

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 181 for the definition of admission) of patients with any type of cancer and those with lung cancer specifically are mapped, but admissions resulting from cancer of the prostate are not mapped, as there were too few cases at the small area level from which to calculate reliable rates. The number of variables analysed and mapped was also constrained by the size of the atlas. 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 189).

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
- terminations of pregnancy (see additional comments below).

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

Some of these issues are discussed elsewhere in this chapter and details on statistics for cancer incidence and screening are included. As regards the data for termination of pregnancy, terminations are undertaken both in hospitals and in clinics which are not hospitals. These clinics are not, therefore, included in the State and Territory hospital data collections. In an attempt to obtain a complete dataset, details of the age and area of residence of women undergoing a pregnancy termination other than in a hospital were obtained from Health Insurance Commission data and added to the hospitals' dataset. This combined dataset was compared with the data from States with complete coverage in their hospital collections, to see if it provided an accurate picture. Unfortunately the combined dataset was inconsistent with data from the other sources and 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 189).

Admissions to hospitals

Introduction

There were almost 4.8 million admissions (see the box below) to hospitals in Australia in 1995/96 (420 thousand admissions in South Australia), 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 189).

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 in **Adelaide** 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; genitourinary conditions; injuries; musculo-skeletal 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 in **Adelaide** that can be linked to socioeconomic effects was as high as 47 per cent.

Differences for Aboriginal people

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

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

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

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

¹Excludes admissions to the Darwin Private Hospital

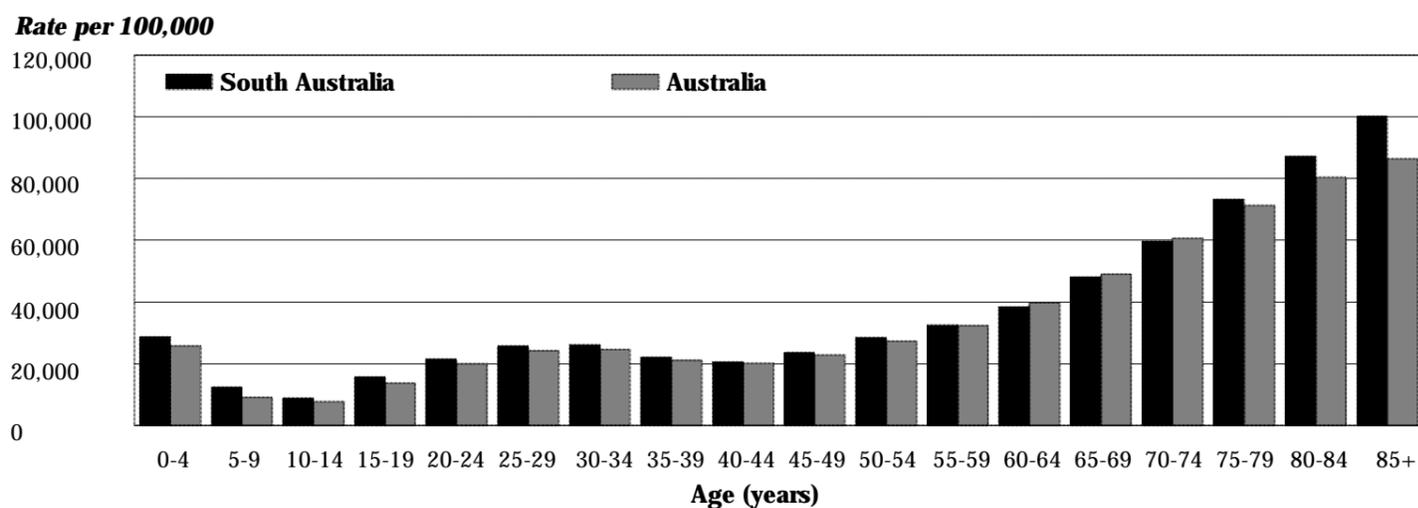
²Age-standardised hospital admission ratio is equal to hospital admissions identified as being of Indigenous people, divided by expected admissions, based on all-Australian rates

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

Differences between South Australia and Australia

Figure 6.1 shows the rates of admission per 100,000 population for residents of South Australia and Australia for each five year age group. Admission rates for South Australia and Australia are similar across the age groups, with higher rates recorded for South Australian residents in most age groups.

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



Source: See Data sources, Appendix 1.3

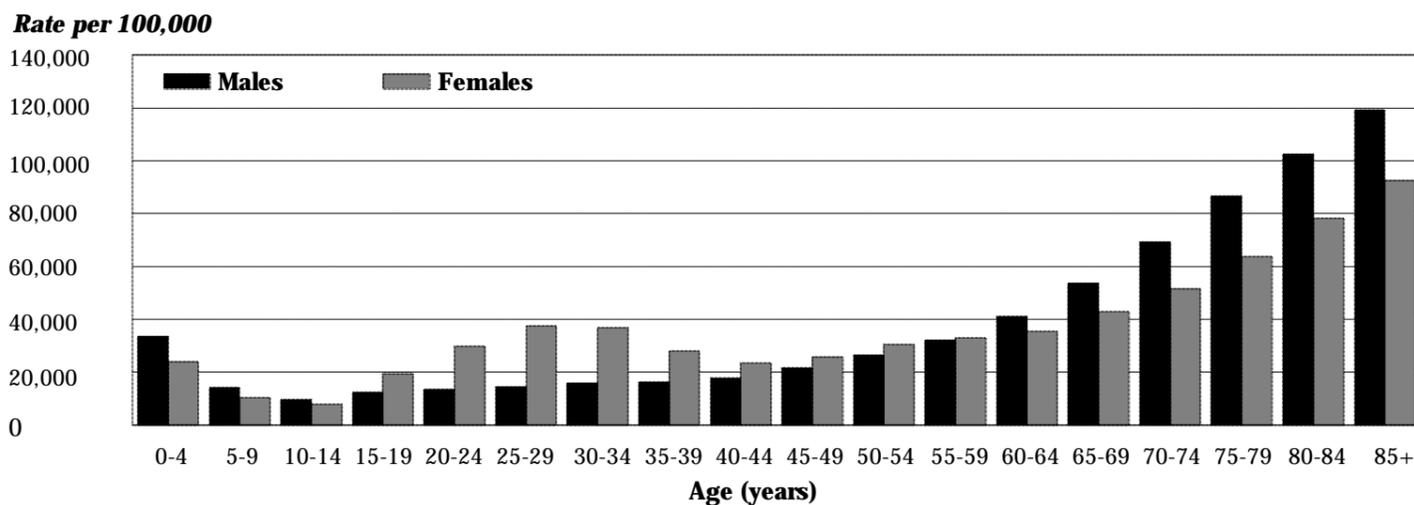
Differences related to age, sex and hospital type

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

Females accounted for 55.1 per cent of admissions, 18.7 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 2.6 times that for males. Female rates in the 20 to 24 (2.2 times), 30 to 34 (2.3 times) and 35 to 39 (1.7 times) year age groups were slightly lower but still well above those for males. These higher admission rates largely reflect episodes of hospitalisation for childbirth and associated admissions. The rates for males were higher than for females among those aged from 0 to 4 and 5 to 9 years (1.4 times as high), and from age 60 (the greatest disparity being the rates for 70 to 74, 75 to 79 and 80 to 84 year old males) 1.4 times higher than the corresponding female rates.

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



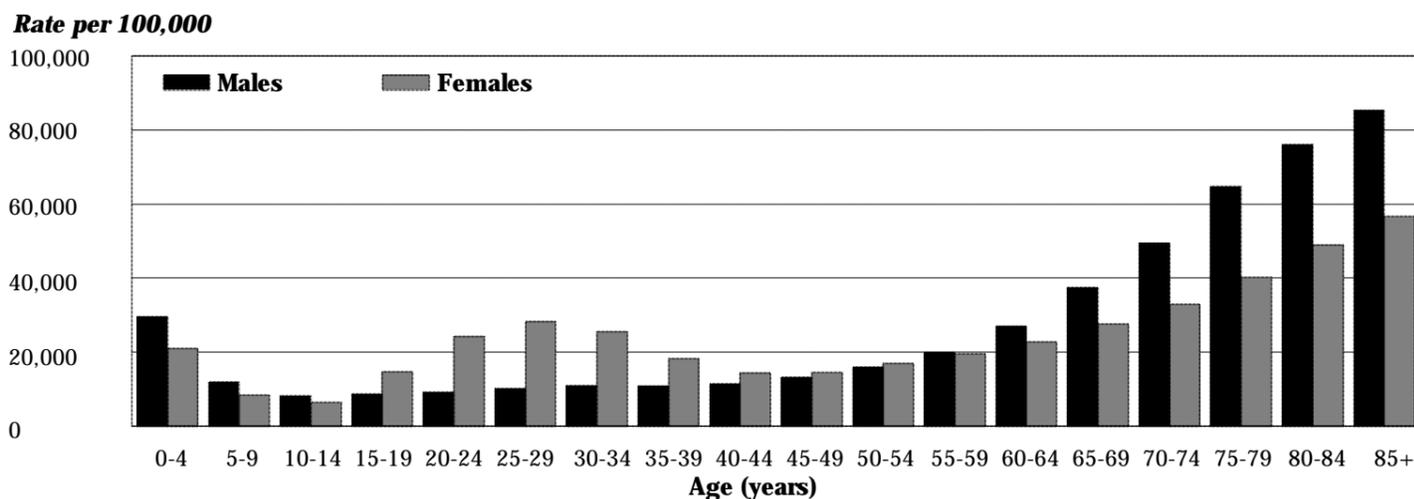
Source: See Data sources, Appendix 1.3

The profile of admissions to public acute hospitals (Figure 6.3) is markedly similar to that for all admissions (Figure 6.2). Higher rates of admissions of females are evident from the 15 to 19 year age group through to the 40 to 44 year age group. Male rates are higher at the youngest ages, and again from the 60 to 64 year age group onwards.

Overall, private hospitals accounted for 31.0 per cent of the admissions analysed for South Australia. Females make greater use of private hospitals than do males, with admissions to private

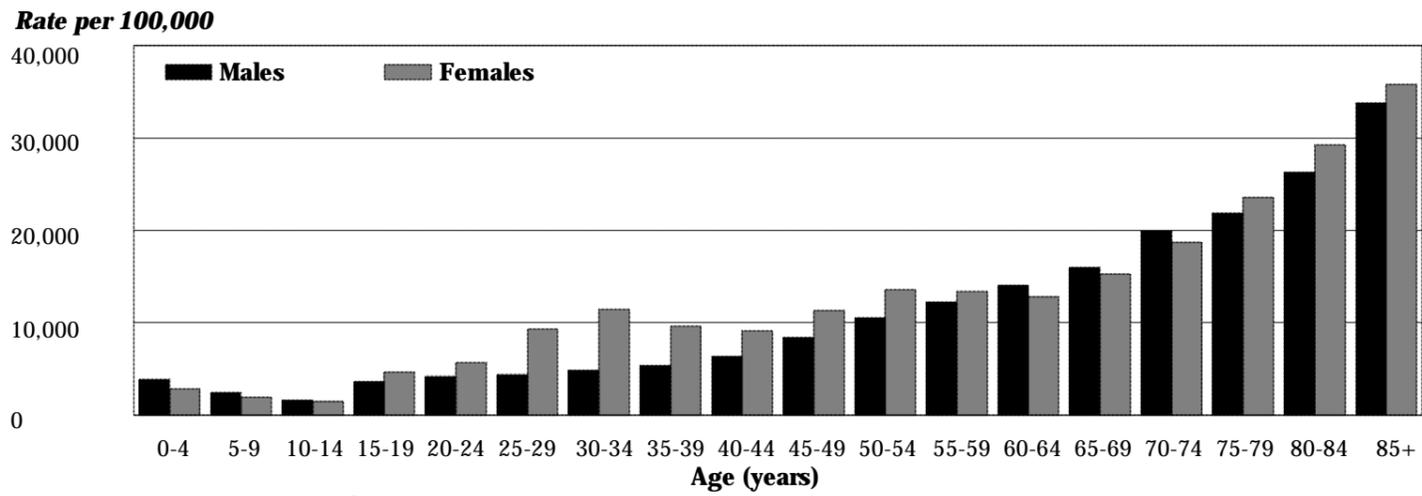
hospitals representing 32.6 per cent of all female admissions studied (compared with 29.1 per cent for males) and accounting for 57.9 per cent of private hospital admissions (53.9 per cent in public acute hospitals). The pattern of admissions to private hospitals by age and sex (Figure 6.4) is again 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 75 years of age.

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



Source: See Data sources, Appendix 1.3

Figure 6.4: Admissions to private hospitals, by age and sex, South Australia, 1995/96

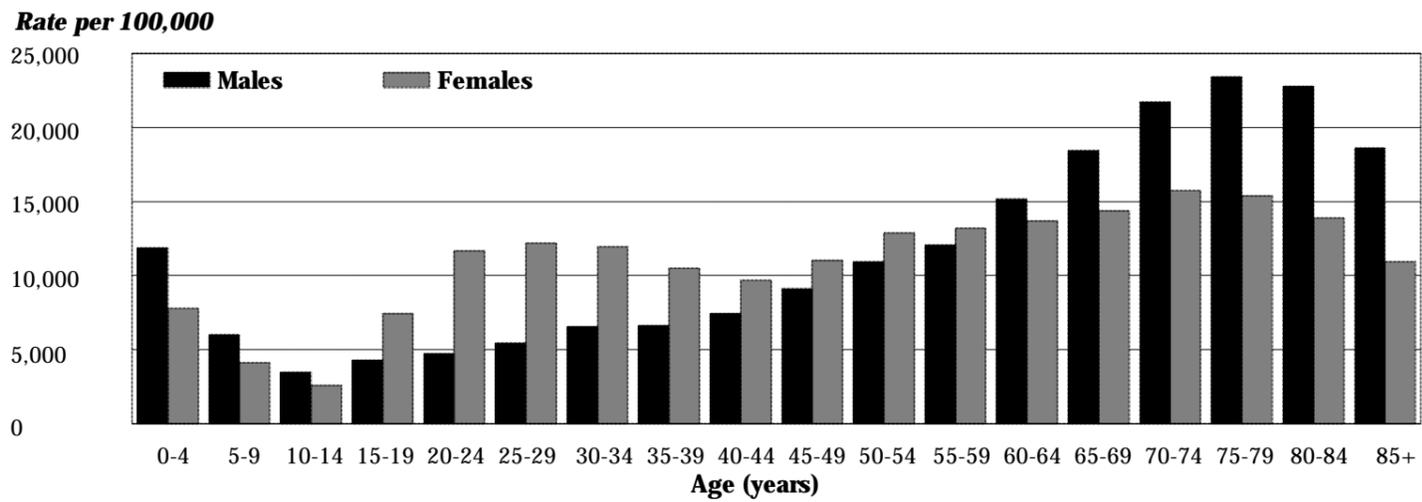


Source: See Data sources, Appendix 1.3

The general pattern of higher admission rates among females aged 15 to 44 years and among males in the youngest and oldest age groups, is also evident for same day admissions (Figure 6.5). However, there are some notable differences. From the age of 25 years, female rates remain reasonably consistent, increasing

marginally in the 50 to 54 age group before declining at the age of 75 years and over. Same day admission rates for males are similar to the rates recorded for total admissions until the 75 to 79 year age group, from where they begin to decline.

Figure 6.5: Same day admissions to hospitals, by age and sex, South Australia, 1995/96

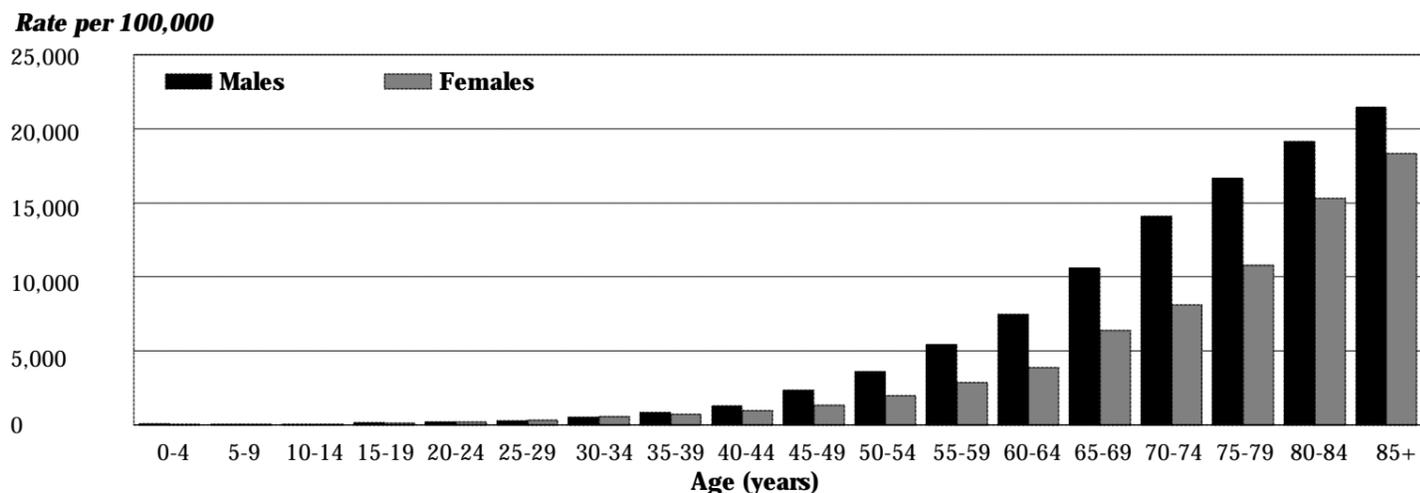


Source: See Data sources, Appendix 1.3

Figure 6.6 and **Figure 6.7** show admissions for circulatory and respiratory system diseases, respectively. **Figure 6.6** highlights the steep rise in hospital admissions for circulatory system diseases from the age of 40 years, with males predominating across the age groups. Admission rates for respiratory system

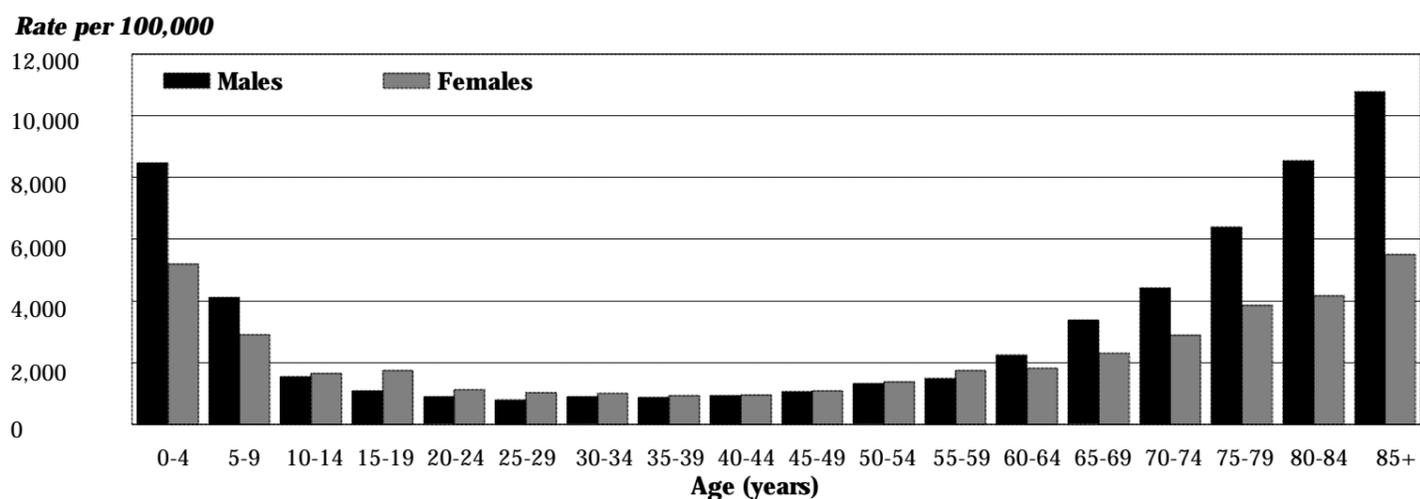
diseases were highest among children aged 0 to 4 years and people aged from 75 years, with little difference between the age groups from 20 to 54 years (**Figure 6.7**): males predominate in the majority of these groups.

