

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 includes 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 data set. For example, admissions to hospital (see box on page 115 for the definition of admission) of patients with all types 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. Therefore the variables mapped 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 123).

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 (eg. patient is unwell and nature of illness, has an injury, or is seeking advice), type of services provided (eg. 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, to understand the appropriateness of the services provided, and 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;
- services provided through community based care (eg. 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

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.

- terminations of pregnancy (see additional comments below).

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 therefore, this variable was not 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 admissions data* (page 123).

Admissions to hospitals

Introduction

There were almost 4.8 million admissions (see the box below) to hospitals in Australia in 1995/96 (50 thousand admissions in the Australian Capital 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 123).

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 (ie. 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 the Indigenous population, 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 the Indigenous population 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 the Indigenous population 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 the Indigenous population, divided by expected admissions, based on all-Australian rates

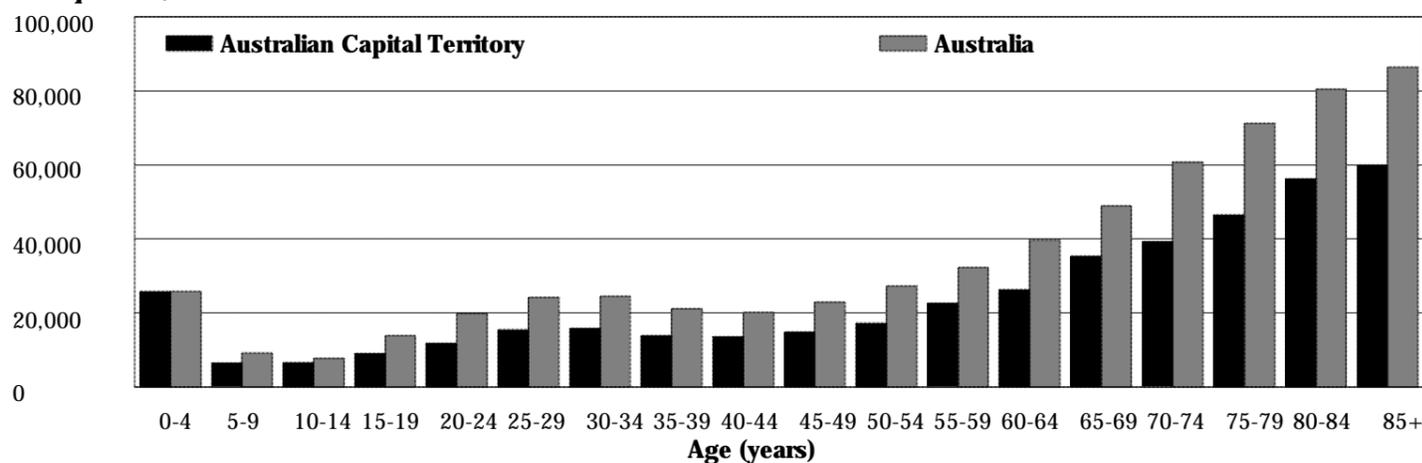
Source: ABS/AIHW, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, Table 7.19, pp 112, 1999

Differences between the Australian Capital Territory and Australia

Figure 6.1 shows the rates of admission per 100,000 population for residents of the Australian Capital Territory (ACT) and Australia for each five year age group. Admission rates for ACT and Australia are similar across the age groups, with ACT residents having lower rates across the age range.

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

Rate per 100,000



Source: See Data sources, Appendix 1.3

Differences related to age, sex, and, hospital type

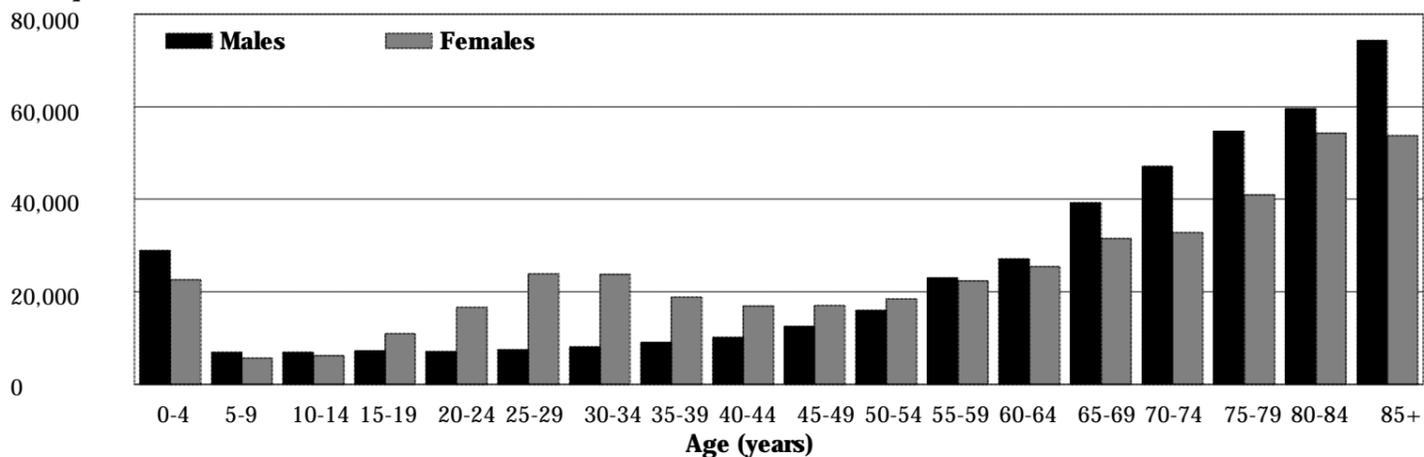
Figures 6.2 to 6.10 show, for a selection of the variables mapped, the rates of admission for each five year age group per 100,000 population for residents of the Australian Capital Territory admitted to a hospital.

Females accounted for 57.4 per cent of admissions, 25.9 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 25 to 29 year age group, with the

female rate 3.2 times that for males. Female rates in the 20 to 24 (2.3 times), 30 to 34 (2.9 times) and 35 to 39 (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 0 to 4 years (1.3 times as high), and from age 60 (the greatest disparity being the rate for 70 to 74 year old males and males aged 85 years and over) 1.4 times higher than the corresponding female rate.

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

Rate per 100,000



Source: See Data sources, Appendix 1.3

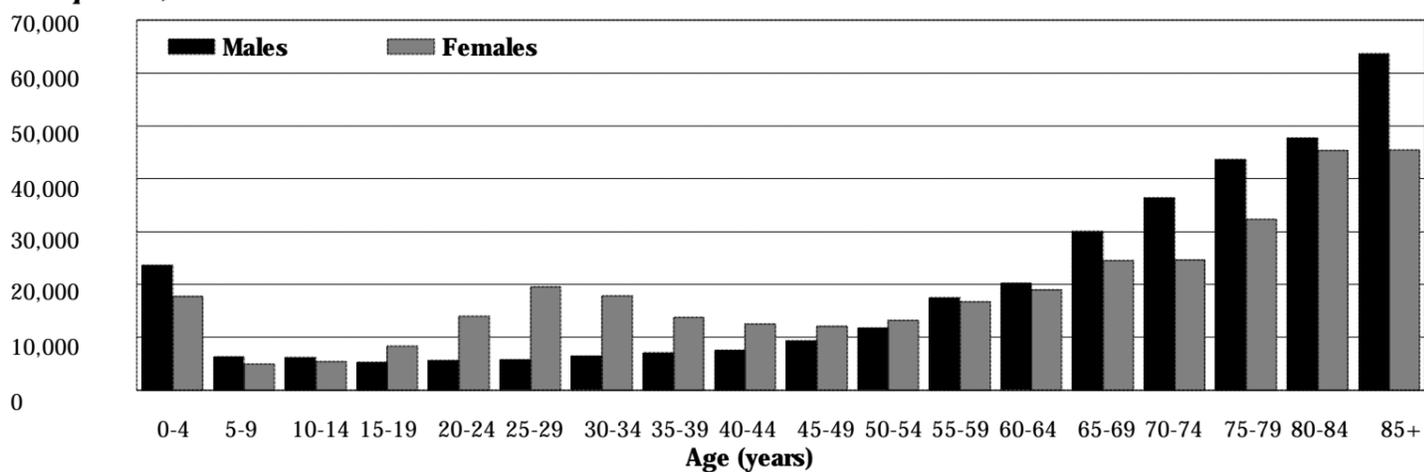
The profile of admissions to public acute hospitals (Figure 6.3) is markedly similar to that for all admissions (Figure 6.2). Higher rates of admissions of females are evident from the 15 to 19 year age group through to the 50 to 54 year age group. Male rates are higher at the youngest ages, and again from the 55 to 59 year age group onwards.

Overall, private hospitals accounted for 22.2 per cent of the admissions in the analysis for the ACT. Females make greater use of private hospitals than males, with admissions to private

hospitals representing 22.6 per cent of all female admissions studied (compared with 21.6 per cent for males) and accounting for 58.6 per cent of private hospital admissions (57.1 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 males above 80 years of age.

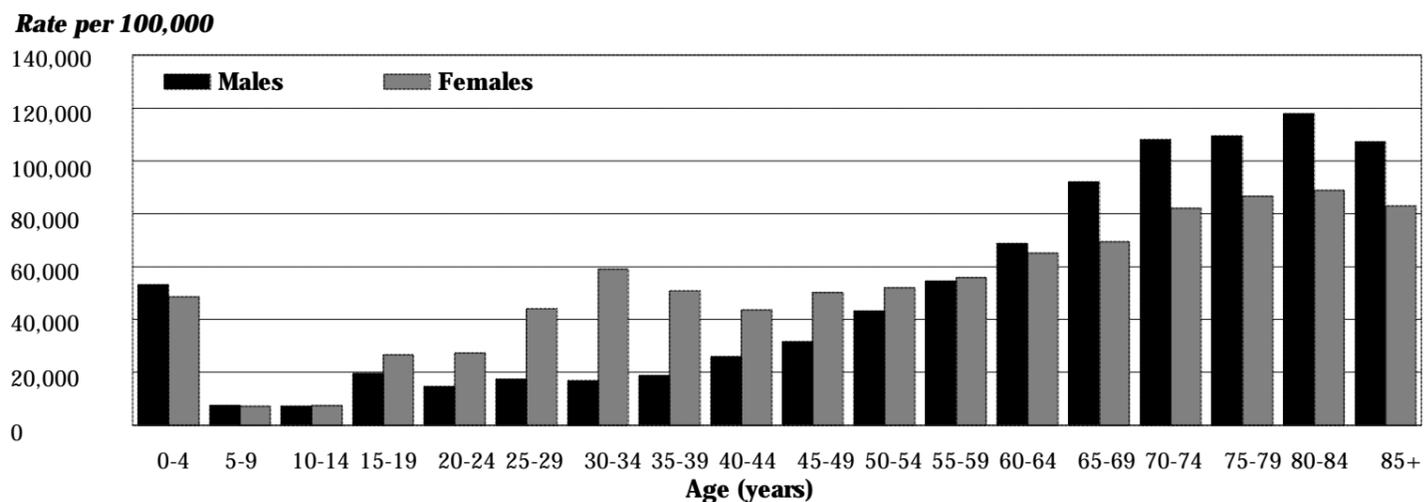
Figure 6.3: Admissions to public acute hospitals, by age and sex, Australian Capital Territory, 1995/96

Rate per 100,000



Source: See Data sources, Appendix 1.3

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

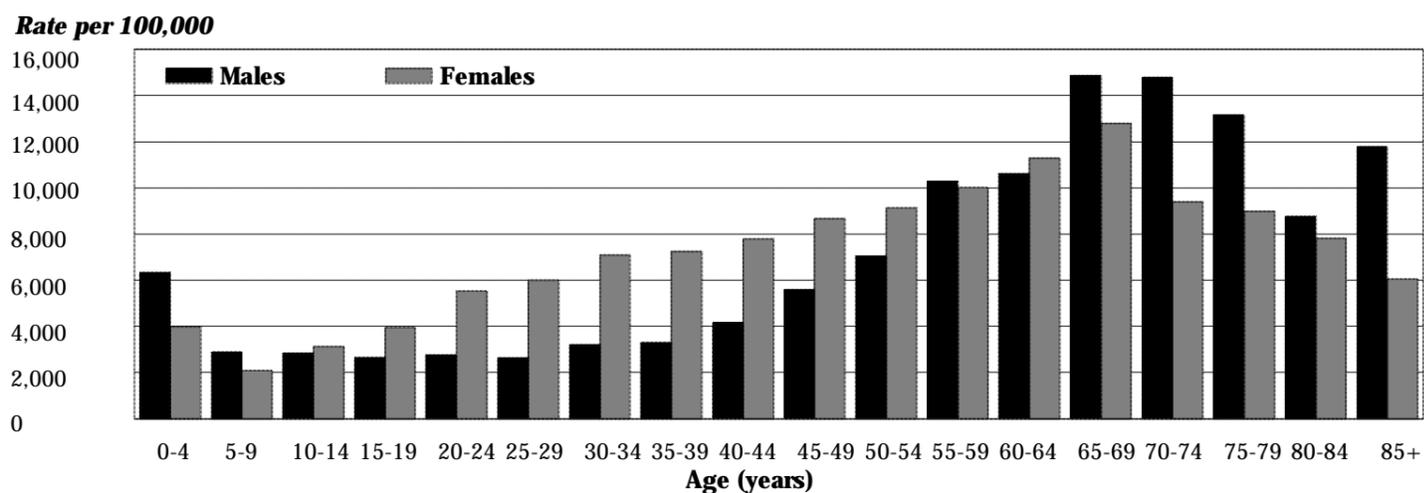


Source: See Data sources, Appendix 1.3

The general pattern of higher admissions 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 30 years, female rates remain reasonably consistent, increasing

marginally in the 40 to 44 age group before declining at the age of 70 years and over. Same day admission rates for males are similar to the rates recorded for total admissions until the age of 69 years, from where they begin to decline.

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

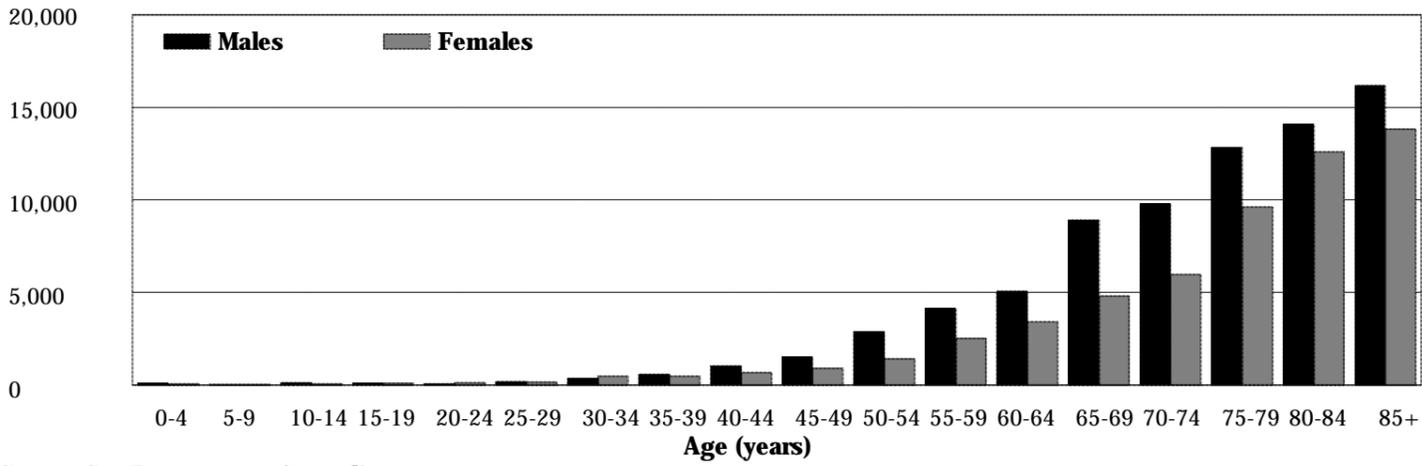


Source: See Data sources, Appendix 1.3

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 30 years, with males predominating across the age groups. Admission rates for respiratory system diseases were highest among children aged 0 to 4 years and people aged 75 years and over, with little difference between the age groups from 20 to 54 years (Figure 6.7): males predominate in each of these groups.

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

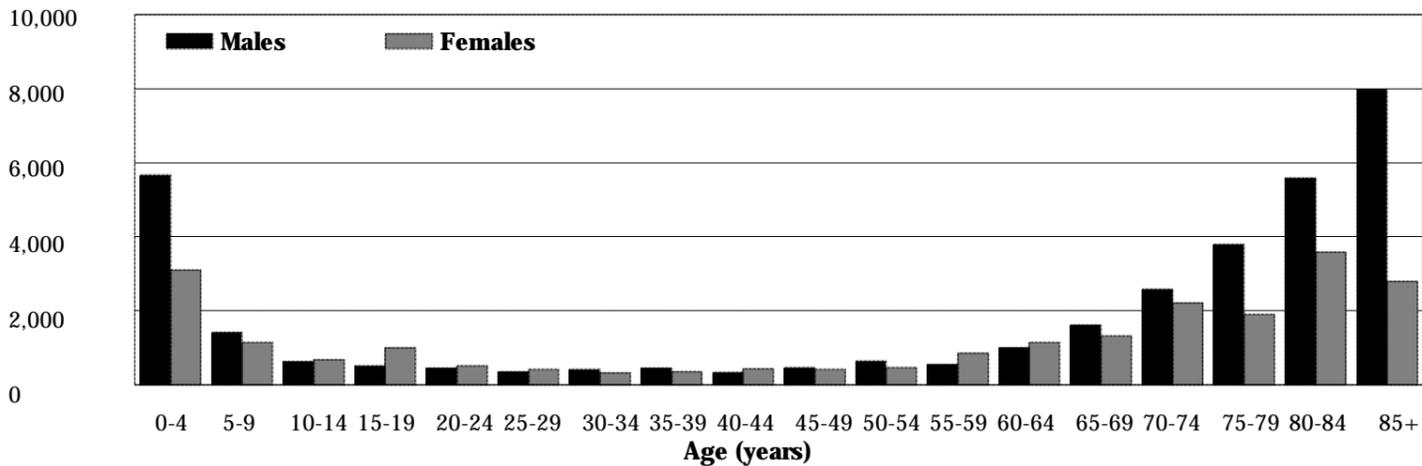
Rate per 100,000



Source: See *Data sources*, Appendix 1.3

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

Rate per 100,000



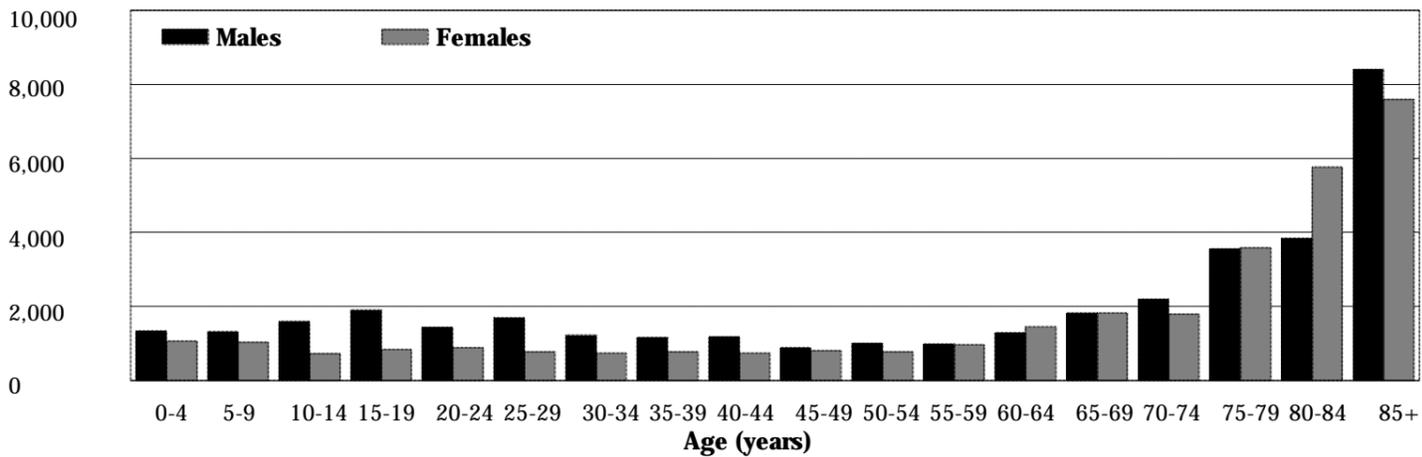
Source: See *Data sources*, Appendix 1.3

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**). Whereas females predominate at ages from 15 to 54 years in total admissions, their admission

rates for accidents, poisonings and violence are higher than those for males only in the age groups from 60 to 64 years and 80 to 84 years. The largest differentials of male over female rates are in the age groups from 10 to 29 years.

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

Rate per 100,000

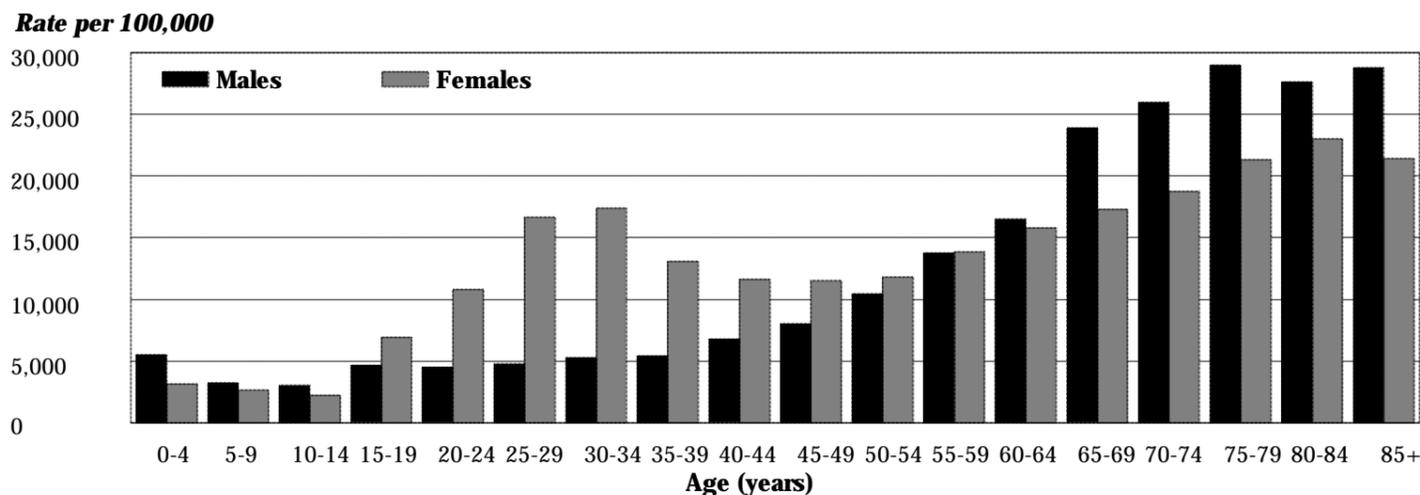


Source: See *Data sources*, Appendix 1.3

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 females aged from 35 to 59 years.

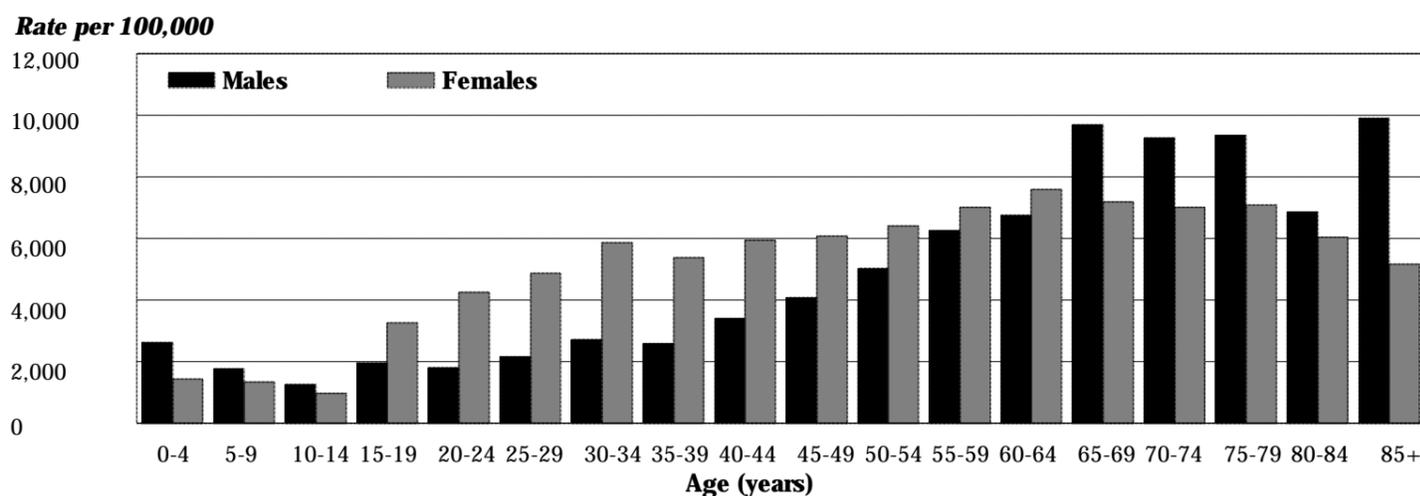
Within this age span, rates for same day admissions of females for a surgical procedure increase rather than decrease as they did for total surgical admissions.

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



Source: See Data sources, Appendix 1.3

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



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 admission 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 the Indigenous population noted above on page 115, higher rates of hospitalisation for Aboriginal people in the non-metropolitan areas are also likely to reflect significantly larger proportions of the Indigenous population 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 hospitals) 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 were not able to be included.

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.

Coverage

Hospital admissions data presented in this atlas includes 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.

