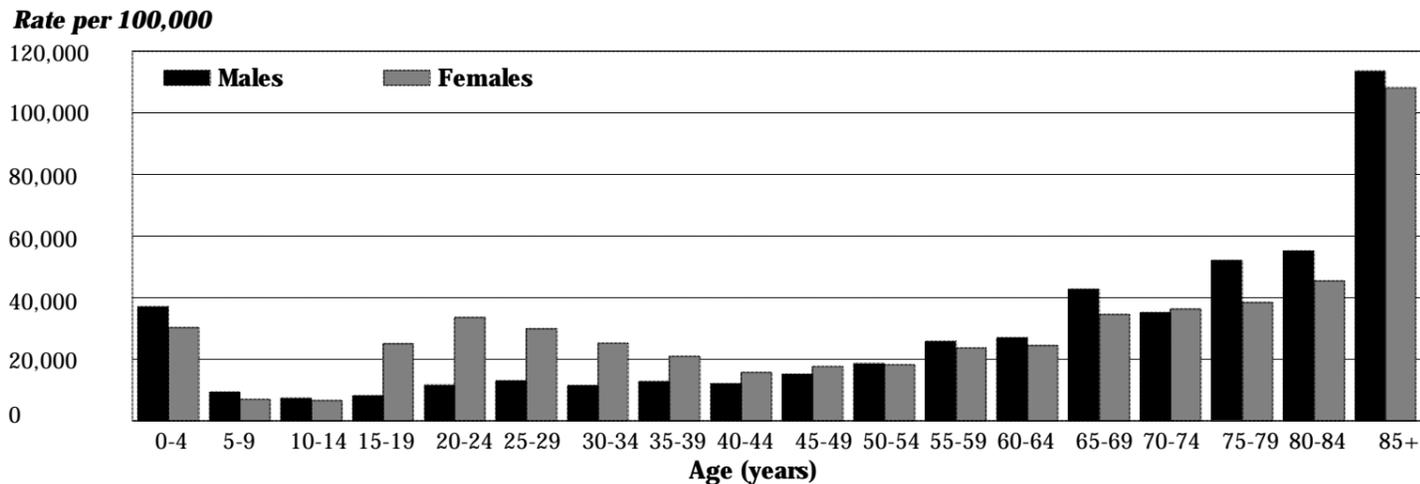
Source: See Data sources, Appendix 1.3

The profile of admissions to public acute hospitals (Figure 6.3) is markedly similar to that for all admissions (Figure 6.2). Higher rates of admissions of females are evident from the 15 to 19 year age group through to the 45 to 49 year age group. Male rates are higher at the youngest ages, and again from the 55 to 59 year age group (with the exception of the 70 to 74 year age group).

Overall, private hospitals accounted for 22.6 per cent of the admissions analysed for the Northern Territory. Males use private hospitals for a greater proportion of their admissions than do

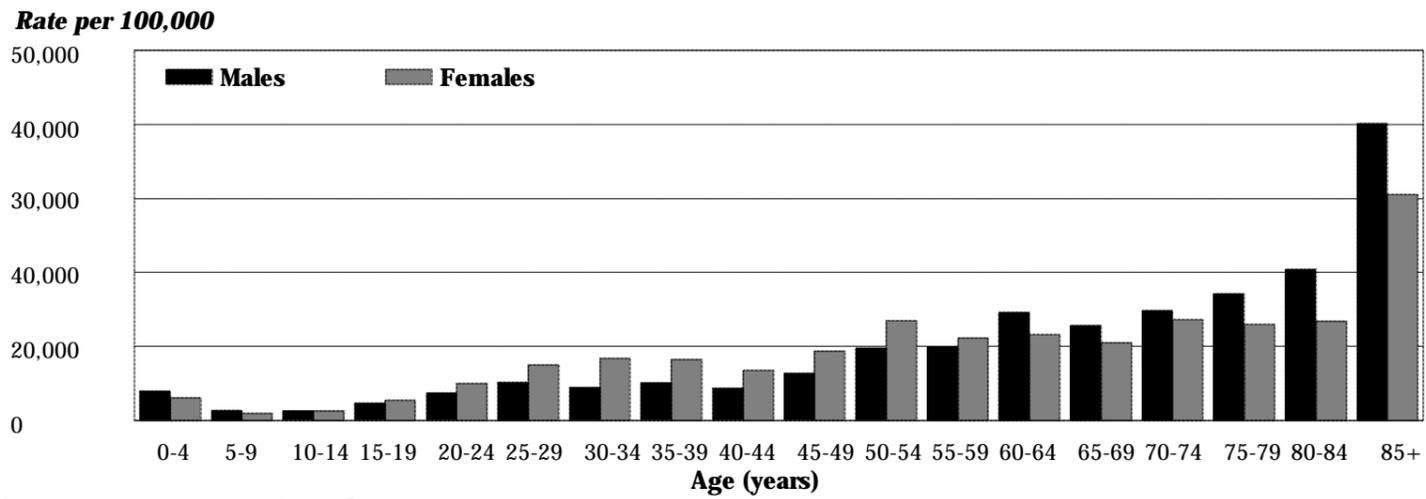
females, with admissions to private hospitals representing 23.5 per cent of all male admissions studied (compared with 21.9 per cent for females): however, males accounted for less than half (45.6 per cent) of private hospital admissions (43.5 per cent in public acute hospitals). The pattern of admissions to private hospitals by age and sex (Figure 6.4) is again similar to that in the previous graphs. The most noticeable differences are the lower overall rates of admission and the lower admission rates for females above 80 years of age.

Figure 6.3: Admissions to public acute hospitals, by age and sex, Northern Territory, 1995/96



Source: See Data sources, Appendix 1.3

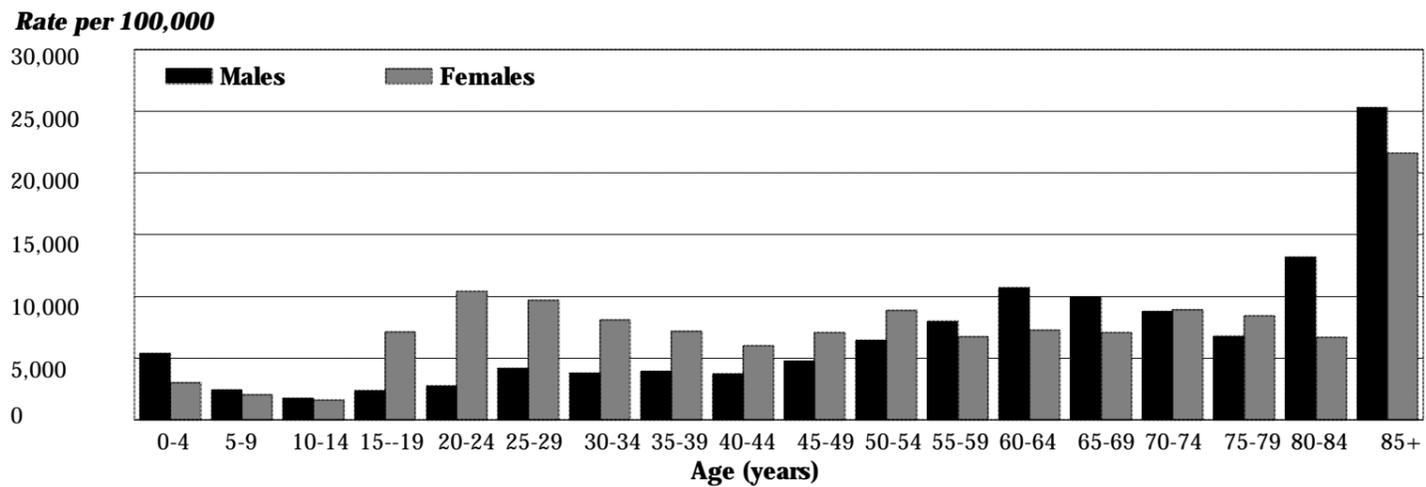
Figure 6.4: Admissions to private hospitals, by age and sex, Northern Territory, 1995/96



Source: See *Data sources*, Appendix 1.3

The general pattern of higher admission rates among females aged 15 to 44 years and among males in the youngest and oldest age groups, is also evident for same day admissions (Figure 6.5). However, there are some notable differences. From the age of 25 years, male rates remain reasonably consistent, increasing marginally in the 50 to 64 age groups before declining to the 75 to 79 year age groups and increasing at age 80 years and over. Same day admission rates for females are similar to the rates recorded for total admissions until the 75 to 79 year age group, from where they begin to decline until age 85.

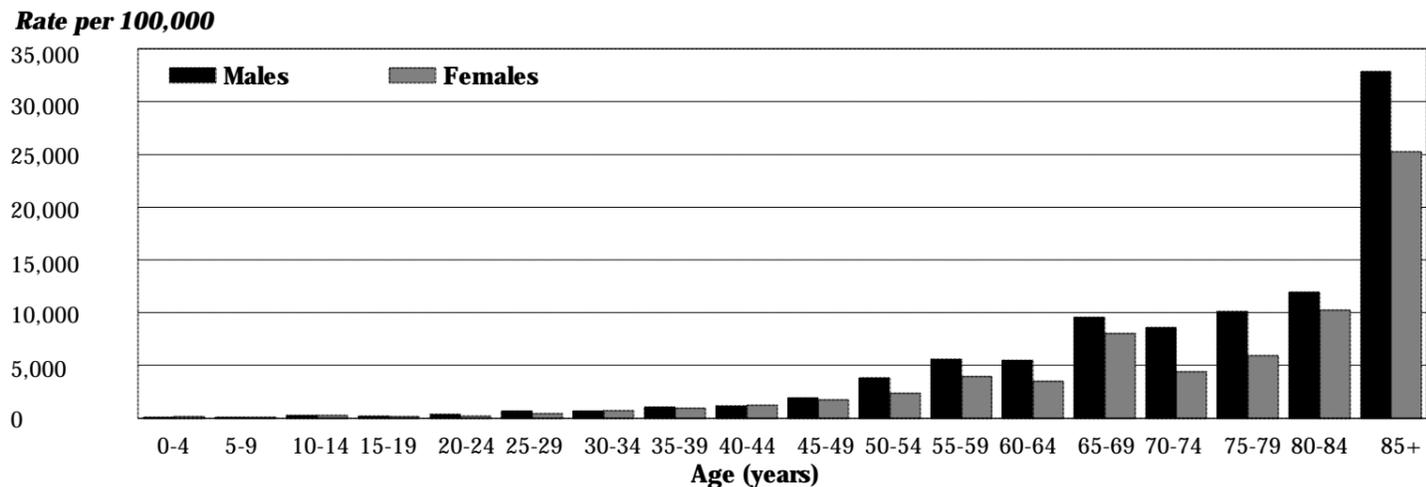
Figure 6.5: Same day admissions, by age and sex, Northern Territory, 1995/96



Source: See *Data sources*, Appendix 1.3

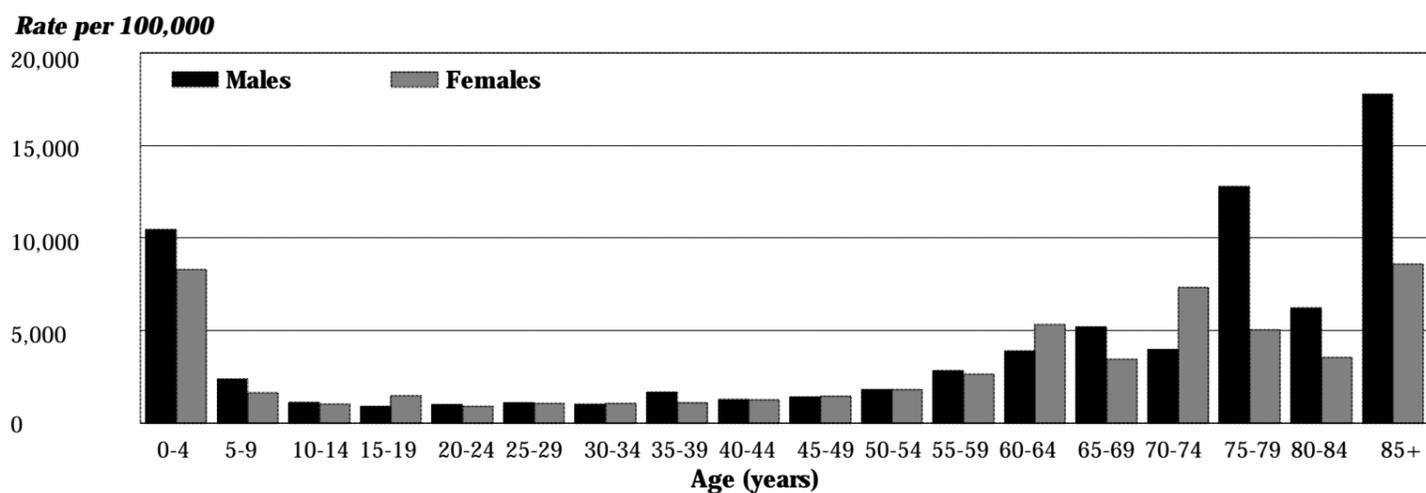
Figure 6.6 and **Figure 6.7** show admissions for circulatory and respiratory system diseases, respectively. **Figure 6.6** highlights the steep rise in hospital admissions for circulatory system diseases from the age of 40 years, with males predominating across almost all age groups. Admission rates for respiratory system diseases were highest among children aged from 0 to 4 years and people aged 85 years and over, with little difference between the age groups from 10 to 54 (**Figure 6.7**): males predominate in the majority of these groups.

Figure 6.6: Admissions for circulatory system diseases, by age and sex, Northern Territory, 1995/96



Source: See *Data sources*, Appendix 1.3

Figure 6.7: Admissions for respiratory system diseases, by age and sex, Northern Territory, 1995/96

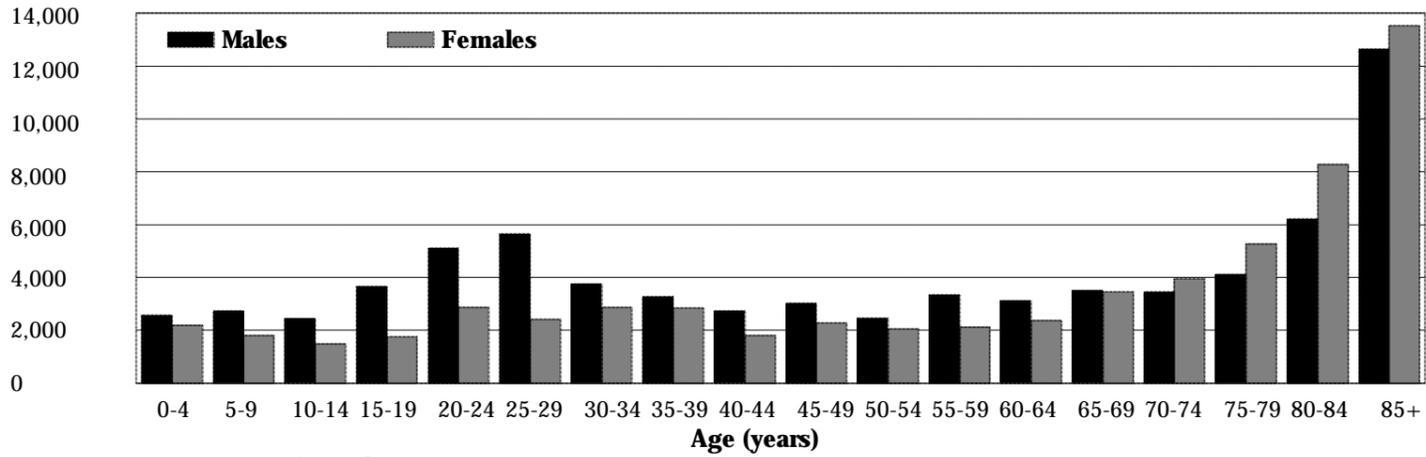


Source: See *Data sources*, Appendix 1.3

Male and female admission rates for accidents, poisonings and violence (**Figure 6.8**) are in direct contrast with the pattern for total admissions (**Figure 6.2**). Males predominate in all age groups up to and including the 65 to 69 year age group, with the largest differentials between the ages of 10 and 34 years. Female admission rates are consistent across most of the age groups until around the 70 to 74 year age group, after which the rates begin to increase steadily, and to exceed eventually those for males.

Figure 6.8: Admissions from accidents, poisonings and violence, by age and sex, Northern Territory, 1995/96

Rate per 100,000



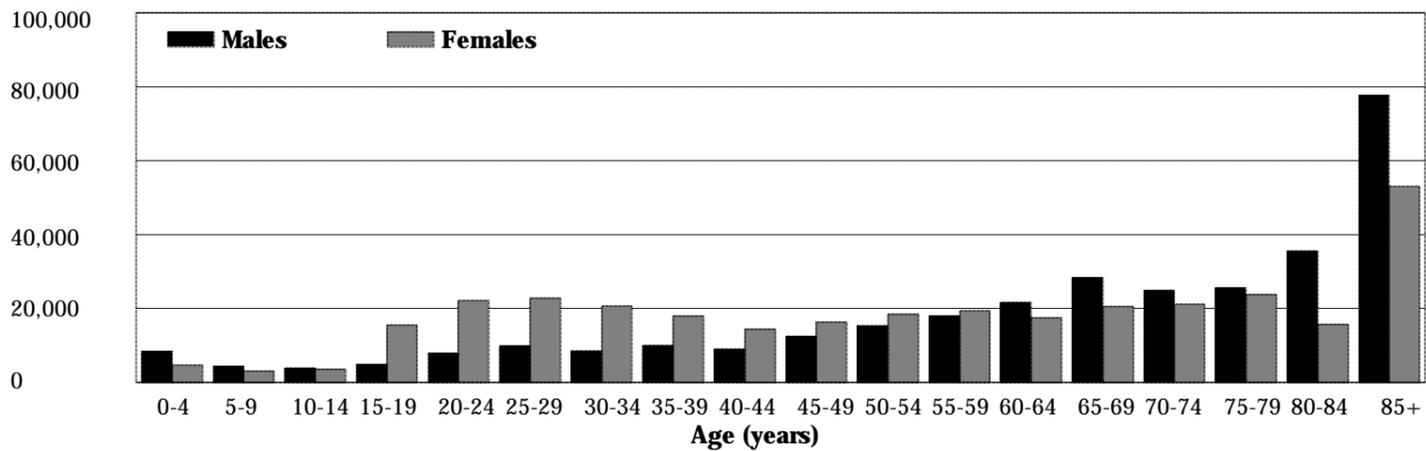
Source: See *Data sources*, Appendix 1.3

There is little variation in admission rates by either age or sex for admissions for a surgical procedure (Figure 6.9) and same day admissions for a surgical procedure (Figure 6.10), with the major difference occurring for males aged from 75 to 79 years. Within

this age span, rates for same day admissions of males for a surgical procedure decreased, rather than remain consistent as they did for total surgical admissions.

Figure 6.9: Admissions for a surgical procedure, by age and sex, Northern Territory, 1995/96

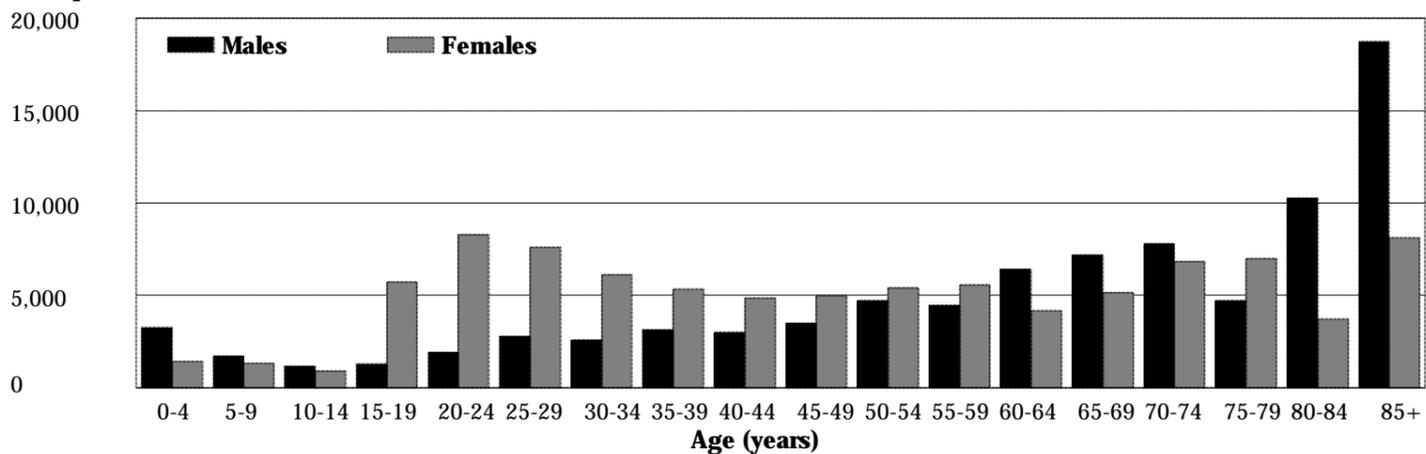
Rate per 100,000



Source: See *Data sources*, Appendix 1.3

Figure 6.10: Same day admissions for a surgical procedure, by age and sex, Northern Territory, 1995/96

Rate per 100,000



Source: See *Data sources*, Appendix 1.3

Differences related to area of residence

In addition to the differences noted above in relation to variations in admission rates between population groups, there are notable variations in hospitalisation rates between residents of the capital cities and the non-metropolitan areas. In many instances, admission rates are considerably higher for country residents than they are for city residents. Examples of these differences can be seen in many of the tables in this chapter. Some suggested reasons for the higher rates of admissions of residents of these non-metropolitan areas are given below. In some cases these comments reiterate those for the population groups discussed above.

Some suggested reasons for the higher admission rates of residents of the non-metropolitan areas:

Isolation and distance

Factors such as distance and isolation of people living in these, often remote, areas are important. In country areas, people are more likely to be admitted 'for observation' than be sent home if their homes are a significant distance from the hospital.

Higher risks faced

A higher proportion of the population of these areas are engaged in activities in agriculture and the mining industry, which have relatively high rates of accidents and injuries, often leading to hospitalisation. Higher rates of motor vehicle traffic accidents for people living in rural and remote areas, who are driving longer distances and more often, are also a contributing factor.

Lack of, or inadequate, alternative options/services such as community based care and respite care services

In the absence of community based care, respite care and other services, hospitals in country areas often have a 'surrogate' caring role. This includes, in some instances, admitting people who would otherwise go to specialist psychiatric hospitals; and providing the respite care found in other types of institutions in major urban centres for the aged and younger people with physical and intellectual disabilities. There are also occasions where the circumstances of individuals or families are such that they do not have adequate resources and/or support available which result in hospital admissions. For example, a child of a single parent, living in a country town where there are limited family or community support services, may be more likely to be admitted to hospital for a minor condition, or for observation. This type of situation is often referred to as a 'social admission'.

Ready availability of beds

There is clear evidence that if there is a ready supply of hospital beds, they will be used: this is particularly likely to occur when linked with a lack of appropriate alternative services as mentioned above. Generally more beds are available in country than in city hospitals.

Higher rates of admission of Aboriginal people

In addition to the greater burden of ill health among Indigenous people noted above on page 185, higher rates of hospitalisation for Aboriginal people in the non-metropolitan areas are also likely to reflect significantly larger proportions of Indigenous people resident in these areas.

Explanatory notes

Classification of hospitals

Hospitals can be classified as 'acute hospitals' or 'psychiatric hospitals'. Acute hospitals are those which

"provide at least minimal medical, surgical or obstetrical services for inpatients, and which provide round-the-clock comprehensive qualified nursing services as well as other necessary professional services. They must be licensed by the State health authority controlled by government departments. Most of the patients have acute conditions or temporary ailments and the average stay per admission is relatively short." (AIHW, 1998).

Acute hospitals are further classified as 'public' (those hospitals recognised under the Medicare agreement, plus Veterans' Affairs hospital) or 'private'.

Psychiatric hospitals mainly provide treatment and care to patients with psychiatric, mental or behavioural disorders. Public psychiatric hospitals treat people with the most severe psychiatric conditions: this group tends to be mainly older people, and to have longer lengths of stay. Public acute and private acute hospitals and private psychiatric hospitals treat people with less severe psychiatric conditions².

Data for public psychiatric hospitals are not available for all States and Territories in a standard format and was not able to be included.

Coverage

Hospital admissions data presented in this atlas include episodes of hospitalisation in public acute and private (acute and psychiatric) hospitals. To enhance consistency, admissions of long stay nursing home type patients (patients with a length of stay in hospital of 35 days or longer and not considered to be 'acute' patients) have been excluded because the proportion of these patients in public hospitals varies between, and within, the States and Territories. Around three quarters of bed days for patients in this category occurred in hospitals in non-metropolitan areas, with the exception of the Northern Territory where the proportion was just one quarter (24.9 per cent). The average across the non-metropolitan areas of the remainder of Australia was 69.9 per cent.

All admissions, including admissions of same day patients, have been included with the exception of admissions for renal dialysis. Same day admissions for renal dialysis have been excluded as they cover many repeat visits by a relatively small number of patients, who may have several admissions in a week.

²Some larger acute public hospitals (generally teaching hospitals) have dedicated psychiatric units. However patients treated in public acute hospitals (but not in the psychiatric unit) and in private hospitals may also, at the end of their hospital episode, be given a diagnosis indicating their principal condition was a mental disorder. These cases are included in the data analysed and mapped here in this atlas.

Further, an examination of the data suggests that some patients have changed address to live close to the location of renal dialysis facilities, thus distorting the patterns of use by address of usual residence. It should be noted that the acute episodes analysed also include repeat admissions, although not to the extent occurring among same day patients (in particular those requiring chemo-therapy or renal dialysis).

Data issues

Data mapped

The analysis of admissions has been restricted to examining admissions for all causes (separately for public acute and private

hospitals, and for females and males); and selected diagnoses (based on the patient's principal diagnosis); and selected procedures (based on the patient's principal procedure), which are major contributors to variations in the pattern of distribution of hospitalisation at the regional and small level, and are known to be associated with socioeconomic status. These admissions (**Table 6.3**) represent 78.3 per cent of total acute admissions for 1995/96.

Standardised admission ratios have been calculated for SLAs by indirect age-sex standardisation. A description of the technique of standardisation is in Appendix 1.3.

Table 6.3: Public acute and private hospital admissions included in the analysis¹, Northern Territory, 1995/96

Principal diagnosis/procedure	Same day		Overnight		Total	
	No.	% ²	No.	% ²	No.	% ²
Principal diagnosis						
Infectious and parasitic diseases	130	1.4	1,786	5.3	1,916	4.5
Cancer						
lung cancer	11	0.1	64	0.2	75	0.2
cancer of the female breast	21	0.2	77	0.2	98	0.2
Total cancer	295	3.2	860	2.5	1,155	2.7
Mental disorders						
psychosis	48	0.5	505	1.5	553	1.3
neurotic, personality or other mental disorders	46	0.5	460	1.4	506	1.2
Total mental disorders	94	1.0	971	2.9	1,065	2.5
Circulatory system diseases						
ischaemic heart disease	26	0.3	617	1.8	643	1.5
Total circulatory diseases/disorders	185	2.0	1,865	5.5	2,050	4.8
Respiratory system diseases						
bronchitis, emphysema and asthma	39	0.4	587	1.7	626	1.5
Total respiratory diseases/disorders						
0 to 4 year olds	79	0.9	1,443	4.3	1,522	3.5
all ages	285	3.1	3,614	10.7	3,898	9.1
Accidents, poisonings and violence	607	6.6	4,228	12.5	4,835	11.2
All causes (excl. renal dialysis)						
Females	5,482	59.2	18,634	55.2	24,116	56.0
Males	3,779	40.8	15,140	44.8	18,919	44.0
Public acute hospitals (excl. renal dialysis)	7,613	82.2	25,688	76.1	33,301	77.4
Private acute & psychiatric hospitals (excl. renal dialysis)	1,648	17.8	8,085	23.9	9,734	22.6
Total admissions (excl. renal dialysis)	9,261	100.0	33,774	100.0	43,035	100.0
Total admissions						
Admissions for renal dialysis	11,865	56.2	36	0.1	11,901	21.7
All other admissions	9,261	43.8	33,774	99.9	43,035	78.3
Total admissions (incl. renal dialysis)	21,126	100.0	33,810	100.0	54,936	100.0
Principal procedure						
Tonsillectomy	82	1.2	109	0.7	191	0.9
Myringotomy	181	2.7	20	0.1	201	0.9
Caesarean section	4	0.1	700	4.8	704	3.3
Hysterectomy	0	0.0	313	2.1	313	1.5
Hip replacement	0	0.0	42	0.3	42	0.2
Lens insertion	131	2.0	189	1.3	320	1.5
Endoscopy	1,138	17.2	940	6.4	2,078	9.8
Total (incl. all other) procedures	6,626	100.0	14,596	100.0	21,222	100.0

¹Excludes long stay nursing home type patients: includes admissions of residents of New South Wales, regardless of the State/Territory of the hospital to which they were admitted

²Percentage of Total admissions for Principal diagnosis and of Total procedures for Principal procedures

Source: See *Data sources*, Appendix 1.3

Deficiencies in the admissions data

As noted above, the majority of hospital inpatient data at the small area level are now available from the Australian Institute of Health and Welfare National Hospital Morbidity Database. There are a number of deficiencies for small area analysis in this database.

For example, the database does not include the address of usual residence at the SLA level for admissions of people occurring outside their home State or Territory. These admissions are of particular significance in places such as the Gold Coast, with people from New South Wales (and in particular from Tweed Heads), being major users of Gold Coast hospitals. Other examples are cross-border flows between Albury (in New South Wales) and Wodonga (in Victoria), and between Canberra and Queanbeyan and other surrounding parts of New South Wales (see **Table 6.5**).

Secondly, the Queensland Health Department does not provide the usual residence of the patient to the AIHW by SLA (as do other States and Territories), instead only making the data available by Statistical Subdivision.

In both of these instances, the State and Territory authorities were approached and provided the necessary data to make the database complete to enable mapping at the SLA level.

A third shortcoming of the National Hospital Morbidity Database is that the Darwin Private Hospital is not included in the Northern Territory hospital inpatient collection. This is the only hospital of significant size (across Australia) that was not included in the 1995/96 database, and remains so. As it accounts for some 20 per cent of admissions occurring in the Northern Territory, it is essential that it be included in any analysis and mapping at the small area level. Fortunately, the Manager of Patient Services at the Darwin Private Hospital arranged for the necessary details (of the age, sex, principal diagnosis, principal procedure and postcode of address of each admission) to be provided to the atlas project. To maintain confidentiality of the hospital's data, admissions to the private hospital in the Northern Territory have not been mapped separately as they have for the other States and the Australian Capital Territory. As the finest detail of patient address was the postcode, it has not been possible to map this data at the SLA level in Darwin (where SLAs are smaller than postcode areas).

The lack of a unique patient identifier represents a major deficiency in analysing data for individuals rather than admissions. Although many hospitals have unique identifiers for patients within their hospitals, such identifiers do not exist between hospitals³. Thus the data includes repeat admissions and is, therefore, of limited value in describing patterns of hospitalisation for individuals. These issues also apply to many other collections of service utilisation data.

Differences in data treatment between editions

In the first edition of the atlas all same day patients were excluded from the analysis, and were not mapped. The decision to exclude this group of patient episodes was based on a concern

³Although potentially useful as an identifier, the Medicare number is not always included on inpatient records. Nor is it a unique identifier, with some individuals having more than one number.

that the inclusion of such admissions could distort the patterns of admission at the SLA level. This could occur because the measure mapped is the number of admissions, and not the number of individuals (for which data are not available). In any year an estimated 20 per cent of the population is admitted to hospital (ABS 1997) and most of those admitted have only one admission in any year. However, some conditions, because of their nature, require many repeat admissions. Admission rates for SLAs with above average proportions of such repeat admissions will be distorted. Examples of such admissions are those for renal dialysis and chemotherapy, which may require admission to hospital (or to a same day clinic) every few days, or even daily. It became evident from an examination of the patterns of distribution of admissions for same day patients that some people had moved residence to live in close proximity to the unit they attended for treatment. For this reason same day admissions were excluded from the analysis in the first edition.

Same day admissions have increased to comprise an even greater proportion of all admissions, and to cover a growing range of conditions and procedures, and this approach is no longer appropriate. Instead, the data analysed for this second edition includes all same day procedures with the exception of admissions for renal dialysis, as it is for these admissions that it appears likely that people may have moved residence. The exclusion of admissions for renal dialysis resulted in the exclusion of 11,901 admissions in 1995/96, 21.7 per cent of all admissions (**Table 6.3**). In this way the major distorting influence is removed, but the large number of other same day admissions is included. It should be noted that the admissions for renal dialysis excluded were admissions specifically for dialysis (ie. for continuous ambulatory dialysis). Admissions during which renal dialysis was undertaken as an integral component of the episode are included.

In hindsight, it would have been more appropriate to have used this approach in the first edition of the atlas. Had this been done a major differential evident between the standardised ratios for many of the variables for New South Wales in relation to those for the other States could well have been explained (and, at least in part, removed). For example, in 1989-90, the standardised admission ratio (SAR) for both male and female residents of New South Wales was 80. The equivalent ratios for South Australia were 104 for males and 102 for females. For both males and females this represents a differential of just over 25 per cent.

In 1989-90, same day patients accounted for some 27.8 per cent of all admissions in New South Wales and a lower 22.7 per cent in South Australia (1989) (**Table 6.4**)⁴. It is likely that the inclusion of the same day figures in the analysis for the first edition may have reduced, or eliminated, the differentials reported. It is interesting to note that the differential in the proportion of admissions represented by same day patients in these two States has declined substantially, from 22.5 per cent in 1989, to 7.1 per cent in 1995/96. A similar narrowing has occurred across all of the States.

⁴The comparison in **Table 6.3** has been limited to these two States out of the four mapped in the first edition because of the ready availability of the data for the earlier period shown: they were also the States with the greatest differentials in standardised ratios.

Table 6.4: Public acute and private hospital admissions, by type of admission: Comparison between editions¹

Admission type	1989 ²		1995/96	
	Number	Per cent	Number	Per cent
South Australia				
Same day				
Renal dialysis	13,927	3.9	34,766	7.6
Other	67,881	18.8	144,725	31.6
Total same day	81,808	22.7	179,491	39.2
Overnight stay	278,521	77.3	278,437	60.8
Total admissions	360,329	100.0	457,928	100.0
New South Wales				
Same day				
Renal dialysis	60,022	4.8	111,065	6.3
Other	289,489	23.0	627,508	35.7
Total same day	349,511	27.8	738,573	42.0
Overnight stay	904,099	72.2	1,017,892	58.0
Total admissions	1,253,610	100.0	1,756,465	100.0

¹The comparison in this table has been limited to these two States out of the four mapped in the first edition of the atlas because of the ready availability of the data for the earlier period shown: they were also the States with the greatest differentials in standardised ratios

²1989-90 for New South Wales

Source: See *Data sources*, Appendix 1.3

There were 43,035 admissions to hospital of residents of the Northern Territory in 1995/96, of which 92.5 per cent were admissions to hospitals within the State (**Table 6.5**). Of the small proportion (7.5 per cent) of admissions occurring in another State, 4.4 per cent were admitted to hospitals in South Australia, 1.5 per cent were admitted to Queensland hospitals and 0.7 were admitted to hospitals in New South Wales.

Table 6.5: Admissions of residents of Northern Territory by State/Territory of location of hospital, 1995/96

Place of residency	Location of hospital								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
Number	278	154	658	1,817	241	5	39,825	3	43,035
Per cent	0.65	0.36	1.53	4.35	0.56	0.01	92.54	0.01	100.00

Source: See *Data sources*, Appendix 1.3

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Admissions to public acute hospitals and private hospitals, 1995/96

Capital city comparison (Australia as the Standard)

The admissions included in this analysis are described in detail on page 191. In brief, they include acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit. The area for which admissions are mapped relates to the address of usual residence recorded in the hospital's administrative records.

The low standardised admission ratios (SARs) in **Canberra** (70**) and **Perth** (88**) provided the largest variation from the *All capitals* ratio of 97**, with only **Hobart** (102**), **Adelaide** (101**) and **Darwin** (101) recording ratios above the level expected from the Australian rates. The main difference evident in standardised admission ratios between the two periods shown in **Table 6.6** was the substantially lower differential (from the Australian rates) in the SAR recorded for **Sydney** in 1995/96. The higher SAR in this later period suggests an increase (relative to the Australian rates) in admission rates between the periods analysed. A similar, although substantially smaller, increase occurred in **Darwin**, while there was a small decrease (relative to the Australian rates) for admissions of residents of **Adelaide** and **Perth**.

Table 6.6: Admissions to public acute hospitals and private¹ hospitals, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
1995/96 ³	99**	97**	98**	101**	88**	102**	101	70**	97**
1989 ⁴	80**	..	98*	103	93*	..	100*	..	89**

¹Includes acute and psychiatric hospitals and day surgery facilities

²Includes Queanbeyan (C)

³Includes same day admissions, other than for renal dialysis

⁴Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As the private hospital data for the Northern Territory were only available by postcode, the SLA map for total admissions to public acute and private hospitals of residents of **Darwin** has not been included, and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 17,894 admissions to public acute and private hospitals of residents of **Darwin**, 10 per cent fewer admissions than were expected from the Northern Territory rates (an SAR of 90**). Females accounted for 55.5 per cent of these admissions.

Postcodes (aggregates of suburbs)

The SARs for total hospital admissions in **Darwin** did not extend over a particularly wide range (**Map 6.1**). The highest ratio, an SAR of 106**, was recorded for residents of Palmerston, with 6 per cent more admissions than expected from the Northern Territory rates. Darwin: South West, with an SAR of 102, also recorded an elevated ratio.

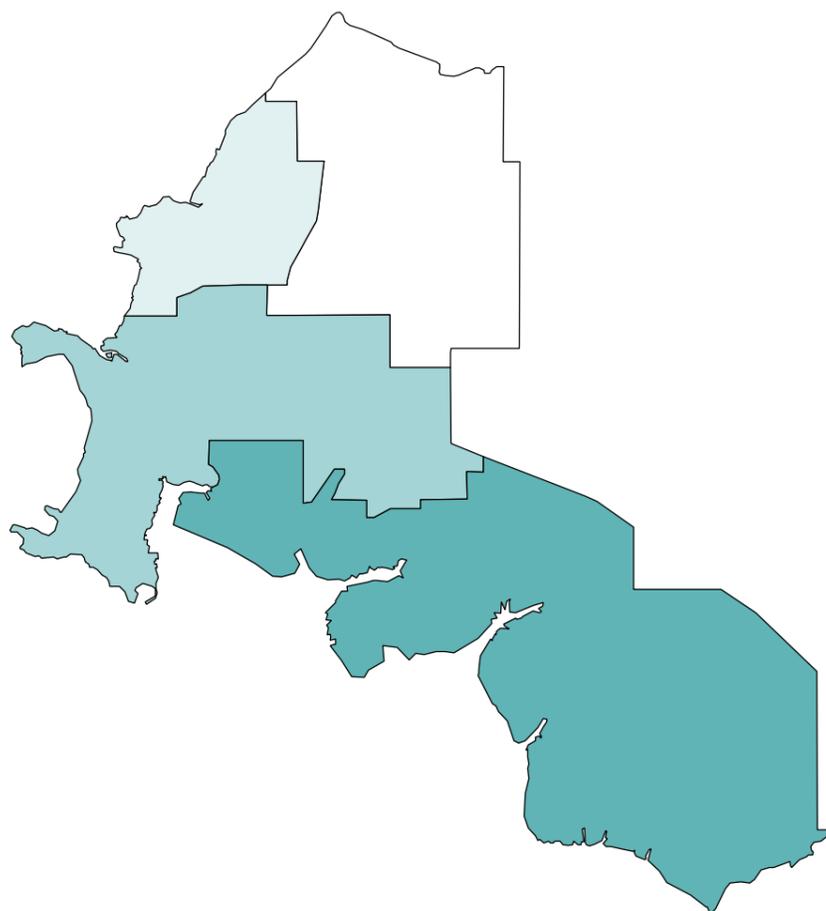
Darwin: North West had an SAR of 85** and Darwin: North East, with an SAR of 79**, recorded the lowest ratio (21 per cent fewer hospital admissions than were expected from the Northern Territory rates).

The residents of Darwin: North West had the largest number of hospital admissions, with 6,017 admissions. Residents of Darwin: South West and Darwin: North East recorded similar numbers of 4,536 and 4,193 admissions, respectively. The lowest number of admissions, 3,147, was recorded for residents of Palmerston.

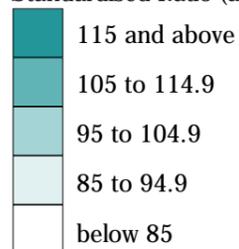
Map 6.1

Admissions to public acute hospitals and private hospitals, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions to public acute hospitals and private hospitals, 1995/96

State/Territory comparison (Australia as the Standard)

The admissions in this chapter include all acute admissions to hospitals in Australia, as well as including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

The most highly elevated standardised admission ratios (SARs) for residents of the non-metropolitan areas were those for the Northern Territory (123**) and South Australia (118**), with elevated SARs in all but Tasmania (**Table 6.7**). The notes on page 191, under the heading *Some suggested reasons for the higher rates of hospitalisation in country areas*, are of relevance in understanding these high admission rates. At the *Whole of State/Territory* level, the Northern Territory had the highest SAR in 1995/96 for this dataset (an SAR of 113**), followed by South Australia (105**) and Queensland (103**).

In all of the States and Territories for which data are available for both periods, SARs were lower in the later period. The main differences are the substantially lower differentials (from the Australian rates) in the SARs recorded for the Northern Territory, Western Australia and South Australia in 1995/96. The lower SARs in this later period suggest a reduction (relative to the Australian rates) in admission rates for non-metropolitan residents between the periods analysed.

Table 6.7: Admissions to public acute hospitals and private¹ hospitals, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96²									
Capital city	99**	97**	98**	101**	88**	102**	101	70**	97**
Other major urban centres ³	94**	83**	97**	..	..	..	..	..	94**
Rest of State/Territory	107**	105**	111**	118**	112**	92**	123**	- ⁴	108**
Whole of State/Territory	101**	99**	103**	105**	95**	96**	113**	69**	100
1989⁵									
Rest of State/Territory	118**	..	123**	136**	151**	..	172**	..	127**

¹Includes acute and psychiatric hospitals and day surgery facilities

²Includes same day admissions, other than for renal dialysis

³Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

⁴Data unreliable: included with ACT total

⁵Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 25,141 admissions of residents of the non-metropolitan areas of the Northern Territory to public and private hospitals, eight per cent more than expected from the Northern Territory rates (an SAR of 108**). Some comments on the possible reasons for the generally higher admission ratios for residents of country areas are provided on page 191. Over half (56.4 per cent) of these admissions were females.

Standardised admission ratios for the non-metropolitan SLAs covered a wide range of values, with most SLAs recording an elevated ratio (**Map 6.2**). Three SLAs had ratios in the top range mapped, with the highest ratio by far (an SAR of 228**) recorded for residents of the town of Tennant Creek, where hospital admissions were over two and a quarter times the number expected from the Northern Territory rates. Elsey Balance (150**) and Sandover-Balance (144**) also had ratios in the top range.

Residents of four SLAs recorded highly significant ratios in the range from 110 to 129. In the north of the state, Bathurst-Melville had the highest ratio in this range (an SAR of 129**). Residents of Gulf (120), Katherine (119**) and East Arnhem-Balance (118**) in the north east and Tanami (128**) in the south-west were also in this group.

With the exception of Katherine, Indigenous Australians comprised over thirty per cent of the populations of all areas mentioned so far. Nine SLAs recorded ratios in the middle range mapped, but only Daly (with an SAR of 108*) and West Arnhem (107*) had SARs of statistical significance.

The residents of Litchfield [Part A] (16**) and South Alligator (55**) had the lowest ratios, although they represented just 21 and 90 admissions respectively. Other significantly low ratios were recorded in Jabiru (75**), Tennant Creek-Balance (78**) and Litchfield [Part B] (84**).

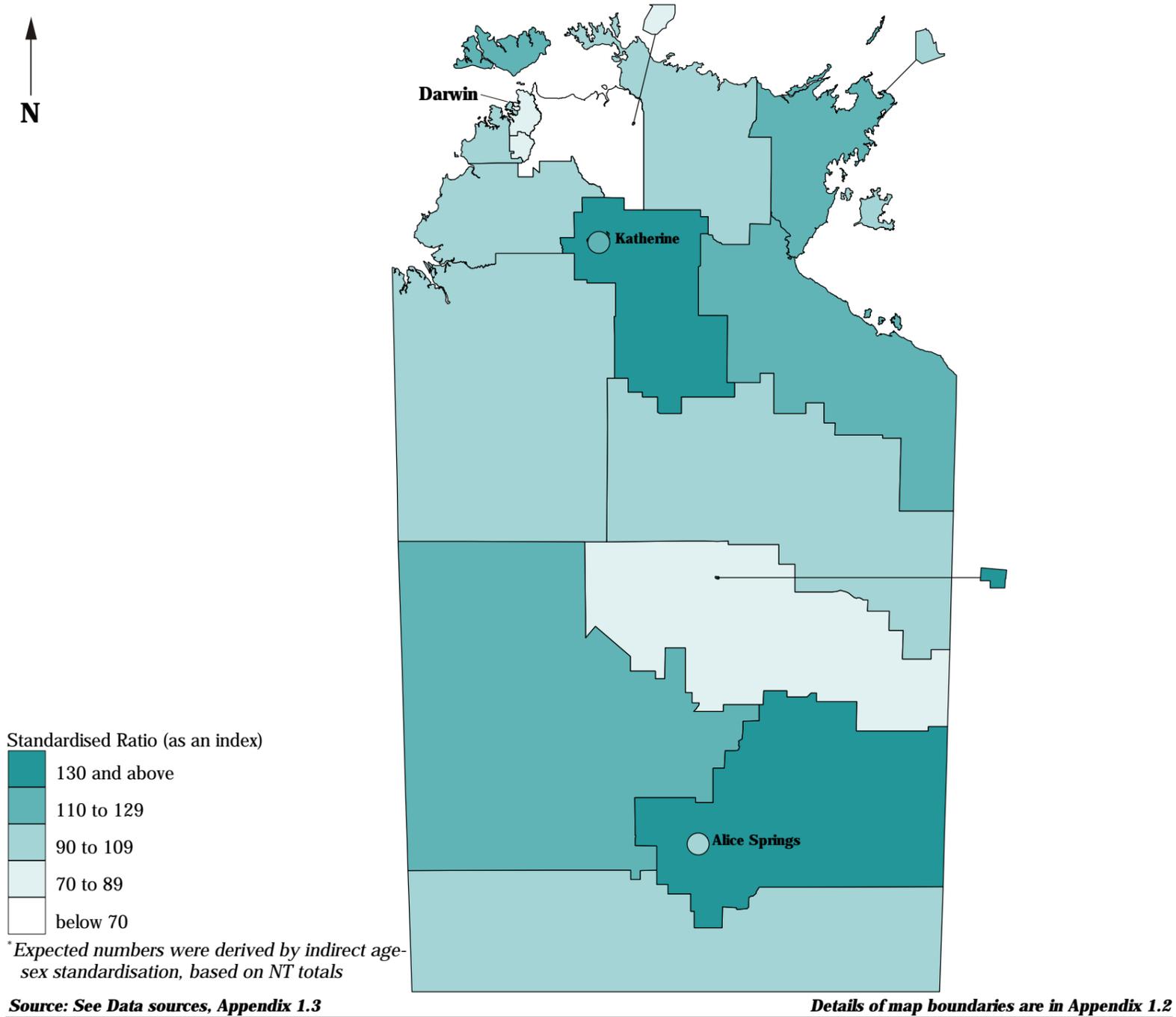
The largest numbers of hospital admissions were of residents of Alice Springs (6,214 admissions), Katherine (2,545), Litchfield [Part B] (2,478) and Tennant Creek (1,780).

There were weak correlations recorded with most of the indicators of socioeconomic disadvantage.

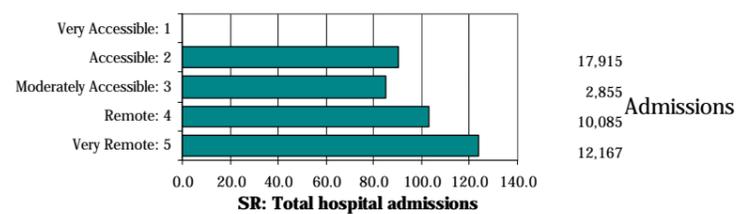
Map 6.2

Admissions to public acute hospitals and private hospitals, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions to hospital increase from lower than expected ratios in the Moderately Accessible (an SAR of 85) and Accessible (90) areas, to just above the level expected in the Remote areas (an SAR of 103), before increasing to 24 per cent more admissions than expected from the Northern Territory rates (an SAR of 124) in the Very Remote category. The Very Remote and Remote areas have the second and third largest numbers of admissions, respectively.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Admissions to public acute hospitals, 1995/96

Capital city comparison (Australia as the Standard)

The admissions in this analysis are acute admissions to public acute hospitals (see page 191 for a definition of this hospital type) in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

Residents of the capital cities have lower rates of admission than do residents of the non-metropolitan areas of Australia. This is evident from the standardised admission ratios (SARs) in **Table 6.8**, which vary from a high of 99** in **Sydney** to a low of 79** in **Hobart** and 81** in **Canberra**.

Table 6.8: Admissions to public acute hospitals¹, capital cities, 1995/96
Age-sex standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
99**	86**	89**	93**	88**	79**	87**	81**	92**

¹Includes same day admissions other than for renal dialysis

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

The age profile for admissions of females (55.9 per cent of admissions) and males to public acute hospitals is graphed in **Figure 6.2**, page 187. The most notable features are the higher admission rates for males and females in the 0 to 4 year old age group; the higher admission rates for females from ages 15 to 49 years; and the higher admission rates for males from the mid-fifties.

Darwin (Northern Territory as the Standard)

There were 31 per cent fewer admissions to public acute hospitals of **Darwin** residents than were expected from the Northern Territory rates (an SAR of 69**). This reflects both the reduction in demand for public beds in **Darwin** as a result of the availability of beds in the private hospital, and the lower overall rates of admission of urban residents.

Statistical Local Areas (SLAs)

All but six of **Darwin's** SLAs were mapped in the lowest range for this variable (**Map 6.3a**). City-Inner had by far the highest SAR (243**) with residents recording well over twice the expected number of public acute hospital admissions. Elevated ratios were also recorded in Marrara (121**) and Winnellie (118).

Nightcliff (99) was the only SLA with a ratio in the middle range, and just two areas were mapped in the range between 85 and 94; the are the combined Palmerston SLAs (89**) and the Narrows (87).