Figure 6.6: Admissions to hospitals for circulatory system diseases, by age and sex, South Australia, 1995/96



Source: See Data sources, Appendix 1.3

Figure 6.7: Admissions to hospitals for respiratory system diseases, by age and sex, South Australia, 1995/96



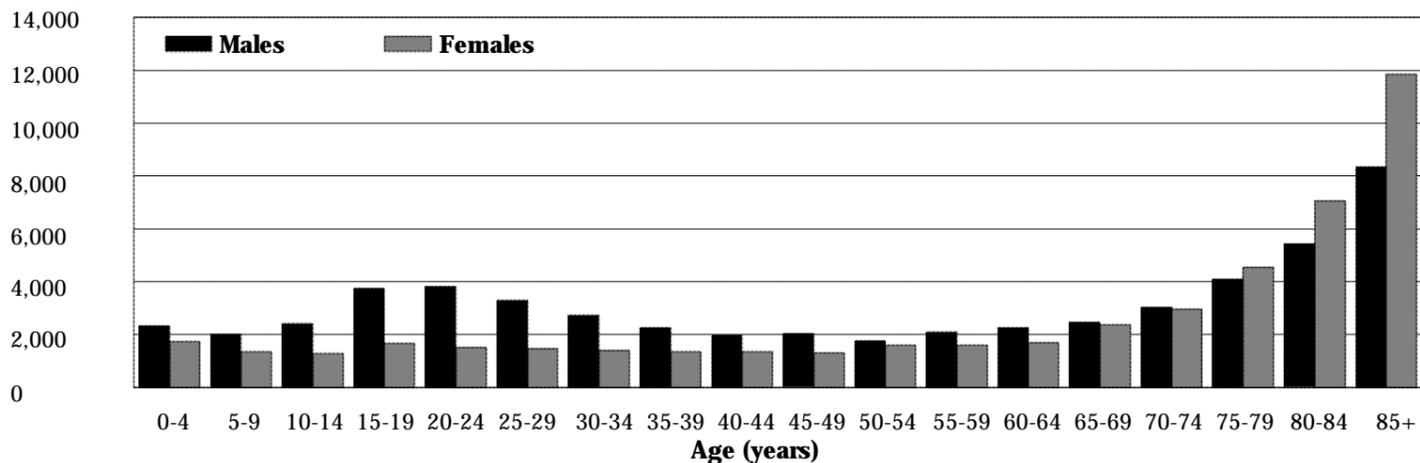
Source: See Data sources, Appendix 1.3

Male and female admission rates for accidents, poisonings and violence (**Figure 6.8**) are in direct contrast with the pattern for total admissions (**Figure 6.2**). Males predominate in all age groups up to and including the 70 to 74 year age group, with the largest differentials between the ages of 10 and 34 years.

Female admission rates are consistent across most of the age groups until around the 70 to 74 year age group, after which the rates begin to increase steadily, and to exceed eventually those for males.

Figure 6.8: Admissions to hospitals from accidents, poisonings and violence, by age and sex, South Australia, 1995/96

Rate per 100,000



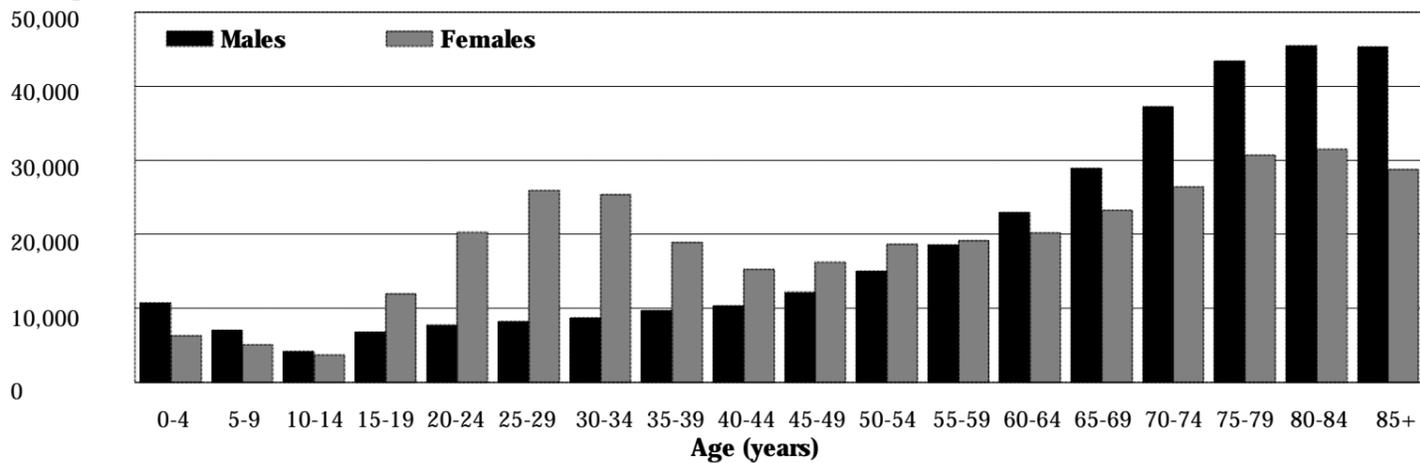
Source: See Data sources, Appendix 1.3

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 group, rates for same day admissions of females for a surgical procedure increased rather than decreased, as they did for total surgical admissions.

Figure 6.9: Admissions to hospitals for a surgical procedure, by age and sex, South Australia, 1995/96

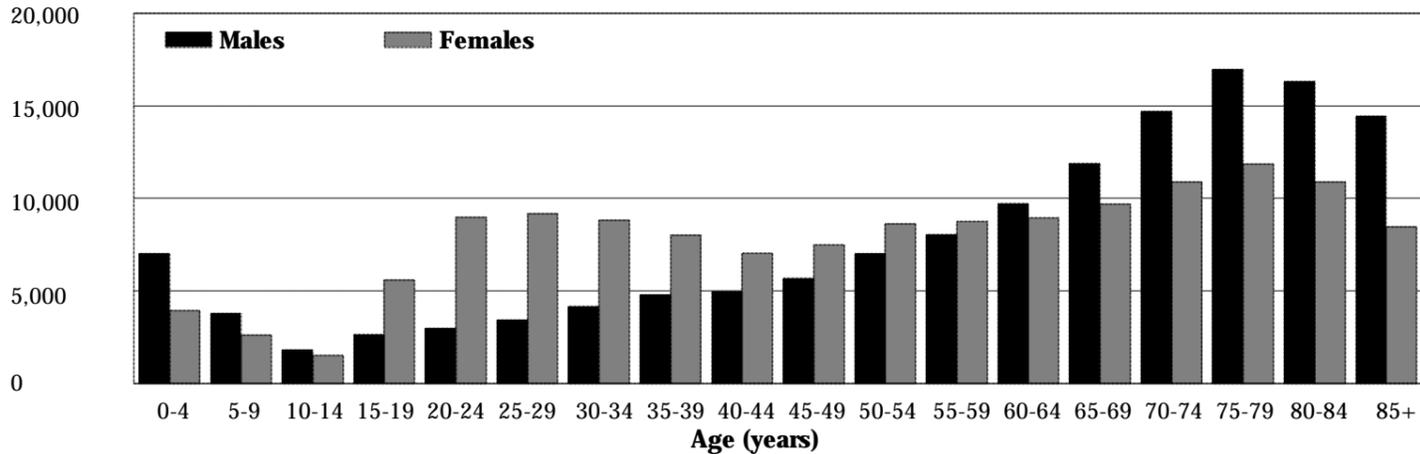
Rate per 100,000



Source: See Data sources, Appendix 1.3

Figure 6.10: Same day admissions to hospitals for a surgical procedure, by age and sex, South Australia, 1995/96

Rate per 100,000



Source: See Data sources, Appendix 1.3

Differences related to area of residence

In addition to the differences noted above in relation to variations in admission rates between population groups, there are notable variations in 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 Indigenous people noted above on page 181, higher rates of hospitalisation for Aboriginal people in the non-metropolitan areas are also likely to reflect significantly larger proportions of Indigenous people resident in these areas.

Explanatory notes

Classification of hospitals

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

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

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

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

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

Coverage

Hospital admissions data presented in this atlas 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. Almost all (97.2 per cent) of bed days for patients in this category in South Australia occurred in hospitals in the non-metropolitan areas, where there are fewer aged care facilities, and such patients are frequently cared for in an 'acute' hospital. The average across the non-metropolitan areas of Australia was 69.9 per cent.

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

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.

occurring among same day patients (in particular those requiring chemotherapy or renal dialysis).

Data issues

Data mapped

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 92.4 per cent of the 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, South Australia, 1995/96

Principal diagnosis/procedure	Same day		Overnight		Total	
	No.	% ²	No.	% ²	No.	% ²
Principal diagnosis						
Infectious and parasitic diseases	2,446	1.7	5,350	1.9	7,796	1.8
Cancer						
lung cancer	214	0.2	1,537	0.6	1,751	0.4
cancer of the female breast	207	0.1	1,288	0.5	1,495	0.4
Total cancer	7,127	4.9	14,976	5.4	22,103	5.2
Mental disorders						
psychosis	1,382	1.0	8,604	3.1	9,986	2.4
neurotic, personality or other mental disorders	1,136	0.8	5,630	2.0	6,766	1.6
Total mental disorders	2,523	1.7	14,246	5.1	16,769	4.0
Circulatory system diseases						
ischaemic heart disease	2,292	1.6	11,341	4.1	13,633	3.2
Total circulatory diseases/disorders	5,436	3.8	33,202	11.9	38,638	9.1
Respiratory system diseases						
bronchitis, emphysema or asthma	658	0.5	8,052	2.9	8,710	2.1
Total respiratory diseases/disorders						
0 to 4 year olds	950	0.7	5,772	2.1	6,722	1.6
all ages	3,042	2.1	28,601	10.3	31,643	7.5
Accidents, poisonings and violence	7,654	5.3	26,712	9.6	34,366	8.1
All causes (excl. renal dialysis)						
Females	77,953	53.9	155,346	55.8	233,299	55.1
Males	66,772	46.1	122,960	44.2	189,732	44.9
Public acute hospitals (excl. renal dialysis)	98,038	67.7	193,776	69.6	291,814	69.0
Private acute & psychiatric hospitals (excl. renal dialysis)	46,687	32.3	84,530	30.4	131,217	31.0
Total admissions (excl. renal dialysis)	144,725	100.0	278,306	100.0	423,031	100.0
Total admissions						
Admissions for renal dialysis	34,766	19.4	131	0.1	34,897	7.6
All other admissions	144,725	80.6	278,306	99.9	423,031	92.4
Total admissions (incl. renal dialysis)	179,491	100.0	278,437	100.0	457,928	100.0
Principal procedure						
Tonsillectomy	12	0.0	3,414	2.6	3,426	1.5
Myringotomy	3,386	3.4	401	0.3	3,787	1.6
Caesarean section	7	0.01	4,086	3.1	4,093	1.8
Hysterectomy	1	0.0	3,066	2.3	3,067	1.3
Hip replacement	1	0.0	1,358	1.0	1,359	0.6
Lens insertion	5,059	5.1	2,888	2.2	7,947	3.4
Endoscopy	20,314	20.6	4,690	3.6	25,032	10.9
Total (incl. all other) procedures	98,404	100.0	131,970	100.0	230,374	100.0

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

²Percentage is 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 6.4**).

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 the hospital³. Thus the data includes repeat admissions and are, 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 the inclusion of such admissions could distort the patterns of admission at the SLA level. This could occur because the

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

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

Same day admissions have increased to comprise an even greater proportion of all admissions, and to cover a growing range of conditions and procedures, and this approach is no longer appropriate. Instead, the data analysed for this second edition includes all same day procedures with the exception of admissions for renal dialysis, as it is for these admissions that it appears likely that people may have moved residence. The exclusion of admissions for renal dialysis resulted in the exclusion of 34,897 admissions in 1995/96, 7.6 per cent of all admissions (**Table 6.3**). In this way the major distorting influence is removed, but the large number of other same day admissions is included. It should be noted that the admissions for renal dialysis excluded were admissions specifically for dialysis (ie. for continuous ambulatory dialysis). Admissions during which renal dialysis was undertaken as an integral component of the episode are included.

In hindsight, it 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 South Australia 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**)⁴. It is likely that the inclusion of the same day figures in the analysis for the first edition may have reduced, or eliminated, the differentials reported. It is interesting to note that the differential in the proportion of admissions represented by same day patients in these two States has declined substantially, from 22.5 per cent in 1989, to 7.1 per cent in 1995/96. A similar narrowing has occurred across all of the States.

⁴The comparison in **Table 6.4** 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

¹ The 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.

² 1989-90 for New South Wales

Source: See *data source*, Appendix 1.3

There were 423,031 admissions to hospitals of residents of South Australia in 1995/96, of which 99.2 per cent were admissions to hospitals within the State, 0.31 per cent were to hospitals in Victoria and 0.25 per cent were to hospitals in New South Wales (Table 6.5).

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 South Australia by State/Territory of location of hospital, 1995/96

	Location of hospital								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
Number	1,059	1,309	507	419,704	191	34	189	38	423,031
Per cent	0.25	0.31	0.12	99.21	0.05	0.01	0.04	0.01	100.00

Source: See *Data sources*, Appendix 1.3

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

Capital city comparison (Australia as the Standard)

The admissions included in this analysis are described in detail on page 187. In brief, they include acute admissions to hospitals in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit. The area for which admissions are mapped relates to the address of usual residence recorded in the hospital's administrative records.

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

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

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

¹Includes acute and psychiatric hospitals and day surgery facilities

²Includes Queanbeyan (C)

³Includes same day admissions, other than for renal dialysis

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

Source: See *Data sources*, Appendix 1.3

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

Adelaide (South Australia as the Standard)

There were 298,209 admissions to public acute and private hospitals of residents of **Adelaide** in 1995/96, four per cent fewer admissions than were expected from the State rates (an SAR of 96**). Females accounted for 55.8 per cent of these admissions.

Almost two thirds (63.3 per cent) of the SLAs had ratios below the level expected (ie. under 100), with just under one quarter recording ratios in the lowest range mapped (six SLAs). Only one SLA had an SAR in the highest range mapped (**Map 6.1**).

The highest SAR, of 123**, was recorded in Elizabeth, indicating that there were 23 per cent more admissions than were expected from the State rates. The next highest ratios were in the SLAs of Adelaide (with an SAR of 113**), Glenelg (110**) and Salisbury (107**). Other areas with ratios elevated above the level expected were Enfield [Part A] (an SAR of 103**), to the north of the city centre; Gawler (102) in the outer northern suburbs; Port Adelaide (103**), Enfield [Part B] (102) and West Torrens (101), located in the west; and Brighton (102) and Willunga (102) in the south.

The SLA of Thebarton had the lowest SAR for this variable, with 22 per cent fewer admissions than were expected from the State rates (an SAR of 78**). Prospect, Burnside, Stirling, Tea Tree Gully and Payneham all had ratios of 15 per cent or more below the level expected from the State rates, all of which were highly significant.

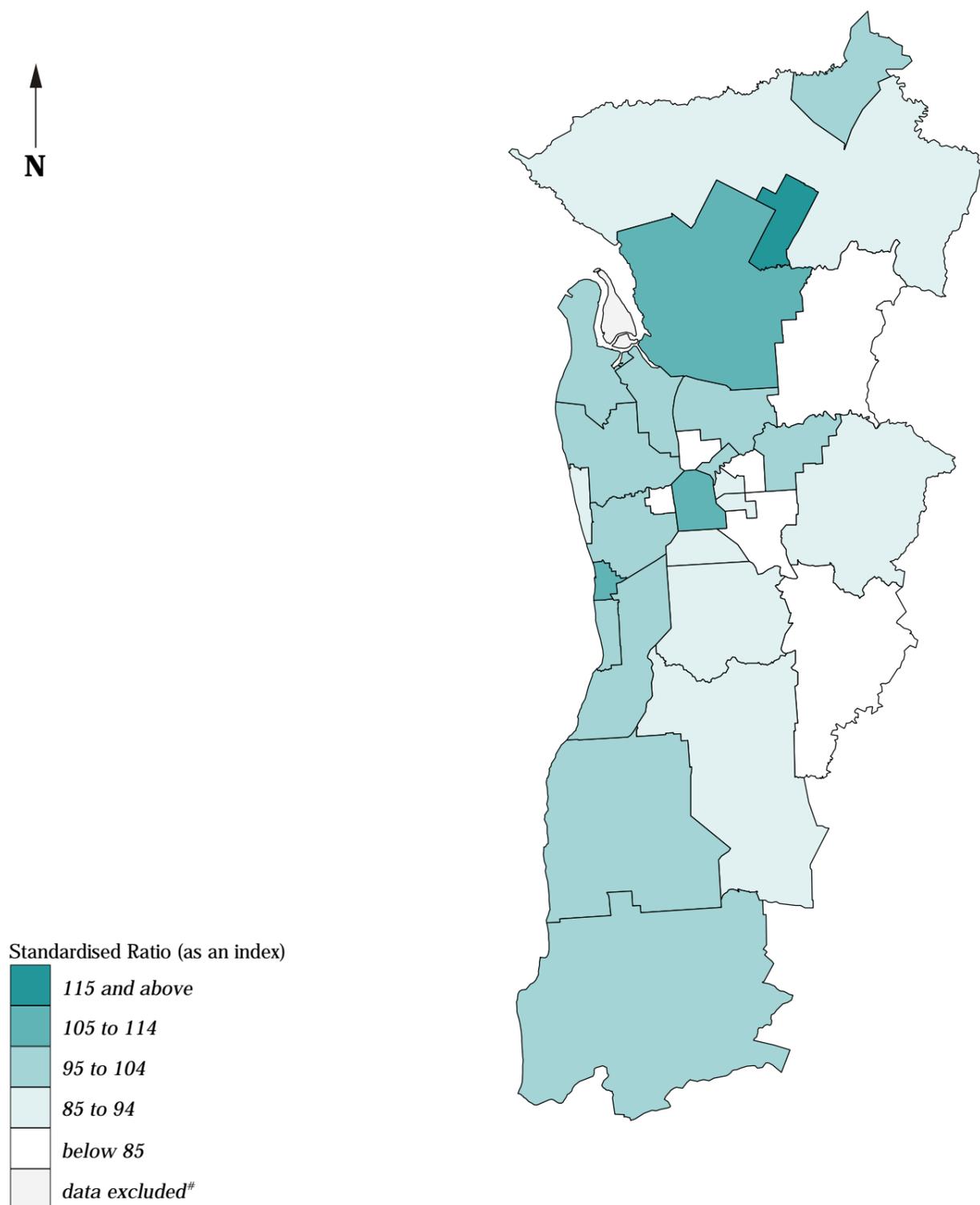
Salisbury had the largest number of admissions (30,618) to public acute and private hospitals. High numbers of admissions were also recorded for residents of Hindmarsh and Woodville, with 25,851; Noarlunga, with 23,511; and Marion, with 22,763. Residents of East Torrens (1,534 admissions), Thebarton (1,866) and Walkerville (2,174) recorded the lowest numbers of admissions.

There were correlations of meaningful significance with the variables for unemployment (0.54), Indigenous people (0.54), unskilled and semi-skilled workers (0.51) and dwellings rented from the State housing authority (0.51). Inverse correlations were recorded with the variables for female labour force participation (-0.64), high income families (-0.45) and managers and administrators, and professionals (-0.44). These results, together with the inverse correlation with the IRSD (-0.53), indicate the existence of an association at the SLA level between high rates of admissions to hospitals and socioeconomic disadvantage.

Map 6.1

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

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

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

State/Territory comparison (Australia as the Standard)

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

The most highly elevated standardised admission ratios (SARs) for residents of the non-metropolitan areas were those for the Northern Territory (123**) and South Australia (118**), with elevated SARs in all but Tasmania (**Table 6.7**). The notes on page 187, under the heading *Some suggested reasons for the higher rates of hospitalisation in country areas*, are of relevance in understanding these high admission rates. At the *Whole of State/Territory* level, the Northern Territory had the highest SAR in 1995/96 for this dataset (an SAR of 113**), followed by South Australia (105**) and Queensland (103**).

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

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

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

¹Includes acute and psychiatric hospitals and day surgery facilities

²Includes same day admissions, other than for renal dialysis

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

⁴Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 124,822 admissions of residents of the non-metropolitan areas of South Australia to public acute and private hospitals in 1995/96, 13 per cent more than were expected from the State rates (an SAR of 113**). The elevated ratio is in contrast to the below average rate of admissions of city residents. Females accounted for 53.7 per cent of these admissions.

SLAs with ratios elevated by 30 per cent or more were scattered throughout the State in no notable pattern, with the exception of the west coast (**Map 6.2**). Almost two thirds (63.2 per cent) of the State's SLAs had more admissions than were expected from the State rates, with only 7.4 per cent (7 SLAs) mapped in the lowest range.

The most highly elevated SAR was recorded in Unincorporated West Coast, with almost four times the number of admissions expected from the State rates (a ratio of 376** and 578 admissions). In total, 22 SLAs were mapped in the highest range, including Coober Pedy (with an SAR of 198**), Carrieton (192**), Ceduna (186**), Hawker (161**), Port Broughton (159**), and Crystal Brook-Redhill and Naracoorte (M) (both 158**).