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. 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 chemotherapy 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 86.0 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, Australian Capital Territory, 1995/96

Principal diagnosis/procedure	Same day		Overnight		Total	
	No.	% ²	No.	% ²	No.	% ²
Principal diagnosis						
Infectious and parasitic diseases	100	0.6	822	2.5	922	1.8
Cancer						
lung cancer	15	0.1	62	0.2	77	0.2
cancer of the female breast	39	0.2	166	0.5	205	0.4
Total cancer	922	5.3	1,394	4.3	2,316	4.6
Mental disorders						
psychosis	49	0.3	837	2.6	886	1.8
neurotic, personality or other mental disorders	108	0.6	490	1.5	598	1.2
Total mental disorders	158	0.9	1,331	4.1	1,489	3.0
Circulatory system diseases						
ischaemic heart disease	335	1.9	1,322	4.0	1,657	3.3
Total circulatory diseases/disorders	787	4.5	3,166	9.7	3,953	7.9
Respiratory system diseases						
bronchitis, emphysema or asthma	34	0.2	668	2.0	702	1.4
Total respiratory diseases/disorders						
0 to 4 year olds	66	0.4	924	2.8	990	2.0
all ages	252	1.5	2,792	8.5	3,044	6.1
Accidents, poisonings and violence	476	2.7	3,305	10.1	3,780	7.5
All causes (excl. renal dialysis)						
Females	9,871	56.8	18,895	57.8	28,765	57.4
Males	7,503	43.2	13,813	42.2	21,316	42.6
Public acute hospitals (excl. renal dialysis)	13,170	75.8	25,802	78.9	38,972	77.8
Private acute & psychiatric hospitals (excl. renal dialysis)	4,204	24.2	6,906	21.1	11,110	22.2
Total admissions (excl. renal dialysis)	17,374	100.0	32,708	100.0	50,081	100.0
Total admissions						
Admissions for renal dialysis	8,125	31.9	5	0.02	8,130	14.0
All other admissions	17,374	68.1	32,708	99.98	50,081	86.0
Total admissions (incl. renal dialysis)	25,498	100.0	32,713	100.0	58,211	100.0
Principal procedure						
Tonsillectomy	4	0.03	375	2.29	379	1.34
Myringotomy	263	2.20	11	0.07	274	0.97
Caesarean section	1	0.01	755	4.62	756	2.67
Hysterectomy	0	0.00	452	2.76	452	1.60
Hip replacement	0	0.00	169	1.03	169	0.60
Lens insertion	106	0.89	228	1.39	334	1.18
Endoscopy	2,624	22.0	587	3.59	3,211	11.35
Total (incl. all other) procedures	11,933	100.0	16,353	100.0	28,286	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 SLA 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 location of address (eg. suburb, town or locality) 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.

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 hospitals¹. 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 that their inclusion could distort the pattern of admission at the SLA level. This could occur because the measure mapped is the number

¹Although 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.

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 8,130 admissions in 1995/96, 14.0 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 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 might 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 Australians 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**)². 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.

²The comparison in **Table 6.4** 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 50,081 admissions to hospital of residents of the Australian Capital Territory in 1995/96, of which 92.4 per cent were admissions to hospitals within the State, 6.64 per cent were to hospitals in New South Wales, 0.46 per cent were to Victorian hospitals and 0.31 were to hospitals in Queensland (**Table 6.5**).

Variations in the proportions of residents of the Australian Capital Territory admitted to hospitals outside of the State are largely related to the location of their residence.

Note that it is the residential location of the person admitted to hospital that is mapped in this atlas, irrespective of the location of the hospital.

Table 6.5: Admissions of residents of the Australian Capital Territory by State/Territory of location of hospital, 1995/96

	Location of hospital							Total	
	NSW	Vic	Qld	SA	WA	Tas	NT		
Number	3325	230	156	58	27	16	17	46,252	50,081
Per cent	6.64	0.46	0.31	0.12	0.05	0.03	0.03	92.35	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 121. 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

	<i>Age-sex standardised admission ratios</i>								
	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

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 55,310 admissions to public acute and private hospitals of residents of **Canberra-Queanbeyan**, over half (57.4 per cent) of which were of females.

Statistical Local Areas (SLAs)

Although standardised admission ratios at the SLA level in **Canberra-Queanbeyan** ranged from 7** to 349**, over two thirds (68.8 per cent) of SLAs had ratios in a narrower range, within 15 per cent of the level expected from the ACT rates.

Thirteen SLAs had ratios in the top range mapped, all but two of which were highly statistically significant. The most highly elevated ratio was recorded in Tuggeranong (Balance), with three and a half times the number of admissions expected from the ACT rates (an SAR of 349**). Other SLAs with elevated ratios included City (164**), Charnwood (130**), Oaks Estate (130**), Page (129**), Ngunnawal (129**), Lyons (122**) and Pialligo (122).

The lowest ratio (for SLAs with over 20 admissions) was recorded in Acton, with 74 per cent fewer admissions than were expected from the ACT rates (an SAR of 26**). Other SLAs with very low ratios were Gungahlin (Balance) (with an SR of 52**), Symonston (58**), Gowrie (68**) and Red Hill (74**). In total, eighteen SLAs had ratios in this lowest range (**Map 6.1a**).

Although there were fewer than 20 admissions recorded for people living in Duntroon, it had a notably low ratio (an SAR of 9**): this is likely a result of the use by those living in Duntroon of defence force medical and hospital facilities. Fyshwick (not mapped because the population was below 100) had a highly elevated ratio (an SAR of 564**) with 72 admissions, the majority (50) of whom were males. The largest numbers of admissions in **Canberra** (excluding Queanbeyan, discussed below) were of residents of Kambah (2,867), Kaleen (1,347), Wanniasa (1,345) and Narrabundah (1,193).

Residents of Queanbeyan had 18 per cent more admissions for this variable than were expected from the ACT rates (an SAR of 118**). Of the 5,527 admissions over half (56.5 per cent) were females.

Postcode-based areas

All but three postcode areas have been mapped in the middle three ranges, with almost half (45 per cent) of the areas recording ratios within five per cent of the level expected from the ACT rates (**Map 6.1b**). The highest ratios were recorded in Eastern Fringe (with an SAR of 114*), Kambah (107**), Belconnen West (107**), Gungahlin-Hall (107**) and Canberra North (104**). Elevated ratios were also recorded in Belconnen South (103) and Belconnen North (102).

None of the SLAs with ratios in the lowest range mapped had more than 20 admissions to public acute and private hospitals; and there were no admissions of residents of Belconnen (Balance) (when 70.2 were expected from the ACT rates for a population of this size and age/sex composition). Low ratios were also recorded in Stromlo (with an SAR of 7**, one admission when 17.9 were expected) and Kowen/Majura (27**, 14 admissions when 52 were expected).

There were correlations of meaningful significance with the variables for the Indigenous population and private dwellings without a motor vehicle (both 0.50) and female labour force participation (an inverse correlation of -0.52). These results, together with the weak inverse correlation with the IRSD (-0.20), suggest the existence of an association at the postcode level between high rates of hospital admissions and socioeconomic disadvantage.

Residents of the ACT-Balance Statistical Subdivision had 260 admissions to hospitals in 1995/96, more than four times the number expected from the ACT rates (an SAR of 412**).

Map 6.1

Admissions to public acute hospitals and private hospitals, Canberra–Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected admissions

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

Capital city comparison (Australia as the Standard)

The admissions in this analysis are acute admissions to public acute hospitals (see page 121 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 6.7**, which vary from a high of 99** in **Sydney** to a low of 79** in **Hobart** and 81** in **Canberra**.

Table 6.7: 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

Admissions to public acute hospitals (excluding public psychiatric hospitals) accounted for 77.8 per cent of the Territory's admissions in 1995/96 (a rate of 12,728 per 100,000 population). The remaining 22.2 per cent of admissions were to private (acute or psychiatric) hospitals. For residents of Queanbeyan the proportion was substantially higher, at 90.0 per cent (a rate of 17,402 per 100,000 population).

The age profile for female (57.1 per cent of inpatient admissions) and male admissions is graphed in **Figure 6.3**, page 117. The most notable features are the higher admission rates for males at the youngest ages and from the mid-fifties, and the high admission rates for females from ages 15 to 54 years. The age profile for residents of Queanbeyan is similar to that recorded for residents of the ACT, with the exception of males aged from 60 years, where the admission rates remain relatively consistent before increasing markedly for those aged 85 years and over.

Canberra-Queanbeyan (ACT as the Standard)

There were 43,703 public acute hospital admissions recorded for residents of **Canberra-Queanbeyan**.

Statistical Local Areas (SLAs)

A high proportion of the SLAs in **Canberra-Queanbeyan** were mapped in each of the lowest (30.9 per cent) and middle (28.9 per cent) ranges (**Map 6.2a**).

The most highly elevated ratio was recorded in Tuggeranong (Balance), with over four times the number of public acute hospital admissions than were expected from the ACT rates (an SAR of 410**, and 73 admissions). The next highest ratio was recorded in each of Charnwood, Ngunnawal and Oaks Estate (an SAR of 143**). Other SLAs mapped in the top range were Lyons (with an SAR of 140**), Page (130**), Scullin (125**), Narrabundah (123**), Fisher (121**), Barton (117), Downer (116**) and Dickson (115**).

There were 4,975 admissions to a public acute hospital of people living in Queanbeyan, 37 per cent more than were expected from the ACT rates for an area of this population and age/sex distribution (an SAR of 137**). Over half (56.7 per cent) of the admissions were females.

SLAs mapped in the lowest range (and with more than 20 admissions) included Acton (with an SAR of 29**), Forrest (49**), Gungahlin (Balance) (51**), Symonston (55**) and O'Malley (56**). There were no admissions to public acute hospitals of residents of Belconnen (Balance), when 55.7 were expected. Other low ratios for SLAs with fewer than 20 admissions were recorded in Hall (an SAR of 4**, two admissions), Stromlo (8**, one), Duntroon (9**, 13: see the note on page 126 re the low rates in this SLA), Majura (12**, four) and Harman (23**, six).

Excluding Queanbeyan, the largest numbers of admissions to public acute hospitals were recorded for residents of Kambah (2,278 admissions), Wanniasa (1,048), Kaleen (1,045) and Narrabundah (993).

Postcode-based areas

Eastern Fringe (with an SAR of 119*) was the only postcode area in **Canberra** mapped in the top range (**Map 6.2b**). Six postcode areas had ratios in the range from 105 to 114; Tuggeranong South (with an SAR of 112**), Gungahlin-Hall (110**), Kambah (109**), Canberra North (108**), Woden Central (107*) and Belconnen West (106**).

Residents of the remaining postcode areas had fewer admissions than were expected from the ACT rates. Low ratios (in SLAs with more than 20 admissions) were recorded in Tuggeranong North East (with an SAR of 84**), Woden North (87**), Woden South (91**) and Canberra Central (91**).

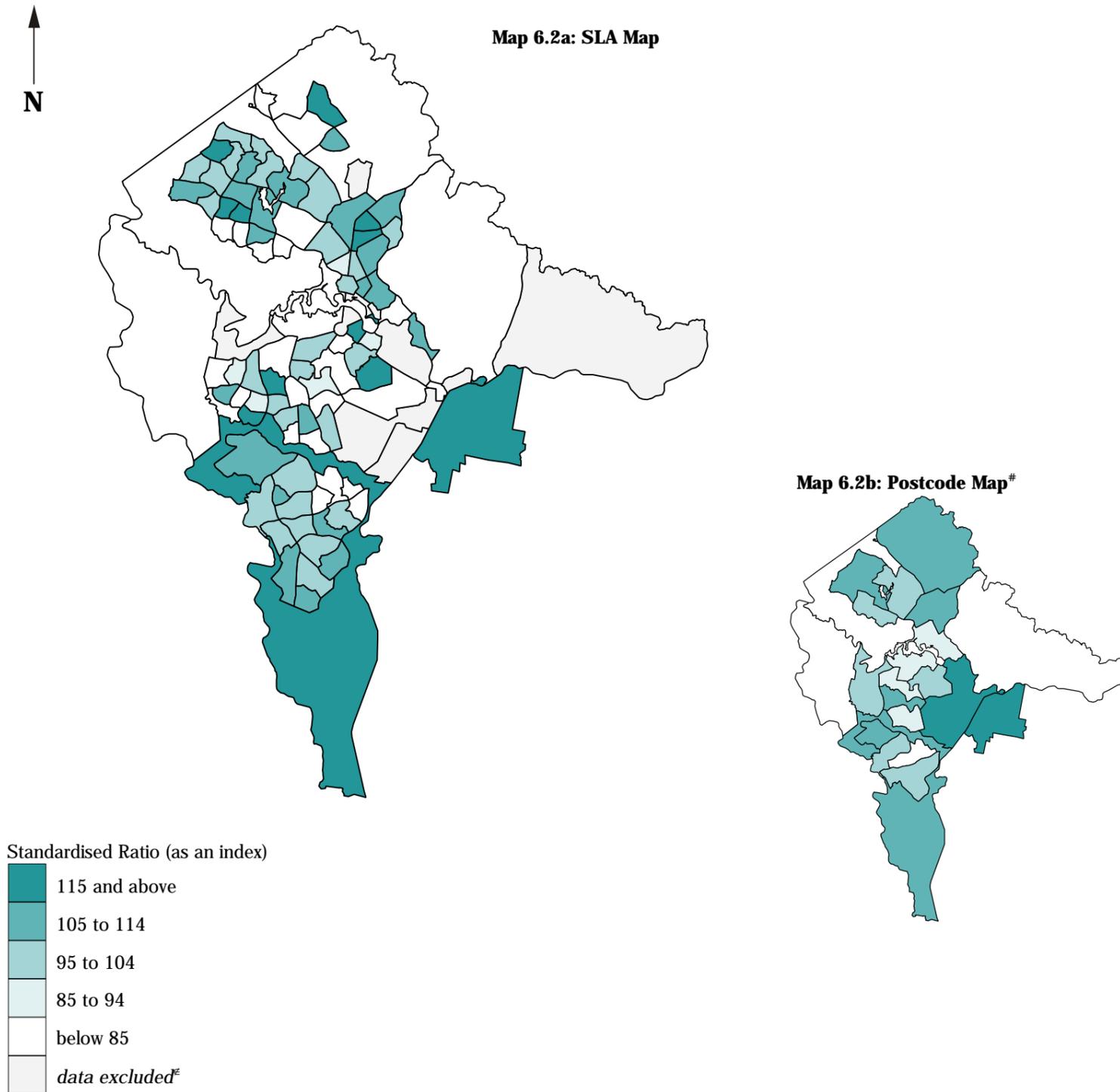
There were correlations of meaningful significance with the variables for the Indigenous population (0.59), private dwellings without a motor vehicle (0.51) and female labour force participation (an inverse correlation of -0.53). These results, together with the weak inverse correlation of substantial significance with the IRSD (-0.29), suggest the existence of an association at the postcode level between high rates of admissions to public acute hospitals and socioeconomic disadvantage.

There were 207 public acute hospital admissions recorded for residents of the ACT-Balance Statistical Subdivision, more than four times the number expected from the ACT rates (an SAR of 419**).

Map 6.2

Admissions to public acute hospitals, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[€]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 121 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 6.8**, 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 128, **Table 6.7**) and levels of provisions of private hospitals (Chapter 7) are also relevant.

Table 6.8: 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

Admissions to private hospitals account for 22.2 per cent of all admissions (excluding those in public psychiatric hospitals, same day patients and long stay nursing home type patients) in the Australian Capital Territory in 1995/96 (a rate of 3,628 per 100,000 population). The remaining 77.8 per cent were admissions to public acute hospitals. For residents of Queanbeyan, the proportion was lower, at 10.0 per cent (a rate of 1,947 per 100,000 population).

Females make greater use of private hospitals than males, with admissions to private hospitals representing 22.6 per cent of all female admissions (compared with 21.6 per cent for males) and accounting for 58.6 per cent of private hospital admissions (57.1 per cent in public acute hospitals).

The age profile for admissions of females and males is graphed in **Figure 6.4**, page 118. The most notable features are the higher admission rates for females from age 10 years through the child-bearing years to the mid-fifties, and from age 70 years. The age profile for residents of Queanbeyan was different to that recorded in the ACT, with females having higher rates from age 25 to 44 years, and males having higher rates for the younger age groups and for those aged 45 to 49, 70 to 74 and 80 to 84 years.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 11,608 admissions to private hospitals of residents of **Canberra-Queanbeyan**.

Statistical Local Areas (SARs)

A high proportion of SLAs in **Canberra-Queanbeyan** have been mapped in the highest range (33.0 per cent) and the lowest range (34.0 per cent), with the remaining SLAs divided relatively evenly between the middle three ranges (**Map 6.3a**).

The most highly elevated ratio, recorded in City (an SAR of 403**), represents a relatively small number of admissions (41 admissions, when 10 were expected from the ACT rates). Other SLAs with highly elevated ratios included O'Malley (with an SAR of 183**), Forrest (174**), Yarralumla (167**), Pialligo (159, eight admissions), Isaacs (154**), Chapman (152**) and Bruce (149**).

There were fewer than 20 admissions to private hospitals in nine of the 32 SLAs with the lowest ratios. SLAs with more than 20 admissions and very low ratios included Gowrie (with an SAR 25**), Gordon (27**), Oxley (31**), Chifley (36**) and Weston (47**).

There were 551 admissions to private hospitals of residents of Queanbeyan, 46 per cent fewer than were expected from the ACT rates (an SAR of 54**). Females comprised over half (54.6 per cent) of the admissions.

Excluding Queanbeyan, the largest numbers of admissions were recorded for people from Kambah (589 admissions), Kaleen (302), Wanniasa (297) and Curtin (248).

Postcode-based areas

Three postcode areas were mapped in the top range; Belconnen South, Woden South and Woden North (all with an SAR of 122**) (**Map 6.3b**). Elevated ratios were also recorded in Belconnen North (with an SAR of 111**), Belconnen West (109**), Canberra Central (106) and Weston Creek (101).

Low ratios of statistical significance were recorded in Tuggeranong South (with an SAR of 51**), Woden Central (64**), Tuggeranong North West (83**) and Canberra South (83**). There were no admissions of residents of Belconnen (Balance), when 14.5 were expected.

There was a correlation of meaningful significance with the variable for managers and administrators, and professionals (0.56), and a weaker association with the variable for high income families (0.22). An inverse correlation of meaningful significance was recorded with the variable for female labour force participation (-0.53). The weak positive correlation with the IRSD (0.22) also suggests the existence of an association at the postcode level between high rates of admission to private hospitals and high socioeconomic status.

There were 53 private hospital admissions recorded for residents of the ACT-Balance Statistical Subdivision, almost four times the number expected from the ACT rates (an SAR of 389**).

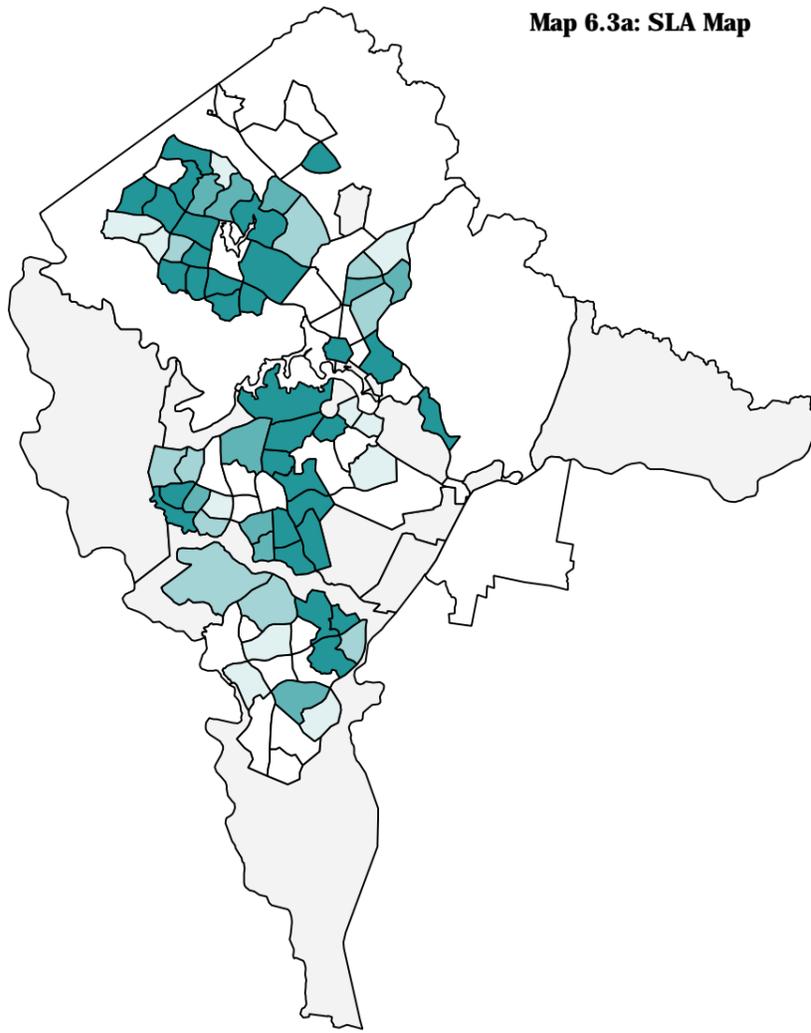
Map 6.3

Admissions to private hospitals, Canberra-Queanbeyan, 1995/1996

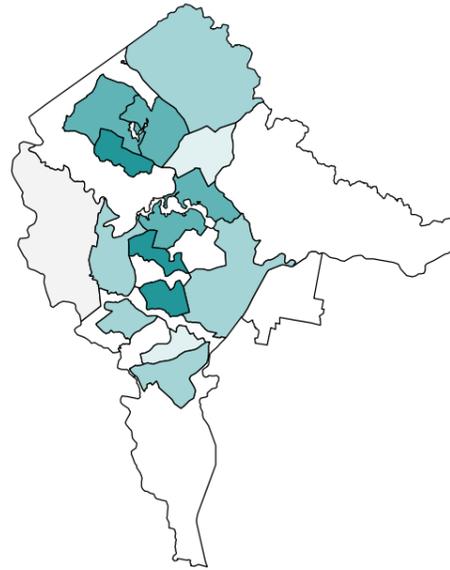
Standardised Ratio: number of admissions in each area compared with the number expected*



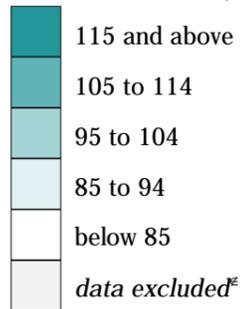
Map 6.3a: SLA Map



Map 6.3b: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

€ Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.9** 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 6.9: 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 42.6 per cent of all admissions of residents of the Australian Capital Territory (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) (a rate of 13,830 per 100,000 male population). For Queanbeyan residents the proportion was similar, at 43.5 per cent of admissions (a rate of 16,633 per 100,000 male population).

Canberra-Queanbeyan (ACT as the Standard)

There were 23,572 admissions of males resident in **Canberra-Queanbeyan**.

Statistical Local Areas (SLAs)

18.6 per cent of SLAs (18 SLAs) in **Canberra-Queanbeyan** had ratios elevated by 15 per cent or more (**Map 6.4a**). The two highest ratios, recorded in Tuggeranong (Balance) (with an SAR of 334**) and City (229**), represented relatively small numbers of 40 and 50 admissions of males, respectively. Other SLAs with high ratios included Fisher (with an SAR of 135**), Page (135**), Oaks Estate (133), Mawson (131**) and Charnwood and McKellar (both with 129**). Males living in Fyshwick (not mapped as it had a population below 100) had 50 admissions, when 9.1 were expected from the ACT rates for a population of this size and age distribution (an SAR of 551**).

SLAs mapped in the lowest range (and with more than 20 admissions of males) included Acton (with an SAR of 39**), Gowrie (63**), Forrest (73**), Stirling (73**) and Red Hill (73**).

Of the SLAs to record a ratio in the lowest range, seven had fewer than 20 admissions. Hall and Belconnen (Balance) were notable with no admissions of males when 27.3 and 30.3, respectively, were expected. Males in Duntroon (with an SAR of 9**) recorded just 10 admissions when 115.5 were expected from the ACT rates (see the note on page 126 re the low rates in this SLA).

There were 2,405 admissions of males living in Queanbeyan, 20 per cent more admissions than were expected from the ACT rates (an SAR of 120**).

With the exception of Queanbeyan, the largest numbers of admissions were of male residents of Kambah (1,271 admissions), Wanniassa (583 admissions) and Kaleen (551 admissions) and Narrabundah (474 admissions).

Postcode-based areas

All but three of the postcode areas studied had ratios for admissions of males within 15 per cent of the level expected (**Map 6.4b**). The highest ratios were recorded in Eastern Fringe (with an SAR of 112), Kambah (111**) and Belconnen West (107**).

The lowest ratios were recorded in three SLAs with fewer than 20 admissions: Kowen/Majura, Stromlo and Belconnen (Balance). There were no admissions of males from Belconnen (Balance), when 30.3 were expected. Postcode areas with ratios of statistical significance included Tuggeranong South (with an SAR of 88**), Tuggeranong North East (89**), Tuggeranong South East (92**), Woden North (92*) and Canberra South (93**).

There were correlations of meaningful significance with the variables for public rental housing (0.53) and the Indigenous population (0.50), and weaker correlations with single parent families, unemployment and low income families. An inverse correlation of meaningful significance was recorded with the variable for female labour force participation (-0.55). These results, together with the weak inverse correlation with the IRSD (-0.20), suggest the existence of an association at the postcode level between high rates of admission of males and socioeconomic disadvantage.

There were 124 admissions of males resident in the ACT-Balance Statistical Subdivision, almost four times the number expected from the ACT rates (an SAR of 388**).

Map 6.4

Admissions of males, Canberra-Queanbeyan, 1995/1996

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



*Expected numbers were derived by age standardisation, based on ACT totals

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.10**).

As was the case for males, the main difference evident in admission rates between the two periods shown in **Table 6.9** 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 6.10: 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 over half (57.4 per cent) of all admissions of residents of the Australian Capital Territory. Overall, females had higher admission rates than males: 18,913 admissions per 100,000 population for females, and 13,830 admissions per 100,000 population for males. Female residents of Queanbeyan also had higher admission rates than males: 22,143 admissions per 100,000 population for females, and 16,633 admissions per 100,000 population for males.

Canberra-Queanbeyan (ACT as the Standard)

There were 31,738 admissions of females resident in **Canberra-Queanbeyan**.

Statistical Local Areas (SLAs)

Overall, the standardised admission ratios for female admissions were relatively evenly distributed over the ranges mapped. As shown in **Map 6.5a**, 15.5 per cent of SLAs in **Canberra-Queanbeyan** (15 SLAs) recorded ratios in the top range.

The most highly elevated ratio was recorded in Tuggeranong (Balance) (with an SAR of 366**), although this represented a comparatively low number of 39 admissions of females (when 10.7 were expected from the ACT rates). Other SLAs with elevated ratios of statistical significance were Ngunnawal (with an SAR of 134**), Charnwood (130**), Palmerston and Scullin (both with an SAR of 127**), Page (125**) and Rivett and Lyons (both with an SAR of 123**).

There were 3,121 admissions of females in Queanbeyan, 17 per cent more admissions to public acute and private hospitals than were expected from the ACT rates (an SAR of 117**). They accounted for over half (56.5 per cent) of all admissions of people living in Queanbeyan.

Of the 20 SLAs with ratios elevated by between five and 15 per cent, statistically significant ratios were recorded in Holt (with an SAR of 113**), Theodore (113*), Florey (111*), Ainslie (110*) and Kaleen (107*).

Twenty two SLAs were mapped in the lowest range, with six of them recording fewer than 20 admissions of females. The SLAs with more than 20 admissions included Acton with 81 per cent fewer admissions of females than expected from ACT rates (with an SAR of 19**), Gungahlin (Balance) (38**), Bruce (64**), Gowrie (73**) and Red Hill (75**).

Excluding Queanbeyan, the largest numbers of female admissions were recorded for females of Kambah (1,596 admissions), Kaleen (796) and Wanniasa (762).