Very low ratios and admission numbers were recorded in East Arm (1**, one admission when 75 were expected), The Gardens (3**, six admissions when 183 were expected) and Lee Point-Leanyer Swamp (9**, four admissions when 47 were expected).

Ratios below 55 and representing more than 20 admissions were recorded in Malak (26**), Brinkin (40**), Larrakeyah (48**), Anula (50**), Rapid Creek (51**), Leanyer (52**) and Wulagi (54**). Residents of the remaining 15 SLAs recorded between 25 and 45 per cent fewer admissions than were expected from the Northern Territory rates.

Correlations with the indicators of socioeconomic status were weak; the strongest was recorded with the variable for private dwellings without a vehicle (0.38) and inverse correlations were recorded with the variables for female labour force participation (-0.39), the Indigenous population (-0.29) and recent immigrants (-0.27). Correlations of meaningful significance were recorded at the SLA level with the variables for total deaths (0.67), the Total Fertility Rate (0.62) and years of potential life lost (0.57).

Postcodes (aggregates of suburbs)

Map 6.3b shows that, with an SAR of 86**, Palmerston was the only postcode area in **Darwin** not to record a ratio in the lowest range. Palmerston is a developing area that has recorded the highest proportions for most indicators of socioeconomic disadvantage, including low income families, single parent families and dwellings rented from the Territory housing authority, as well as the highest proportions for most categories of income support recipients.

Residents of Darwin: South West recorded the second highest ratio, an SAR of 77**, with 23 per cent fewer public acute hospital admissions than were expected from the Northern Territory rates. This postcode area includes the city centre and adjacent older established suburbs. There were 33 per cent fewer public acute hospital admissions of residents of Darwin: North West than were expected from the Northern Territory rates (an SAR of 67**).

The lowest SAR, 57**, was recorded for residents of Darwin: North East, who had 43 per cent fewer public acute hospital admissions than were expected.

Map 6.3

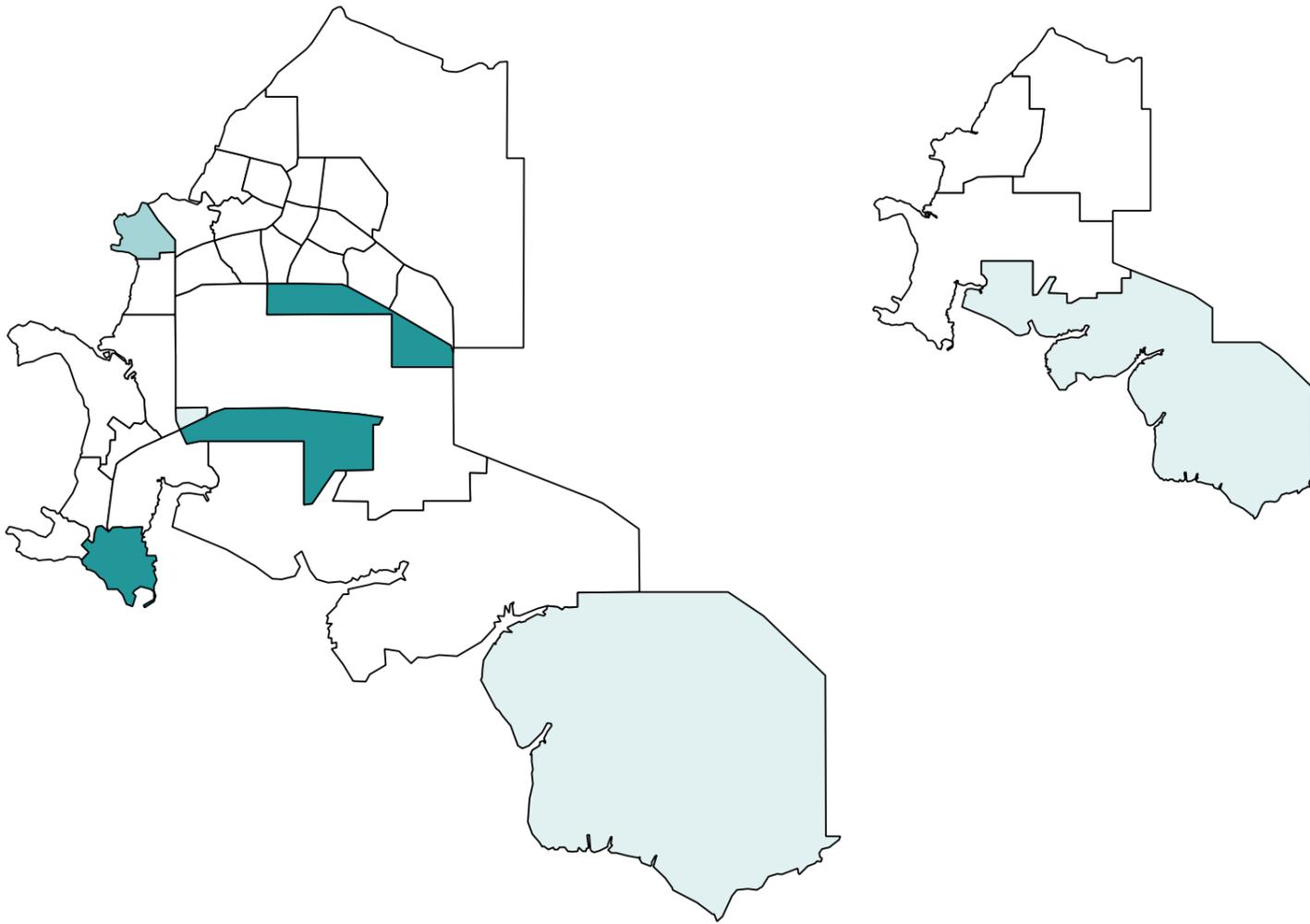
Admissions to public acute hospitals, Darwin, 1995/1996

Standardised Ratio: number of admissions in each area compared with the number expected*

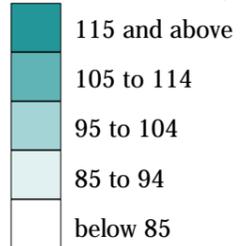


Map 6.3a: SLA Map

Map 6.3b: Postcode Map#



Standardised Ratio (as an index)



*Expected numbers were derived by age-sex standardisation, based on NT totals

#SLAs have been grouped to approximate postcode areas

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions to public acute hospitals, 1995/96

State/Territory comparison (Australia as the Standard)

The most highly elevated standardised admission ratios (SARs) for admissions to public acute hospitals of residents of the non-metropolitan areas of Australia were in the Northern Territory (159**), South Australia (149**) and Western Australia (139**): ratios were elevated by more than 20 per cent also in New South Wales and Victoria. Only in Tasmania were there fewer admissions of residents of the non-metropolitan areas than expected from the Australian rates (**Table 6.9**), although details of admissions to private hospitals (page 206 and **Table 6.11**) are also relevant.

At the *Whole of State/Territory* level, the Northern Territory had the highest SAR for admissions to public acute hospitals in 1995/96 (an SAR of 126**), followed by South Australia (108**) and New South Wales (105**).

Table 6.9: Admissions to public acute hospitals¹, State/Territory, 1995/96
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	99**	86**	89**	93**	88**	79**	87**	81**	92**
Other major urban centres ²	93**	89**	73**	..	..	..	..	..	86**
Rest of State/Territory	123**	122**	110**	149**	139**	80**	159**	- ³	121**
Whole of State/Territory	105**	96**	96**	108**	102**	80**	126**	78**	100

¹Includes same day admissions, other than for renal dialysis

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

The relative availability of public hospitals and the absence of private hospitals throughout the non-metropolitan areas of the Northern Territory is evident from the high rate of use of public compared with private hospitals. Residents of these non-metropolitan areas had 26 per cent more admissions to public acute hospitals than expected from the Northern Territory rates (an SAR of 126**) and 53 per cent fewer private hospital admissions (and SAR of 47**). Some reasons for the substantially higher rates, compared with those in **Darwin**, are described on page 191.

Of the 23 SLAs in the non-metropolitan areas of the Northern Territory, 16 had ratios elevated by more than 10 per cent above the level expected from the Northern Territory rates, and eleven had ratios elevated by 30 per cent or more (**Map 6.4**). The highest ratio, an SAR of 288**, was recorded for residents of Tennant Creek (with more than two and a half times the number of admissions expected from the Northern Territory rates). One of the Northern Territory's three country hospitals is located in Tennant Creek. (Note: Although the area shown here is the SLA of the usual residence of the patient (and not the location of the hospital), the presence of a hospital is likely to result in higher admission rates than would occur if there were no hospital in the area). Other high admission rates were recorded for residents of Elsey Balance (an SAR of 188**), Sandover-Balance (177**), Bathurst-Melville (164**), Tanami (159**), Gulf (150**), East Arnhem-Balance (143**), Katherine (137**), Petermann (133**), Victoria (133**) and West Arnhem (130**). With the exception of Katherine and Petermann, the above SLAs had large populations of Indigenous Australians, representing in excess of 35 per cent of their total population.

Five SLAs recorded ratios in the second highest range mapped, with the highest SAR in Cox-Finniss (128**) and the lowest ratio in Nhulunbuy (113**). Residents of Alice Springs were also in this group, with 22 per cent more admissions than were expected from the Northern Territory rates (with an SAR of 122**).

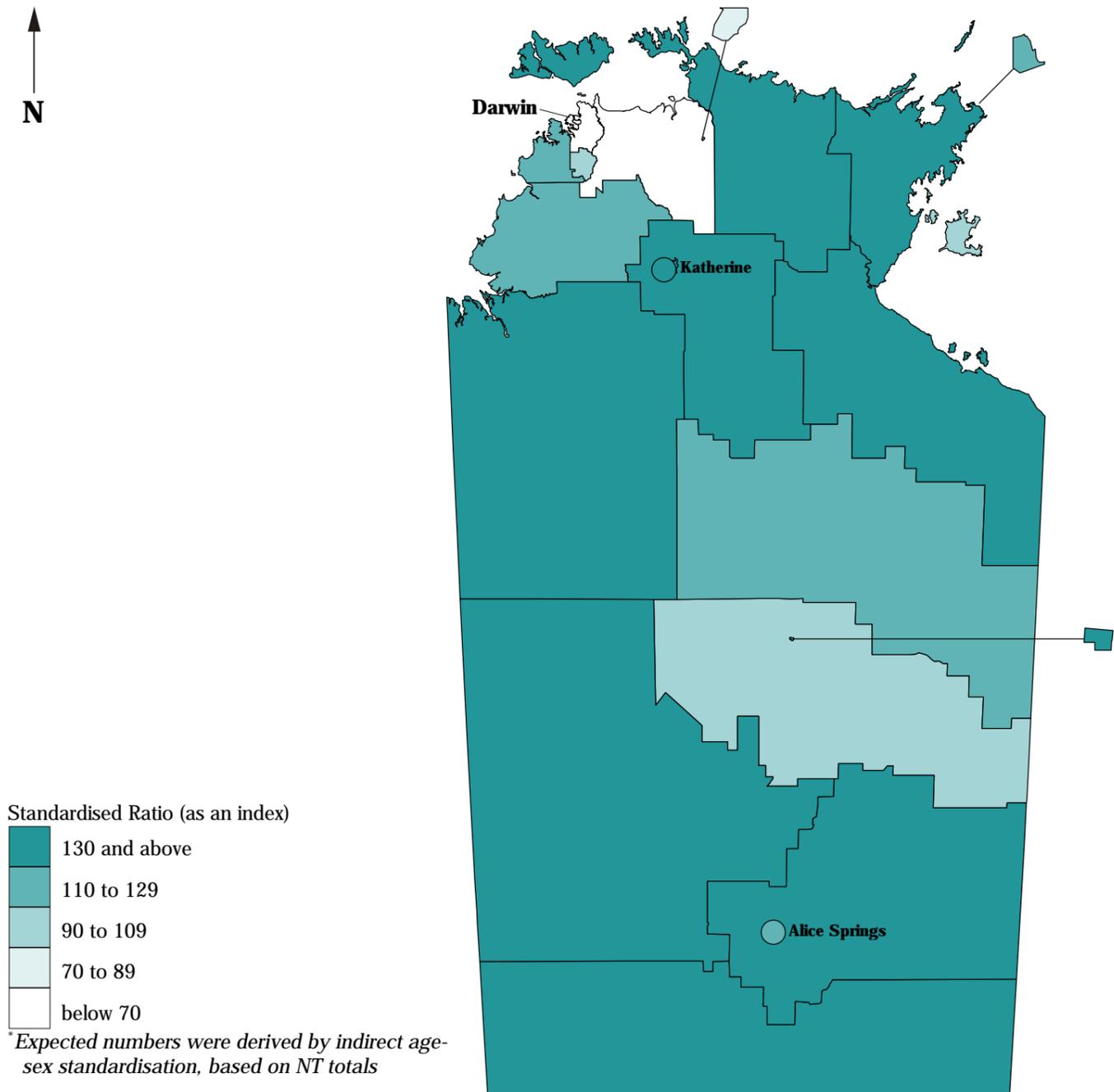
With the exception of residents of Groote Eylandt (with an SAR of 99) and Tennant Creek-Balance (91), all SLAs with low standardised admission ratios were located adjacent to **Darwin**. Residents of Litchfield [Part A] (with an SAR of 7**) recorded the lowest ratio followed by South Alligator (26**), Litchfield [Part B] (62**), Jabiru (71**) and Coomalie (92).

Overall, there were weak associations with most indicators of socioeconomic disadvantage, including the variables for single parent families (0.44) and the Indigenous population (0.43), as well as all of the income support payment variables. These results, together with the inverse correlation with the IRSD (-0.41), suggest the existence of an association at the SLA level between high rates of public hospital admissions and socioeconomic disadvantage.

Map 6.4

Admissions to public acute hospitals, Northern Territory, 1995/1996

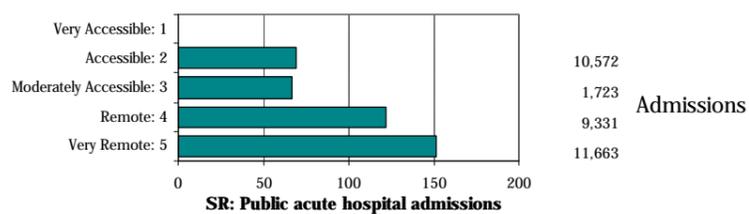
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions to public acute hospitals increase more markedly between the ARIA categories than do those for total admissions and cover a wider range. There are lower than expected ratios in both the Moderately Accessible (an SAR of 67, 33 per cent fewer admissions than expected from the Northern Territory rates) and Accessible (69) areas and higher than expected ratios in both the Remote areas (122) and Very Remote areas (an SAR of 151, 51 per cent more admissions than expected from the Northern Territory rates).

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions to private hospitals, 1995/96

Capital city comparison (Australia as the Standard)

The admissions included in this analysis are acute admissions to private hospitals in Australia (both private acute and private psychiatric hospitals: see page 191 for a definition of these hospital types). Admissions of same day patients (other than for renal dialysis) are included, whether to a hospital or to a same day surgical unit.

As most private hospitals are located in the capital cities, residents of these cities generally have higher rates of admission to private hospitals than does the population living in the non-metropolitan areas of Australia. This is evident from the standardised admission ratios (SARs) in **Table 6.10**, which are generally higher in the capital cities than expected from the Australian rates. The low level of provision of private hospital facilities in **Perth** and **Canberra** is reflected in the low ratios for these two capital cities. Details of admissions to public acute hospitals (page 200, **Table 6.8**) and levels of provisions of private hospitals (Chapter 7) are also relevant.

Table 6.10: Admissions to private¹ hospitals, capital cities, 1995/96
Age-sex standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
98**	121**	116**	116**	89**	150**	133**	46**	108**

¹Includes acute and psychiatric hospitals and day surgery facilities, including same day admissions, other than for renal dialysis

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Details mapped here are of admissions to private hospitals in Australia of residents of **Darwin**, regardless of the State/Territory of location of the private hospital to which they were admitted. As for all of the other maps in this chapter, admissions of residents from other States or the Australian Capital Territory to the private hospital in **Darwin** have been excluded, and are included in the datasets for the atlases for those jurisdictions.

The greater proportion of private hospital admissions were of **Darwin** residents (75.3 per cent of admissions and 43.9 per cent of the population) with residents of the non-metropolitan areas accounting for just 24.7 per cent.

Males make greater use of private hospitals than females, with admissions to private hospitals representing 23.5 per cent of all male admissions studied (compared with 21.9 per cent for females), however they accounted for just under half (45.7 per cent) of private hospital admissions.

The age profile for admissions of females and males is graphed in **Figure 6.4**, page 188. The most notable feature is the higher admission rates for females from age 15 years through the child-bearing years to the late fifties. Males had higher admission rates for all other age groups.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

The highly elevated standardised admission ratio for **Darwin** (an SAR of 159**), is a reflection of the urban location of the private hospital and the limited access to private hospitals of residents of the non-metropolitan areas of the Northern Territory.

Postcodes (aggregates of suburbs)

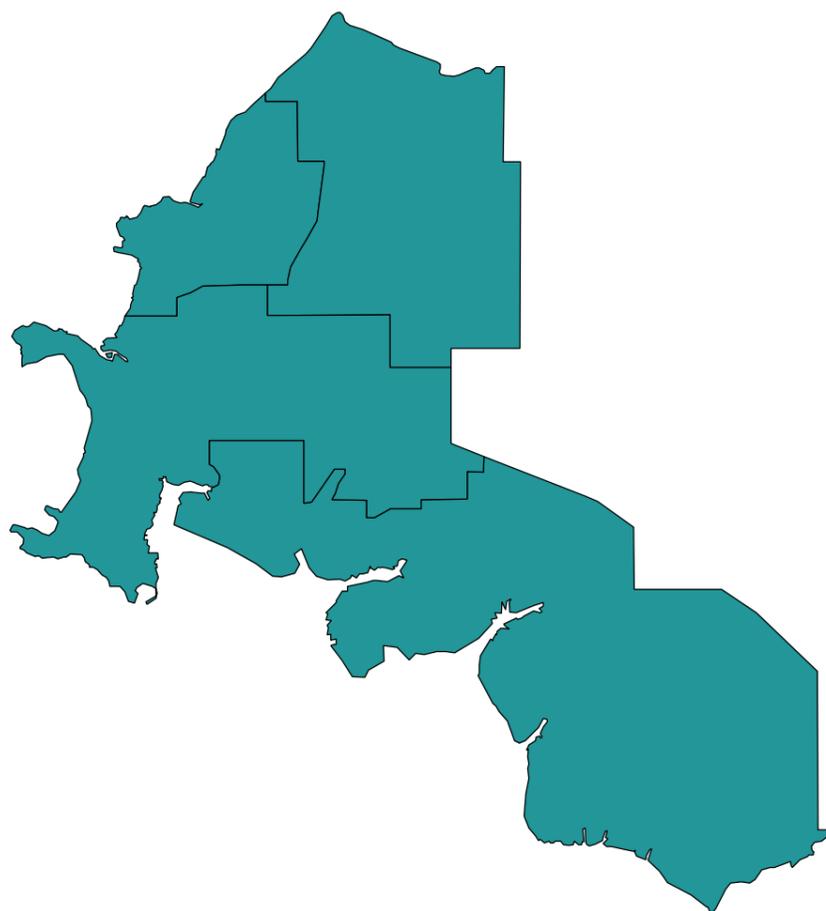
All of the postcode areas in **Darwin** had highly elevated ratios for this variable (**Map 6.5**). The highest ratio, an SAR of 183**, was recorded in Darwin: South West, which includes the inner city and established suburbs. Residents of this area had 83 per cent more admissions than were expected from the Northern Territory rates (an SAR of 183**). Residents of Palmerston, in the south east, had the second highest SAR, of 179**.

Residents of the northern suburbs of Darwin: North East (151**) and Darwin: North West (143**) also had notably elevated SARs for private hospital admissions.

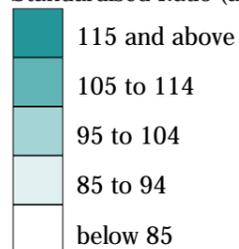
Map 6.5

Admissions to private hospitals, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions to private hospitals, 1995/96

State/Territory comparison (Australia as the Standard)

The most highly elevated standardised admission ratios (SARs) for admissions to private hospitals of residents of the non-metropolitan areas of Australia were in Tasmania (118**) and Queensland (113**). Ratios in all of the other States and the Northern Territory were substantially lower than expected from the Australian rates (**Table 6.11**). The lowest were in the Northern Territory (39**), South Australia and Western Australia (both with SARs of 55**). Details of admissions to public acute hospitals (page 202, **Table 6.9**) and levels of provisions of private hospitals (Chapter 7) are also relevant.

At the *Whole of State/Territory* level, Tasmania had the highest SAR for admissions to private hospitals in 1995/96 (an SAR of 131**), followed by Queensland (119**) and Victoria (106**).

Table 6.11: Admissions to private¹ hospitals, State/Territory, 1995/96
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	98**	121**	116**	116**	89**	150**	133**	46**	108**
Other major urban centres ²	96**	72**	147**	..	..	..	..	..	113**
Rest of State/Territory	73**	69**	113**	55**	55**	118**	39**	- ³	81**
Whole of State/Territory	91**	106**	119**	100	80**	131**	84**	48**	100

¹Includes acute and psychiatric hospitals and day surgery facilities, including same day admissions, other than for renal dialysis

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

The absence of private hospitals in the non-metropolitan areas of the Northern Territory is reflected in the low rate of use of private compared with public hospitals. Residents of the non-metropolitan areas had 53 per cent fewer admissions to the private hospital than were expected from the Northern Territory rates, an SAR of 47**.

Map 6.6 shows that all but three SLAs had ratios in the lowest range mapped. The only two elevated ratios were recorded in South Alligator (an SAR of 154**) and Litchfield [Part B] (153**), where residents had 54 and 53 per cent more private hospital admissions respectively than were expected from the Northern Territory rates. Jabiru (91) was the only other SLA not to record an SAR of below 75. Each of the above SLAs is located close to **Darwin** and has relatively easy access to the private hospital.

Of the remaining SLAs, the highest ratios were recorded in Coomalie (75), Groote Eylandt (74**), Nhulunbuy (59**), Daly (57**) and Katherine (53**).

The lowest ratio, an SAR of 5**, was recorded in Petermann where residents had 95 per cent fewer private hospital admissions than were expected from the Northern Territory rates. Very low ratios were also recorded in Victoria (an SAR of 6**), Bathurst-Melville (8**), Gulf (12**), Tanami (16**), Eley Balance (17**), Tennant Creek (18**) and West Arnhem (19**). These SLAs had large populations of Indigenous Australians. Residents of Alice Springs had 81 per cent fewer admissions than were expected, an SAR of 19**.

High rates of private hospital admissions were not highly correlated with any of the variables for socioeconomic status. However, there were correlations of meaningful significance with the variables for managers and administrators and professionals (0.55) and the IRSD (0.58), indicating an association with high socioeconomic status.

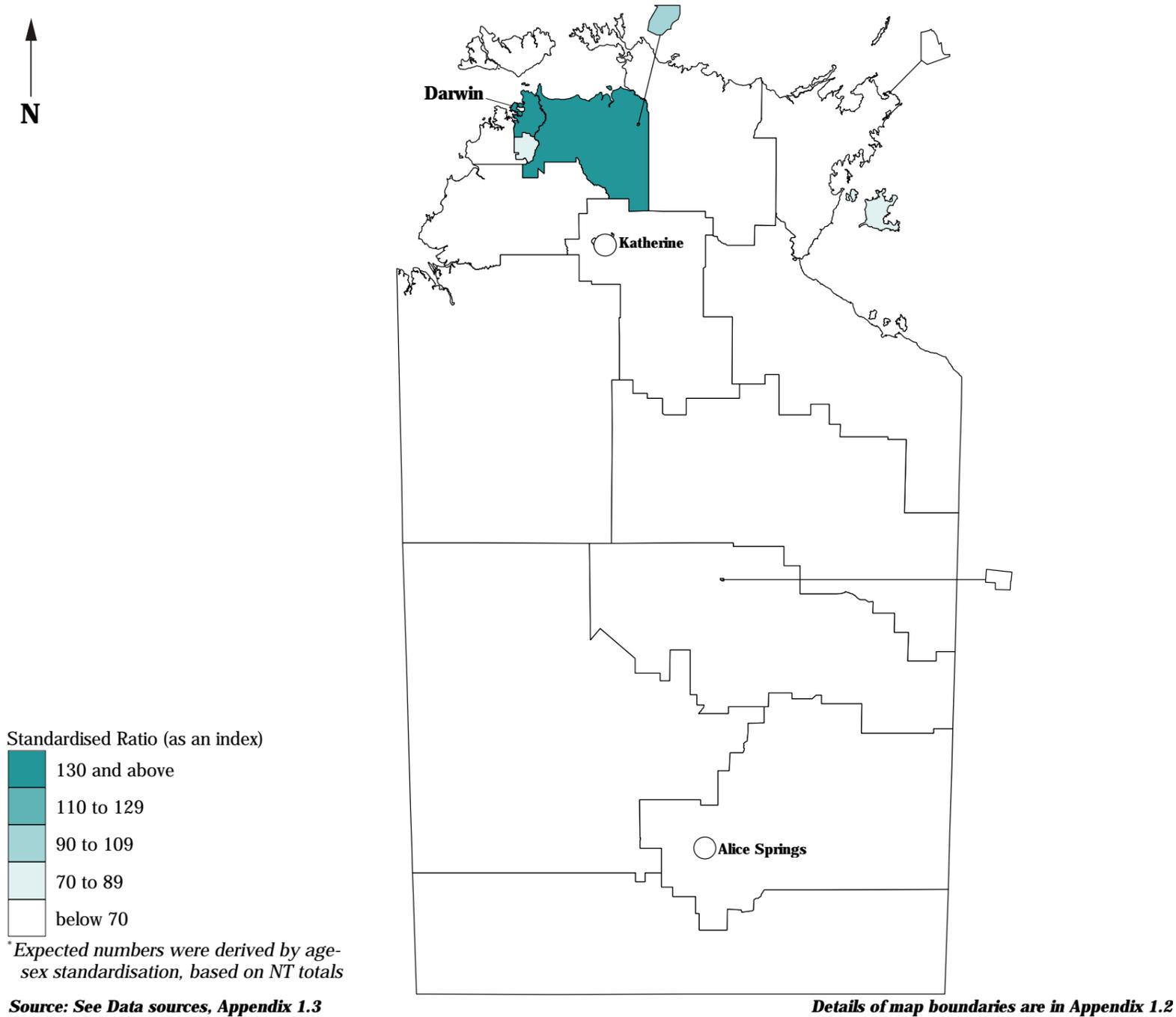
There were weak correlations with the variables for high income families and female labour force participation.

Inverse correlations of meaningful significance were recorded with a number of indicators of low socioeconomic status, including single parent families (-0.54), early school leavers (-0.53) and the Indigenous population (-0.55), with weaker inverse associations with other variables.

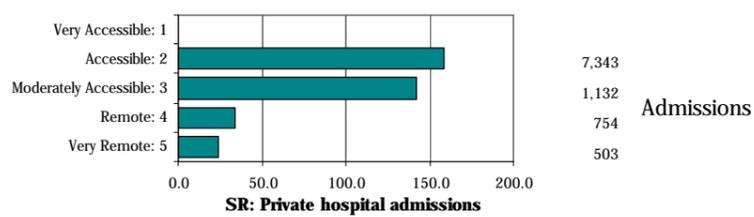
Map 6.6

Admissions to private hospitals, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions to private hospitals are highly elevated in both the Accessible areas (an SAR of 159, 59 per cent more admissions of residents to private hospitals than expected from the Northern Territory rates) and Moderately Accessible areas (142). Residents of both the Remote and Very Remote ARIA categories had far fewer admissions to private hospitals than expected, with SARs of 34 and 24, respectively. Private hospital beds are only located in the Accessible ARIA category (see Chapter 7).

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Admissions of males, 1995/96

Capital city comparison (Australia as the Standard)

The admissions in this chapter are of acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

Males in **Hobart** had the highest standardised admission ratio (SAR) with two per cent more admissions than expected from the Australian rates, followed by **Sydney**, **Adelaide** and **Darwin** with one per cent more admissions than expected from the Australian rates. As for all admissions, the lowest ratios were recorded for residents of **Canberra** (68^{**}) and **Perth** (89^{**}).

The main difference evident in admission rates between the two periods shown in **Table 6.12** was the substantially lower differential (from the Australian rates) in the SAR recorded for **Sydney** in 1995/96. The higher SAR in this later period suggests an increase (relative to the Australian rates) in admission rates between the periods analysed. There was a small reduction (relative to the Australian rates) in admission rates for male residents of **Brisbane**, **Adelaide**, **Perth** and **Darwin**.

Table 6.12: Admissions of males, capital cities
Standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	101 ^{**}	96 ^{**}	98 ^{**}	101 [*]	89 ^{**}	102 ^{**}	101	68 ^{**}	97 ^{**}
1989 ³	80 ^{**}	..	101 ^{**}	104 ^{**}	91 ^{**}	..	103 [*]	..	89 ^{**}

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients, other than for renal dialysis

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Males account for 44.0 per cent of all admissions of Northern Territory residents (which includes admissions to public acute and private hospitals, private psychiatric hospitals and same day surgery facilities, but excludes admissions of same day patients for renal dialysis and long stay nursing home type patients). For metropolitan residents the proportion was similar, at 44.5 per cent of admissions.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 7,956 admissions to hospital of male residents of **Darwin**, 8 per cent fewer admissions than expected from the Territory rates (an SAR of 92^{**}).

Postcodes (aggregates of suburbs)

The highest SAR at the postcode level was 109^{**}, recorded for males of Darwin: South West, the area covering the inner city and older, established suburbs (**Map 6.7**). The developing suburbs of Palmerston in the south-east also recorded an elevated ratio, of 106^{*}.

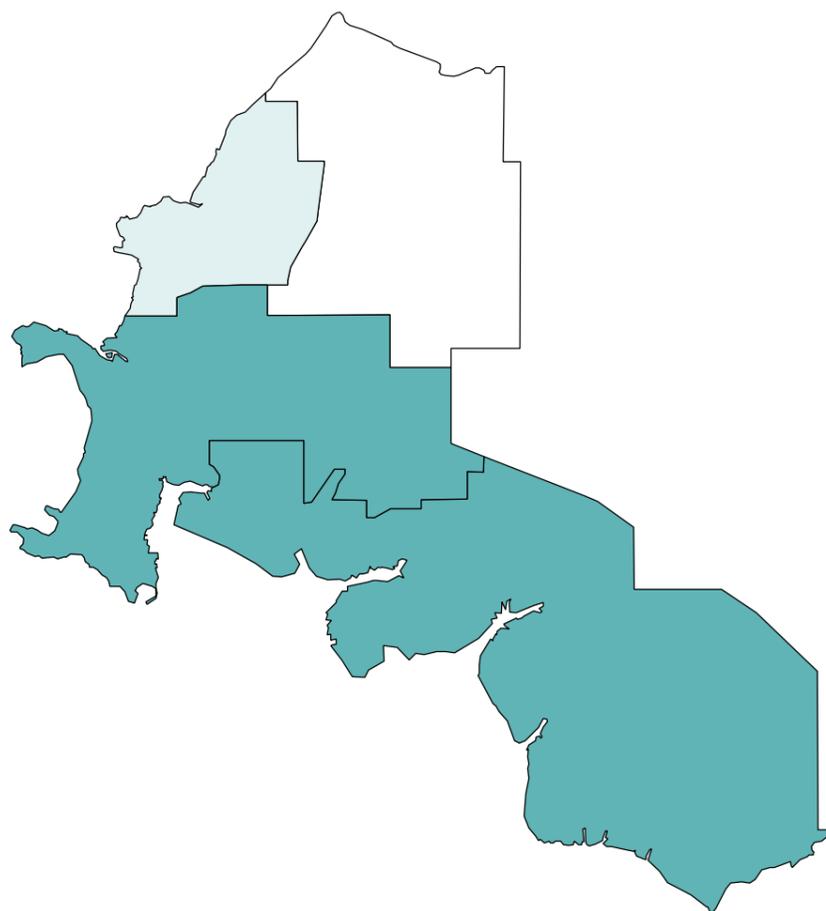
Males in Darwin: North West (with an SAR of 86^{**}) had 14 per cent fewer hospital admissions than were expected. The lowest ratio, 76^{**}, was recorded in Darwin: North East.

Males from Darwin: North West had the largest number of hospital admissions, with 2,695 admissions. The lowest number, 1,340 admissions, was of males from Palmerston. Males from Darwin: South West and Darwin: North East recorded 2,219 and 1,702 hospital admissions, respectively.

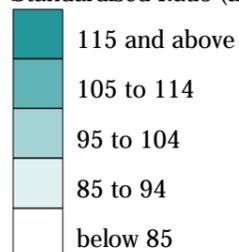
Map 6.7

Admissions of males, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of males, 1995/96

State/Territory comparison (Australia as the Standard)

The admissions in this chapter are of all acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

The most highly elevated standardised admission ratios (SARs) for male residents of the non-metropolitan areas were those in the Northern Territory (120**), South Australia (116**) and Queensland (113**). Only in Tasmania were there fewer admissions than expected from the Australian rates (**Table 6.13**). Overall, the Northern Territory had the highest SAR in 1995/96 for this dataset (an SAR of 111**), followed by South Australia (105**) and Queensland (104**).

In all of the States and Territories for which data were available for both periods, SARs were lower in the later period. The main differences are the substantially lower differential (from the Australian rates) in the SARs recorded for the Northern Territory, Western Australia and South Australia in 1995/96. The lower SARs in this later period suggest a reduction (relative to the Australian rates) in admission rates for males between the years analysed.

Table 6.13: Admissions of males, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	101**	96**	98**	101*	89**	102**	101	68**	97**
Other major urban centres ²	93**	81**	99*	..	..	..	..	..	94**
Rest of State/Territory	106**	102**	113**	116**	108**	90**	120**	- ³	107**
Whole of State/Territory	101**	98**	104**	105**	94**	95**	111**	67**	100
1989⁴									
Rest of State/Territory	116**	..	123**	134**	142**	..	176**	..	124**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients, other than for renal dialysis

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 10,962 admissions to hospital of males resident in the non-metropolitan areas of the Northern Territory, 7 per cent more admissions than were expected from the Territory rates (an SAR of 107**). The elevated ratio is in contrast to the below average ratio for residents of **Darwin**. Some comments as to the possible reasons for the generally higher standardised admission ratios for residents of country areas are provided on page 191.

The range of standardised admission ratios extends from 19** in Litchfield [Part A] to 231** in the town of Tennant Creek (**Map 6.8**). Five SLAs had ratios in the highest range mapped, with the highly elevated ratio in Tennant Creek indicating that there were more than twice the number of admissions of males than were expected from the Northern Territory rates. Sandover-Balance (with an SAR of 152**), Bathurst-Melville (143**), Eley Balance (134**) and Tanami (134**) all had ratios elevated by over 30 per cent. Elevated ratios were also recorded for males from Katherine (124**), East Arnhem-Balance (121**) and Petermann (110). Apart from Katherine and Petermann, all of these SLAs had large Aboriginal populations, comprising over 35 per cent of the total population.

Eight SLAs in the non-metropolitan areas of the Northern Territory were mapped in the middle range, of 10 per cent above or below the level expected from the Northern Territory rates.

The highest ratio of 108 was recorded in Gulf. Alice Springs recorded a ratio of 99.

Ratios of between 70 and 89 were recorded for males from five SLAs. The lowest of these ratios were recorded in Tennant Creek-Balance and Jabiru, both with SARs of 76**.

The lowest SARs were recorded for males from Litchfield [Part A] (19**) and South Alligator (58**), with 81 and 42 per cent fewer admissions than were expected from the Northern Territory rates. However, the ratios represented relatively low numbers of 12 and 42 admissions, respectively.

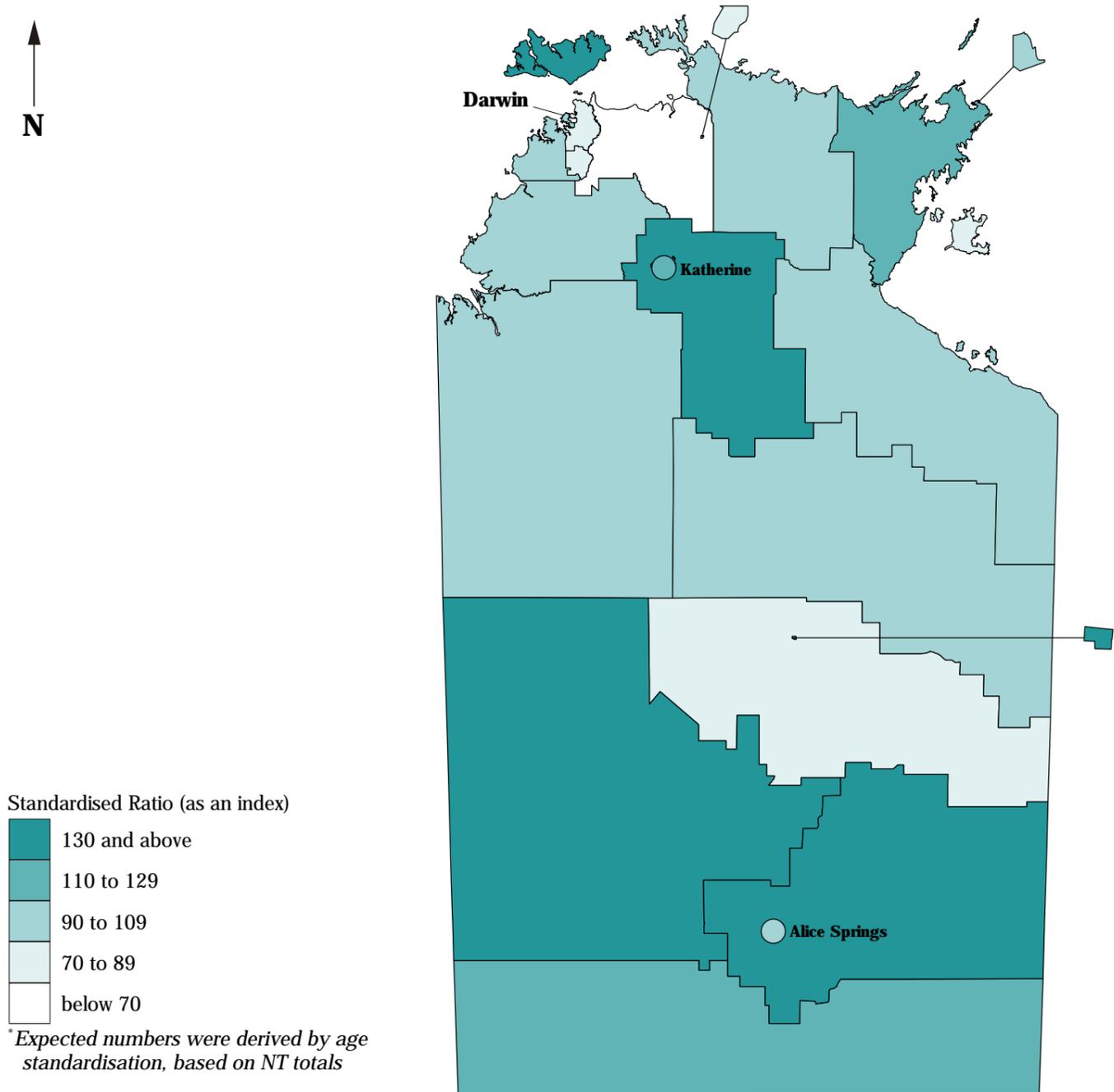
The largest numbers of admissions for males resident in the non-metropolitan areas of the Northern Territory were in Alice Springs (2,662 admissions), Katherine (1,178 admissions) and Litchfield [Part B] (1,102 admissions).

High rates of admissions of males were highly correlated with many of the other variables mapped in this chapter including admissions for circulatory system diseases (0.87); respiratory system diseases (0.87); accidents, poisonings and violence (0.82); and respiratory system diseases of 0 to 4 year olds (0.77). These results, together with the weak correlation with the IRSD (-0.34), suggest the existence of an association at the SLA level between high rates of admissions of males and socioeconomic disadvantage.

Map 6.8

Admissions of males, Northern Territory, 1995/1996

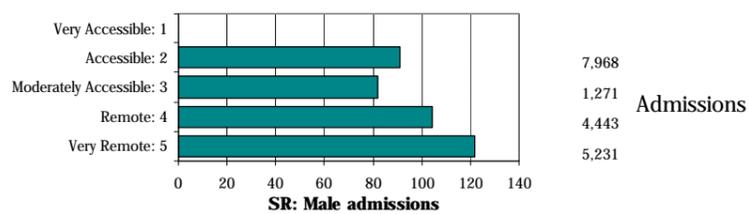
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for males closely follow the pattern evident for total admissions, increasing from ratios of 82 in the Moderately Accessible areas and 91 in the Accessible areas, to just above the level expected in the Remote areas (an SAR of 104), before increasing to the highest ratio (an SAR of 122) in the Very Remote category (22 per cent more admissions than expected from the Northern Territory rates). The Very Remote and Remote areas have the second and third largest numbers of admissions of males, respectively.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions of females, 1995/96

Capital city comparison (Australia as the Standard)

The admissions in this chapter are of acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

With the exception of lower ratios in **Canberra** and, to a lesser extent, **Perth**, there was little variation across the capital cities in standardised admission ratios (SARs) for females (**Table 6.14**).

As was the case for males, the main difference evident in admission rates between the two periods shown in **Table 6.12** was the substantially lower differential (from the Australian rates) in the SAR recorded for **Sydney** in 1995/96. The higher SAR in this later period suggests an increase (relative to the Australian rates) in admission rates between the periods analysed. A similar, although substantially smaller, increase occurred in **Brisbane** and **Darwin**, while there was a small reduction (relative to the Australian rates) in admission rates for residents of **Adelaide** and **Perth**.

Table 6.14: Admissions of females, capital cities
Standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	98**	98**	98**	101**	88**	103**	102	71**	97**
1989 ³	80**	..	95**	102**	95**	..	97*	..	89**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients, other than for renal dialysis

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Females accounted for 55.5 per cent of all admissions of residents of **Darwin** and for 56.4 per cent of admissions of non-metropolitan residents. Overall, females had higher admission rates than males: 25,101 admissions per 100,000 population for females, compared with 17,796 admissions per 100,000 population for males.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 9,938 admissions to hospital of females resident in **Darwin**, 11 per cent fewer admissions than expected from the Northern Territory rates.

Postcodes (aggregates of suburbs)

Palmerston recorded the only elevated ratio, of 106**, with 6 per cent more female admissions than were expected from the Northern Territory rates (**Map 6.9**). As mentioned in the section on total admissions, Palmerston had the highest proportions for most indicators of socioeconomic disadvantage, supporting the observation that it is this group of the population that has higher rates of utilisation of health services.

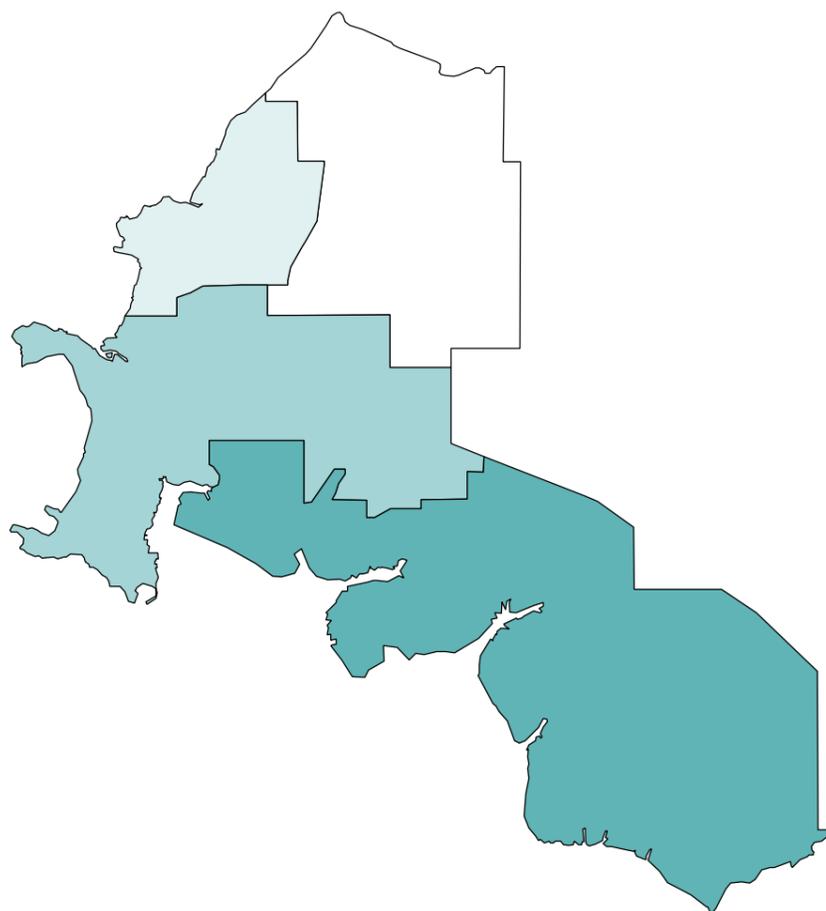
Females from Darwin: South West had the second highest SAR, with 4 per cent fewer admissions than were expected from the Northern Territory rates, an SAR of 96*. Although they appear in different ranges on **Map 6.9**, Darwin: North West and Darwin: North East had similar ratios, of 85** and 81** respectively.

The largest number of hospital admissions was of female residents of Darwin: North West, 3,322 admissions. Females from Palmerston recorded 1,807 admissions and females from Darwin: South West and Darwin: North East had 2,317 and 2,491 admissions, respectively.

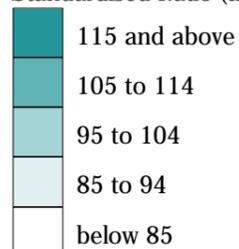
Map 6.9

Admissions of females, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of females, 1995/96

State/Territory comparison (Australia as the Standard)

The admissions in this chapter are of all acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

The most highly elevated standardised admission ratios (SARs) for female residents of the non-metropolitan areas were those in the Northern Territory (126**), South Australia (121**) and Western Australia (116**). Only in Tasmania were there fewer admissions than expected from the Australian rates (**Table 6.15**). At the *Whole of State/Territory* level, the Northern Territory had the highest SAR in 1995/96 for this dataset (an SAR of 114**), followed by South Australia (106**) and Queensland (102**).

In all of the States and Territories for which data were available for both periods, SARs were lower in the later period. The main differences are the substantially lower differential (from the Australian rates) in the SARs recorded for the Northern Territory, Western Australia, South Australia and Queensland in 1995/96. The lower SARs in this later period suggest a reduction (relative to the Australian rates) in admission rates for females between the years analysed.

Table 6.15: Admissions of females, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	98**	98**	98**	101**	88**	103**	102	71**	97**
Other major urban centres ²	95**	85**	96**	..	..	..	..	..	94**
Rest of State/Territory	108**	107**	109**	121**	116**	94**	126**	- ³	109**
Whole of State/Territory	100	100	102**	106**	95**	98**	114**	70**	100
1989⁴									
Rest of State/Territory	120**	..	124**	138**	159**	..	169**	..	128**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients, other than for renal dialysis

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 14,178 admissions of female residents of the non-metropolitan areas of the Northern Territory, 9 per cent more than expected from the Territory rates (an SAR of 109**). Some comments on the possible reasons for the generally higher admission ratios for residents of country areas are provided on page 191.

The SARs for female hospital admissions covered an extensive range of values (**Map 610**), similar to that for males. Four SLAs had 30 per cent or more admissions of females than were expected from the Northern Territory rates. The highest ratio, an SAR of 226**, was recorded in Tennant Creek, where there were just over two and a quarter times the number of admissions expected from the Northern Territory rates. Eley Balance (with an SAR of 164**), Sandover-Balance (137**) and Gulf (130**) were also in this range.

Six SLAs recorded highly significant ratios in the range from 110 to 129. Tanami (124**) had the highest ratio in this range, followed by Bathurst-Melville (119**), Victoria (117**), East Arnhem-Balance (116**), Katherine (114**) and West Arnhem (111**). Excluding Katherine, the SLAs mentioned to this point had large populations of Indigenous Australians, comprising over 50 per cent of the total population in eight SLAs.

Of the eight SLAs with ratios in the middle range mapped, Daly (109*) was the only one with a ratio of statistical significance. Females from Alice Springs (99) had just one per cent fewer admissions than were expected from the Northern Territory rates.

Significantly low ratios were recorded in Jabiru (74**), Tennant Creek-Balance (80**) and Litchfield [Part B] (87**).

The lowest ratios were recorded in Litchfield [Part A] (an SAR of 13**, with just 9 admissions) and South Alligator (53**, with 48 admissions).