Residents of Naracoorte (DC), Pirie and Roxby Downs had the lowest ratios for this variable, with SARs of 46**, 46** and 50** respectively. Other ratios mapped in this range were in Light (with an SAR of 63**), Mount Gambier (DC) (66**) and Robertstown (69**). There were 66 per cent fewer admissions of residents of Unincorporated Riverland, although this represented only 14 admissions.

The largest numbers of admissions were recorded for residents of the towns of Whyalla, with 8,507 admissions; Mount Gambier, with 6,351 admissions; and Port Augusta, with 5,918 admissions.

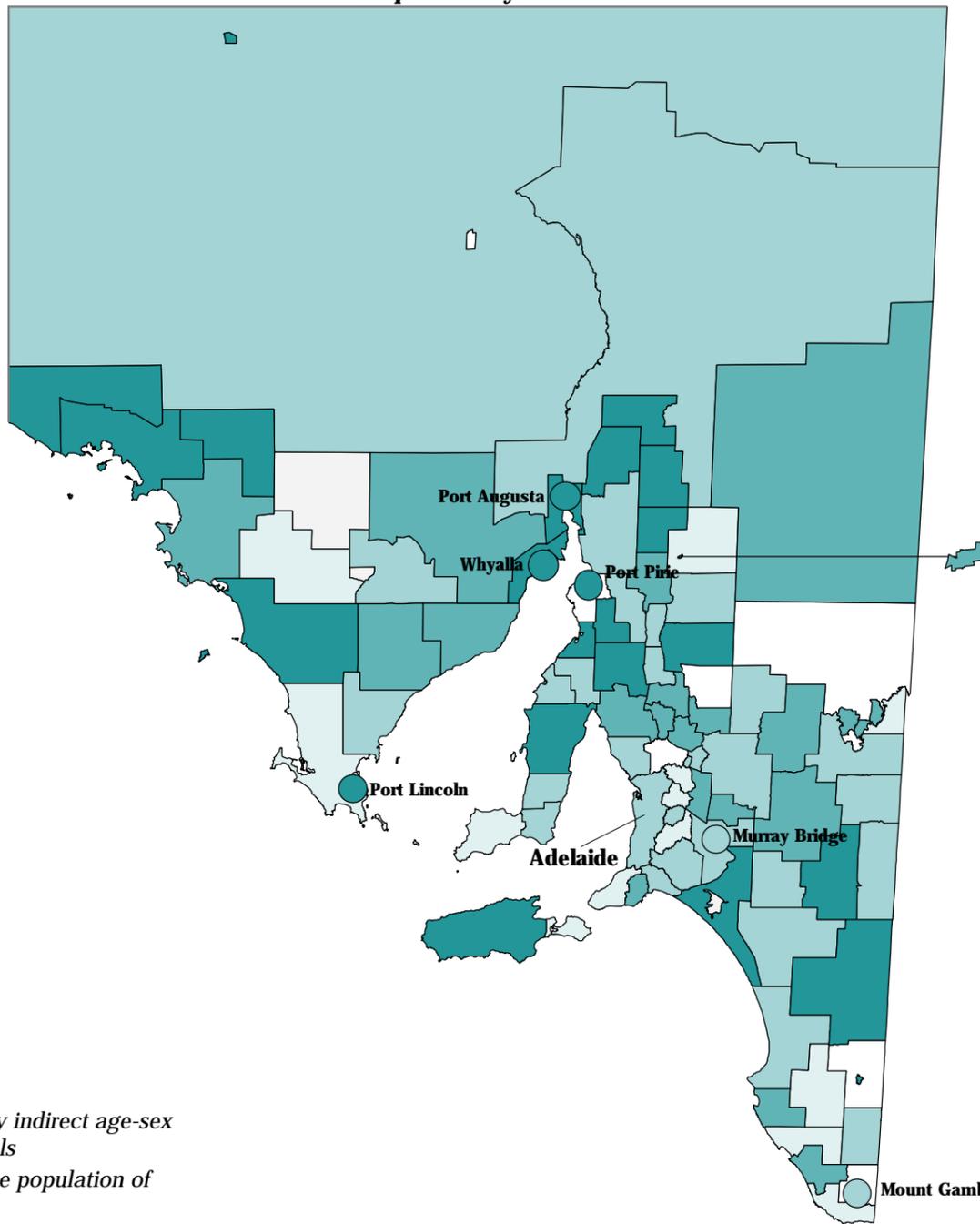
There were weak positive correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.72), suggest the existence of an association at the SLA level between high rates of admissions to hospital and socioeconomic disadvantage.

Map 6.2

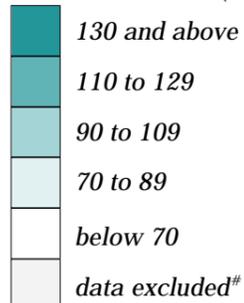
Admissions to public acute hospitals and private hospitals, South Australia, 1995/96

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

Map boundary truncated



Standardised Ratio (as an index)



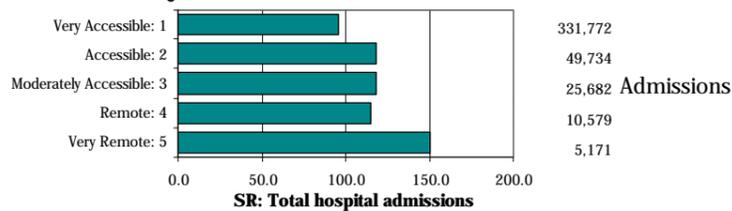
*Expected numbers were derived by indirect age-sex standardisation, based on SA totals

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



There is an increase in standardised admission ratios (SARs) for admissions to public acute and private hospitals of more than fifty per cent (56.3 per cent), from an SAR of 96 in the Very Accessible ARIA category to 150 in the Very Remote category. SARs in the three middle categories were also elevated, by 18 per cent in the Accessible and Moderately Accessible categories and 15 per cent in the Remote category.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions to public acute hospitals, 1995/96

Capital city comparison (Australia as the Standard)

The admissions in this analysis are acute admissions to public acute hospitals (see page 187 for a definition of this hospital type) in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

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

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

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

¹Includes same day admissions other than for renal dialysis

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Admissions to public acute hospitals (excluding public psychiatric hospitals) accounted for 69.0 per cent of the State's admissions in 1995/96. The remaining 31.0 per cent of admissions were to private (acute or psychiatric) hospitals. For metropolitan residents, the proportion was 62.3 per cent and for non-metropolitan residents, it was a substantially higher 85.0 per cent, reflecting both the higher rates of admissions of country residents and the greater availability of public hospitals and the lack of private hospitals.

The age profile for female (53.9 per cent of inpatient admissions) and male admissions is graphed in **Figure 6.3**, page 183. 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 49 years.

Adelaide (South Australia as the Standard)

There were 185,700 admissions to public acute hospitals of residents of **Adelaide**, 14 per cent fewer than expected from the State rates. This reflects a number of factors, including the ready availability in **Adelaide** of private hospitals, which reduces the demand for public beds, as well as lower overall hospital use by metropolitan residents than by residents of country areas.

The pattern of distribution at the SLA level of standardised admission ratios for admissions to public acute hospitals reveals a strong association between SLAs whose residents are high users of public hospitals and those whose residents are of lower socioeconomic status, as shown in the maps in Chapter 3. It also shows a clear divergence between areas whose residents use and those who do not use public hospitals at the average rate for all South Australians. More than two thirds (70.0 per cent) of SLAs had ratios below the level expected from the State rates, with more than half recording ratios in the lowest range mapped. Only two SLAs had ratios in the highest range mapped (**Map 6.3**).

The two SLAs with ratios elevated by at least fifteen per cent were Elizabeth (with an SAR of 138**) and Enfield [Part B] (with an SAR of 125**). The other areas with ratios above the level expected were the northern SLAs of Salisbury (111**), Enfield [Part A] (110**), Munno Para (103) and Gawler (102); the north-western SLA of Port Adelaide (107**); the inner SLA of Adelaide (103); and the southern SLA of Noarlunga (101).

Residents of Burnside had under half the number of admissions to public hospitals than were expected from the State rates, an SAR of 43**. Relatively low ratios were also recorded in East Torrens (50**) and Stirling (54**), located in the east; in Walkerville (55**), Unley (62**), Prospect (66**) and Kensington and Norwood (66**), all situated in the inner areas of **Adelaide**; and in Happy Valley (60**), Mitcham (63**) and Brighton (68**), located in the south.

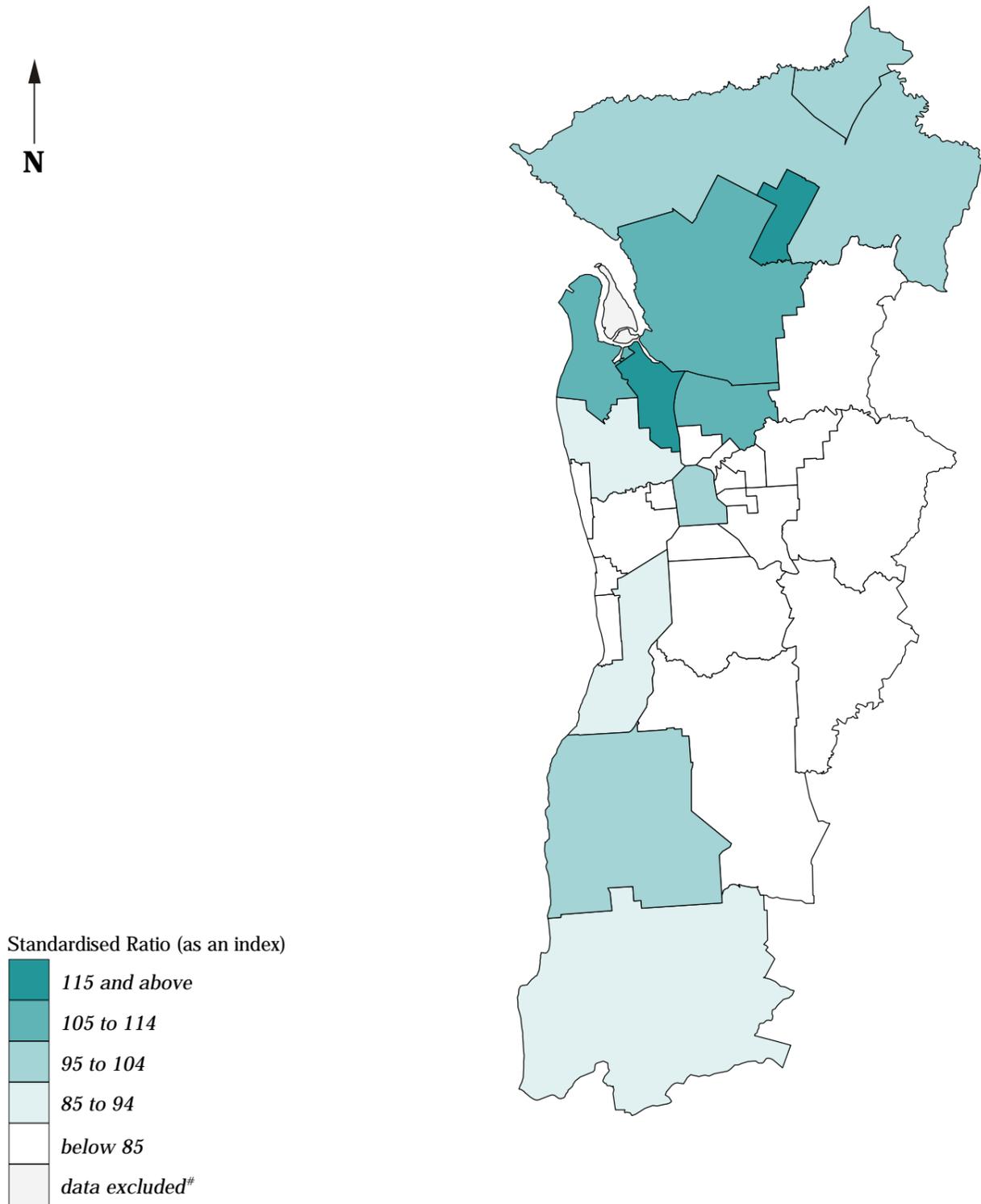
In 1995/96, the largest number of admissions to public hospitals was recorded for residents of Salisbury, with 22,144 admissions. More than 10,000 admissions were also recorded for residents of Hindmarsh and Woodville (17,397 admissions), Noarlunga (17,091 admissions), Marion (14,049 admissions), Tea Tree Gully (12,706 admissions) and Enfield [Part A] (10,735 admissions).

There were correlations of substantial significance with the variables for unemployed people (0.88), unskilled and semi-skilled workers (0.88), the Indigenous population (0.86), low income families (0.85), early school leavers (0.84), dwellings rented from the State housing authority (0.81) and single parent families (0.80). These results, together with the inverse correlation of substantial significance with the IRSD (-0.90), indicate the existence of an association at the SLA level between high rates of admissions to public acute hospitals and socioeconomic disadvantage.

Map 6.3

Admissions to public acute hospitals, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions to public acute hospitals, 1995/96

State/Territory comparison (Australia as the Standard)

The most highly elevated standardised admission ratios (SARs) for admissions to public acute hospitals of residents of the non-metropolitan areas of Australia were in the Northern Territory (159**), South Australia (149**) and Western Australia (139**): ratios were elevated by more than 20 per cent also in New South Wales and Victoria. Only in Tasmania were there fewer admissions of residents of the non-metropolitan areas than expected from the Australian rates (**Table 6.9**), although details of admissions to private hospitals (page 202 and **Table 6.11**) are also relevant.

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

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

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

¹Includes same day admissions, other than for renal dialysis

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

The relative availability of public acute hospitals and the lack of private hospitals throughout the non-metropolitan areas of South Australia is evident from the high rate of use of public compared with private hospitals. Country residents had 38 per cent more admissions to public hospitals than expected from the State rates (an SAR of 138**) and 45 per cent fewer private hospital inpatient admissions. Some reasons for the substantially higher rates, compared with those in **Sydney**, are described on page 187. It should be noted that although between twenty and thirty per cent of admissions of country residents occur in hospitals in **Adelaide** (in general, the further from **Adelaide**, the lower the proportion), the admissions are mapped to the SLA of usual residence of the patient.

More than half of the SLAs (53.1 per cent) in the non-metropolitan areas of South Australia recorded ratios in the highest range mapped (**Map 6.4**). Ratios with at least twice the number of admissions to public hospitals than expected from the State rates were recorded for residents of Unincorporated West Coast (an SAR of 524**), Coober Pedy (273**), Ceduna (249**), Carrieton (240**), Hawker (214**), Port Broughton (209**), Port Augusta (205**), Naracoorte (M) (201**) and Crystal Brook-Redhill (200**). Relatively high ratios were also recorded in the mid northern SLAs of Kanyaka and Quorn (199**), Port Pirie (188**) and Orroroo (179**); on the Eyre Peninsula in Port Lincoln (188**), Whyalla (180**) and Elliston (170**); in the Riverland in Berri (173**) and Barmera (172**); and in the SLAs of Meningie (191**), and Wallaroo (171**).

With more than three quarters of the SLAs recording ratios above the level expected, very few had ratios lower than expected. The lowest of these was recorded for residents of Roxby Downs, with 65 per cent fewer admissions than expected (an SAR of 35**). The next lowest ratios were recorded in Pirie (an SAR of 43**),

Unincorporated Riverland (44**), Naracoorte (DC) (58**), Light (66**) and Onkaparinga (67**). Low ratios were also recorded in the SLAs of Barossa (with an SAR of 71**), Mallala (82**) and Gumeracha (85**), all of which were located in the areas surrounding **Adelaide**.

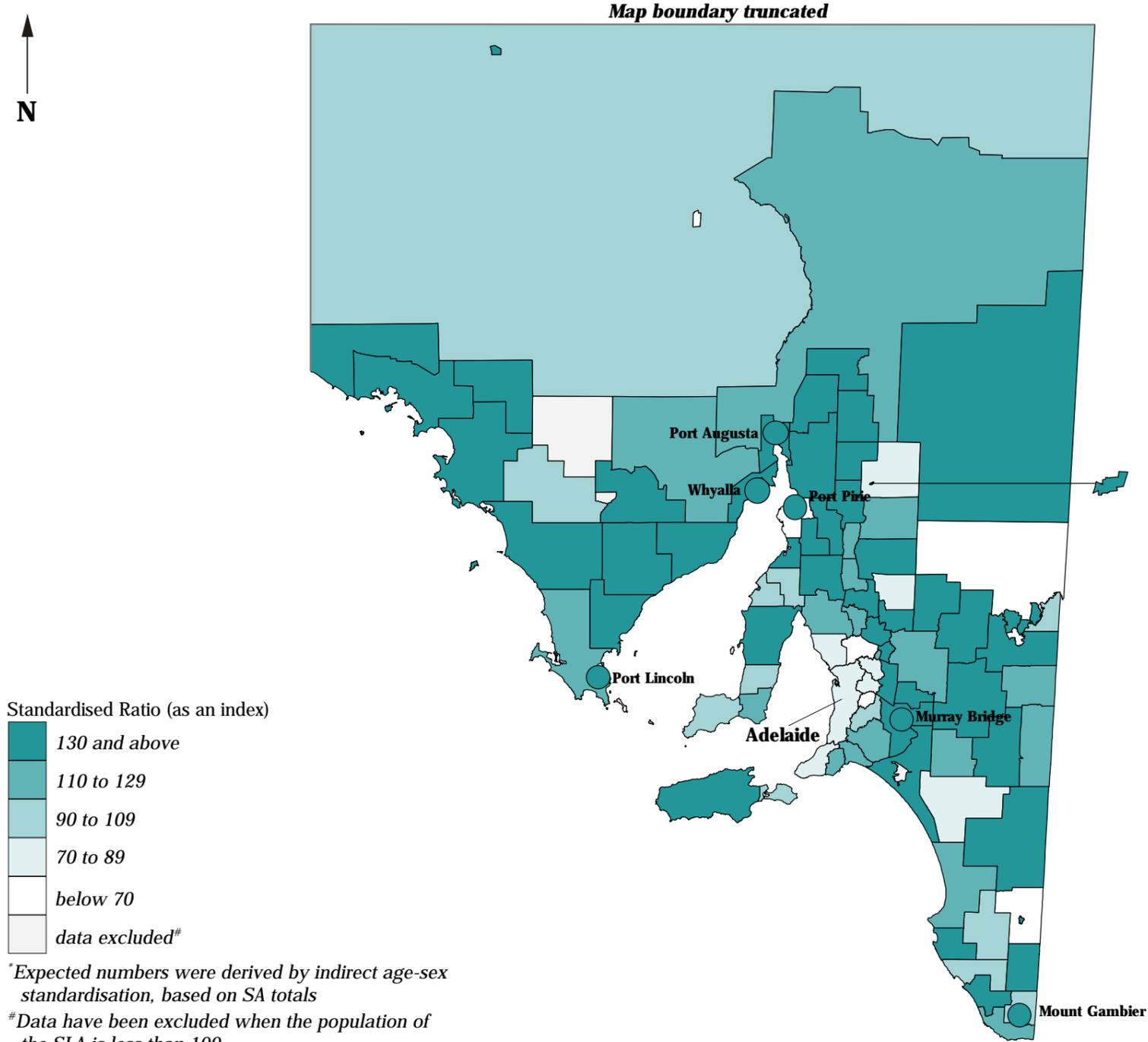
The largest numbers of admissions to public acute hospitals in the non-metropolitan areas of South Australia were recorded in the towns of Whyalla, with 8,115 admissions; Mount Gambier, 5,894 admissions; Port Pirie, 5,461 admissions; Port Augusta, 5,409 admissions; Port Lincoln, 4,550 admissions; and Murray Bridge, 4,363 admissions.

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.33), suggest the existence of an association at the SLA level between high rates of admissions to public acute hospitals and socioeconomic disadvantage.

Map 6.4

Admissions to public acute hospitals, South Australia, 1995/96

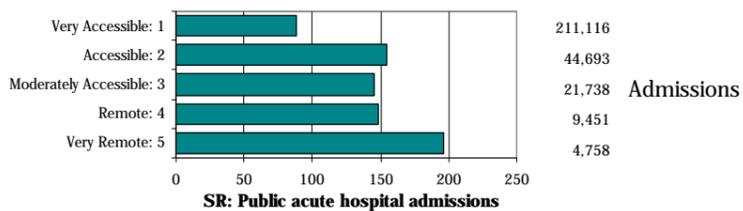
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions to public acute hospitals increase more markedly between the ARIA categories than do those for total admissions, cover a wider range and have a higher overall ratio for residents of areas in the Very Remote category, an SAR of 196. The lowest ratio is in the Very Accessible category (an SAR of 88), with SARs elevated by around fifty per cent in the three middle categories.