Postcode-based areas

The majority of postcode areas had ratios for female admissions in the middle three ranges mapped (**Map 6.5b**). The only postcode area mapped in the top range was Eastern Fringe, with a ratio of 117 (109 admissions). Ratios elevated by between 5 and 15 per cent were recorded by females of Gungahlin-Hall (an SAR of 113**), Belconnen West (107**), with the largest number of 4,027 admissions), Tuggeranong South (106*) and Canberra North (105**). Postcode areas with low ratios and more than 20 admissions included Tuggeranong North East (with an SAR of 82**) and Canberra Central (91**).

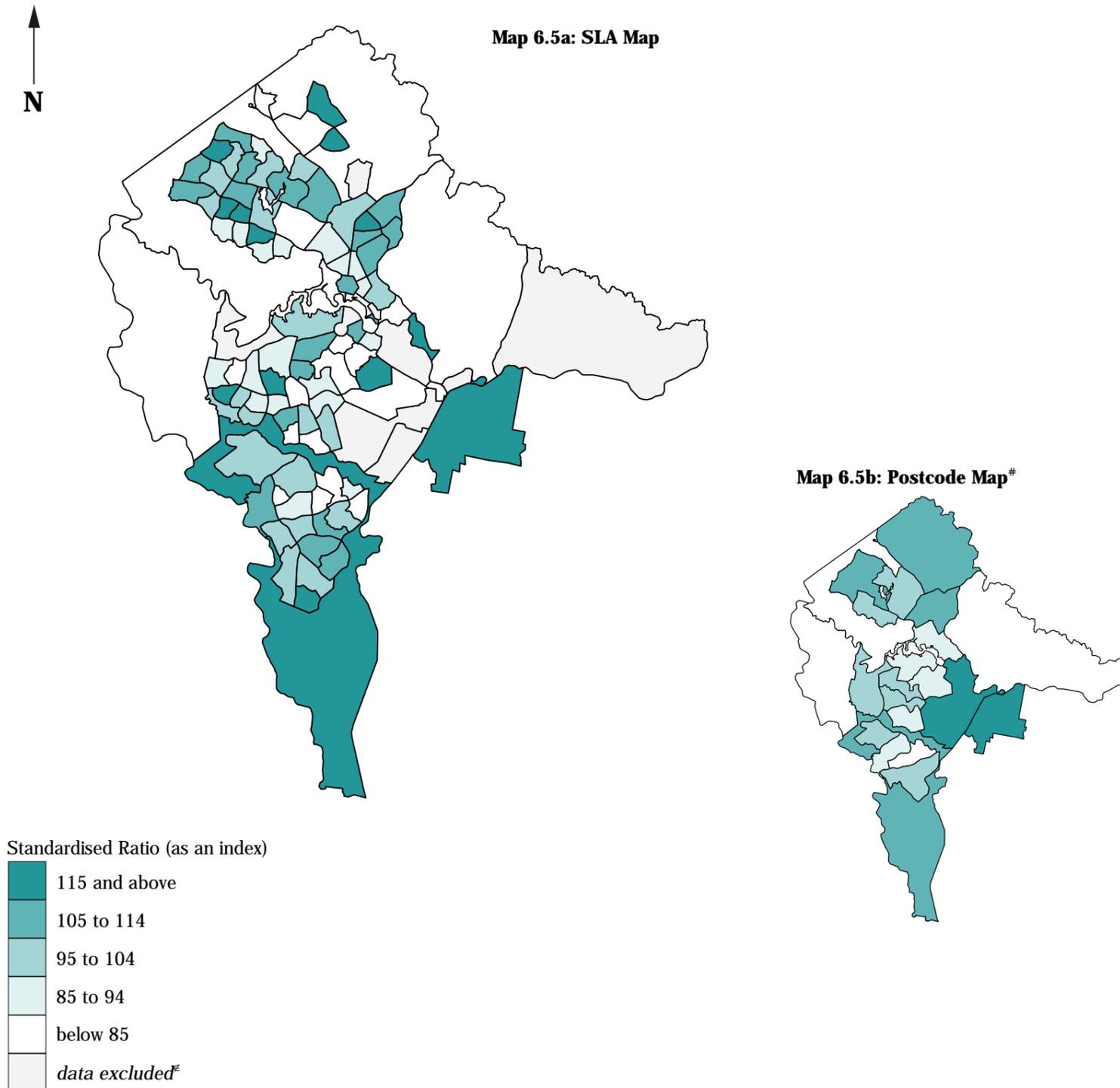
There were correlations with the variables for public rental housing and the Indigenous population (both 0.49), and weaker correlations with single parent families, unemployment and low income families. An inverse correlation of meaningful significance was recorded with the variable for female labour force participation (-0.50). These results, together with the weak inverse correlation with the IRSD (-0.20), suggest the existence of an association at the postcode level between high rates of admission of females and socioeconomic disadvantage.

There were 135 admissions of females resident in the ACT-Balance Statistical Subdivision, more than four times the number expected from the ACT rates (an SAR of 437**).

Map 6.5

Admissions of females, Canberra-Queanbeyan, 1995/1996

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



*Expected numbers were derived by age standardisation, based on ACT totals

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 121).

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 6.11). This information was not collected for the first edition of the atlas (see page 123).

Table 6.11: 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 just over one third (34.7 per cent and a rate of 5674 per 100,000 population) of all admissions in 1995/96 of residents of the Australian Capital Territory, with similar percentages recorded for admissions of males (35.2 per cent, 4868 per 100,000 population) and females (34.3 per cent, 6490 per 100,000 population). Same day admissions represented a lower proportion of all admissions in Queanbeyan (33.7 per cent, 6644 per 100,000 population).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 19,171 same day admissions of residents of **Canberra-Queanbeyan**. Females comprised over half (56.7 per cent) of the admissions.

Statistical Local Areas (SLAs)

The two highest standardised admission ratios, recorded in Tuggeranong (Balance) (an SAR of 325**) and City (207**), accounted for comparatively low numbers of 22 and 34 same day admissions, respectively (Map 6.6a). The other 19 SLAs mapped in the top range included Deakin (with an SAR of 146**), Pearce (134**), Isaacs (131**), Mawson (130**), Melba (127**), Gordon and Campbell (both with an SAR of 125**) and Dickson (123**).

There were 1,862 same day admissions of people living in Queanbeyan, 17 per cent more than were expected from the ACT rates (an SAR of 117**). Over half (54.9 per cent) of these same day admissions were females.

Thirteen SLAs recorded between five per cent and 15 per cent more same day admissions than were expected from the ACT rates, with just Kambah (114**) and Macgregor (113') recording ratios of statistical significance.

Of the twenty-six SLAs with ratios in the lowest range mapped, nine had fewer than 20 admissions. They included Nicholls (with an SAR of 60**), Red Hill (61**), Gilmore and Gowrie (both with an SAR of 69**), Chifley (71**) and Duffy (74**). There were no same day admissions recorded for residents of Belconnen (Balance), Stromlo and Hall and those from Duntroon (with an SAR of 6**) had just four same day admissions (see the note on page 126 regarding the low rates in this SLA).

The largest numbers of same day admissions (after Queanbeyan) were recorded for residents of Kambah (1,125 admissions), Wanniasa (550), Kaleen (467) and Narrabundah (336).

Postcodes

All but four postcode areas had standardised admission ratios that were within 15 per cent of the level expected from the ACT rates (Map 6.6b). The most highly elevated ratio was recorded in Tuggeranong South (an SAR of 119**). A further seven postcode areas had elevated ratios with those in Kambah (114**), Woden South (110**) and Tuggeranong North West (109') being statistically significant.

The three postcode areas mapped in the lowest range all had fewer than 20 same day admissions, with no admissions recorded from Stromlo and Belconnen (Balance) when 6.0 and 22.1 admissions, respectively, were expected from the ACT rates.

Other ratios that were lower than expected were recorded for residents of Tuggeranong North East and Canberra South (both with an SAR of 88**), Gungahlin-Hall, Woden Central and Woden North (each with 90').

The largest numbers of same day admissions were recorded for residents of Belconnen West (2,366 admissions), Canberra North (1,592) and Weston Creek (1,551).

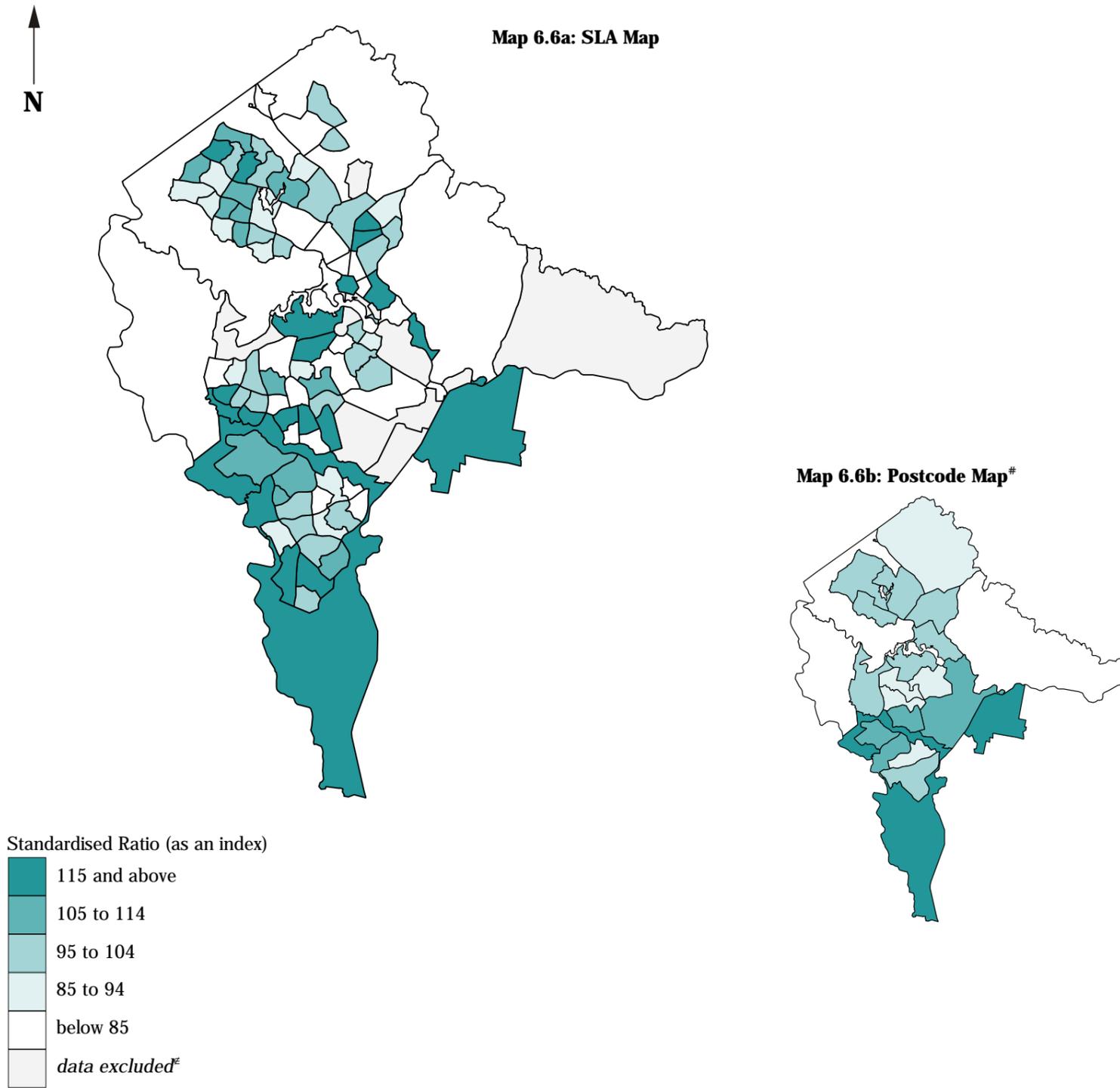
There were weak inverse correlations with the indicators of high socioeconomic status (the strongest with female labour force participation, -0.48), as well as weak positive correlations with most of the indicators of socioeconomic disadvantage (the strongest with the variables for the Indigenous population (0.47) and private dwellings without a motor vehicle (0.45)). These results, together with the weak inverse correlation with the IRSD (-0.15), suggest the existence of an association at the postcode level between high rates of same day admissions and socioeconomic disadvantage.

In 1995/96, there were 63 same day admissions of residents of the ACT-Balance Statistical Subdivision, almost three times the number expected from the ACT rates (an SAR of 299**).

Map 6.6

Same day admissions, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.12**). Both **Sydney** and **Darwin** had substantially higher ratios in the later period shown in **Table 6.12**, suggesting an increase (relative to the Australian rates) in admissions for these diseases. The increase for **Sydney** was substantial.

Table 6.12: 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 (22 admissions per thousand population for males and 20 for females), with the next highest rates being in the 75 years and over age groups. 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.

Canberra-Queanbeyan (ACT as the Standard)

Residents of **Canberra-Queanbeyan** had 1,022 admissions for infectious and parasitic diseases. Just over half (51.0 per cent) were females.

Statistical Local Areas (SLAs)

Overall, the numbers of admissions for infectious and parasitic diseases at the SLA level were low, with residents from 18.6 per cent of SLAs (18 SLAs) recording fewer than five expected cases: just nine SLAs had more than 20 admissions. The standardised admission ratios are most predominant in the highest and lowest ranges mapped (**Map 6.7a**). Over three quarters (82.3 per cent) of SLAs with elevated ratios are in the top range mapped and over half (56.8 per cent) of the SLAs which recorded lower than expected numbers of admissions were mapped in the lowest range. However few ratios were statistically significant.

The highest ratio, recorded in Griffith (an SAR of 184**), accounted for 18 admissions. Other elevated ratios (but with at least 20 admissions) were recorded for people living in Narrabundah (an SAR of 165**), Bonython (149), Curtin (136), Wanniasa (115) and Kaleen (112).

There were 104 admissions of residents of Queanbeyan for infectious and parasitic diseases, 13 per cent more admissions from these diseases than were expected from the ACT rates (an SAR of 113).

The only statistically significant ratios in the lowest range mapped were recorded in Chapman (with an SAR of 15*) and Evatt (53*), accounting for just one and nine admissions respectively. Most SLAs with ratios in this range recorded fewer than 10 admissions for this variable.

The largest number of admissions for infectious and parasitic diseases was recorded for residents of Kambah (46 admissions).

Postcode-based areas

The four postcode areas mapped in the highest two ranges form a cluster in the centre of Canberra. Canberra South (with an SAR of 149**) and Woden North (129) had the most highly elevated ratios, with lower ratios in Canberra Central (107) and Woden Central (106). Half of the postcode areas mapped had ratios within five per cent of the level expected from the ACT rates, including Belconnen West (with an SAR of 104). Tuggeranong South East (with an SAR of 100) had the largest number of 126 admissions for infectious and parasitic diseases. The lowest ratio, an SAR of 68*, was recorded in Woden South.

There was a positive correlation with the variable for low income families (0.52) and weaker correlations with other indicators of socioeconomic disadvantage. Inverse correlations were recorded with the variables for female labour force participation (-0.45) and high income families (-0.37). These results, together with the weak inverse correlation with the IRSD (-0.28), suggest the existence of an association at the postcode level between high rates of admissions for infectious and parasitic diseases and socioeconomic disadvantage.

There were four admissions for infectious diseases of residents of the ACT-Balance Statistical Subdivision, too few cases from which to calculate reliable rates.

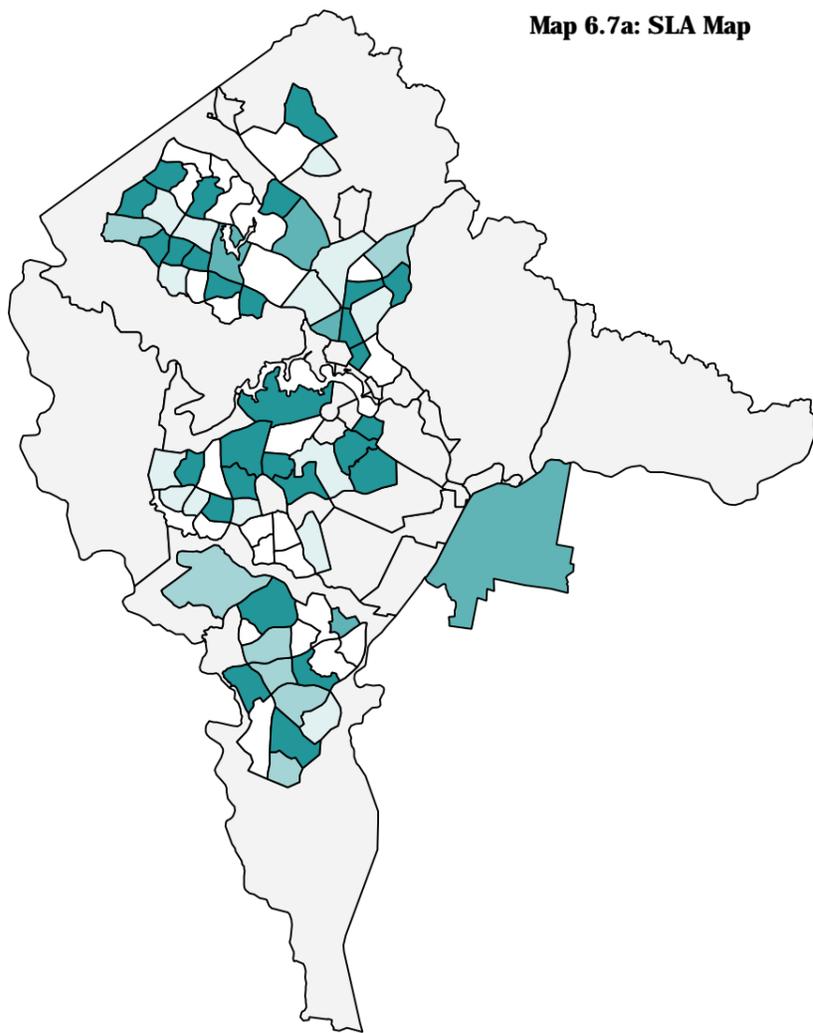
Map 6.7

Admissions for infectious and parasitic diseases, Canberra-Queanbeyan, 1995/1996

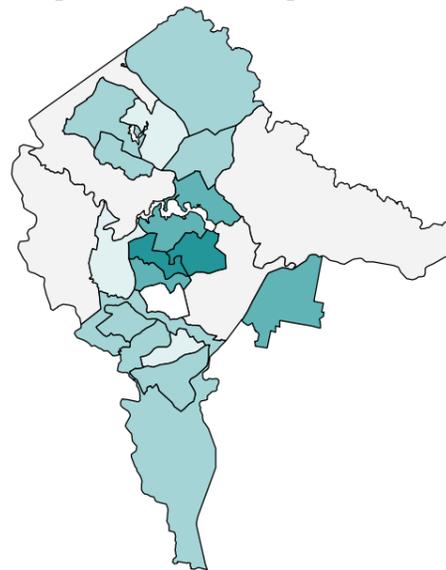
Standardised Ratio: number of admissions in each area compared with the number expected*



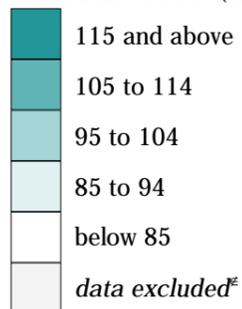
Map 6.7a: SLA Map



Map 6.7b: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

€Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.13**). There was relatively little change in the ratios between the periods shown in **Table 6.13**, 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 6.13: 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 4.6 per cent of all the admissions analysed for residents of the Australian Capital Territory (a rate of 756 per 100,000 population) and 4.5 per cent of residents of Queanbeyan (902 per 100,000 population).

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, people living in the middle and lower socioeconomic status postcodes had more admissions for cancers than did those from higher socioeconomic status postcodes.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 2,556 admissions for cancer of residents of **Canberra-Queanbeyan**. Males comprised over half (56.2 per cent) of these admissions.

Statistical Local Areas (SLAs)

The distribution of SARs for admissions for cancer across **Canberra-Queanbeyan** was concentrated in the highest and lowest ranges mapped (**Map 6.8a**), with most SLAs recording fewer than 50 admissions for cancer.

Residents of almost a third of all SLAs had ratios elevated by 15 per cent or more. SLAs with the most highly elevated ratios of

statistical significance (and with more than 20 admissions) were Bruce (with an SAR of 202**), Fisher (183**), McKellar (149*), Chisholm (145*) and Kambah (130**), with the largest number of 145 admissions). Residents of Banks (an SAR of 201**) and Macarthur (191**) had 18 and 16 admissions respectively. Most of the 23 SLAs with ratios in the lowest range had fewer than 20 admissions. Statistically significant ratios were recorded in Braddon (32**), Red Hill (50**), Cook (54*) and Curtin (67*).

There were 248 admissions for cancer of people living in Queanbeyan, 19 per cent more admissions for cancer than were expected from the ACT rates (an SAR of 119**). Over half (56.8 per cent) of the admissions were males.

Postcode-based areas

The highest SARs for admissions for cancer at the postcode level were recorded in Tuggeranong South (144**), Kambah (130**) and Eastern Fringe (122) (**Map 6.8b**). A further five areas had elevated ratios, ranging from 102 in Woden South to 112 in Weston Creek. The two lowest ratios were recorded in Woden Central (with an SAR of 71*) and Gungahlin-Hall (83). The largest numbers of admissions for cancer (excluding Queanbeyan) were recorded for residents of Canberra North (257 admissions), Belconnen West (254) and Weston Creek (249).

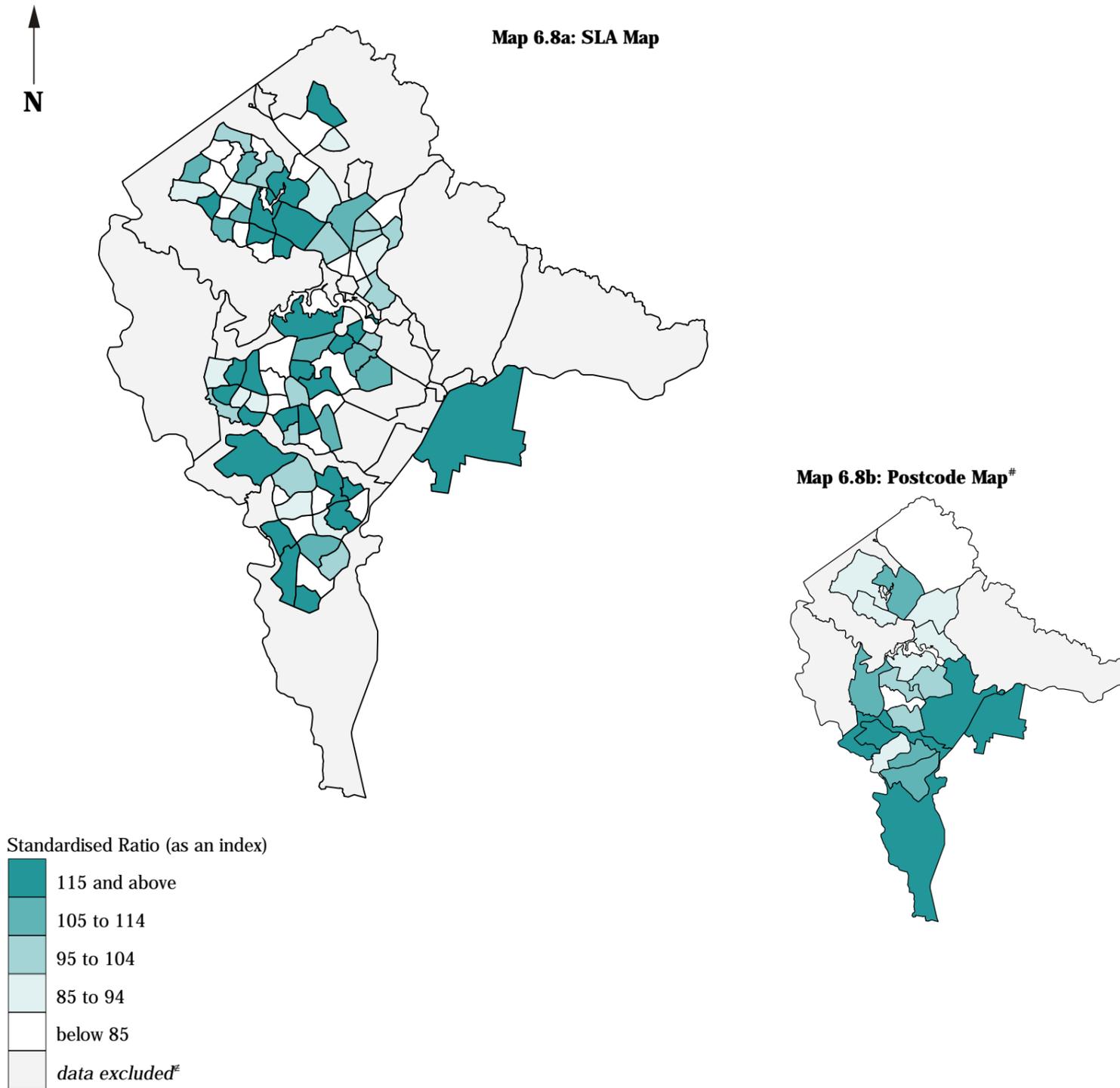
There were correlations of meaningful significance with the variables for unskilled and semi-skilled workers (0.54) and early school leavers (0.52); and inverse correlations with the variables for managers and administrators, and professionals (-0.52) and recent immigrants (-0.66). These results, together with the weak inverse correlation with the IRSD (-0.22), suggest the existence of an association at the postcode level between high rates of admissions for cancer and socioeconomic disadvantage. Inverse correlations of meaningful significance were also recorded with the variables for people born in predominantly non-English speaking countries (-0.66, for recent migrants and -0.60 for longer term migrants) and -0.63 for those reporting poor proficiency in English: these results indicate that these groups have lower rates of admissions for these diseases.

The ACT-Balance Statistical Subdivision had eight admissions for cancer, when three admissions were expected from the ACT rates, almost three times the number expected (an SAR of 280**).

Map 6.8

Admissions for cancer, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

Source: See Data sources, Appendix 1.3

**Details of map boundaries are in Appendix 1.2
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 6.14**).

Between the two periods shown in **Table 6.14**, 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 6.14: 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 3.3 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 residents of the Australian Capital Territory (a rate of 25 per 100,000 population). Admissions for lung cancer accounted for a substantially higher 12.5 per cent of all admissions for cancer for residents of Queanbeyan and 0.6 per cent of all admissions analysed (110 per 100,000 population).

As noted in the commentary to the map for all cancers (page 140), 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 the Indigenous people (ABS/AIHW 1999).