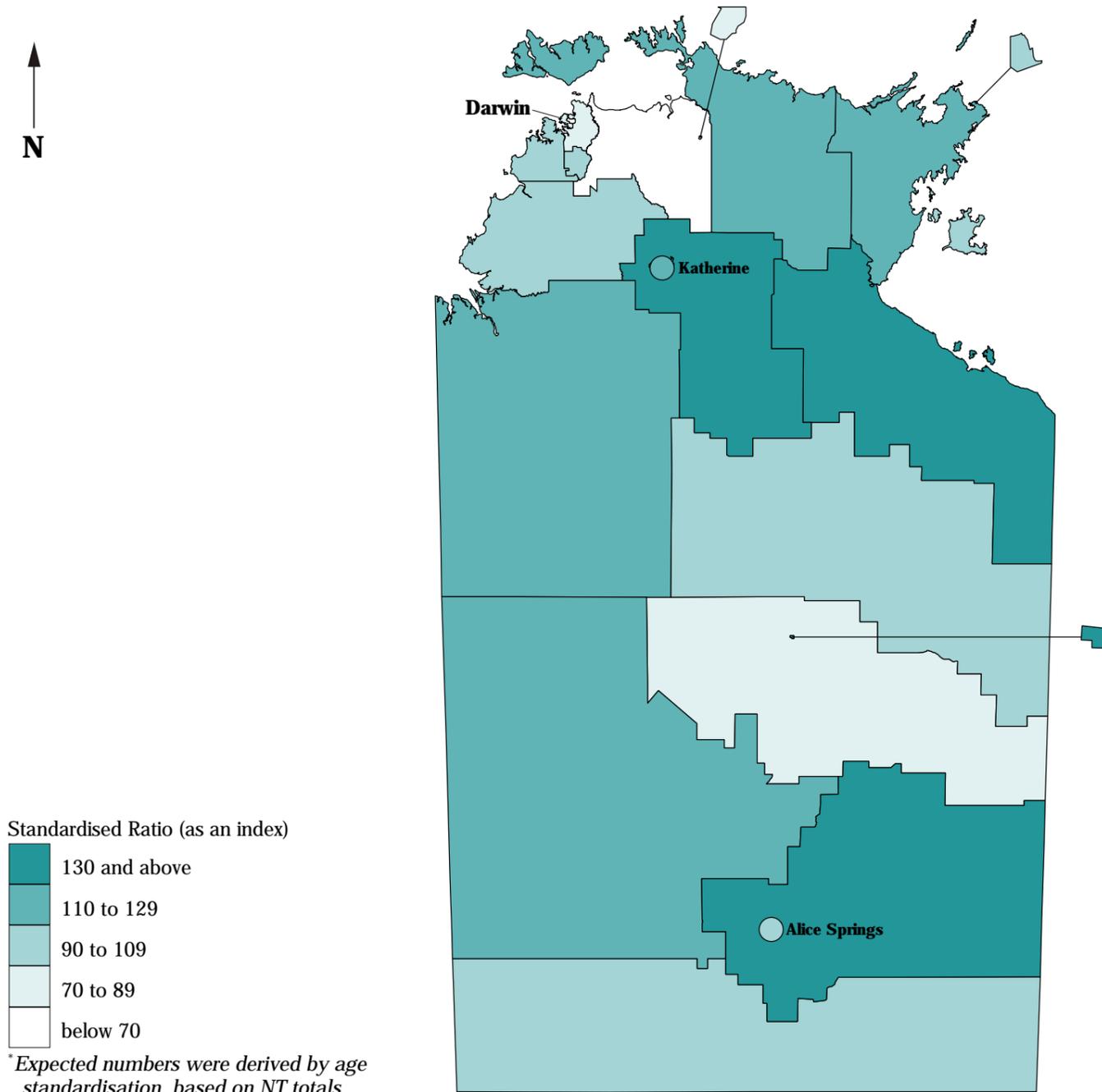
The largest numbers of hospital admissions were of females from Alice Springs (3,552 admissions), Litchfield [Part B] (1,376), Katherine (1,367) and Tennant Creek (991).

Correlations of substantial significance were recorded with many of the other variables for admissions mapped in this chapter including admissions for circulatory system diseases (0.78), respiratory system diseases (0.75) and accidents, poisonings and violence (0.88). There was a weak inverse correlation with the variable for private hospital admissions (-0.47). There was also a weak correlation with the IRSD (-0.33) suggesting the existence of an association at the SLA level between high rates of hospital admissions of females and socioeconomic disadvantage.

Map 6.10

Admissions of females, Northern Territory, 1995/1996

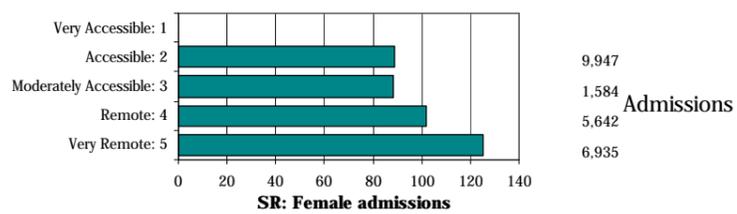
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for females also closely follow the pattern evident for total admissions, increasing from ratios of 88 in the Moderately Accessible areas and 91 in the Accessible areas, to just above the level expected in the Remote areas (an SAR of 102), before increasing to the highest ratio (an SAR of 125) in the Very Remote category (25 per cent more admissions than expected from the Northern Territory rates). The Very Remote and Remote areas have the second and third largest numbers of admissions of females, respectively.

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Same day admissions, 1995/96

Capital city comparison (Australia as the Standard)

The same day admissions in this analysis include admissions of same day patients (other than for renal dialysis), whether to a public acute hospital, a private (acute or psychiatric) hospital or to a same day surgical unit. Patients admitted on a same day basis for renal dialysis have been excluded, due to their frequent repeat visits for treatment which distorts the patterns of hospitalisation (see page 191).

There is a wide variation in standardised admission ratios (SARs) between the capital cities, from elevated ratios of 115** in **Melbourne**, 109** in **Sydney** and 108** in **Brisbane**, to a low of 62** in **Canberra** and 65** in **Darwin** (Table 6.16). This information was not collected for the first edition of the atlas (see page 193).

Table 6.16: Same day admissions¹, capital cities, 1995/96
Age-sex standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
109**	115**	108**	97**	91**	96**	65**	62**	106**

¹Includes same day admissions to public acute hospitals, private hospitals and day surgery facilities: excludes admissions for renal dialysis

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Same day admissions accounted for 21.5 per cent of all admissions in 1995/96 of Northern Territory residents, with females recording a slightly higher percentage (22.7 per cent) than males (20.0 per cent). Same day admissions represented a higher proportion of all admissions in **Darwin** (25.7 per cent) than in the rest of Territory (18.6 per cent).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 4,590 same day admissions of residents of **Darwin**, 7 per cent more than were expected from the Northern Territory rates (an SAR of 107**). The total of same day admissions was comprised of 2,718 females (59.2 per cent) and 1,872 males (40.8 per cent).

Postcodes (aggregates of suburbs)

The developing area of Palmerston (with an SAR 129**) had the highest ratio for same day admissions at the postcode level, although this represented the lowest number of 813 admissions (Map 6.11).

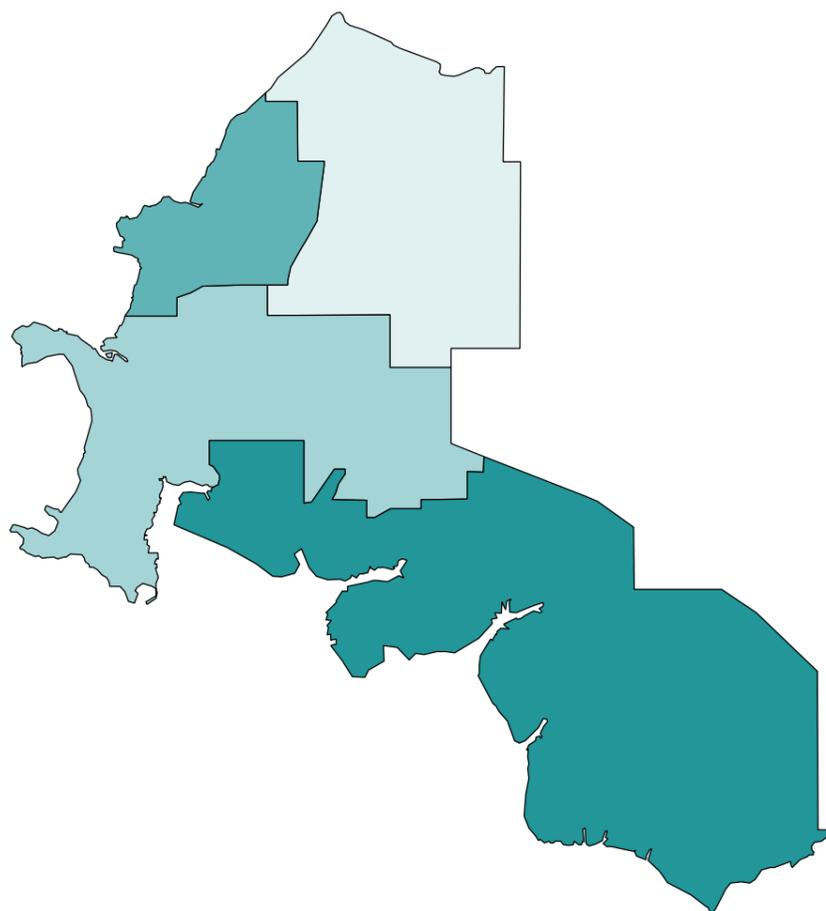
Elevated ratios were also recorded in Darwin: North West (with an SAR of 108**, representing the highest number of 1,678 admissions) and Darwin: South West (104, 1,004 admissions).

Residents of Darwin: North East (94) had 6 per cent fewer same day admissions than were expected from the Northern Territory rates, a total of 1,096 admissions.

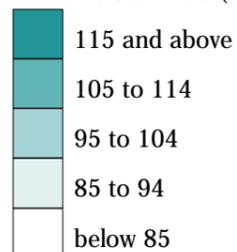
Map 6.11

Same day admissions, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Same day admissions, 1995/96

State/Territory comparison (Australia as the Standard)

The same day admissions in this analysis include admissions of same day patients (other than for renal dialysis), whether to a public acute hospital, a private (acute or psychiatric) hospital or to a same day surgical unit. See the comments on the previous text page and on page 191 for reasons for the exclusion of same day admissions for renal dialysis.

In all cases, there are relatively more admissions of same day patients who were residents of the capital cities than of the non-metropolitan areas (**Table 6.17**). This pattern is a reflection of the location of these facilities which is predominantly in the capital cities, making them less available to residents of the non-metropolitan areas of Australia. There is less variation evident across the non-metropolitan areas than was evident for the capital cities, with standardised admission ratios (SARs) varying from a high of 97** in Queensland to a low of 58** in the Northern Territory. All of these SARs are lower than expected from the Australian rates.

Table 6.17: Same day admissions¹, State/Territory, 1995/96
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	109**	115**	108**	97**	91**	96**	65**	62**	106**
Other major urban centres ²	97**	71**	103**	..	..	..	..	..	97**
Rest of State/Territory	84**	94**	97**	89**	79**	77**	58**	- ³	89**
Whole of State/Territory	101**	108**	102**	95**	88**	85**	62**	61**	100

¹Includes same day admissions to public acute hospitals, private hospitals and day surgery facilities; excludes admissions for renal dialysis

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 6 per cent fewer same day admissions in the non-metropolitan areas of the Northern Territory than were expected from the Northern Territory rates, a ratio of 94**. Females accounted for 59.2 per cent of the 4,671 admissions, and males accounted for 40.8 per cent.

The distribution of standardised admission ratios for same day patients (**Map 6.12**) contrasted with that recorded for total admission (admissions to public acute and private hospitals, **Map 6.2**). Residents of all but seven non-metropolitan SLAs had fewer same day admissions than were expected from the Northern Territory rates, with the majority of SLAs (13) recording ratios in the lowest range mapped. Elevated ratios tended to occur in towns, or in SLAs close to **Darwin**, underlining the connection between the location of same day facilities and their use.

Only two SLAs recorded ratios in the top range mapped; the towns of Tennant Creek (193**) and Nhulunbuy (138**) had 93 per cent and 38 per cent more same day admissions than were expected from the Northern Territory rates, respectively. The next highest ratios were recorded in Alice Springs (129**), Cox-Finniss (124) and Coomalie (112).

Residents of Litchfield [Part A], with the lowest SAR of 16**, had 84 per cent fewer admissions than were expected from the Northern Territory rates (this ratio, however, represented a total of just five same day admissions). Low ratios were also recorded in East Arnhem-Balance (41**), Tennant Creek-Balance (47**), Tanami (47**), Bathurst-Melville (47**), Gulf (48**) and Tableland (53**). Generally, the SLAs with the largest Indigenous populations had SARs in the lowest range.

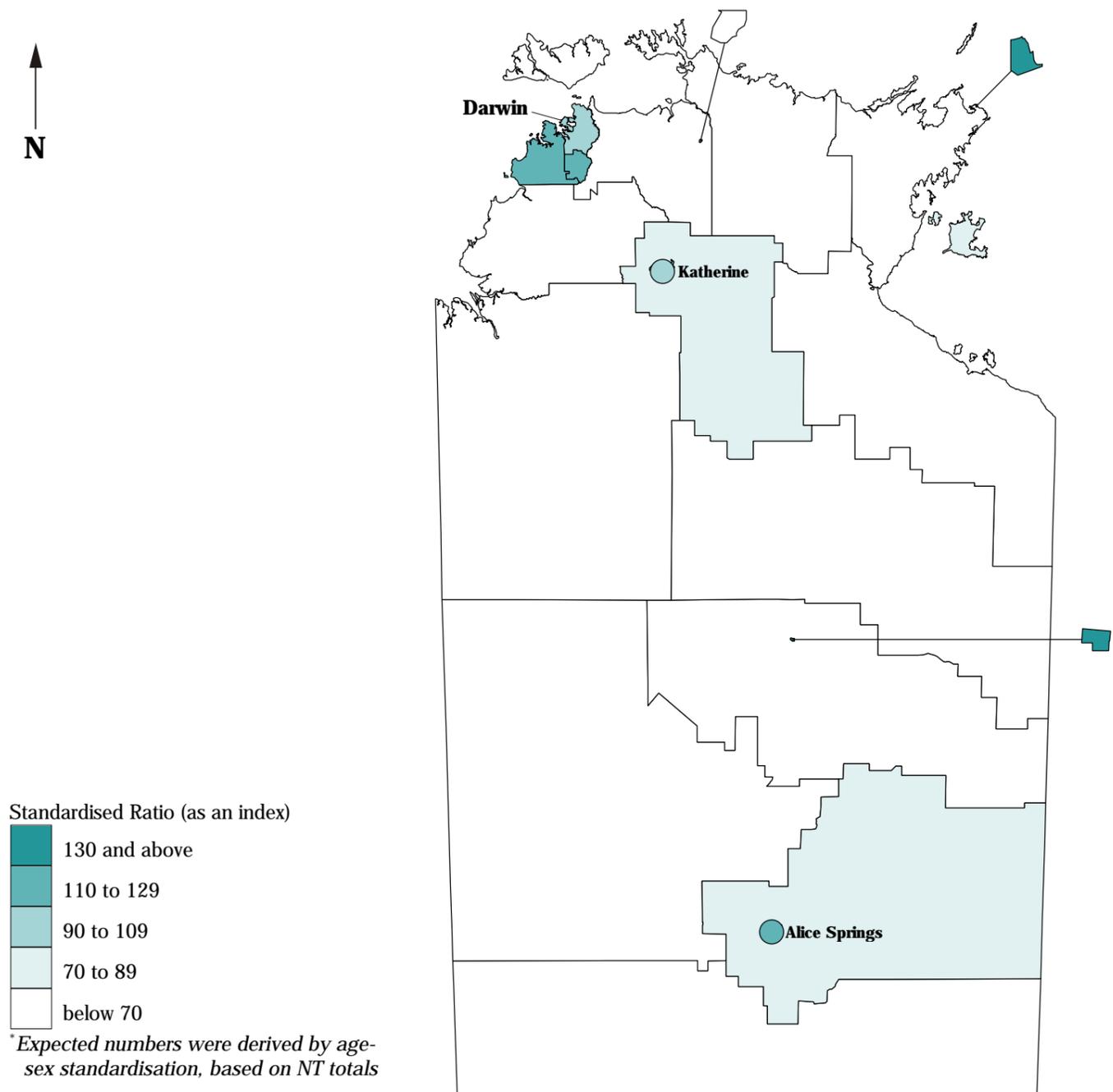
Residents of Alice Springs (1,743 same day admissions), Litchfield [Part B] (634), Katherine (471) and Tennant Creek (318) had the largest numbers of same day admissions.

The positive correlation with the IRSD (0.48) suggest the existence of an association at the SLA level between high rates of same day admissions and high socioeconomic status. This is supported by the overall weak inverse correlations with indicators of socioeconomic disadvantage.

Map 6.12

Same day admissions, Northern Territory, 1995/1996

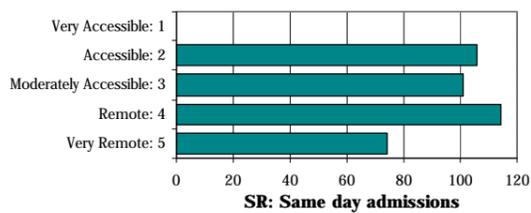
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



The highest standardised admission ratio (SAR) for same day admissions is in the Remote areas, an SAR of 114 (14 per cent more same day admissions than expected from the Northern Territory rates) and the lowest is in the Very Remote areas (an SAR of 74). The ratios in the Moderately Accessible and Accessible ARIA categories are just above the level expected from the Northern Territory rates, with SARs of 101 and 106, respectively. The relatively large number of same day admissions of residents of the Remote areas is likely to reflect the greater access of people in Alice Springs to these services.

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions for infectious and parasitic diseases, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for infectious and parasitic diseases (described below) varied widely between the capital cities, from a high of 116** in **Sydney**, to a low of 66** in **Canberra**. **Adelaide** (108**) and **Darwin** (106) were the only other capital cities with elevated ratios (**Table 6.18**). Both **Sydney** and **Darwin** had substantially higher ratios in the later period shown in **Table 6.18**, suggesting an increase (relative to the Australian rates) in admissions for these diseases. The increase for **Sydney** was substantial.

Table 6.18: Admissions with a principal diagnosis of infectious and parasitic diseases, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	116**	71**	84**	108**	78**	75**	106	66**	92**
1989 ³	69**	..	85**	90**	77**	..	84*	..	76**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients,

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources, Appendix 1.3*

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

In the early part of the century infectious and parasitic diseases were a major cause of disease and death. Reductions in deaths from these causes were a "significant factor in reducing death rates between 1921 and the early 1960s ..., particularly among infants and young children." (AIH 1990). They are still an important cause of hospital admission, in particular for viral diseases and intestinal infections. Children aged 0 to 4 years had the highest rate for these admissions (72.0 admissions per thousand population for males and 69.7 for females), with the next highest rates being in the 75 years and over age group. In 1996/97, the category 'infectious and parasitic diseases' accounted for about twice as many admissions for Indigenous people as expected based on all-Australian rates (ABS/AIHW 1999).

High rates of admission for infectious and parasitic diseases also occur among those who are socioeconomically disadvantaged. Esterman et al. (1990) found that admissions of people from lower socioeconomic status postcodes in **Adelaide** (socioeconomic status based on household income) were 6 per cent higher in the middle and 47 per cent higher in the lower income areas, for all infectious and parasitic diseases in aggregate, than in the more affluent areas. This is consistent with the higher notification rates found in the poorer areas for a wide range of communicable diseases.

Hospital admissions for infectious and parasitic diseases accounted for 4.5 per cent of all admissions of Northern Territory residents.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 404 admissions of residents of **Darwin** for infectious and parasitic diseases, 51 per cent fewer than were expected from the Northern Territory rates (an SAR of 49**). Of the 404 admissions, 217 were males (53.7 per cent) and 187 were females (46.3 per cent).

Postcodes (aggregates of suburbs)

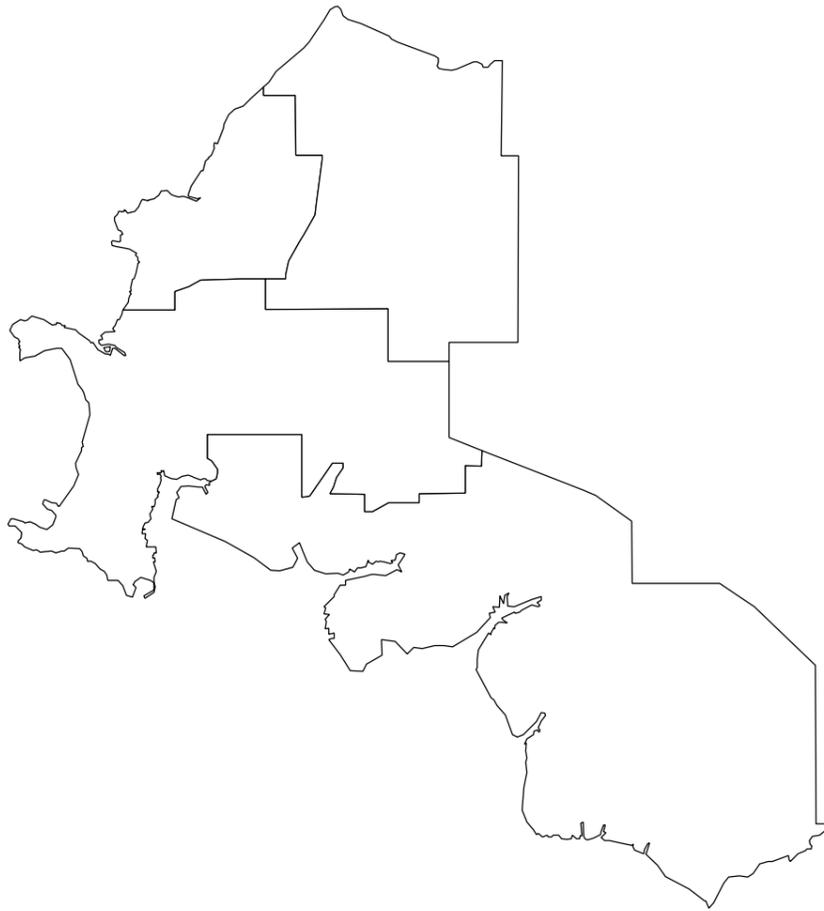
Residents of all the postcode areas in **Darwin** recorded at least 35 per cent fewer admissions than were expected from the Northern Territory rates (**Map 6.13**). The highest SAR at the postcode level, an SAR of 64** (with 105 admissions for infectious and parasitic diseases), was recorded in Darwin: South West, which includes the inner city and surrounding older suburbs. Residents of Darwin: North East (with an SAR of 52**) had the largest number of 119 admissions and residents of Palmerston (49**) recorded the lowest number of 72 admissions.

The lowest ratio, an SAR of 39**, was recorded in Darwin: North West, where residents had 61 per cent fewer admissions than were expected from the Northern Territory rates (108 admissions).

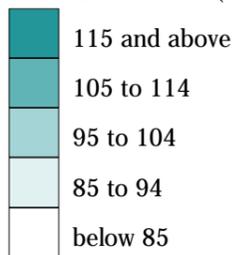
Map 6.13

Admissions for infectious and parasitic diseases, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for infectious and parasitic diseases, 1995/96

State/Territory comparison (Australia as the Standard)

With the exception of Tasmania and Victoria, standardised admission ratios (SARs) for admissions for infectious and parasitic diseases (described on the previous text page) of residents of the non-metropolitan areas were all highly elevated (**Table 6.19**). The most highly elevated ratios were in the non-metropolitan areas of the Northern Territory (305**), Western Australia (153**), South Australia (134**) and Queensland (126**).

The ratios for the non-metropolitan areas for each of the States named above declined (and some declined substantially) between the periods shown in **Table 6.19** with the largest change being that for the Northern Territory. These lower ratios suggest a decline (relative to the Australian rates) in admissions for these diseases.

Table 6.19: Admissions with a principal diagnosis of infectious and parasitic diseases, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	116**	71**	84**	108**	78**	75**	106	66**	92**
Other major urban centres ²	73**	83**	93**	..	..	..	..	..	81**
Rest of State/Territory	118**	93**	126**	134**	153**	85**	305**	- ³	121**
Whole of State/Territory	111**	77**	103**	115**	99	81**	219**	66**	100
1989⁴									
Rest of State/Territory	147**	..	162**	136**	170**	..	547**	..	164**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources, Appendix 1.3*

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 1,512 admissions for infectious and parasitic diseases of residents of non-metropolitan areas of the Northern Territory, 38 per cent more than were expected from the Northern Territory rates (an SAR of 138**). This represents a substantial difference in the rate of hospitalisation between residents of non-metropolitan areas and **Darwin**. Males accounted for just under half (48.6 per cent) of these admissions.

Map 6.14 shows that there tends to be a polarisation of SARs toward the highest and lowest ranges mapped, with almost half of the non-metropolitan SLAs recording SARs elevated by over 30 per cent above the expected level. The majority of SLAs in this range had large populations of Indigenous Australians.

The highest ratio, an SAR of 360**, was recorded in Bathurst-Melville, indicating that residents had over three and a half times the expected number of admissions for infectious and parasitic diseases. Highly elevated ratios (of at least twice the level expected from the Northern Territory rates) were recorded in Daly (an SAR of 262**), Tanami (259**), Sandover-Balance (255**), Tennant Creek (230**), East Arnhem-Balance (215**) and West Arnhem (214**). Highly elevated ratios were also recorded in Petermann (170**), Victoria (160** and Gulf (154**). Elevated ratios were also recorded in Elsey Balance (142), Tennant Creek-Balance (127) and Katherine (114).

Residents of Alice Springs, the only area with a ratio in the middle range mapped, had 9 per cent fewer admissions than were expected from the Northern Territory rates. Residents of Nhulunbuy (with an SAR of 81), Groote Eylandt (76) and Tableland (an SAR of 72, representing just seven admissions) also had fewer admissions for infectious and parasitic diseases than were expected from the Northern Territory rates.

With the exception of Litchfield [Part B] (with an SAR of 45** representing 55 admissions), residents of all SLAs with ratios in the lowest range mapped recorded fewer than 10 admissions for these causes. Residents of Litchfield [Part A] had no admissions when six were expected from the rates for the Northern Territory. Low ratios were also recorded in South Alligator (12*), Cox-Finniss (18*), Coomalie (42*) and Jabiru (44*).

The largest numbers of admissions for infectious and parasitic diseases were recorded for residents of Alice Springs (with an SAR of 257), East Arnhem-Balance (165), Tanami (160) and Daly (135).

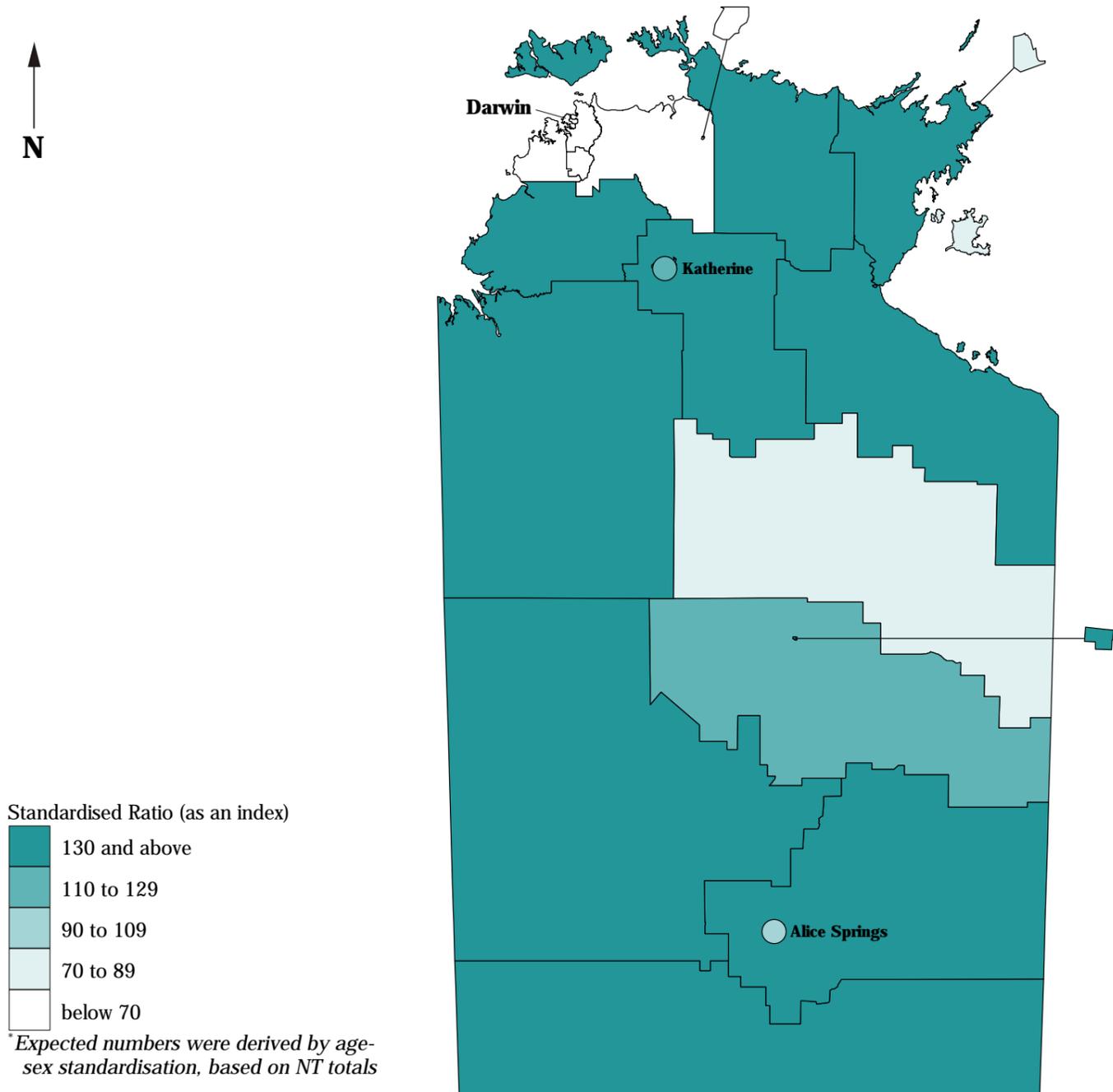
There correlations of substantial significance with the variables for Indigenous Australians (0.76) and private dwellings without a vehicle (0.80); and correlations of meaningful significance with single parent families (0.62), children aged from 0 to 4 years (0.58) and early school leavers (0.52). These results, together with the inverse correlation of substantial significance with the IRSD, indicates an association between high rates of admissions from these diseases and socioeconomic disadvantage.

A correlation of meaningful significance was also recorded with the variable for fair or poor health status (0.69) and an inverse correlation of meaningful significance with the variable for children fully immunised at 12 months of age (-0.53).

Map 6.14

Admissions for infectious and parasitic diseases, Northern Territory, 1995/1996

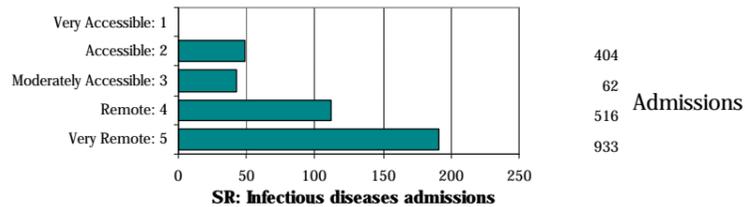
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for infectious and parasitic diseases are round half the level expected from the Northern Territory rates in areas in the Accessible and Moderately Accessible ARIA categories (with SARs of 49 and 43, respectively), and 12 per cent higher than expected in the Remote areas (an SAR of 112). The highly elevated rate of admissions of residents of the Very Remote areas, an SAR of 191 (almost twice the number of admissions for infectious diseases than expected from the Northern Territory rates, and four times the level in the most accessible areas) is likely to reflect admissions of the Indigenous population.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Admissions for cancer, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admissions ratios (SARs) for admissions for cancer (described below) varied between the capital cities, from a high of 121** in **Brisbane**, to a low of 78** in **Canberra**. **Hobart** (87**), **Perth** (89**) and **Sydney** (95**) also had fewer than expected admissions for these diseases (**Table 6.20**).

There was relatively little change in the ratios between the periods shown in **Table 6.20**, with the largest change being an increase in the admission ratio for **Darwin**, suggesting an increase (relative to the Australian rates) in admissions for these diseases.

Table 6.20: Admissions with a principal diagnosis of cancer, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	95**	103**	121**	105**	89**	87**	106	78**	101*
1989 ³	90**	..	121**	104**	99	..	98	..	99**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Admissions to hospital for cancer (malignant neoplasms) accounted for 2.7 per cent of all the admissions analysed for Northern Territory residents; 5.5 per cent of residents of **Darwin** and 2.0 per cent in the non-metropolitan areas.

Esterman et al. (1990), reporting on hospital admissions for cancers, noted a 21 per cent higher hospital admission rate for males compared with females in South Australia in 1988. They commented on differences in admission rates and incidence of various cancers related to differences in socioeconomic status. They found that admission rates for malignant neoplasms were 14 per cent higher for the middle and 20 per cent higher for the lower than those for the upper income category (based on household incomes in postcodes). They also reported that South Australian Cancer Registry data showed that the poorer areas have a higher incidence of cancers of the following anatomical sites: lung, pancreas, larynx, liver, pleura, cervix, and stomach. It is likely that these cancers would have contributed to the higher admission rates.

Just as people from middle and lower socioeconomic status postcodes have higher rates of incidence of some cancers, so too do people from higher socioeconomic status postcodes. Those cancers are reported by Esterman et al. (1988) as being of the female breast, uterus (body), prostate, testis, skin (melanoma), and colon. Overall, however, residents of middle and lower socioeconomic status postcodes had more admissions for cancers than did those from higher socioeconomic status postcodes.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 652 admissions to hospital of residents of **Darwin** for cancer, 14 per cent more than expected from the Northern Territory rates (an SAR of 114**). Males accounted for over half (54.8 per cent) of the admissions, with 358 admissions.

Postcodes (aggregates of suburbs)

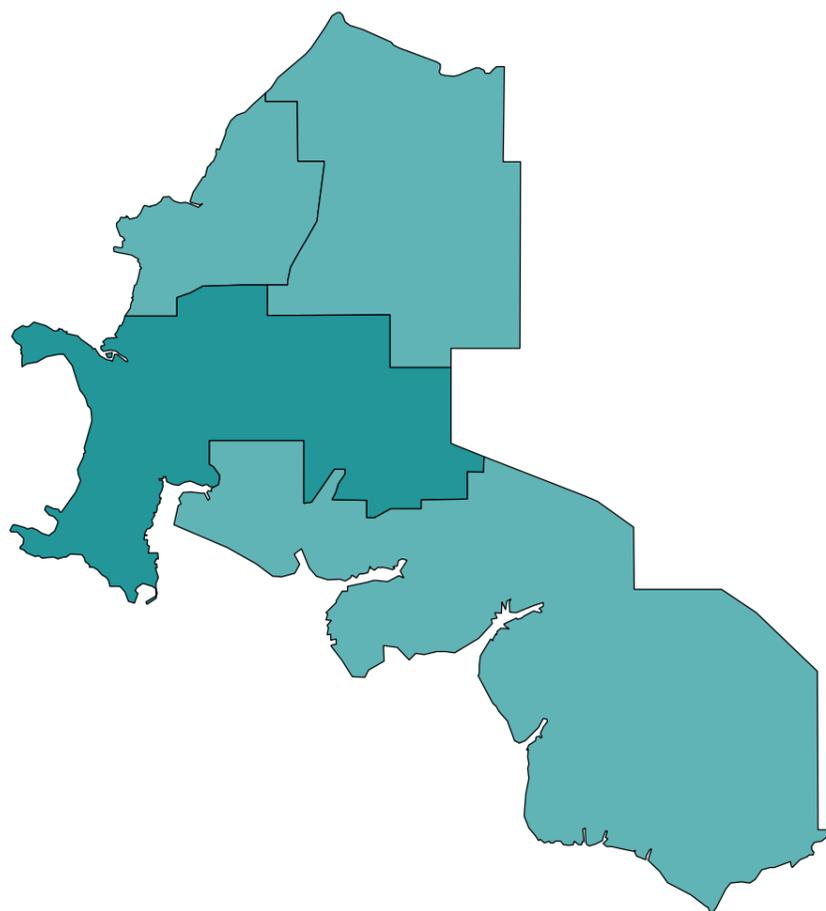
All the postcode areas in **Darwin** had elevated SARs for admissions for cancer, with the highest, and only significant ratio, an SAR of 124**, recorded in the older inner city areas of Darwin: South West (**Map 6.15**). Darwin: North West (110), Darwin: North East (111) and Palmerston (114) recorded similar ratios.

Residents of Darwin: North West had the largest number of admissions for cancer (239 admissions) and residents of Palmerston had the lowest number (83). Residents of Darwin: South West and Darwin: North East had 169 and 160 admissions for cancer respectively.

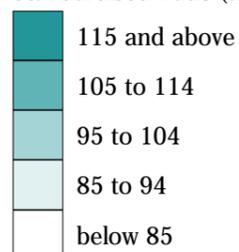
Map 6.15

Admissions for cancer, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for cancer, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for cancer (described on the previous text page) of residents of the non-metropolitan areas were relatively uniform across the States and Territories (**Table 6.21**). The most highly elevated ratio was in Queensland (109**), and the lowest in the Northern Territory (79**) and Western Australia (84**).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.21**, with the largest changes being for New South Wales, Western Australia and the Northern Territory. These lower ratios suggest a decline (relative to the Australian rates) in admissions for these diseases.

Table 6.21: Admissions with a principal diagnosis of cancer, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	95**	103**	121**	105**	89**	87**	106	78**	101*
Other major urban centres ²	90**	87**	106**	..	..	..	..	..	95**
Rest of State/Territory	99	99	109**	104**	84**	90**	79**	- ³	100
Whole of State/Territory	96**	102**	114**	104**	88**	89**	92**	77**	100
1989⁴									
Rest of State/Territory	107**	..	107**	105**	91**	..	73**	..	..

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources, Appendix 1.3*

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

The total of 503 admissions of residents of non-metropolitan Northern Territory for cancer was 14 per cent lower than expected from the Northern Territory rates (an SAR of 86**). Males and females were evenly represented in the admissions, with proportions of 50.5 and 49.5 per cent respectively. Overall, the numbers of admissions from individual SLAs were low, with most areas recording fewer than 20 admissions.

With most ratios skewed to the lower values, the distribution of SARs in non-metropolitan areas (**Map 6.16**) presents a contrast to that in **Darwin**. Only two SLAs recorded elevated ratios; residents of Groote Eylandt (286**) had almost three times the expected number of admissions for cancer, and residents of Litchfield [Part B] (120) had 20 per cent more admissions than expected from the Northern Territory rates.

Daly (with an SAR of 99), Katherine (94) and East Arnhem-Balance (94) recorded ratios in the middle range mapped (within 10 per cent of the level expected).

Ratios in the next lowest range (of between 70 and 90 per cent lower than expected) were recorded in Elsey Balance (87), Nhulunbuy (86), Coomalie (79) and Tennant Creek-Balance (72), all with fewer than 20 admissions. Residents of Alice Springs (with an SAR of 76**) recorded the largest number of admissions for cancer in the non-metropolitan areas of Northern Territory (126 admissions).

All SLAs with ratios in the lowest range mapped had fewer than 20 admissions for cancer. The lowest ratios were recorded in Jabiru (39), Bathurst-Melville (40*), Gulf (42*) and Victoria (48*). The only other significantly low ratio was an SAR of 61*, recorded in Tanami.

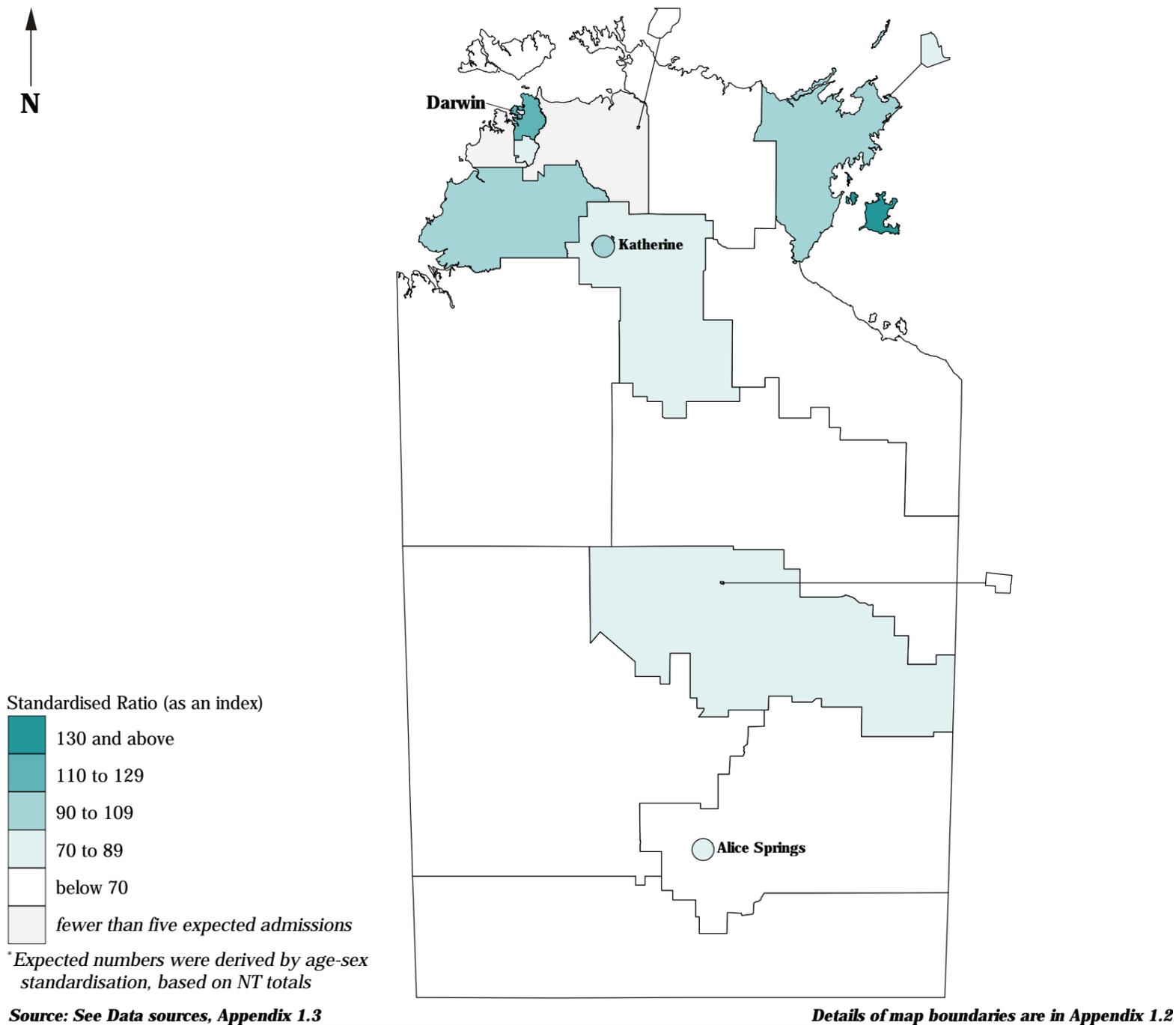
Apart from Alice Springs (mentioned above), the largest numbers of admissions for cancer were recorded for residents of Litchfield [Part B] (110 admissions), Katherine (47) and Groote Eylandt (37).

The strongest associations with socioeconomic disadvantage evident from the correlation analysis was with the variable for early school leavers (-0.30).

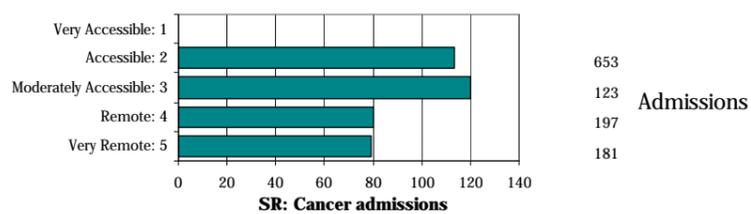
Map 6.16

Admissions for cancer, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for cancer have a distinctive distribution across the ARIA categories. There are elevated ratios in the Moderately Accessible (an SAR of 120, 20 per cent more admissions for cancer than expected from the Northern Territory rates) and Accessible areas (113) and lower than expected ratios of 79 in the Very Remote areas and 80 in the Remote areas.

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions for lung cancer, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for lung cancer (described below) varied between the capital cities, from a high of 121** in **Brisbane** and **Adelaide**, to a very low 54** in **Canberra**. **Sydney** (88**) also had a relatively low standardised admission ratio (**Table 6.22**).

Between the two periods shown in **Table 6.22**, the ratios for **Brisbane** and **Darwin** fell, suggesting a decline (relative to the Australian rates) in admissions for these diseases. The increases evident for the ratios in **Perth** and **Sydney** suggest an increase (relative to the Australian rates) in admissions for lung cancer, although both ratios remain below the level expected from the Australian rates.

Table 6.22: Admissions with a principal diagnosis of lung cancer, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	88**	99	121**	121**	89**	95	100	54**	98
1989 ³	82**	..	154**	119**	77**	..	162**	..	100

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Hospital admissions for lung cancer, which includes cancers of the trachea, bronchus and lung, accounted for 6.5 per cent of all admissions for cancer in 1995/96. However, lung cancer accounted for only 0.2 per cent of all admissions analysed for Northern Territory residents.

Residents of Darwin: North East (89) had eight admissions when 9 were expected; and residents of Darwin: North West recorded the lowest ratio, an SAR of 57, with just eight admissions when 14.3 were expected.

As noted in the commentary to the map for all cancers (page 224), incidence rates for some cancers are higher among people from poorer areas. Esterman et al. (1990) estimated the differential for lung cancer in the poorest areas compared with the most affluent areas to be approximately fifty per cent, that is the highest of all the cancers studied. In both SA and the NT, a higher than expected incidence of lung cancer has been observed among Indigenous people (ABS/AIHW 1999).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin⁵ (Northern Territory as the Standard)

There were 35 admissions of residents of **Darwin** for lung cancer, 7 per cent fewer admissions than were expected from the Northern Territory rates (an SAR of 93). Males accounted for just over half (54.3 per cent) of the admissions.

Postcodes (aggregates of suburbs)

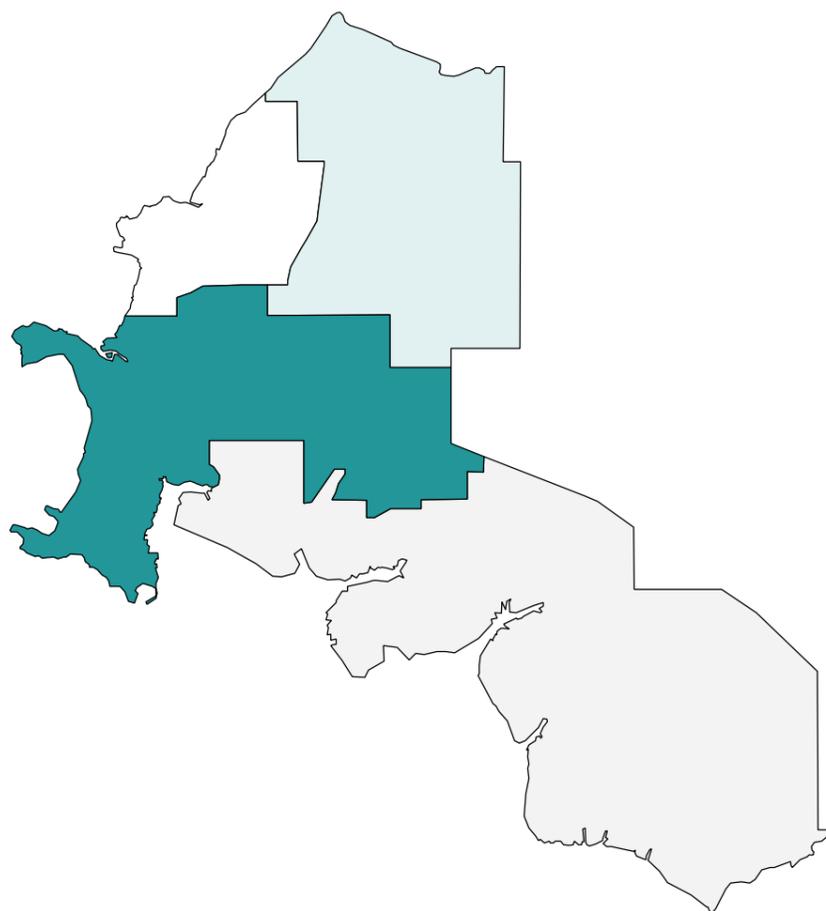
Darwin: South West, which includes the inner city and surrounding older suburbs, had the highest SAR at the postcode level, an SAR of 145, with 14 admissions for lung cancer (when ten were expected from the rates for the Northern Territory) (**Map 6.17**). Palmerston (although not mapped) recorded an elevated ratio of 106 representing 5 admissions when 4.7 were expected.

⁵As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 293.

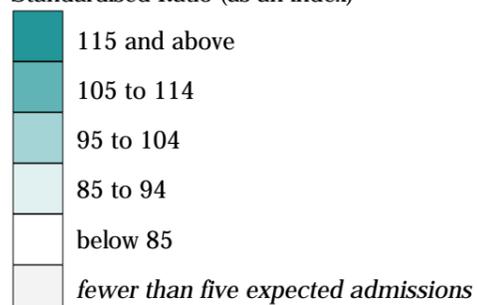
Map 6.17

Admissions for lung cancer, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of females aged 40 years and over for breast cancer, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions of females aged 40 years and over from breast cancer were relatively uniform across the capital cities, with the exception of higher ratios in **Darwin** and **Melbourne** and lower ratios in **Hobart** and **Perth** (Table 6.23).

The SARs in **Sydney** have remained consistent for both periods shown in Table 6.23 and have declined in **Brisbane**, **Adelaide**, **Perth** and **Darwin** (where, despite a substantial decline, the ratio remains well above the level expected). The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions for these diseases.

Table 6.23: Admissions of females aged 40 years and over¹ with a principal diagnosis of breast cancer, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
1995/96 ³	97	125**	93*	94*	81**	71**	129	90	102
1989 ⁴	96	..	108*	102	87**	..	182**	..	98

¹Data for '1989' is of females of all ages

²Includes Queanbeyan (C)

³Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

⁴Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Breast cancer is the most common cancer notified for females in the Northern Territory. Incidence rates for some cancers are higher among people from the most affluent areas (Esterman et al. 1990).

In 1995/96, hospital admissions for breast cancer accounted for 0.2 per cent of all admissions analysed and 7.7 per cent of admissions for cancer of Northern Territory residents.

The data mapped are for females aged 40 years and older, as very few females at younger ages are admitted to hospital for this disease.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin⁶ (Northern Territory as the Standard)

A total of 55 admissions for cancer of the female breast were recorded for female residents (aged 40 years and over) of **Darwin** in 1995/96, 21 per cent more admissions than were expected from the Northern Territory rates (an SAR of 121).

Postcodes (aggregates of suburbs)

Darwin: North East (with an SAR of 268**) was the only postcode area of **Darwin** to record an elevated ratio (Map 6.18). The total of 34 admissions for cancer of the female breast, the largest number in the postcode areas, was over two and a half times more than the number of admissions expected from the Northern Territory rates.