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

Admissions to private hospitals, 1995/96

Capital city comparison (Australia as the Standard)

The admissions included in this analysis are acute admissions to private hospitals in Australia (both private acute and private psychiatric hospitals: see page 187 for a definition of these hospital types). Admissions of same day patients (other than for renal dialysis) are included, whether to a hospital or to a same day surgical unit.

As most private hospitals are located in the capital cities, residents of these cities generally have higher rates of admission to private hospitals than does the population living in the non-metropolitan areas of Australia. This is evident from the standardised admission ratios (SARs) in **Table 6.10**, which are generally higher in the capital cities than expected from the Australian rates. The low level of provision of private hospital facilities in **Perth** and **Canberra** is reflected in the low ratios for these two capital cities. Details of admissions to public acute hospitals (page 196, **Table 6.8**) and levels of provisions of private hospitals (Chapter 7) are also relevant.

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Admissions to private hospitals account for 31.0 per cent of all admissions (excluding those in public psychiatric hospitals, same day patients and long stay nursing home type patients) in 1995/96. The remaining 69.0 per cent of admissions were to public acute hospitals. For metropolitan residents, the proportion was higher, at 37.7 per cent, and for non-metropolitan residents, it was a substantially lower 15.0 per cent.

Females make greater use of private hospitals than males, with admissions to private hospitals representing 32.6 per cent of all female admissions studied (compared with 29.1 per cent for males) and accounting for 57.9 per cent of private hospital admissions (53.9 per cent in public acute hospitals).

The age profile for admissions of females and males is graphed in **Figure 6.4**, page 184. The most notable features are the higher admission rates for females from age 15 years through the child-bearing years to the mid-fifties, and from age 70 years. This is in contrast to the profile in public hospitals where males had higher rates at older ages.

Adelaide (South Australia as the Standard)

The standardised admission ratio was 16 per cent higher than expected in relation to the State rates (an SAR of 116** and 112,509 admissions), reflecting the largely metropolitan location of private hospitals.

Just as the use of public hospitals had a distribution strongly associated with the location of residents of lower socioeconomic status postcodes, so private hospital admissions are generally higher in areas of higher socioeconomic status; that is, in areas where residents are more likely to have private health insurance.

There is a wide range between the highest and lowest ratios, from almost twice the expected number of admissions in Glenelg (191*) to just over half the expected number in Enfield [Part B] (51**).

SLAs with ratios in excess of one and a half times the expected number of admissions were recorded for residents of Walkerville (an SAR of 184**), Brighton (173**), East Torrens (169**) and Burnside (165**). Also mapped in the highest range were the southern SLAs of Stirling (an SAR of 148**), Happy Valley (147**) and Mitcham (143**); the western area of West Torrens (145**); and in the inner SLAs of Unley (142**), Adelaide (136**), St Peters, and Kensington and Norwood (each with 131**).

The lowest SARs were mainly distributed in two locations (**Map 6.5**); in the western areas of Enfield [Part B] (51**), Thebarton (70**), Port Adelaide (94**) and Hindmarsh and Woodville (98); and in the northern SLAs of Munno Para (72**), Enfield [Part A] (86**), Elizabeth (88**) and Salisbury (99).

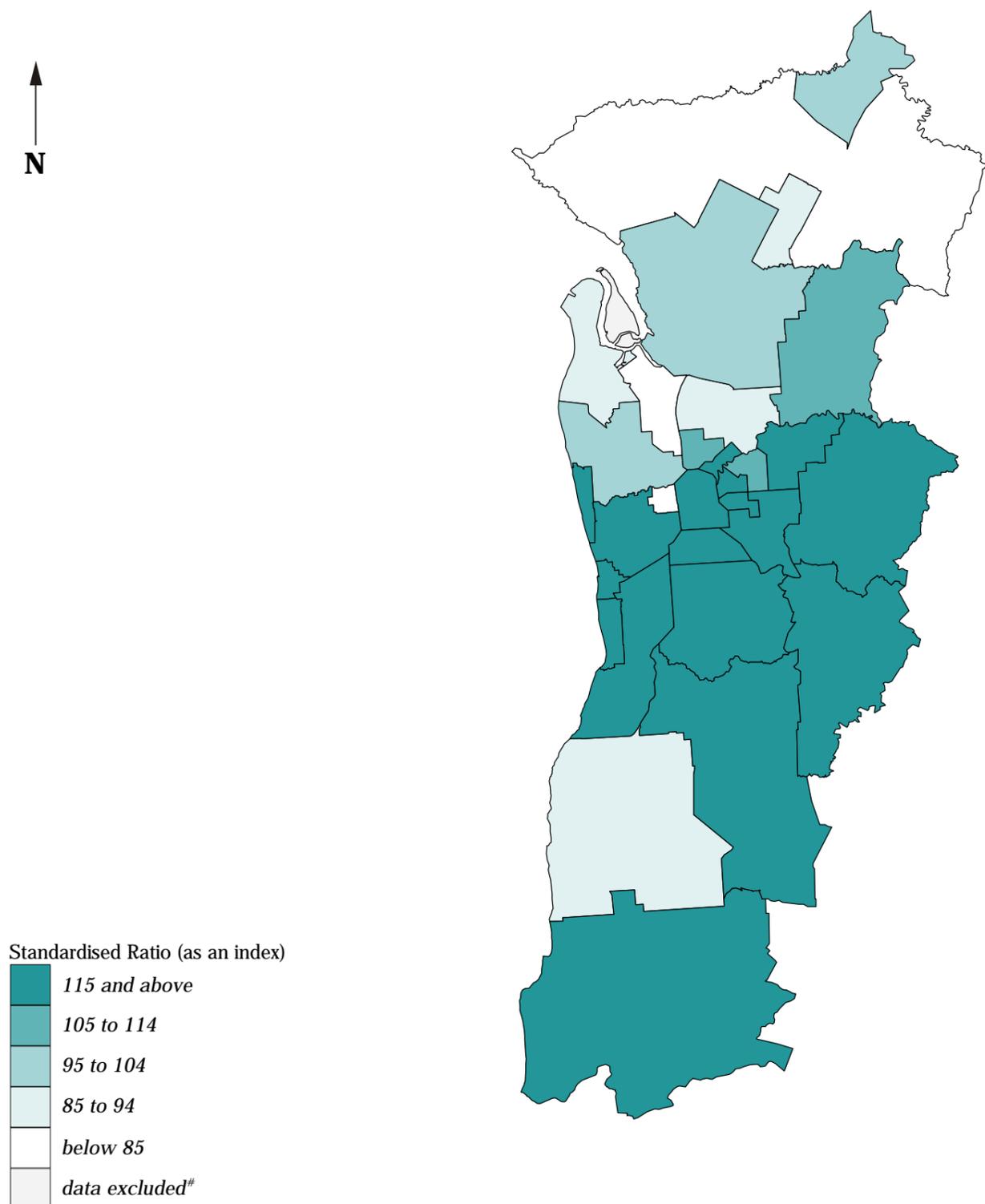
The largest numbers of admissions to private hospitals were recorded in the SLAs of Marion (with 8,714 admissions), Mitcham (8,667), Salisbury (8,473), Hindmarsh and Woodville (8,454) and Tea Tree Gully (8,024).

The correlation analysis revealed a positive association with indicators of high socioeconomic status, with correlations of substantial significance recorded with the variables for high income families (0.77), managers and administrators, and professionals (0.72) and female labour force participation (0.71). These results and the correlation of substantial significance with the IRSD (0.81) indicate an association at the SLA level between high rates of admission to private hospitals and high socioeconomic status.

Map 6.5

Admissions to private hospitals, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions to private hospitals, 1995/96

State/Territory comparison (Australia as the Standard)

The most highly elevated standardised admission ratios (SARs) for admissions to private hospitals of residents of the non-metropolitan areas of Australia were in Tasmania (118**) and Queensland (113**). Ratios in all of the other States and the Northern Territory were substantially lower than expected from the Australian rates (**Table 6.11**). The lowest were in the Northern Territory (39**), South Australia and Western Australia (both with SARs of 55**). Details of admissions to public acute hospitals (page 198, **Table 6.9**) and levels of provisions of private hospitals (Chapter 7) are also relevant.

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

The lack of private hospitals and the relative availability of public hospitals throughout the non-metropolitan areas of South Australia are evident from the low rate of use of private compared with public hospitals. Country residents had 45 per cent fewer admissions (an SAR of 55**) to private hospitals than expected from the State rates (and 38 per cent more public hospital admissions). Overall there were 18,708 admissions to private hospitals.

Only eight SLAs in the non-metropolitan areas of South Australia had elevated SARs. By far the most highly elevated of these ratios was recorded for residents of Onkaparinga, with more than one and a half times the number of admissions expected from the State rates (an SAR of 165**). The remaining elevated ratios were recorded in Central Yorke Peninsula (144**); Tatiara (139**) and Victor Harbor (101), located in the south-east; Coonalpyn Downs (135**) and Lameroo (107), in the Murray Lands; Mallala (121**), located on the outskirts of **Adelaide**; and in Unincorporated Pirie (103).

Fewer than half the expected number of admissions were recorded in half of the non-metropolitan SLAs, however the number of admissions in each of these SLAs was quite small. Areas with the lowest SARs, of those with more than 100 admissions, were Whyalla (C) (an SAR of 20** and 392 admissions), Millicent (21** and 134), Berri (21** and 122), Mount Gambier (C) (24** and 457), Renmark (25** and 166), Loxton (25** and 157), Port Lincoln (29** and 306), Barmera (33** and 133), Port Pirie (34** and 442), Murray Bridge (37** and 532), Kapunda (40** and 121), Waikerie (43** and 183), Mount Remarkable (43** and 123), Port Augusta (44** and 509), Yorketown (44** and 144), Ridley-Truro (45** and 113) and Strathalbyn (49** and 298).

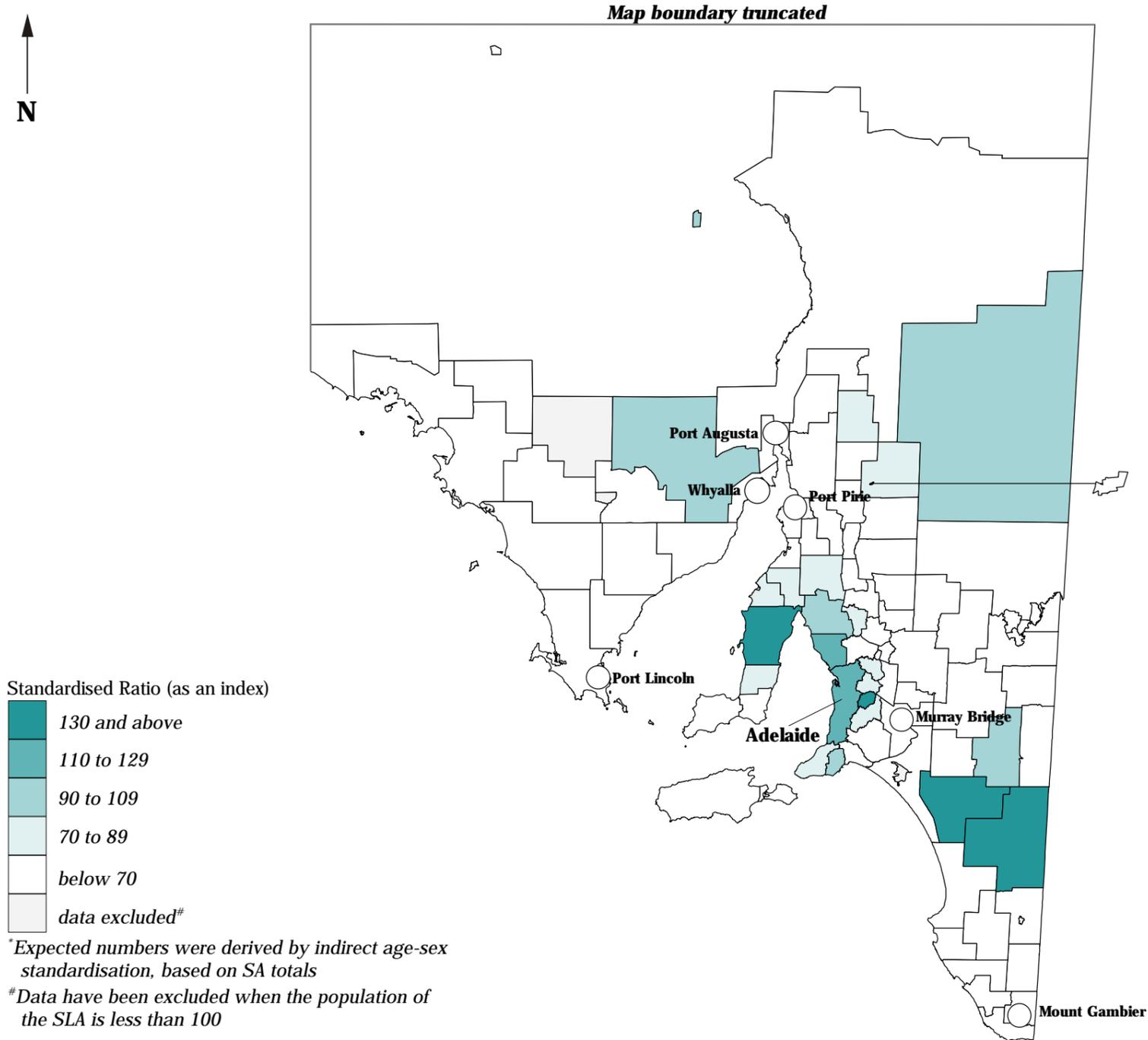
The largest number of admissions to private hospitals was in Mount Barker, with 1,429 admissions. More than 500 admissions were recorded for residents of Onkaparinga (1,153 admissions), Victor Harbor (1,057), Tatiara (796), Central Yorke Peninsula (755), Mallala (674), Northern Yorke Peninsula (650), Port Elliot and Goolwa (571), Murray Bridge (532) and Port Augusta (509).

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak correlation with the IRSD (0.30), suggest the existence of an association at the SLA level between high rates of admissions to private hospitals and high socioeconomic status.

Map 6.6

Admissions to private hospitals, South Australia, 1995/96

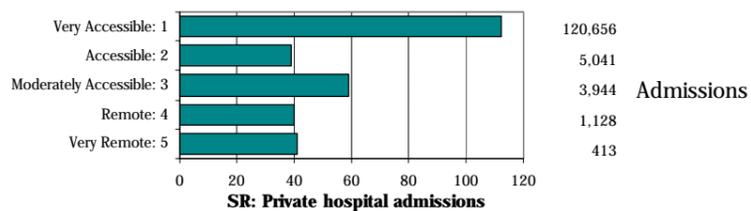
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Residents of the Very Accessible areas under the ARIA classification accounted for the majority of admissions to private hospitals (92.0 per cent) and had the only elevated standardised admission ratio (112), reflecting the greater availability of these facilities in the largest urban areas. Ratios in the other categories were all lower, dropping to an SAR of 41 in the Very Remote ARIA category. Private hospital beds were only located in the three 'accessible' ARIA categories (see Chapter 7).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions of males, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Males account for 44.9 per cent of all admissions of South Australian residents (which includes admissions to public and private acute hospitals and private psychiatric hospitals and same day surgery facilities, but excludes admissions of same day patients for renal dialysis and long stay nursing home type patients). For metropolitan residents the proportion was similar, at 44.2 per cent of admissions.

Adelaide (South Australia as the Standard)

There were 131,938 admissions of males resident in **Adelaide**, four per cent fewer than expected from the State rates. The distribution of standardised admission ratios for males produces a pattern at the SLA level consistent with that evident with many of the measures of low socioeconomic status (Chapter 3).

The four SLAs with ratios in the highest two categories stood out in marked contrast to the pattern of generally low to average ratios (**Map 6.7**). These were the City of Adelaide (with an SAR of 129**), Elizabeth (123**) and Glenelg (116**) in the highest range and, in the second highest range, the SLA of Salisbury (109**). Male admissions in the SLAs of Port Adelaide, Brighton, West Torrens and Enfield [Part A] were marginally above the level expected, with ratios ranging from 102 to 104**.

Of the remaining 22 SLAs, four were mapped in the lowest range, with the majority (11 SLAs) recording ratios in the second lowest range of 5 to 14 per cent lower than expected.

Residents of Prospect had the lowest ratio for this variable, with 26 per cent fewer male admissions than were expected from the State rates, a ratio of 74**. Thebarton, Happy Valley, Burnside, Tea Tree Gully, and Stirling all had ratios that were 15 per cent or more below the level expected from the State rates.

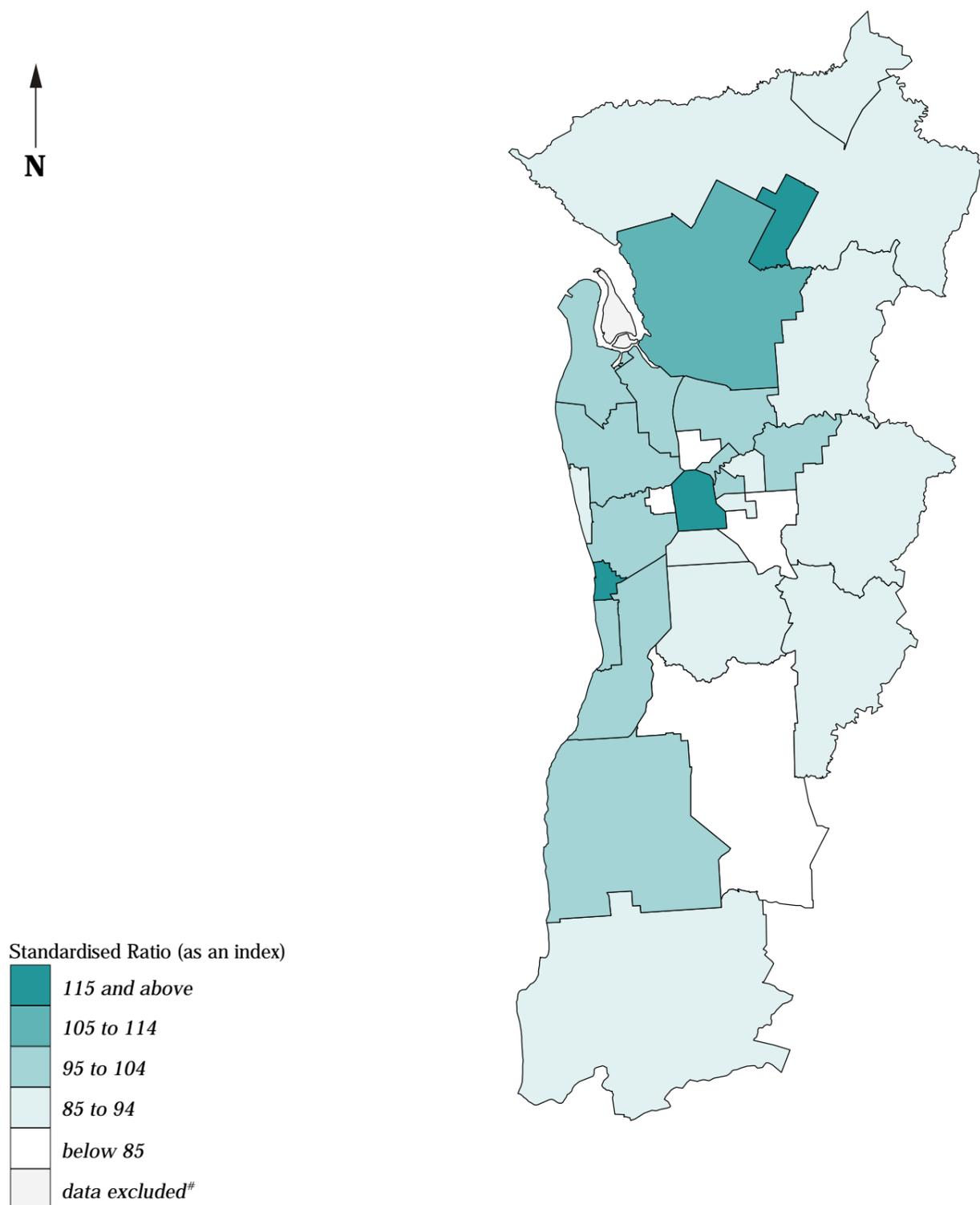
The largest numbers of admissions were recorded for males in Salisbury (13,735) and Tea Tree Gully (9,438), situated in the north; Hindmarsh and Woodville (11,616), located in the west; and Noarlunga (10,287) and Marion (10,028), in the south. At the other end of the scale, there were fewer than 1,000 admissions of males in the SLAs of East Torrens, Thebarton and Walkerville, with 767, 813 and 909 admissions, respectively.

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.34), suggest the existence of an association at the SLA level between high rates of admissions of males and socioeconomic disadvantage.