Canberra-Queanbeyan (ACT as the Standard)

Males accounted for over half (58.4 per cent) of the 108 admissions for lung cancer recorded for residents of **Canberra-Queanbeyan**. For almost all of the variables analysed in this chapter, the ratios for **Canberra-Queanbeyan** were within one or two per cent of the levels expected from the ACT rates. In this case, however, there were 28 per cent more admissions of residents of **Canberra-Queanbeyan** for lung cancer than were expected from the ACT rates (an SAR of 128**). This is largely a result of the higher than expected number of admission of people from Queanbeyan. When compared to the totals for New South Wales, residents of Queanbeyan had just over twice the expected number of admissions for lung cancer (an SAR of 211**); when compared to the lower rates in the ACT, they had over four times the expected number of admissions for lung cancer (an SAR of 437**). Males comprised of the admissions of people living in **Canberra-Queanbeyan**.

Statistical Local Areas (SLAs)

As the numbers of admissions for lung cancer from individual SLAs in **Canberra-Queanbeyan** were very small the data has not

been mapped. The largest numbers of admissions were recorded for people living in Macquarie (six admissions, when 0.9 admissions were expected from the ACT rates) and Aranda, Pearce and O'Connor (each with five admissions). There were no admissions for lung cancer of residents of the majority of SLAs.

There were 31 admissions recorded for residents of Queanbeyan for lung cancer, over four times the number expected from the ACT rates (a highly elevated SAR of 437**). Over half of the admissions (58.1 per cent) were males.

Postcode-based areas

Even with the SLAs aggregated to the larger postcode areas, five or more admissions for lung cancer were expected in just seven areas (and none had more than 12 admissions) (**Map 6.9**).

The highest ratio (an SAR of 176*) was recorded in Belconnen South with 12 admissions when 6.8 were expected from the ACT rates. Elevated ratios were also recorded in Canberra South (with an SAR of 121, and eight admissions when 6.6 were expected), Canberra North (113, 12 admissions compared with 10.6) and Belconnen West (106, nine admissions compared with 8.5).

The lowest ratio (an SAR of 39) was recorded in Weston Creek; however, this represented just three admissions. Ratios below the expected level were also recorded in Canberra Central (with an SAR of 80, and six admissions when 7.5 were expected from the ACT rates) and in Woden South (86, 5 admissions compared with 5.8).

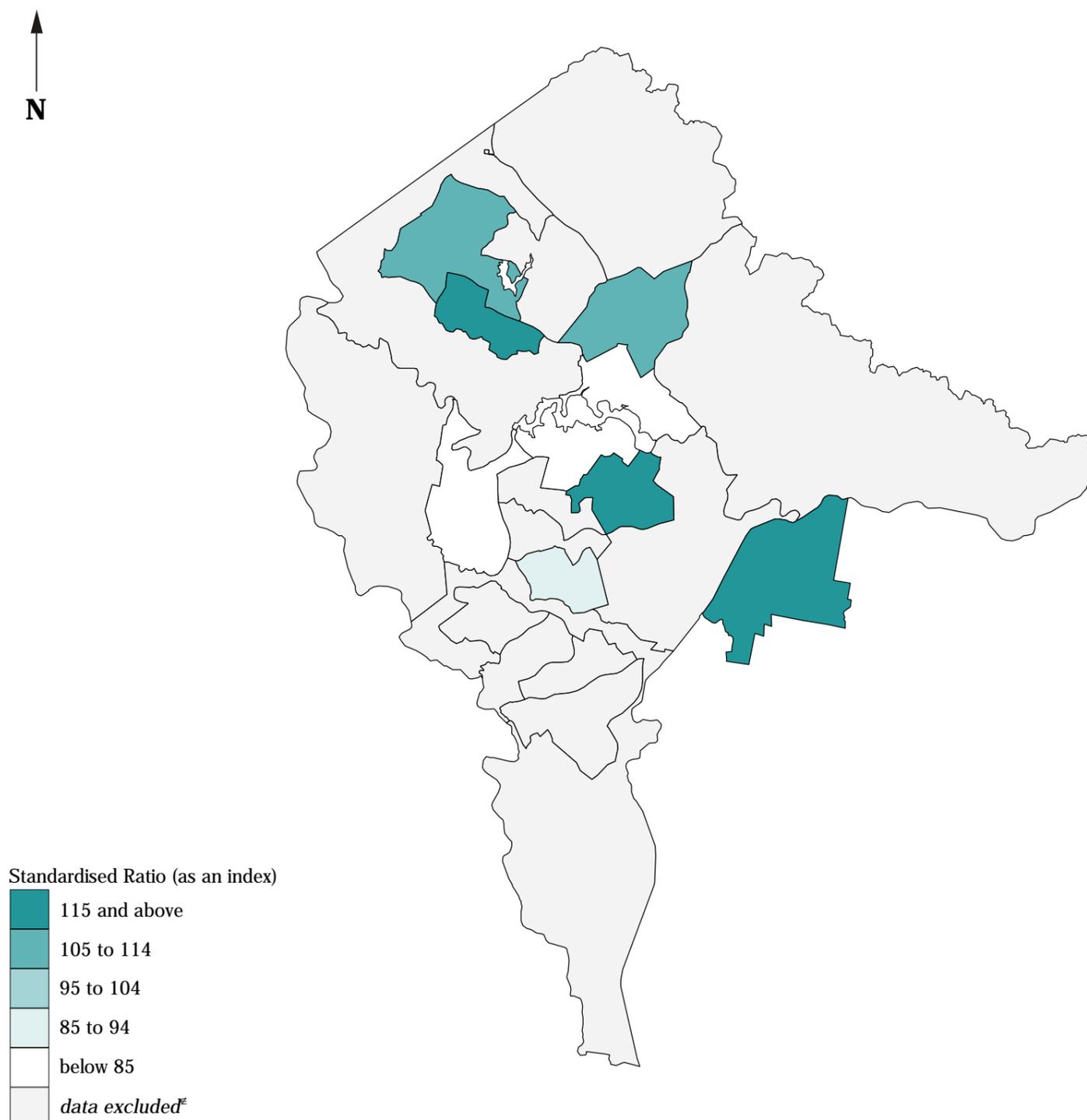
The correlation analysis was not undertaken as there were too many postcode areas with small numbers of cases.

There were no admissions of residents of the ACT-Balance Statistical Subdivision for lung cancer in 1995/96.

Map 6.9

Admissions for lung cancer, Canberra-Queanbeyan, 1995/1996

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



* SLAs have been grouped to approximate postcode areas

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

[‡] Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 6.15).

The SARs in **Sydney** have remained consistent for both periods shown in Table 6.15 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 6.15: 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 Australian Capital Territory. Incidence rates for some cancers are higher among people from the most affluent areas (Esterman 1990).

In 1995/96, hospital admissions for breast cancer accounted for 0.4 per cent of all admissions analysed and 8.6 per cent of admissions for cancer of residents of the Australian Capital Territory (a rate of 54 per 100,000 female population). For residents of Queanbeyan the proportions were similar, with admissions for breast cancer accounting for 7.7 per cent of all admissions for cancer and 0.3 per cent of all admissions analysed (a rate of 159 per 100,000 female population).

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.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 202 admissions of female residents (aged 40 years and over) of **Canberra-Queanbeyan** for breast cancer.

Statistical Local Areas (SLAs)

As the numbers of admissions of females for breast cancer at the SLA level in **Canberra-Queanbeyan** were very small, the data has not been mapped. The largest numbers of admissions were recorded for residents of Macquarie (six admissions, when 0.9 admissions were expected from the ACT rates) and Aranda, Pearce and O'Connor (each with five admissions). There were no admissions from forty two per cent of SLAs.

There were five or more expected admissions for breast cancer in just two SLAs: they were Kambah (13 admissions when 10.3 were expected, resulting in the highest SAR of 127) and Wanniasa (an SAR of 108 and six admissions).

Females in Queanbeyan had 19 admissions of females for breast cancer, 23 per cent more admissions than expected from the ACT rates (an SAR of 123).

Postcode-based areas

Even with the SLAs aggregated to the larger postcode areas, only Belconnen West (with an SAR of 82) had more than 20 admissions of females for breast cancer (and none had more than 12 admissions) (Map 6.10).

The highest ratio, an SAR of 161 recorded in Tuggeranong North East, represented just 11 admissions (when 6.8 were expected from the ACT rates). Other SLAs with elevated ratios included Belconnen North (an SAR of 129, 17 admissions), Tuggeranong South East (128, 11 admissions), Kambah (127, 13 admissions), Belconnen South (107, 17 admissions), Tuggeranong North West (106, 7 admissions) and Canberra South (104, 13 admissions).

The lowest ratios were recorded in Canberra North (75, 15 admissions when 19.9 were expected) and Canberra Central (75, 10 admissions when 13.3 were expected).

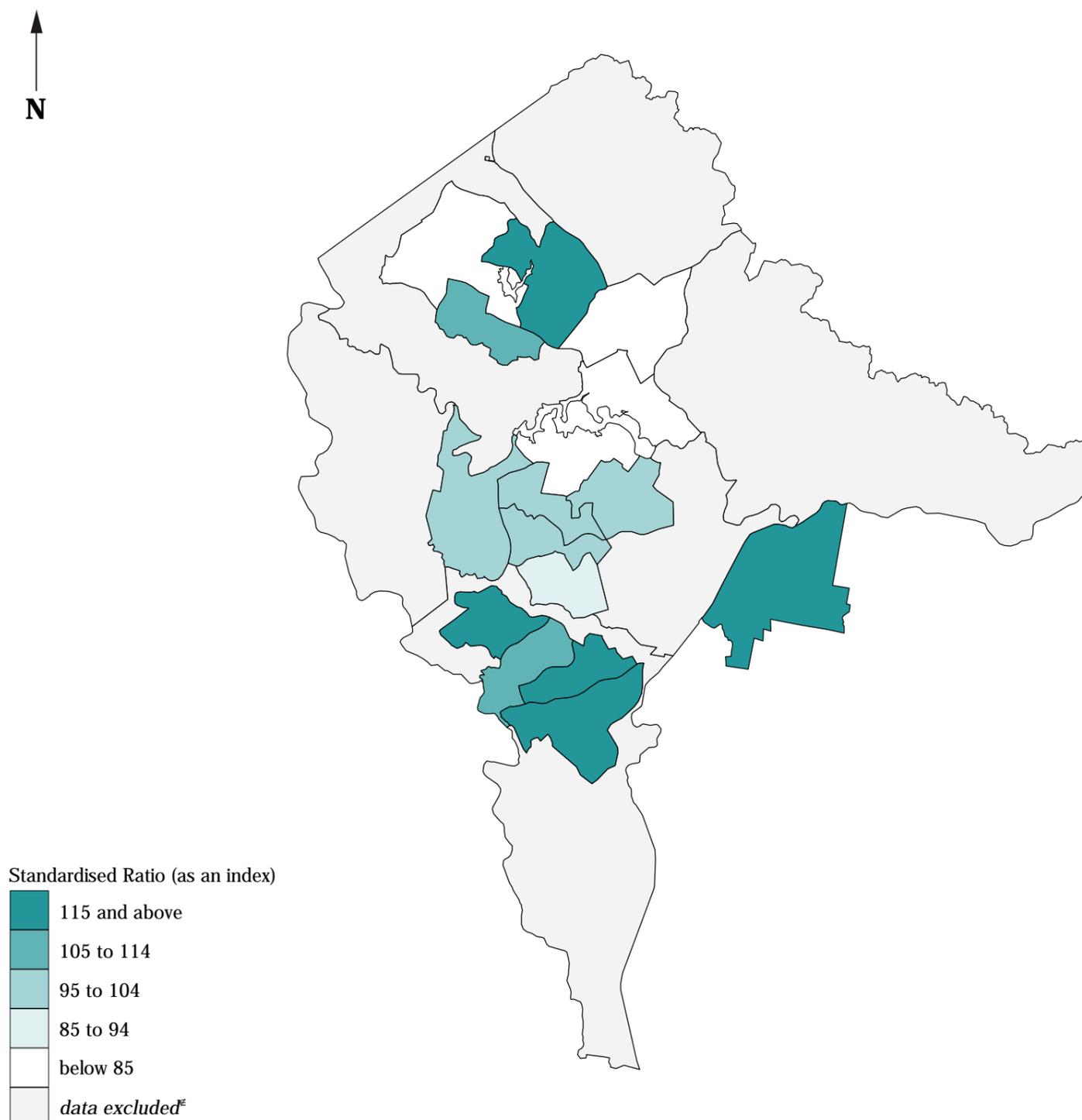
The correlation analysis was not undertaken as there were too many postcode areas with small numbers of cases.

In 1995/96, no admissions for breast cancer were recorded for female residents of the ACT-Balance Statistical Subdivision aged 40 years and over.

Map 6.10

Admissions of females aged 40 years and over for breast cancer, Canberra-Queanbeyan, 1994

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



*SLAs have been grouped to approximate postcode areas

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

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 6.16). **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 6.16: 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.

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 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 1.8 per cent of all admissions analysed for residents of the Australian Capital Territory, with higher proportions recorded for males (2.1 per cent and a rate of 294 per 100,000 population) than females (1.5 per cent and a rate of 285 per 100,000 population). For residents of Queanbeyan, admissions for psychosis accounted for 2.0 per cent of all admissions analysed, 2.7 per cent (a rate of 437 per 100,000 population) for males and 1.5 per cent (a rate of 394 per 100,000 population) for females.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 965 admissions recorded for residents of **Canberra-Queanbeyan** for psychosis. Over half (51.5 per cent) of these admissions were males.

Statistical Local Areas (SLAs)

The distribution of standardised admission ratios for psychosis in **Canberra-Queanbeyan** is concentrated in the highest and lowest ranges mapped (Map 6.11a). The highest ratios were in SLAs clustered around Braddon and Griffith and in several north-eastern SLAs. Most SLAs had fewer admissions than were expected from the ACT rates.

The most highly elevated ratio was recorded in Reid, with over five times the number of admissions expected from the ACT rates (an SAR of 542**). Other SLAs with highly elevated ratios included Lyons (with an SAR of 439**), Braddon (354**), Turner (320**), Lyneham (285**), O'Connor (233**) and Campbell (223**).

People living in Queanbeyan had 111 admissions for psychosis, 36 per cent more than expected from the ACT rates (an SAR of 136**).

Of the forty five SLAs in **Canberra-Queanbeyan** with ratios in the lowest range mapped, residents of all areas except Kambah (70*, 34 admissions compared to an expected 48.8) recorded fewer than 20 admissions.

Overall, the numbers of admissions for psychoses of residents of **Canberra-Queanbeyan** were low, with the largest numbers recorded in Lyons (40) and Lyneham (37).

Postcode-based areas

A cluster of areas with high ratios lies in the central area of **Canberra**, with the highest ratios recorded in Woden Central (an SAR of 230**), Canberra Central (207**) and Canberra North (177**) (Map 6.11b).

All of the postcode areas with lower ratios than expected were in the lowest range mapped. The lowest ratios were recorded in Gungahlin-Hall (with an SAR of 27**, seven admissions when 26.3 were expected) and Tuggeranong South (32**, 10 admissions when 30.8 were expected).

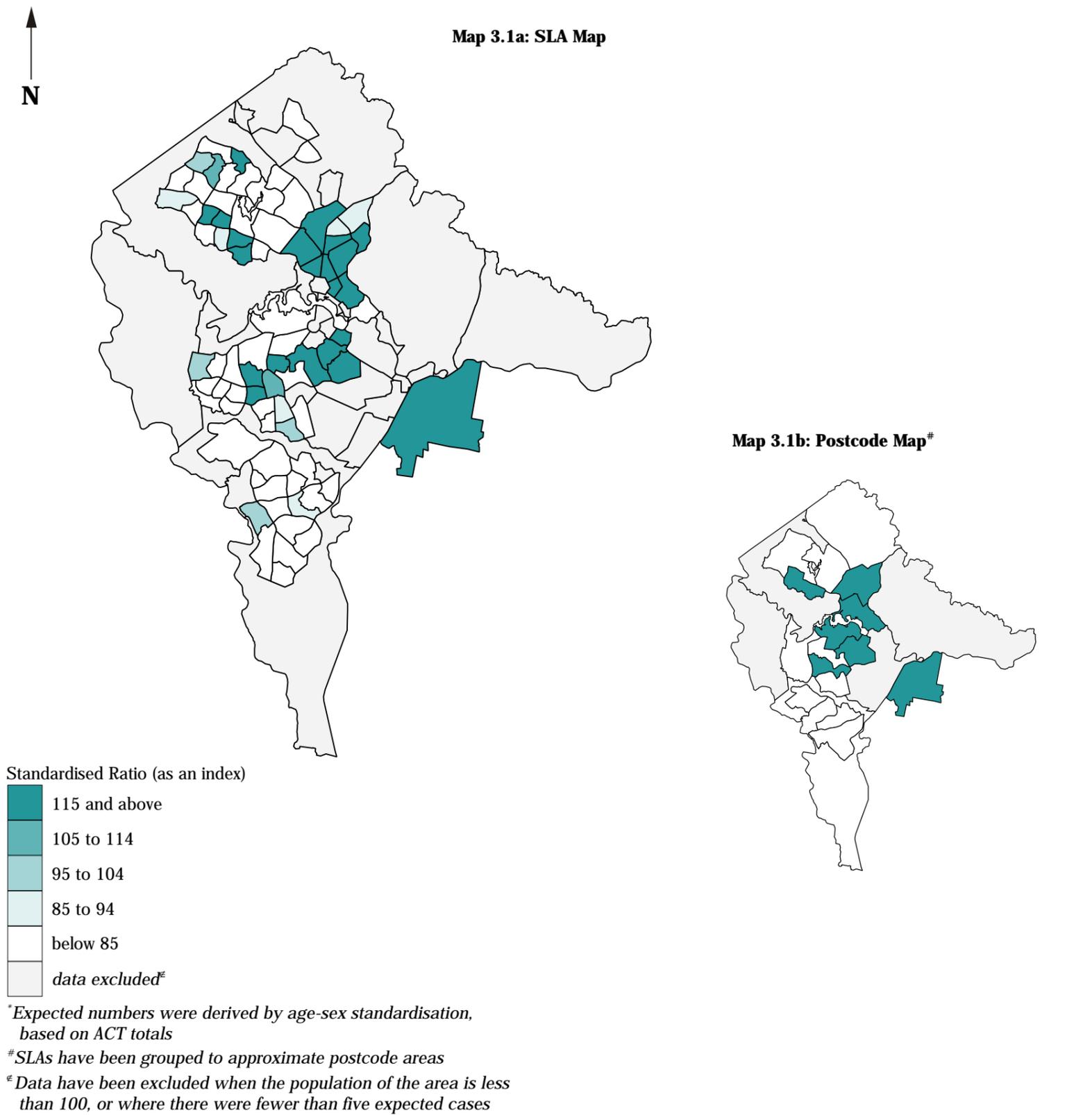
There were correlations of substantial significance with the variables for private dwellings without a motor vehicle (0.97), unemployed people (0.78) and public rental housing (0.75), as well as a correlation of meaningful significance with low income families (0.69). These results, together with the inverse correlation with the IRSD (-0.48), indicate an association at the postcode level between high rates of admission for psychosis and socioeconomic disadvantage. In contrast, there is also a correlation of meaningful significance with the variable for managers and administrators, and professionals (0.54).

There were 33 admissions for psychosis of residents of the ACT-Balance Statistical Subdivision: as only 1.2 admissions were expected from the ACT rates, the standardised ratio has not been calculated.

Map 6.11

Admissions for psychosis, Canberra-Queanbeyan, 1995/1996

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



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 disorders, 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 6.17**). 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 6.17: 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 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 146) 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. The introduction to the previous variable (psychosis) refers to the coverage of the data.

Females had a higher overall rate of admissions for neurotic personality or other mental disorders than did males (250 admissions per 100,000 population compared with 142). Admissions to hospital for neurotic, personality or other mental disorders accounted for 1.2 per cent of all the admissions analysed for residents of the Australian Capital Territory (1.8 per cent of admissions for residents of Queanbeyan and a rate of 360 per 100,000 population).

Canberra-Queanbeyan (ACT as the Standard)

There were 696 admissions for neurotic, personality and other disorders of residents of **Canberra-Queanbeyan**, seven per cent more admissions than were expected from the ACT rates (an SAR of 107). This elevated ratio is a result of the highly elevated ratio in Queanbeyan (an SAR of 184**). Close to two thirds (62.2 per cent) were females.

Statistical Local Areas (SLAs)

As for admissions for psychosis, the distribution of standardised admission ratios for neurotic, personality or other mental disorders in **Canberra-Queanbeyan** is concentrated in the highest and lowest ranges mapped (**Map 6.12a**).

Highly elevated ratios, with around four times the expected number of admissions, were recorded in Chapman (with an SAR of 465**) and Lyons (380**). Elevated ratios (in SLAs with fewer than 20 admissions) were recorded in Belconnen Town Centre (an SAR of 277**, 18 admissions), Weston (187*, 13 admissions), Narrabundah (173*, 18 admissions) and O'Connor (169*, 16 admissions).

The largest numbers of admissions for neurotic, personality and other disorders were recorded for people living in Chapman (28 admissions) and Kaleen and Kambah (both with 25 admissions). Residents of the majority of SLAs had fewer than 10 admissions. Of the SLAs mapped in the lowest range, only Kambah had more than 10 admissions.

There were 84 per cent more admissions for neurotic, personality and other mental disorders in Queanbeyan than were expected from the ACT rates (an SAR of 184**). Over half (53.7 per cent) of the 101 admissions were of females, lower than the 63.7 per cent in **Canberra**.

Postcodes

Elevated ratios were concentrated in the central areas through to the northern most areas of Canberra, and low ratios were recorded in the southern areas and the Belconnen suburbs (**Map 6.12b**). Significantly elevated ratios were recorded in Woden Central (with an SAR of 191**), Canberra South (144*) and Weston Creek (137**) in the central region of **Canberra** and in Gungahlin-Hall (154*) in the north. Elevated ratios were also recorded in Canberra Central (113), Canberra North (107) and Woden North (107). Residents of six postcode areas had ratios that were more than 15 per cent below the level expected from the ACT rates. The lowest ratios were recorded in the southern postcode areas of Tuggeranong North West (with an SAR of 45**, 11 admissions), Tuggeranong North East (53*, 15 admissions), Kambah (69, 25 admissions) and Tuggeranong South (70, 16 admissions).

The largest numbers of admissions for neurotic, personality and other disorders were recorded for people living in Weston Creek (68 admissions), Belconnen West (67) and Tuggeranong South East (58).

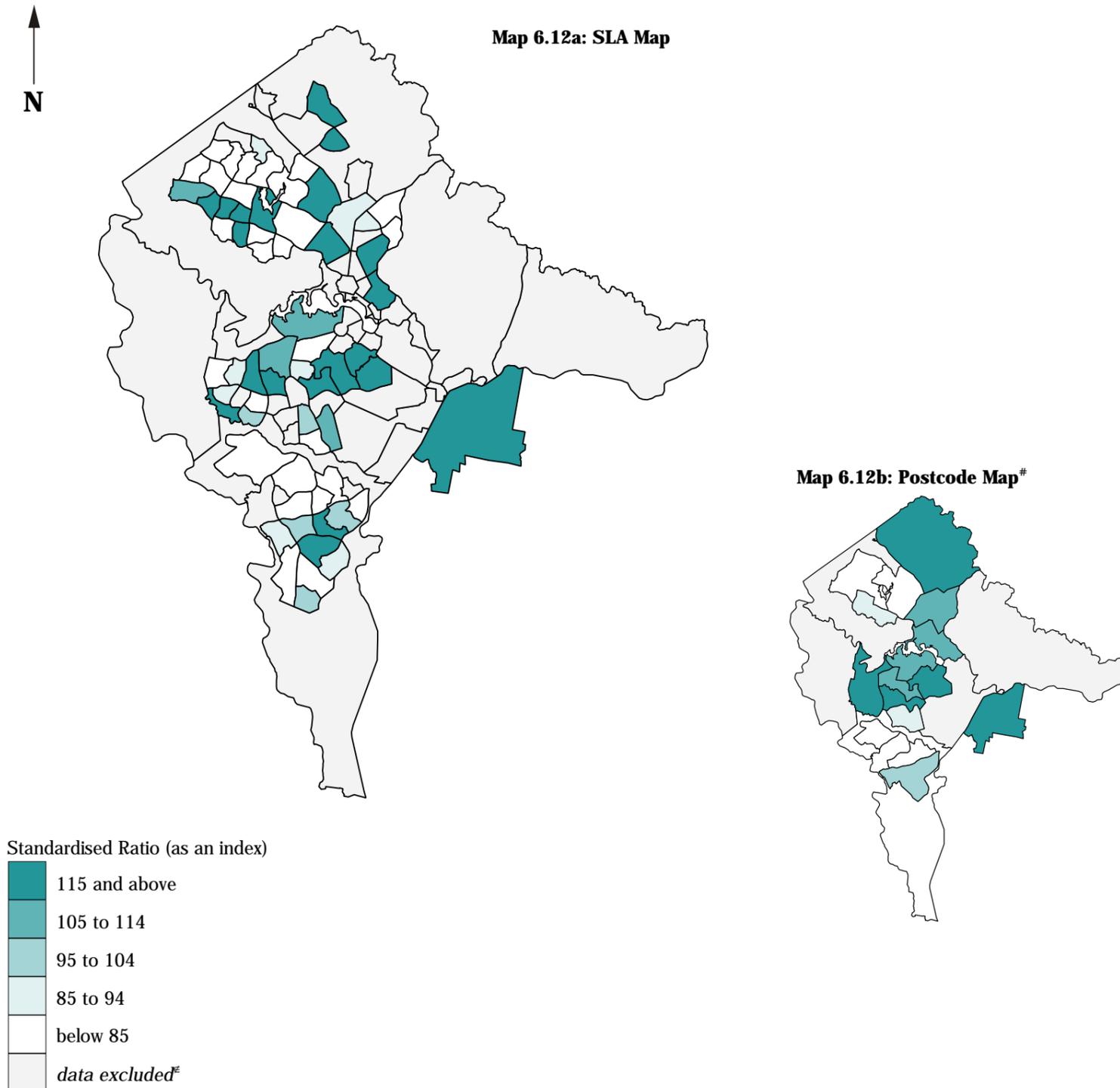
There were weak correlations with a number of the indicators of socioeconomic disadvantage, and weak inverse correlations with those of high socioeconomic status. The weak inverse correlation with the IRSD (-0.36) also suggest the existence of an association at the postcode level between high admission rates for neurotic, personality and other mental disorders and socioeconomic disadvantage. There were correlations of meaningful significance with the variables for people with poor English proficiency (0.66) and people born in predominantly non-English speaking countries and resident in Australia for five years or more (0.54): these results indicate that these groups have lower rates of admissions for these diseases.

There were three admissions for neurotic, personality or other mental disorders of residents of the ACT-Balance Statistical Subdivision, too few cases from which to calculate reliable rates.

Map 6.12

Admissions for neurotic, personality or other mental disorders, Canberra–Queanbeyan, 1994

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.18).