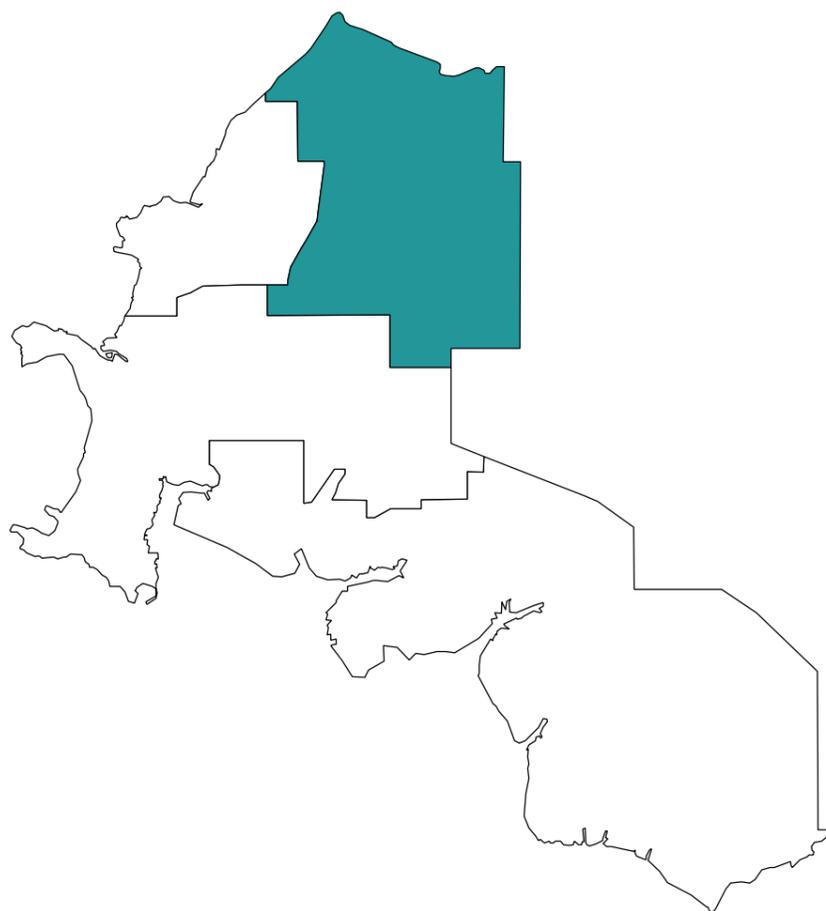
Considerably lower ratios (and numbers of admissions) were recorded in Darwin: South West (77, seven admissions when nine were expected), Palmerston (75, four admissions when five were expected) and Darwin: North West (54*, 10 admissions when 19 were expected).

⁶As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 294.

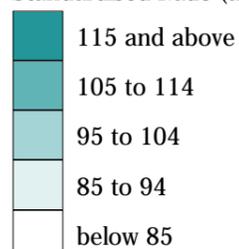
Map 6.18

Admissions of females aged 40 years and over for breast cancer, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for psychosis, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for psychosis (described below) varied widely between the capital cities (Table 6.24). **Brisbane** and **Adelaide** (each with an SAR of 139**) had highly elevated SARs, with a ratio of less than half of this level in **Canberra** (64**). The SARs in **Melbourne** and **Darwin** (both 83**) were also much lower than the *All capitals* rate of 110**.

Table 6.24: Admissions¹ with a principal diagnosis of psychosis, capital cities, 1995/96
Age-sex standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
114**	83**	139**	139**	119**	112**	83**	64**	110**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Mental illness is a major cause of disability, particularly among the high risk groups of people who are unemployed, alcoholic, homeless, and others suffering a major life loss such as divorce, or death of a close friend or family member.

Residents of Darwin: North East (63**, 43 admissions when 68.7 were expected) and Palmerston (51**, 18 admissions when 35.2 were expected) recorded 37 and 49 per cent fewer admissions than were expected from the Northern Territory rates.

Mental disorder is classified as being psychosis, neurotic, personality or other mental disorder, or mental retardation. The variable mapped opposite is of people diagnosed with psychosis. Psychosis is a major mental disorder in which a person's ability to think, respond emotionally, remember, communicate, interpret reality and behave appropriately is impaired and insight is usually absent. It includes people exhibiting a range of behaviours, from violent behaviour, to hallucination, to those who are withdrawn and immobile, schizophrenia is included in this category.

In this, and the following map, admissions analysed include inpatients with the appropriate disease code as a principal diagnosis in public acute hospitals and private acute and psychiatric hospitals, regardless of whether they were in a specialist psychiatric unit within these hospitals.

Hospital admissions for psychosis accounted for 1.3 per cent of all admissions analysed for Northern Territory residents, with higher proportions recorded for males (1.7 per cent and a rate of 367.5 per 100,000 population) than females (0.9 per cent and a rate of 260.5 per 100,000 population).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 278 admissions of residents of **Darwin** in 1995/96 for psychosis, 1.7 per cent of admissions in the analysis. Residents of **Darwin** had 6 per cent more admissions for psychosis than were expected from the Northern Territory rates, an SAR of 106. Males accounted for over half (59.0 per cent) of these admissions.

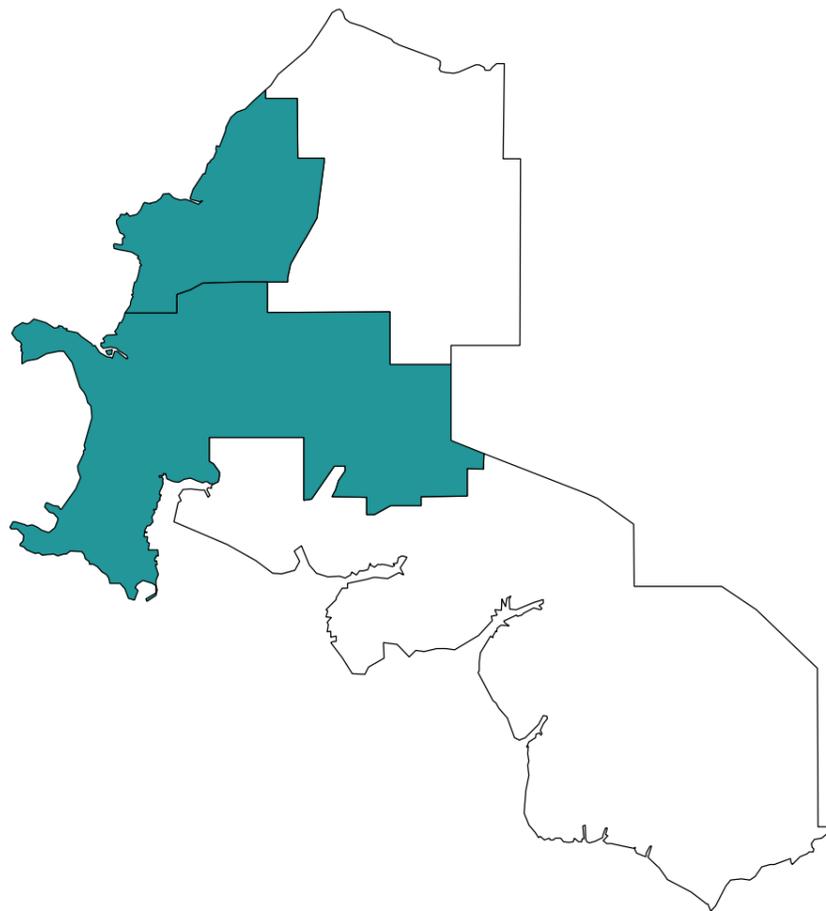
Postcodes (aggregates of suburbs)

There is a polarisation evident in the distribution of the SARs for admissions for psychosis (Map 6.19). Elevated ratios were recorded in Darwin: South West (160**, 100 admissions) and Darwin: North West (122*, 117 admissions).

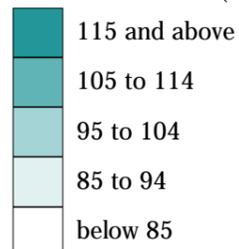
Map 6.19

Admissions for psychosis, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for psychosis, 1995/96

State/Territory comparison (Australia as the Standard)

In all cases, there were relatively more admissions for psychosis of people who were residents of the capital cities than of the non-metropolitan areas, with the widest variations being in Tasmania, Queensland and Western Australia (**Table 6.25**). The SAR of 118** in the non-metropolitan areas of South Australia was 40 per cent higher than the next highest SAR (in New South Wales).

Table 6.25: Admissions¹ with a principal diagnosis of psychosis, State/Territory, 1995/96
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	114**	83**	139**	139**	119**	112**	83**	64**	110**
Other major urban centres ²	89**	103	82**	..	..	..	..	..	88**
Rest of State/Territory	83**	70**	81**	118**	80**	69**	74**	- ³	81**
Whole of State/Territory	103**	80**	108**	133**	109**	87**	79**	64**	100

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 275 admissions for psychosis of residents of non-metropolitan Northern Territory, five per cent fewer admissions than were expected from the Northern Territory rates (an SAR of 95). Males had the larger proportion of admissions, 60.7 per cent.

As in **Darwin**, the distribution of SARs tends to be concentrated in the highest and lowest ranges mapped, with the largest proportion of non-metropolitan SLAs recording SARs of below 70. All but six SLAs had fewer than 10 admissions (**Map 6.20**).

The highest SAR, 233**, was recorded in the town of Tennant Creek, where there were 23 admissions for psychosis, when 10 were expected from the rates for the Northern Territory. Bathurst-Melville (153), Katherine (135) and Tanami (133) also recorded ratios in the top range mapped.

Alice Springs recorded the lowest elevated ratio (an SAR of 121).

Of the remaining SLAs, East Arnhem-Balance (92), Victoria (89) and Litchfield [Part B] (79) were the only areas that did not have ratios in the lowest range mapped.

Eight SLAs recorded SARs below 70, all representing fewer than eight admissions. The highest ratio in this range (an SAR of 57) was recorded in both Nhulunbuy and Daly. The lowest ratios were recorded in Tennant Creek-Balance (6⁺), Gulf (18⁺) and Sandover-Balance (22⁺).

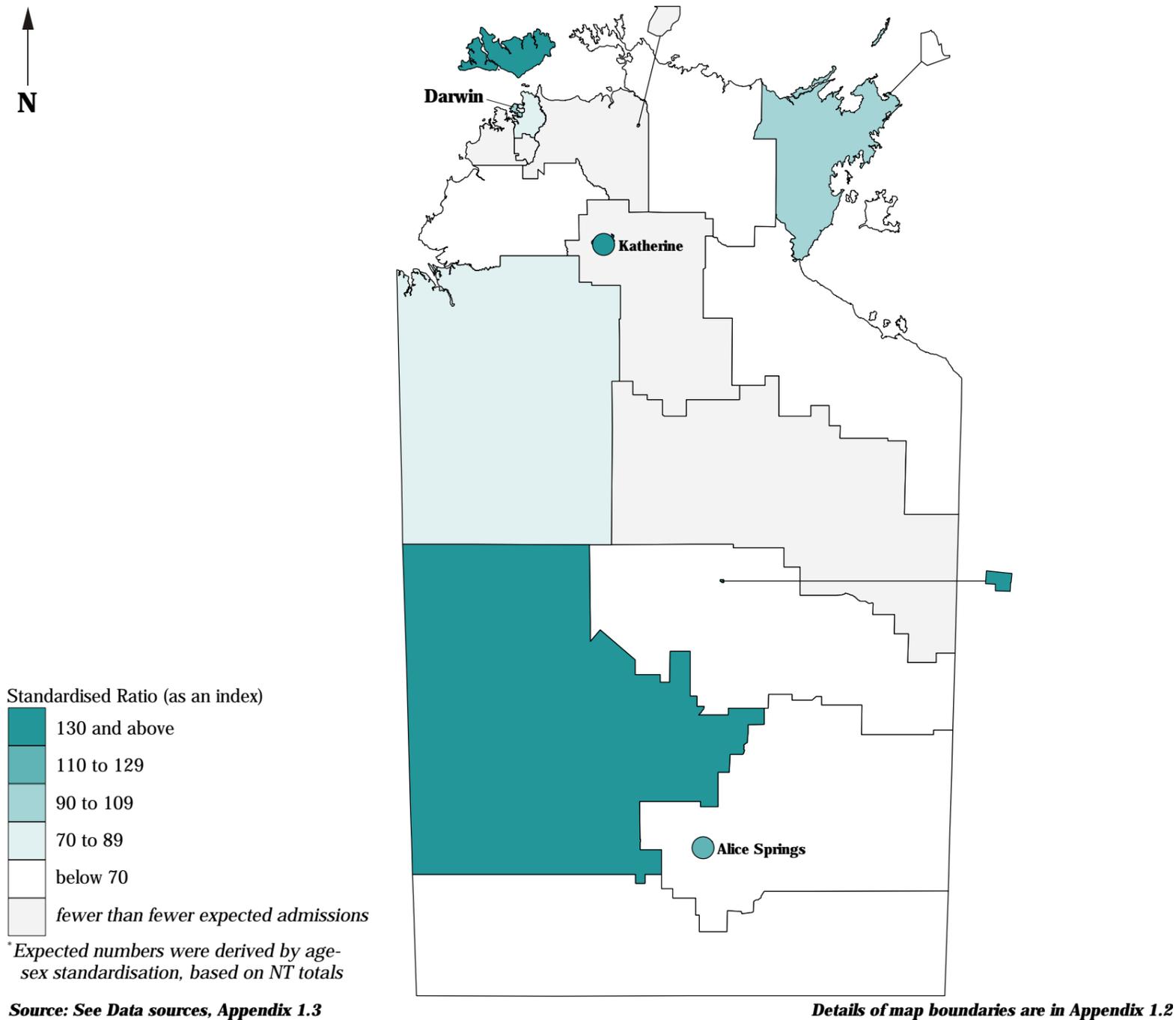
The largest numbers of admissions for psychosis were of residents of the towns of Alice Springs (98 admissions), Katherine (37) and Tennant Creek (23). Residents of the semi-urban area of Litchfield [Part B] recorded 31 admissions for psychosis.

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

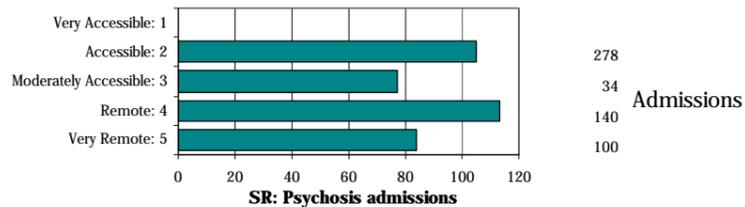
Map 6.20

Admissions for psychosis, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



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Standardised admission ratios for psychosis are highest in the two ARIA categories with the most highly urbanised populations, the Remote areas (largely comprised of people in towns including Alice Springs and Katherine, with an SAR of 113 and the second largest number of admissions) and the Accessible areas (which covers Darwin, an SAR of 105 and the largest number of admissions). Lower than expected ratios were recorded for admissions of residents of the Moderately Accessible areas (an SAR of 77, 23 per cent fewer admissions than expected from the Northern Territory rates) and Very Remote areas (84).

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions for neurotic, personality or other mental disorder, 1995/96

Capital city comparison (Australia as the Standard)

As was the case for admissions for psychosis, standardised admission ratios (SARs) for admissions for neurotic, personality or other mental disorders (described below) varied widely between the capital cities (**Table 6.26**). The pattern of variation was, however, somewhat different, in particular the ratios in **Adelaide** and **Canberra** were substantially lower, whereas SARs in the other capital cities were substantially higher. **Sydney** (with an SAR of 140**), **Hobart** (135**), **Brisbane** (122**) and **Perth** (103*) all had elevated SARs, with a ratio of around one third this level in **Canberra** (44**).

Table 6.26: Admissions¹ with a principal diagnosis of neurotic, personality or other mental disorders, capital cities, 1995/96
Age-sex standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
140**	61**	122**	86**	103*	135**	59**	44**	103**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

The introduction to the previous variable (psychosis) refers to the coverage of the data and other background information of relevance.

The variable under discussion here includes admissions of people diagnosed as having a neurotic, personality or other mental disorder. They are distinguished from those with psychosis (see page 232) by the fact that a neurosis arises as a result of stressors and anxieties in the person's environment. The most common are anxiety states, reactive depression and obsessive-compulsive disorders.

Males had a higher overall rate of admissions for neurotic, personality or other mental disorder than did females (318.7 admissions per 100,000 population compared with 256.8). Admissions to hospital for neurotic, personality or other mental disorders accounted for 1.2 per cent of all the admissions analysed for Northern Territory residents.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 220 admissions for neurotic, personality or other mental disorders of residents of **Darwin**, 1.2 per cent of all admissions. Males accounted for almost two thirds (62.3 per cent) of the admissions. **Darwin** residents had 7 per cent fewer admissions for this variable than were expected from the Northern Territory rates, an SAR of 93.

Postcodes (aggregates of suburbs)

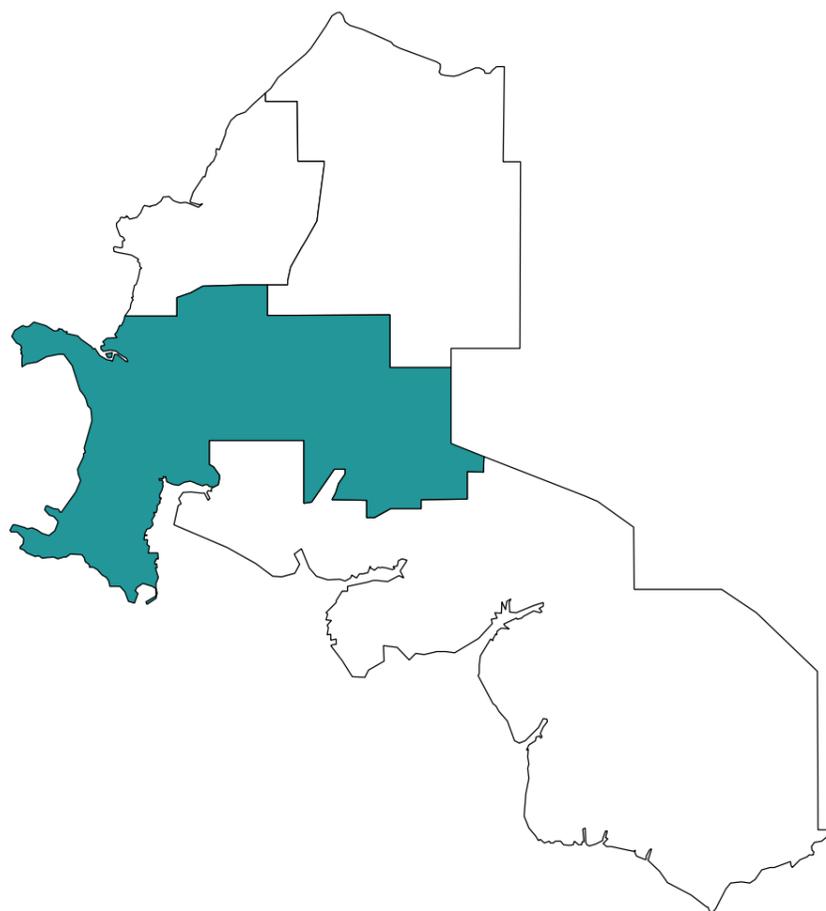
The only elevated ratio at the postcode level, an SAR of 169**, was recorded in Darwin: South West, with the largest number of admissions (94 admissions) (**Map 6.21**).

Admissions for neurotic, personality or other disorders below the expected level from the Northern Territory rates were recorded for residents of Palmerston (an SAR of 74, and 24 admissions), Darwin: North East (69*, 43 admissions) and Darwin: North West (68**, 59 admissions).

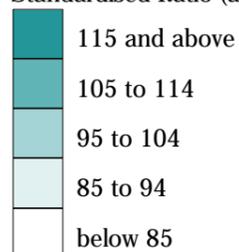
Map 6.21

Admissions for neurotic, personality or other mental disorders, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for neurotic, personality or other mental disorder, 1995/96

State/Territory comparison (Australia as the Standard)

There was no consistent pattern for admissions for neurotic, personality or other mental disorders (described below) in the standardised admission ratios (SARs) between residents of the capital cities and of the non-metropolitan areas (Table 6.27). In New South Wales, Queensland and Tasmania capital city ratios were higher, with the reverse applying in South Australia, Western Australia, Victoria and the Northern Territory.

Table 6.27: Admissions¹ with a principal diagnosis of neurotic, personality or other mental disorders, State/Territory, 1995/96
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	140**	61**	122**	86**	103*	135**	59**	44**	103**
Other major urban centres ²	81**	60**	84**	..	..	..	..	..	80**
Rest of State/Territory	104**	70**	107**	130**	112**	79**	67**	- ³	98**
Whole of State/Territory	124**	63**	111**	98	105**	102	64**	42**	100

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 286 admissions for neurotic, personality or other mental disorders of residents of the non-metropolitan areas of the Northern Territory, 6 per cent more than expected from the Northern Territory rates (an SAR of 106). Males accounted for just over half (52.5 per cent) of the admissions.

Fewer than five admissions were expected for this variable from just over a third of non-metropolitan SLAs and, accordingly, these SLAs have not been mapped. The ratios in the remaining SLAs were concentrated in the highest and lowest ranges mapped (Map 6.22). Residents of all SLAs with fewer admissions than expected from the Northern Territory rates had fewer than 10 admissions.

Elevated ratios of statistical significance were all recorded in towns, with the highest ratio recorded in Nhulunbuy (with residents having almost two and a half times the expected number of admissions for neurotic, personality or other mental disorders, an SAR of 243**). Tennant Creek (with an SAR of 219** and 19 admissions), East Arnhem-Balance (135) Alice Springs (134**) and Katherine (133) were also mapped in the top range. The only other elevated ratio, 112, was recorded in Litchfield [Part B].

Of the six SLAs mapped in the lowest range, statistically significant ratios were recorded in just West Arnhem (with the lowest SAR of 21** representing just two admissions compared to an expected 11) and Tanami (47*, seven admissions when 14 were expected from the Northern Territory rates). Low ratios were also recorded in Petermann (with an SAR of 37, two admissions compared to an expected seven admissions) and Gulf (40, three admissions compared to an expected seven).

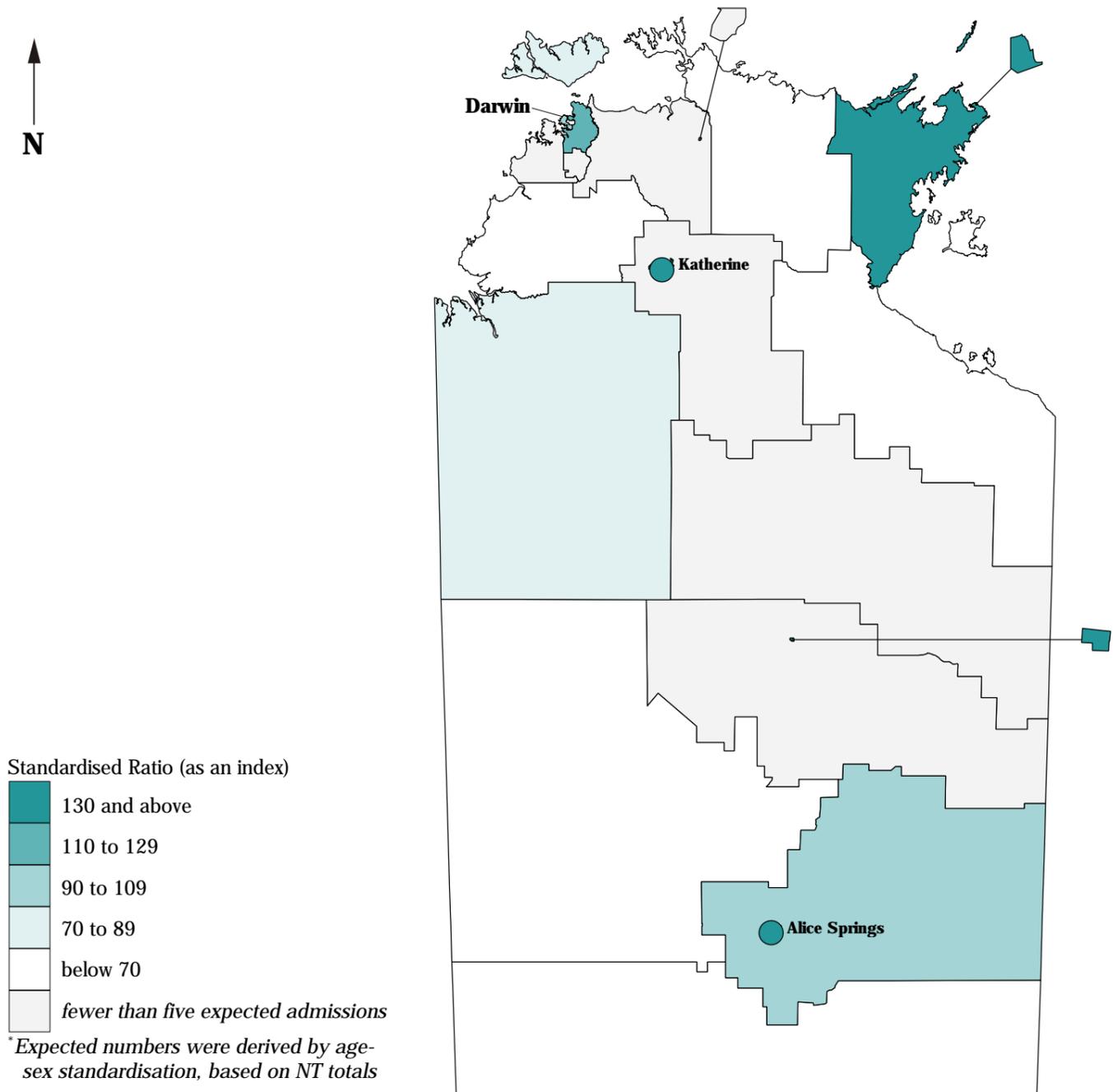
The largest numbers of admissions were of residents of Alice Springs (100 admissions), Litchfield [Part B] (40), Katherine (34) and Nhulunbuy (26).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Map 6.22

Admissions for neurotic, personality or other mental disorders, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Standardised Ratio (as an index)

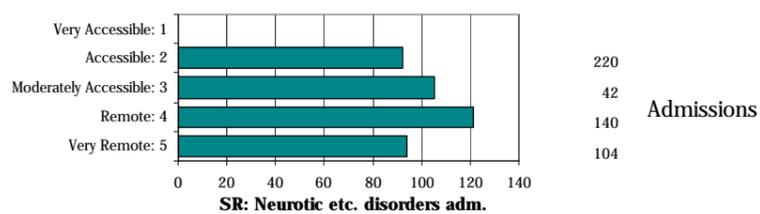
- 130 and above
- 110 to 129
- 90 to 109
- 70 to 89
- below 70
- fewer than five expected admissions

*Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for neurotic, personality or other mental disorders increase across the ARIA categories from an SAR of 92 in the Accessible areas (8 per cent fewer admissions for these conditions than expected from the Northern Territory rates) to an elevated SAR of 121 in the Remote areas (21 per cent more admissions than expected). Residents of the Very Remote areas had a ratio almost as low as that in the Accessible areas, an SAR of 94.

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions for circulatory system diseases, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for diseases of the circulatory system (described below) varied little between the capital cities, with the exception of relatively low ratios in **Canberra** (80**) and **Perth** (84**) (Table 6.28).

Both **Brisbane** and **Perth** had lower ratios in the later period shown in Table 6.28, suggesting a decline (relative to the Australian rates) in admissions for these diseases. The SARs in **Sydney** and **Darwin** increased, suggesting an increase (relative to the Australian rates) in admissions over this period.

Table 6.28: Admissions with a principal diagnosis of circulatory system diseases, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	99**	94**	92**	102**	84**	97*	94	80**	95**
1989 ³	88**	..	104**	102**	91**	..	60**	..	93**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Admissions for circulatory system diseases in the Northern Territory accounted for 4.8 per cent of admissions in this analysis. They include admissions for ischaemic heart disease, other forms of heart disease and cerebrovascular disease.

Admission rates from these causes are affected by age and sex, socioeconomic status, race and country of birth. Esterman et al. (1990) report that in **Adelaide**, there was a pronounced upward gradient in admission rates for all circulatory system diseases with lowering income status. Residents of the poorest areas had a rate 34 per cent higher than for the wealthiest areas. The corresponding elevation was 47 per cent for ischaemic heart disease, 15 per cent for stroke and 143 per cent for hypertension.

For 1996/97, age-standardised admission ratios for Indigenous men for diseases of the circulatory system were 1.7 times higher, and for Indigenous women, twice the admission ratios for non-Indigenous people (ABS/AIHW 1999).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 941 admissions of residents of **Darwin** for circulatory system diseases in 1995/96, 6 per cent fewer admissions than were expected from the Northern Territory rates (an SAR of 94⁺). Males accounted for 567 admissions (60.2 per cent) and females accounted for 374 admissions (39.8 per cent).

Postcodes (aggregates of suburbs)

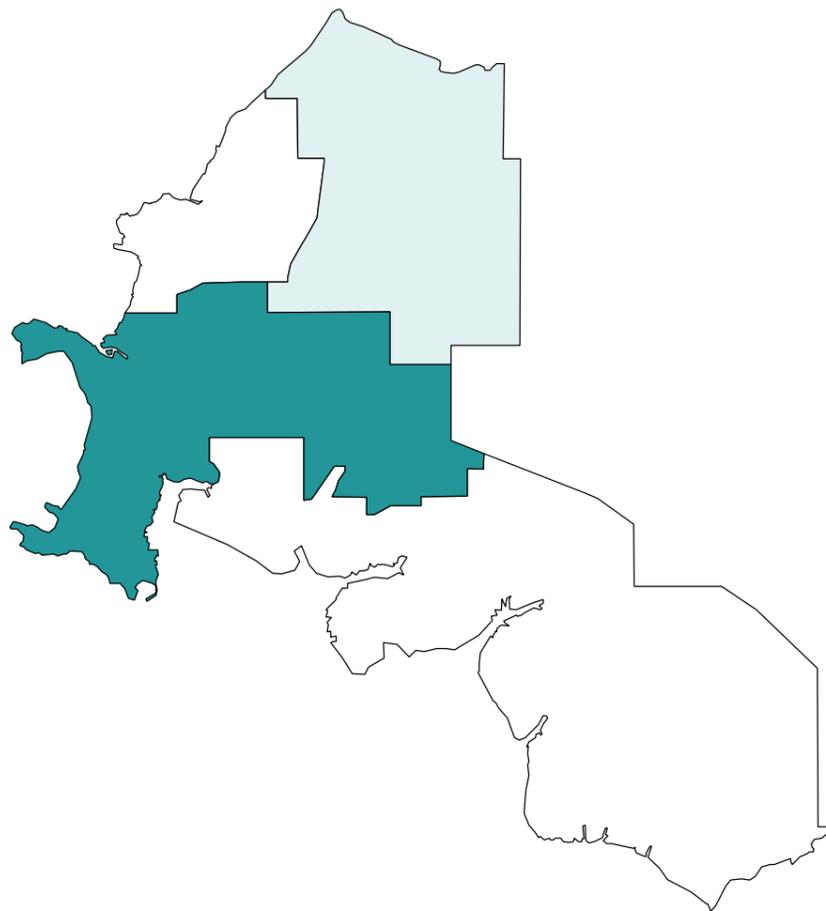
Residents of Darwin: South West, the only postcode area to record an elevated ratio (131**), had the largest number of 325 admissions for circulatory system diseases (Map 6.23).

The lowest ratio, 79**, was recorded in Darwin: North West and represented 294 admissions. Residents of Darwin: North East (86⁺) and Palmerston (80⁺) had 216 and 106 admissions respectively.

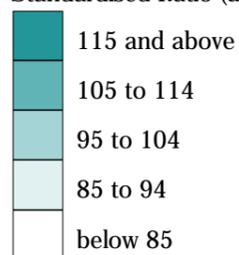
Map 6.23

Admissions for circulatory system diseases, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for circulatory system diseases, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for diseases of the circulatory system (described on the previous text page) of residents of the non-metropolitan areas were, with the exception of Tasmania (with an SAR of 95**), relatively uniform across the States and Territories (**Table 6.29**). The most highly elevated ratios were in New South Wales (116**), South Australia (115**) and Victoria (113**).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.29** with the greatest change being the decrease shown for Western Australia.

Table 6.29: Admissions with a principal diagnosis of circulatory system diseases, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	99**	94**	92**	102**	84**	97*	94	80**	95**
Other major urban centres ²	97**	91**	99	..	..	..	..	..	97**
Rest of State/Territory	116**	113**	106**	115**	103**	95**	108**	- ³	111**
Whole of State/Territory	104**	100	98**	105**	89**	96**	101	78**	100
1989⁴									
Rest of State/Territory	118**	..	110**	117**	113**	..	102	..	115**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 1,109 admissions of residents of non-metropolitan Northern Territory for circulatory system diseases, 6 per cent more than expected from the Northern Territory rates (an SAR of 106*). Males accounted for 58.4 per cent of these admissions.

The distribution of standardised admission ratios was relatively evenly spread, both spatially and in terms of the ranges mapped (**Map 6.24**). The highest ratio (an SAR of 270**) was recorded in Tennant Creek, where residents had over two and a half times the expected number of admissions for circulatory system diseases. Significantly elevated ratios were also recorded in East Arnhem-Balance (159**) and Tanami (140**). Bathurst-Melville (143) and Daly (130) also had ratios in the top range mapped. These SLAs all had large populations of Indigenous Australians (see comment on the previous text page regarding higher rates of admission from circulatory system diseases for Indigenous Australians).

SARs of between 110 and 129 were recorded in Petermann (126), Katherine (125*), Groote Eylandt (123) and Tableland (111).

SLAs with standardised admission ratios falling within 10 per cent of the level expected from the Northern Territory rates were Nhulunbuy (104), Sandover-Balance (104), Gulf (103), Cox-Finniss (102), Elsey Balance (97), West Arnhem (94) and Alice Springs (93).

The three lowest ratios were recorded in SLAs close to **Darwin**, in Litchfield [Part A] (19*), Coomalie (35*) and Litchfield [Part B] (64**). Residents of the first two SLAs had very low numbers of admissions for circulatory system diseases with one and five admissions respectively.

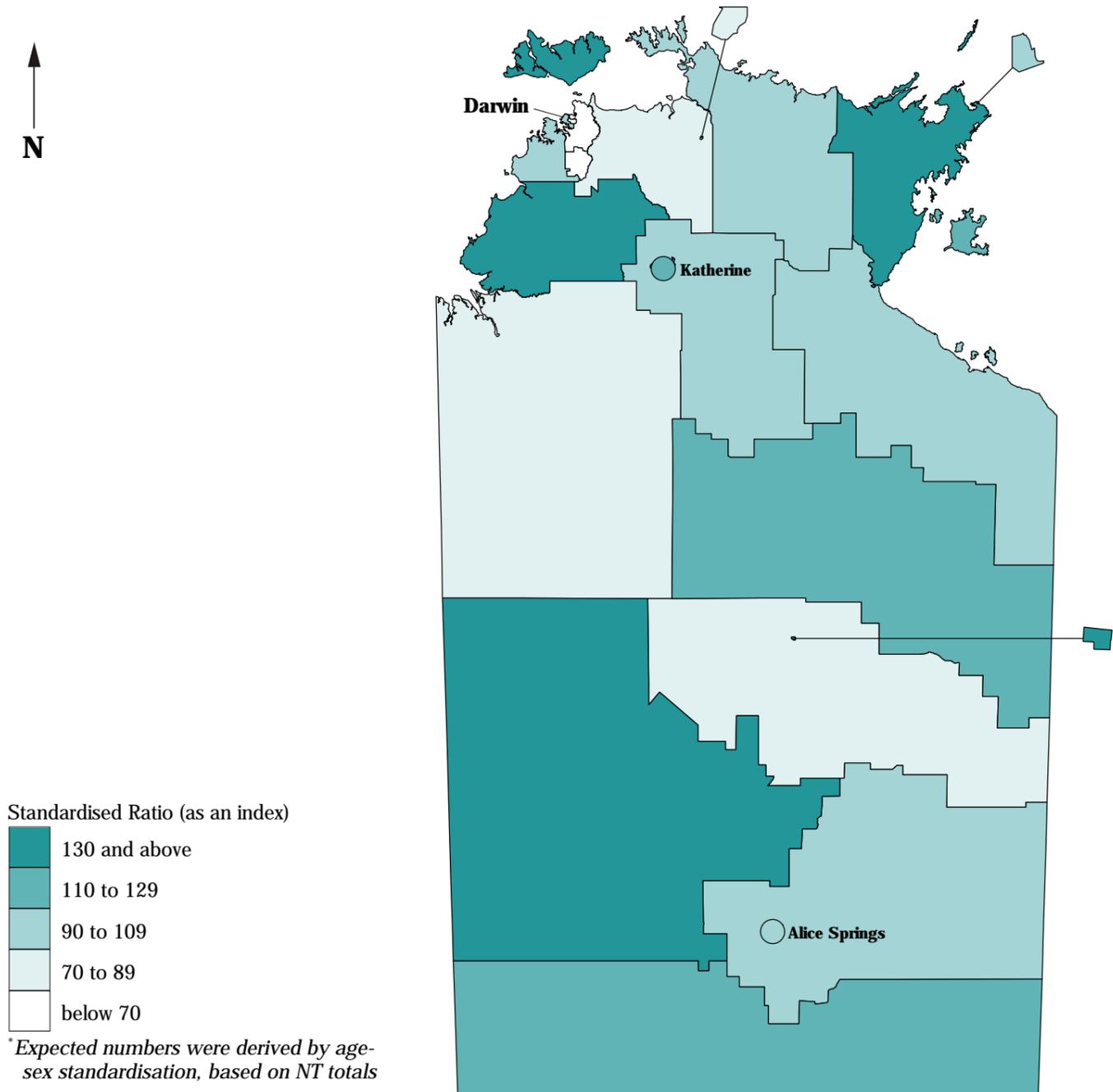
The largest numbers of admissions for circulatory system diseases in the non-metropolitan areas of the Northern Territory were recorded for residents of the towns of Alice Springs (274 admissions), Katherine (115), Tennant Creek (104) and Litchfield [Part B] (101). The largest number of admissions for residents of non-metropolitan areas were recorded in East Arnhem-Balance and Tanami (both with 78 admissions).

There were weak associations in the correlation analysis with indicators of socioeconomic disadvantage, with the strongest associations recorded with the variables for age pensioners (0.44), dwellings rented from the Territory housing authority (0.37), the Indigenous population (0.33) and single parent families (0.30). These results, together with the weak inverse correlation with the IRSD (-0.29), suggest the existence of an association at the SLA level between high rates of admission for circulatory system diseases and socioeconomic disadvantage.

Map 6.24

Admissions for circulatory system diseases, Northern Territory, 1995/1996

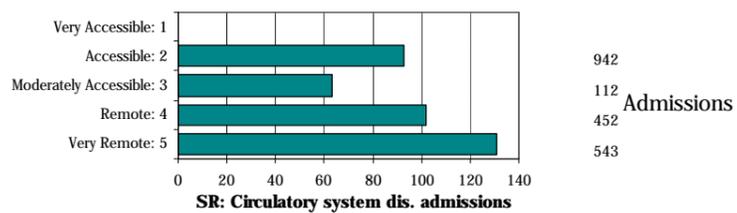
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for circulatory system diseases are below the level expected from the Northern Territory rates in the Accessible ARIA category, with an SAR of 93. Ratios more than double across the other ARIA categories, from an SAR of 63 in the Moderately Accessible areas, 37 per cent fewer admissions than expected from the Northern Territory rates) to an SAR of 131 (31 per cent more). Residents of the Remote areas had close to the expected number of admissions, an SAR of 102. The elevated rate of admissions of residents of the Very Remote areas is likely to reflect admissions of the Indigenous population.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions for ischaemic heart disease, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for ischaemic heart disease (described below) varied over a relatively narrow range, from the highest ratio in **Hobart** (105^{*}) to the lowest in **Perth** (86^{**}) (**Table 6.30**).

Brisbane, **Adelaide** and **Perth** each had lower ratios in the later period shown in **Table 6.30**, suggesting a decline (relative to the Australian rates) in admissions for this disease. The SARs in **Sydney** and **Darwin** increased, suggesting an increase (relative to the Australian rates) in admissions for ischaemic heart disease over this period.

Table 6.30: Admissions with a principal diagnosis of ischaemic heart disease, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	103 ^{**}	93 ^{**}	93 ^{**}	98 [*]	86 ^{**}	105 [*]	87 [*]	91 ^{**}	96 ^{**}
1989 ³	95 ^{**}	..	105 ^{**}	106 ^{**}	90 ^{**}	..	44 ^{**}	..	98 ^{**}

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Ischaemic heart disease results from poor blood supply to the heart and leads to heart attacks and angina. Hospital admissions for ischaemic heart disease accounted for 1.5 per cent of admissions of Northern Territory residents and 31.4 per cent of admissions for all circulatory system diseases.

As for all circulatory system diseases, higher admissions rates occur among those who are socioeconomically disadvantaged.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 322 admissions of residents of **Darwin** for ischaemic heart disease, which was equivalent to the number expected from the Northern Territory rates (an SAR of 100). Males comprised the larger proportion of these admissions, 69.8 per cent (225 admissions).

Postcodes (aggregates of suburbs)

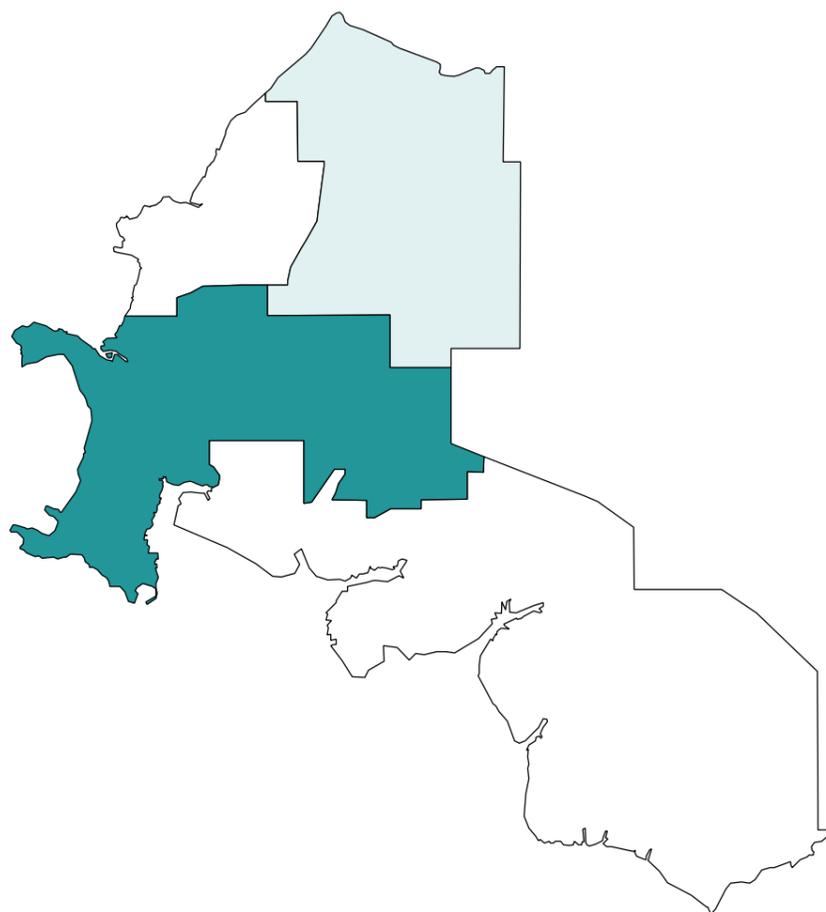
The only elevated ratio at the postcode level was an SAR of 140^{**}, recorded in Darwin: South West (**Map 6.25**). Residents in this area also recorded the largest number of admissions for ischaemic heart disease (113 admissions).

Ratios below the level expected from the Northern Territory rates were recorded for residents of Darwin: North East (with an SAR of 94 and 74 admissions), Darwin: North West (83, 102 admissions) and Palmerston (81, 32 admissions).

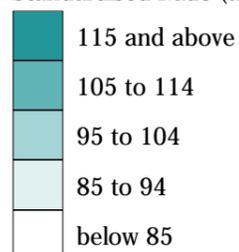
Map 6.25

Admissions for ischaemic heart disease, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for ischaemic heart disease, 1995/96

State/Territory comparison (Australia as the Standard)

As was the case for circulatory system diseases, standardised admission ratios (SARs) for admissions for ischaemic heart disease (described on the previous text page) were, with the exception of Tasmania (with an SAR of 95^{*}) and Northern Territory (87^{*}), higher for residents of the non-metropolitan areas than in the capital cities (**Table 6.31**). The most highly elevated ratios were in New South Wales (112^{**}) and Victoria (111^{**}).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.31** with the exception of the Northern Territory. The higher ratios in the later period shown suggests an increase (relative to the Australian rates) in admissions over this period. It should be noted, however, that the Western Australian and Northern Territory ratios remained below the Australian rate.

Table 6.31: Admissions with a principal diagnosis of ischaemic heart disease, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	103 ^{**}	93 ^{**}	93 ^{**}	98 [*]	86 ^{**}	105 [*]	87 [*]	91 ^{**}	96 ^{**}
Other major urban centres ²	114 ^{**}	95	101	..	..	..	..	..	108 ^{**}
Rest of State/Territory	112 ^{**}	111 ^{**}	99	108 ^{**}	90 ^{**}	95 [*]	87 [*]	- ³	106 ^{**}
Whole of State/Territory	107 ^{**}	98 ^{**}	96 ^{**}	101	87 ^{**}	99	87 ^{**}	89 ^{**}	100
1989⁴									
Rest of State/Territory	111 ^{**}	..	95 ^{**}	100	86 ^{**}	..	53 ^{**}	..	101 [*]

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources, Appendix 1.3*

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

Admissions of residents of non-metropolitan areas of the Northern Territory for ischaemic heart disease accounted for 29.0 per cent of all admissions for circulatory system diseases and 1.3 per cent of all admissions studied. The total of 322 admissions was equivalent to the number of admissions expected from the Northern Territory rates (an SAR of 100). Males comprised just over two thirds (67.7 per cent) of these admissions.

Generally, the numbers of admissions for ischaemic heart disease were low in non-metropolitan areas, with just five of the 17 SLAs analysed recording 20 or more admissions. Data has not been mapped for the six SLAs in which fewer than five admissions were expected from the Northern Territory rates (**Map 6.26**).

Standardised ratios elevated by at least thirty per cent were recorded in Tennant Creek (an SAR of 291^{**} and 36 admissions), East Arnhem-Balance (250^{**} and 35 admissions), Bathurst-Melville (196^{*}, 12 admissions) and Daly (145, 16 admissions). Another four SLAs recorded elevated ratios, with the highest ratio in this group (127) recorded in West Arnhem and representing 13 admissions.

Residents of Katherine had 27 admissions for ischaemic heart disease, equivalent to the expected number (an SAR of 100). Admissions for Alice Springs residents were eight per cent lower than expected (an SAR of 92).

Litchfield [Part B] (58^{**}) was the only SLA mapped in the lowest range with more than 20 admissions for ischaemic heart disease. The lowest ratios were recorded in Victoria (53, five admissions) and Sandover-Balance (58, four admissions).

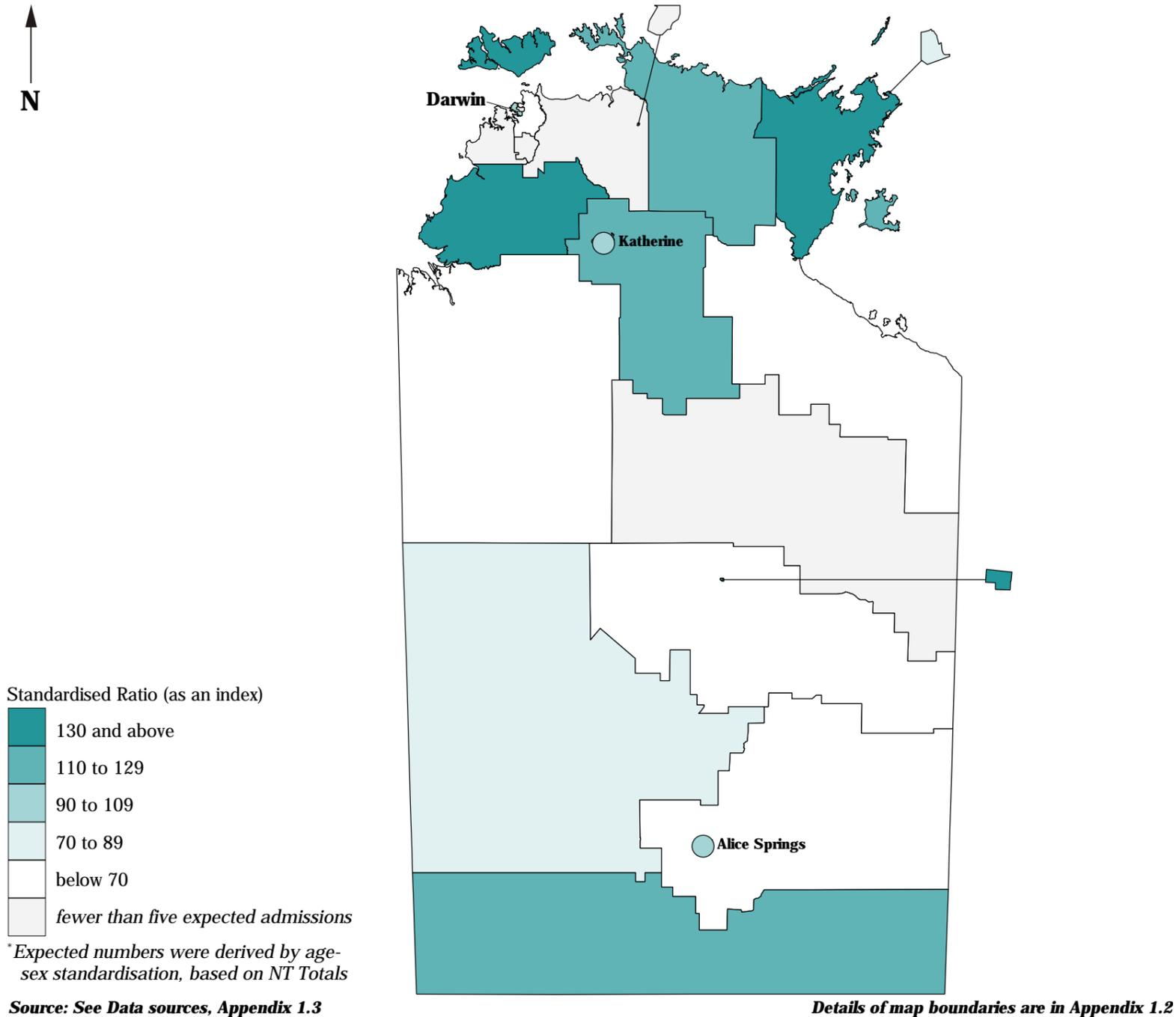
The largest numbers of admissions were recorded for residents of Alice Springs (84 admissions), Tennant Creek (36 admissions) and East Arnhem-Balance (35 admissions).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

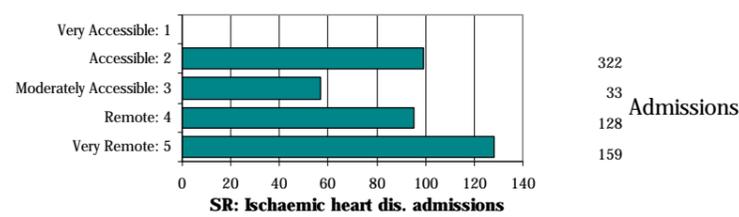
Map 6.26

Admissions for ischaemic heart disease, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



There are close to the expected number of admissions for ischaemic heart disease of people living in the Accessible and Remote areas (SARs of 99 and 95, respectively). Ratios more than double across the other ARIA categories, from the lowest ratio (an SAR of 57 in the Moderately Accessible areas, 43 per cent fewer admissions than expected from the Northern Territory rates) to the highest (an SAR of 128, 28 per cent more than expected). The elevated rate of admissions of residents of the Very Remote areas is likely to reflect admissions of the Indigenous population.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Admissions for respiratory system diseases, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for respiratory system diseases (described below) varied widely between the capital cities (**Table 6.32**). The only elevated ratios were in **Adelaide** (an SAR of 114**) and **Darwin** (102) and the lowest ratio was in **Canberra** (67**).