Map 6.7

Admissions of males, Adelaide, 1995/6

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



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

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions of males, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 57,794 admissions of males resident in the non-metropolitan areas of South Australia, 11 per cent more admissions than were expected from the State rates (111**). The elevated ratio is in contrast to the below average ratio for city residents. Some comments as to the possible reasons for the generally higher standardised admission ratio for residents of the non-metropolitan areas of South Australia are on page 187.

Several SLAs had ratios in the highest range mapped, ranging from an SAR of 268** (and 207 admissions) in Unincorporated West Coast to 132** (and 233 admissions) in Elliston. The highly elevated ratio in Unincorporated West Coast indicates that there were more than two and a half times the number of admissions of males than was expected from the State rates. Carrieton (in the Flinders Ranges), Ceduna (on the west coast), Coober Pedy (in the far north) and Meningie (in the Murray Lands) all had rates elevated by 60 per cent or more. All of these SLAs apart from Carrieton have relatively large Aboriginal populations.

There were 28 SLAs in country South Australia that were mapped in the middle range of 10 per cent above or below the level expected (**Map 6.8**). The highest ratio, of 109, was recorded in both Robe and Minlaton, indicating that there were nine per cent more male hospital admission than the level expected. The only ratio of statistical significance, within this class interval, occurred in the town of Mount Gambier, with an SAR of 106**.

Roxby Downs and Naracoorte (DC) had the lowest SARs, of 46** and 50** respectively. Pirie, Light, Barossa, Mount Gambier (DC), Yankalilla, Robertstown, Beachport and Spalding also had ratios of 70 or lower. Although Unincorporated Riverland had the lowest SAR in the non-metropolitan areas of South Australia, with 62 per cent fewer admissions than expected, there were only eight male admissions compared with an expected 21.9.

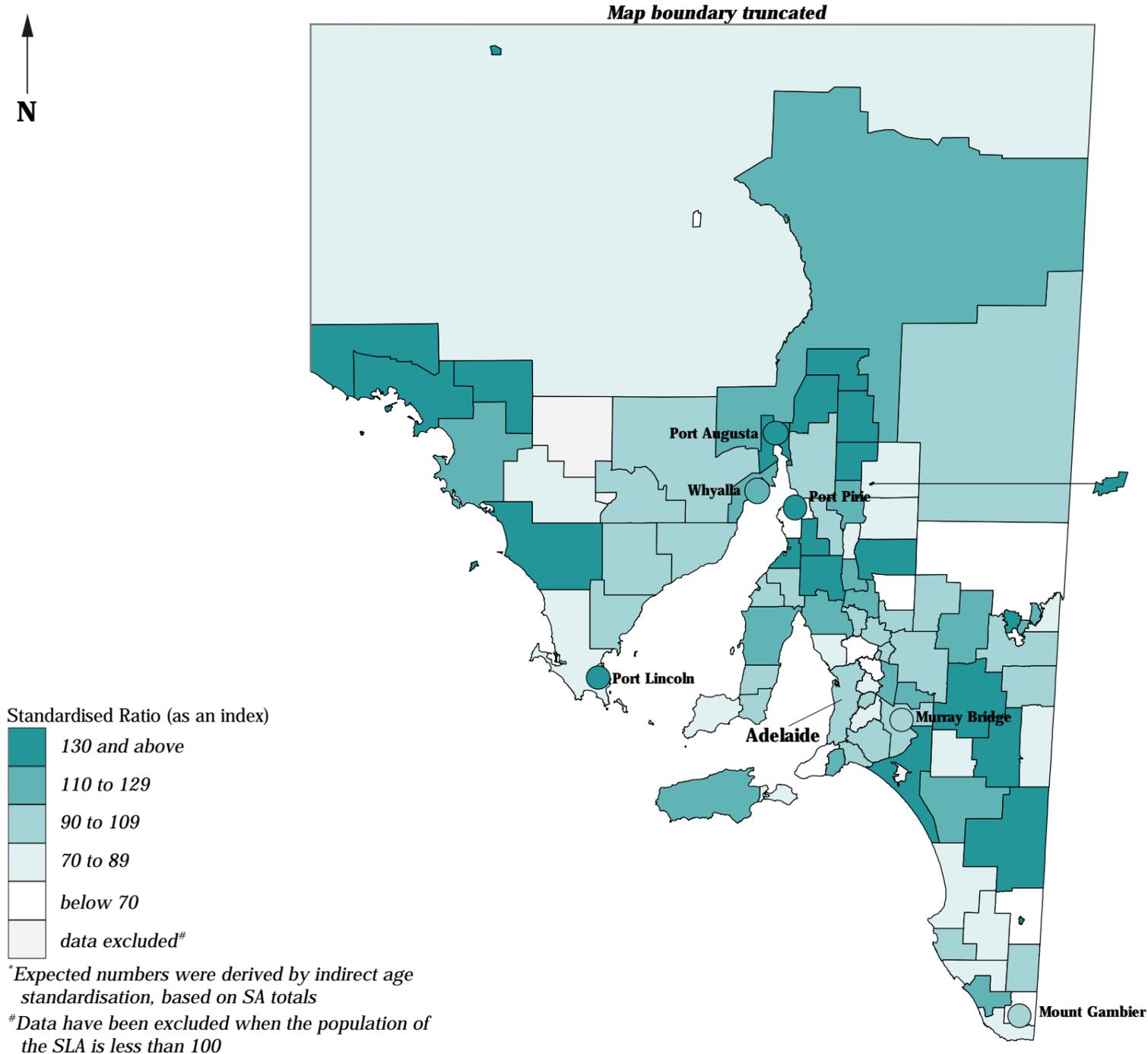
The largest numbers of admissions for males resident in the non-metropolitan areas of South Australia in 1995/96 were in the town of Whyalla (3,732 admissions), Mount Gambier (2,936) and Port Pirie (2,634).

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with most of the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.20), support the existence of an association at the SLA level between high rates of admissions of males and socioeconomic disadvantage.

Map 6.8

Admissions of males, South Australia, 1995/96

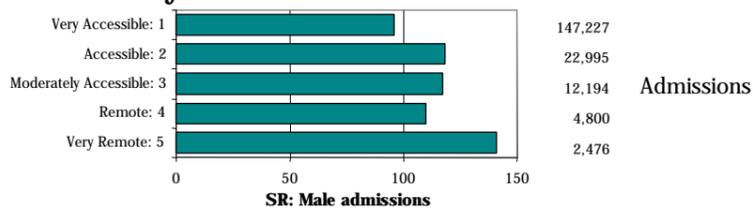
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for males closely follow the pattern evident for total admissions, with a ratio of 96 in the Very Accessible category; ratios of 118, 117 and 110 in the three middle categories; and increasing to an SAR of 141 in the Very Remote category.

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

Admissions of females, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Females accounted for 55.8 per cent of all admissions of residents of **Adelaide** and for 53.7 per cent of admissions of non-metropolitan residents. Overall, females had higher admission rates than males: 31,353 admissions per 100,000 population for females, compared with 25,882 admissions per 100,000 population for males.

Adelaide (South Australia as the Standard)

There were 166,272 admissions of females resident in **Adelaide**, five per cent fewer than expected from the State rates (an SAR of 95**).

The distribution of standardised admission ratios for females across **Adelaide** was less skewed toward the highest category than that for males, with only Elizabeth recording a standardised admission ratio in the highest range (an SAR of 122**).

Gawler (110**) and Salisbury (107**) located in the north, and Willunga (109**) and Glenelg (107**) situated in the south, were mapped in the second highest range.

Of the twelve SLAs with SARs in the middle range (five per cent above or below the level expected from the State rates), seven were of statistical significance. Statistically significant ratios within this class interval occurred in Enfield [Part B] (104*), Enfield [Part A] (103*), Noarlunga (98*), Marion (97*), Campbelltown (96**), Munno Para (96**) and Hindmarsh and Woodville (95**).

The lowest ratios were recorded for residents of Thebarton (79**), Stirling and Burnside (both 82**). The SLAs of Tea Tree Gully, Prospect, Payneham, Kensington and Norwood and East Torrens (all with a ratio of 83**), and Unley (with a ratio of 84**) were also mapped in the lowest range (**Map 6.9**).

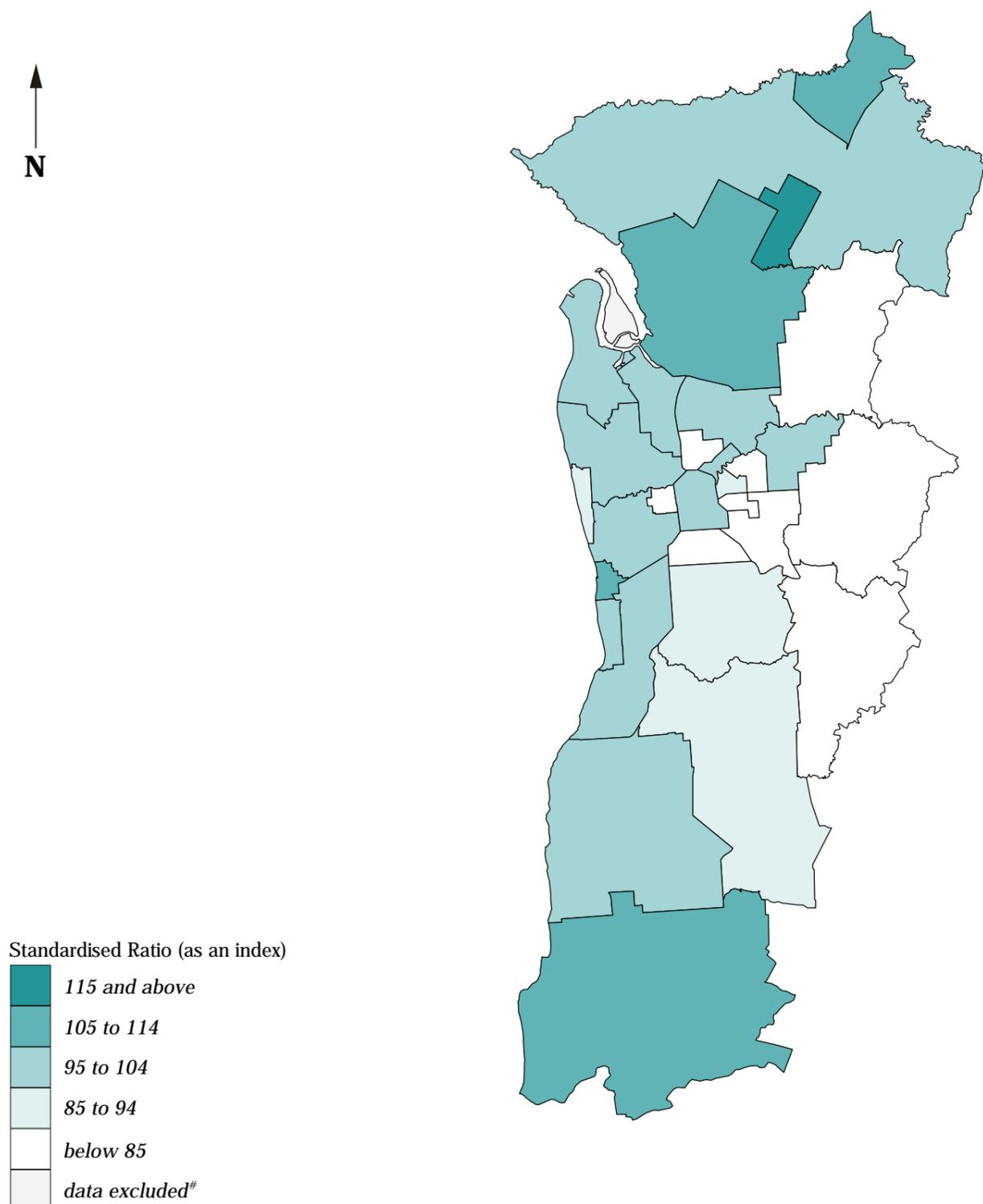
The largest number of admissions were recorded for female residents of Salisbury (16,883 admissions), Hindmarsh and Woodville (14,234) and Noarlunga (13,224). In contrast, there were 768 admissions of females in East Torrens, 1,053 in Thebarton and 1,196 in St. Peters.

High rates of admissions of females were more highly correlated with indicators of socioeconomic disadvantage than was the case for admissions of males. There were correlations of meaningful significance the variables for unskilled and semi-skilled workers (0.65), early school leavers (0.62), low income families (0.61), unemployed people (0.60), Indigenous people (0.57), dwellings rented from the State housing authority (0.54) and single parent families (0.53). These results, together with the inverse correlation with the IRSD (-0.63), indicate the existence of an association at the small area level between high rates of admissions of females and socioeconomic disadvantage.

Map 6.9

Admissions of females, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions of females, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 67,028 admissions of females resident in country areas of South Australia, 14 per cent more than expected from the State rates (a ratio of 114**). Some comments on the possible reasons for the generally higher admission ratios for residents the non-metropolitan areas are provided on page 187.

As for males, the highest ratio was recorded in Unincorporated West Coast (an SAR of 487**). There were 371 admissions for females in this SLA, almost five times the number of admissions expected from the State rates. This SLA, and several others with high ratios, have relatively large Aboriginal populations.

In total, 25 SLAs were mapped in the highest range with ratios elevated by 30 per cent or more (**Map 6.10**). The next highest of these ratios were in Coober Pedy (an SAR of 225**), Ceduna (179**) and Unincorporated Pirie and Hawker (both 169**). Port Broughton (166**) on the Yorke Peninsula and Port Augusta (162**) in the Flinders Ranges had similarly highly elevated ratios. The many other SLAs with highly elevated ratios were spread across most of the State, with the exception of the lower south-east and a number of the SLAs to the east of **Adelaide**.

Pirie, situated in the north, and Naracoorte (DC), located in the south-east, had the lowest SARs, of 39** and 41**, respectively. Low ratios were also recorded in the SLAs of Roxby Downs, Light, Mount Gambier (DC) and Robertstown, all of which were

mapped in the lowest range. Also mapped in this range was Unincorporated Riverland, with only six admissions of females, and an SAR of 29**.

The major regional cities of Whyalla, Mount Gambier and Port Augusta had the largest number of admissions with 4,775, 3,416, and 3,290 admissions respectively.

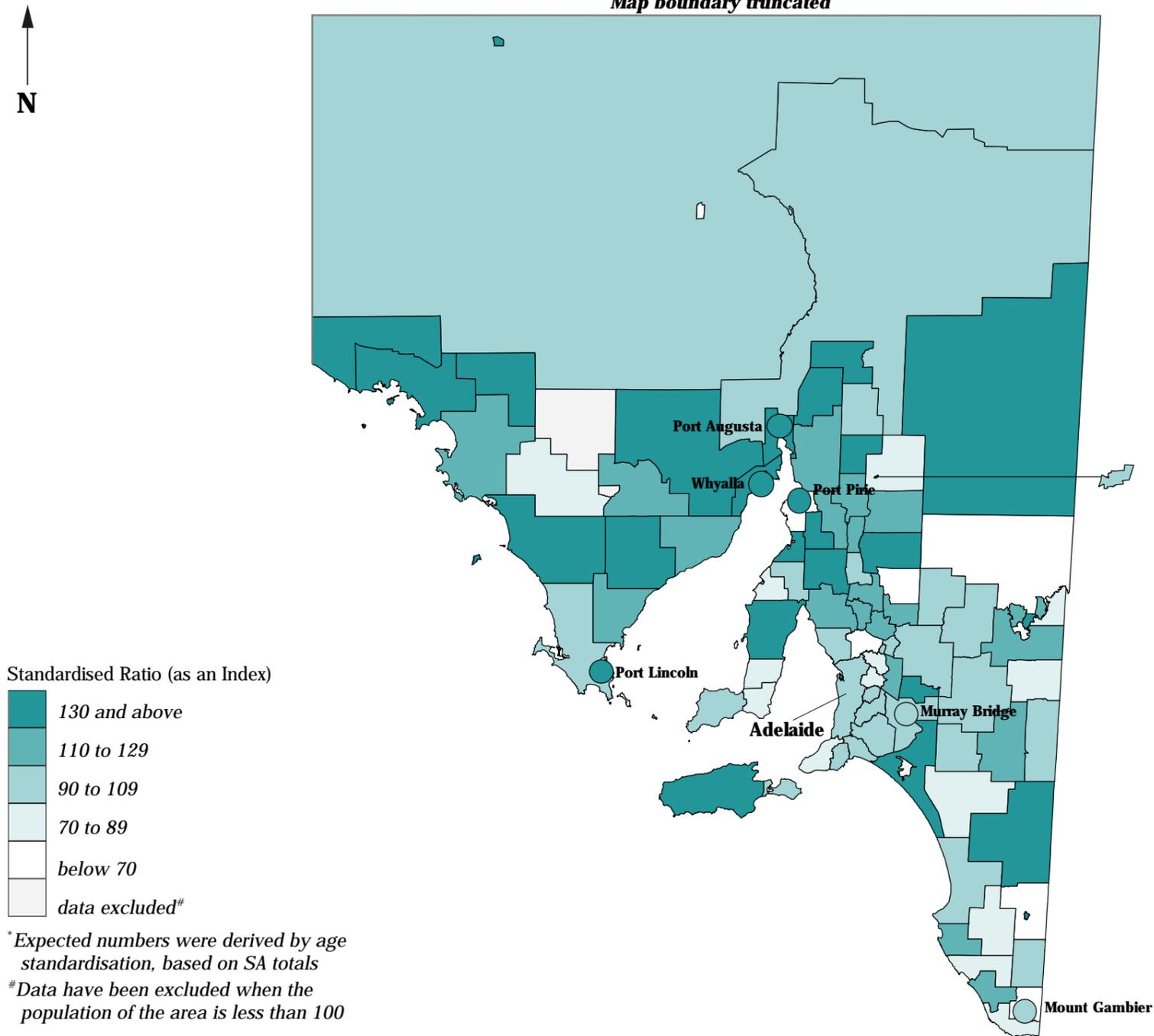
There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with most of the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.30), support the existence of an association at the SLA level between high rates of admissions of females and socioeconomic disadvantage.

Map 6.10

Admissions of females, South Australia, 1995/96

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

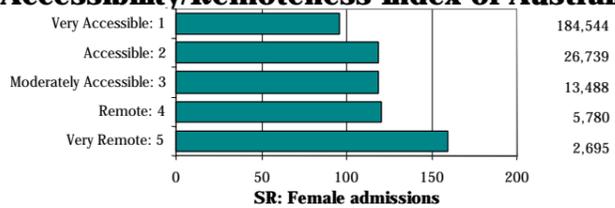
Map boundary truncated



Source: Calculated on data from ABS 1996 Census

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Admissions

Standardised admission ratios for females also closely follow the pattern evident for total admissions, with a ratio of 96 in the Very Accessible category; ratios of 119, 119 and 120 in the three middle categories; and increasing to an SAR of 159 in the Very Remote category. The number of admissions is higher in each category than those for males, and ratios in all but the Very Accessible category are also higher.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Same day admissions, 1995/96

Capital city comparison (Australia as the Standard)

The same day admissions in this analysis include admissions of same day patients (other than for renal dialysis), whether to a public acute hospital, a private (acute or psychiatric) hospital or to a same day surgical unit. Patients admitted on a same day basis for renal dialysis have been excluded, due to their frequent repeat visits for treatment, which distorts the patterns of hospitalisation (see page 187).

There is a wide variation in standardised admission ratios (SARs) between the capital cities, from elevated ratios of 115** in **Melbourne**, 109** in **Sydney** and 108** in **Brisbane**, to a low of 62** in **Canberra** and 65** in **Darwin** (Table 6.16). This information was not collected for the first edition of the atlas (see page 189).

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Same day admissions accounted for 34.2 per cent of all admissions in 1995/96 of South Australian residents, with similar percentages recorded for males (35.2 per cent) and females (33.4 per cent). Same day admissions represented a higher proportion of all admissions in **Adelaide** (36.5 per cent) than in the rest of the State (28.7 per cent).

Adelaide (South Australia as the Standard)

In 1995/96 there were 108,945 same day admissions of residents of **Adelaide**, two per cent more than were expected from the State rates. The total of same day admissions was comprised of 59,475 females (54.6 per cent) and 49,470 males (45.4 per cent).

Residents of the SLAs of Adelaide (118**), Elizabeth (117**) and Glenelg (116**) had the highest ratios for this variable, with 18 per cent, 17 per cent and 16 per cent respectively more same day admissions than were expected from the State rates. Ratios elevated by five per cent or more were also recorded in the SLAs of Brighton, Enfield [Part B], West Torrens, Salisbury, Port Adelaide, Enfield [Part A], Marion, and Hindmarsh and Woodville.