Both **Brisbane** and **Perth** had lower ratios in the later period shown in Table 6.18, 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 6.18: 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 Australian Capital Territory accounted for 7.9 per cent of admissions (a rate of 1,291 per 100,000 population) in this analysis (8.2 per cent of all admissions for residents of Queanbeyan, and a rate of 1,639 per 100,000 population). 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).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 4,383 admissions for circulatory system diseases of residents of **Canberra-Queanbeyan**, just over half (57 per cent) of which were males.

Statistical Local Areas (SLAs)

Of the 22 SLAs mapped in the top range, elevated ratios of statistical significance were recorded in Gordon (an SAR of 214**), Banks (207**), Monash (166**), Macquarie (158**), Holt (139**), Lyons (139**), McKellar (141*), Downer (127*) and Ainslie (125*) (Map 6.13a).

There were 451 admissions of people living in Queanbeyan, 27 per cent more admissions than were expected from the ACT rates (an SAR of 127**). Almost two thirds (64.3 per cent) of the admissions were males.

Twenty five SLAs in **Canberra** had ratios in the lowest range mapped: the lowest of these were in Symonston (with an SAR of 14*, one admission when 7.3 were expected) and Kingston (49,

12 admissions when 24.6 were expected). Low ratios with at least 20 admissions were recorded for residents of Waramanga (with an SAR of 57**), Gowrie (60*), Deakin (66**), Farrer (69**), Garran (69*) and Wanniasa (70**).

The 19 SLAs with fewer than five expected admissions for circulatory system diseases have not been mapped.

The largest numbers of admissions for circulatory system diseases were recorded for people living in Kambah (197 admissions), Narrabundah (132), Ainslie (127) and Curtin (101).

Postcode-based areas

The highest ratios for admissions for circulatory system diseases at the postcode level were recorded in Tuggeranong South (with an SAR of 203**) and the northern area of Gungahlin-Hall (123) (Map 6.13b). Elevated ratios were also recorded in Woden Central (120*), Kambah (112), Tuggeranong North East (110), Tuggeranong South East (104) and Canberra North, Belconnen South and Belconnen West (all with an SAR of 107).

The lowest ratios were recorded in the Tuggeranong North West (with an SAR of 77*), Canberra Central (79**), and Eastern Fringe (81, 14 admissions when 17.6 were expected). Residents of Canberra South and Woden South (both with an SAR of 87*) had 13 per cent fewer admissions than were expected from the ACT rates.

The largest numbers of admissions for this variable were recorded for residents of Canberra North (538 admissions) and Belconnen West (481).

There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for circulatory system diseases and socioeconomic status.

Residents of the ACT-Balance Statistical Subdivision (with 21 admissions for circulatory system diseases) had more than four times the number of admissions for circulatory system diseases than were expected from the ACT rates, an SAR of 424**.

Map 6.13

Admissions for circulatory system diseases, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.19).

Brisbane, **Adelaide** and **Perth** each had lower ratios in the later period shown in Table 6.19, 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 6.19: 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 3.3 per cent of admissions of residents of the Australian Capital Territory and 41.9 per cent of admissions for all circulatory system diseases (a rate of 541 per 100,000 population). The proportions were similar for residents of Queanbeyan, with admissions for ischaemic heart disease accounting for 3.3 per cent of all admissions analysed and 40.6 per cent of admissions for circulatory system diseases (662 per 100,000 population).

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

Canberra-Queanbeyan (ACT as the Standard)

Of the 1,831 admissions for ischaemic heart disease of residents of **Canberra-Queanbeyan** in 1995/96, over two thirds (66.4 per cent) were males.

Statistical Local Areas (SLAs)

The distribution of SARs for ischaemic heart disease in **Canberra** ranged widely, from 270^{**} to 10^{**}, with most ratios concentrated in the highest and lowest ranges (Map 6.14a). A higher proportion of the high ratios were found in northern SLAs, while SLAs with lower ratios tended to be located in the central part of **Canberra**.

Residents of Gordon had over two and a half times the expected number of admissions for ischaemic heart disease (an SAR of 270^{**}), although the ratio represented a comparatively small number of 16 admissions, when 5.9 were expected. Elevated ratios of statistical significance were also recorded in McKellar (with an SAR of 196^{**} and 22 admissions) and Monash (195^{**} and 27 admissions). SLAs with significantly elevated ratios (and with more than 20 admissions) were Macquarie (with an SAR of 150^{*}), Rivett (146^{*}), Lyons (142^{*}), Ainslie (138^{*}) and Downer (137^{*}). Lower numbers of admissions were recorded for residents of Oxley (with an SAR of 190^{*}, 12 admissions) and Calwell (156^{*}, 19 admissions).

There were 183 admissions of residents of Queanbeyan for ischaemic heart disease, 22 per cent more admissions than were

expected from the ACT rates (an SAR of 122^{**}). Over two thirds of the admissions (70.1 per cent) were males.

Ratios of at least 15 per cent lower than expected from the ACT rates were recorded in one third of the mapped SLAs (27 SLAs). The lowest ratios were recorded in Kingston (10^{**}, one admission when 9.9 were expected) and Farrer (40^{**}, 13 admissions when 32.5 were expected). Significantly elevated ratios (with at least 20 admissions) were recorded in O'Connor (with an SAR of 67^{*}), and Wanniasa and Curtin (both with an SAR of 69^{*}).

The largest numbers of admissions for ischaemic heart disease were recorded for residents of Kambah (75 admissions), Ainslie (57) and Narrabundah (51). Residents from all other SLAs had 40 admissions or less.

Postcode-based areas

The highest ratios for ischaemic heart disease at the postcode level tended to be located in the northern and southern areas of **Canberra** (Map 6.14b). The most highly elevated ratio was recorded in Tuggeranong South, with over three times the expected number of admissions (an SAR of 311^{**}). Other ratios elevated by 15 per cent or more were also recorded in Gungahlin-Hall (with an SAR of 140), Woden Central (124), Tuggeranong North East (123) and Belconnen West (117^{*}).

Four postcode areas had ratios in the lowest range mapped. The lowest ratio, recorded in Eastern Fringe, accounted for just 4 admissions when 7.8 were expected (an SAR of 49). Other low ratios were recorded in Woden North (an SAR of 67^{**}), Canberra Central (72^{**}) and Canberra South (84).

The largest numbers of admissions for ischaemic heart disease were recorded for residents of Canberra North (225 admissions), Belconnen West (217) and Weston Creek (167).

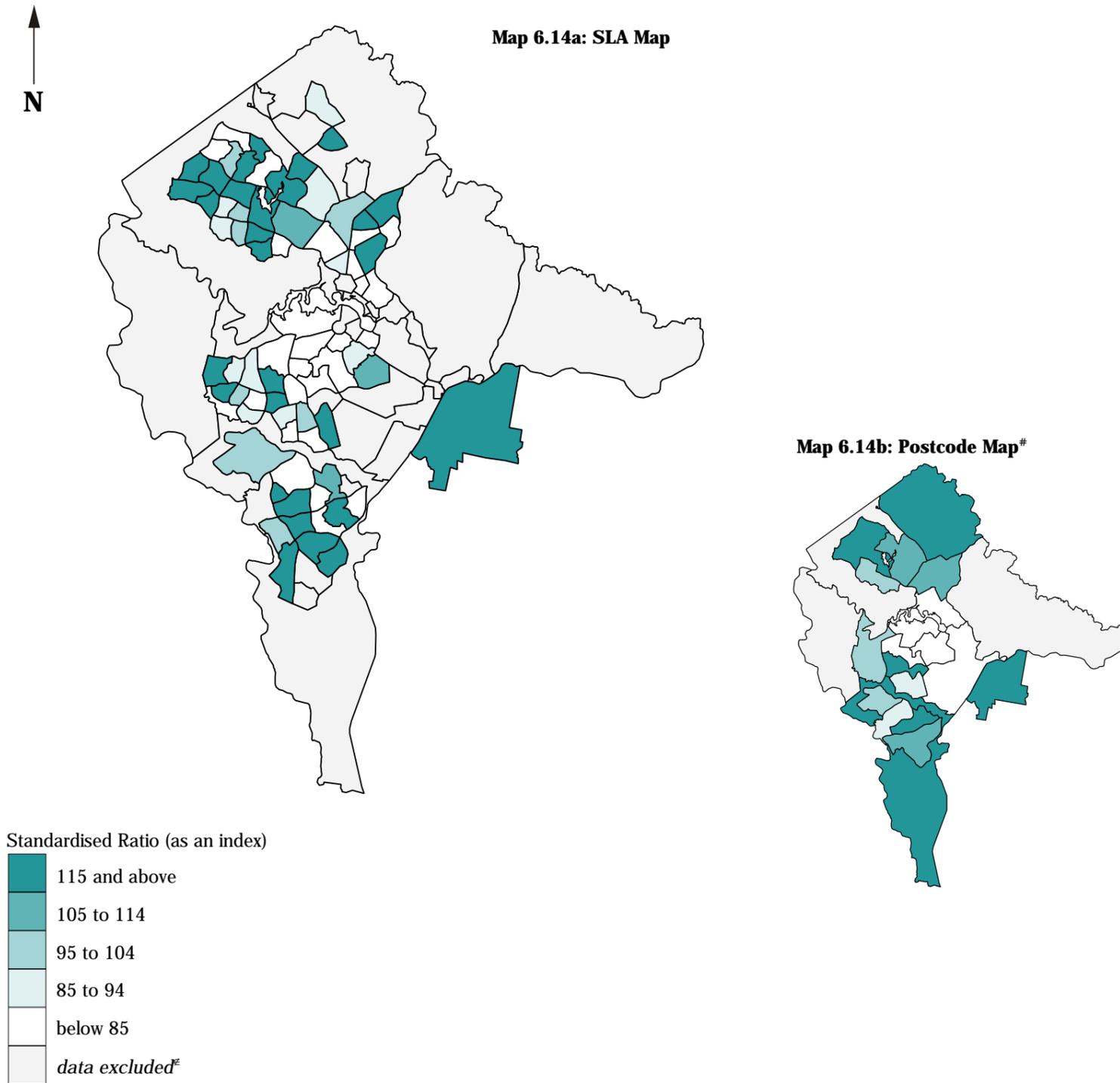
There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for ischaemic heart disease and socioeconomic status.

There were nine admissions for ischaemic heart disease in the ACT-Balance Statistical Subdivision in 1995/96: as only 2.2 admissions were expected from the ACT rates, the standardised ratio has not been calculated.

Map 6.14

Admissions for ischaemic heart disease, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.20). 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 6.20: 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 6.1 per cent (a rate of 994 per 100,000 population) of all admissions analysed for residents of the Australian Capital Territory (6.6 per cent of all admissions for residents of Queanbeyan, and a rate of 1,242 per 100,000 population).

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-the Indigenous population (ABS/AIHW 1999).

Canberra-Queanbeyan (ACT as the standard)

There were 3,399 admissions for respiratory system diseases of residents of **Canberra-Queanbeyan**, over half (54.7 per cent) of which were of males.

Statistical Local Areas (SLAs)

Eighteen SLAs in **Canberra-Queanbeyan** had standardised admission ratios for respiratory system diseases elevated by 15 per cent or more above the level expected from the ACT rates (Map 6.15a). The highest ratio was recorded in Scullin, with 70 per cent more admissions than were expected (an SAR of 170**). Other highly elevated ratios of statistical significance were recorded in Fisher (with an SAR of 156**), Theodore (153**), Narrabundah (150**), Richardson (150**), Downer (144**), McKellar (139*) and Mawson (138*).

There were 27 SLAs with ratios in the lowest range mapped (seven of which had fewer than 20 admissions for respiratory system diseases). There were no admissions of residents of Belconnen (Balance), when 5.8 admissions were expected. Low ratios of statistical significance were also recorded in Duntroon (with an SAR of 9**, and one admission when 13.3 were expected), Acton (31*, three admissions), Spence (58*, 16

admissions), Weetangera (59*, 15 admissions). There were more than 20 admissions in both Griffith (with an SAR of 64*) and Banks (67*).

In 1995/96, the largest numbers of admissions for respiratory system diseases were recorded for residents of Kambah (183 admissions), Narrabundah (94) and Wanniasa (89).

There were 367 admissions for respiratory system diseases of residents of Queanbeyan, 25 per cent more admissions than were expected from the ACT rates (an SAR of 125**). Just over half (51.7 per cent) were of males.

Postcode-based areas

The only postcode area mapped in the top range was Kambah (with an SAR of 115), with 15 per cent more admissions than were expected from the ACT totals (Map 6.15b). Other SLAs with elevated ratios included Woden South (with an SAR of 113), Belconnen North (110), Tuggeranong South East (106), Canberra North and Canberra South (both with an SAR of 106).

The lowest ratio for admissions for respiratory system diseases (an SAR of 56) was recorded in Eastern Fringe, with seven admissions when 12.2 were expected from the ACT rates. Canberra Central (with an SAR of 81**) and Tuggeranong South (83*) recorded the only ratios of statistical significance.

The largest numbers of admissions for respiratory diseases were recorded for residents of Belconnen West (385 admissions), Tuggeranong South East (375) and Canberra North (284).

There was no consistent evidence in the correlation analysis of an association at the postcode level between high admission rates for respiratory system diseases and socioeconomic status.

There were 12 admissions for respiratory system diseases of residents of the ACT-Balance Statistical Subdivision, just over three times the number expected from the ACT rates (an SAR of 304**).

Map 6.15

Admissions for respiratory system diseases, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.21**). 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 6.21: 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
1995/96 ²	95**	68**	99	118**	91**	71**	88*	80**	89**
1989 ³	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 (32.5 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.

Canberra-Queanbeyan (ACT as the Standard)

There were 1,079 admissions for respiratory system diseases of 0 to 4 year old residents of **Canberra-Queanbeyan**: males comprised almost two thirds (64.4 per cent) of these admissions.

Statistical Local Areas (SLAs)

The distribution of SARs for respiratory system diseases of 0 to 4 year olds in **Canberra** were generally concentrated in the highest and lowest ranges (**Map 6.16a**). Just 31.0 per cent of SLAs (22 SLAs) were mapped in the middle three ranges. Overall, numbers of admissions were low, with just 14 SLAs recording 20 or more admissions for these diseases.

Only six of the 23 SLAs mapped in the top range had statistically significant ratios. Weston, with the highest ratio, had just 17 admissions when 8.3 were expected (an SAR of 206**). Elevated ratios of statistical significance were also recorded in Giralang (with an SAR of 187**), Richardson (182**), Theodore (179**), Narrabundah (154*) and Kambah (135*).

Elevated ratios (in SLAs with at least 20 admissions) were also recorded in Bonython (with an SAR of 127), Monash (114), Wanniasa (106) and Kaleen (101).

Residents of all but two SLAs with ratios in the lowest range had fewer than 20 admissions: they were Gordon (with an SAR of 84) and Palmerston (64*).

The largest numbers of admissions for respiratory system diseases were of children of Kambah (66 admissions), Theodore (51) and Gordon (40).

There were 91 admissions of children aged from 0 to 4 years from Queanbeyan for respiratory system diseases, 15 per cent fewer than were expected from the ACT rates (an SAR of 85). Males comprised over half (54.5 per cent) of these admissions.

Postcode-based areas

Children in four postcode areas, all located in the central area of **Canberra**, had 15 per cent or more admissions for respiratory system diseases than were expected from the ACT rates; Kambah (with an SAR of 135*), Weston Creek (128*), Canberra South (120) and Woden South (119) (**Map 6.16b**).

The lowest SARs for admissions for respiratory system diseases of 0 to 4 year olds were recorded in Canberra Central (with an SAR of 66*), Gungahlin-Hall (67*), Woden Central (70) and Canberra North (81).

The largest numbers of admissions for this variable were recorded for children from Tuggeranong South East (195 admissions) and Belconnen West (130 admissions). There were fewer than 80 admissions of children from all other areas.

There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for respiratory system diseases and socioeconomic status.

There were two admissions of children aged from 0 to 4 years from the ACT-Balance Statistical Subdivision for respiratory system diseases, too few cases from which to calculate reliable rates.

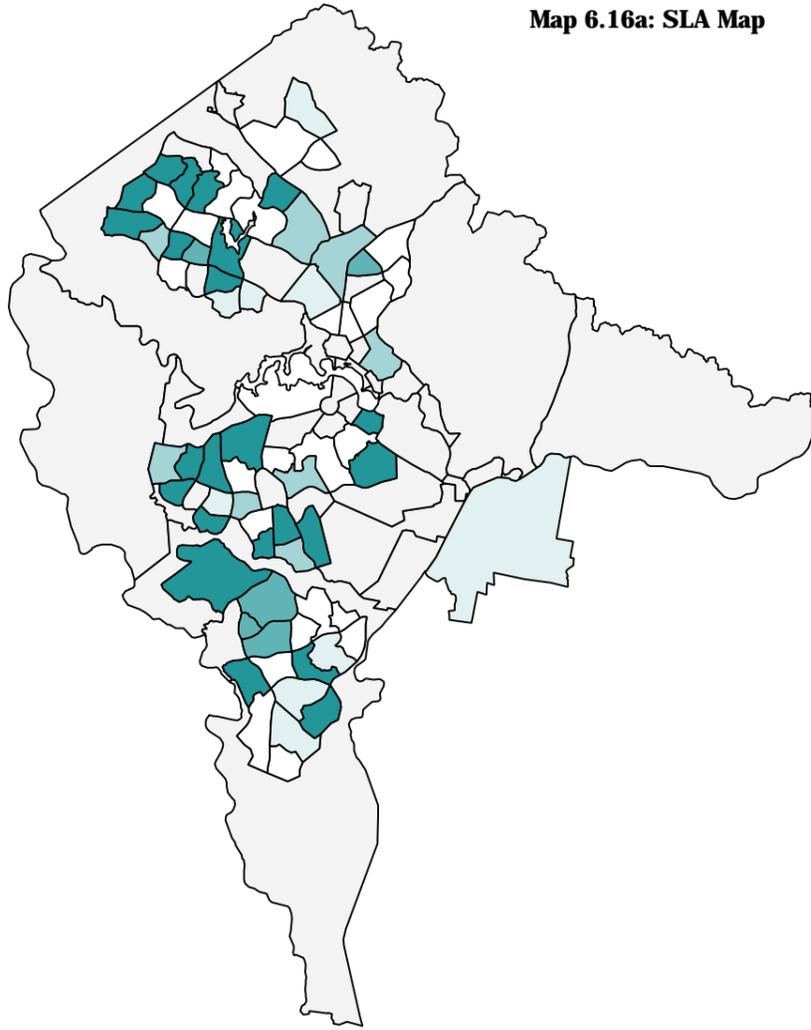
Map 6.16

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

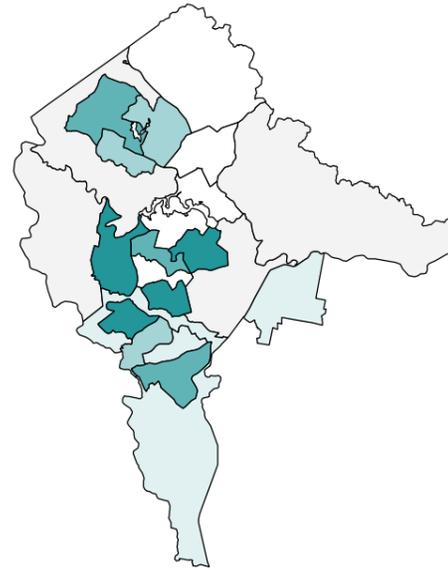
Standardised Ratio: number of admissions in each area compared with the number expected*



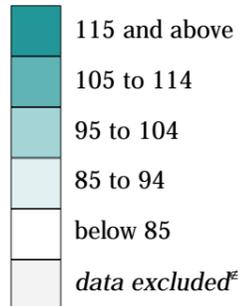
Map 6.16a: SLA Map



Map 6.16: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

^eData have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.22). 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 6.22: 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, more than one third (38.6 per cent) of admissions for cystic fibrosis, bronchitis, emphysema or asthma over 1995/96 were of children aged from 0 to 4 years. Males had substantially higher admission rates in the age groups under 15 years, and higher rates from 65 years, while females had slightly higher rates in the other age groups (with the exception of the 30 to 34 year age group). The distribution of admissions in Queanbeyan is similar to that recorded for the ACT, although males had slightly higher rates in the 45 to 49 year age group.

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 or asthma comprised 23.1 per cent of admissions for all respiratory system diseases of residents of the Australian Capital Territory in 1995/96 (a rate of 229 per 100,000 population); a lower 17.4 per cent was recorded for residents of Queanbeyan (215 per 100,000 population).

Canberra-Queanbeyan (ACT as the Standard)

The 766 admissions for bronchitis, emphysema or asthma comprised 1.4 per cent of all admissions of residents of **Canberra-Queanbeyan**. Males accounted for over half (53.6 per cent) of these admissions.

Statistical Local Areas (SLAs)

The distribution of SARs for admissions for bronchitis, emphysema or asthma was concentrated in the highest and lowest ranges mapped (Map 6.17a). Overall, numbers of

admissions were low, with only three SLAs recording 20 or more admissions and 28 SLAs (28.9 per cent of SLAs) not mapped as fewer than five admissions for were expected from the ACT rates.

Twenty five SLAs had SARs in the top range mapped, with highly elevated ratios in Macquarie (an SAR of 195*, and 11 admissions), Scullin (186*, 13 admissions) and Downer (184*, 13 admissions). The three SLAs with 20 or more residents admitted for bronchitis, emphysema or asthma were also mapped in the top range; Monash (with an SAR of 143), Kambah (129) and Calwell (121).

Of the 28 SLAs mapped in the lowest range, only two had 10 or more admissions (Kaleen, with 13 admissions; and Wanniasa, with 16 admissions).

There were 64 admissions of residents of Queanbeyan for bronchitis, emphysema or asthma, six per cent fewer than expected from the ACT rates (an SAR of 94). Almost two thirds (63.5 per cent) were females.

Postcode-based areas

The highest ratios for admissions for bronchitis, emphysema or asthma at the postcode level were recorded in Kambah (with an SAR of 129), Canberra North (123) and Weston Creek (116). Elevated ratios were also recorded in Belconnen West (114, with the largest number of 103 admissions), Woden South (111), Belconnen South (110) and Woden North (103).

The lowest ratios were recorded in Woden Central (with an SAR of 51, eight admissions), Gungahlin-Hall (55*, 15 admissions) and Tuggeranong South (80, 29 admissions).

There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for bronchitis, emphysema or asthma and socioeconomic status.

There were no admissions for bronchitis, emphysema or asthma in the ACT-Balance Statistical Subdivision in 1995/96.

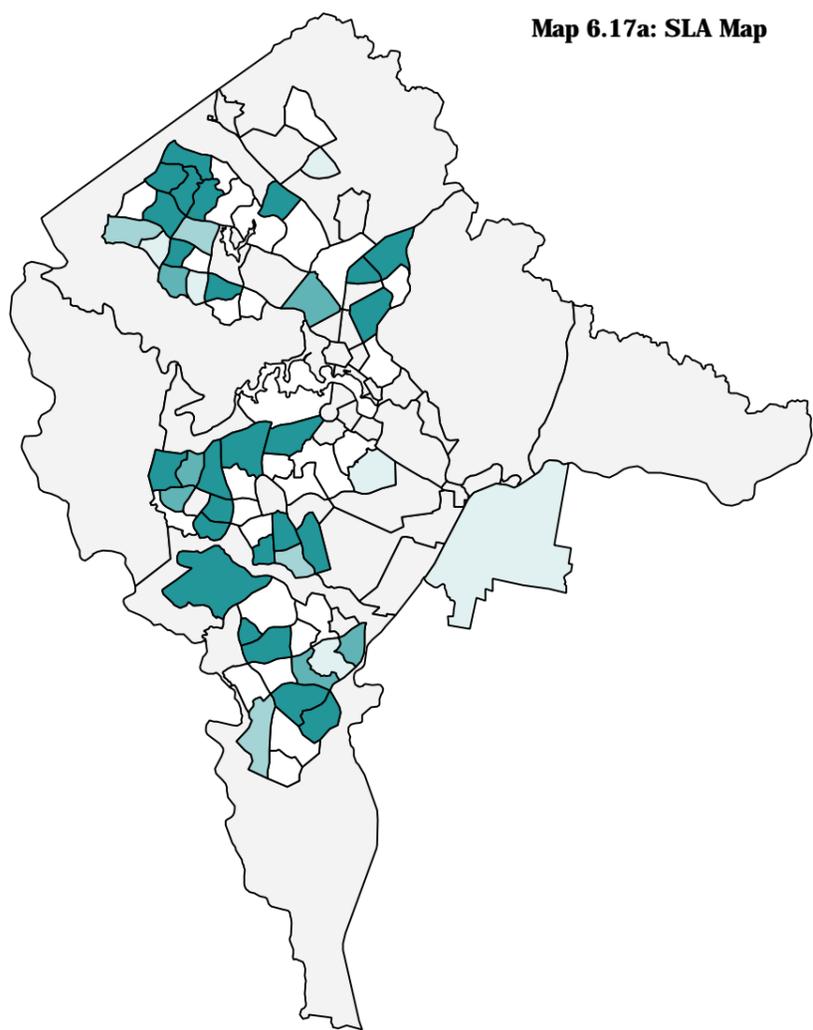
Map 6.17

Admissions for bronchitis, emphysema or asthma, Canberra-Queanbeyan, 1995/1996

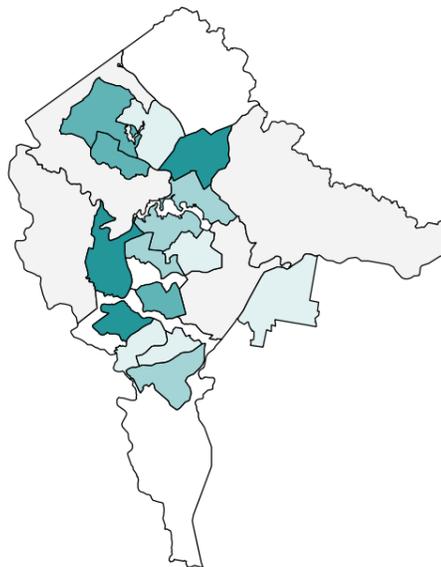
Standardised Ratio: number of admissions in each area compared with the number expected*



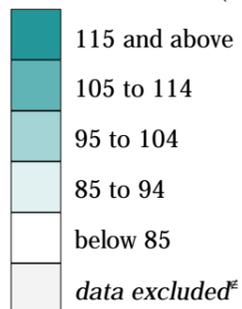
Map 6.17a: SLA Map



Map 6.17b: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.23). Both **Adelaide** and **Perth** had substantially lower ratios in the later period shown in Table 6.23, 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 6.23: 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 7.5 per cent (a rate of 1,235 per 100,000 population) of all admissions studied for residents of the Australian Capital Territory; 10.3 per cent of male admissions and 5.5 per cent of female admissions. A similar proportion was recorded for residents of Queanbeyan, with admissions from accidents, poisonings and violence accounting for 7.3 per cent of all admissions analysed (a rate of 1,433 per 100,000 population). 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 91.8 per cent of admissions from these external causes, and were largely accidental falls (20.0 per cent of all admissions from these external causes) and motor vehicle traffic accidents (6.7 per cent). Admission rates for males were substantially higher for motor vehicle traffic accidents and injury purposely inflicted by another person; and for females, admission rates were higher for accidental falls and attempted suicide or self-inflicted injury. Esterman et al. (1990) found that admission rates from these 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 were of women identified as Indigenous (ABS/AIHW 1999).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 4,127 admissions from accidents, poisonings and violence in **Canberra-Queanbeyan**, of which males accounted for 57.6 per cent and females for 42.4 per cent.