The SAR for **Darwin** almost doubled, increasing from 53** in 1987 to 102 in 1995/96, suggesting an increase (relative to the Australian rates) in admissions over this period.

Table 6.32: Admissions with a principal diagnosis of respiratory system diseases, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	91**	87**	92**	114**	83**	77**	102	67**	91**
1989 ³	69**	..	93**	108**	82**	..	53**	..	81**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Respiratory system diseases include the diseases of pneumonia, influenza, bronchitis, emphysema and asthma. This category includes people with chronic obstructive pulmonary disease – a persistent obstruction of bronchial air flow, manifesting as asthma, chronic bronchitis, and chronic emphysema – as well as acute respiratory infections. Admissions from these diseases represented 9.1 per cent of all admissions analysed for Northern Territory residents: 6.7 per cent of residents of **Darwin** and 10.8 per cent in the non-metropolitan areas.

For 1996/97, age-standardised admission ratios for Indigenous women for diseases of the respiratory system were 2.3 times higher, and for Indigenous men, twice the admission ratios for non-Indigenous people (ABS/AIHW 1999).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 1,195 admissions for respiratory system diseases recorded for residents of **Darwin**, 31 per cent fewer admissions than expected from the Northern Territory rates (an SAR of 69**). Males comprised just over half (54.5 per cent) of these admissions.

Postcodes (aggregates of suburbs)

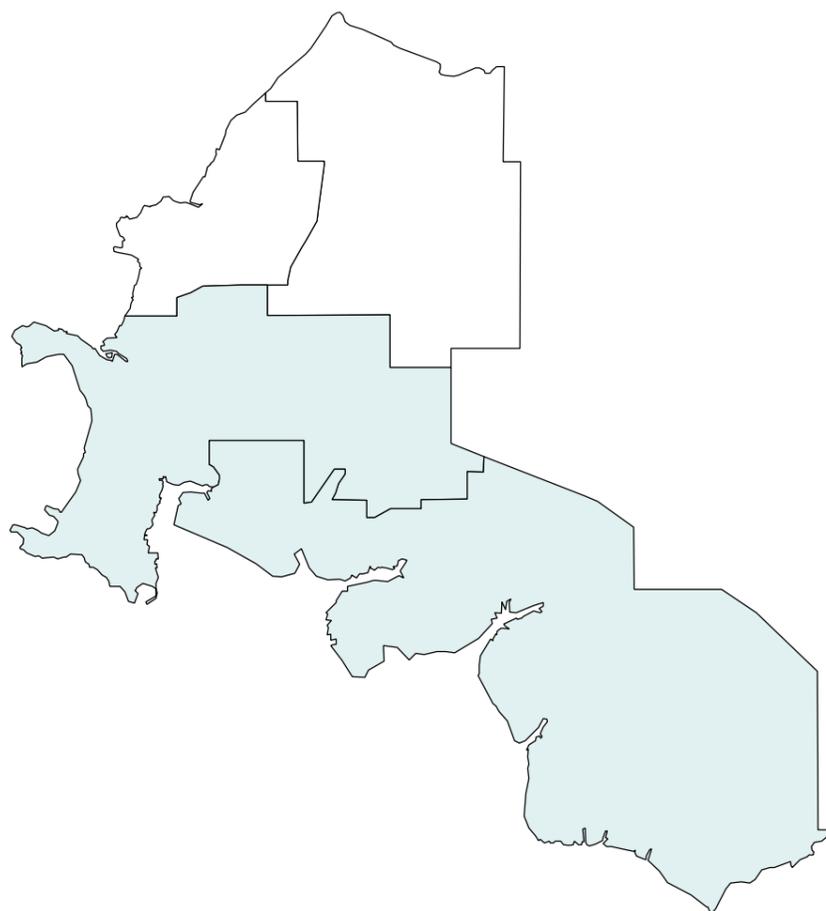
Residents of all the postcode areas recorded fewer admissions for respiratory system diseases than were expected from the Northern Territory rates (**Map 6.27**). Palmerston had the highest ratio, an SAR of 82**, with the lowest number of 234 admissions. Residents of Darwin: South West (with an SAR of 80**) had 293 admissions, 20 per cent fewer than expected, and residents of Darwin: North West (67**) had 400 admissions from this group of causes.

The lowest ratio was recorded in Darwin: North East (with an SAR of 56**) and 267 admissions, 44 per cent fewer than expected from the Northern Territory rates.

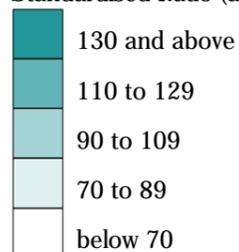
Map 6.27

Admissions for respiratory system diseases, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for respiratory system diseases, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for respiratory system diseases (described on the previous text page) were higher, and often substantially higher, for residents of the non-metropolitan areas than of the capital cities (**Table 6.33**). The most highly elevated ratios were in the Northern Territory (an SAR of 180**), South Australia (156**) and Western Australia (147**). Only in Tasmania was the ratio below the Australian rate.

The SARs for the non-metropolitan areas in each of the four States, for which data were analysed for both periods, declined between the two periods (**Table 6.33**). The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. However, the ratios recorded for the Northern Territory increased (relative to the Australian rates) between the two periods, rising from 164** in 1987 to 180** in 1995/96.

Table 6.33: Admissions with a principal diagnosis of respiratory system diseases, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	91**	87**	92**	114**	83**	77**	102	67**	91**
Other major urban centres ²	82**	85**	86**	..	..	..	..	..	84**
Rest of State/Territory	123**	116**	115**	156**	147**	80**	180**	- ³	123**
Whole of State/Territory	99**	95**	101	125**	101	79**	146**	66**	100
1989⁴									
Rest of State/Territory	135**	..	130**	169**	176**	..	164**	..	143**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 2,704 admissions of residents of the non-metropolitan areas of the Northern Territory for respiratory system diseases. This was a substantial 24 cent more admissions than expected from the Northern Territory rates (an SAR of 124**) and comprised 10.8 per cent of all admissions of non-metropolitan residents. This indicates an over-representation of respiratory related health problems in non-metropolitan areas. Males accounted for over half (55.2 per cent) of these admissions.

Just over one third (34.8 per cent) of non-metropolitan SLAs were mapped in the top range, with at least 30 per cent more admissions than expected from the Northern Territory rates (**Map 6.28**). Most of these areas had large populations of Indigenous people, as did the majority of SLAs with elevated ratios. Five of the six lowest ratios were recorded in SLAs clustered around **Darwin**.

Residents of three SLAs had over twice the expected number of admissions for respiratory system diseases; Sandover-Balance (267**), Tennant Creek (258**) and Tanami (203**). Highly significant ratios above 130 were also recorded in Bathurst-Melville (173**), East Arnhem-Balance (156**), Katherine (155**), Petermann (148**) and Daly (144**).

Ratios between 10 and 29 per cent above the level expected from the Northern Territory rates were recorded for residents of West Arnhem (125*), Gulf (119) and Alice Springs (111**). Elevated ratios were also recorded in Elsey Balance (109) and Victoria (102).

Of the five SLAs mapped in the lowest range, only residents of Litchfield [Part B] (50**) recorded more than 20 admissions for respiratory system diseases. Other SLAs in this range were Litchfield [Part A] (20**, two admissions compared to an expected 12), South Alligator (32*, four admissions compared to an expected 12), Tableland (64, 14 admissions compared to an expected 22) and Cox-Finniss (66, eight admissions compared to an expected 13).

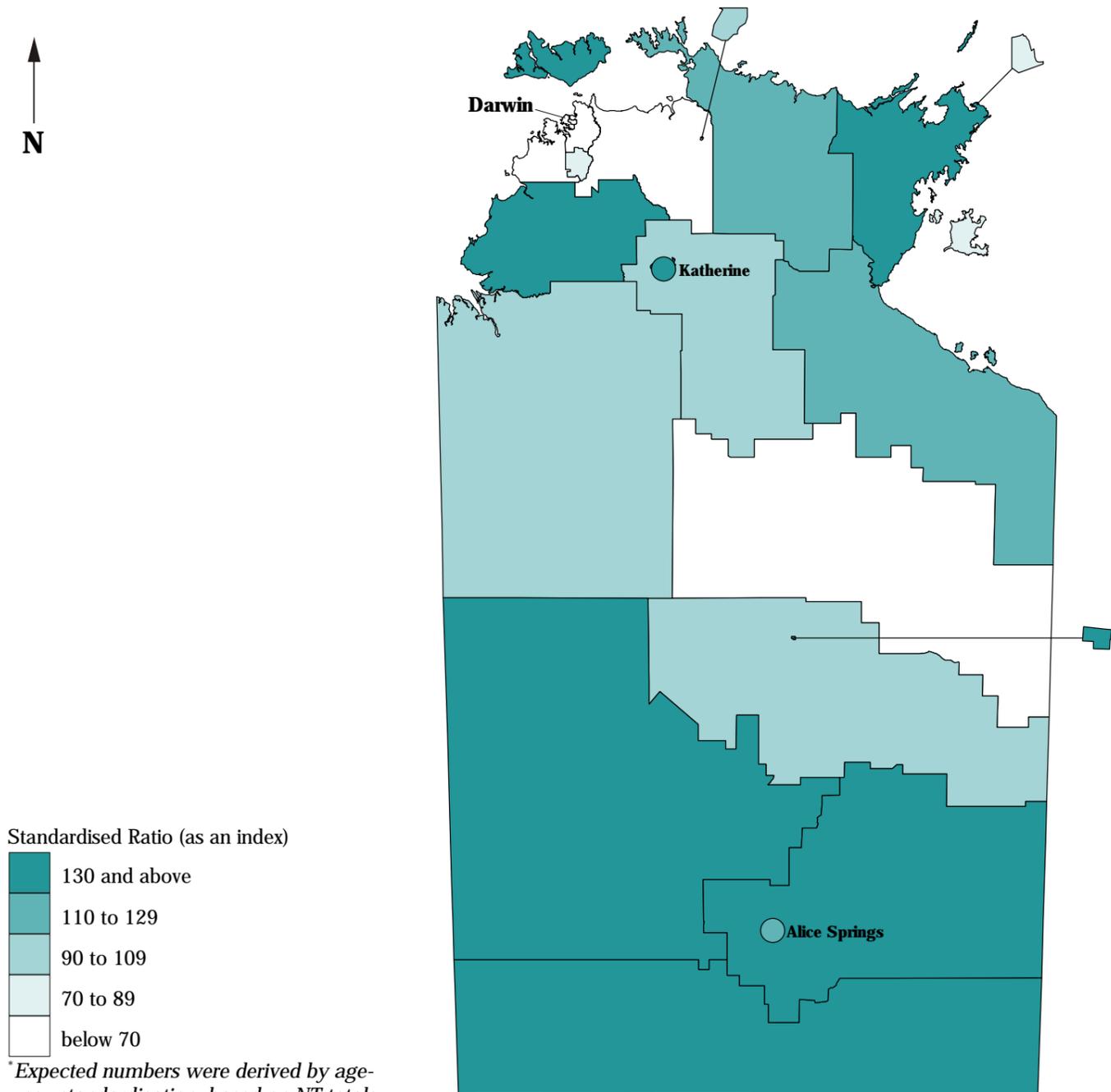
The largest numbers of admissions were recorded for residents of Alice Springs (633 admissions), Katherine (308 admissions), Tanami (253 admissions) and East Arnhem-Balance (219 admissions).

There were correlations of meaningful significance with the variables Age Pension recipients (0.54), people reporting their health as fair or poor (0.51) and the Indigenous population (0.50). The inverse correlation with the IRSD (-0.45) suggests the existence of an association at the SLA level between high rates of admissions for respiratory system diseases and socioeconomic disadvantage.

Map 6.28

Admissions for respiratory system diseases, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*

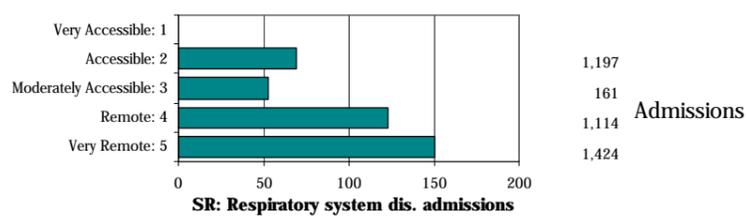


*Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for respiratory system diseases show a strong relationship with remoteness. The ratios increase by almost three times from an SAR of 53 in the Moderately Accessible areas to an SAR of 150 in the Very Remote areas. The second highest ratio is in the Remote areas (an SAR of 123), with an SAR of 69 in the areas in the Accessible category. The highly elevated rate of admissions of residents of the Very Remote areas (with the largest number of admissions) is likely to reflect admissions of the Indigenous population.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions of children aged 0 to 4 years for respiratory system diseases, 1995/96

Capital city comparison (Australia as the Standard)

As was the case for people of all ages, standardised admission ratios (SARs) for admissions of children aged from 0 to 4 years from respiratory system diseases (described below) varied widely between the capital cities (**Table 6.34**). The most highly elevated ratio was in **Adelaide** (118**) and the lowest in **Melbourne** (68**).

The increase in the SAR for **Darwin**, from 38** in 1987 to 88* in 1995/96, suggests an increase (relative to the Australian rates) in admissions over this period; however, the ratio remains below the *All capitals* rate. Similar, albeit smaller, increases were recorded for children in **Sydney**, **Perth** and **Brisbane**, whereas the ratio for **Adelaide** declined, from a high 123** to 118**.

Table 6.34: Admissions of 0 to 4 year olds with a principal diagnosis of respiratory system diseases, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96²	95**	68**	99	118**	91**	71**	88*	80**	89**
1989³	67**	..	90**	123**	79**	..	38**	..	80**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Data is for 0 to 14 year olds and excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Diseases of the respiratory system are a major cause of admission to hospital for children. As children also comprise a relatively large proportion (39.0 per cent) of admissions of all ages with respiratory system diseases, they were mapped separately. The major causes included in this group of diseases are chronic obstructive lung disease (which includes cystic fibrosis, chronic bronchitis, emphysema and asthma), acute respiratory infections and chronic diseases of tonsils and adenoids.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 336 admissions for respiratory system diseases of residents of **Darwin** aged from 0 to 4 years, 45 per cent fewer admissions than expected from the Northern Territory rates (an SAR of 55**). This figure indicates an over-representation of admissions for respiratory system diseases of children in non-metropolitan areas. Males comprised 55.1 per cent of these admissions.

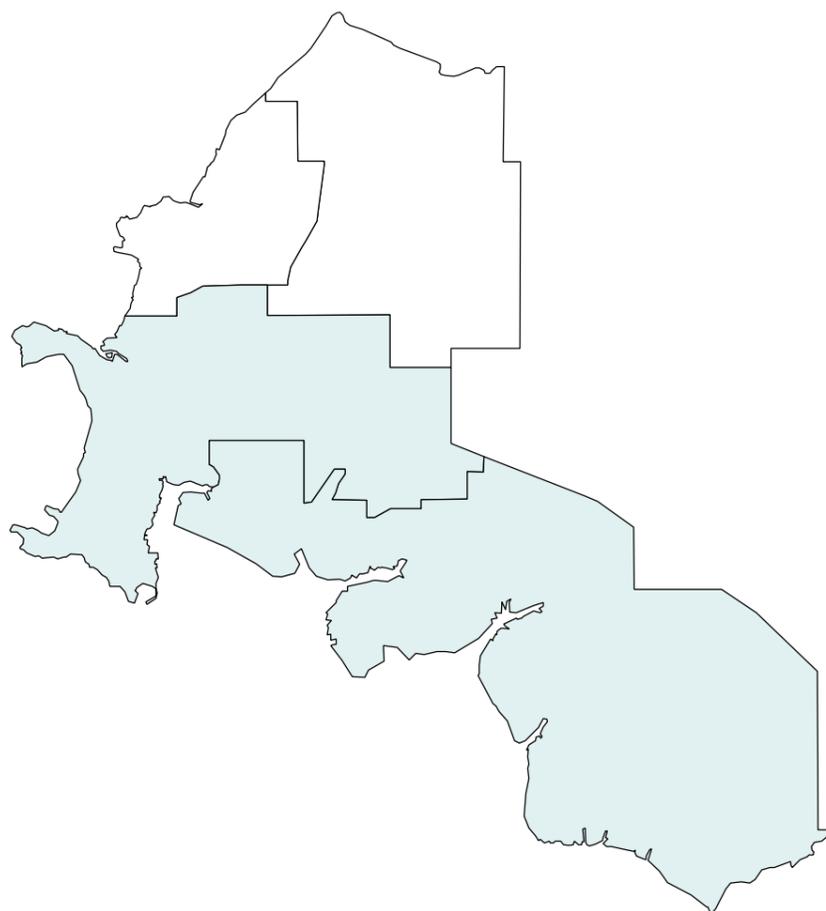
Postcodes (aggregates of suburbs)

As was to be expected, 0 to 4 year old residents of all postcode areas recorded fewer admissions for respiratory system diseases than were expected from the Northern Territory rates. The highest ratio, an SAR of 82* representing the highest number of 100 admissions, was recorded in Palmerston which also had the highest proportion of 0 to 4 year olds at the postcode level (**Map 6.29**). The second highest ratio, an SAR of 72** representing 81 admissions, was recorded in Darwin: South West, which had the lowest proportion of 0 to 4 year olds. Very low ratios were recorded in Darwin: North East (44**, 77 admissions) and Darwin: North West (38**, 78 admissions).

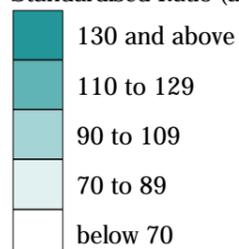
Map 6.29

Admissions of children aged 0 to 4 years for respiratory system diseases, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation,
based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of children aged 0 to 4 years for respiratory system diseases, 1995/96

State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions for respiratory system diseases (described on the previous text page) were higher, in most cases substantially so, for residents of the non-metropolitan areas than in the capital cities (**Table 6.35**). The most highly elevated ratios were in the Northern Territory (212**), Western Australia (165**), South Australia (146**) and New South Wales (132**).

The SARs for the non-metropolitan areas in each of the four States for which data were analysed for both periods, declined between the two periods, with the largest declines in South Australia and Western Australia (**Table 6.35**). The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. SARs in the Northern Territory, however, increased over this period, from 163** in 1987 to 212** in 1995/96.

Table 6.35: Admissions of 0 to 4 year olds with a principal diagnosis of respiratory system diseases, State/Territory Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	95**	68**	99	118**	91**	71*	88*	80**	89**
Other major urban centres ²	81**	92	85**	..	..	..	..	..	83**
Rest of State/Territory	132**	103*	116**	146**	165**	68**	212**	- ³	125**
Whole of State/Territory	104**	78**	105**	126**	114**	69**	162**	81**	100
1989⁴									
Rest of State/Territory	138**	..	121**	180**	177**	..	163**	..	142**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Data is for 0 to 14 year olds and excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Northern Territory as the Standard)

Children aged from 0 to 4 years accounted for well over one third (43.9 per cent) of all admissions of non-metropolitan residents with respiratory system diseases in 1995/96. The total of 1,186 admissions was 31 per cent more than was expected from the Northern Territory rates, an SAR of 131**. This indicates a considerable over representation of admissions non-metropolitan children for respiratory system diseases. Males comprised over half (56.7 per cent) of these admissions.

In contrast to the situation in **Darwin**, over half of the rural SLAs in the Northern Territory recorded elevated ratios for this variable, with over one third (39.1 per cent) of all non-metropolitan SLAs mapped in the highest range (**Map 6.30**). The pattern of distribution of ratios for admissions of 0 to 4 year olds was similar to that for all respiratory system diseases.

The highest ratio, an SAR of 339**, was recorded in Sandover-Balance, with 0 to 4 year old children recording more than three times the expected level of admissions. Admissions that were over twice the expected level were recorded for children from Tennant Creek (with an SAR of 281**), Tanami (271**) and Bathurst-Melville (231**). Highly elevated ratios were also recorded in Daly (an SAR of 181**), Petermann (180**), East Arnhem-Balance (172**) and West Arnhem (164**) and Victoria (145*).

Ratios of between 10 and 29 per cent above the level expected from the Northern Territory rates were recorded for residents of Tennant Creek-Balance (127), Gulf (120) and Katherine (112).

Litchfield [Part B] (with an SAR of 42**) was the only SLA mapped in the lowest range to record more than 20 admissions for respiratory system diseases. The lowest ratios were recorded in Litchfield [Part A] (18, one admission when 5.5 were expected from the Northern Territory rates) and Cox-Finiss (39, two admissions when five were expected). Ratios of statistical significance were also recorded in Nhulunbuy (49**, 17 admissions) and Groote Eylandt (58*, 14 admissions).

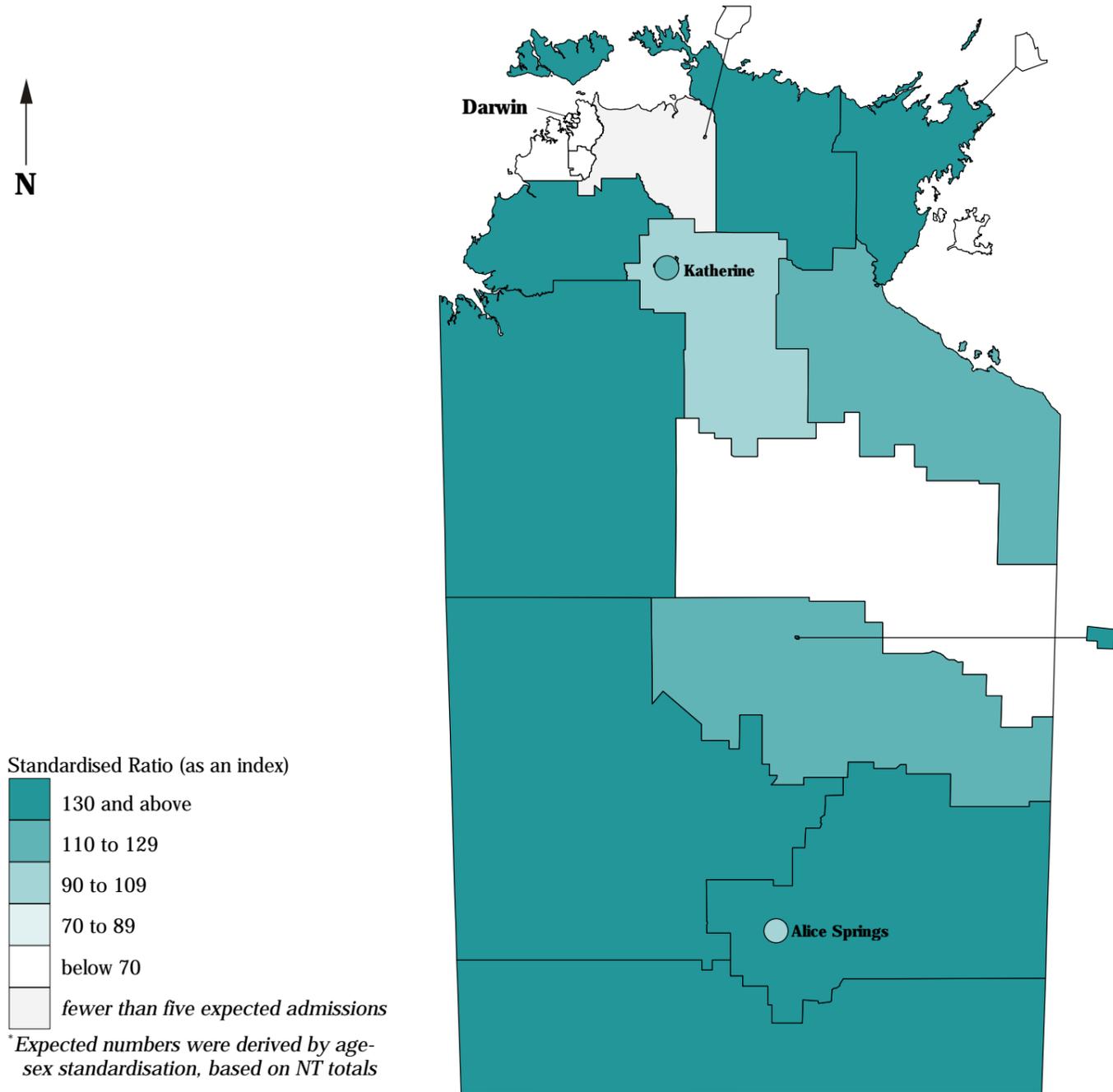
The largest numbers of admissions for respiratory system diseases among this age group were recorded for children from Alice Springs (223 admissions), Tanami (136), East Arnhem-Balance (119) and Sandover-Balance (90).

Correlations of meaningful significance were recorded at the SLA level with the variables for the Indigenous population (0.63) and single parent families (0.55). These results, together with the inverse correlation of meaningful significance with the IRSD (-0.60) indicate an association at the SLA level between high rates of admissions of children with respiratory system diseases and socioeconomic disadvantage.

Map 6.30

Admissions of children aged 0 to 4 years for respiratory system diseases, Northern Territory, 1995/1996

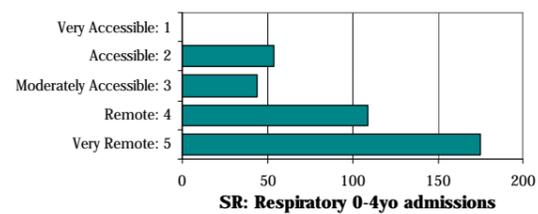
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for respiratory system diseases of children aged from 0 to 4 years increase by four times, from an SAR of 44 in the Moderately Accessible areas to an SAR of 175 in the Very Remote areas. The second highest ratio is in the Remote areas (109), with the second lowest ratio in the Accessible areas (54). The highly elevated rate of admissions of residents of the Very Remote areas (with the largest number of admissions) is likely to reflect admissions of Aboriginal children.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Admissions for bronchitis, emphysema or asthma, 1995/96

Capital city comparison (Australia as the Standard)

As was the case for admissions for all respiratory system diseases, standardised admission ratios (SARs) for admissions for bronchitis, emphysema or asthma (described below) varied widely between the capital cities (Table 6.36). Only **Adelaide** (123**) and **Brisbane** (105**) had elevated ratios. The lowest SARs were recorded for residents of **Canberra** (60**), **Hobart** and **Melbourne** (both 70**).

The SAR for **Darwin** increased from 44** in 1987 to 80** in 1995/96 and for **Sydney** from 67* to 99, suggesting an increase (relative to the Australian rates) in admissions over this period. A similar, albeit smaller, increase was recorded for **Perth**.

Table 6.36: Admissions with a principal diagnosis of bronchitis, emphysema or asthma, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	99	70**	105**	123**	90**	70**	80**	60**	91**
1989 ³	67**	..	103*	103*	81**	..	44**	..	81**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Bronchitis, emphysema and asthma are grouped together as chronic obstructive pulmonary diseases in the International Classification of Diseases (ICD-9), which is used to code causes of admissions. However, although they are of a similar nature, they are distinct conditions, affecting different age groups in the population. Admissions for asthma and bronchitis occur at all ages, more frequently among children and older people, whereas those from emphysema (contributing the smallest numbers to this group) are almost exclusively of older people, more frequently males. For example, almost one quarter (35.3 per cent) of admissions for bronchitis, emphysema or asthma in 1995/96 were of children aged from 0 to 4 years. Males had substantially higher admission rates in the age groups under 15 years with admission rates being particularly high in the 0 to 4 year age group for males and females. Differences in admission rates between males and females varied between the age groups although both sexes had notable increases in admission rates from the age of 70 years.

Other reasons for grouping these conditions are: because the allocation of diagnoses between asthma and bronchitis (particularly in children) is not always consistent and also to ensure that there were sufficient cases for analysis.

Admissions for bronchitis, emphysema and asthma comprised 16.1 per cent of admissions for all respiratory system diseases of Northern Territory residents; 20.3 per cent in **Darwin** and 14.2 per cent in the non-metropolitan areas.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

As was the case for all respiratory system diseases, there were fewer admissions for this group of diseases than expected from the Northern Territory rates (13 per cent fewer, an SAR of 87*) in **Darwin**. In total, there were 242 admissions for these causes, with equal proportions for males and females.

Postcodes (aggregates of suburbs)

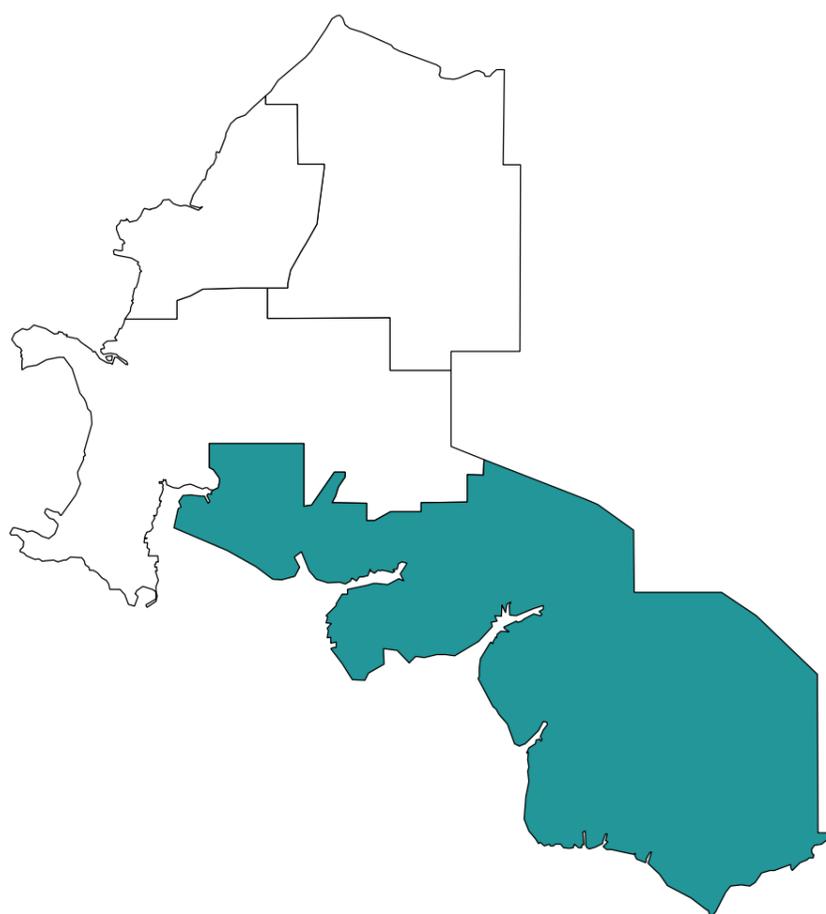
The only elevated ratio at the postcode level, an SAR of 127 (58 admissions), was recorded in the developing southern Palmerston area (Map 6.31). This area had the highest proportions for a number of indicators of socioeconomic disadvantage including low income families and single parent families.

Residents of Darwin: North West (with an SAR of 83, and the highest number of 80 admissions) and Darwin: South West (82, 47 admissions) recorded 17 and 18 per cent fewer admissions for bronchitis, emphysema and asthma than were expected from the Northern Territory rates. The lowest ratio, an SAR of 74* recorded in Darwin: North East, accounted for 57 admissions.

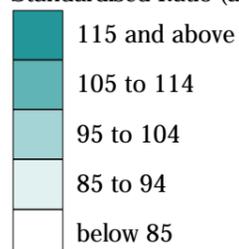
Map 6.31

Admissions for bronchitis, emphysema or asthma, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for bronchitis, emphysema or asthma, 1995/96

State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions for bronchitis, emphysema or asthma (described on the previous text page) were higher (and often substantially so) for residents of the non-metropolitan areas than in the capital cities (**Table 6.37**). The most highly elevated ratios were in South Australia (182**) and Western Australia (167**).

The SARs for the non-metropolitan areas of Queensland and New South Wales declined between the two periods shown in **Table 6.37**. The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. The higher ratios in the later period shown for Western Australia and the Northern Territory suggest an increase (relative to the Australian rates) in admissions over this period.

Table 6.37: Admissions with a principal diagnosis of bronchitis, emphysema or asthma, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	99	70**	105**	123**	90**	70**	80**	60**	91**
Other major urban centres ²	76**	74**	77**	..	..	..	..	..	76**
Rest of State/Territory	121**	117**	111**	182**	167**	62**	98	- ³	123**
Whole of State/Territory	102**	83**	104**	139**	112**	65**	90	60**	100
1989⁴									
Rest of State/Territory	130**	..	145**	181**	157**	..	83**	..	142**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Northern Territory as the Standard)

Admissions for the diseases of bronchitis, emphysema or asthma comprised 14.2 per cent of admissions for respiratory system diseases of residents of the non-metropolitan areas of the Northern Territory. In 1995/96, residents of these areas recorded 384 admissions from these causes, 10 per cent more admissions than expected from the Northern Territory rates (an SAR of 110⁺). Just over half (54.7 per cent) of these admissions were males.

Ratios elevated by more than twice the level expected from the Northern Territory rates were recorded for residents of Tennant Creek (with an SAR of 216**) and the town of Katherine (213**) (**Map 6.32**). Alice Springs (with an SAR of 128**) was the only other SLA with an elevated ratio that had more than 20 admissions for bronchitis, emphysema or asthma. Although ratios elevated by between 10 and 29 per cent were recorded in Bathurst-Melville (with an SAR of 129) and Nhulunbuy (114), they represented low numbers of nine and 16 admissions respectively.

Residents of East Arnhem-Balance (with an SAR of 93) recorded 21 admissions for these causes compared to an expected 22.7. Residents of all other SLAs mapped in the middle range had fewer than 20 admissions.

The lowest ratios were recorded in Tennant Creek-Balance (with an SAR of 27, two admissions when seven were expected from the Northern Territory rates), Litchfield [Part B] (57**, 24 admissions) and Daly (62, 10 admissions).

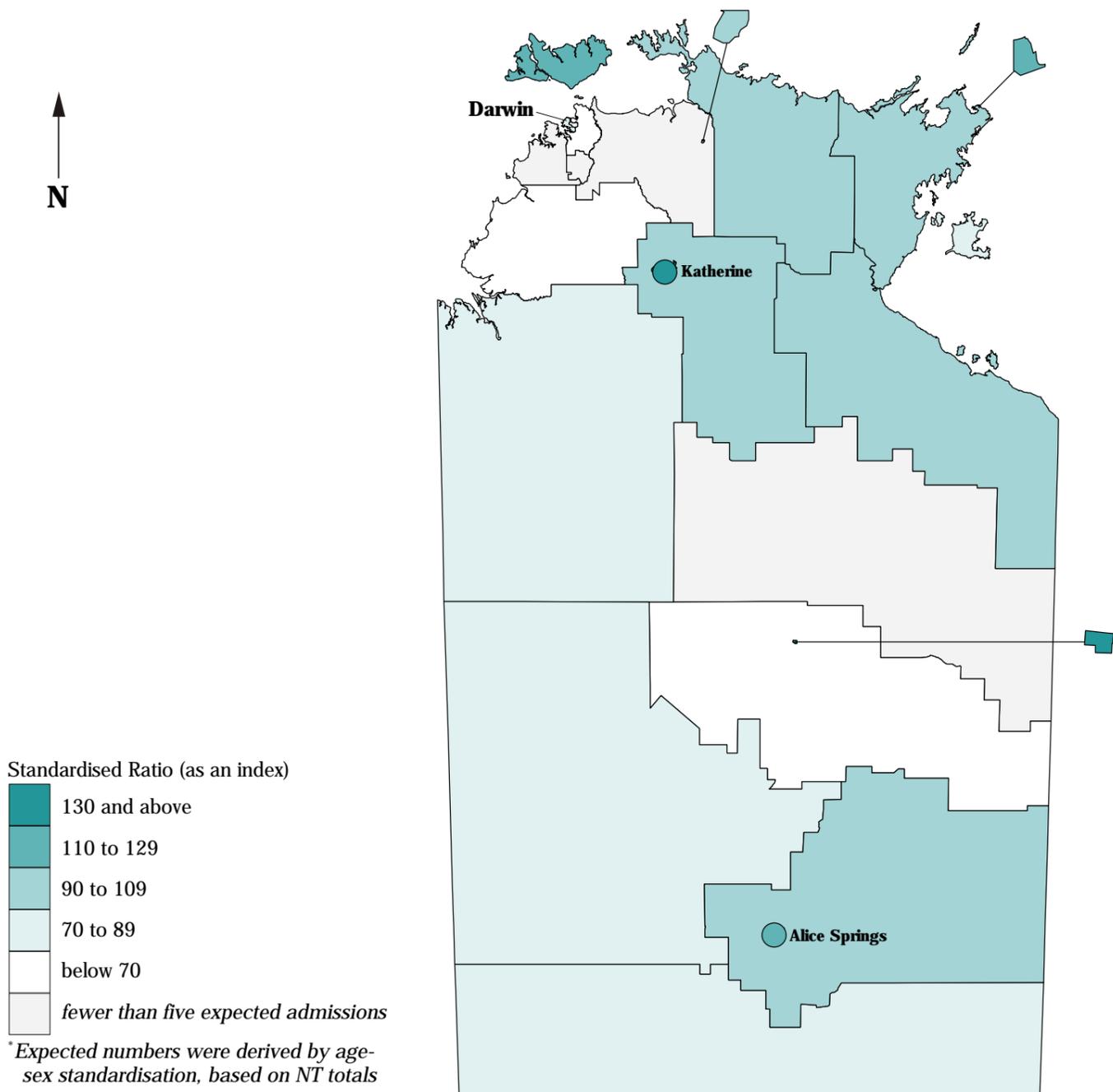
The largest numbers of admissions were recorded for residents of Alice Springs (116 admissions), Katherine (69 admissions) and Tennant Creek (25 admissions).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Map 6.32

Admissions for bronchitis, emphysema or asthma, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Standardised Ratio (as an index)

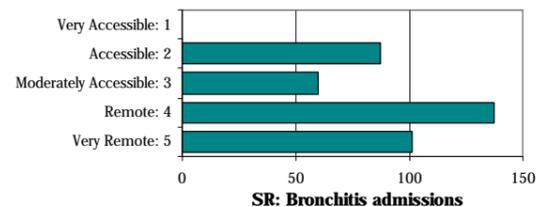
- 130 and above
- 110 to 129
- 90 to 109
- 70 to 89
- below 70
- fewer than five expected admissions

*Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for bronchitis, emphysema or asthma are elevated only in the Remote areas, which largely comprise the towns of Alice Springs, Jabiru and Katherine (an SAR of 137, 37 per cent more admissions than expected from the Northern Territory rates). The lowest ratio is in the Moderately Accessible areas, an SAR of 60, 40 per cent fewer admissions than expected), with a lower than expected ratio also recorded for areas in the Accessible category (87) and close to the expected level of admissions in the Very Remote areas (101).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions from accidents, poisonings and violence, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions from the external causes of accidents, poisonings and violence (described below) varied between the capital cities, from a high of 112** in **Hobart** to a low of 60** in **Canberra** (Table 6.38).

Both **Adelaide** and **Perth** had substantially lower ratios in the later period shown in Table 6.38, suggesting a decline (relative to the Australian rates) in admissions from these combined causes. The SARs in **Sydney**, **Brisbane** and **Darwin** increased, suggesting an increase (relative to the Australian rates) in admissions over this period.

Table 6.38: Admissions with an external cause of accidents, poisonings and violence, capital cities
Age-sex standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 ²	92**	84**	95**	94**	86**	112**	111**	60**	90**
1989 ³	78**	..	85**	114**	101	..	101	..	88**

¹Includes Queanbeyan (C)

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Excludes same day admissions: for Sydney the period is 1989/90 and for Darwin it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Accidents, poisonings and violence are a major cause of hospitalisation, accounting for 11.2 per cent of all admissions analyses for Northern Territory residents; 15.6 per cent of male admissions and 7.8 per cent of female admissions. Admissions arising from accidents, poisonings and violence are classified according to the external cause, that is, according to the circumstances of the accident or violence that produced the injury, as well as by the nature of the injury.

Accidents accounted for 77.3 per cent of admissions from these external causes, and were largely accidental falls (17.8 per cent of all admissions from these external causes) and motor vehicle traffic accidents (10.1 per cent). Admission rates for males were substantially higher for motor vehicle traffic accidents and accidental falls; and for females admission rates were higher for injury purposely inflicted by other person. Admissions from attempted suicide or self-inflicted injury were similar for males and females.

Esterman et al. (1990) found that admission rates from these external causes are affected by socioeconomic status. They reported that, for postcode areas in Adelaide, "compared with the highest income areas, admission rates were 10% higher in the middle category and 26% higher in the poorest areas".

In 1996/97, intentional injury (ie. injury inflicted purposely by others) accounted for more hospital admissions for Indigenous people than transport accidents and accidental falls combined. There were almost seven times more hospital admissions for intentional injury than expected among Indigenous men and about twenty times more than expected for Indigenous women (based on all-Australian rates). Almost half (46%) of all admissions for females for intentional injury in Australia in 1996/97 were of women identified as Indigenous (ABS/AIHW 1999).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

There were 1,728 admissions of residents of **Darwin** from the combined causes of accidents, poisonings and violence, 21 per cent fewer than expected from the Northern Territory rates (an SAR of 79**). Males accounted for almost two thirds (65.0 per cent) of the admissions.

Postcodes (aggregates of suburbs)

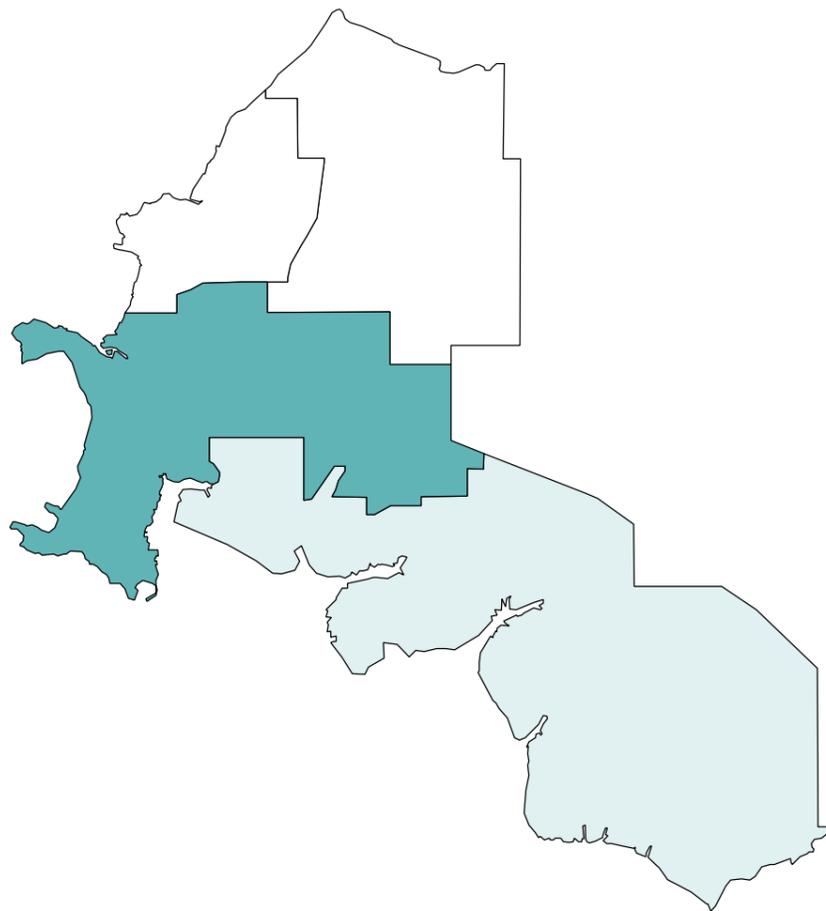
The only elevated ratio at the postcode level (an SAR of 106, with 527 admissions) was recorded in Darwin: South West (**Map 6.33**).

Residents of Palmerston (94, 306 admissions) recorded 6 per cent fewer admissions from accidents, poisonings or violence than were expected from the Northern Territory rates. Low ratios were recorded in Darwin: North West (71**, accounting for the largest number of 559 admissions) and Darwin: North East (57**, 336 admissions).

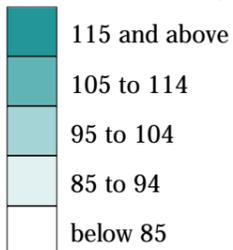
Map 6.33

Admissions from accidents, poisonings and violence, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions from accidents, poisonings and violence, 1995/96

State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions from the external causes of accidents, poisonings and violence (described on the previous text page) were higher, and often substantially higher, for residents of the non-metropolitan areas than of the capital cities (**Table 6.39**). The most highly elevated ratios were in the Northern Territory (166**), Queensland (147**), Western Australia (146**) and South Australia (138**).

The SARs for the non-metropolitan areas of the Northern Territory and Western Australia declined between the two periods shown in **Table 6.39**, with the largest decline in the Northern Territory. The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. The higher ratio in the later period shown for Queensland suggests an increase (relative to the Australian rates) in admissions over this period.

Table 6.39: Admissions with an external cause of accidents, poisonings and violence, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	92**	84**	95**	94**	86**	112**	111**	60**	90**
Other major urban centres ²	89**	87**	96**	..	..	..	..	..	91**
Rest of State/Territory	114**	106**	147**	138**	146**	86**	166**	- ³	124**
Whole of State/Territory	98**	90**	117**	106**	102**	97**	141**	60**	100
1989⁴									
Rest of State/Territory	112**	..	128**	139**	171**	..	204**	..	129**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Northern Territory as the Standard)

In 1995/96, there were 3,107 admissions of residents of the non-metropolitan areas of the Northern Territory from the combined causes of accidents, poisonings and violence, 18 cent more than expected from the Northern Territory rates (an SAR of 118**). Males comprised over half (59 per cent) of the admissions. The relatively higher rates of hospitalisation of people from non-metropolitan areas, in general and from these causes, are discussed on page 191. In addition, the higher rates of hospitalisation of Indigenous people from these causes (see comments on page 185) are likely to influence the high standardised admission ratios recorded for some of the more remote areas.

Residents of just over one third (34.8 per cent) of non-metropolitan SLAs had 30 per cent or more admissions than were expected from the Northern Territory rates. The highest ratio, an SAR of 340**, was recorded in Tennant Creek, with residents recording nearly three and a half times the number of admissions from accidents, poisonings or violence which were expected from the Northern Territory rates. Residents of Eley Balance (with an SAR of 240**) and Cox-Finniss (201**) had over twice the expected number of admissions. Victoria (176**), Katherine (162**), Bathurst-Melville (159**), Tableland (156**) and Gulf (155**) were also mapped in the highest range.

Three SLAs were mapped in the lowest range: Litchfield [Part A] (with an SAR of 7**, one admission when 14.5 were expected), South Alligator (49*, 10 admissions) and Tennant Creek-Balance (68*, 34 admissions). Ratios that were significantly below the expected level were also recorded for residents of West Arnhem (an SAR of 81*) and Litchfield [Part B] (87*).

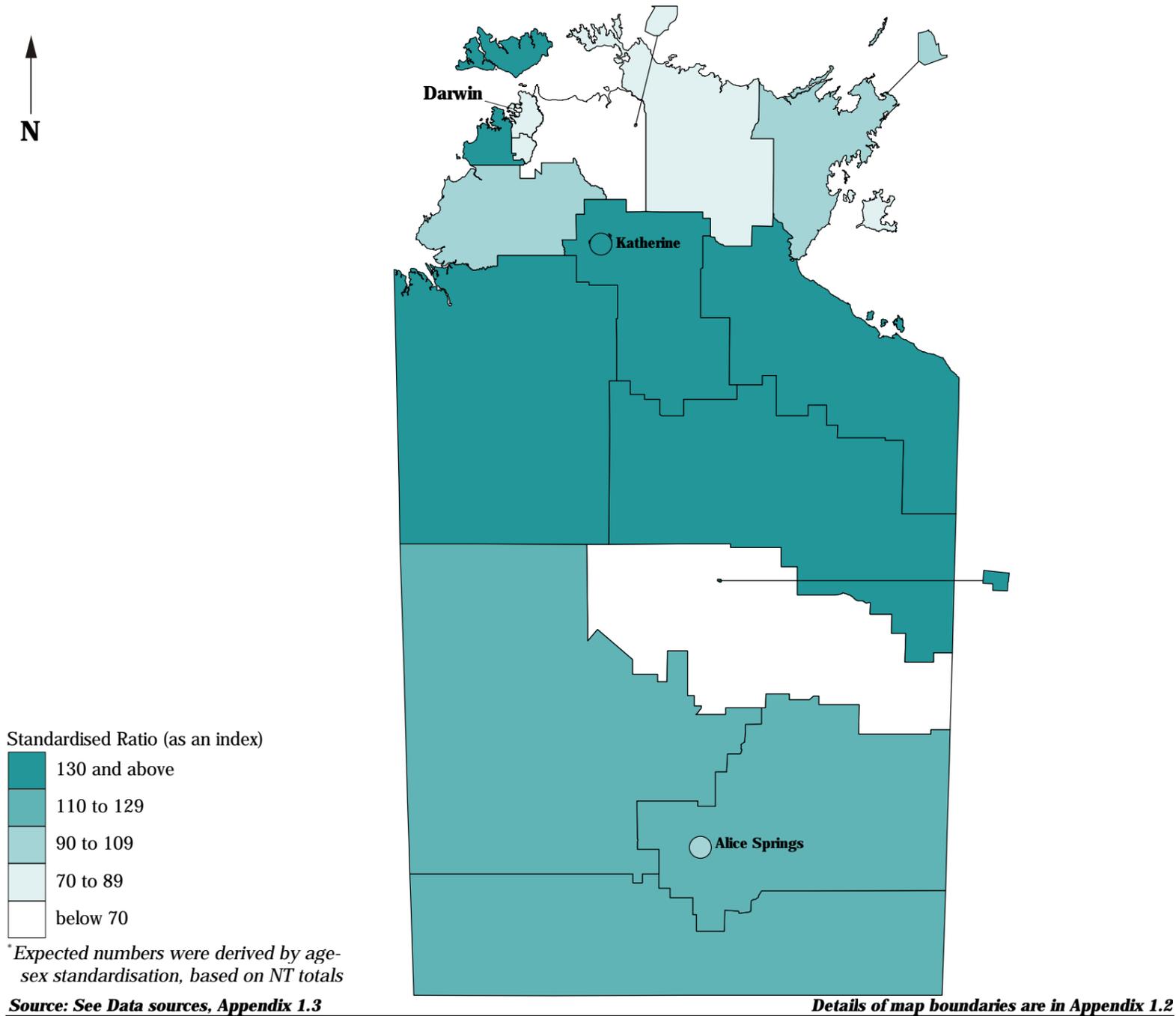
The largest numbers of admissions from accidents, poisonings and violence were recorded for residents of Alice Springs (672 admissions), Katherine (405 admissions), Tennant Creek (289 admissions) and Litchfield [Part B] (283 admissions).