Several SLAs had ratios in the middle range mapped, of five per cent above or below the level expected from the State rates. Walkerville (with an SAR of 103) and Mitcham (103⁺) had the highest SAR in this range, while Payneham and East Torrens (both 95) and Henley and Grange (95⁻) had the lowest.

Residents of Thebarton recorded 16 per cent fewer same day admissions than were expected, a ratio of 84**. Low ratios were also recorded in the eastern SLAs of Prospect (86**), Stirling (87**), Kensington and Norwood (90**) and Burnside (91**). In the north, Gawler, Tea Tree Gully and Munno Para, and in the south, Willunga, were also among areas with the lowest standardised admission ratios.

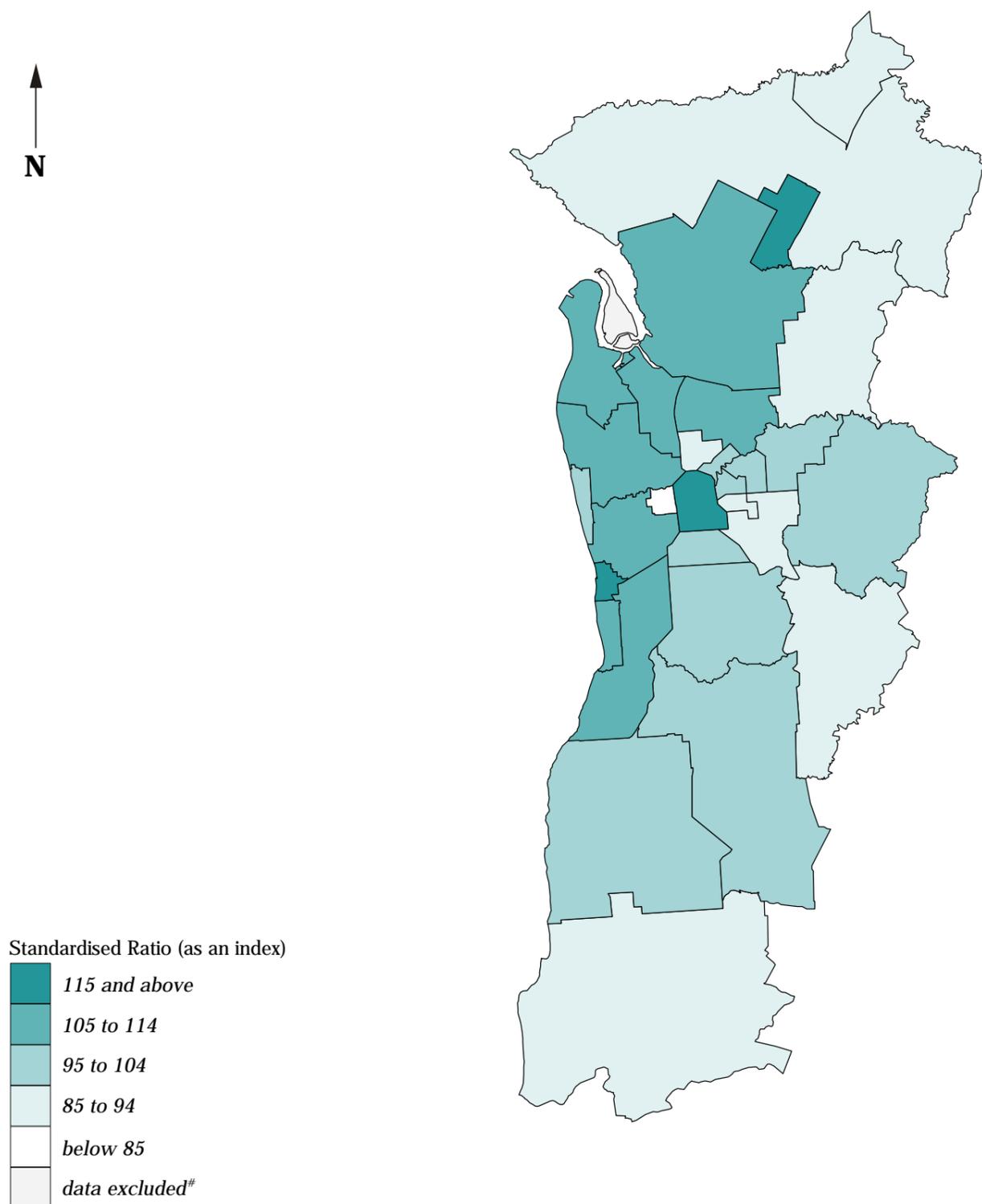
The largest numbers of same day admissions were recorded for residents of the SLAs of Salisbury (11,449 admissions), Hindmarsh and Woodville (9,775), Marion (8,737) and Noarlunga (8,479).

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with most of the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.37), support the existence of an association at the SLA level between high rates of same day admissions and socioeconomic disadvantage.

Map 6.11

Same day admissions, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Same day admissions, 1995/96

State/Territory comparison (Australia as the Standard)

The admissions included in this analysis are of all admissions of same day patients (other than for renal dialysis), whether to a public acute hospital, a private (acute or psychiatric) hospital or to a same day surgical unit. See the comments on the previous text page and on page 187 for reasons for the exclusion of same day admissions for renal dialysis.

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were seven per cent fewer same day admissions in the non-metropolitan areas of South Australia than were expected from the State rates, a ratio of 93**. Females accounted for 51.6 per cent of the total 35,780 admissions, while males accounted for 48.4 per cent.

The distribution of standardised admission ratios for same day patients was in direct contrast with that recorded for total admissions (admissions to public acute hospitals plus private hospitals). Only three SLAs had SARs in the highest range mapped, compared to 22 SLAs for total admissions. The most notable difference was in the northern region of the State, where same day admissions were mapped in the lowest range, while total admissions were mapped in the highest (**Map 6.12**). This emphasises the point made above as to the location of these facilities in the capital city, which limits their access by people in remote regions.

Carrieton, located in the Flinders Ranges, had the highest SAR, of 379**, indicating that there were more than three and half times the number of same day admissions than were expected from the State rates (a total of 65 admissions). The SLAs of Naracoorte (M) and Crystal Brook-Redhill also had highly elevated SARs, with 75 per cent and 51 per cent more admissions than expected, respectively.

The towns of Port Lincoln (with an SAR of 120**), Whyalla (115**) and Port Augusta (113**) and the smaller rural SLAs of Lameroo (126**), Hawker (125**) and Burra Burra (122**) all had elevated same day admission ratios.

Residents of Pirie (an SAR of 35**), Robertstown (39**), Roxby Downs (41**), Warooka (48**) and Tumby Bay (49**) had very low admission rates for this variable. By far the lowest ratio of same

day admissions was in the SLA of Unincorporated Riverland, with 92 per cent fewer admissions than were expected from the State rates: however this represented only one same day admission (compared with an expected 15.6).

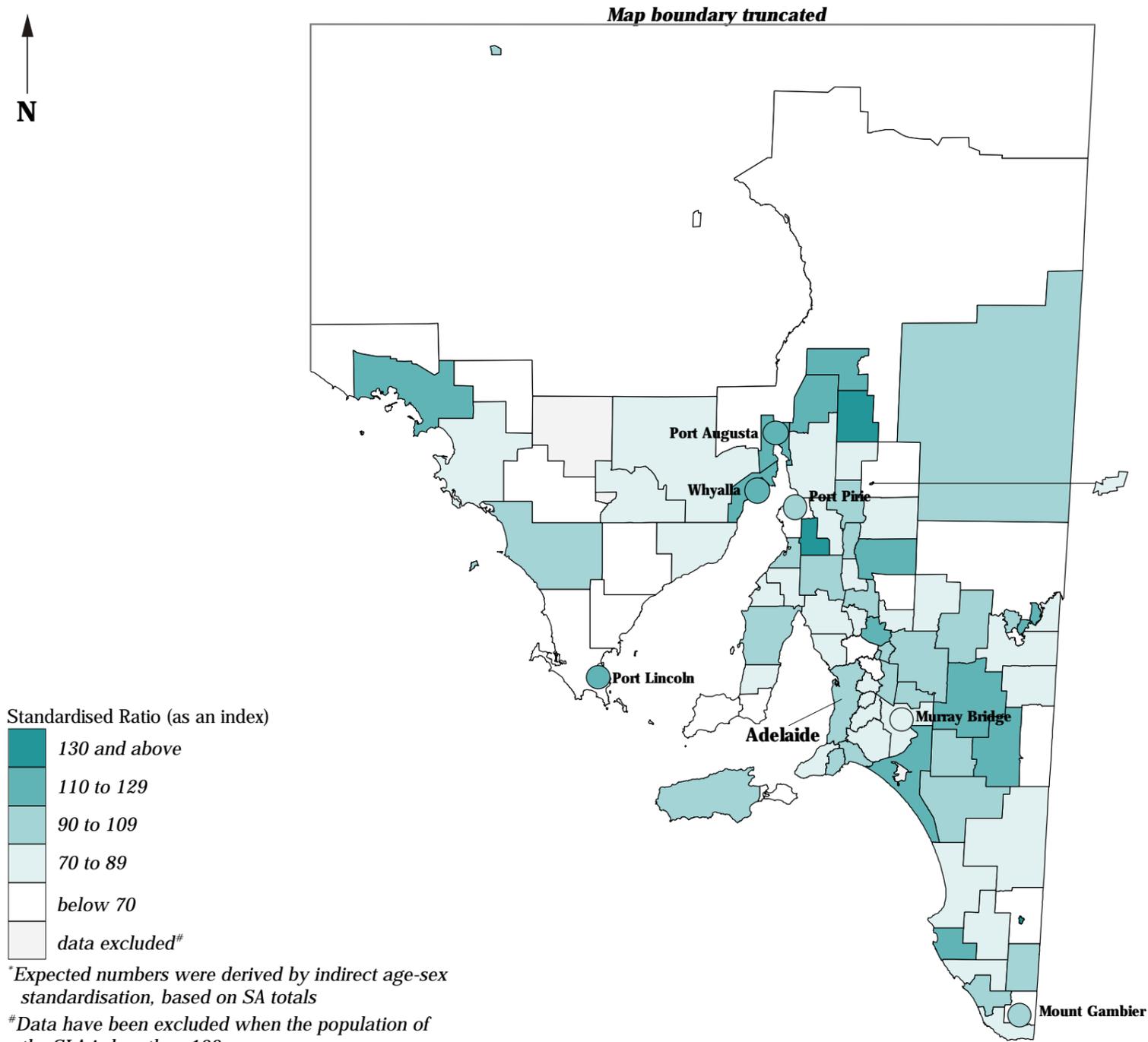
The largest numbers of same day admissions were in the SLAs of Whyalla, Mount Gambier (C) and Mount Barker, with 2,635, 2,153 and 1,687 admissions respectively.

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of same day admissions and socioeconomic status.

Map 6.12

Same day admissions, South Australia, 1995/96

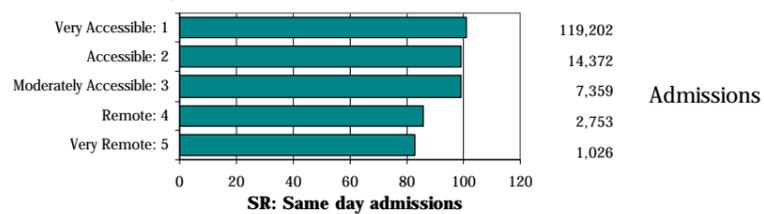
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for same day admissions are around 100 in the three 'accessible' ARIA categories, dropping to SARs of 86 and 83 in the Remote and Very Remote categories, respectively.

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

Admissions for infectious and parasitic diseases, 1995/96

Capital city comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for infectious and parasitic diseases (described below) varied widely between the capital cities, from a high of 116** in **Sydney**, to a low of 66** in **Canberra**. **Adelaide** (108**) and **Darwin** (106) were the only other capital cities with elevated ratios (**Table 6.18**). Both **Sydney** and **Darwin** had substantially higher ratios in the later period shown in **Table 6.16**, suggesting an increase (relative to the Australian rates) in admissions for these diseases. The increase for **Sydney** was substantial.

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

In the early part of the century, infectious and parasitic diseases were a major cause of disease and death. Reductions in deaths from these causes were a "significant factor in reducing death rates between 1921 and the early 1960s ..., particularly among infants and young children." (AIH 1990). They are still an important cause of hospital admission, in particular for viral diseases and intestinal infections. Children aged 0 to 4 years had the highest rate for these admissions (27.3 admissions per thousand population for males and 27.8 for females), with the next highest rates being in the 75 years and over age group. In 1996/97, the category 'infectious and parasitic diseases' accounted for about twice as many admissions for Indigenous people as expected based on all-Australian rates (ABS/AIHW 1999).

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

Hospital admissions for infectious and parasitic diseases accounted for 1.8 per cent of all admissions of South Australian residents.

Adelaide (South Australia as the Standard)

There were 5,302 admissions of residents of **Adelaide** for infectious and parasitic diseases, six per cent fewer than were expected from the State rates (an SAR of 94**). Of the 5,302 admissions, 2,702 were males and 2,600 were females.

Fewer than half (40.0 per cent) of the SLAs mapped for this variable had elevated ratios, only four of which were mapped in the highest range, with SARs of 115 or more (**Map 6.13**). The highest of these occurred in the SLA of Adelaide, where there were 79 per cent more admissions than were expected from the State rates (an SAR of 179**). West Torrens. Port Adelaide and

Thebarton were also mapped in the highest range, with SARs of 135**, 127** and 122 respectively. The only ratio elevated by more than 10 per cent was recorded in Campbelltown (an SAR of 111).

As noted above, the majority of SLAs had below average ratios, many of which were of statistical significance. All ratios mapped in the lowest range were recorded in the eastern or southern SLAs, with the exception of Tea Tree Gully (76**) located in the north. Areas with ratios of 15 per cent or more lower than expected from the State rates included Stirling (62**), Prospect (70**), Happy Valley (72**), Burnside (74**), Willunga (76**), Noarlunga (77**) and Mitcham (82**). St. Peters (68*) and East Torrens (67) were also mapped in this range; however the number of admissions recorded for infectious diseases in these SLAs was quite small, being 28 and 23 respectively.

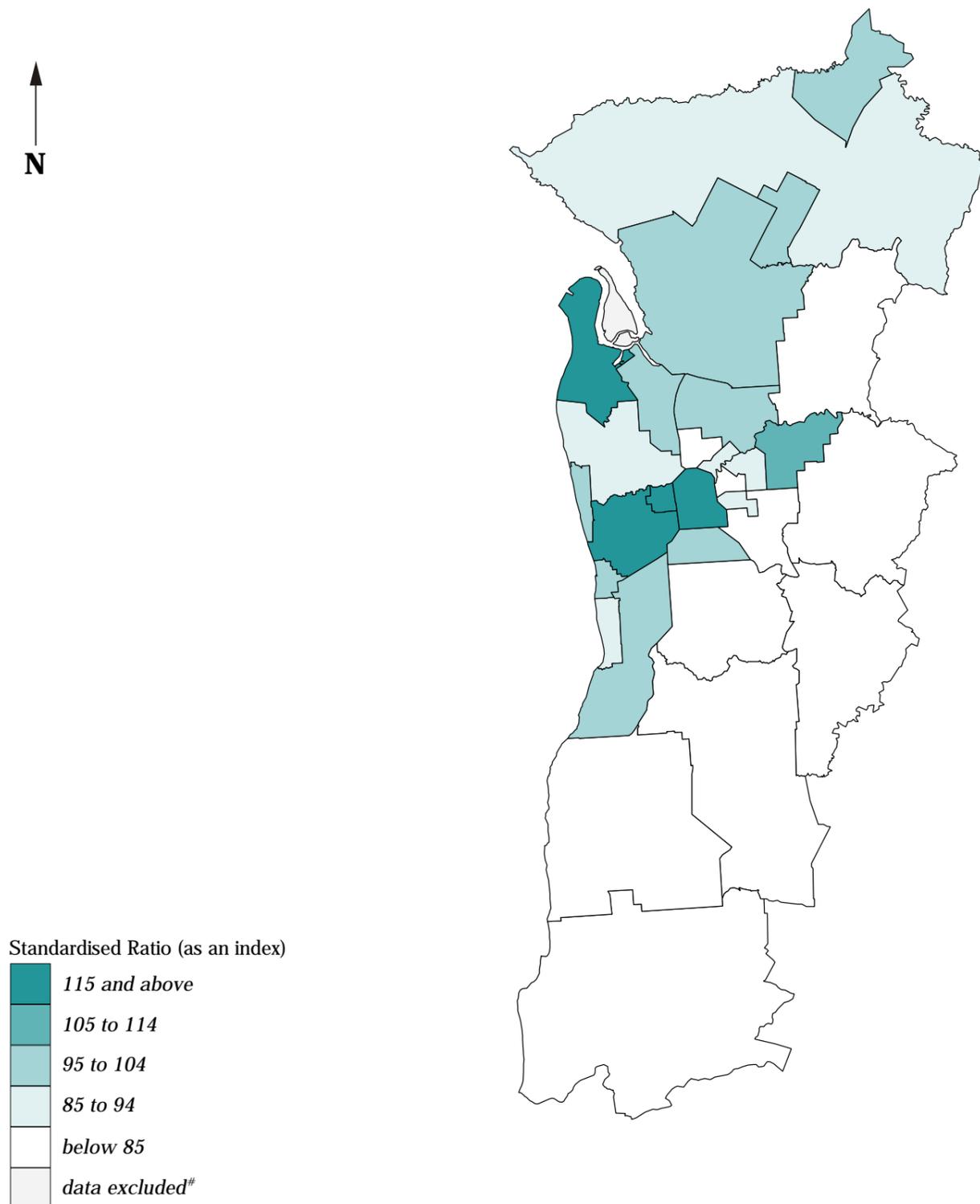
The largest numbers of admissions for infectious diseases were of residents in the SLAs of Salisbury (635), Hindmarsh and Woodville (423) and Marion (409).

There were weak correlations with most of the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.29), suggest the existence of an association at the SLA level between high rates of admissions infectious and parasitic diseases and socioeconomic disadvantage.

Map 6.13:

Admissions for infectious and parasitic diseases, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for infectious and parasitic diseases, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 2,494 admissions for infectious and parasitic diseases of residents of the non-metropolitan areas of South Australia, 16 per cent more than were expected from the State rates (an SAR of 116**). This represents a substantial difference in the rate of hospitalisation between residents of the non-metropolitan areas and **Adelaide**. Males accounted for 45.3 per cent of these admissions.

Highly elevated ratios (at least twice the level expected from the State rates) were recorded in the SLAs of Robe, Coober Pedy and Ceduna, with SARs of 399**, 281** and 235** respectively. There were also elevated ratios in Port Augusta (an SAR of 185**), Mannum (180**), Ridley-Truro (172**), Meningie (170**), Port Pirie (156**), Victor Harbor (152**), Port Lincoln (142**), Tatiara (140**), Whyalla (C) (139**), Mount Gambier (122') and Naracoorte (M) (121).

In total, 17 SLAs were mapped in the middle range, with SARs of 10 per cent above or below the level expected from the State rates (**Map 6.14**). Within this range, there were nine per cent more admissions in Strathalbyn, and 10 per cent fewer than expected in Clare.

The SLAs with the lowest ratios (for which there were more than 20 admissions) were Northern Yorke Peninsula, with an SAR of 60**; Loxton (72), Mallala (73) and Onkaparinga (74).

Paringa (with an SAR of 12*, one admission when eight were expected) and Morgan (18, one admission when six were expected) located in the Riverland, and Naracoorte (DC) (25*, two admissions when nine were expected), situated in the upper

south-east, had the lowest SARs, but each had small numbers of admissions. Ratios of below 50 were also recorded in Pirie, Beachport, Lucindale, Roxby Downs, Barmera, Streaky Bay and Yankalilla.