Statistical Local Areas (SLAs)

Residents of Page recorded nearly twice the expected number of admissions from accidents, poisonings and violence (an SAR of

197**). Other elevated ratios of statistical significance were recorded in Campbell (with an SAR of 146**), Ainslie (136**), Narrabundah (134**), Reid (147), Dickson (140), Lyons (139), Richardson (135), Rivett (133) and O'Connor (131).

There were 406 admissions of residents of Queanbeyan from accidents, poisonings and violence, 16 per cent more admissions than were expected from the ACT rates (an SAR of 116**). Over half (54.3 per cent) of the admissions were males.

Thirty six SLAs (40.4 per cent of all mapped SLAs) had ratios in the lowest range mapped. The lowest ratios (of statistical significance) were recorded in Duntroon (with an SAR of 26**, and seven admissions when 27.7 were expected) and Gordon (with an SAR of 60**). The largest numbers of admissions from these external causes were recorded for residents of Kambah (234 admissions) and Kaleen (110).

Postcode-based areas

The highest ratio for accidents, poisonings and violence was recorded in the postcode area of Eastern Fringe, but this accounted for just 28 admissions (an SAR of 169**). Other elevated ratios of significance were recorded in Canberra North (with an SAR of 119**) and Canberra South (115). There were no admissions of residents of Belconnen (Balance), when 5.7 were expected. Low ratios were recorded in Tuggeranong South (with an SAR of 67**), Gungahlin-Hall (75**), Woden South (76**) and Tuggeranong North East (83).

There were correlations of meaningful significance with the variables for low income families (0.68), unemployed people (0.63), public rental housing (0.53) and the Indigenous population (0.51); and inverse correlations with female labour force participation (of substantial significance, -0.83) and high income families (of meaningful significance, -0.64). These results, together with the inverse correlation of meaningful significance with the IRSD (-0.61), indicate the existence at the postcode level of an association between high admission rates from accidents, poisonings and violence and socioeconomic disadvantage.

In the ACT-Balance Statistical Subdivision there were 60 admissions from the combined causes of accidents, poisonings and violence, more than twelve times the number expected from the ACT rates (an SAR of 1220**).

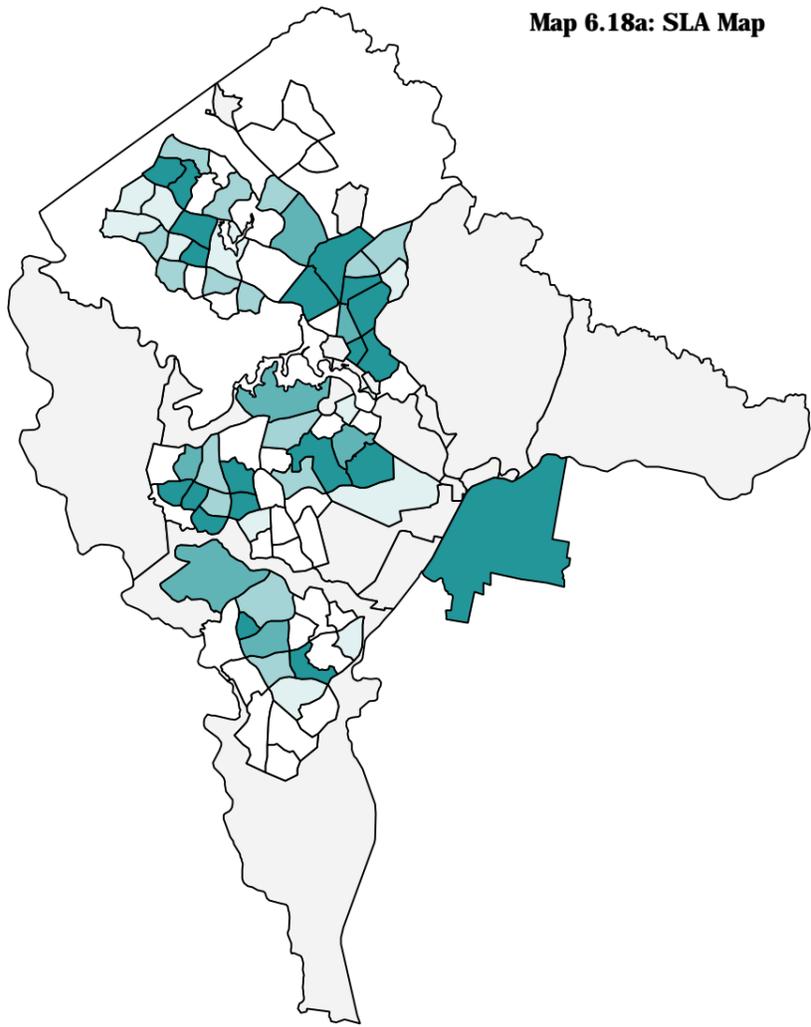
Map 6.18

Admissions from accidents, poisonings and violence, Canberra-Queanbeyan, 1995/1996

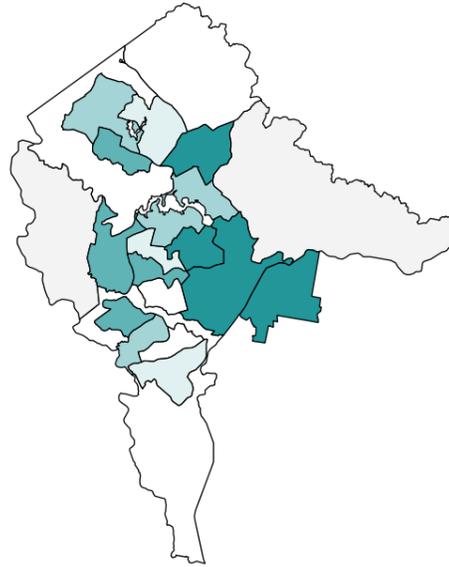
Standardised Ratio: number of admissions in each area compared with the number expected*



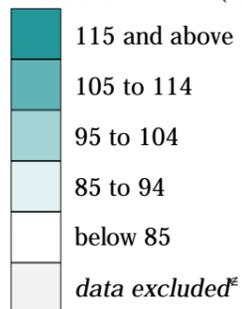
Map 6.18a: SLA Map



Map 6.18b: Postcode Map[#]



Standardised Ratio (as an index)



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

[#]SLAs have been grouped to approximate postcode areas

[€]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

Source: See Data sources, Appendix 1.3

**Details of map boundaries are in Appendix 1.2
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 procedures⁵ 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 6.24** lists a number of sentinel procedures for which data have been published over some years.

⁵A procedure is an intervention that is surgical in nature, carries a procedural risk, carries an anaesthetic risk, requires specialised training, or requires special facilities or equipment only available in an acute setting (National Health Data Committee 1997).

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 rates vary widely at the spatial level.

Descriptions of the procedures for which details are mapped are included in the text accompanying the maps.

In the majority of cases, the procedure is the principal procedure, that is 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 Australian Capital Territory has a standardised admission rate lower than the average of the other States for nearly all of these procedures, with the exception of hip replacement and hysterectomy (**Table 6.24**). Rates for lens insertion, endoscopy and angioplasty were well below the *Other States*' rate.

Table 6.24: Admission rates for selected sentinel procedures, public and private hospitals, 1996/1997

Sentinel procedure	Standardised admission rates ¹		
	Australian Capital Territory	Other States	Difference
Appendectomy	1.17	1.43	-17.9**
Coronary artery bypass graft	0.79	0.91	-12.8
Angioplasty	0.47	0.73	-35.3**
Caesarean section	2.54	2.79	-8.9**
Cholecystectomy	2.09	2.19	-4.5
Endoscopy	13.38	24.15	-44.6**
Hip replacement	1.21	1.00	21.3**
Hysterectomy	1.94	1.84	5.0
Lens insertion	2.45	5.08	-51.8**
Myringotomy	1.91	2.30	-17.2**
Tonsillectomy	1.65	1.86	-11.0**

¹Admission 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 6.25**. Standardised admission ratios in the Australian Capital Territory were lower (relative to the Australian rates) in 1996/97 than they were in 1986 for all of the procedures shown in the table, with the exception of hip replacement.

Table 6.25: Standardised admission ratios¹ for selected surgical procedures, Australian Capital Territory

Procedure	1986	1996/97
Appendectomy	98.9	81.8
Caesarean section	143.2	91.0
Cholecystectomy	110.7	95.9
Hip replacement	108.0	121.0
Hysterectomy	115.0	105.4
Lens insertion	158.3	48.5
Tonsillectomy	108.6	88.7

¹Admission ratios are age- and sex-standardised to the Australian population

Source: 1986 data from Renwick, M. & Sadkowsky, K. *Variations in surgery rates*, Australian Institute of Health & Welfare: 1996/97 data based on Australian Hospital Statistics, Australian Institute of Health & Welfare, June 1998

Context

Australia

There were 2,593,937 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 54.3 per cent of all admissions studied in this project (which includes all acute admissions, other than for renal dialysis). Nearly two thirds (63.0 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 7.2 per cent were of residents of the other major urban centres and 29.8 per cent were of residents of the non-metropolitan areas. Females accounted for 57.3 per cent of admissions, varying from 58.2 per cent of admissions of residents of the capital cities to 55.7 of non-metropolitan residents. Less than half (46.3 per cent) of these principal procedures were performed on a same day basis, with males having slightly more procedures on a same day basis (47.2 per cent of all male principal procedures, compared with 45.6 per cent for females).

The Australian Capital Territory

In 1995/96, there were 28,286 admissions of residents of the Australian Capital Territory to public acute and private hospitals (including day surgery facilities), 1.1 per cent of all admissions in Australia, at which at least one surgical procedure was performed. These admissions involving a surgical procedure represented 56.5 per cent of all admissions of residents of the Australian Capital Territory in this analysis (which includes all acute admissions, other than for renal dialysis). Females accounted for 59.9 per cent of admissions. Again less than half (42.2 per cent) of the procedures were done as same day admissions, with males having slightly more of their principal procedures on a same day basis (44.0 per cent of all male principal procedures compared with 40.9 per cent for females).

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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 6.26: 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 over a half (56.5 per cent) of the admissions to acute hospitals of residents of the Australian Capital Territory involved a surgical procedure. Females accounted for 59.9 per cent of the such admission, and males for 40.1 per cent. For females, admission rates were highest in the 25 and 34 year age groups and again from age 60, while for males, they were most common among those aged from their late fifties, increasing with each age group (**Figure 6.9**, page 120). The age distribution of admissions for residents of Queanbeyan was different to that recorded for both male and female residents of the ACT, with the rates for male residents remaining consistent for those aged from their late fifties, only increasing substantially among those aged 85 years and over. The admission rates for females were generally consistent from the age of 20 years.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 30,894 admissions of residents of **Canberra-Queanbeyan**, of which males accounted for 57.6 per cent and females for 42.4 per cent.

Statistical Local Areas (SLAs)

Although the standardised admission ratios for admissions for surgical procedures ranged widely, from 354** to 0**, the majority of SLAs in **Canberra-Queanbeyan** had ratios within 15 per cent of the level expected from the ACT rates (**Map 6.19a**).

The highest ratio was recorded in Tuggeranong (Balance), represented a comparatively low number of 42 admissions involving a surgical procedure (an SAR of 354**), as did the second highest ratio, recorded in Pialligo and representing 21 admissions (an SAR of 162*). Other SLAs with ratios elevated by 15 per cent or more above the expected level included Ngunnawal (133**), Charnwood (127**), Rivett (124**), Page (122**), Palmerston (121**), Theodore (118**), and Narrabundah and Calwell (both with an SAR of 115**).

In 1995/96, there were 2,739 admissions of people living in Queanbeyan involving a surgical procedure, five per cent more than were expected from the ACT rates (an SAR of 105**). Well over half (60.6 per cent) of the admissions were females.

Twenty two SLAs had ratios in the lowest range mapped; all but two of these ratios were highly statistically significant. There were no admissions involving a surgical procedure of residents of Belconnen (Balance) and Hall (when 35.4 and 33.3, respectively

were expected). Residents of Duntroon had five admissions when 111 were expected for a population of this size and age/sex composition (an SAR of 5**): see the note on page 126 re the low rates in this SLA. SLAs mapped in the lowest range and with more than 20 admissions included Acton (with an SAR of 25**), Symonston (52**), Red Hill (74**), Gowrie (75**) and Bruce (76**).

The largest numbers of admissions involving a surgical procedure were recorded for residents in Kambah (1,650 admissions), Wanniasa (775), Kaleen (738) and Narrabundah (654).

Postcode-based areas

All but five postcode areas were mapped in the middle three ranges for this variable (**Map 6.19b**). Eastern Fringe (with an SAR of 118*) was the only area mapped in the top range. SARs elevated by between 5 and 15 per cent above the level expected from the ACT rates were recorded for residents of Gungahlin-Hall (with an SAR of 111**), Tuggeranong South East (109**), Belconnen West (107**) and Kambah (106*).

Of the four postcode areas mapped in the lowest range, only Canberra Central (with an SAR of 83**) had more than 20 admissions involving a surgical procedure.

The largest numbers of admissions involving a surgical procedure were recorded for residents of Belconnen West (3,953 admissions), Canberra North (2,755 admissions) and Tuggeranong South East (2,738 admissions).

There were weak correlations with the indicators of socioeconomic disadvantage (the strongest with the variables for the Indigenous population (0.44) and private dwellings without a motor vehicle (0.39)); and an inverse correlation of meaningful significance with female labour force participation (-0.50). These results, together with the inverse correlation of substantial significance with the IRSD (-0.15), suggest the existence of an association at the postcode level between high rates of admission involving a surgical procedure and socioeconomic disadvantage.

In 1995/96, there were 131 admissions of residents of the ACT-Balance Statistical Subdivision for a surgical procedure, more than three and a half times the number expected from the ACT rates (an SAR of 371**).

Map 6.19

Admissions for surgical procedures, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.26**), standardised admission ratios (SARs) for same day admissions involving a surgical procedure (**Table 6.27**) 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 6.27: 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

Just under half (42.2 per cent) of all admissions of residents of the Australian Capital Territory in 1995/96 involving a surgical procedure were same day admissions. Females accounted for over 50 per cent (56.8 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 60 to 64 years (**Figure 6.10**, page 120). For males, the largest differentials over the rates for females were in the 0 to 4 year age group and from age 65 years. Admission rates for female residents of Queanbeyan were also higher than those recorded for males in the age groups from 15 to 64 years: however, for males, the largest differentials over the rates for females were in the age groups from age 80 years and over.

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 13,100 same day admissions of residents of **Canberra-Queanbeyan**. Females accounted for 7,630 of the admissions (58.2 per cent) while 5,470 (41.8 per cent) were for males.

Statistical Local Areas (SLAs)

There were 11 same day admissions involving a surgical procedure in Pialligo, twice the number expected from the ACT rates (an SAR of 204*). Other elevated ratios of statistical significance (but with at least 20 same day admissions) were recorded in Rivett (with an SAR of 135**), Charnwood (135**), Pearce (123*), Florey (120**), Palmerston (119*), Latham (118*), Calwell (116*) and Narrabundah (114*).

There were 1,211 same day admissions for a surgical procedure of residents of Queanbeyan, 11 per cent more admissions than were expected from the ACT rates (an SAR of 111**). Over half (58.7 per cent) of the admissions were females.

Of the 21 SLAs mapped in the lowest range (**Map 6.20a**), residents of nine had fewer than 20 admissions. There were no admissions of people living in Belconnen (Balance) and Hall (when 14.7 and 14.2, respectively, were expected). Highly significant ratios were also recorded in Duntroon (4**, two admissions when 46.5 were expected: see the note on page 126 re the low rates in this SLA) and Acton (14**, seven admissions, compared to an expected 50.9 admissions). SLAs also mapped

in the lowest range and with at least 20 admissions for a same day procedure included Gowrie (with an SAR of 66**), Red Hill (67**), Chifley (71**) and Turner (73**).

The largest numbers of admissions were recorded for residents of Kambah (723 admissions), Wanniasa (324 admissions) and Kaleen (299 admissions).

Postcode-based areas

Most postcode areas had ratios for same day admissions for all surgical procedures in the middle three ranges mapped (**Map 6.20b**). The only postcode area with a ratio in the top range was Eastern Fringe (an SAR of 115). A further seven postcode areas had elevated ratios, ranging from 113** in Belconnen West to 101 in Belconnen South. The only other elevated ratio of statistical significance was recorded in Tuggeranong South East (an SAR of 106*).

The two lowest ratios, recorded in Belconnen (Balance) (an SAR of 0**) and Kowen/Majura (29*), accounted for just zero and four admissions, respectively. Other SLAs mapped in the lowest range were Canberra Central (with an SAR of 78**) and Woden Central (84**).

The largest numbers of admissions for this variable were recorded for residents of Belconnen West (1,780 admissions), Canberra North (1,117) and Tuggeranong South East (1,116).

There were weak correlations with the indicators of socioeconomic disadvantage (the strongest with the variable for single parent families (0.51)); and an inverse correlation of meaningful significance with female labour force participation (-0.68) (and weaker inverse correlations with other indicators of high socioeconomic status). These results, together with the inverse correlation of substantial significance with the IRSD (-0.15), suggest the existence of an association at the postcode level between high rates of same day admission involving a surgical procedure and socioeconomic disadvantage.

There were 44 same day admissions of residents of the ACT-Balance Statistical Subdivision for surgical procedures in 1995/96, more than three times the number expected from the ACT rates (an SAR of 304**).

Map 6.20

Same day admissions for surgical procedures, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 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 6.28**), from a low of 65** in **Canberra** to a high of 136** (more than double the ratio in **Canberra**) in **Adelaide**.

Table 6.28: 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 Australian Capital Territory were aged under 30 years. The largest number and rate of admissions for a tonsillectomy and/or adenoidectomy was for the 5 to 9 year age group, with 465 procedures per one hundred thousand females and 467 procedures per one hundred thousand males. Up until the age of 34 years, females had the highest admission rates for all except for the 0 to 4 year age group (with 280 admissions per 100,000 females compared with 450 admissions per 100,000 males) and with substantially higher rates than for males in the age groups from 10 to 24 years. Overall, 56.2 per cent of admissions were females. Admission rates for residents of Queanbeyan were highest for males in the 5 to 9 (a rate of 472 per 100,000 population) and 10 to 14 (434 per 100,000 population) year age groups and highest for females in the 5 to 9 (336 per 100,000 population) and 15 to 19 (456 per 100,000 population) year age groups. No admissions were recorded in Queanbeyan for males over the age of 25 years (with the exception of the 65 to 69 year age group) or for females over the age of 35 years.

Data for Australia published by the AIHW (1998) showed the tonsillectomy and/or adenoidectomy rate in the Australian Capital Territory to be 11.0 per cent below that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 411 admissions for tonsillectomies and/or adenoidectomies of residents of **Canberra-Queanbeyan**. Over half (55.5 per cent) of the admissions were females.

Statistical Local Areas (SLAs)

Five or more admissions for tonsillectomies and/or adenoidectomies were expected (from the ACT rates) in only 24.7 per cent of SLAs (24 SLAs) in **Canberra-Queanbeyan** (**Map 6.21a**). SLAs with high SARs for this variable tended to be located in the north and south of **Canberra**.

The highest ratio was recorded in Kaleen (with an SAR of 225**, 24 admissions) and residents of Kambah (with an SAR of 99)

recorded 23 admissions, close to the number expected from the ACT rates (23.2). These were the only SLAs with 20 or more admissions for these procedures. The only other statistically significant elevated ratio, an SAR of 158* recorded in Wanniasa, represented 19 admissions. There were fewer than 10 admissions for this variable in the majority of SLAs.

There were 33 admissions of residents of Queanbeyan admissions for tonsillectomies and/or adenoidectomies, 10 per cent fewer than were expected from the ACT rates (an SAR of 90). Just over half (52.0 per cent) of the admissions were males.

Postcode-based areas

Of the four postcode areas with ratios in the top range mapped, only that in Belconnen North (an SAR of 170**) was statistically significant (**Map 6.21b**). All other elevated ratios were recorded in central and southern postcode areas, including Tuggeranong North West (with an SAR of 132), Woden South (125) and Weston Creek (123).

A cluster of the postcode areas of Woden North (with an SAR of 62, and seven admissions when 11.3 were expected), Canberra South (62, 10 admissions compared to an expected 16.0) and Canberra Central (64, 13 admissions compared to an expected 20.3) had the lowest ratios. Belconnen West (with an SAR of 83) was the only area mapped in the lowest range with more than 20 admissions for tonsillectomies and/or adenoidectomies.

The largest numbers of admissions for tonsillectomies and/or adenoidectomies were recorded for residents of Belconnen North and Tuggeranong South East (both with 54 admissions) and Belconnen West (44 admissions).

There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for tonsillectomies and/or adenoidectomies and socioeconomic status.

There was only one admission for a tonsillectomy and/or adenoidectomy of residents of the ACT-Balance Statistical Subdivision in 1995/96, insufficient cases from which to calculate reliable rates.

Map 6.21

Admissions for a tonsillectomy and/or adenoidectomy, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 6.29**), 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 6.29: 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 (82.3 per cent) of admissions of Australian Capital 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 (52.3 per cent) of the admissions for this procedure in the Australian Capital Territory, with most of the remainder (30.0 per cent) in the 5 to 9 year age group. Males accounted for over half (58.0 per cent) of all admissions for myringotomies and slightly more (63.2 per cent) in the 0 to 4 year age group.

Data for Australia published by the AIHW (1998) showed the myringotomy rate in the Australian Capital Territory to be 17.2 per cent below that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 289 admissions of 0 to 9 year olds in **Canberra-Queanbeyan** for a myringotomy, 4 per cent fewer than were expected from the ACT rates (an SAR of 96). This low ratio is a result of the very low ratio in Queanbeyan (an SAR of 59). Close to two thirds (62.2 per cent) were females.

Statistical Local Areas (SLAs)

Overall, the numbers of admissions of 0 to 9 year olds in **Canberra-Queanbeyan** for a myringotomy were very low, with no SLA recording more than 20 admissions and about a third of SLAs with none at all. Only 15 SLAs have been mapped, as the remainder had fewer than five expected admissions for this procedure (**Map 6.22a**).

Children aged from 0 to 9 years in Queanbeyan had 17 admissions for a myringotomy, 41 per cent fewer admissions

than were expected from the ACT rates (an SAR of 59). Over one half (60 per cent) of the admissions were males.

Of the remaining SLAs, just four had 10 or more admissions for a myringotomy in 1995/96. The highest ratio was recorded in Wanniasa (an SAR of 191*, representing 13 admissions when 6.8 were expected). Young children from Chisholm (with an SAR of 138) also had 13 admissions. The largest number of admissions for a myringotomy was recorded for children of Kambah (16 admissions).

Postcode-based areas

Even at the postcode level, the numbers of admissions of young children for a myringotomy were low, with just four postcode areas recording 20 or more admissions (**Map 6.22b**). The highest ratio was recorded in Tuggeranong North West (an SAR of 133, representing 14 admissions when 10.5 were expected from the ACT rates). Twenty or more admissions were recorded for children in Belconnen West (with an SAR of 123), Belconnen North (123), Canberra North (118) and Tuggeranong South East (an SAR of 100 and the largest number of 49 admissions for a myringotomy).

The lowest ratios were recorded in Tuggeranong South (with an SAR of 48*, and 10 admissions when 21 were expected) and Weston Creek (72, 12 admissions compared to an expected 16.6).

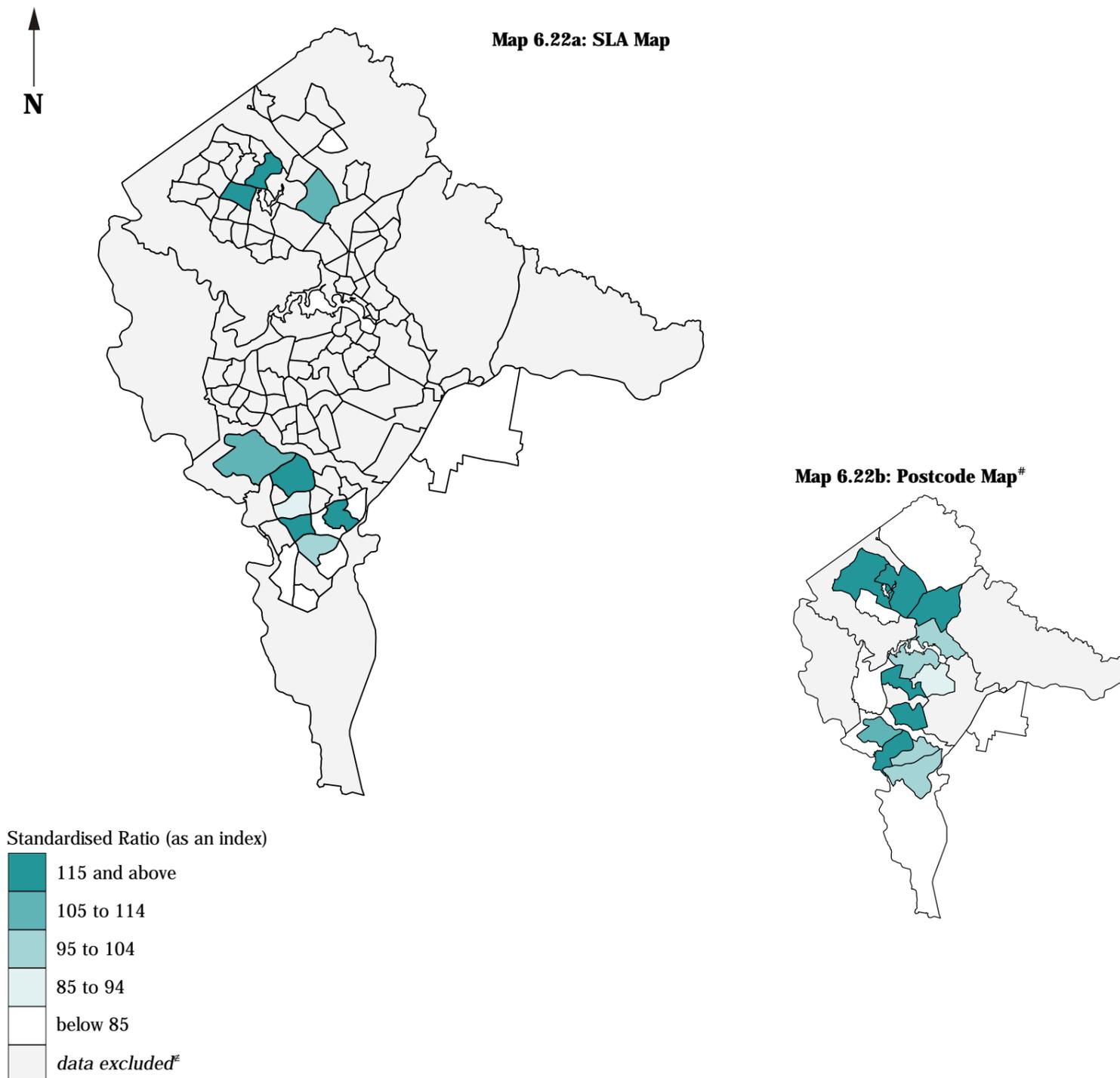
There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for a myringotomy and socioeconomic status.