There were weak correlations with a number of the indicators of socioeconomic disadvantage, including a weak inverse correlation with the IRSD (-0.20), suggesting the existence at the SLA level of an association between high rates of admissions from accidents, poisonings and violence and socioeconomic disadvantage.

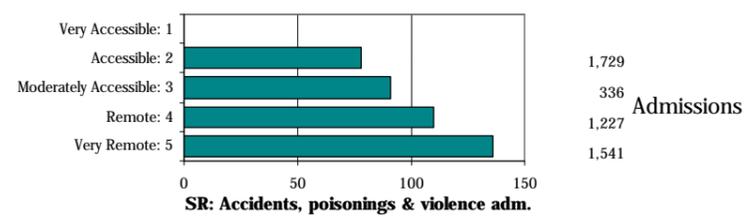
Map 6.34

Admissions from accidents, poisonings and violence, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions from the external causes of accidents, poisonings and violence increase steadily across the ARIA categories. The two 'accessible' categories have fewer admissions from these external causes than expected from the Northern Territory rates (SARs of 78 and 91 in the Accessible and Moderately Accessible categories, respectively), with higher than expected ratios in the two 'remote' categories (an SAR of 110 in the Remote areas and of 136 in the Very Remote areas).

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

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Principal procedures for admitted patients

Introduction

There are variations in the rate at which particular procedures⁷ are undertaken, both between the States and Territories and at a regional level within the States and Territories. Variations at a small area level can point to differences in health status, in access to and availability of services, and in clinical opinion and practice. They may also, in some instances, raise concerns as to possible over servicing.

Data mapped

Details are presented in the following pages of a number of procedures. Some of these are periodically reported on at the State and Territory level as 'sentinel' procedures. Sentinel procedures are common, mostly elective, and considered to be discretionary: that is, there are often conservative or non-surgical alternatives (AIHW 1997). **Table 6.40** lists a number of sentinel procedures for which data have been published over some years.

All but three of these procedures (coronary artery bypass graft, angioplasty and cholecystectomy) are mapped in the following pages. The variable for myringotomy is not one of the nationally published sentinel procedures but has been included in this analysis because it varies widely spatially, and often with a spatial pattern that is the inverse of that for tonsillectomies.

Descriptions of the procedures for which details are mapped are included in the text accompanying the maps. In most cases, the procedure is the principal procedure, the most significant procedure for treatment of the principal diagnosis. The exception is the variable for lens insertion, for which all recorded procedures were examined, as the extraction of the old lens is often the principal procedure.

The Northern Territory has a lower standardised admission rate than the average of the other States for all of the procedures (**Table 6.40**). Rates for tonsillectomy, myringotomy and hip replacement show the largest differentials from the *Other States* rate. These rates and differentials for the Northern Territory should, however, be treated with caution, as the AIHW database does not include admissions to the Darwin Private Hospital. This is likely to result in an understatement of admission rates, in particular rates for residents of the Northern Territory (and especially from **Darwin**). Of the procedures listed in **Table 6.40**, those most likely to be affected are those for tonsillectomy, myringotomy, Caesarean section, hysterectomy, hip replacement, lens insertion and endoscopy. Further details are included in the following pages, with each topic.

⁷A procedure is an intervention that is surgical in nature, carries a procedural risk, requires specialised training, or requires special facilities or equipment in an acute setting (National Health Data Committee 1997).

Table 6.40
Admission rates for selected sentinel procedures, public and private¹ hospitals, 1996/1997

Sentinel procedure	Standardised admission rates ²		
	Northern Territory	Other States	Difference
Appendicectomy	0.85	1.43	-40.5**
Coronary artery bypass graft	0.53	0.90	-41.7**
Angioplasty	0.54	0.72	-25.1*
Caesarean section	2.42	2.79	-13.5**
Cholecystectomy	1.39	2.19	-36.3**
Endoscopy	13.64	24.06	-43.3**
Hip replacement	0.38	1.00	-62.2**
Hysterectomy	1.17	1.85	-36.7**
Lens insertion	4.30	5.05	-14.8**
Myringotomy	0.84	2.31	-63.8**
Tonsillectomy	0.48	1.87	-74.1**

¹Excludes details of admissions to the Darwin Private Hospital

²Admission rates have been produced by direct standardisation

Indicates difference is significant at the 5 per cent (*) and 1 per cent (**) levels

Source: Australian Hospital Statistics, AIHW, June 1998

Earlier studies

Renwick and Sadkowsky (1991) reported on age sex standardised ratios for a number of surgical procedures using data from 1986. Those procedures for which comparable data are also available for 1996/97 are shown in **Table 6.41**. Standardised admission ratios in the Northern Territory were lower (relative to the Australian rates) in 1996/97 than they were in 1986 for all procedures except lens insertion.

However, the data should again be treated with caution, as there was no private hospital in the Northern Territory in 1986 (and such procedures as were undertaken would have been performed at the public hospital in **Darwin**, or elsewhere in Australia) and any admissions in 1996/97 to the Darwin Private Hospital for these procedures are excluded from the figures.

Table 6.41: Standardised admission rates¹ for selected surgical procedures, Northern Territory

	1986	1996/97
Appendicectomy	75.4	59.4
Caesarean section	144.5	86.7
Cholecystectomy	92.7	63.8
Hip replacement	256.1	38.0
Hysterectomy	129.6	63.6
Lens insertion	68.0	85.1
Tonsillectomy	59.5	25.8

¹Admission rates are age- & sex-standardised to the Australian population

Source: 1986 data from Renwick, M. & Sadkowsky, K. *Variations in surgery rates* AIHW: 1996/97 data from Australian Hospital Statistics, AIHW, June 1998

Context

Australia

There were 2,485,792 admissions to public acute and private hospitals (including day surgery facilities) in Australia at which at least one surgical procedure was performed. These 2.5 million admissions represented 52.1 per cent of all admissions studied in this project (which includes all acute admissions, other than for renal dialysis). Nearly two thirds (62.6 per cent) of the admissions involving a procedure were of residents of the capital cities (which comprise 62.8 per cent of Australia's population),

A further 6.6 per cent were of residents of the other major urban centres and 30.6 per cent were of residents of the non-metropolitan areas. Females accounted for 57.5 per cent of admissions, varying from 58.5 per cent of admissions of residents of the capital cities to 55.9 of non-metropolitan residents. Less than half (45.3 per cent) of these principal procedures were performed on a same day basis, with males having slightly more procedures on a same day basis (46.3 per cent of all male principal procedures, compared with 44.6 per cent for females).

Northern Territory

In 1995/96, there were 21,22 admissions of resident of the Northern Territory to public acute and private hospitals (including day surgery facilities), 0.8 per cent of the Australian total, at which at least one surgical procedure was performed. These admissions involving a procedure represented 49.3 per cent of all admissions of resident of the Northern Territory in this analysis (which includes all acute admissions, other than for renal dialysis). Half (50.1 per cent) of the admissions were residents of **Darwin** and half (49.9 per cent) were of residents of the non-metropolitan areas of Northern Territory. Females accounted for 59.2 per cent of admissions, varying from 58.5 per cent of admissions for residents of **Darwin** to 59.8 of non-metropolitan residents. Less than one third (31.2 per cent) of the procedures were performed on a same day basis, with females having slightly more of their principal procedures on a same day basis (32.0 per cent of all female principal procedures compared with 30.0 per cent for males).

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Admissions for surgical procedures, 1995/96

Capital city comparison (Australia as the Standard)

There were 1,636,292 admissions of residents of the capital cities (and an additional 186,672 admissions of residents of other major urban centres) to public acute and private hospitals (including day surgery facilities) at which at least one surgical procedure was performed. Although the *All capitals* average was at the level expected from the Australian rates, standardised admission ratios (SARs) for the individual capitals varied from eight per cent more admissions (than expected from the Australian rates) for a surgical procedure in **Darwin**, to 30 per cent fewer admissions in **Canberra**.

Table 6.42: Admissions¹ for surgical procedures, capital cities, 1995/96
Standardised separation ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
99**	101**	101**	107**	95**	107**	108**	70**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Just under half (49.3 per cent) of the admissions to acute hospitals of residents of Northern Territory in 1995/96 involved a surgical procedure. Females accounted for 59.2 per cent of such admissions, and males for 40.8 per cent. For females, admission rates were highest in the 20 to 29 year age groups and again from age 85, while for males, they were most common among those aged 60 years and over (**Figure 6.8**, page 190).

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 10,633 admissions of residents of **Darwin** for surgical procedures, 7 per cent more than the level expected from the Northern Territory rates (an SAR of 107**). Females accounted for over half (58.5 per cent) of these admissions.

Postcodes (aggregates of suburbs)

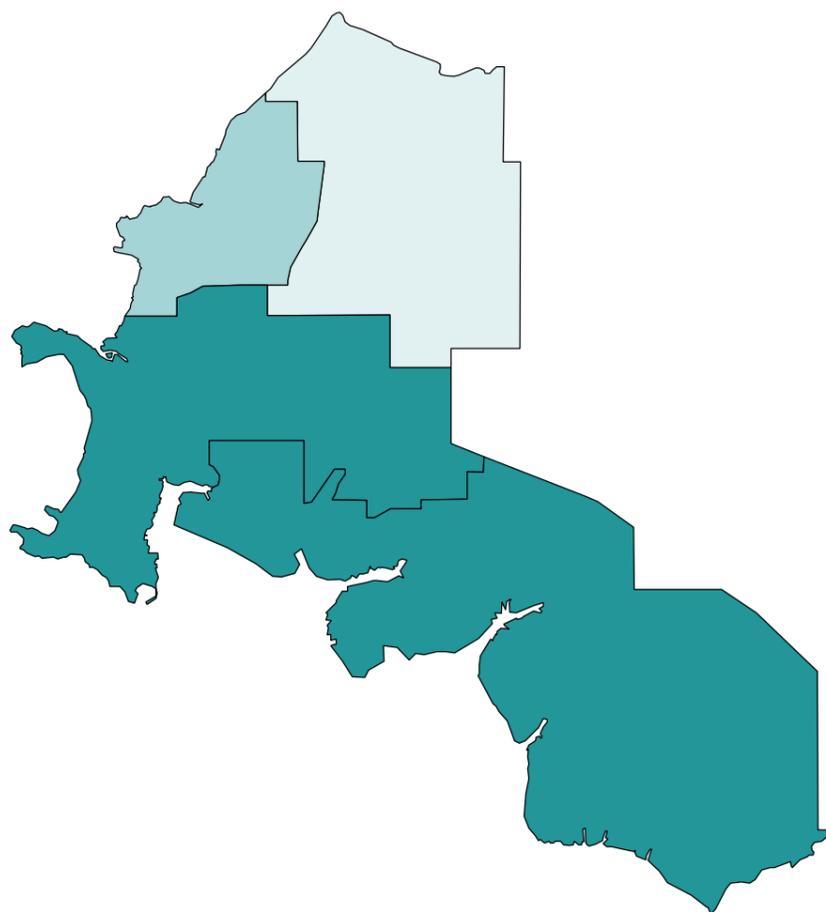
Two postcode areas in **Darwin** had highly elevated ratios of statistical significance for this variable: Palmerston (with an SAR of 131** and 1,876 admissions) and Darwin: South West (120**, 2,707 admissions) (**Map 6.35**).

The number of admissions of residents of Darwin: North West (an SAR of 100) was at the expected level and residents of Darwin: North East (with an SAR of 93**, 2,471 admissions) had 7 per cent fewer admissions than were expected from the Northern Territory rates. Residents of Darwin: North West had the largest number of 3,579 admissions for surgical procedures, while residents of Palmerston had the lowest number, with 1,876 admissions.

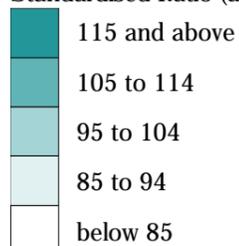
Map 6.35

Admissions for surgical procedures, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



^{*}SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for surgical procedures, 1995/96

State/Territory comparison (Australia as the Standard)

There were 770,971 admissions of residents of the non-metropolitan areas to public acute and private hospitals (including day surgery facilities) at which at least one surgical procedure was performed. With the exception of Victoria and Western Australia, the standardised admission ratios (SARs) in the *Rest of State/Territory* areas are lower than those recorded for the capital cities. The Northern Territory, Tasmania and South Australia had largest differentials in ratios between the *Capital City* and *Rest of State/Territory* areas.

Table 6.43: Admissions¹ for surgical procedures, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	99**	101**	101**	107**	95**	107**	108**	70**	100
Other major urban centres ²	103**	90**	102**	..	..	..	..	..	102**
Rest of State/Territory	99**	104**	98**	104**	96**	95**	95**	- ³	100*
Whole of State/Territory	100	102**	100	106**	96**	100	101	70**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 10,589 admissions of residents of the non-metropolitan areas of the Northern Territory for surgical procedures, 6 per cent fewer admissions than expected from the Northern Territory rates (an SAR of 94**). Females accounted for over half (59.8 per cent) of these admissions.

As can be seen from **Map 6.36**, the majority of SLAs have been mapped in the three lowest ranges, with only one SLA mapped in each of the highest two ranges.

The highest ratio, an SAR of 133**, was recorded in Tennant Creek with residents recording 33 per cent more admissions than were expected from the Northern Territory rates. The second highest ratio, and the only one recorded in the range from 110 to 129, was an SAR of 116 recorded in Cox-Finiss.

Nine SLAs were mapped in the middle range, with ratios of statistical significance recorded in Alice Springs (an SAR of 105**), Tanami (91*) and Katherine (90**).

Highly significant SARs in the range from 70 to 89 were recorded in the northern SLAs of West Arnhem (an SAR of 83**), Daly (81**), Gulf (77**) and South Alligator (72**).

The lowest ratio, an SAR of 24** recorded in Litchfield [Part A], represented 16 admissions, when 65 were expected from the rates for the Northern Territory. This was the only SLA with fewer than 20 admissions for surgical procedures. Low ratios were also recorded in Tennant Creek-Balance (an SAR of 57**), Tableland (57**), Victoria (63**) and East Arnhem-Balance (67**).

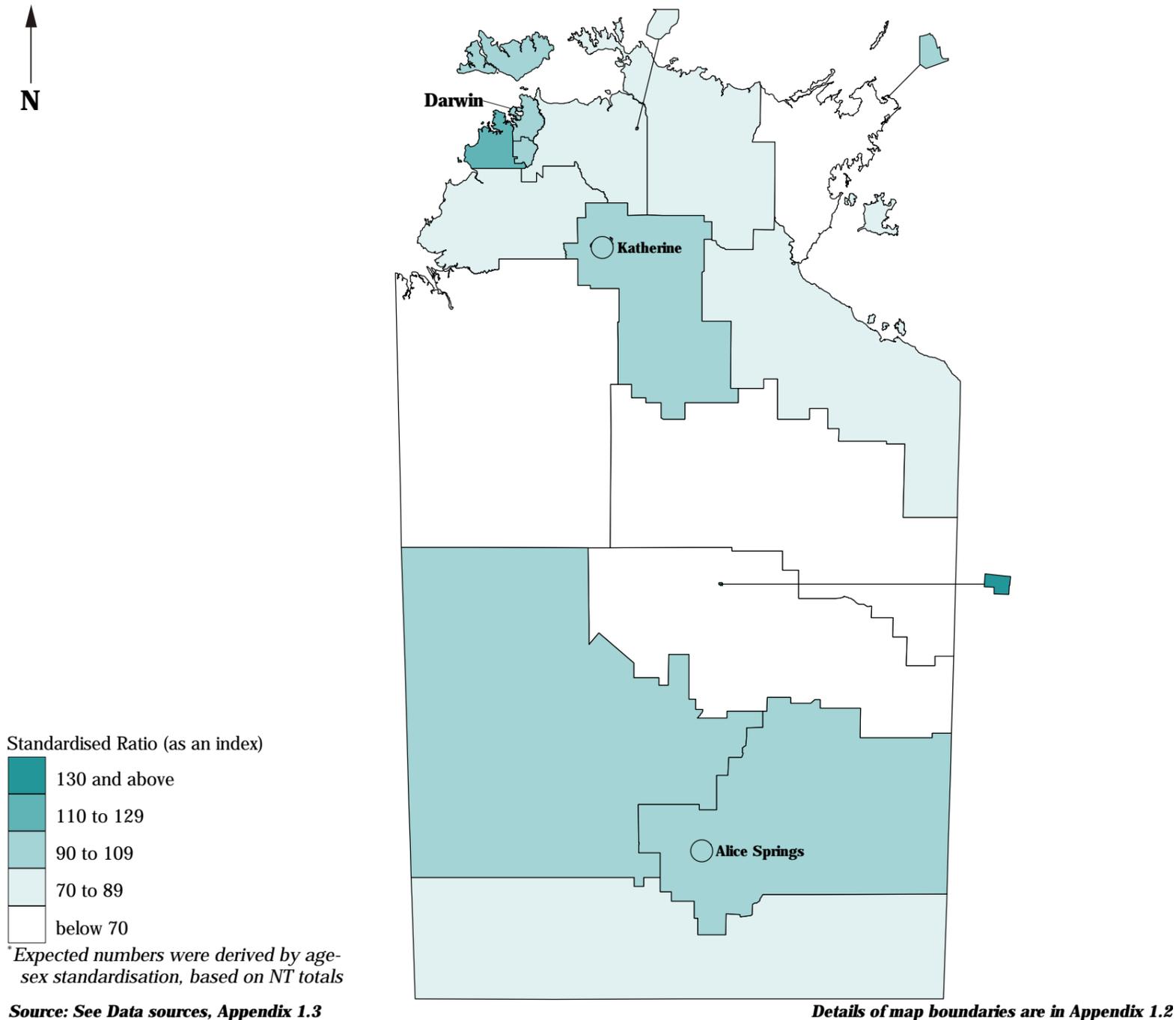
The largest numbers of admissions for a surgical procedure were recorded for residents of Alice Springs (3,243 admissions), Litchfield [Part B] (1,530 admissions), Katherine (952 admissions), Tanami (574 admissions) and Tennant Creek (502 admissions).

Correlations with socioeconomic indicators were weak and varied while that with the IRSD was weak and positive (0.19) indicating a slight association between high rates of admissions involving a surgical procedure and high socioeconomic status.

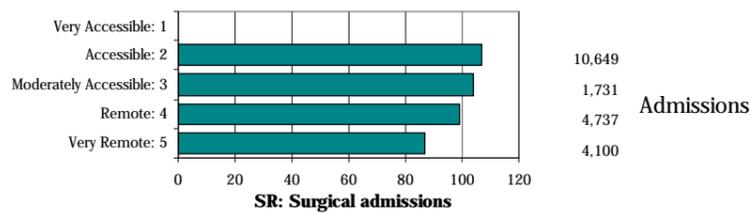
Map 6.36

Admissions for surgical procedures, Northern Territory, 1995/1996

Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a surgical procedure decrease with decreasing accessibility. Ratios in the first three ARIA categories are all relatively close to the level expected from the Northern Territory rates, ranging from the highest ratio of 107 in the Accessible areas to a marginally lower than expected ratio of 99 in the Remote areas. The lowest ratio was in the Very Remote areas, where there were 13 per cent fewer admissions than expected, an SAR of 87.

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Same day admissions for surgical procedures, 1995/96

Capital city comparison (Australia as the Standard)

There were 776,311 same day admissions of residents of the capital cities and 90,521 admissions of residents of the other major urban centres to public acute and private hospitals (including day surgery facilities) at which at least one surgical procedure was performed. These admissions represent 47.5 per cent of all admissions involving a surgical procedure.

The standardised admission ratios (SARs) ranged from 64** in **Canberra** and 72** in **Darwin** to 111** in **Melbourne** and 104** in **Sydney**. When compared with ratios for all admissions for surgical procedures (**Table 6.42**), standardised admission ratios (SARs) for same day admissions involving a surgical procedure (**Table 6.44**) are higher in **Sydney** and lower in **Hobart**, relative to the Australian rates. The lower rate in **Hobart** is likely to reflect the historically slower rate of take-up of same day procedures in Tasmania, a trend that is being rapidly reversed.

Table 6.44: Same day admissions¹ for surgical procedures, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
104**	111**	102**	101**	93**	87**	72**	64**	102**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Almost a third (31.2 per cent) of all admissions of residents of the Northern Territory in 1995/96 involving a surgical procedure were same day admissions. Females accounted for over 60.0 per cent (60.8 per cent) of same day admissions. Admission rates were higher for females than for males in the age groups from 15 to 19 years through to 50 to 59 years (**Figure 6.10**, page 190). For males, the largest differentials over the rates for females were in the 0 to 14 year age groups and from age 60 years.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 3,340 same day admissions of residents of **Darwin** for surgical procedures, 8 per cent more than were expected from the Northern Territory rates (an SAR of 108**). Females accounted for 2,041 of these same day admissions (61.1 per cent) and males for 1,299 admissions (38.9 per cent).

Postcodes (aggregates of suburbs)

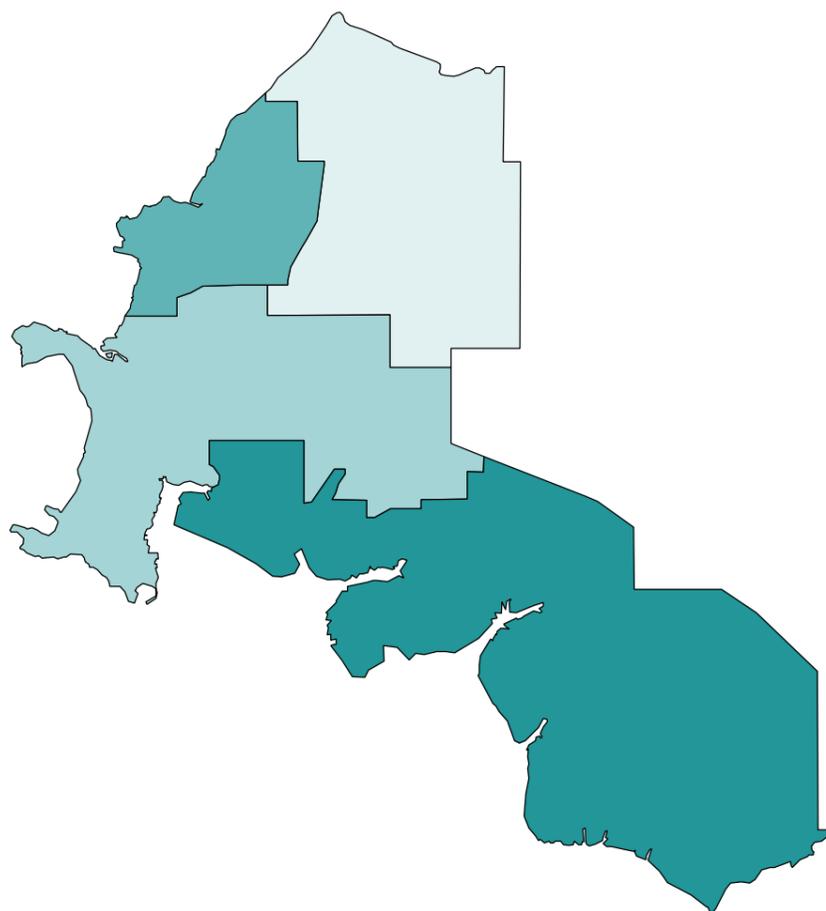
The highest ratio for same day admissions for surgical procedures at the postcode level, an SAR of 141**, was recorded in Palmerston, with residents of this area having 41 per cent more admissions (a total of 635 admissions) than were expected from the Northern Territory rates (**Map 6.37**). Elevated ratios were also recorded in Darwin: North West (110**, 1,215 admissions) and Darwin: South West (103, 718 admissions).

Residents of Darwin: North East (with the lowest ratio of 92') had 8 per cent fewer admissions than were expected from the Northern Territory rates (a total of 772 admissions).

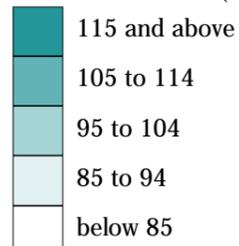
Map 6.37

Same day admissions for surgical procedures, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Same day admissions for surgical procedures, 1995/96

State/Territory comparison (Australia as the Standard)

There were 334,448 same day admissions of residents of the non-metropolitan areas to public acute and private hospitals (including day surgery facilities) at which at least one surgical procedure was performed. These admissions represent 43.4 per cent of all admissions involving a surgical procedure.

Standardised admission ratios (SARs) in the *Rest of State/Territory* category in **Table 6.45** are lower than those in the capital cities for all States and the Northern Territory. The SAR for the non-metropolitan areas was highest in Victoria (105**), and that in the Northern Territory (62**) was the lowest.

Table 6.45: Same day admissions¹ for surgical procedures, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	104**	111**	102**	101**	93**	87**	72**	64**	102**
Other major urban centres ²	110**	79**	109**	..	..	..	..	..	107**
Rest of State/Territory	96**	105**	88**	90**	84**	81**	62**	— ³	93**
Whole of State/Territory	102**	108**	97**	98**	90**	84**	67**	63**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (NT as the Standard)

In 1995/96, there were 3,286 same day admissions of residents of the non-metropolitan areas of the Northern Territory for a surgical procedure, 7 per cent fewer than were expected from the Northern Territory rates (an SAR of 93**). Females comprised the larger proportion of admissions, 60.4 per cent.

As can be seen from **Map 6.38**, almost two thirds (65.2 per cent) of non-metropolitan SLAs have been mapped in the lowest two ranges, with only three SLAs mapped in the highest range. SLAs with elevated ratios tend to be either towns or areas close to **Darwin**, indicating a degree of difficulty for residents of more remote areas in accessing same day facilities.

Admissions that were more than 30 per cent above the expected level were recorded for the residents of Alice Springs (an SAR of 145**), Cox-Finniss (142) and Nhulunbuy (137**).

Just two SLAs had ratios in the range between 110 and 129; Tennant Creek (with an SAR of 124**) and Coomalie (114). Litchfield [Part B] (with an SAR of 108) was the only SLA mapped in the middle range.

There was a considerable gap between the last mentioned ratio (an SAR of 108) and the next ratios, 82 recorded in Jabiru and 82** recorded in Katherine.

The lowest ratios were recorded in Litchfield [Part A] (an SAR of 16**, three admissions, when 21 were expected from the rates for the Northern Territory) and Tableland (28**, 11 admissions when 40 were expected). Low ratios and more than 20 admissions were recorded in a number of SLAs including East Arnhem-Balance (with an SAR of 29**), Tanami (39**), Gulf (42**), Victoria (48**), Groote Eylandt (51**), Bathurst-Melville (56**) and West Arnhem (59**). Most SLAs with ratios in the lowest range had large Indigenous populations, in excess of 35 per cent of their total populations.

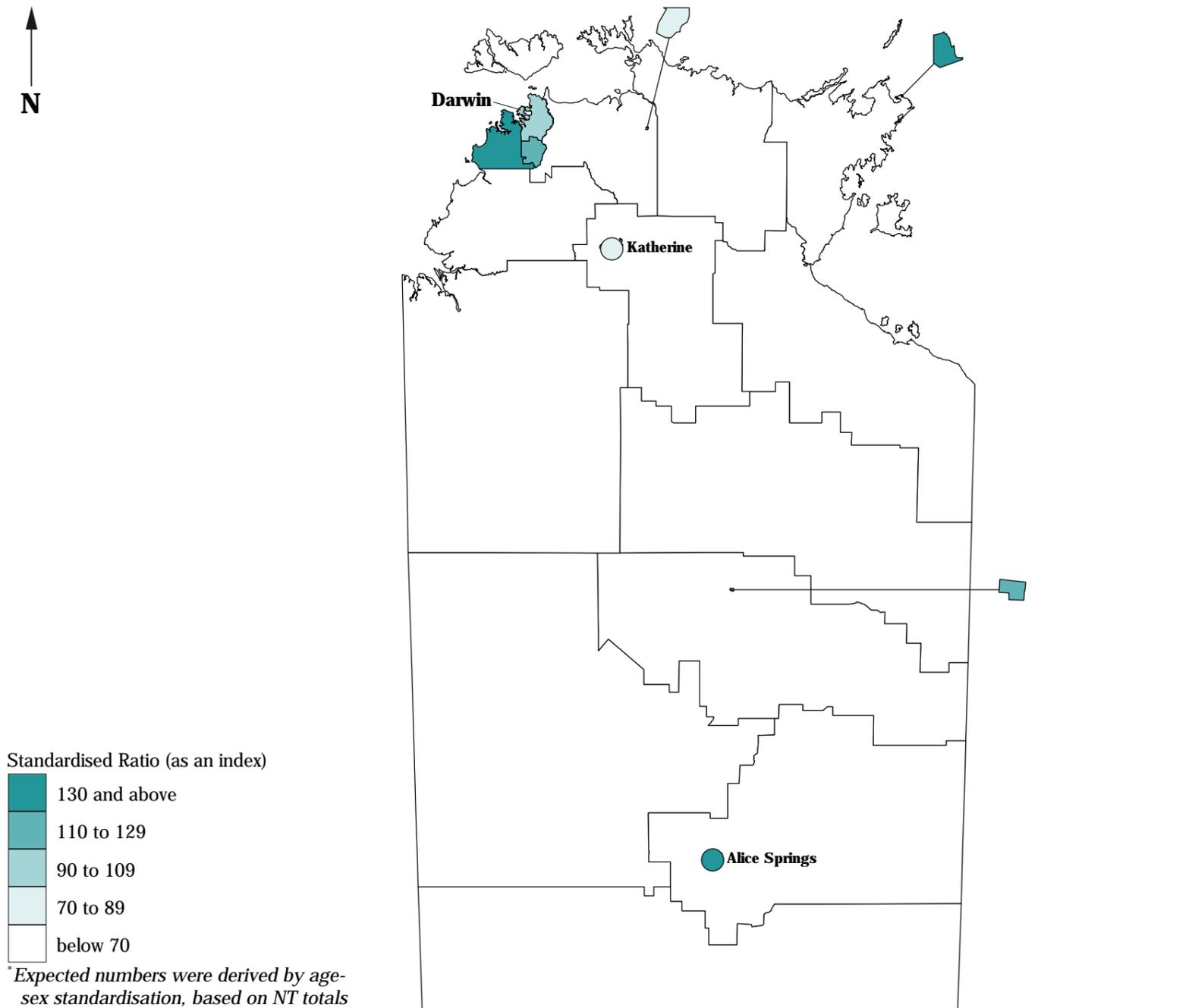
The largest numbers of same day admissions for a surgical procedure in the non-metropolitan areas of the Northern Territory were recorded for residents of Alice Springs (1,396 admissions), Litchfield [Part B] (493 admissions), Katherine (270 admissions), Nhulunbuy (189 admissions) and Tennant Creek (146 admissions).

There were correlations of meaningful significance with the variables for managers and administrators, and professionals (0.57) and female labour force participation (0.55); and inverse correlations with a number of indicators of socioeconomic disadvantage including low income families (-0.60) and the Indigenous population (-0.52). These results, together with the correlation of meaningful significance with the IRSD (0.60), indicate an association between same day admissions involving a surgical procedure and high socioeconomic status.

Map 6.38

Same day admissions for surgical procedures, Northern Territory, 1995/1996

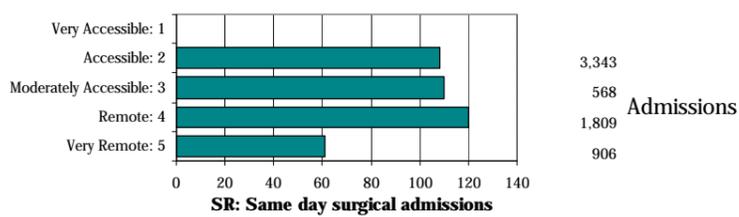
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for same day admissions involving a surgical procedure show a markedly different pattern to that existing for all surgical admissions, with ratios increasing across the first three ARIA categories from an SAR of 108 in the Accessible areas to 120 in the Remote areas (where there were 20 per cent more same day admissions involving a surgical procedure than expected from the Northern Territory rates). The Very Remote areas had a very low SAR of 61, almost half that in the Remote areas and 39 per cent fewer admissions than expected).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions for tonsillectomy and/or adenoidectomy, 1995/96

Capital city comparison (Australia as the Standard)

There were 19,896 procedures for tonsillectomy and/or adenoidectomy (described below) performed as a principal procedure on residents of the capital cities (and an additional 2,305 on residents of other major urban centres). Standardised admission ratios (SARs) for these procedures varied widely between the capital cities (**Table 6.46**), from a low of 65** in **Canberra** to a high of 136** (more than double the ratio in **Canberra**) in **Adelaide**.

Table 6.46: Admissions¹ with a principal procedure of tonsillectomy and/or adenoidectomy, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
89**	109**	101	136**	95*	71**	71**	65**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Tonsillectomies involve the removal of a person's tonsils where, for example, there has been repeated infection of the tonsils over an extended period.

A majority of admissions for these procedures of residents of the Northern Territory were aged under 30 years. For males, the largest number and rate of procedures was for the 5 to 9 year age group, with 243.3 admissions per one hundred thousand males. For females, the largest number and rate was for the 15 to 19 year age group, with 369.4 per one hundred thousand females. Overall, females (132.4 per one hundred thousand females) had higher admission rates than males (86.4 admissions per one hundred thousand males). Accordingly, 59.2 per cent of the 191 admissions for tonsillectomies and/or adenoidectomies in the Northern Territory were of females.

Data for Australia published by the AIHW (1998) show the tonsillectomy and /or adenoidectomy rate in the Northern Territory to be 74.1 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented in **Tables 6.46** and **6.56**. The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory to the Darwin Private Hospital. There were almost as many admissions for this procedure of residents of **Darwin** to the private as to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin⁸ (Northern Territory as the Standard)

In 1995/96, there were 113 admissions for removal of tonsillectomies and/or adenoidectomies in **Darwin**, of which 62.8 per cent were of females and 37.2 per cent of males. This was 39 per cent more than were expected from the Northern Territory rates (an SAR of 139**).

Postcodes (aggregates of suburbs)

All of the postcode areas recorded elevated ratios for this variable (**Map 6.39**). Highly statistically significant ratios were recorded in Darwin: South West (with an SAR of 173**) and Palmerston (170**) with residents of these areas having 73 and 70 per cent more admissions than were expected from the Northern Territory rates. Darwin: North West (with an SAR of 127) was also mapped in the highest range. The lowest ratio, an SAR of 112, was recorded in Darwin: North East.

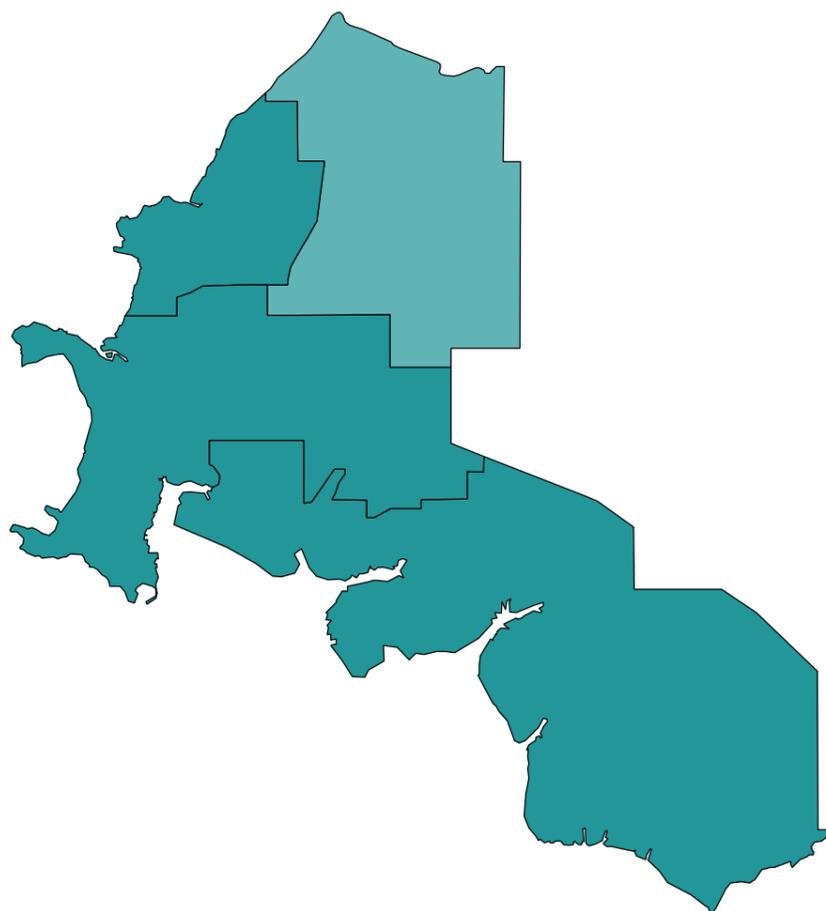
The number of admissions for tonsillectomies and/or adenoidectomies was low in all postcode areas, with the largest number, 35 admissions, recorded for residents of Darwin: North West. Residents of Palmerston had the lowest number, of 24 admissions, while residents of both Darwin: North and Darwin: South West recorded 27 admissions.

⁸As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 295.

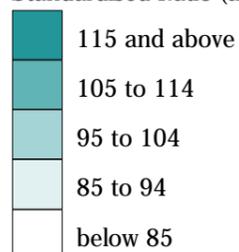
Map 6.39

Admissions for a tonsillectomy and/or adenoidectomy, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of children aged 0 to 9 years for a myringotomy, 1995/96

Capital city comparison (Australia as the Standard)

There were 17,457 admissions for a myringotomy procedure (described below) performed as a principal procedure on children aged from 0 to 9 years and resident in the capital cities (and an additional 1,443 on young residents of the other major urban centres). Over half (60.9 per cent) of these admissions for residents of capital cities were boys. Standardised admission ratios (SARs) for this procedure varied markedly between the capital cities (**Table 6.47**), from a low of 59** in **Canberra** to a highly elevated 205** in **Adelaide** (more than 50 per cent above the next highest ratio).

Table 6.47: Admissions¹ of children aged 0 to 9 years with a principal procedure of myringotomy, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
78**	125**	103	205**	130**	119**	84	59**	112**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources, Appendix 1.3*

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

A myringotomy (incision into the eardrum, or tympanic membrane) is usually performed to relieve pressure and allow for drainage of fluid in the middle ear. Ventilation is maintained by putting a small tube (or grommet) into the incision.

As the majority (87.4 per cent) of admissions of Northern Territory residents for this procedure were of children under 10 years of age, the SLA data have been standardised to the total population for those ages.

Children aged from 0 to 4 years accounted for just over half (53.0 per cent) of the admissions for this procedure, with most of the remainder (34.3 per cent) in the 5 to 9 year age group. Males accounted for over half (59.1 per cent) of all admissions for myringotomies and slightly more (67.2 per cent) in the 0 to 4 year age group.

Data for Australia published by the AIHW (1998) show the myringotomy rate in the Northern Territory to be 63.8 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented in **Tables 6.47** and **6.57**. The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory to the Darwin Private Hospital. There were almost as many admissions for this procedure of residents of **Darwin** to the private as to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin⁹ (Northern Territory as the Standard)

In 1995/96, there were 113 admissions of children in **Darwin** aged from 0 to 9 years for a myringotomy, 40 per cent more than were expected from the Northern Territory rates (an SAR of 140**). Males comprised the larger proportion (61.9 per cent) of these admissions. The majority (93.8 per cent) of admissions for myringotomies were performed on a same day basis.

⁹As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 296.

Postcodes (aggregates of suburbs)

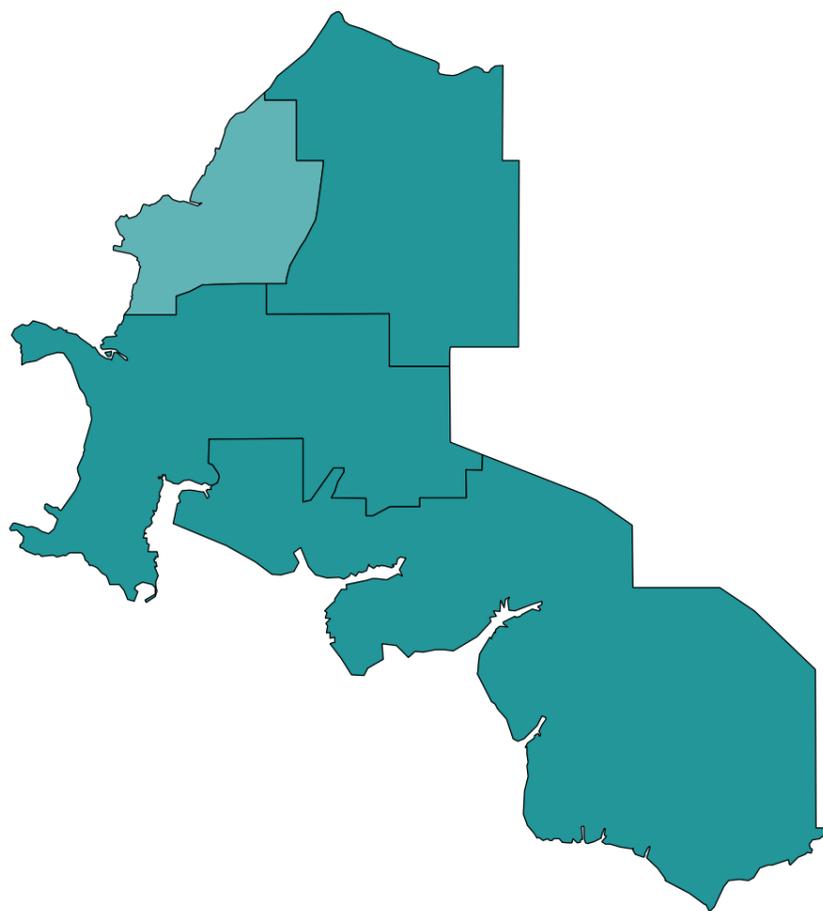
All of the postcode areas recorded elevated ratios for admissions for a myringotomy (**Map 6.40**). The highest ratio, by far, an SAR of 231**, was recorded in Palmerston, where children aged from 0 to 9 years had over two and a quarter times the number of admissions expected from the Northern Territory rates (38 admissions when 16 were expected). Palmerston had the highest proportions of a number of indicators of socioeconomic disadvantage, including single parent families. Also mapped in the highest range were Darwin: North East (with an SAR of 125, 30 admissions) and Darwin: South West (120, but representing 17 admissions).

Darwin: North West recorded the lowest ratio, an SAR of 108 (28 admissions).

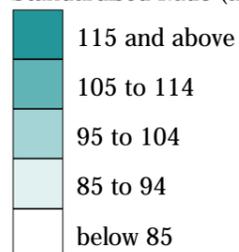
Map 6.40

Admissions of children aged 0 to 9 years for a myringotomy, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of females aged 15 to 44 years for a Caesarean section, 1995/96

Capital city comparison (Australia as the Standard)

There were 29,965 Caesarean sections (described below) performed as a principal procedure on 15 to 44 year old female residents of the capital cities and an additional 3,070 on females resident in the other major urban centres. Most capital cities had near average standardised admission ratios (SARs) for this variable, with **Brisbane** (with the highest SAR of 118**), **Darwin** (115*) and **Adelaide** (107*) recording more procedures than were expected from the Australian rates.

Table 6.48: Admissions¹ of females aged 15 to 44 years with a principal procedure of Caesarean section, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
92**	92**	118**	107**	92**	100	115*	90**	97**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Caesarean sections are performed to intervene in the birth process where the medical practitioner attending the birth perceives that the life of the mother or child is at risk without such an intervention. As Caesarean sections are generally performed on women aged from 15 to 44 years, this age range has been used in standardising the data.

Data for Australia published by the AIHW (1998) show the Caesarean section rate in the Northern Territory to be 13.5 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented on this and the following text pages (**Tables 6.48** and **6.49**). The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory the Darwin Private Hospital. There were slightly more admissions for this procedure of female residents of **Darwin** to the private hospital than to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 286 admissions for Caesarean sections of female residents of **Darwin** aged from 15 to 44 years. This was 11 per cent fewer admissions than were expected from the Northern Territory rates, an SAR of 89*.

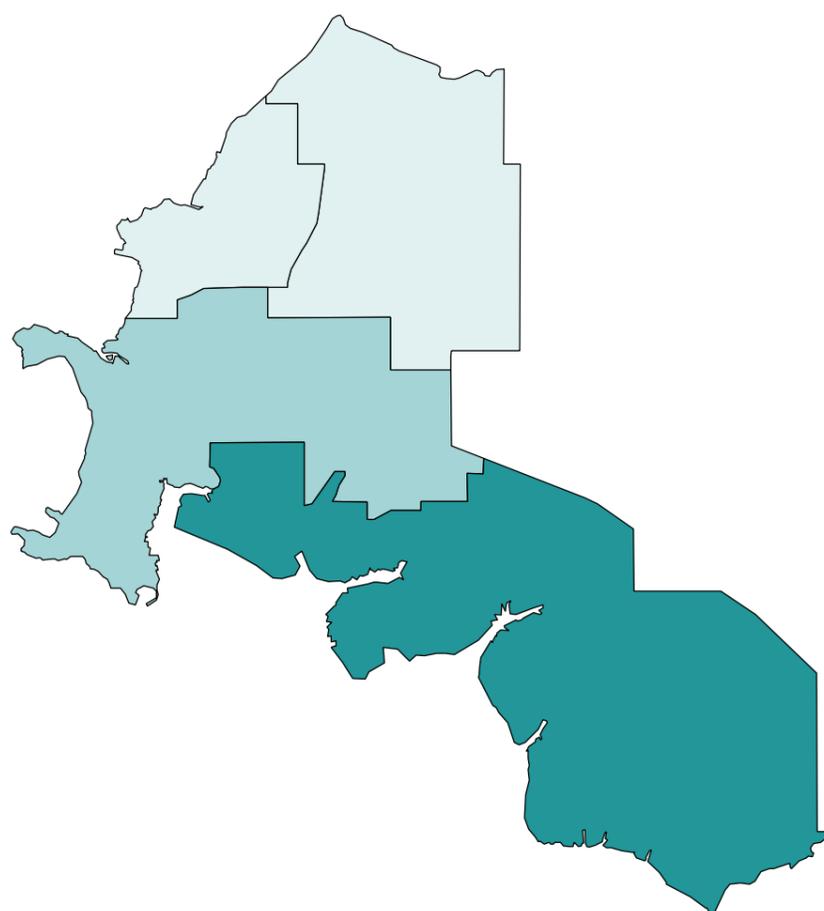
Postcodes (aggregates of suburbs)

Females of the developing suburbs grouped into the Palmerston postcode area had 34 per cent more admissions for a Caesarean section than were expected from the Northern Territory rates (an SAR of 134*, 67 admissions) (**Map 6.41**). Female residents of the other postcode areas recorded fewer admissions than expected; Darwin: South West (with an SAR of 92, 69 admissions), Darwin: North West (80*, 89 admissions) and Darwin: North East (70**, 61 admissions).

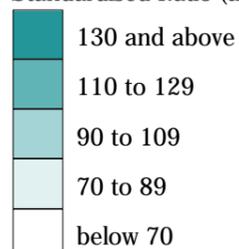
Map 6.41

Admissions of females aged 15 to 44 years for a Caesarean section, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions of females aged 15 to 44 years for a Caesarean section, 1995/96

State/Territory comparison (Australia as the Standard)

There were 13,966 Caesarean sections (described on the previous text page) performed as a principal procedure on female residents of the non-metropolitan areas of Australia. There were elevated standardised admission ratios (SARs) for this variable in most of the non-metropolitan areas other than in Western Australia (with an SAR of 99), with the most highly elevated ratios in the Northern Territory (142**) and South Australia (123**).

Table 6.49: Admissions¹ of females aged 15 to 44 years with a principal procedure of Caesarean section, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	92**	92**	118**	107**	92**	100	115*	90**	97**
Other major urban centres ²	95*	78**	106	..	..	..	..	..	97
Rest of State/Territory	105**	107**	109**	123**	99	104	142**	- ³	108**
Whole of State/Territory	96**	95**	112**	111**	94**	102	130**	87**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, female residents of the non-metropolitan areas of the Northern Territory aged from 15 to 44 years had 419 admissions for Caesarean sections, 10 per cent more admissions than expected from the Northern Territory rates (an SAR of 110).

As can be seen from **Map 6.42**, a number of SLAs have not been mapped for this variable as there were too few cases (fewer than five admissions) to produce reliable results.

In contrast to the situation in **Darwin**, more non-metropolitan SLAs (44.4 per cent) were mapped in the highest range and only two were mapped in the lowest range.

Female residents of Sandover-Balance had more than twice the number of admissions for a Caesarean section expected from the Northern Territory rates, although the ratio of 221** represented just 18 admission (when eight were expected from the rates for the Northern Territory). Statistically significantly elevated ratios were also recorded in Eley Balance (187*, 12 admissions), Gulf (168*, 17 admissions) and Litchfield [Part B] (131*, 54 admissions). Females from West Arnhem (135) also recorded more than 20 admissions. Fewer than 20 admissions were recorded for females of Bathurst-Melville (168, 13 admissions), Tennant Creek (154, 19 admissions) and Nhulunbuy (135, 18 admissions).

Elevated ratios were also recorded in Tanami (120, 27 admissions), Groote Eylandt (106, 11 admissions) and East Arnhem-Balance (103, 25 admissions).

The only other SLAs with more than twenty admissions were Alice Springs (an SAR of 93) and Katherine (an SAR of 88).

The lowest ratios were recorded in Victoria (55, six admissions) and Jabiru (66, four admissions). Low ratios were also recorded in Petermann (71, eight admissions) and Tennant Creek-Balance (74, five admissions).