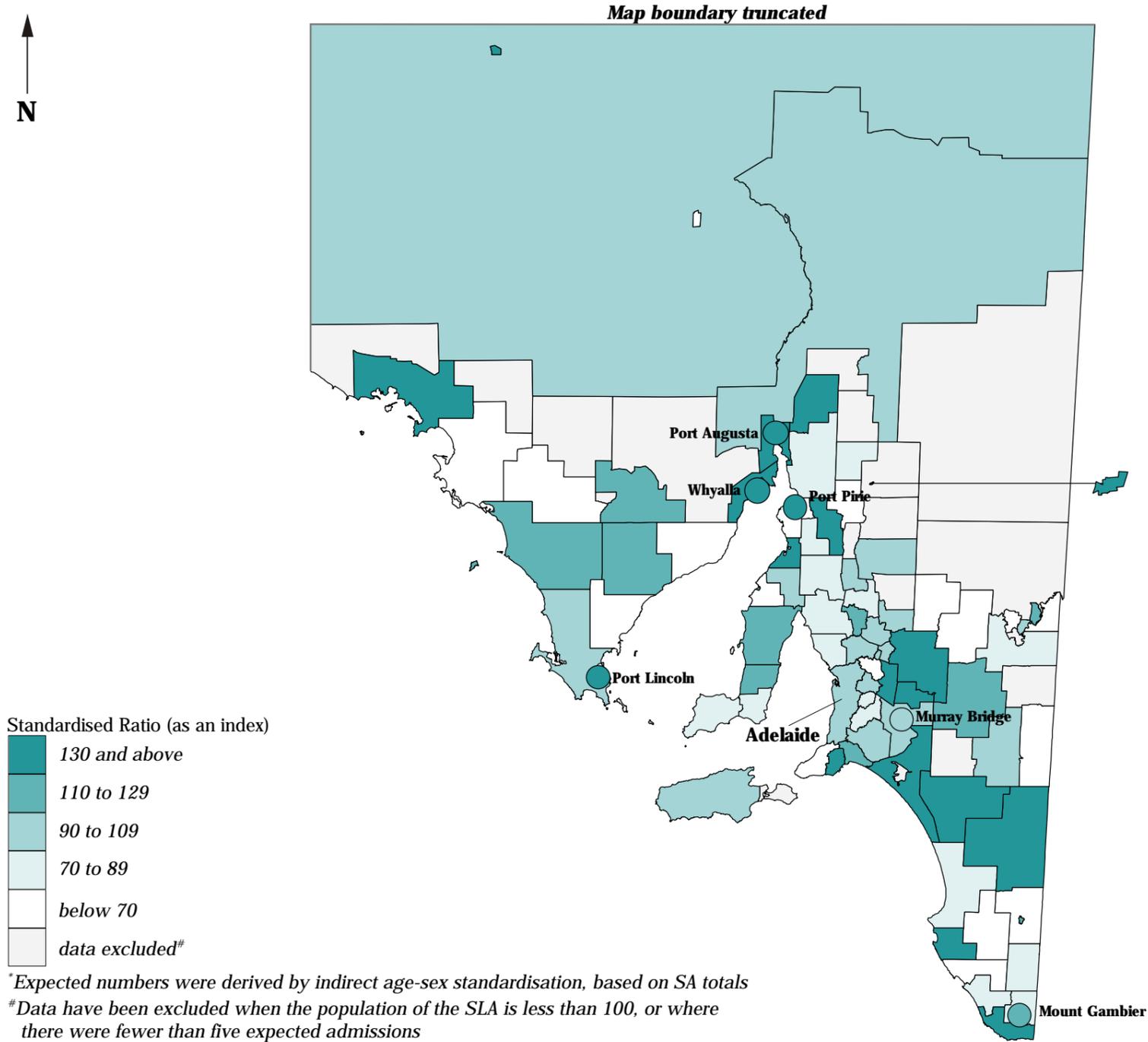
The largest numbers of admissions for infectious and parasitic diseases over this period were recorded for residents of the towns of Whyalla, with 191 admissions, Mount Gambier, with 155, Port Augusta, with 147 and Port Pirie, with 124.

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

Map 6.14

Admissions for infectious and parasitic diseases, South Australia, 1995/96

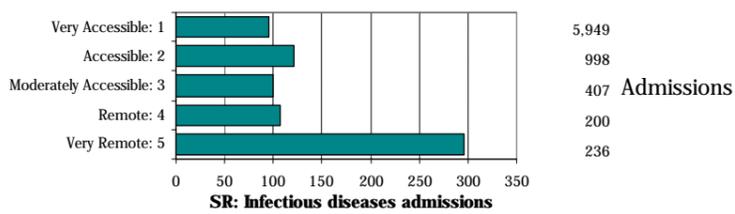
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for infectious diseases are around the level expected from the State rates in the Very Accessible, Accessible and Moderately Accessible categories, higher in the Moderately Accessible category (an SAR of 121) and much higher in the Very Remote category (296). The highly elevated rate of admissions of residents of the Very Remote areas is likely to reflect admissions of the Indigenous population.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Admissions for cancer, 1995/96

Capital city comparison (Australia as the Standard)

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

There was relatively little change in the ratios between the periods shown in **Table 6.18**, with the largest change being an increase in the admission ratio for **Darwin**, suggesting an increase (relative to the Australian rates) in admissions for these diseases.

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Admissions to hospital for cancer (malignant neoplasms) accounted for 5.2 per cent of all admissions analysed for South Australian residents; 5.5 per cent of residents of **Adelaide** and 4.6 per cent in the non-metropolitan areas.

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

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

Adelaide (South Australia as the Standard)

There were 16,305 admissions of residents of **Adelaide** for cancer, with a standardised admission ratio of 100. Males accounted for a larger proportion, with 53.4 per cent (8,715 admissions).

The distribution of standardised admission ratios across **Adelaide** was quite flat, with 20 SLAs (66.7 per cent) recording ratios within 15 per cent of the expected value. There were only five SLAs mapped in each of the highest and lowest ranges (**Map 6.15**).

SLAs with ratios elevated by 15 per cent or more were East Torrens, with an SAR of 145**, Adelaide (140**), Glenelg (135**), Brighton (127**) and Mitcham (118**).

The lowest ratios were recorded for residents of Thebarton and Prospect, located adjacent to the city, with SARs of 62** and 72** respectively. Other highly significant ratios below the level expected were recorded in Gawler, with a ratio of 80*; Payneham (83*); Munno Para (85*); and Tea Tree Gully (91**).

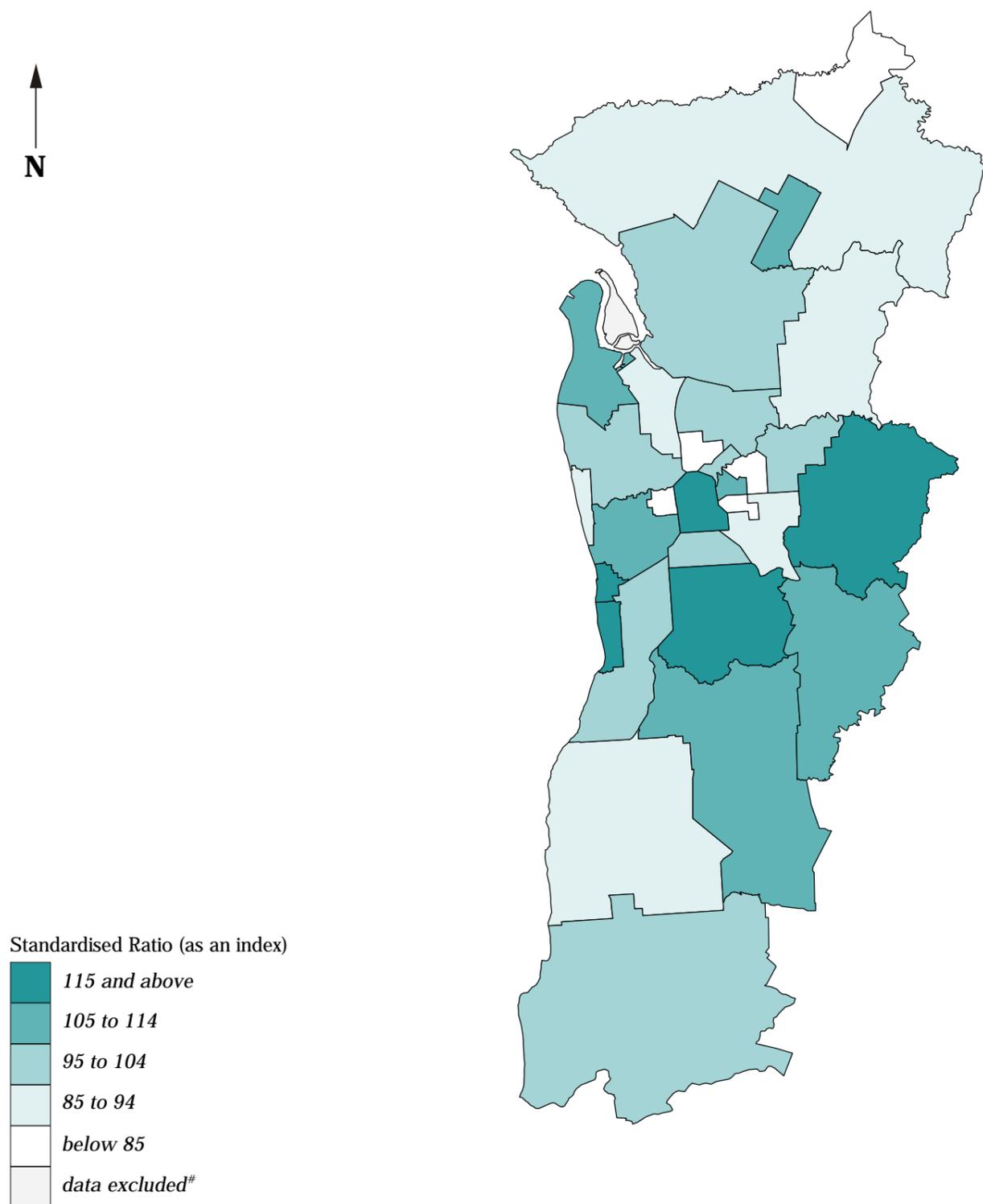
The largest numbers of admissions were recorded for residents of Hindmarsh and Woodville (1,521 admissions), Marion (1,392), Mitcham (1,288), Salisbury (1,096) and Noarlunga (1,001).

There were weak correlations with the indicators of high socioeconomic status and weak inverse correlations with the indicators of socioeconomic disadvantage. These results, together with the weak correlation with the IRSD (0.27), suggest the existence of an association at the SLA level between high rates of admissions for cancer and high socioeconomic status.

Map 6.15

Admissions for cancer, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for cancer, 1995/96

State/Territory comparison (Australia as the Standard)

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

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.19**, with the largest changes being for New South Wales, Western Australia and the Northern Territory. These lower ratios suggest a decline (relative to the Australian rates) in admissions for these diseases.

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 5,798 admissions of residents of the non-metropolitan areas of South Australia for cancer (an SAR of 100). In total, there were 3,294 admissions of males (56.8 per cent) and 2,503 admissions of females (43.2 per cent).

Despite an overall ratio of 100, some SLAs had highly elevated ratios. Those elevated by 30 per cent or more were:

- in the south-east in Naracoorte (M) (with an SAR of 169**) and Millicent (134**);
- on the Yorke Peninsula in Wallaroo (165**) and Central Yorke Peninsula (143**);
- on the outskirts of **Adelaide** in Kapunda (164**);
- in the lower north in Blyth-Snowtown (156**), Saddleworth and Auburn (138*);
- in the Murray Lands in Karoonda and East Murray (151*), Berri (151**), Meningie (144**) and Ridley-Truro (136*);
- in the north in Port Pirie (149**) and Crystal Brook-Redhill (138*); and
- on the Eyre Peninsula in Ceduna (145**), Port Lincoln (137**) and Elliston (130).

Of the 18 SLAs mapped in the middle range (within 10 per cent of the level expected), none were of statistical significance. A number of SLAs had standardised admission ratios in the lowest range mapped: the lowest ratio (with at least twenty admissions) was recorded in Barossa, with just under half the number of admissions expected from the State rates, an SAR of 46**.

Other low SARs were recorded in Port MacDonnell (62*), Burra Burra (64*), Clare (65**), Mount Gambier (DC) (66**) and Penola (67*).

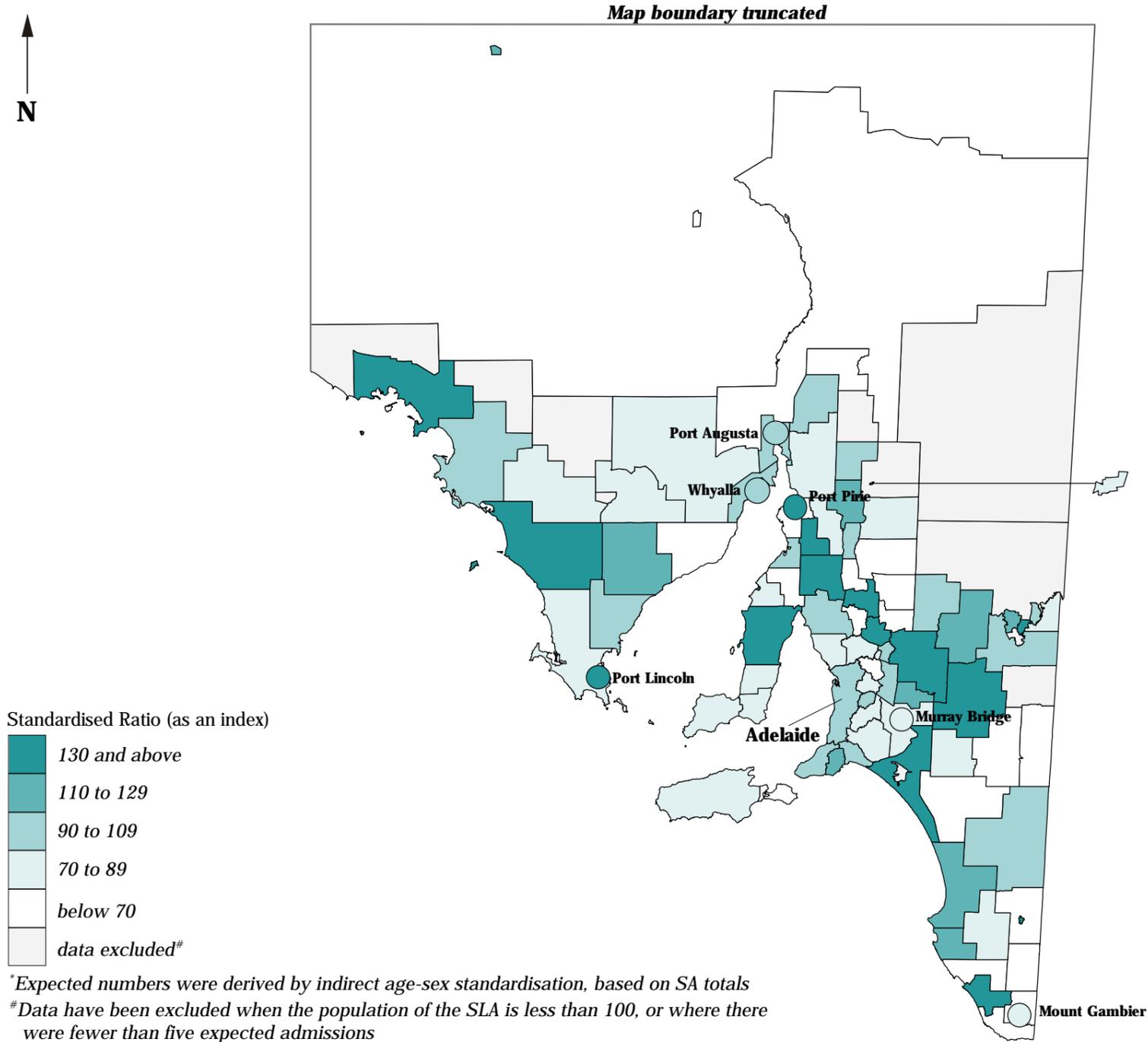
The largest numbers of admissions for cancer were recorded for residents of Port Pirie, with 340 admissions; Whyalla, 286; Victor Harbor, 282; Mount Gambier (C), 261; Port Lincoln, 243; Murray Bridge, 216; and Mount Barker, 203.

There were weak correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.32), suggest the existence of an association at the SLA level between high rates of admissions for cancer and socioeconomic disadvantage. This is the reverse of the implications in the correlation analysis for **Adelaide**.

Map 6.16

Admissions for cancer, South Australia, 1995/96

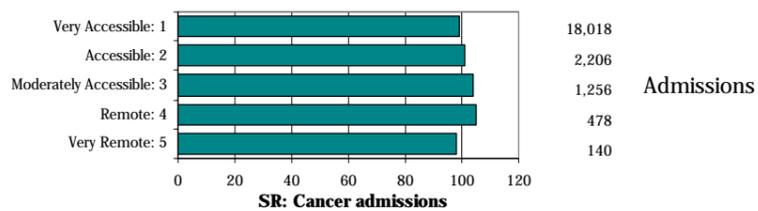
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for cancer varied only marginally across the ARIA categories. Ratios increased across the first four categories (from an SAR of 99 in the Very Accessible category to 105 in the Remote category), before declining to an SAR of 98 in the Very Remote category, with the smallest number of admissions.

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

Admissions for lung cancer, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Hospital admissions for lung cancer, which includes cancers of the trachea, bronchus and lung, accounted for 7.9 per cent of all admissions for cancer in 1995/96. However, lung cancer accounted for only 0.4 per cent of all admissions analysed for South Australian residents.

As noted in the commentary to the map for all cancers (page 220), incidence rates for some cancers are higher among people from poorer areas. Esterman et al. (1990) estimated the differential for lung cancer in the poorest areas compared with the most affluent areas to be approximately fifty per cent, that is the highest of all the cancers studied. In both SA and the NT, a higher than expected incidence of lung cancer has been observed among Indigenous people (ABS/AIHW 1999).

Adelaide⁵ (South Australia as the Standard)

There were 1,239 admissions of residents of **Adelaide** for lung cancer, three per cent fewer admissions than were expected from the State rates (an SAR of 97). Males accounted for two thirds of these admissions (67.0 per cent).

While the lowest range mapped contained the largest number of SLAs (14), the distribution of SARs showed a strong association with socioeconomic status, as would be expected given the findings reported above. Almost all of the SLAs mapped in the two highest ranges were located to the north or south of the city, with the exception being St. Peters (with an SAR of 149) (**Map 6.17**).

The highly elevated ratios recorded in the northern SLAs were in Elizabeth (191**), Salisbury (116), Tea Tree Gully (115) and Enfield [Part A] (119) and Enfield [Part B] (114); and those situated in the south were in Noarlunga and Willunga (both 122) and Marion (105).

⁵As there were relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of South Australia, the data have not been mapped. A summary of the main features is on page 299.

Only two SLAs were mapped in the middle range of five per cent above or below the level expected, all of which had SARs of below 100.

Most of the SLAs with the lowest ratios were situated in the inner, western and eastern SLAs of **Adelaide**, however the majority of these SLAs had fewer than 20 admissions. Within this class interval, SARs of statistical significance were recorded in Thebarton, with a ratio of 30* (three admissions), Brighton, with a ratio of 59* (22 admissions), Unley, with a ratio of 70* (30 admissions) and Burnside, with a ratio of 71* (42 admissions).

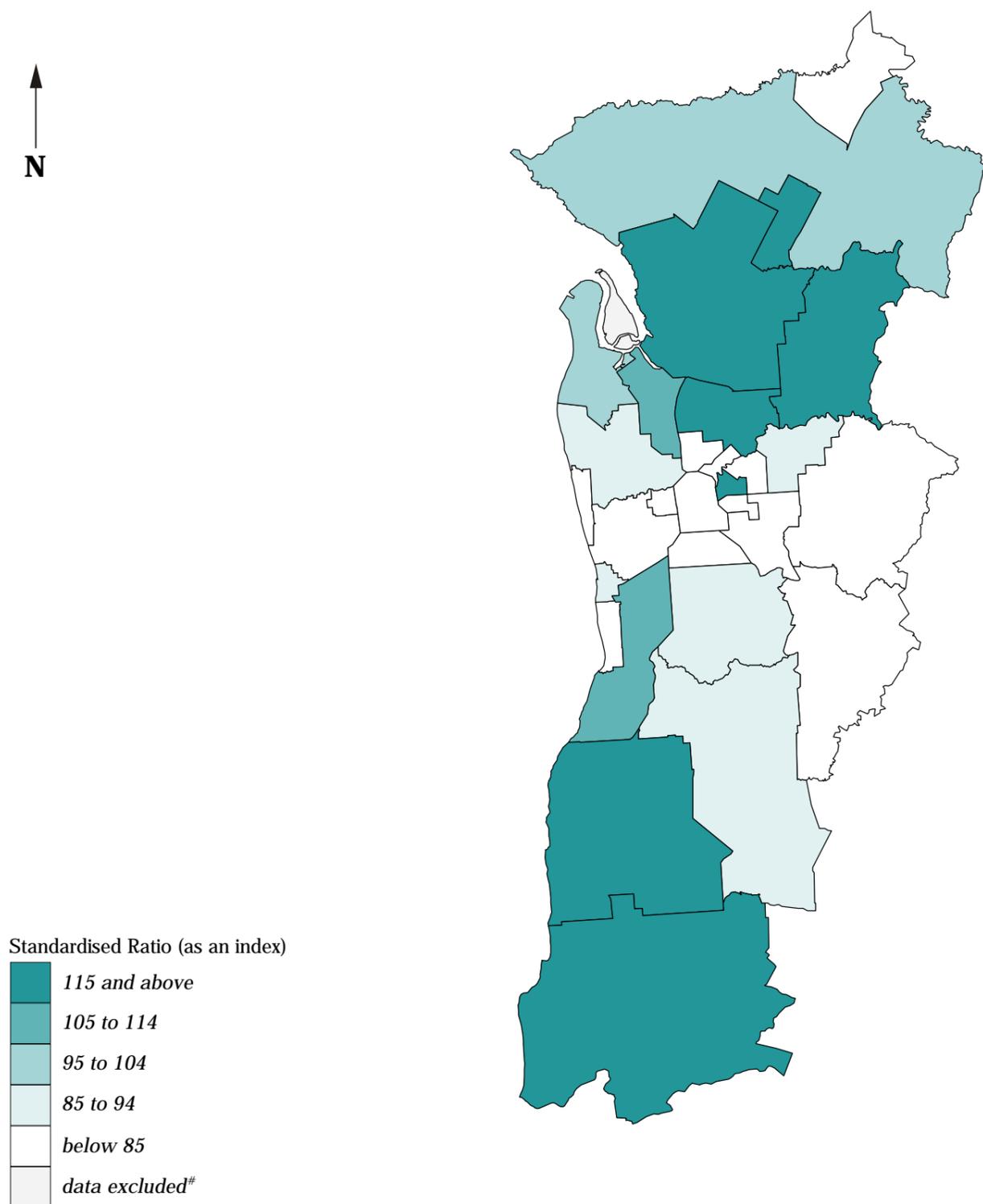
The largest numbers of admissions for lung cancer were recorded for residents of Marion, Hindmarsh and Woodville and Salisbury, with 114, 111 and 102 admissions respectively.