In the ACT-Balance Statistical Subdivision there were two admissions of 0 to 9 year olds for a myringotomy, too few cases from which to calculate reliable rates.

Map 6.22

Admissions of children aged 0 to 9 years for a myringotomy, Canberra-Queanbeyan, 1995/1996

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



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

[#]SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 6.30: 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, that is the range of ages used in standardising the data.

Data for Australia published by the AIHW (1998) showed the Caesarean section rate in the Australian Capital Territory to be 8.9 per cent below that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 859 admissions of females aged from 15 to 44 years from **Canberra-Queanbeyan** for a Caesarean section, 4 per cent more than expected from the ACT rates (an SAR of 104). This elevated ratio is a result of the higher than expected numbers of admissions of females from Queanbeyan (an SAR of 142**).

Statistical Local Areas (SLAs)

Standardised admission ratios tended to be concentrated in the highest and lowest ranges (**Map 6.23a**). However, while 23 SLAs were mapped in the highest range, only four had ratios of statistical significance. The highest ratios were recorded in Mawson (with an SAR of 172, 10 admissions when 5.8 were expected), Ngunnawal (160*, 18 admissions compared to an expected 11.2), Calwell (158**) and Banks (158*). Other SLAs mapped in the top range (and with more than 20 admissions) were Theodore (with an SAR of 146) and Palmerston (143).

Females in all but two SLAs mapped in the lowest range had fewer than 10 admissions for a Caesarean section; Monash (84, 14 admissions) and Evatt (79, 11 admissions).

There were 105 admissions of females aged from 15 to 44 years living in Queanbeyan, 44 per cent more admissions for a Caesarean section than were expected from the ACT rates (an SAR of 144**).

Postcode-based areas

Females aged from 15 to 44 years from four postcode areas had SARs for a Caesarean section elevated by more than 15 per cent (**Map 6.23b**); Tuggeranong South (with an SAR of 126), Tuggeranong South East (122*), Gungahlin-Hall (122) and Weston Creek (115). Elevated ratios were also recorded in Kambah (with an SAR of 111), Woden South (110) and Woden North (110).

The lowest ratios for admissions for Caesarean sections tended to be in the central areas of **Canberra**. Females from Woden Central (with an SAR of 54*, 11 admissions), Canberra South (58*, 19 admissions) and Canberra Central (70*) had significantly fewer admissions than were expected from the ACT rates.

The largest numbers of admissions for Caesarean sections were of females from Tuggeranong South East (129 admissions), Belconnen West (98) and Tuggeranong South (60 admissions).

There were correlations of meaningful significance with the variables for unskilled and semi-skilled workers and children aged from 0 to 4 years (both 0.67) and early school leavers (0.58), as well as inverse correlations of meaningful significance with the variables for managers and administrators, and professionals (-0.70) and public rental housing (-0.68). Despite these strong associations, correlations with a number of the other variables (including the IRSD) were less consistent and it is not clear what the relationship is with socioeconomic status.

Correlations of substantial significance were also recorded with the variables for the Total Fertility Rate (0.75) and admissions for an hysterectomy (0.76).

In 1995/96 there were two admissions for Caesarean sections of female residents of the ACT-Balance Statistical Subdivision aged between 15 and 44 years, too few cases from which to calculate reliable rates.

Map 6.23

Admissions of females aged 15 to 44 years for a Caesarean section, Canberra-Queanbeyan, 1995/1996

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



*Expected numbers were derived by age standardisation, based on ACT totals

[#]SLAs have been grouped to approximate postcode areas

[¶]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 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 6.31: 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 undergoing 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: 126 admissions and a rate of 1026 per one hundred thousand females; 45 to 49 years: 125 admissions and a rate of 1128 per one hundred thousand females). Female residents of Queanbeyan also recorded the largest number and rate of hysterectomy admissions in the 40 to 44 year age group (18 admissions and a rate of 1,917 per one hundred thousand population). As relatively few hysterectomies are performed on women younger than 30 years, the age range used in standardising this data is of women from 30 years.

Data for Australia published by the AIHW (1998) showed the hysterectomy rate in the Australian Capital Territory to be 5.0 per cent above that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 509 admissions of females aged 30 years and over for an hysterectomy in **Canberra-Queanbeyan**, 4 per cent more than expected from the ACT rates. This elevated ratio is a result of the larger than expected numbers of admissions of females from Queanbeyan (an SAR of 152^{**}).

Statistical Local Areas (SLAs)

The numbers of admissions for an hysterectomy at the SLA level in **Canberra-Queanbeyan** were very low and, consequently, over half of the SLAs have not been mapped (**Map 6.24a**). Kambah was the only SLA with more than 20 admissions for an hysterectomy (an SAR of 135^{*} and 42 admissions) and the majority of SLAs had fewer than 10 admissions. Females in Evatt had the second largest number of admissions (13 admissions when 10.6 admissions were expected for a population of this size and age composition).

The highest ratios were recorded in McKellar (with an SAR of 174, and nine admissions when 5.2 were expected), Chisholm (168, 12 admissions when 7.1 were expected) and Calwell (153, 10 admissions when 6.5 were expected). There were 57 admissions of females aged 30 years and over from Queanbeyan for an hysterectomy, 52 per cent more admissions than expected from the ACT rates (an SAR of 152^{**}).

Postcode-based areas

The postcode areas mapped in the highest range were located in the northern and southern areas of **Canberra (Map 6.24b)**. The highest ratio was recorded in Gungahlin-Hall (an SAR of 151 and 14 admissions). Other postcode areas with ratios elevated by 15 per cent or more were Tuggeranong South East (with an SAR of 139^{*}), Kambah (135^{*}), Tuggeranong South (130 and 11 admissions) and Tuggeranong North East (126). Elevated ratios were also recorded in Woden North (with an SAR of 112) and Belconnen North (105).

Females living in Canberra South (with an SAR of 69, and 16 admissions), Woden Central (74, eight admissions), Canberra North (79), Woden South (82) and Tuggeranong North West (84, 17 admissions) had at least 15 per cent fewer admissions of females aged 30 years and over for an hysterectomy than expected from the ACT rates.

In 1995/96, the largest numbers of admissions for an hysterectomy were of females from Belconnen West (59 admissions), Tuggeranong South East (49) and Kambah and Belconnen North (both with 42 admissions).

There was a correlation of substantial significance with the variable for children aged from 0 to 4 years (0.71), and of meaningful significance with unskilled and semi-skilled workers (0.62) and early school leavers (0.60). Inverse correlations of meaningful significance were recorded with the variables for managers and administrators, and professionals (-0.66), public rental housing (-0.61) and private dwellings without a motor vehicle (-0.54). Despite these strong associations, correlations with a number of the other variables (including the IRSD) were less consistent and it is not clear what the relationship is with socioeconomic status.

Correlations of substantial significance were also recorded with the variables for the Total Fertility Rate (0.79) and admissions for a Caesarean section (0.76).

Female residents of the ACT-Balance Statistical Subdivision, aged 30 years and over, had no admissions for an hysterectomy in 1995/96.

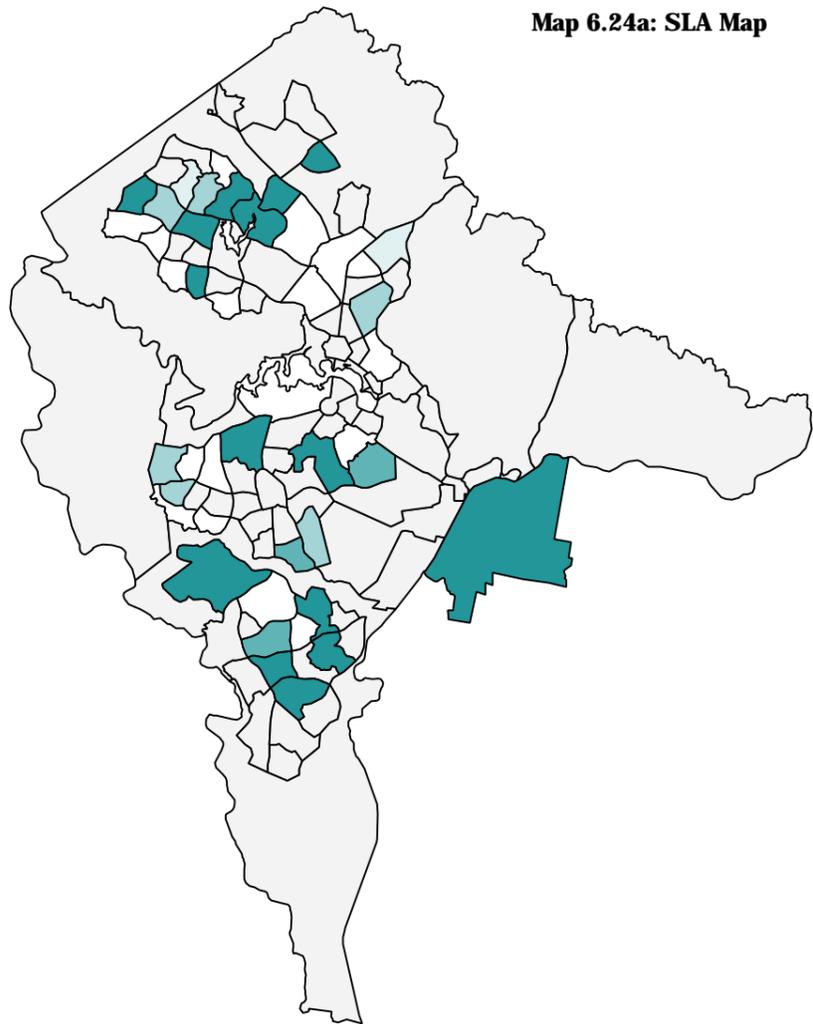
Map 6.24

Admissions of females aged 30 years and over for an hysterectomy, Canberra-Queanbeyan, 1995/1996

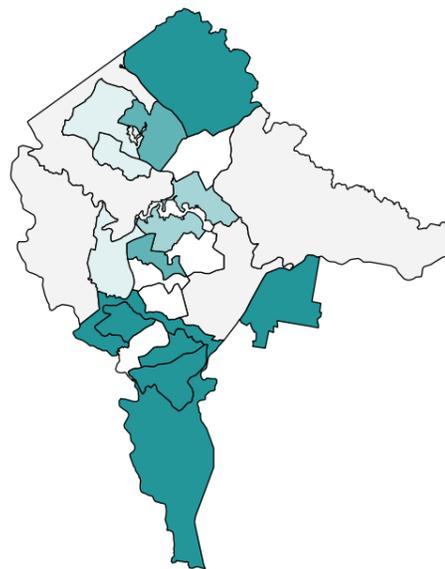
Standardised Ratio: number of admissions in each area compared with the number expected*



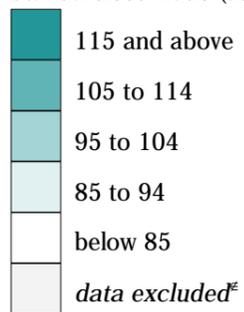
Map 6.24a: SLA Map



Map 6.24b: Postcode Map#



Standardised Ratio (as an index)



*Expected numbers were derived by age standardisation, based on ACT totals

#SLAs have been grouped to approximate postcode areas

€Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 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 6.32: 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.

Females accounted for over half (60.6 per cent, a rate of 67 per 100,000 female population) the admissions for a hip replacement performed in the Australian Capital Territory in 1995/96. Overall, the admission rate is higher for females than males at most age groups, with the exception of the 65 to 79 year age groups. Rates for 65 to 69 year olds are 267 admissions per 100,000 population for females and 361 for males; for 70 to 74 year olds rates are 393 and 447 respectively; and for those 75 to 79 year olds are 495 and 550 respectively. Admission rates for hip replacement are also higher for females (an overall rate of 150 per 100,000 female population) at most age groups in Queanbeyan, with the exception of those aged 25 to 29 years, 40 to 44 years and 60 to 64 years.

Data for Australia published by the AIHW (1998) showed the hip replacement rate in the Australian Capital Territory to be 21.3 per cent above that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96 there were 201 admissions of residents in **Canberra-Queanbeyan** for hip replacements, nine per cent more than expected from the ACT rates. This elevated ratio is a result of the larger than expected numbers of admissions of people living in Queanbeyan (an SAR of 212**).

Statistical Local Areas (SLAs)

The numbers of hip replacements at the SLA level in **Canberra-Queanbeyan** were very low, with no SLAs recording more than 10 admissions, and over a third with no cases at all. Only two SLAs had five or more expected admissions; in Kambah there were two admissions for a hip replacement when 6.9 were expected from the ACT rates (an SAR of 29) and in Narrabundah there were six admissions, when 5.2 were expected (an SAR of 112). People living in Deakin had the largest number of admissions for a hip replacement (nine admissions, when 3.2 admissions were expected from the ACT rates for this procedure).

In 1995/96, there were 33 admissions of residents of Queanbeyan for a hip replacement, over twice the number expected from ACT rates (an SAR of 212**). Almost two thirds (63.3 per cent) were females.

Postcode-based areas

Even at the postcode level, the numbers of admissions for a hip replacement were low, and just two areas had more than 20 admissions. Eight postcode areas had fewer than five expected admissions and have not been mapped (**Map 6.25**).

The postcode areas with elevated ratios were located in the northern part of **Canberra**. The highest ratios were recorded in Weston Creek (with an SAR of 131, 22 admissions) and Canberra North (128, with the largest number of 29 admissions). Elevated ratios (but fewer than 20 admission for a hip replacement) were recorded in Belconnen North (with an SAR of 125, 12 admissions), Belconnen South (121, 18 admissions), Canberra Central (116, 19 admissions) and Woden North (110, 11 admissions).

The four postcode areas mapped in the lowest range had 10 or fewer admissions for a hip replacement. The lowest ratios were recorded in Kambah (with an SAR of 29, two admissions compared), Woden South (47, six admissions) and Tuggeranong South East (59, four admissions).

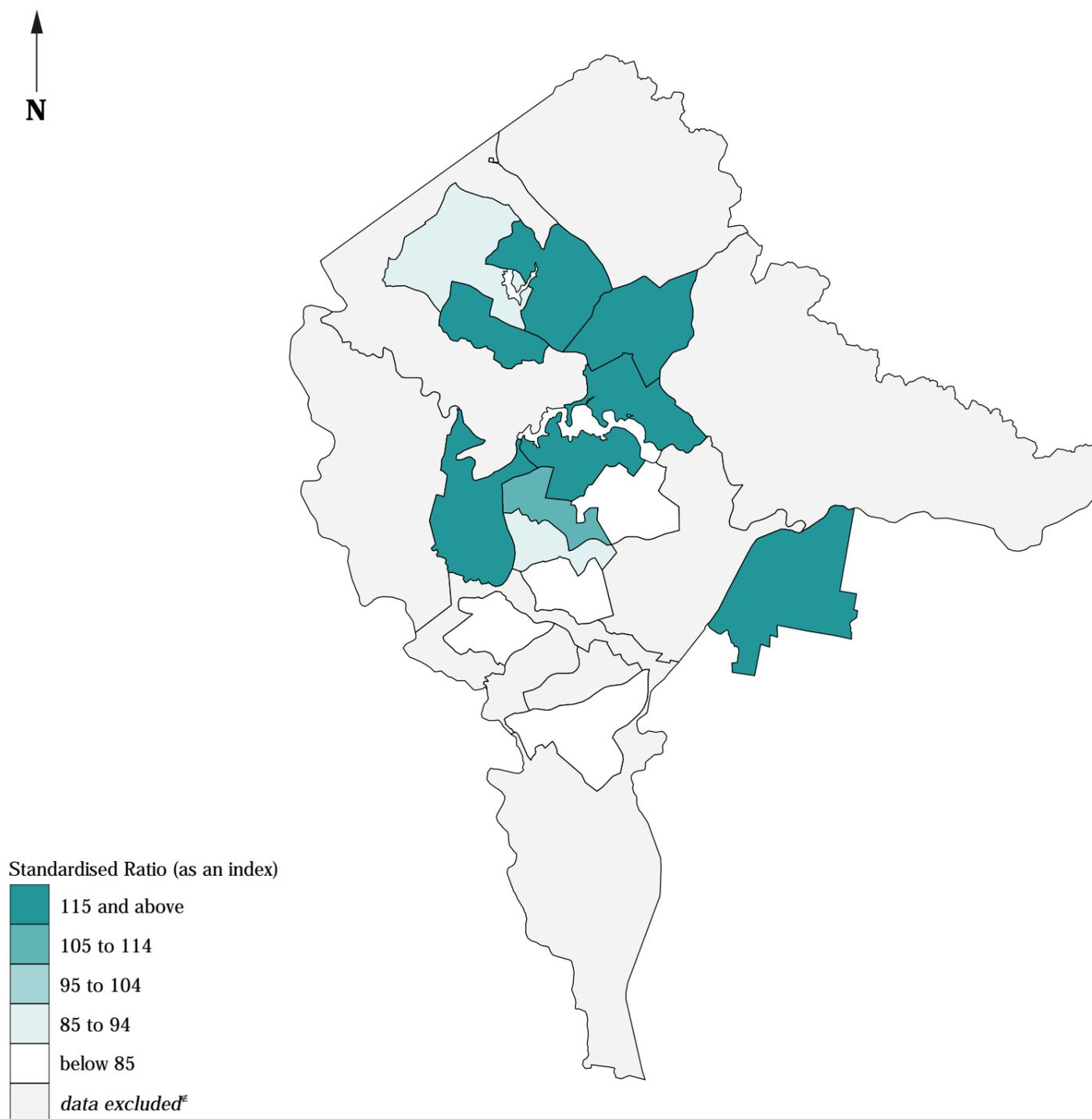
The correlation analysis was not undertaken as there were too many areas with small numbers of cases.

In 1995/96, there was one admission of residents in the ACT-Balance Statistical Subdivision for hip replacement, too few cases from which to calculate reliable rates.

Map 6.25

Admissions for a hip replacement, Canberra-Queanbeyan, 1995/1996

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



*SLAs have been grouped to approximate postcode areas

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

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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^{**}).

Table 6.33: 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) showed the lens insertion rate in the Australian Capital Territory to be 51.8 per cent below that in the other States (Table 6.24, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, residents of **Canberra-Queanbeyan** recorded 373 admissions for a lens insertion. Females accounted for almost two thirds (63.7 per cent) of the admissions. Admission rates per one hundred thousand of population for a lens insertion were variable and low up to the 50 to 54 year age group. However, both male and female admission rates increased notably from the age of 55 years and above, with females recording considerably higher rates than males from the 60 to 64 year age group and up. The highest rates were recorded for the 80 to 84 year age group for both males (2,032.8 admissions per one hundred thousand males) and females (3,286.0 admissions per one hundred thousand females).

Statistical Local Areas (SLAs)

The numbers of admissions for a lens insertion in individual SLAs were very low, with residents of Narrabundah (with an SAR of 123) recording the largest number of 15 admissions. Almost three quarters (74.2 per cent) of SLAs had fewer than five expected admissions for this procedure and were not mapped (Map 6.26a).

The highest ratio, an SAR of 216^{**} recorded in Mawson, represented 12 admissions (when 5.5 were expected from the ACT rates). The second highest ratio was recorded in Lyneham (and SAR of 153, and nine admissions).

There were 42 admissions of residents of Queanbeyan for a lens insertion, 38 per cent more admissions than were expected from the ACT rates (an SAR of 138^{*}). Over half (59.8 per cent) of the admissions were females.

Postcode-based areas

The two highest standardised admission ratios for lens insertion were in the southern postcode areas of Tuggeranong North East (with an SAR of 186^{*}, and 14 admissions when 7.5 were expected from the ACT rates) and Tuggeranong South East (159, 17 admissions compared to an expected 10.7) (Map 6.26b). Elevated ratios were also recorded to the north of the city in Belconnen South (with an SAR of 128) and Belconnen West (110) recording 28 per cent and 10 per cent more admissions than expected, respectively. Woden South (104) also had an elevated ratio.

The lowest ratio (in SLAs with more than 20 admissions for a lens insertion) was recorded in Canberra South (an SAR of 65^{*}). Other low ratios were recorded in Tuggeranong North West (60, 5 admissions), Woden Central (78, 8 admissions) and Kambah (87, 10 admissions).

The numbers of admissions for a lens insertion were low even at the postcode level, with the largest numbers recorded for residents of Canberra North (45 admissions), Belconnen West (38 admissions) and Belconnen South (37 admissions).

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

A total of three admissions involving a lens insertion were recorded for residents of the ACT-Balance Statistical Subdivision, too few cases from which to calculate reliable rates.

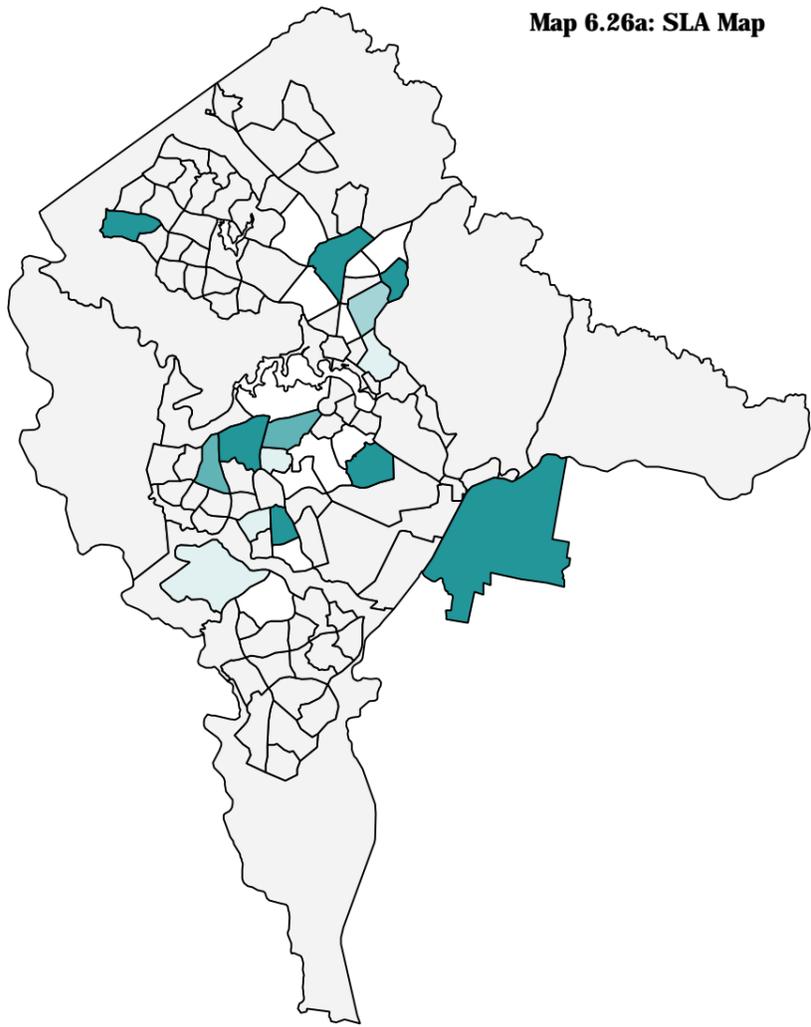
Map 6.26

Admissions for a lens insertion, Canberra-Queanbeyan, 1995/1996

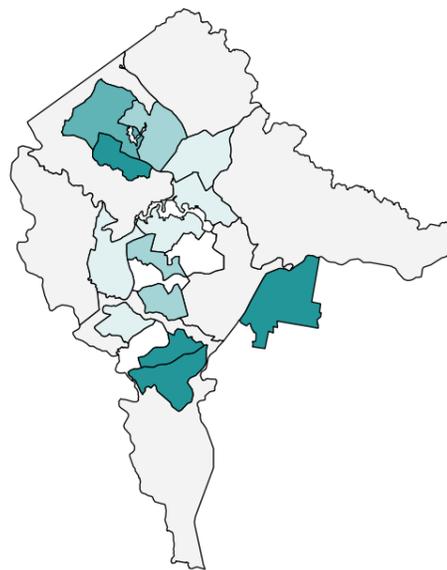
Standardised Ratio: number of admissions in each area compared with the number expected*



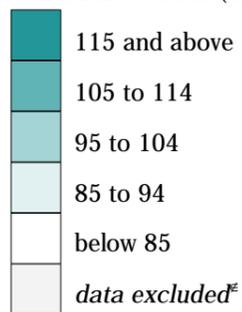
Map 6.26a: SLA Map



Map 6.26b: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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 6.34: 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) showed the endoscopy rate in the Australian Capital Territory to be 44.6 per cent below that in the other States (**Table 6.24**, page 163).

Canberra-Queanbeyan (ACT as the Standard)

In 1995/96, there were 3,523 admissions for endoscopies in **Canberra-Queanbeyan**, over half (53.2 per cent) of which were females. The majority (2,873 admissions, or 81.5 per cent) of all endoscopies were performed on a same day basis.

Statistical Local Areas (SLAs)

The distribution of SARs tended to concentrate in the highest and lowest ranges (**Map 6.27a**). Residents of almost one third (31.0 per cent) of SLAs recorded ratios elevated by 15 per cent or more above the expected level. The most highly elevated ratios were recorded in the northern SLAs of Ngunnawal (with an SAR of 196**) and Palmerston (192**); Charnwood (163**), Latham (146**), Page (141**), Melba (138**) and Scullin (134*) in the north west and Gordon (161**) and Banks (134) in the south. Significantly elevated ratios were also recorded in Downer (131*), Florey (129*) and Ainslie (126*).

There were 325 admissions for endoscopies of residents of Queanbeyan, 13 per cent more than were expected from the ACT rates (an SAR of 113*). Of these, 51.8 per cent were males.

Residents of just over one third (34.5 per cent) of SLAs in **Canberra-Queanbeyan** were mapped in the lowest range. The eight SLAs with the lowest ratios all had fewer than 20 admissions with highly statistically significant ratios recorded in Acton (with an SAR of 0**, no admissions when 7.3 were expected), Chapman (46**, 19 admissions) and Torrens (51**, 16 admissions).

Other SLAs with low ratios included Red Hill (with an SAR of 56**), Curtin (66**), Farrer (69*) and Yarralumla (70*).

The largest numbers of admissions for endoscopies were recorded for residents of Kambah (182 admissions), Kaleen (88 admissions) and Narrabundah (86 admissions).