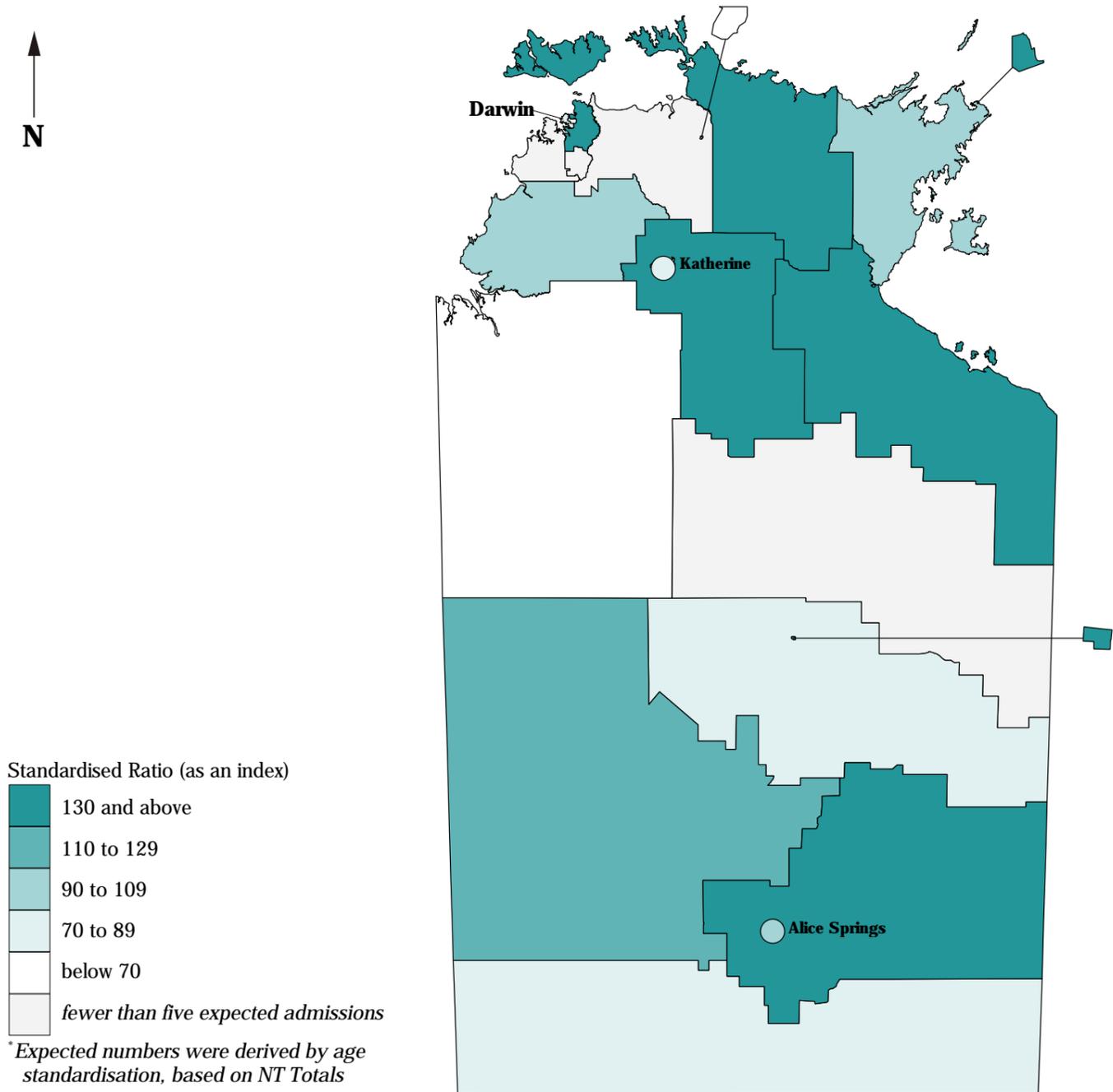
No SLA had more than 100 admissions, with the largest numbers recorded in Alice Springs (98 admissions), Litchfield [Part B] (54 admissions) and Katherine (32 admissions).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Map 6.42

Admissions of females aged 15 to 44 years for a Caesarean section, Northern Territory, 1995/1996

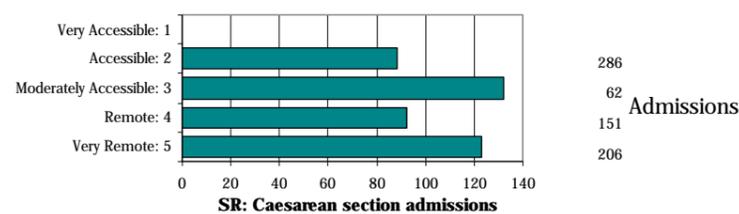
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



There are two levels in the standardised admission ratios for admissions of females aged 30 years and over involving a Caesarean section. The lowest ratios are in the Accessible (an SAR of 88) and Remote (92) areas, which are largely comprised of Darwin, Alice Springs, Jabiru and Katherine. The most highly elevated ratio is in the Moderately Accessible areas, with 32 per cent more admissions than expected from the Northern Territory rates (an SAR of 132), and in the Very Remote areas (123).

Source: Calculated on ARIA classification, DHAC National Social Health Atlas Project, 1999

Admissions of females aged 30 years and over for an hysterectomy, 1995/96

Capital city comparison (Australia as the Standard)

There were 19,868 hysterectomies (described below) performed as a principal procedure on female residents aged 30 years and over of the capital cities and an additional 2,610 on females resident in the other major urban centres. Most capital cities had either low or near average standardised admission ratios (SARs) for this variable, with the most highly elevated ratio being recorded for females in **Darwin** (with an SAR of 135^{**}): other elevated ratios were in **Hobart** (with an SAR of 115^{**}) and **Brisbane** (106^{**}).

Table 6.50: Admissions¹ of females aged 30 years and over with a principal procedure of hysterectomy, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
86 ^{**}	91 ^{**}	106 ^{**}	102	100	115 ^{**}	135 ^{**}	87 ^{**}	94 ^{**}

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Hysterectomies are performed for a number of reasons including the presence of fibroids, uterine cancer and excessive bleeding.

The number of women having an hysterectomy increases with age, with the largest number and rate in the 40 to 44 and 45 to 49 year age groups (40 to 44 years: 88 admissions and a rate of 1,317.1 per one hundred thousand females; 45 to 49 years: 92 admissions and a rate of 1618.0 per one hundred thousand females). As relatively few hysterectomies are performed on women younger than 30 years, the age range used in standardising this data is for women aged from 30 years.

Data for Australia published by the AIHW (1998) show the hysterectomy rate in the Northern Territory to be 36.7 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented in **Tables 6.50** and **6.58**. The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory to the Darwin Private Hospital. There were almost as many admissions for this procedure of females residents of **Darwin** to the private as to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin¹⁰ (Northern Territory as the Standard)

Female residents in **Darwin**, aged 30 years or over, had 185 admissions for an hysterectomy, 18 per cent more admissions than were expected from the Northern Territory rates (an SAR of 118¹⁰).

¹⁰As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 297.

Postcodes (aggregates of suburbs)

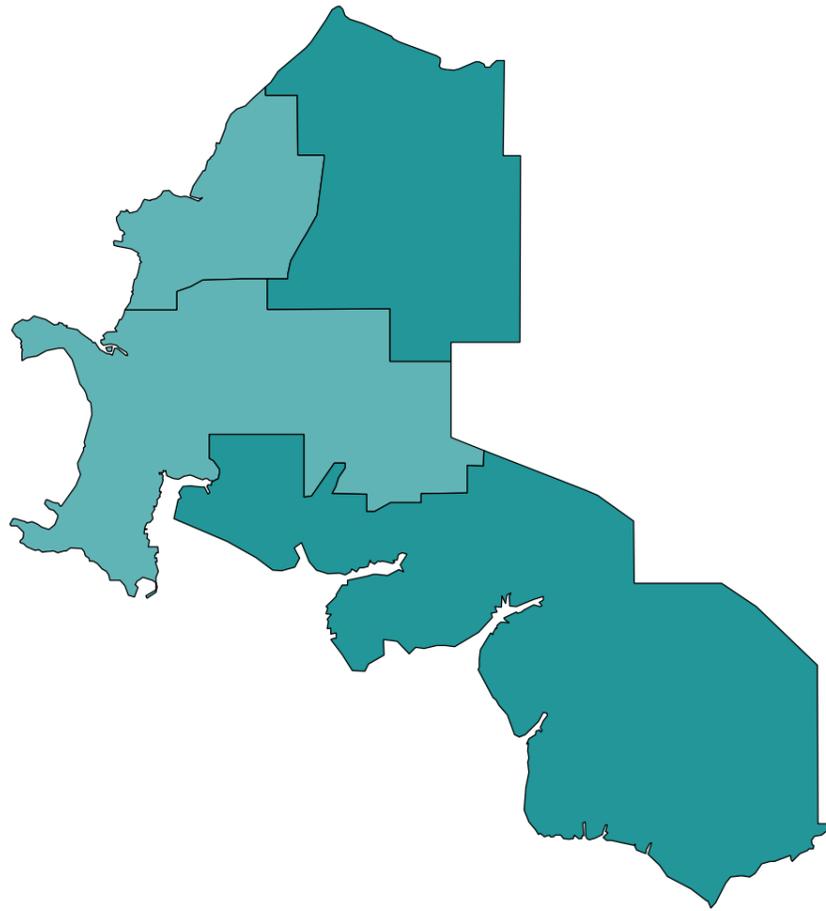
All the postcode areas in **Darwin** recorded elevated ratios for admissions for an hysterectomy (**Map 6.43**). The highest ratio, an SAR of 137, was recorded in Palmerston but had the lowest number of 28 admissions. Darwin: North East was also mapped in the highest range, with an SAR of 121 (56 admissions).

Darwin: North West and Darwin: South West both recorded an SAR of 113, with 66 and 34 admissions respectively.

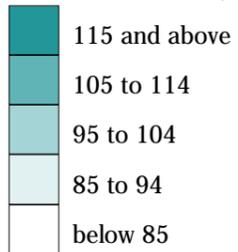
Map 6.43

Admissions of females aged 30 years and over for an hysterectomy, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for a lens insertion, 1995/96

Capital city comparison (Australia as the Standard)

There were 55,446 admissions at which a lens insertion (described below) was undertaken on residents of the capital cities and an additional 8,263 on residents of the other major urban centres. Females accounted for 61.5 per cent of these admissions for residents of capital cities, reflecting their longer life expectancy. Most capital cities had either low or near average standardised admission ratios (SARs) for this variable, other than **Darwin** (with the highest ratio, an SAR of 130^{**}). The lowest SARs were in **Canberra**, with a very low SAR of 36^{**}, and **Perth** (84^{**}).

The high ratio recorded for residents of **Darwin** has a number of possible explanations. Like other areas in northern Australia, people living in the Northern Territory are subjected to high levels of ultraviolet light, which can lead to the development of cataracts. There has been a steady increase in the number of procedures for people recorded as non-indigenous. The NT Aboriginal Eye Health Committee and Territory Health Services had for many years worked on identifying and overcoming structural and other barriers to service delivery for Aboriginal people in the NT and their initiatives from 1992 began to make in-roads. Some of these procedures were undertaken in public hospitals and are therefore included in the statistics. A number were undertaken in field hospitals, by Australian Army surgeons, under a program supported by Rotary International. These procedures are unlikely to be included in the statistics. The mapped rates for some areas (eg. Bathurst Island and Maningrida) are therefore likely to understate the extent to which these procedures have been performed.

Table 6.51: Admissions¹ for a lens insertion, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
102 ^{**}	97 ^{**}	105 ^{**}	93 ^{**}	84 ^{**}	99	130 ^{**}	36 ^{**}	97 ^{**}

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Cataracts are a common cause of impaired vision in people of any age. They may be congenital, or result from trauma, diseases like diabetes or changes associated with ageing. Cataract surgery is one of the most frequently performed surgical procedures in Australia since the introduction of intraocular lens implants. The implants are inserted at the time of surgery after the affected lens has been removed. Increasingly, cataract surgery is being performed as a same day procedure using local anaesthetic techniques, and the lens implant means that most patients enjoy significantly improved vision after surgery.

Data for Australia published by the AIHW (1998) show the lens insertion rate in the Northern Territory to be 14.8 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented in **Tables 6.51** and **6.61**. The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory to the Darwin Private Hospital. There were almost as many admissions for this procedure of residents of **Darwin** to the private as to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin¹¹ (Northern Territory as the Standard)

In 1995/96, there were 178 admissions of residents of **Darwin** involving a lens insertion, 12 per cent more than expected from the Northern Territory rates (an SAR of 112). This higher than

expected rate in **Darwin** (and lower rate in the rest of the Territory) should be read in light of the high overall rate in **Darwin** when compared with the Australian totals (30 per cent more admissions than expected, an SAR of 130^{**}: **Table 6.51**). Males comprised well over half (59.5 per cent) of these admissions (106 admissions).

Postcodes (aggregates of suburbs)

The highest ratio at the postcode level was recorded in Darwin: North West (an SAR of 133^{*}) (**Map 6.44**). Elevated ratios were also recorded in Darwin: South West (122) and Darwin: North East (103).

The lowest ratio, an SAR of 47^{*} recorded in Palmerston, represented just 10 admissions when 21 admissions were expected from the Northern Territory rates.

The largest number of admissions for a lens insertion were recorded for residents of Darwin: North West (77 admissions).

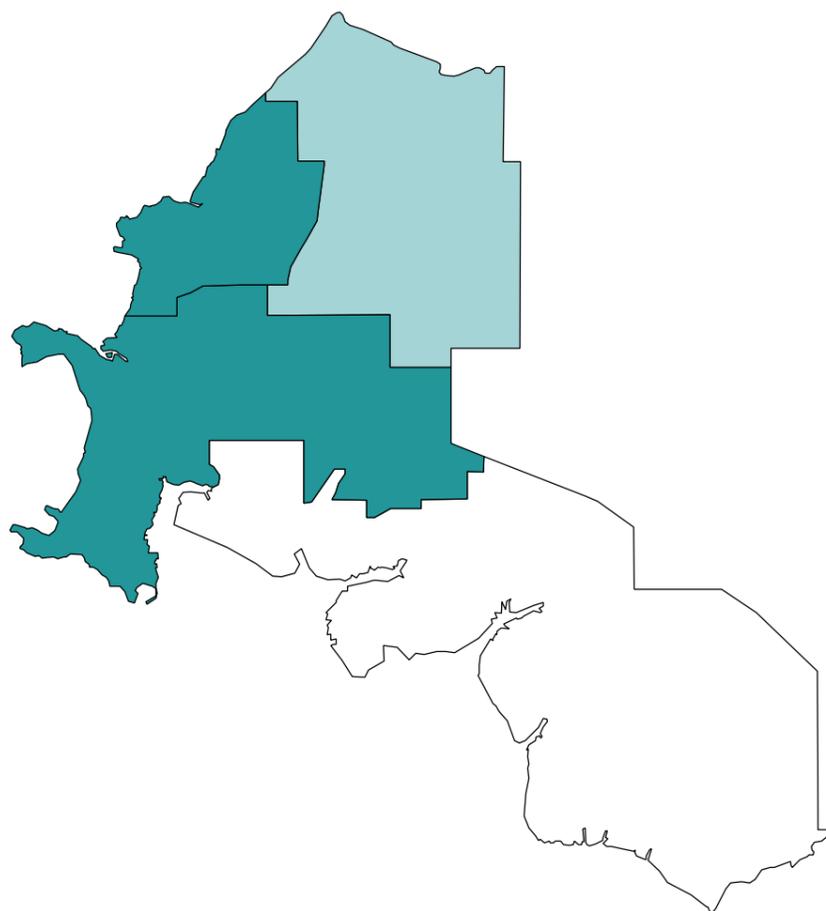
Residents of Darwin: South West and Darwin: North East had 54 and 37 admissions respectively.

¹¹As there are relatively few areas with sufficient numbers of cases for this variable in non-metropolitan Northern Territory, the data have not been mapped. A summary of the main features of the variable is on page 300.

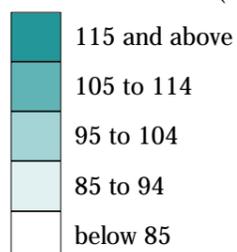
Map 6.44

Admissions for a lens insertion, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for an endoscopy, 1995/96

Capital city comparison (Australia as the Standard)

There were 249,411 endoscopies (described below) performed as a principal procedure on residents of the capital cities and an additional 26,647 on residents of the other major urban centres. Females accounted for 61.5 per cent of these admissions, reflecting their longer life expectancy. Standardised admission ratios (SARs) for this variable varied over a wide range, from a low of 58** in **Canberra**, to highs of 115** in **Brisbane**, 111** in **Melbourne** and 111** in **Hobart**. These large differences suggest markedly different clinical practice between the various States and Territories.

Table 6.52: Admissions¹ with a principal procedure of endoscopy, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
110**	111**	115**	81**	82**	111**	92**	58**	104**

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Endoscopy procedures involve looking inside hollow organs or cavities in the body such as the intestinal tract, stomach, bladder, abdominal cavity and airways, using a rigid or flexible instrument, the endoscope. Endoscopies allow visual examination, photography, biopsy and some diagnostic and treatment procedures to be undertaken while a person is relaxed and conscious. These procedures are often now performed in accredited day endoscopy facilities, relieving pressure on hospital inpatient beds.

Data for Australia published by the AIHW (1998) show the endoscopy rate in the Northern Territory to be 43.3 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented on this and the following text pages (**Tables 6.52** and **6.53**). The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of the Northern Territory to the Darwin Private Hospital. There were almost as many admissions for this procedure of residents of **Darwin** to the private as to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 1,182 admissions of residents of **Darwin** for endoscopies, 18 per cent more admissions than were expected from the Northern Territory rates (an SAR of 118**). Of these admissions, 597 were males (50.5 per cent) and 585 were females (49.5 per cent). Only a small proportion (7.2 per cent, representing a total of 85) of all endoscopies was performed on a same day basis.

Postcodes (aggregates of suburbs)

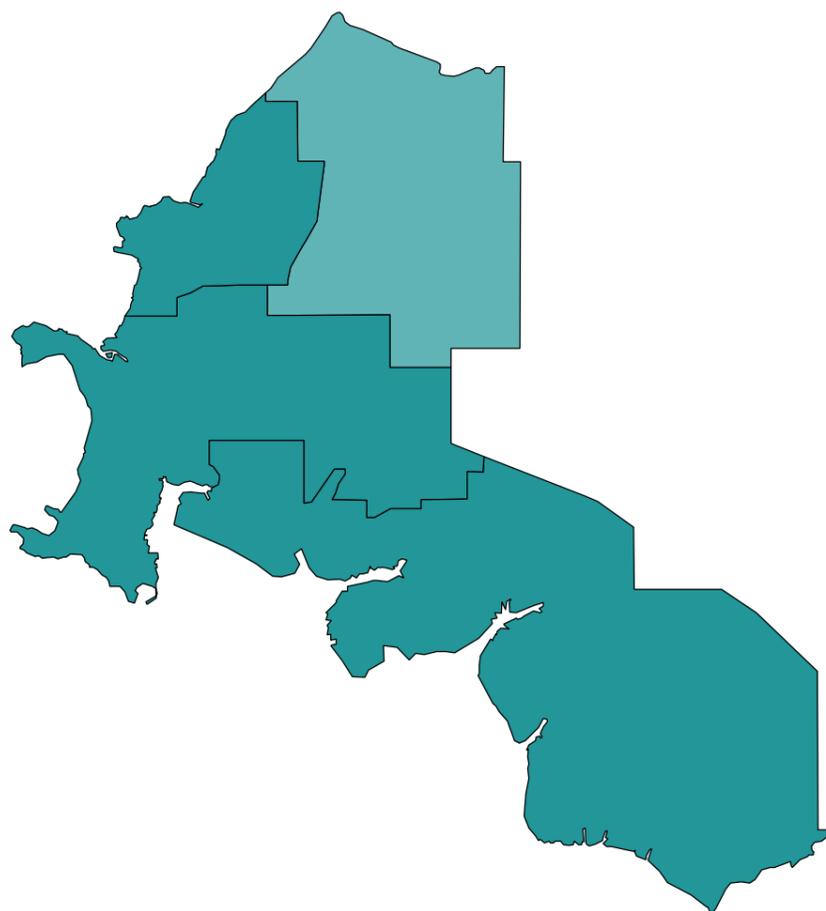
All of the postcode areas in **Darwin** had elevated ratios for this variable (**Map 6.45**). Highly statistically significant ratios were recorded in Palmerston (140**), Darwin: North West (118**) and Darwin: South West (118**). Darwin: North East had the lowest ratio of 105.

Residents of Darwin: North West recorded the largest number of admissions for an endoscopy, with 443 admissions, followed by residents of Darwin: North East and Darwin: South West, with 280 and 272 admissions, respectively. Residents of Palmerston had the lowest number of 187 admissions.

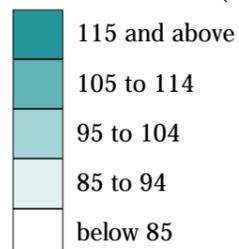
Map 6.45

Admissions for an endoscopy, Darwin, 1995/1996

Standardised Ratio: number of admissions in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by age-sex standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Admissions for endoscopy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 106,877 endoscopies (described on the previous text page) performed as a principal procedure on residents of the non-metropolitan areas. Just over half (52.5 per cent) of these admissions were females, compared with 61.5 per cent in the capital cities.

With the exception of Tasmania and the Northern Territory, the standardised admission ratios (SARs) at the *Whole of State/Territory* and *Rest of State/Territory* levels largely followed the direction of the ratios for the capital cities, although they are somewhat closer to the Australian rates. In both Tasmania (an SAR of 77**) and the Northern Territory (66**), ratios were substantially below the level expected from the Australian rates. The only elevated SARs were in Victoria (104**) and Queensland (101').

Table 6.53: Admissions¹ with a principal procedure of endoscopy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	110**	111**	115**	81**	82**	111**	92**	58**	104**
Other major urban centres ²	97**	70**	104**	..	..	..	..	..	97**
Rest of State/Territory	92**	104**	101*	62**	80**	77**	66**	- ³	93**
Whole of State/Territory	104**	108**	108**	76**	82**	108**	78**	58**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

In 1995/96, there were 896 admissions of residents of the non-metropolitan areas of the Northern Territory for endoscopies, 16 per cent fewer admissions than expected from the Northern Territory rates (an SAR of 84**). Males accounted for just over half (51.3 per cent) of these admissions. Only a small proportion (5.1 per cent) of all endoscopies was performed on a same day basis.

As can be seen from **Map 6.46**, over half of the SLAs (60.9 per cent) were mapped in the lowest range: these SLAs were generally non-metropolitan SLAs as opposed to towns. SLAs with ratios in the higher range mapped were more likely to be towns, or were located close to **Darwin**.

Elevated ratios (in SLAs with more than 20 admissions) were recorded for residents of Alice Springs (an SAR of 119**), Tennant Creek (114) and Litchfield [Part B] (104). Other elevated ratios were recorded in Jabiru (an SAR of 121, 16 admissions), South Alligator (111, eight admissions) and Cox-Finiss (109, six admissions).

With the exception of Nhulunbuy (with an SAR of 98), Katherine (77'), Groote Eylandt (75) and Tanami (36**), other SLAs with fewer admissions than expected had fewer than 20 admissions.

Low ratios were recorded in Tennant Creek-Balance (24**, four admissions, when 18 were expected from the rates for the Northern Territory), East Arnhem-Balance (31**, 17 admissions), Elsey Balance (33**, six admissions) and Tableland (37', four admissions).

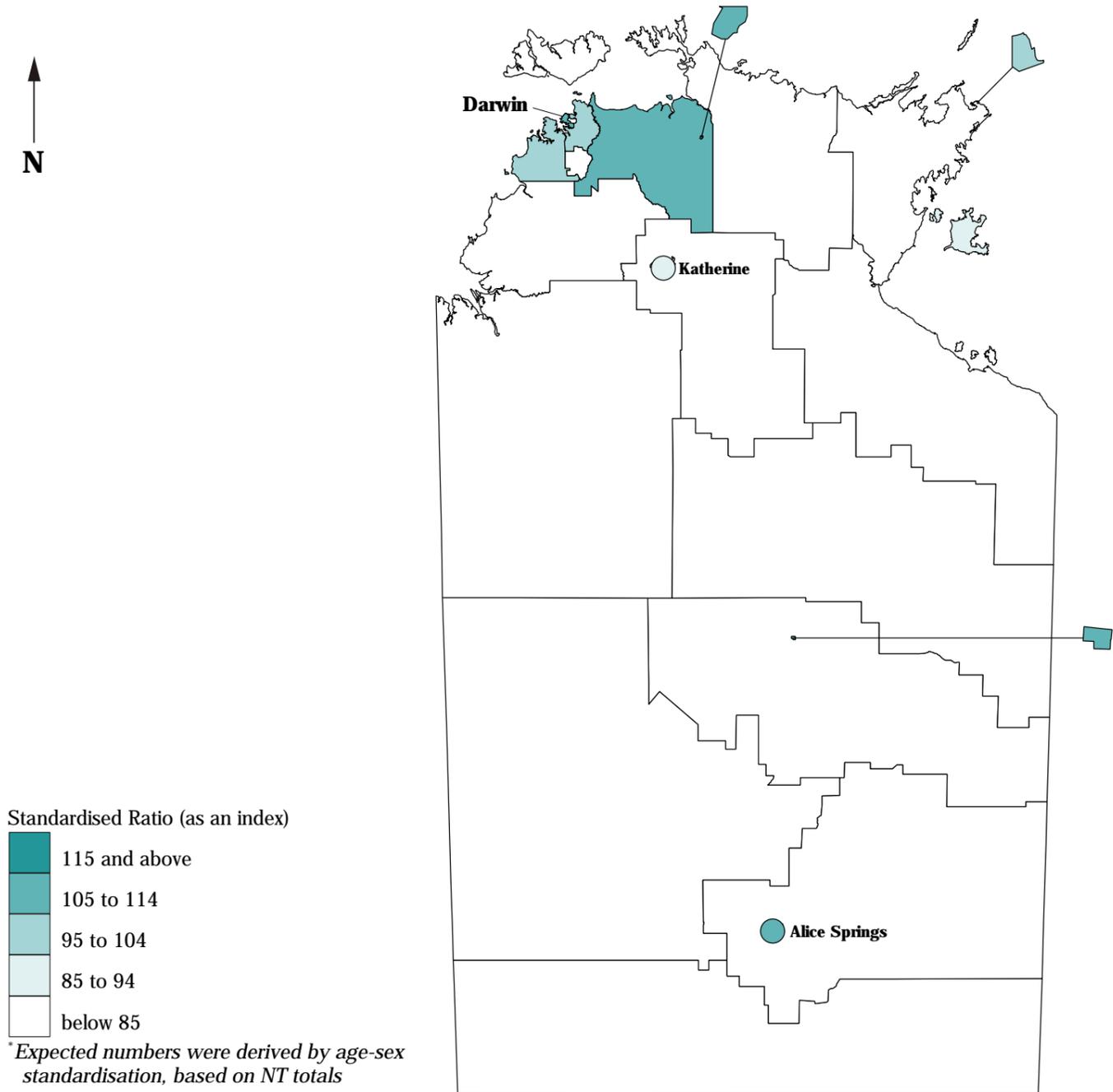
The largest numbers of admissions for endoscopies in non-metropolitan Northern Territory were recorded for residents of Alice Springs (357 admissions), Litchfield [Part B] (168 admissions), Katherine (76 admissions) and Nhulunbuy (44 admissions).

There were inverse correlations of statistical significance with a number of the indicators of socioeconomic disadvantage, including the variables for low income families (-0.71), early school leavers (-0.70), the Indigenous population (-0.65) and single parent families (-0.63).

Map 6.46

Admissions for an endoscopy, Northern Territory, 1995/1996

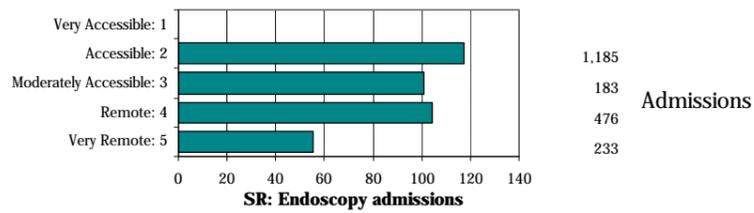
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving an endoscopy decrease in a step wise fashion across the ARIA categories. The highest ratio was in the Accessible areas, an SAR of 117 (17 per cent more admissions for an endoscopy than expected from the Northern Territory rates). Ratios close to the level expected from the Northern Territory rates were recorded in the Moderately Accessible and Remote areas (SARs of 101 and 104, respectively). The lowest ratio was in the Very Remote areas, with almost half the number of admissions expected from the Northern Territory rates, an SAR of 55.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

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The information on these eight pages provides summary details for variables where it was considered that there were too few cases to map the data at the SLA level. Where SLA data is available it is in the tables in Volume 8.1.

Admissions for lung cancer, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for lung cancer (described on page 228) of residents of the non-metropolitan areas were relatively uniform across the States and Territories, with the exception of higher ratios in South Australia, Queensland, Tasmania and the Northern Territory (Table 6.54).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in Table 6.54.

Table 6.54: Admissions with a principal diagnosis of lung cancer, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	88**	99	121**	121**	89**	95	100	54**	98
Other major urban centres ²	72**	116	92	..	..	..	..	..	83**
Rest of State/Territory	99	105	117**	135**	91	114*	116	- ³	108**
Whole of State/Territory	89**	102	114**	125**	90**	106	108	42**	100
1989⁴									
Rest of State/Territory	94**	..	121**	126**	87*	..	119	..	106**

¹Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

⁴Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See Data sources, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

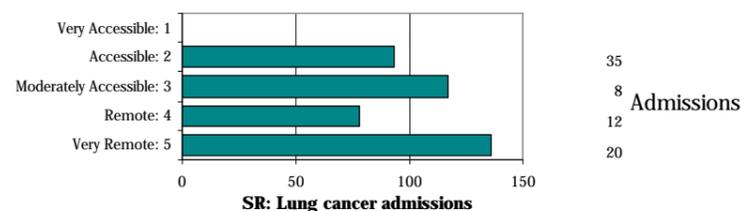
There were only 40 admissions of residents of the Northern Territory for lung cancer, seven per cent more than expected (an SAR of 107). Males comprised almost three quarters (72.8 per cent) of these admissions.

There were more than five admissions for lung cancer expected from the Northern Territory rates in just two SLAs, both of which had low SARs. Residents of Alice Springs (with an SAR of 47) had five admissions when 11 were expected from the Northern Territory rates, and residents of Litchfield [Part B] (49) had three admissions when six were expected.

Residents of West Arnhem recorded the largest number of admissions for lung cancer, with six admissions when only one was expected from the Northern Territory rates.

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Accessibility/Remoteness Index of Australia



Unlike all cancers, the standardised admission ratios (SARs) for lung cancer increase markedly with increasing remoteness, other than for areas in the Remote category. Ratios increase from an SAR of 93 (seven per cent fewer admissions for lung cancer than expected from the Northern Territory rates) to elevated ratios of 117 in the Moderately Accessible areas and 136 in the Very Remote areas (36 per cent more admissions for lung cancer than expected). The lowest ratio is in the Remote areas, where there were 22 per cent fewer admissions for lung cancer than expected (an SAR of 78). The population in these areas is predominantly in the towns of Alice Springs, Jabiru and Katherine, and the SLAs of Daly and South Alligator located relatively near Darwin, compared with the population in the Very Remote areas which is predominantly in smaller settlements, and has a large Indigenous component.

Source: Calculated on ARIA classification, DHAC

Admissions of females aged 40 years and over for breast cancer, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for breast cancer of female residents of the non-metropolitan areas, who were aged 40 years and over, were most notably higher than expected in South Australia (122**) and lower than expected in a number of jurisdictions, including Western Australia (72**) and the Northern Territory (81). SARs in the other States were near average. In general, the differentials in the ratios between the two periods shown suggest lower rates of admission in the later period.

Table 6.55: Admissions of females aged 40 years and over¹ with a principal diagnosis of breast cancer, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96²									
Capital city	97	125**	93*	94	81**	71**	129	90	102*
Other major urban centres ³	89**	118	95	..	..	..	..	..	93*
Rest of State/Territory	101	101	94	122**	72**	87	81	- ⁴	97
Whole of State/Territory	97*	118**	94**	101	79**	81**	106	89	100
1989⁵									
Rest of State/Territory	115**	..	114**	100	80**	..	65	..	109**

¹Data for '1989' is of females of all ages

²Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

³Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

⁴Data unreliable: included with ACT total

⁵Excludes same day admissions: for New South Wales the period is 1989/90 and for Northern Territory it is 1987

Source: See *Data sources*, Appendix 1.3

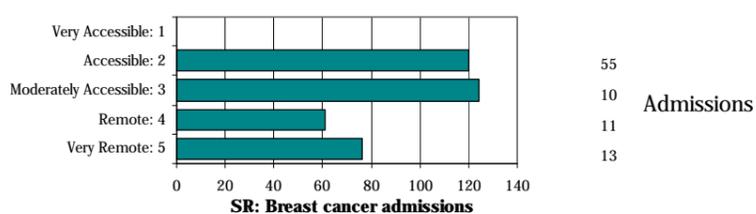
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 34 admissions for breast cancer of females aged 40 years and over and resident in the non-metropolitan areas of the Northern Territory, 22 per cent fewer admissions than were expected from the Northern Territory rates (an SAR of 78). There were fewer than 10 admissions for cancer of the female breast from all non-metropolitan SLAs, with either one or no admissions from most SLAs.

Residents of Alice Springs recorded six admissions (when 13 were expected), with an SAR of 47. The largest number of admissions was recorded for females of Litchfield [Part B] (seven admissions and an SAR of 95).

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for cancer of the female breast show a pattern of distribution by ARIA category that is almost identical with that for all cancers, although the numbers of admissions are less than 10 per cent of those for all cancers. There are elevated ratios in the Moderately Accessible (an SAR of 124, 24 per cent more admissions for cancer than expected from the Northern Territory rates) and Accessible areas (120), and lower than expected ratios of 61 in the Remote areas and 76 in the Very Remote areas.

Source: Calculated on ARIA classification, DHAC

Admissions for a tonsillectomy and/or adenoidectomy, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for the procedures of tonsillectomy and/or adenoidectomy (described on page 276) varied widely between the States and Territories, including across the non-metropolitan areas of Australia (**Table 6.56**). The range was from a low of 35** for the non-metropolitan areas of Northern Territory to a high of 141** in the non-metropolitan areas of South Australia. There were 10,042 of these procedures performed as a principal procedure on residents of the non-metropolitan areas.

Table 6.56: Admissions¹ with a principal procedure of tonsillectomy and/or adenoidectomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	89**	109**	101	136**	95*	71**	71**	65**	100
Other major urban centres ²	100	147**	106	..	..	..	..	..	106**
Rest of State/Territory	101	115**	84**	141**	92*	67**	35**	- ³	99
Whole of State/Territory	94**	112**	94**	137**	94**	68**	50**	66**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

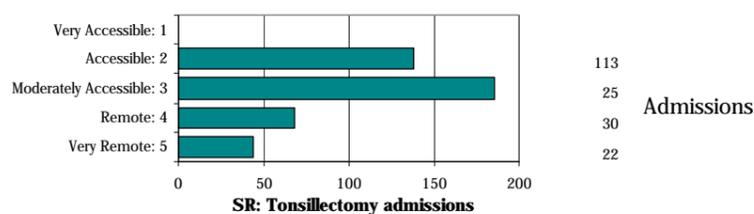
Rest of Territory (NT as the Standard)

As there were only 78 admissions of residents of non-metropolitan Northern Territory for tonsillectomies and/or adenoidectomies in 1995/96, the data have not been mapped.

Of the seven SLAs that had five or more admissions for this variable, two recorded elevated ratios. The highest ratio, an SAR of 169[†] recorded in Litchfield [Part B], represented 20 admissions (the largest number recorded in rural Northern Territory). Katherine had an SAR of 135 (14 admissions).

Residents of all remaining SLAs recorded fewer than 10 admissions including Alice Springs (34**, nine admissions, when 27 were expected from the rates for the Northern Territory). East Arnhem-Balance had the only other significant ratio, 25*, representing two admissions, when eight were expected. Residents of Daly (with an SAR of 80), Tanami (43) and West Arnhem (28) recorded four, three and two admissions for tonsillectomies and/or adenoidectomies respectively.

Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving a tonsillectomy and/or adenoidectomy vary widely across the ARIA categories. The two 'accessible' categories have more admissions than expected from the Northern Territory rates, with a highly elevated SAR of 185 in the Moderately Accessible areas (85 per cent more admissions than expected from the Northern Territory rates) and an SAR of 138 in the Accessible areas. There were lower than expected ratios in the two 'remote' categories, with SARs of 44 in the Very Remote areas (fewer than half the admissions expected from the Northern Territory rates) and 68 in the Remote areas.

Source: Calculated on ARIA classification, DHAC

Admissions of children aged 0 to 9 years for a myringotomy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 6,989 procedures for myringotomy (described on page 278) performed as a principal procedure on children aged from 0 to 9 years and resident in the non-metropolitan areas of Australia. As was the case for the capital cities, standardised admission ratios (SARs) for these procedures varied markedly across the non-metropolitan areas (Table 6.57), from lows of 44** in the Northern Territory and 59** in Queensland, to a highly elevated 163** in South Australia.

Table 6.57: Admissions¹ of children aged 0 to 9 years with a principal procedure of myringotomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	78**	125**	103	205**	130**	119**	84	59**	112**
Other major urban centres ²	70**	133**	91*	..	..	..	..	..	85**
Rest of State/Territory	64**	116**	59**	163**	82**	68**	44**	- ³	82**
Whole of State/Territory	73**	123**	82**	192**	114**	88**	60**	61**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

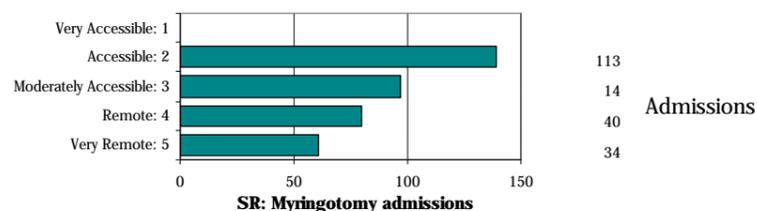
Rest of Territory (NT as the Standard)

There were 88 admissions of residents of non-metropolitan Northern Territory for myringotomies in 1995/96 (an SAR of 73**).

Of the eight SLAs that had five or more expected admissions for a myringotomy, only Nhulunbuy recorded an elevated ratio of 132 (with seven admissions, when five were expected). Residents of Alice Springs (with an SAR of 78) had the largest number of 23 admissions. Other SLAs in this group were Katherine (95, 11 admissions), Litchfield [Part B] (92, 11 admissions), East Arnhem-Balance (64, six admissions) and Daly (43, three admissions). Residents of West Arnhem and Tanami had no admissions.

A notable SLA with fewer than five expected admissions for myringotomies was Bathurst-Melville, with residents recording 10 admissions, when two were expected from the rates for the Northern Territory.

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a myringotomy decrease strongly with increasing remoteness, although only the ratio in the Accessible areas is elevated (an SAR of 139). This is more than twice the level of admissions in the Very Remote areas, with 39 per cent fewer admissions involving a myringotomy than expected from the Northern Territory rates, an SAR of 61. The Remote and Moderately Accessible areas had SARs of 80 and 97, respectively.

Source: Calculated on ARIA classification, DHAC

Admissions of females aged 30 years and over for an hysterectomy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 10,657 hysterectomies (described on page 284) performed as a principal procedure on female residents of the non-metropolitan areas of Australia aged 30 years and over. Elevated standardised admission ratios (SARs) were recorded in the non-metropolitan areas of all States, with the most highly elevated ratios in South Australia (135**) and Tasmania (120**).

Table 6.58: Admissions¹ of females aged 30 years and over with a principal procedure of hysterectomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	86**	91**	106**	102	100	115**	135**	87**	94**
Other major urban centres ²	125**	103	98	..	..	..	..	..	114**
Rest of State/Territory	113**	108**	102	135**	106	120**	92	- ³	110**
Whole of State/Territory	98*	95**	104**	110**	101	118**	113*	83**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

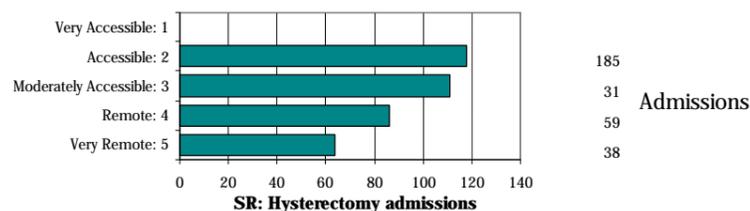
There were 128 admissions of females of non-metropolitan Northern Territory for an hysterectomy in 1995/96 (an SAR of 82*).

Of the areas where five or more admissions for an hysterectomy were expected, only Katherine (125, 19 admissions compared) and Litchfield [Part B] (114, 29 admissions) had elevated ratios.

Apart from Litchfield [Part B], Alice Springs was the only other SLA with female residents recording more than 20 admissions (33 admissions). Other SLAs that had five or more expected admissions were Nhulunbuy (97, 7 admissions), East Arnhem-Balance (81, 7 admissions), Tennant Creek (74, 4 admissions) and Tanami (26*, 2 admissions).

Female residents of all other SLAs recorded five or fewer admissions for an hysterectomy.

Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving a hysterectomy decrease strongly across the ARIA categories. The two 'accessible' categories have more admissions than expected from the Northern Territory rates, with elevated ratios of 118 in the Accessible areas (18 per cent more admissions than expected from the Northern Territory rates) and 115 in the Moderately Accessible areas. There were lower than expected ratios in the two 'remote' categories, with SARs of 64 in the Very Remote areas (less than two thirds number of admissions expected from the Northern Territory rates) and 86 in the Remote areas.

Source: Calculated on ARIA classification, DHAC

Admissions for a hip replacement, 1995/96

Capital city comparison (Australia as the Standard)

There were 8,246 hip replacements (described below) performed as a principal procedure on residents of the capital cities and an additional 1,004 on residents of the other major urban centres. Females accounted for 57.4 per cent of these admissions for residents of the capital cities, reflecting their longer life expectancy. Most capital cities had either low or near average standardised admission ratios (SARs) for this variable, with the highest ratio in **Hobart** (an SAR of 135**) and a very low SAR of 51** in **Darwin**.

Table 6.59: Admissions¹ with a principal procedure of hip replacement, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
91**	103	75**	99	90**	135**	51**	112	94**

¹Includes admissions to public acute hospitals and private hospitals

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Hip replacements are mainly performed on people at older ages, and mainly on females. The operation is undertaken to replace the hip joint where there has been deterioration, usually caused by arthritis. The higher rates for females are likely to reflect the higher incidence of loss of bone density (resulting in a higher rate of accidental falls) among females, as well as their longer life expectancy.

Males accounted for just over two thirds (69.0 per cent) the admissions for a hip replacement performed in the Northern Territory in 1995/96. The admission rate was higher for males than females at most ages with the exception of the 45 to 49 year age group. However, admissions for a hip replacement were very low, with males having 29 and females 13 admissions. These low numbers are, in part, a reflection of the low proportion of elderly people in the Northern Territory population.

Data for Australia published by the AIHW (1998) show the hip replacement rate in the Northern Territory to be 62.2 per cent below that in the other States (**Table 6.40**, page 265). This result is at odds with the data presented on this and the following text pages (**Tables 6.59** and **6.60**). The difference is likely to have occurred because the AIHW database does not include admissions for this procedure of residents of **Darwin** to the Darwin Private Hospital. There were slightly more admissions for this procedure of residents of **Darwin** to the private hospital than to the public hospital.

As the private hospital data for the Northern Territory were only available by postcode, the data has been analysed by SLA and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

In 1995/96, there were 15 admissions of residents of **Darwin** for hip replacements, 29 per cent fewer than were expected from the Northern Territory rates (an SAR of 71). Of the 15 admissions, 11 were males and 4 were females.

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Admissions for a hip replacement, 1995/96

State/Territory comparison (Australia as the Standard)

There were 4,955 hip replacements (described on the previous text page) performed as a principal procedure on residents of the non-metropolitan areas of Australia. Females accounted for 48.6 per cent of these admissions, lower than the 57.4 per cent in the capital cities. The higher proportion for males may in part reflect the occupations held by men in rural Australia and the need for such a procedure. Standardised admission ratios (SARs) varied across the non-metropolitan areas of Australia, with elevated ratios in all but Queensland and the Northern Territory. The highest ratio was in Victoria (an SAR of 129**) and the lowest ratio (82**) was in Queensland.

Table 6.60: Admissions¹ with a principal procedure of hip replacement, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	91**	103	75**	99	90**	135**	51**	112	94**
Other major urban centres ²	96	118	86**	..	..	..	..	..	95
Rest of State/Territory	122**	129**	82**	125**	107	120**	91	- ³	113**
Whole of State/Territory	100	111**	80**	106*	94*	127**	71*	103	100

¹Includes admissions to public acute hospitals, private (acute and psychiatric) hospitals

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

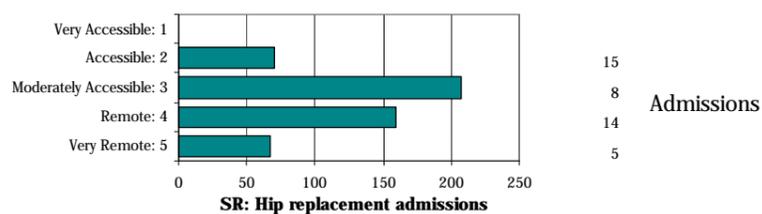
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

There were 27 admissions of residents of non-metropolitan Northern Territory for hip replacements in 1995/96, 30 per cent more than expected from the Northern Territory rates (an SAR of 130).

Residents of Litchfield [Part B] had the largest number of admissions (eight) although, like all SLAs other than Alice Springs, there were fewer than five expected admissions and the standardised admission ratio was not calculated. Together with Alice Springs (with an SAR of 103), Katherine had the second largest number of six admissions. There were two or fewer admissions of residents of all other areas for a hip replacement, most having none at all.

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for the small number of admissions for a hip replacement have an unusual distribution by ARIA category, with the lowest ratios in the most accessible and most remote areas, SARs of 67 and 70 in the Very Remote and Accessible areas, respectively. The highly elevated SAR of 207 in the Moderately Accessible areas indicates that there were more than twice the number of admissions in these areas (eight admissions) for a hip replacement than were expected from the Northern Territory rates. The Remote areas also had an elevated ratio, an SAR of 160.

Source: Calculated on ARIA classification, DHAC

Admissions for a lens insertion, 1995/96

State/Territory comparison (Australia as the Standard)

There were 28,332 admissions for which a lens insertion (described on page 286) was undertaken on residents of the non-metropolitan areas of Australia. Females accounted for 58.1 per cent of these admissions, reflecting their longer life expectancy. Standardised admission ratios (SARs) varied across the non-metropolitan areas of Australia, with the highest ratios in Queensland and New South Wales (with SARs of 119** and 112** respectively) and low ratios in Victoria and Tasmania (78** and 82** respectively).

Table 6.61: Admissions¹ for lens insertion, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	102**	97**	105**	93**	84**	99	130**	36**	97**
Other major urban centres ²	103	73**	163**	..	..	..	..	..	120**
Rest of State/Territory	112**	78**	119**	93**	89**	82**	104	- ³	101*
Whole of State/Territory	105**	91**	119**	93**	85**	89**	117**	35**	100

¹Includes admissions to public acute hospitals, private hospitals and day surgery facilities, including admissions of same day patients

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

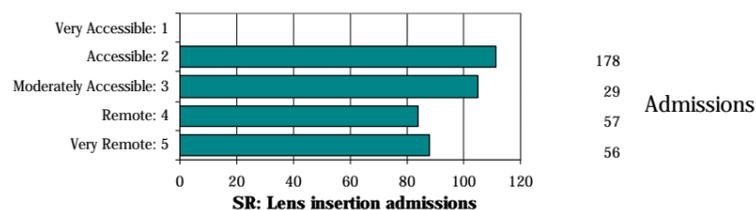
Rest of Territory (NT as the Standard)

There were 142 admissions (11 per cent fewer admissions than expected from the Northern Territory rates, an SAR of 89) of residents of the non-metropolitan areas of the Northern Territory for lens insertions in 1995/96. This lower than expected rate in the Rest of the Territory (and higher rate in **Darwin**) should be read in light of the high overall rate in the non-metropolitan areas of the Northern Territory when compared with the Australian totals (four per cent more admissions than expected, an SAR of 104, **Table 6.61**).

Of the eight SLAs for which there were five or more admissions for a lens insertion expected from the Northern Territory rates, only Tennant Creek (with an SAR of 163) and Tanami (107) had elevated ratios. Both recorded 10 admissions.

The largest numbers of admissions were recorded for residents of Alice Springs (an SAR of 81, 37 admissions), with fewer admissions than expected from the Northern Territory rates, Litchfield [Part B] (99, 24 admissions) and Katherine (94, 12 admissions). Residents of all other areas recorded 10 or fewer admissions for a lens insertion.

Accessibility/Remoteness Index of Australia



Only the Accessible (with an SAR of 111, 11 per cent more admissions than expected from the Northern Territory rates) and Moderately Accessible (105) areas had elevated standardised admission ratios for admissions involving a lens insertion. The Remote and Very Remote areas had similarly low ratios of 84 and 88, respectively.

Source: Calculated on ARIA classification, DHAC

General medical practitioner services

Introduction

General medical practitioners (GPs) comprise the largest group of health professionals providing primary health care services. They are frequently the first point of contact with the health care system, for the 80 per cent of the population who visit them each year. As such, they are an essential part of the health care system.

Background

In 1996/97, the Health Insurance Commission (which operates the national health insurance plan, Medicare) processed accounts for 5.4 thousand unreferral attendances (called services in this atlas)¹² by GPs in the Northern Territory, an average of 2.9 services for each person enrolled with Medicare. Total Medicare payments to GPs for these services were in excess of \$12 million (Health Insurance Commission 1997).

Consultations with GPs cover a wide range of injuries and illness conditions, in addition to consultations for preventive measures. The most frequently reported reasons for consulting a doctor, as reported in the 1995 National Health Survey, were diseases of the respiratory, musculoskeletal and circulatory systems.

Data limitations

Coverage

The following analysis uses Medicare statistics for the year 1996. Details of the number of GP services in each postcode were provided by the Medicare Statistics Section, Department of Health and Aged Care, based on Medicare data from the Health Insurance Commission. This dataset includes services provided at a surgery/clinic, at the patient's home or in an institution (hostel, nursing home, etc). It excludes GP type services not covered by Medicare, which are mainly:

- inpatient services to 'hospital' patients in public acute hospitals (ie. patients receiving treatment under Medicare);
- attendances at accident and emergency/ casualty departments of public acute hospitals for GP type services;
- GP services at some community health services which do not bill their clients;
- services operated by the Aboriginal Medical Service and some State and Territory funded Aboriginal health services; and
- medical services provided by private companies (eg. mining companies), the defence forces and the Royal Flying Doctor Service (**Table 6.62** includes details of the operations of this service, some of which are GP type services).

¹²At each consultation, a GP may provide one or more service. One of these services will be the consultation itself: additional services, such as a minor surgical procedure or immunisation, may also be provided, and are recorded separately in Medicare statistics. It is estimated that there are, on average, 1.1 services per consultation.

National data are not available for the number of attendances at accident and emergency departments of public hospitals that are for primary health care services: that is, services that could have been provided by a GP. A study in South Australia in 1993/94 found that up to one third of such attendances were of this kind. This represents the equivalent of approximately 1.3 per cent of GP attendances recorded in the Medicare statistics collection for that year. These attendances are again likely to be predominantly of people of lower socioeconomic status.

Similarly, the exclusion of data for attendances at community health centres is also unlikely to change the spatial patterns of distribution evident in the maps. Not only do these centres account for a relatively small number of attendances, their clients are also predominantly of lower socioeconomic status.

The impact on the data of services provided by Aboriginal Medical Services is of particular relevance in rural and remote areas. Details of the number of services provided through Aboriginal Medical Services by GPs, Aboriginal workers, etc. are not currently available. The Office of Aboriginal and Torres Strait Islanders Health is currently undertaking a collection of this information which may, in time, fill an important gap in the available data.

Missing data

In the dataset provided for the atlas, there were 103,695 records (0.1 per cent of all records for Australia) for which the postcode was not able to be allocated to an SLA using the postcode to SLA converter from the ABS (see Chapter 2 for details of this conversion process). The postcode associated with these records was either not valid (four fifths) or was not on the postcode to SLA conversion list (one fifth). This latter group includes postcodes for businesses and post office boxes, as well as valid residential postcodes that do not appear in the ABS conversion table (eg. where there are two postcodes in a Collection District (CD), the whole CD is allocated to just one postcode and this is shown in the conversion table; the other postcode does not appear).

Other gaps and deficiencies

The data presented here are only of services provided by general practitioners and not by specialist medical practitioners. The spatial patterns of distribution of services of specialist medical practitioners would be of value in informing strategic policy and planning activities. They cannot, however, be mapped as details of the large number of such services provided through public hospitals outpatient departments (and the lesser number through public hospital accident and emergency departments) are not available by SLA. Details of such services provided outside of public hospitals by specialist medical practitioners (and billed through Medicare) are available, but to map just this set of the whole would provide a biased view of the distribution at the small area level.

Table 6.62: Location of Royal Flying Doctor Service bases and number of services, 1997

Operational organisation	Remote consultations		Patients attended				Patient transport		Clinics	Patient contacts	Doctors	Nurses
	Radio	Telephone	Field clinics	Other clinics	Inpatient services	Immunisations	Evacuation	Hospital transfers				
Queensland												
Mt Isa	6	3,624	4,522	-	-	-	240	473	335	9,200	-	-
Charleville	37	1,893	4,373	-	-	-	185	168	259	6,915	-	-
Cairns	10	6,370	10,609	-	-	-	396	757	602	18,744	-	-
Rockhampton	-	-	-	-	-	-	14	939	-	953	-	-
Brisbane	-	-	-	-	-	-	5	843	-	948	-	-
Townsville	-	-	-	-	-	-	14	357	-	371	-	-
Total	53	11,887	19,504	-	-	-	854	3,537	1,196	37,031	11	24
New South Wales												
Broken Hill	5	6,741	14,624	-	-	506	339	484	917	23,616	-	-
Moomba	-	-	-	5,782	-	-	-	-	-	5,782	-	-
Sydney	-	-	17,962	-	-	-	-	-	-	17,962	-	-
Tasmania	-	-	-	-	-	-	-	162	-	162	-	-
Total	5	6,741	32,586	5,782	-	506	339	646	917	47,522	5	10
Central Section												
Alice Springs	60	870	3,552	-	-	-	1,459	237	158	6,336	-	-
Yulara	-	-	-	9,242	-	93	-	-	364	9,699	-	-
Port Augusta	12	8,020	3,682	119	3,683	555	947	574	278	17,870	-	-
Adelaide	-	-	-	-	-	-	306	2,712	-	3,018	-	-
Total	72	8,890	7,234	9,361	3,683	648	2,712	3,523	800	36,923	6	25
Western Operations												
Derby	-	-	7,346	-	-	-	338	662	477	8,823	-	-
Jandakot	98	2,031	3,886	49	58	-	63	1,335	270	7,790	-	-
Kalgoorlie	15	4,267	3,075	80	973	-	281	842	299	9,832	-	-
Meekatharra	2	2,591	735	7,658	1,135	-	82	729	57	12,989	-	-
Port Hedland	146	2,941	1,987	880	1,144	-	184	577	155	8,014	-	-
Total	261	11,830	17,029	8,667	3,310	-	948	4,145	1,258	47,448	10	25
Tasmania Section												
Launceston	-	-	-	118	-	-	180	262	-	560	-	-
All Sections	391	39,348	76,353	23,928	6,993	1,154	5,033	12,113	4,171	169,484	32²	84²

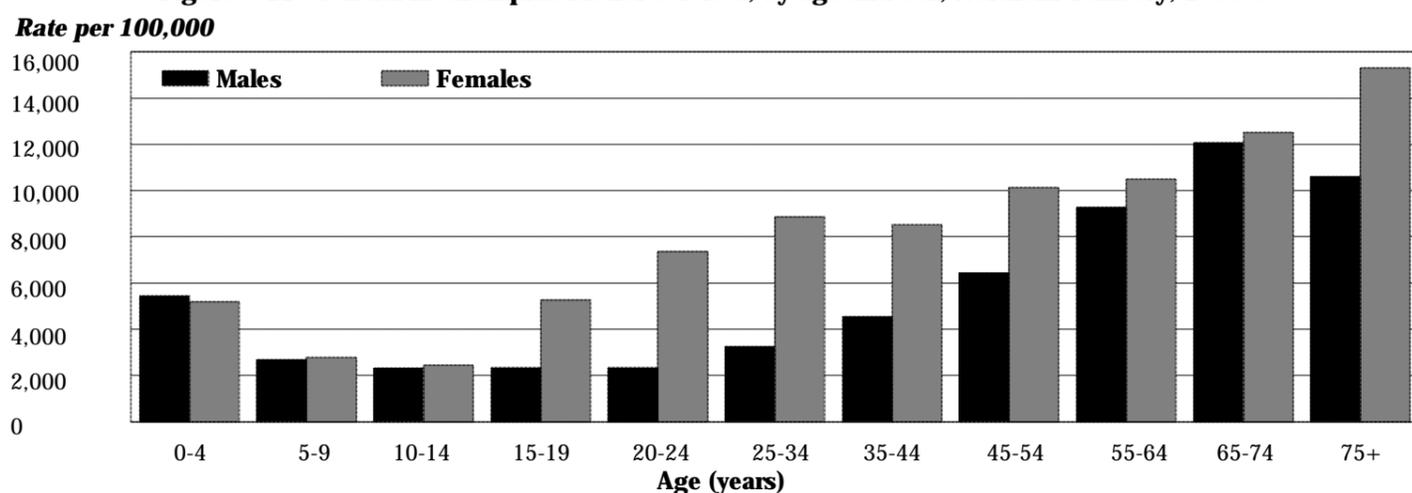
Source: Annual Report 1996 Royal Flying Doctor Service of Australia

GP services by age and sex of patient

Females used GP services more than males, accounting for 56.4 per cent of services in the Northern Territory in 1996. Females accounted for more services per patient at each age group from the 15 to 24 year age group right through to 75 years and over,

with males accounting for more services only in the 0 to 4 year age group (Figure 6.11). Females and males had similar rates in the 5 to 14 year age group.

Figure 6.11: General medical practitioner services, by age and sex, Northern Territory, 1996-97



Source: See Annual Report, Health Insurance Commission

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General medical practitioner services to males, 1996

Capital city comparison (Australia as the Standard)

Standardised ratios (SRs) for general medical practitioner (GP) services to males varied between the capital cities (broadly in proportion to their population) from the highest ratio in the largest capital city of **Sydney** (125**), to the lowest in **Darwin** (80**). The differentials between the highest and lowest ratios is substantial, at just over fifty per cent.

Between 1989 and 1996 the *All capitals* SR increased (relative to the Australian rate) from 108** to 113**, indicating a higher rate of use of GP services by male residents of the capital cities relative to those in the non-metropolitan areas of Australia. At the capital city level, the largest movements were increases in **Melbourne** (where the ratio moved from well below the *All capitals* figure in 1989 to equal it in 1995/96) and **Perth** (where the ratio remained well below the *All capitals* average) to a decrease in **Hobart**.

Table 6.63: General medical practitioner services to males, capital cities
Standardised ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1996	125**	113**	106**	107**	101**	90**	80**	87**	113**
1989	124**	99**	111**	106**	91**	101**	84**	86**	108**

¹Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As this data was only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

The largest numbers of GP services to males were recorded in Darwin: North West (52,988 GP services) Darwin: South West (47,002). Males in Darwin: North East and Palmerston recorded 31,356 and 27,576 GP services respectively.

Darwin (Northern Territory as the Standard)

In 1989, there were 118,537 GP services to males of **Darwin**; by 1996 this number had increased by 34.1 per cent, to reach a total of 158,922 GP services to males. In 1996, this represented 52 per cent more GP services to males than expected from the Northern Territory rates, an SR of 152**. While this figure indicates an over-representation of these services in **Darwin** relative to the non-metropolitan areas, it should be kept in mind that the *Rest of Territory* numbers are understated to the extent that data from services such as the Royal Flying Doctor Service and the Aboriginal Medical Service are not included. The age distribution of males using GP services is shown in **Figure 6.11** on page 302.

Postcodes (aggregates of suburbs)

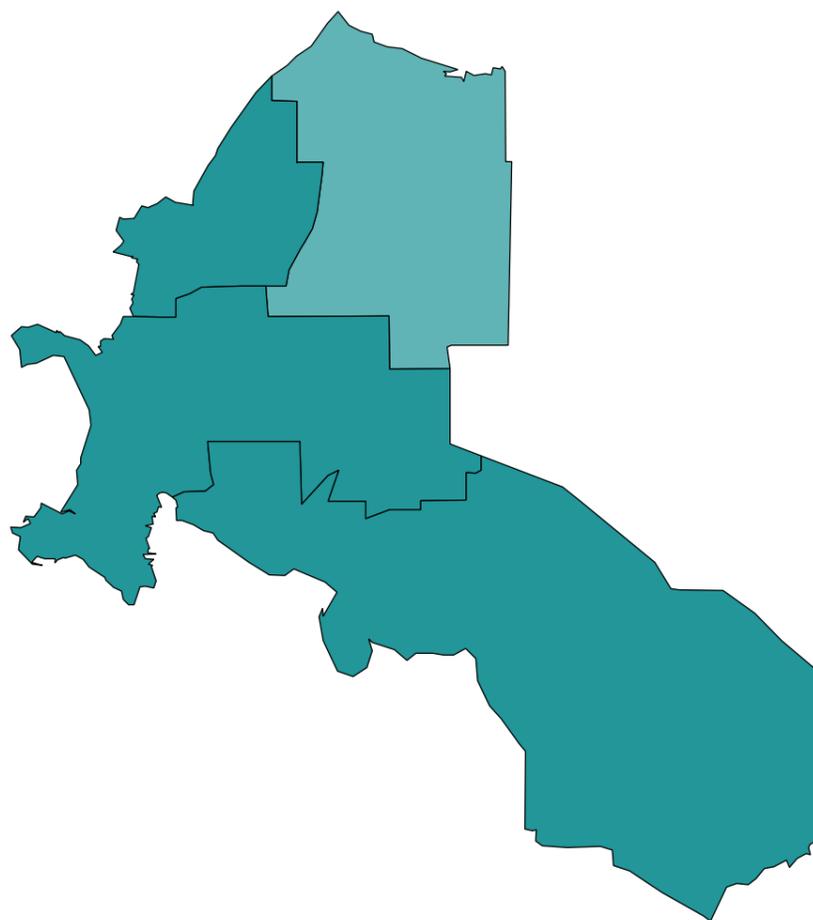
As **Map 6.47** shows, all of the postcode areas in **Darwin** had considerably higher numbers of GP services to males than were expected from the Northern Territory rates. The highest ratio, an SR of 173**, was recorded in the south-eastern, developing suburbs in the Palmerston postcode group, where 73 per cent more GP services to males were recorded than were expected. Palmerston also tends to have high rates for the indicators of low socioeconomic status, including dwellings rented from the Territory housing authority, low income families and single parent families. Males in the inner city and established suburbs of Darwin: South West recorded a similarly high ratio of 171**. Darwin: North West (151**) also had a ratio in the top range mapped.

The lowest ratio, an SR of 120**, was recorded in the relatively recently established suburbs of Darwin: North East, where 20 per cent more GP services to males were recorded than were expected from the Northern Territory rates.

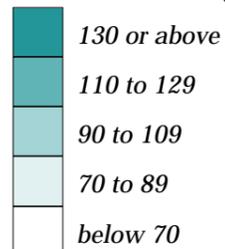
Map 6.47

General medical practitioner services to males, Darwin, 1996

Standardised Ratio: number of services in each postcode area* compared with the number expected[#]



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

[#]Expected numbers were derived by indirect age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

General medical practitioner services to males, 1996

State/Territory comparison (Australia as the Standard)

Standardised ratios (SRs) for GP services to males were lower in the non-metropolitan areas than in the capital cities, some substantially so. SRs ranged from a high of 83** in Tasmania (the State with the smallest differential between the capital city and *Rest of State* rate) to a very low 31** in the rural and remote areas of the Northern Territory. Readers should be aware of the notes on page 301, under *Data limitations*, as to the gaps in the data which are particularly likely to be contributing to the low rates in the Northern Territory and, to a lesser extent, Western Australia. The information in Chapter 7 as to the numbers and distribution of GPs in these areas is also of relevance.

With the exception of Victoria, SRs declined (relative to the Australian rate) in the non-metropolitan areas of all the States and the Northern Territory. The largest declines were in the Northern Territory, New South Wales and Tasmania,

Table 6.64: General medical practitioner services to males, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1996									
Capital city	125**	113**	106**	107**	101**	90**	80**	87**	113**
Other major urban centres ¹	99**	90**	97**	..	..	..	..	..	97**
Rest of State/Territory	74**	76**	79**	79**	61**	83**	31**	- ²	74**
Whole of State/Territory	108**	103**	93**	99**	90**	86**	53**	88**	100
1989									
Rest of State/Territory	87**	76**	85**	80**	63**	95**	44**	- ²	81**

¹Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

²Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

Male residents living outside of **Darwin** received significantly (41 per cent) fewer services from GPs in 1996 than were expected from the Northern Territory rates, an SR of 59**; these low rates of use are in line with the lower levels of provision of GP services in non-metropolitan areas (see Chapter 7 for details of the distribution of GPs). It should be kept in mind that the *Rest of Territory* numbers are understated to the extent that data from services such as the Royal Flying Doctor Service and the Aboriginal Medical Service are not included. The total number of GP services in 1996 represents an increase of 5.2 per cent on that for 1989, of 78,184 services.

Map 6.48 shows that nearly all of the SLAs had ratios below the level expected, and that the majority of these had over thirty per cent fewer GP services to males than were expected from the Northern Territory rates. With the exception of the Alice Springs suburb of Larapinta (with an SAR of 102*), the only area in non-metropolitan Northern Territory to record an elevated ratio was Tennant Creek-Balance (102). Together with the above two SLAs, Coomalie (with an SAR of 94*) also had a ratio in the middle range mapped.

Ratios in the range between 70 and 89 were recorded in Tennant Creek (with an SAR of 89**), Alice Springs (84**), South Alligator (83**), Tableland (77**), Jabiru (72**) and the semi-urban area of Litchfield [Part B] (72**).

The remaining 16 non-metropolitan SLAs had ratios below 70. The lowest ratios were recorded in West Arnhem (with an SAR of 7**), Petermann (8**), Cox-Finiss (8**), Bathurst-Melville (8**) and Daly (15**). Sandover-Balance (with an SAR of 27**), Tanami (31**), Victoria (33**), Elsey Balance (41**), Nhulunbuy (44**) and Litchfield [Part A] (48**) all recorded ratios of between 25 and 50.

Also in the lowest range mapped were East Arnhem-Balance (51**), Groote Eylandt 60**), Gulf (62**) and Katherine (69**).

One or more services funded by the Office for Aboriginal and Torres Strait Health Services were located in a number of these SLAs and therefore, considering the large proportions of Indigenous people in the populations of these SLAs, would reduce the recorded number of males using GP services.

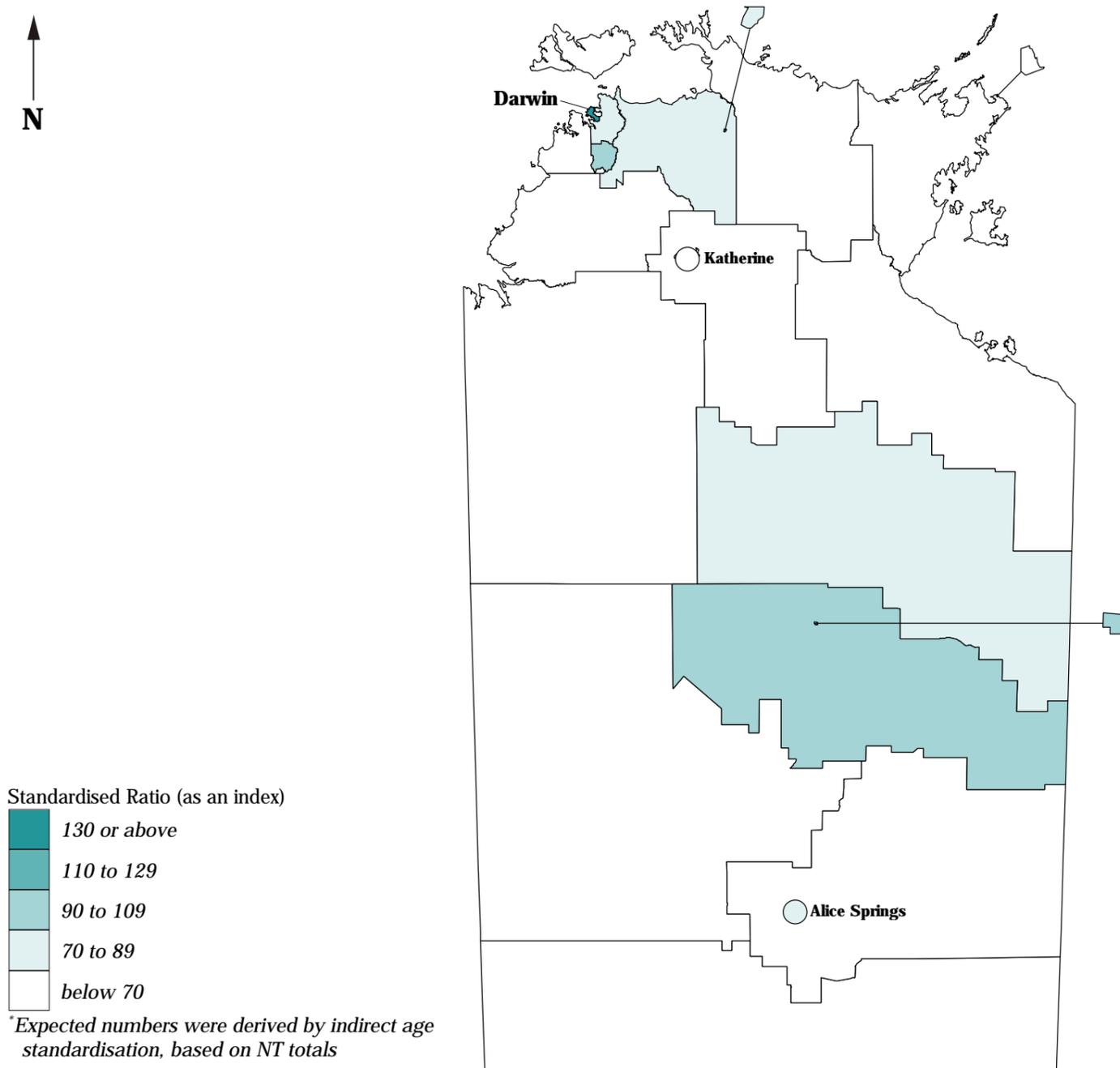
Alice Springs had an SR of 84**, with a total of 26,480 GP services, 16 per cent fewer than were expected from the Northern Territory rates. The largest numbers of GP services to males outside of **Darwin** and Alice Springs were in Litchfield [Part B] (11,861 services), Katherine (9,329 services), Tennant Creek (4,224 services) and East Arnhem-Balance (3,383 services).

GP services to males tended to be inversely correlated with indicators of socioeconomic disadvantage. Inverse correlations of meaningful significance were recorded with the variables for unemployed people (-0.51), private dwellings without a motor vehicle (-0.52), people in receipt of unemployment benefits (-0.65) and dependent children of selected pensioners and beneficiaries (-0.54). These results, together with the weak correlation with the IRSD (0.36), suggest the existence of an association at the SLA level between high rates of use of GP services by males and socioeconomic advantage.

Map 6.48

General medical practitioner services to males, Northern Territory, 1996

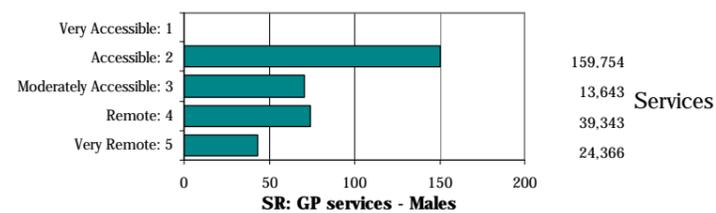
Standardised Ratio: number of services in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised ratios for general medical practitioner (GP) services to males decrease sharply across the ARIA categories. The highest ratio was in the Accessible areas, with 50 per cent more GP services than expected from the Northern Territory rates (an SR of 150). Ratios of nearly one third lower than expected were recorded in the Moderately Accessible and Remote areas (SRs of 71 and 74, respectively). The lowest ratio was in the Very Remote areas, with less than half the number of GP services expected from the Northern Territory rates, an SAR of 43. Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

General medical practitioner services to females, 1996

Capital city comparison (Australia as the Standard)

As was the case for GP services to males, the level of GP services received by females resident in the capital cities closely mirrored population size. There was, however, a lower differential (of 44.4 per cent) between the highest ratio, of 117** in **Sydney**, and the lowest, of 81** in **Darwin**, than was evident for males (56.2 per cent).

Between 1989 and 1996 SRs declined (relative to the Australian rates) in five of the capital cities, with the largest declines being in **Darwin** and **Hobart**.

Table 6.65: General medical practitioner services to females, capital cities
Standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1996	117**	110**	107**	105**	102**	96**	81**	88**	110**
1989	120**	99**	110**	103**	92**	102**	88**	89**	107**

¹Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As noted in the introductory text, females use more general medical practitioner (GP) services than males, 6.6 services per female and 4.7 services for male. The highest rates of use by women, and the greatest difference between their rates of use and those of men, were by women in the 20 to 50 year age groups. The age distribution of women receiving these services is shown in **Figure 6.11** on page 302.

As this data was only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin (Northern Territory as the Standard)

Female residents of **Darwin** had 203,729 services from GPs in 1996, 47 per cent services more than expected from the Northern Territory rates, an SR of 147**. This was an increase of 28.4 per cent on the 1989 number of 158,617 GP services.

Postcodes (aggregates of suburbs)

The map of GP services to females is similar to the map of GP services to males in **Darwin**, with all postcode areas recording highly elevated ratios (**Map 6.49**). The highest ratio, an SR of 177**, was recorded in the south western, developing suburbs in the Palmerston where females received 77 per cent more GP services than were expected from the Northern Territory rates. Palmerston postcode tended to have the highest rates for a number of indicators of low socioeconomic status, including low income families, single parent families and semi-skilled and unskilled workers.

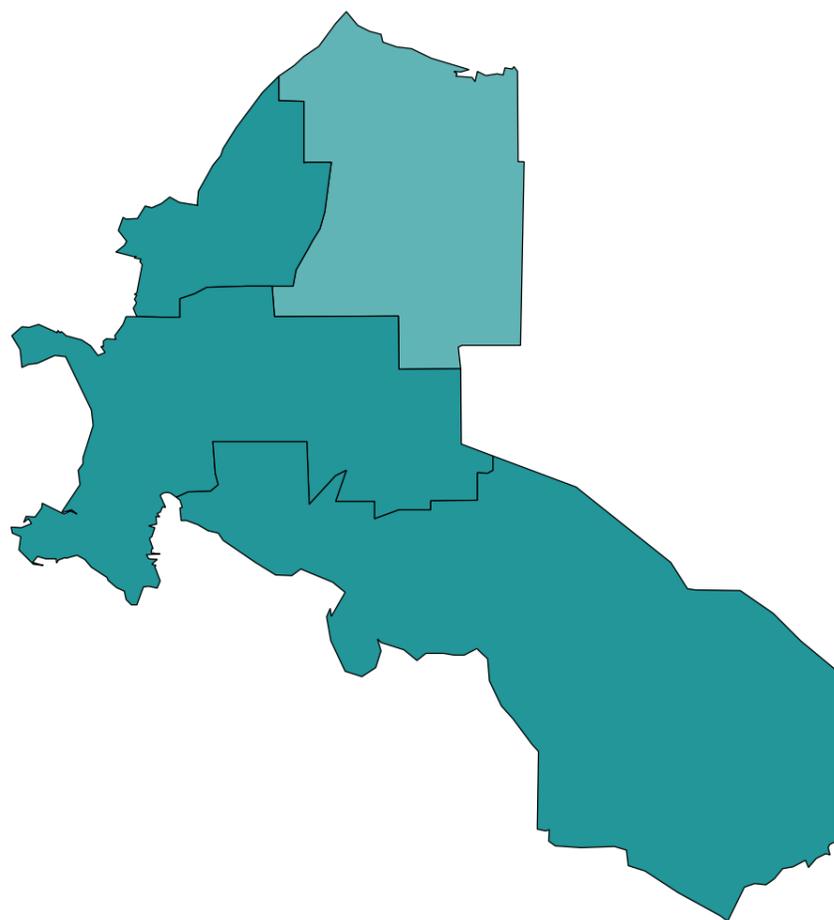
High ratios were also recorded in Darwin: South West, consisting of the inner city area and older, established suburbs (with an SR of 167**) and Darwin: North West (144**), while, Darwin: North East recorded the lowest ratio (117**).

The largest number of GP services to females, 68,321 services, was recorded in Darwin: North West, followed by 52,987 GP services to females in Darwin: South West. Females in Darwin: North East and Palmerston recorded 43,743 and 38,678 GP services respectively.

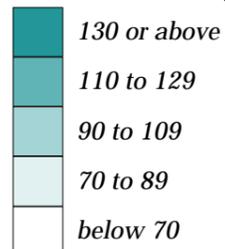
Map 6.49

General medical practitioner services to females, Darwin, 1996

Standardised Ratio: number of services in each postcode area* compared with the number expected#



Standardised Ratio (as an index)



*SLAs have been grouped to approximate postcode areas

#Expected numbers were derived by indirect age standardisation, based on NT totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

General medical practitioner services to females, 1996

State/Territory comparison (Australia as the Standard)

As for males, standardised ratios (SRs) for GP services for females were lower in the *Rest of State/Territory* areas than in the capital cities for all the States and the Northern Territory. SRs were, however, generally higher than those for males. Again, SRs ranged from the highest in Tasmania (89**) to the lowest in the Northern Territory (33**). The data limitations for these rural and remote areas should be borne in mind when using this data (see page 301). The information in Chapter 7 as to the numbers and distribution of GPs in these areas is also of relevance.

There was less movement in the SRs between 1989 and 1996 than was evident for GP services to males. The largest declines in GP service use were in the ratios for Queensland and the Northern Territory.

Table 6.66: General medical practitioner services to females, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1996									
Capital city	117**	110**	107**	105**	102**	96**	81**	88**	110**
Other major urban centres ¹	98**	92**	97**	..	..	..	..	..	97**
Rest of State/Territory	78**	81**	82**	82**	70**	89**	33**	- ²	79**
Whole of State/Territory	105**	102**	95**	99**	94**	93**	55**	89**	100
1989									
Rest of State/Territory	88**	79**	100	81**	70**	95**	46**	- ²	87**

¹Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

²Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of Territory (NT as the Standard)

As for male residents living outside of **Darwin**, females also had significantly (38 per cent) fewer services from GPs in 1996 than expected from the Northern Territory rates, an SR of 62**; these low rates of use are in line with the lower levels of provision of GP services in non-metropolitan areas (see Chapter 7 for details of the distribution of GPs). It should be kept in mind that the *Rest of Territory* numbers are understated to the extent that data from services such as the Royal Flying Doctor Service and the Aboriginal Medical Service are not included. The total number of 103,298 GP services to females in 1996 represents an increase of 9.5 per cent on that in 1989, of 94,339 services.

Maps 6.50 shows a similar distribution of standardised ratios for GP services to females to that for males (**Map 6.48**). Tennant Creek-Balance (with an SR of 111**), in the centre of the Territory, was the only SLA to record an elevated ratio, with 11 per cent more GP services to females than were expected from the Northern Territory rates. The next highest ratios were recorded in Coomalie (with an SR of 92**), South Alligator (88**) and Tableland (87**).

All SLAs with ratios in the range from 70 to 84 were recorded in towns; Alice Springs (with an SR of 84**), Katherine (83**), Jabiru (81**) and Tennant Creek (73**).

The majority of non-metropolitan SLAs in the Northern Territory had ratios of less than 70. The lowest ratios were in West Arnhem (an SR of 7**), Bathurst-Melville (7**), Cox-Finniss (8**), Petermann (10**) and Daly (15**). The highest ratios in this range were recorded in Litchfield [Part B] (with an SR of 68**), Eley Balance (61**), Gulf (58**) and Groote Eylandt (54**). Generally, SLAs with ratios in this range were those with the highest proportions of Indigenous people in their populations.

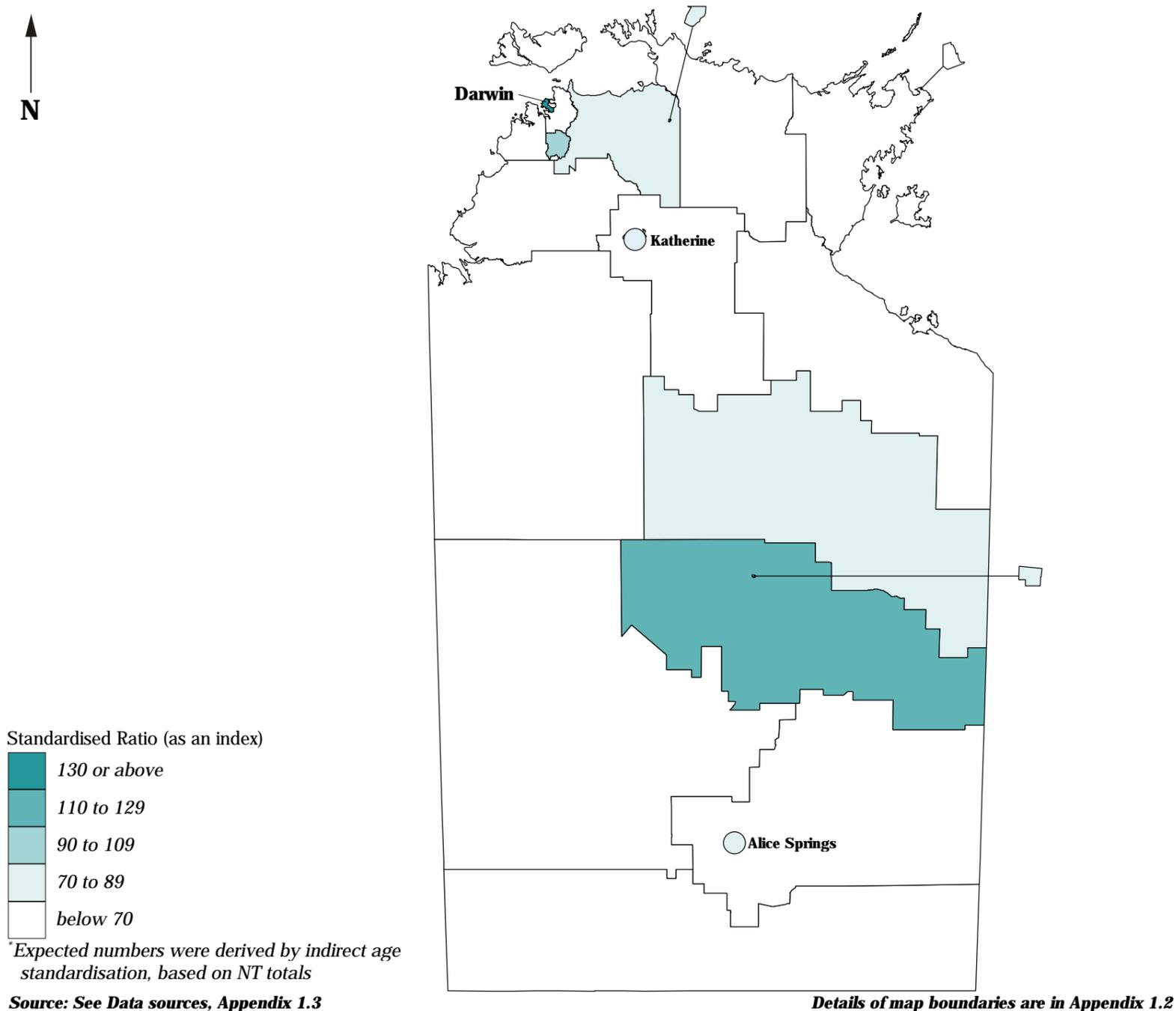
The largest numbers of GP services were recorded for females from Alice Springs (37,107 services), Litchfield [Part B] (13,623 services), Katherine (13,596 services) and Tennant Creek (4,515 services).

There were weak correlations with indicators of socioeconomic advantage, including high income families (0.31) and female labour force participation (0.35). There were inverse correlations of meaningful significance with a number of indicators of socioeconomic disadvantage, including the variables for unemployed people (-0.53) and dependent children of selected pensioners and beneficiaries (-0.53). These results, together with the weak correlation with the IRSD (0.37), suggest the existence of an association at the SLA level between high rates of GP services to females and high socioeconomic status.

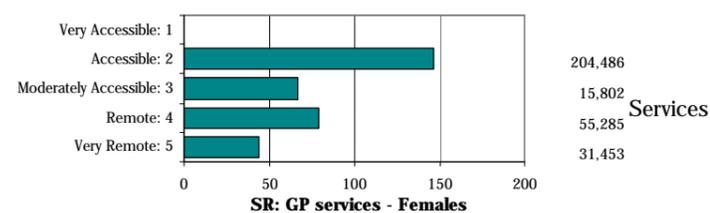
Map 6.50

General medical practitioner services to females, Northern Territory, 1996

Standardised Ratio: number of services in each Statistical Local Area compared with the number expected*



Accessibility/Remoteness Index of Australia



Females in areas included in the Accessible category had the highest rate of use of general medical practitioner (GP) services, using 46 per cent more GP services than expected from the Northern Territory rates (an SR of 146). Ratios then decrease sharply across the ARIA categories to an SR of 67 in the Moderately Accessible areas and to a very low SR of 44 in the Very Remote areas, with less than half the number of GP services expected. The SR of 79 in the Remote areas is likely to reflect the greater access to GPs in the towns in this ARIA category than in the adjoining areas. Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

Immunisation status of children at 12 months of age, 1998

Capital city comparison

Immunisation data are collected by the Health Insurance Commission which maintains the Australian Childhood Immunisation Register (ACIR). The ACIR, a project funded by the Commonwealth Government through the Commonwealth Department of Health and Aged Care, provides comprehensive information on the immunisation status of children under seven years of age in Australia. These data are used to provide a measure of coverage at a National, State/Territory and local level and to provide an effective management tool for monitoring immunisation coverage and service delivery. The register was commenced in 1996 and by mid 1998 had sufficient coverage of the immunisation status of children at twelve months of age to be used for this analysis. Hull et al. (1999) reported that 80.1 per cent of vaccinations recorded in the ACIR for New South Wales were provided by GPs, 8.4 per cent by municipal councils and 11.5 per cent by other providers (eg. Government operated community health centres, Aboriginal health services and Royal Flying Doctor services).

The data shown here are the proportion of children born between 1 October 1996 and 30 September 1997 who were registered with Medicare and who were shown on the ACIR at 31 December 1998 as being fully immunised. Children who were fully immunised at 12 months of age were those who had been immunised for three doses of DTP (diphtheria, tetanus and pertussis), three doses of OPV (oral polio vaccine) and three doses of Hib (*Haemophilus influenzae* type b). The calculations shown in the tables and maps were made by the National Centre for Immunisation Research and Surveillance (NCIRS).

Immunisation rates for the capital cities were all close to the *All capitals* average of 82.5 per cent, ranging from 79.7 per cent in **Sydney** to 86.9 per cent in **Canberra**.

Table 6.67: Proportion of children who were fully immunised at 12 months of age, capital cities, 1998

<i>Per cent</i>								
Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra¹	All capitals
79.7	84.0	85.4	84.5	81.2	84.0	80.0	86.9	82.5

¹Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

As this data was only available by postcode, the SLA map has not been included and the correlation analysis has not been undertaken.

Darwin

In 1998, 80.0 per cent of **Darwin's** population at 12 months of age were fully immunised, a total of 1,597 children.

Postcodes (aggregates of suburbs)

Immunisation rates were highest in Darwin: North East (85.5 per cent of children at 12 months of age), an area which includes several relatively recently established suburbs with high proportions of young families purchasing their own homes (**Map 6.51**). Most SLAs in this postcode area also had above the **Darwin** average proportion of children aged from 0 to 4 years.

In Palmerston, 81.8 per cent of children at 12 months of age were fully immunised. The developing suburbs of Palmerston also recorded the highest rates for several indicators of low socioeconomic status, including low income families and dwellings rented from the Territory housing authority, as well as having the highest proportion of children aged from 0 to 4 years.

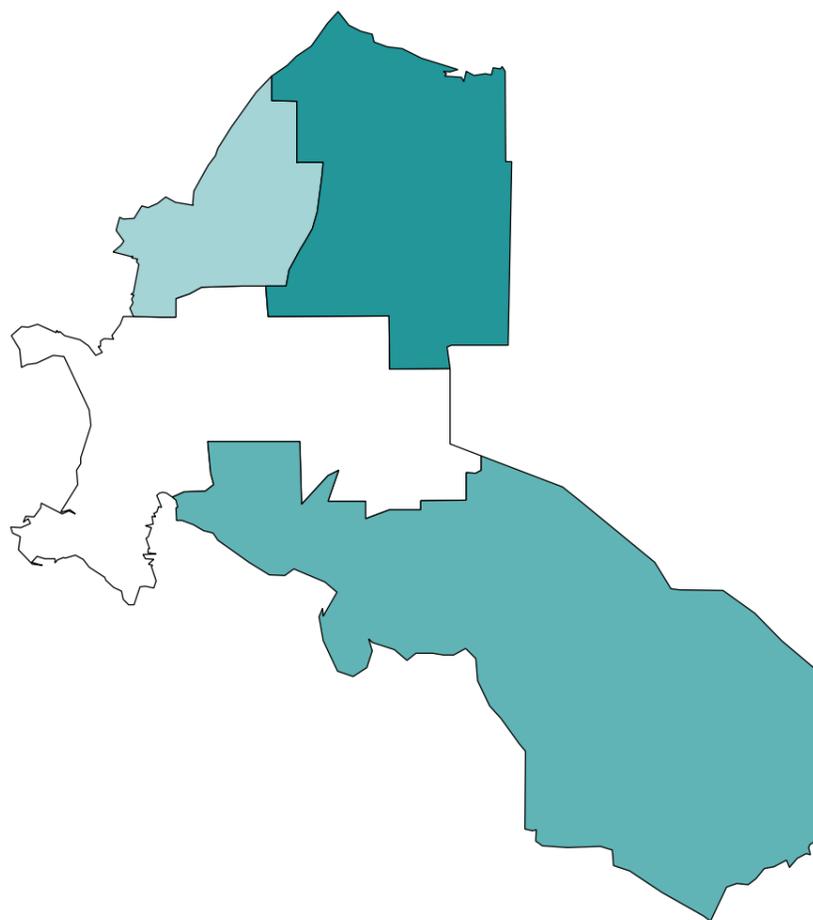
The established suburbs of Darwin: South West had the lowest proportion of fully immunised children (75.1 per cent of children at 12 months of age) and Darwin: North West had the second lowest (78.1 per cent).

The largest number of fully immunised children at 12 months of age were recorded in the postcode areas of Palmerston (337 children) Darwin: North East (439), Darwin: South West (368) and Darwin: North West (337).

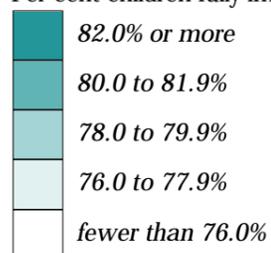
Map 6.51

Immunisation status of children at 12 months of age, Darwin, 1996

as a percentage of all children at 12 months of age in each postcode area*



Per cent children fully immunised



*SLAs have been grouped to approximate postcode areas

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2
National Social Health Atlas Project, 1999

Immunisation status of children at 12 months of age, 1998

State/Territory comparison

Details of the information described below are on the previous text page. Immunisation rates were higher in the *Rest of State/Territory* areas than in the capital cities in a number of States, with the highest rates in Queensland and Victoria. As can be seen from the graph of the ARIA index (opposite page), these higher rates do not apply uniformly across the *Rest of State/Territory* areas. With the exception of the Northern Territory, immunisation rates for the non-metropolitan areas of Australia were all close to the *Rest of State/Territory* average of 83.6 per cent. The low rate reported for the Northern Territory reflects a number of factors, including difficulties in transmitting accurate data on levels of immunisation in the Territory: it is unclear whether the real rate is lower than in other parts of Australia.

Table 6.68: Proportion of children who were fully immunised at 12 months of age, State/Territory, 1998
Per cent

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total ¹
Capital city	79.7	84.0	85.4	84.5	81.2	84.0	80.0	86.9 ¹	82.5
Other major urban centres ²	86.0	86.9	84.2	..	..	..	..	..	85.4
Rest of State/Territory	81.8	86.0	86.1	83.6	80.6	84.5	62.8	— ³	83.6
Whole of State/Territory	81.0	84.6	85.5	84.2	81.0	84.3	70.6	86.8	83.0

¹Includes Queanbeyan (C)

²Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

³Data included with ACT total

Source: See *Data sources, Appendix 1.3*

Rest of Territory

In 1998, 1,965 children in the non-metropolitan areas of the Northern Territory were fully immunised at the age of 12 months, almost two thirds (62.8 per cent) of the population of this age group. Rates of immunisation of infants in all SLAs were low by Australian standards, with almost half (47.8 per cent) of the SLAs recording fewer than 60 per cent of children being fully immunised at 12 months of age. In addition to their remoteness, most of these SLAs are characterised by high proportions (above 50 per cent) of Indigenous Australians and high proportions of low income families. Another factor that may have bearing on these relatively low rates is the high level of dwellings without a vehicle which was characteristic of many isolated areas of the Northern Territory. This would restrict access to services such as immunisation programs.

As can be seen from **Map 6.52**, apart from Tableland (70.0 per cent of children fully immunised at 12 months of age), the highest rates of immunisation tended to be located in the northern areas of the Territory. The highest proportions were recorded in Coomalie (78.9 per cent of children at 12 months of age were fully immunised), Jabiru (75.0 per cent), Katherine (72.3 per cent) and South Alligator (72.0 per cent).

Elsey Balance (69.0 per cent), Litchfield [Part B] (66.5 per cent) and Victoria (66.4 per cent) were the only SLAs with rates of immunisation in the second highest range mapped.

SLAs with rates of between 60 and 65 per cent were Groote Eylandt (64.3 per cent), Nhulunbuy (62.7 per cent), Tennant Creek-Balance (61.9 per cent) and Alice Springs (61.8 per cent).

The southernmost SLAs of the Northern Territory, Petermann (56.5 per cent), Sandover-Balance (57.2 per cent) and Tanami (57.2 per cent) recorded proportions in the second lowest range mapped. Also in this range were East Arnhem-Balance (58.8 per cent), Tennant Creek (58.5 per cent) and Gulf (55.9 per cent).

In five SLAs less than 55 per cent of children at 12 months of age had been fully immunised. The lowest proportion, of 50.7 per cent, was recorded in Bathurst-Melville. Cox-Finniss (50.8 per cent), West Arnhem (51.2 per cent), Daly (52.9 per cent) and Litchfield [Part A] (53.6 per cent) were also in this group.

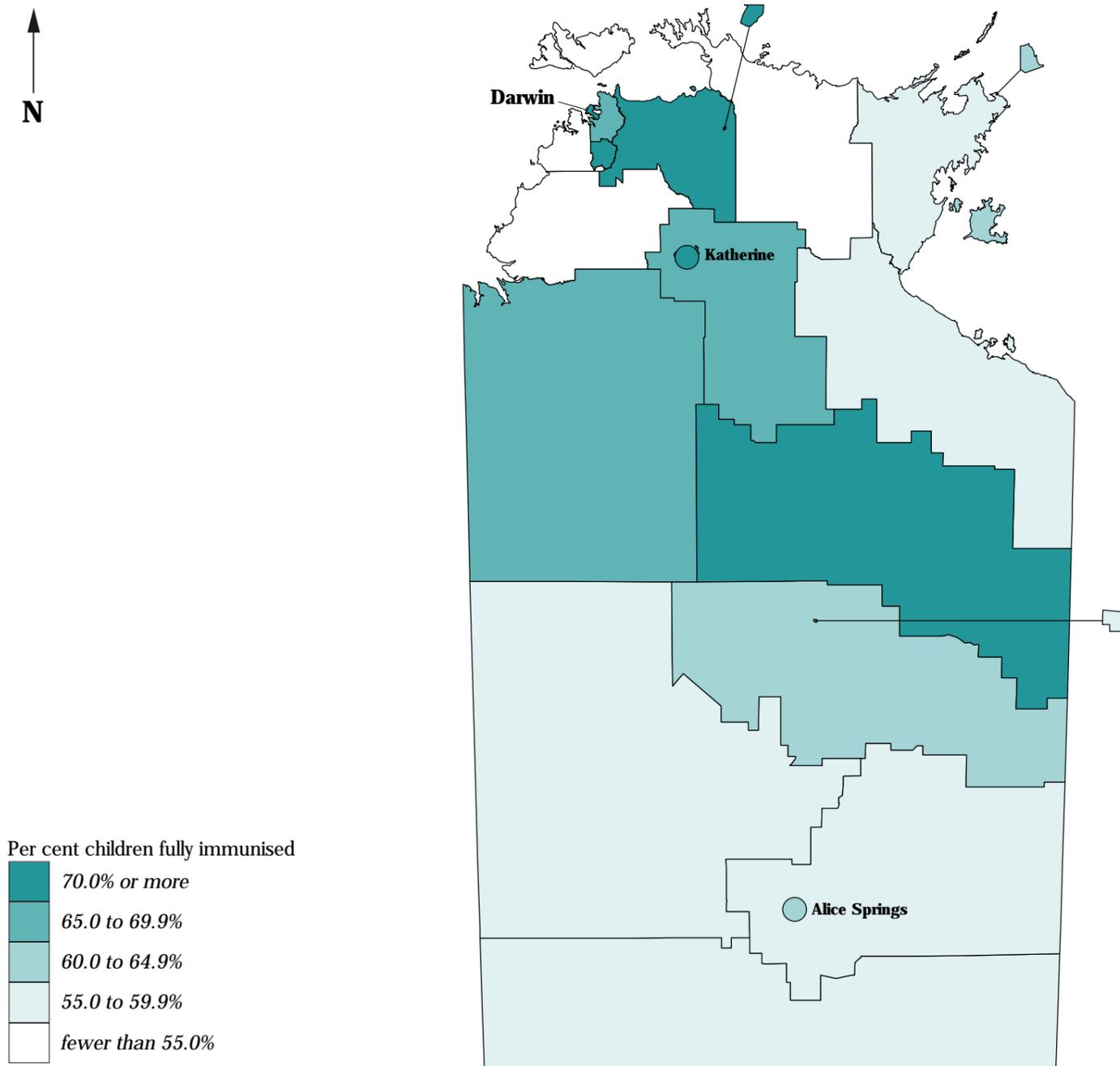
The largest numbers of fully immunised children in the Northern Territory, outside of **Darwin**, were recorded in the towns of Alice Springs (611 children at 12 months of age) and Katherine (240 children). More than 100 fully immunised children were also recorded in Litchfield [Part B] (198 children) and East Arnhem-Balance (144 children).

There were inverse correlations of meaningful significance with the variables for people in receipt of unemployment benefits (-0.61), private dwellings without a vehicle (-0.56) and the Indigenous population (-0.52). These results, together with the weak correlation with the IRSD (0.47), support the existence at the SLA level of an association between high rates of immunisation at 12 months of age and high socioeconomic status.

Map 6.52

Immunisation status of children at 12 months of age, Northern Territory, 1996

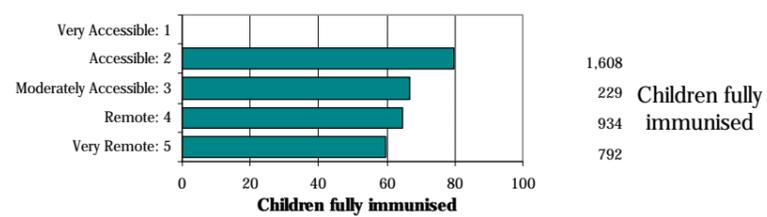
as a percentage of all children at 12 months of age in each Statistical Local Area



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



There is a larger differential in immunisation rates in the Northern Territory between the most accessible and most remote areas than in any of the States. The highest rate is recorded in the Accessible areas, with 79.8 per cent of children at 12 months of age being fully immunised, and the lowest is in the Very Remote areas (59.8 per cent). This latter rate is, however, not much lower than the rates of 64.6 per cent and 66.7 per cent in the Remote and Moderately Accessible areas, respectively. See the note (opposite page) concerning these low rates.

Source: Calculated on ARIA classification, DHAC
National Social Health Atlas Project, 1999

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