Postcode-based areas

SLAs with elevated ratios for admissions for endoscopies tended to be located in the northern and southern areas of **Canberra**, with most of the central postcode areas mapped in the lowest range (**Map 6.27b**). The highest ratio was recorded in Gungahlin-Hall, with residents recording 61 per cent more than the expected number of admissions for endoscopies (an SAR of 161**). Other elevated ratios of statistical significance were recorded in Tuggeranong South (with an SAR of 146**), Belconnen West (127**), Canberra North (119**), Belconnen South (114*) and Kambah (105).

The lowest ratio for admissions for endoscopies, an SAR of 44* recorded in Eastern Fringe, represented just six admissions when 13.4 were expected from the ACT rates. Highly statistically significant ratios in the lowest range were recorded in Canberra Central (an SAR of 75**), Weston Creek (77**) and Woden South (79**).

The largest numbers of admissions for endoscopies were recorded for residents of Belconnen West (519 admissions), Canberra North (402) and Belconnen South (284).

There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of admissions for endoscopies and socioeconomic status.

There were 12 admissions for endoscopies of residents of the ACT-Balance Statistical Subdivision in 1995/96, when only 3.7 admissions were expected from the ACT rates (an SAR of 329**).

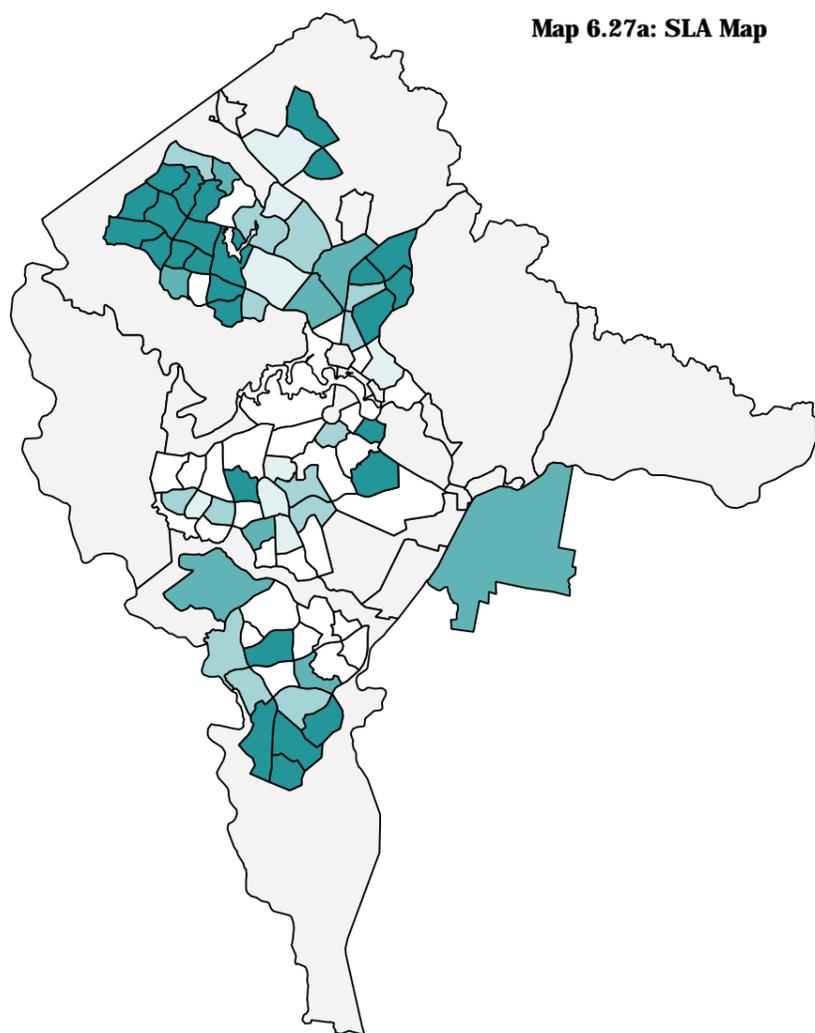
Map 6.27

Admissions for an endoscopy, Canberra-Queanbeyan, 1995/1996

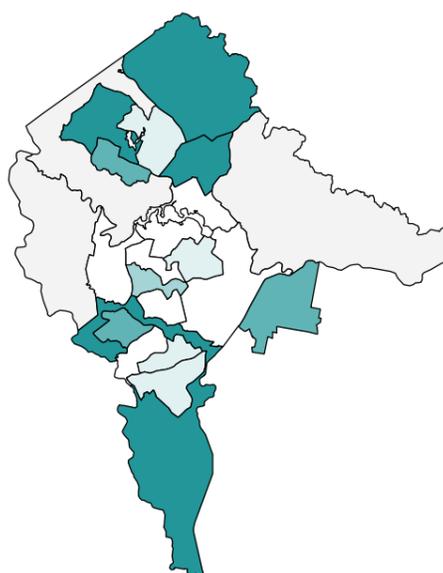
Standardised Ratio: number of admissions in each area compared with the number expected*



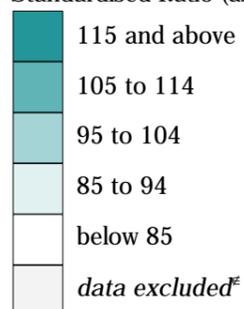
Map 6.27a: SLA Map



Map 6.27b: Postcode Map#



Standardised Ratio (as an index)



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

#SLAs have been grouped to approximate postcode areas

‡Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

Source: See Data sources, Appendix 1.3

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

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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 1.4 million unreferral attendances (called services in this atlas)⁶ by GPs in the Australian Capital Territory, an average of 4.6 services for each person enrolled with Medicare. Total Medicare payments to GPs for these services were \$33 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 funded Aboriginal health services; and
- medical services provided by private companies (eg. mining companies), the defence forces and the Royal Flying Doctor Service (**Table 6.35** includes details of the operations of this service, some of which are GP type services).

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

⁶At 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.

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 some 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 Islander 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 6.35: 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

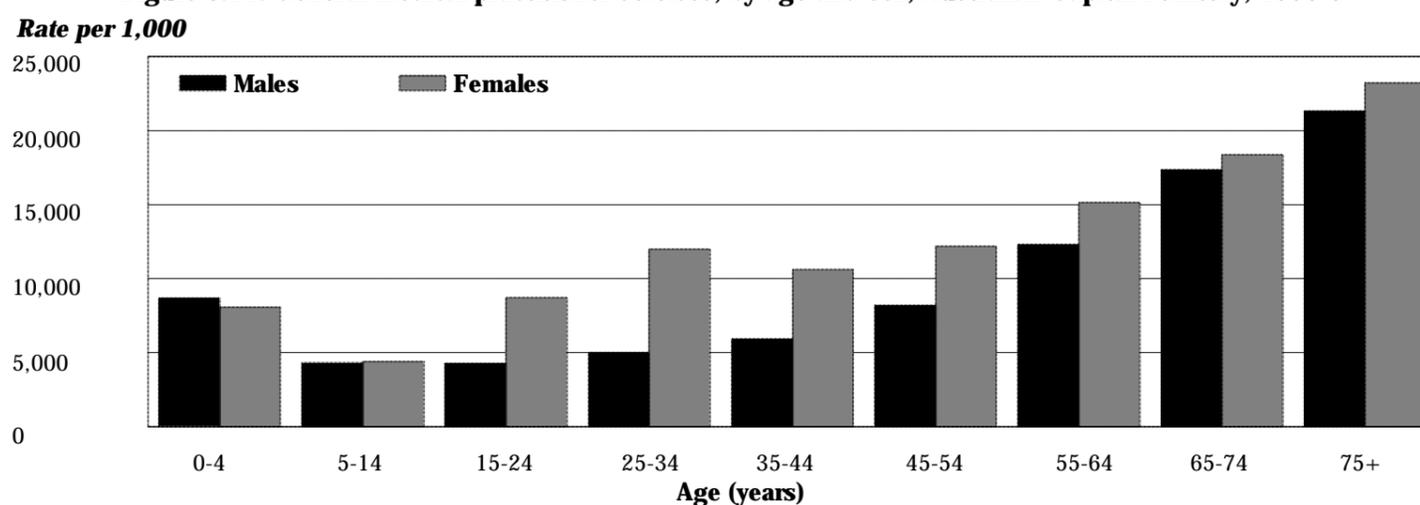
Source: Annual Report 1996, Royal Flying Doctor Service of Australia

GP services by age and sex of patient

Females used GP services more than males, accounting for 61.0 per cent of services in the Australian Capital Territory in 1996. Females accounted for more services per patient at each age group from the 5 to 14 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, Australian Capital Territory, 1996-97



Source: Statistical Tables, 1996-97, 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 6.36: 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

The age distribution of men receiving these services in the Australian Capital Territory is shown in **Figure 6.11** on page 186.

Canberra-Queanbeyan (ACT as the Standard)

Males living in **Canberra-Queanbeyan** received 642,380 services from GPs in 1996. The total number of services was 27.0 per cent higher than the number of services in 1989 (505,804 services).

There were 51,806 GP services to males in Queanbeyan, nine per cent fewer GP services to males than were expected from the ACT rates (an SR of 91**).

Postcode-based areas

Most postcode areas in **Canberra-Queanbeyan** were mapped in the middle three ranges, and areas with the lowest ratios were confined to the central and eastern regions of **Canberra** (**Map 6.28**).

Tuggeranong North West (with an SR of 128**) and Woden Central (121**) had 28 per cent and 21 per cent more GP services to males than were expected from the ACT numbers. Other elevated ratios of statistical significance were recorded in Belconnen West (with an SR of 109**), Belconnen (Balance) (106*), Canberra North (105**), Belconnen North (105**) and Kambah (104**).

All but one SLA with low rates of use of GP services by males had highly statistically significant ratios. Ratios between 85 and 94 were recorded in Tuggeranong North East (93**), Gungahlin-Hall (91**) and Woden North (87**).

The lowest ratios were recorded in Eastern Fringe, with males using 29 per cent fewer GP services than were expected from the ACT rates (an SR of 71**), Kowen/Majura (an SR of 77** but a relatively low number of 609 GP services) and Canberra Central (with an SR of 78**).

The largest numbers of GP services to males were recorded in Belconnen West (81,922 services), Tuggeranong South East (58,178 services), Canberra North (54,801 services) and Belconnen North (45,478 services).

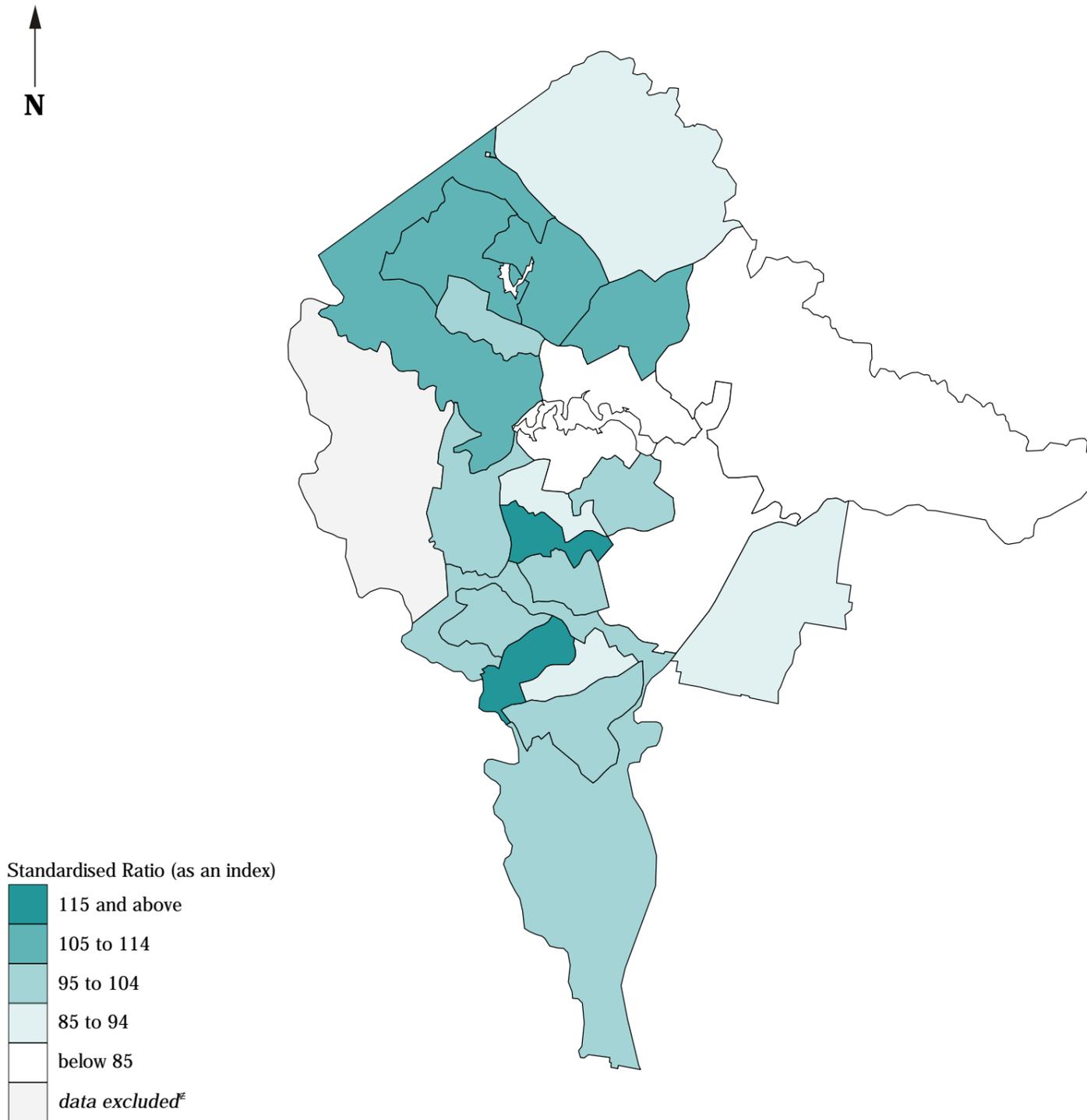
There was no consistent evidence in the correlation analysis of an association at the postcode level between high rates of GP services to males and socioeconomic disadvantage.

Male residents of the ACT-Balance Statistical Subdivision received 691 services from GPs in 1996, 27 per cent fewer than expected from the ACT rates (a standardised ratio of 73**).

Map 6.28

General medical practitioner services to males, Canberra-Queanbeyan, 1996

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



*SLAs have been grouped to approximate postcode areas

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

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.37: General medical practitioner services to females, capital cities
Standardised 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, 5.6 services per female and 3.8 services per 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 15 to 44 year age groups. The age distribution of women receiving these services in the Australian Capital Territory is shown in **Figure 6.11** on page 186.

Canberra-Queanbeyan (ACT as the Standard)

In 1989, there were 709,125 GP services to females in **Canberra/Queanbeyan**. By 1996, the number had increased, by 30.3 per cent, to 924,075 GP services.

There were 75,210 GP services to females in Queanbeyan, five per cent fewer GP services to females than were expected from the ACT rates (an SR of 95**).

Postcode-based areas

The pattern of distribution at the postcode level of ratios for GP services to females is similar to that for males (**Map 6.29**).

The highest ratio was recorded in Stromlo but represented a relatively low number of 265 GP services (an SR of 163**). There were 28 and 16 per cent, respectively, more GP services provided to females in Tuggeranong North West (with an SR of 128**) and Woden Central (116**) than were expected from the ACT rates.

Elevated ratios were also recorded in Eastern Fringe (an SR of 112**), Kambah (105**), Belconnen West (105**) and Belconnen (Balance) (105*), Tuggeranong South East (104**), Woden South (102**), Tuggeranong South (102**), Canberra North (101**) and Belconnen North (101**).

The lowest ratios were recorded in Canberra Central (with an SR of 78**) and Kowen/Majura (82**), with 22 and 18 cent fewer GP services to females than were expected from the ACT rates.

The largest numbers of GP services to females were recorded in Belconnen West (113,781 services), Tuggeranong South East (84,991 services), Canberra North (79,548 services) and Weston Creek (65,427 services).

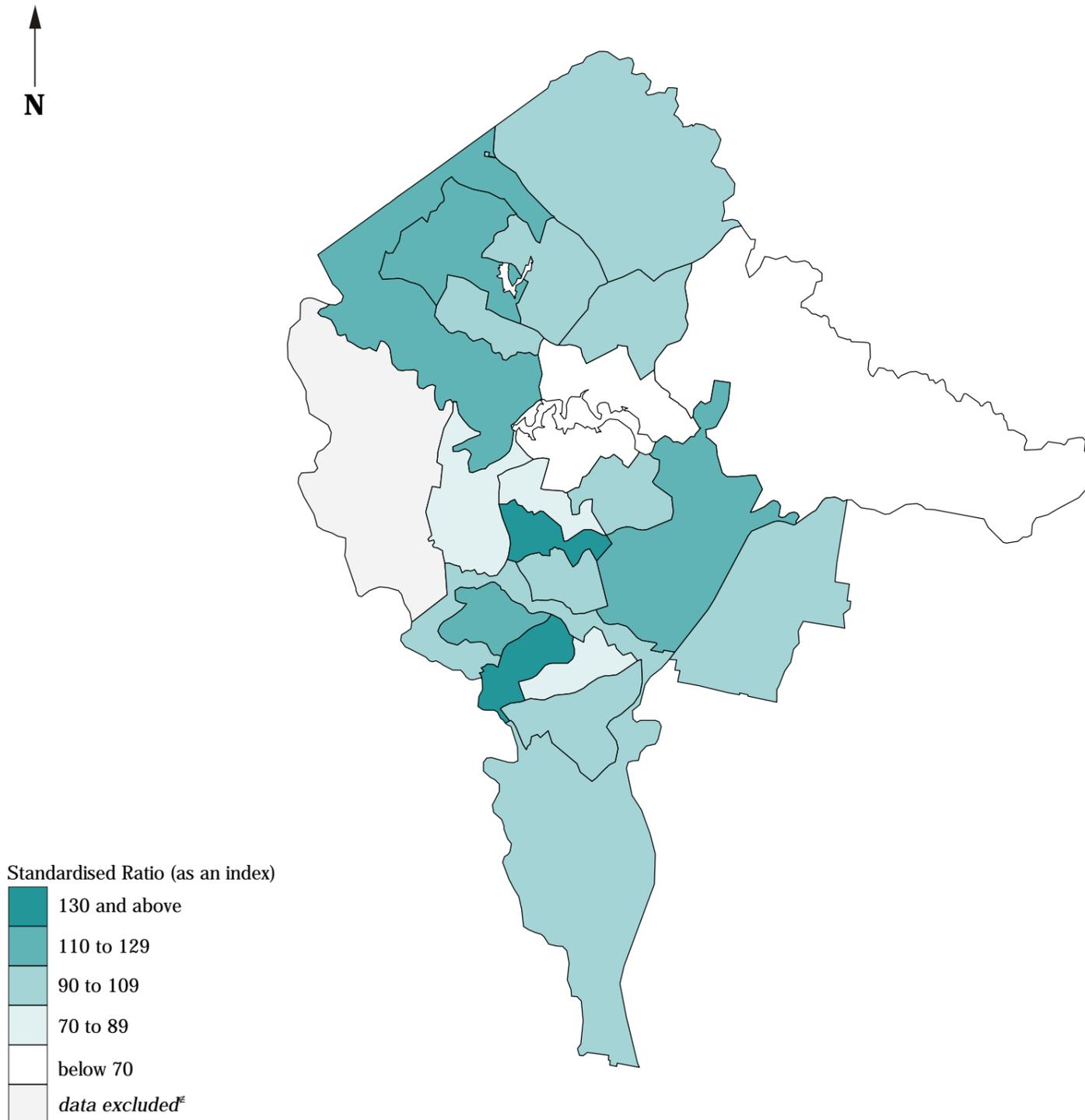
There was a correlation of meaningful significance with the variable for unskilled and semi-skilled workers (0.50), and weaker correlations with a number of the other indicators of socioeconomic disadvantage. These results, together with the weak inverse correlation with the IRSD (-0.14), suggest the existence of an association at the SLA level between high rates of use of GP services by females and socioeconomic disadvantage.

Female residents of the ACT-Balance Statistical Subdivision received 1,004 services from GPs in 1996, 15 per cent more than expected from the State rates (an SR of 115**).

Map 6.29

General medical practitioner services to females, Canberra-Queanbeyan, 1996

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



*SLAs have been grouped to approximate postcode areas

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

[‡]Data have been excluded when the population of the area is less than 100, or where there were fewer than five expected cases

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

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 6.38: Proportion of children who were fully immunised at 12 months of age, capital cities, 1998
Per cent

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	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

Canberra-Queanbeyan

In 1998, 4,626 children at 12 months of age living in **Canberra-Queanbeyan** had been fully immunised, 86.9 per cent of the population in this age group.

In Queanbeyan, 88.2 per cent of children aged 12 months were fully immunised, a total of 447 children.

Postcode-based areas

With the exception of Tuggeranong North West, lower immunisation rates were recorded in the central and eastern parts of **Canberra** and higher rates were recorded in the western areas (**Map 6.30**).

The northernmost SLA of Gungahlin-Hall (91.7 per cent) and the southernmost SLA of Tuggeranong South (90.9 per cent) were the only SLAs with over 90.0 per cent of 12 month old children fully immunised. These areas comprise some of the most recently established suburbs in **Canberra** and had the highest proportions of children aged 0 to 4 years.

Between 85 per cent and 90 per cent of 12 month old children were fully immunised in just over half of the postcode areas in **Canberra**. Included in this group were the north-western areas of Belconnen South (89.8 per cent), Belconnen (Balance) (89.5 per cent), Belconnen West (89.4 per cent) and Belconnen North (87.9 per cent). Further south, Woden South (89.4 per cent), Tuggeranong South East (88.5 per cent), Weston Creek (88.4 per cent) and Kambah (88.3 per cent) had similar proportions.

Canberra Central (84.3 per cent) and Eastern Fringe (81.7 per cent) had proportions in the middle range mapped: however, the latter areas had just 18 and four fully immunised children, respectively.

The lowest rate was recorded in Tuggeranong North West, the only area mapped in the lowest range, with two thirds (66.6 per cent, 183 children) of the 12 month old children who were fully immunised.

Around the centre of **Canberra**, Canberra North (80.0 per cent), Canberra South (79.7 per cent) and Woden Central (76.0 per cent) had some of the lowest proportions recorded for this variable.

The largest numbers of children who were fully immunised at the age of 12 months were in Tuggeranong South East (575 children), Belconnen West (537 children), Tuggeranong South (406 children) and Gungahlin-Hall (394 children).

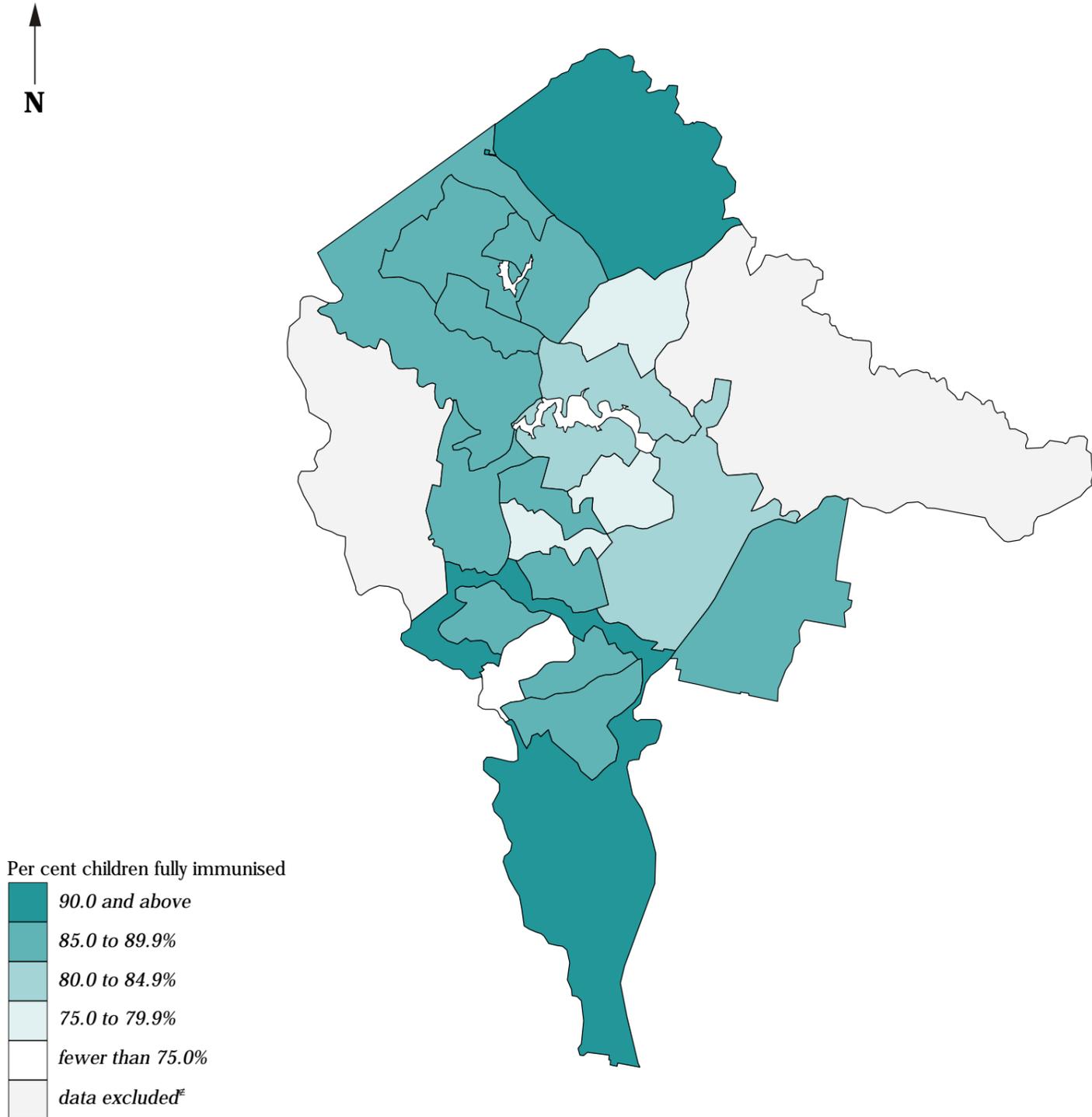
There were weak inverse correlations with the variables for private dwellings without a motor vehicle (-0.46), single parent families (-0.44) and low income families (-0.41); and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak correlation with the IRSD (0.31), suggest the existence of an association at the postcode level between high immunisation rates and high socioeconomic status.

In 1998, four children, 87.7 per cent of the ACT-Balance Statistical Subdivision's population aged 12 months, was fully immunised.

Map 6.30

Immunisation status of children at 12 months of age, Canberra-Queanbeyan, 1995/1996

as a percentage of all children at 12 months of age in each area* compared with the number expected#



*SLAs have been grouped to approximate postcode areas

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

‡Data have been excluded when the population of the area is less than 100, or where there were fewer than five cases

Source: See Data sources, Appendix 1.3

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

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