Correlations of meaningful significance were recorded with the variables for unskilled and semi-skilled workers (0.58), children aged from 0 to 4 years (0.57), single parent families (0.56), early school leavers (0.53), unemployed people (0.51) and dwellings rented from the State housing authority (0.51). The inverse correlation (-0.50) with the IRSD also indicates an association at the SLA level between high rates of admission for lung cancer and socioeconomic disadvantage.

Map 6.17

Admissions for lung cancer, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

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

Capital city comparison (Australia as the Standard)

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

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

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

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

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

²Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

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

In 1995/96, hospital admissions for breast cancer accounted for 0.4 per cent of all admissions analysed and 6.8 per cent of admissions for cancer of South Australian residents.

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

Adelaide⁶ (South Australia as the Standard)

A total of 907 admissions for cancer of the female breast were recorded for female residents (aged 40 years and over) of **Adelaide** in 1995/96, seven per cent fewer admissions than expected from the State rates (an SAR of 93*).

The SLA of Adelaide had the highest SAR for this variable (of 333**), with more than three times the number of admissions expected. Walkerville (with an SAR of 137) and Campbelltown (129*), situated in the east, and Willunga (185**), Brighton (118) and Noarlunga (114), located in the south, also recorded relatively high SARs.

The SLAs mapped in the middle range (five per cent above or below the level expected from the State rates) were mainly distributed throughout the western and eastern suburbs (Map 6.18), and included Thebarton (104), Burnside (103), Unley (99) and Stirling (98). A ratio of 101 was recorded in Henley and Grange, and Happy Valley.

Although the lowest ratios were those in the SLAs of St. Peters (an SAR of 42) and Payneham (56), these areas contained a relatively small number of admissions, of three and 10 respectively. Marion and Port Adelaide both had 36 per cent

fewer admissions than expected, with SARs of 64* and 64** respectively. Also mapped in the lowest range were the north-western SLAs of Prospect, Hindmarsh and Woodville and Enfield [Part A] and the northern SLAs of Elizabeth and Salisbury.

More than 50 admissions of females for breast cancer were recorded for residents of Noarlunga (79 admissions), Salisbury (67), Tea Tree Gully (65), Hindmarsh and Woodville (65), Mitcham (60) and Campbelltown (58).

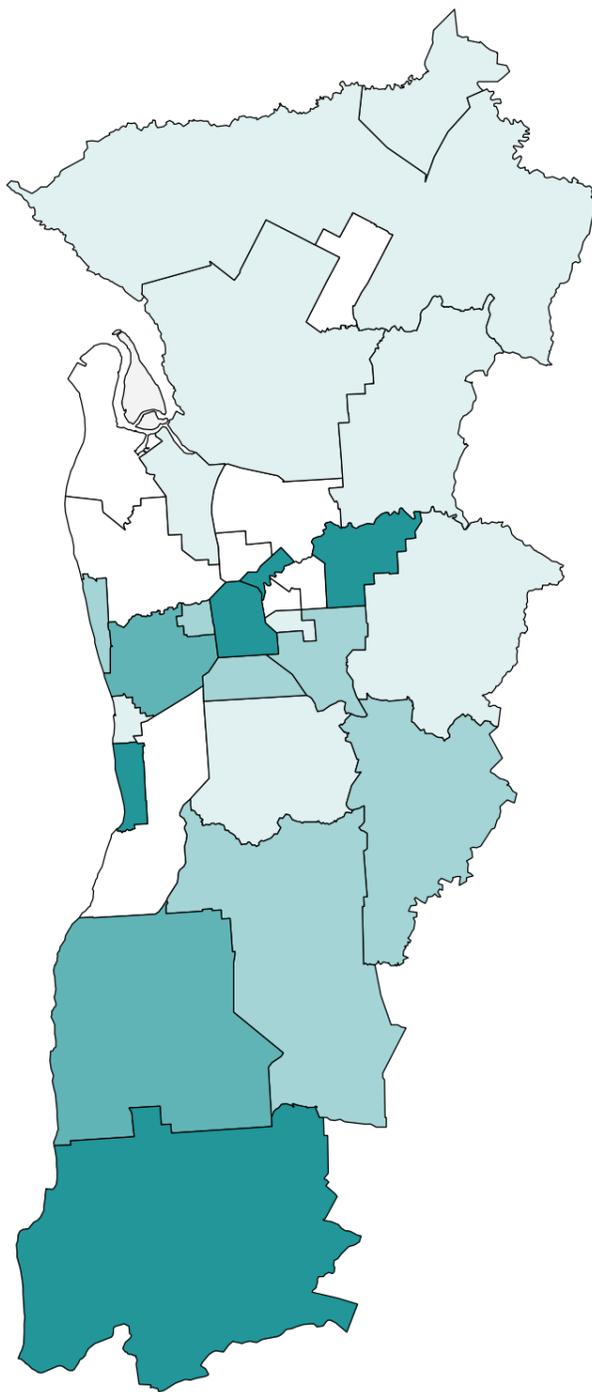
There was a weak association with the variables for high income families (0.27) and managers and administrators, and professionals (0.28). These correlations support the contention (above) that the incidence of cancer of the female breast is higher in high socioeconomic status areas.

⁶As there were relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of South Australia, the data have not been mapped. A summary of the main features is on page 300.

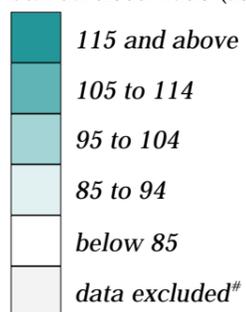
Map 6.18

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

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



Standardised Ratio (as an index)



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for psychosis, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

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

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

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

Hospital admissions for psychosis accounted for 2.4 per cent of all admissions analysed for South Australian residents, with similar proportions recorded for males (2.5 per cent and rate of 653.4 per 100,000 population) and females (2.2 per cent and a rate of 698.3 per 100,000 population).

Adelaide (South Australia as the Standard)

There were 7,734 admissions of residents of **Adelaide** for psychosis in 1995/96, 2.6 per cent of admissions studied. Females accounted for 52.3 per cent of these admissions.

Overall there were four per cent more admissions from psychosis of residents of **Adelaide** than were expected from the State rates, an SAR of 104**. Despite this slightly elevated ratio, just over half of **Adelaide's** SLAs had ratios below the level expected.

The spatial distribution of patient addresses for this illness can be affected by the location of hostels, boarding houses and shelters providing accommodation for people with a chronic psychiatric disability. These premises cater for people who may have several admissions in a year for mental disorders, including admissions to a public acute hospital. It is perhaps timely to reiterate that the data presented here are of the number of admissions, not the number of individuals.

These admissions are also likely to include numbers of homeless people, including those who live largely 'on the street', affecting in particular the rates for the SLA of **Adelaide**.

The SLAs with the highest ratios included the City of Adelaide, with an SAR of 240**, indicating in excess of twice the expected number of admissions; Walkerville (169**); Enfield [Part A] (162**) and St. Peters (157**). Other SLAs with elevated ratios included Glenelg (150**), Elizabeth (145**), West Torrens (141**), Port Adelaide (125**), Kensington and Norwood (125') and Thebarton (122). Many of these areas (eg. the City of Adelaide, Port Adelaide and Glenelg) include shelters and boarding houses as described above, and are also the locale for other homeless people.

In total, eight SLAs were mapped in the lowest range, of ratios 15 per cent or more below the level expected from the State rates (**Map 6.19**). These were Happy Valley, Stirling, Munno Para, Brighton, Enfield [Part B], East Torrens, Mitcham and Marion: Happy Valley had the lowest ratio, of 48**.

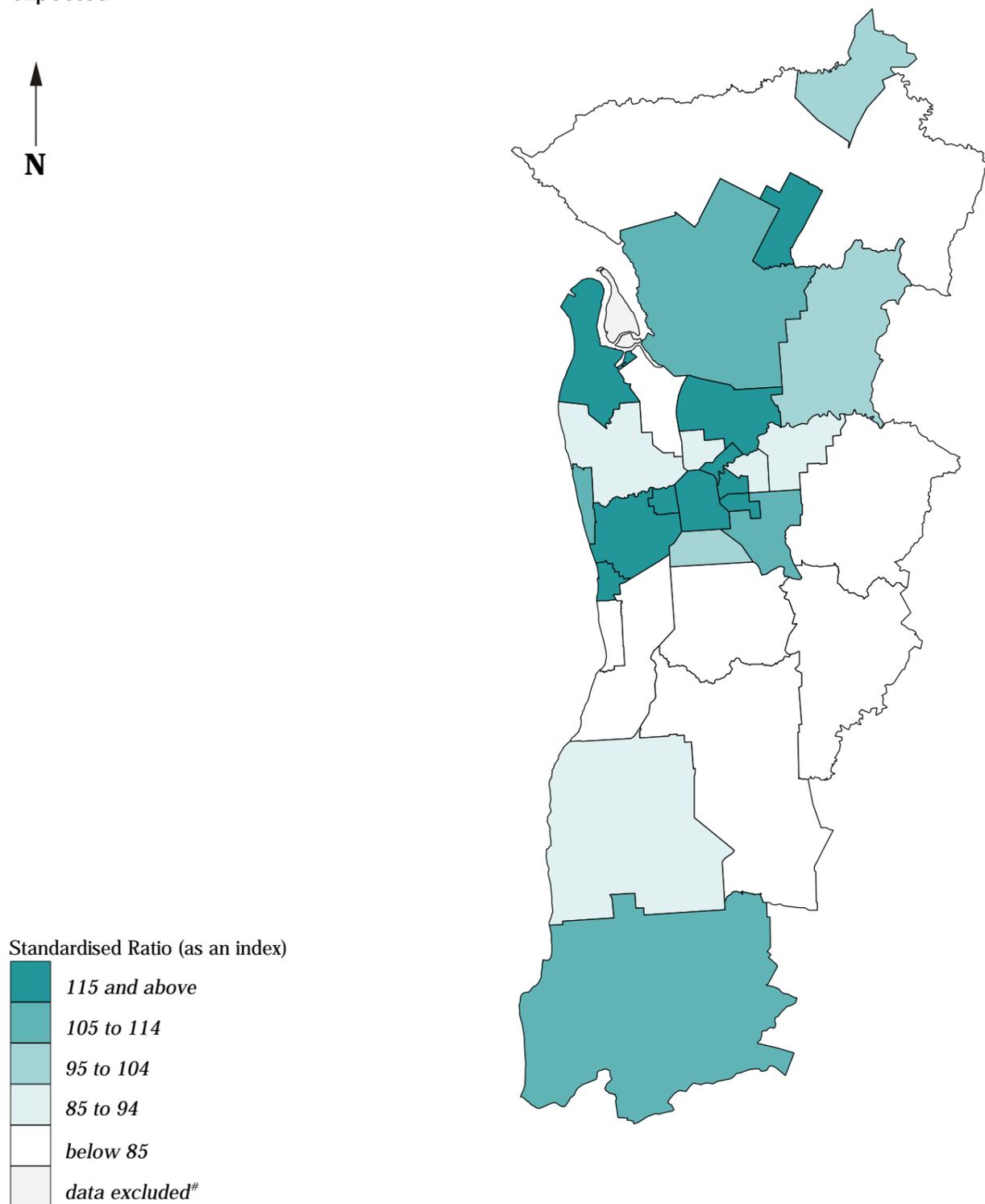
The largest numbers of admissions were recorded for residents of Salisbury (780 admissions, an SAR of 113**), Tea Tree Gully (603, an SAR of 99) and Hindmarsh and Woodville (578, an SAR of 90).

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

Map 6.19

Admissions for psychosis, Adelaide, 1995/96

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



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

Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for psychosis, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

In 1995/96 there were 2,252 admissions of residents of the non-metropolitan areas of South Australia (for psychosis), 11 per cent fewer admissions than were expected from the State rates (an SAR of 89**). There were similar numbers of admissions for females (1,154) and males (1,098).

A high proportion of the non-metropolitan SLAs (29 SLAs) had ratios in the lowest range mapped, with 30 per cent fewer admissions than expected (**Map 6.20**). One fifth of SLAs also had more admissions than expected, with SARs as high as 300**.

The most highly elevated SARs were recorded for residents in:

- the west of the State in Elliston, an SAR of 300** (24 admissions); Franklin Harbor, 214** (17); Streaky Bay, 141 (17) and Ceduna, 133 (28);
- the north, in Coober Pedy, an SAR of 199** (27 admissions);
- the mid north in Crystal Brook-Redhill, an SAR of 179** (24 admissions); and Orroroo, 146 (10);
- on the Fleurieu Peninsula in Victor Harbor, an SAR of 160** (112 admissions);
- in the Riverland in Barmera, an SAR of 145* (42 admissions); Loxton, 138* (62); Morgan, 134 (10); and
- in Kingscote (DC), an SAR of 239** (49 admissions); Wallaroo, 145 (24); Meningie, 143* (34); and Kapunda, 137 (31).

The majority of SLAs recording ratios that were lower than expected had very few admissions.

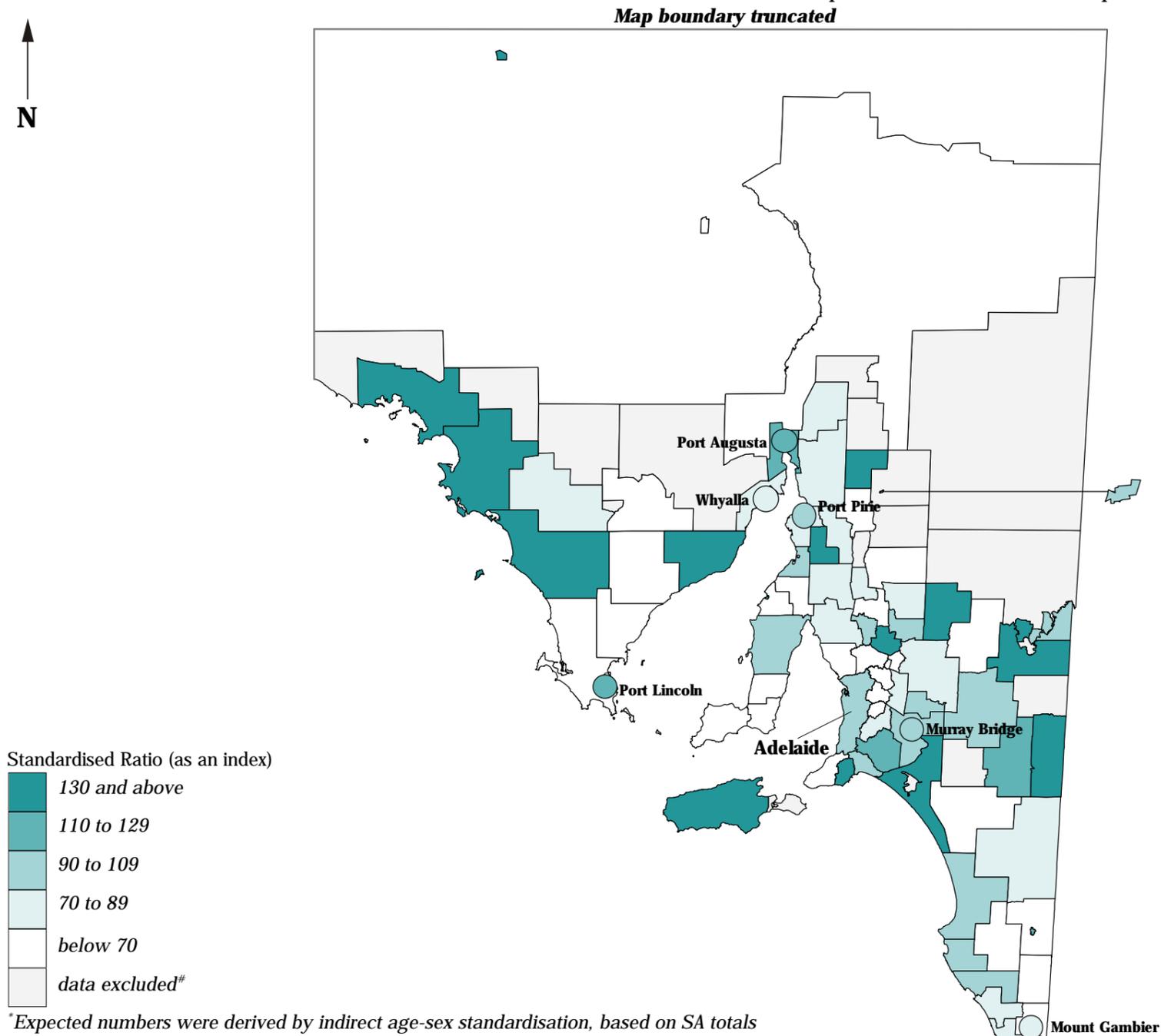
The largest numbers of admissions for psychosis were of residents of Mount Gambier, 119 admissions (an SAR of 80*); Whyalla, 118 admissions (an SAR of 78**); Murray Bridge, 116 admissions (an SAR of 108); Victor Harbor, 112 (an SAR of 160**); and Port Augusta, 102 admissions (an SAR of 115).

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

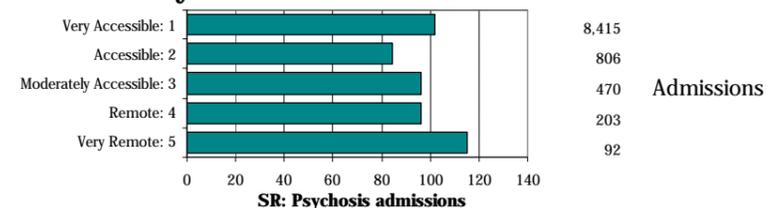
Map 6.20

Admissions for psychosis, South Australia, 1995/96

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



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for psychosis dropped from an SAR of 102 in the Very Accessible category to a low of 84 in the Accessible category, before increasing to 96 in the Moderately Accessible and Remote and categories, and to 115 in the Very Remote category. As is the case for many of the earlier variables, the numbers of admissions in the most remote areas are quite low.

Source: Calculated on ARIA classification, DHAC 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 6.26**). The pattern of variation was, however, somewhat different, in particular the ratios in **Adelaide** and **Canberra** were substantially lower, whereas SARs in the other capital cities were substantially higher. **Sydney** (with an SAR of 140**), **Hobart** (135**), **Brisbane** (122**) and **Perth** (103*) all had elevated SARs, with a ratio of around one third this level in **Canberra** (44**).

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

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

The variable under discussion here includes admissions of people diagnosed as having a neurotic, personality or other mental disorders. They are distinguished from those with psychosis (see page 228) by the fact that a neurosis arises as a result of stresses and anxieties in the person's environment. The most common are anxiety states, reactive depression and obsessive-compulsive disorders.

Females had a higher overall rate of admissions for neurotic, personality or other mental disorder than did males (513.7 admissions per 100,000 population compared with 401.6) and higher rates at almost all ages, in particular from 15 through to 44 years of age. Admissions to hospital for neurotic, personality or other mental disorders accounted for 1.6 per cent of all the admissions analysed for South Australian residents (1.5 per cent of admissions of residents of **Adelaide**).

Adelaide (South Australia as the Standard)

There were 4,426 admissions for neurotic, personality or other mental disorders of residents of **Adelaide**, 1.5 per cent of all admissions analysed. Females accounted for over half of these admissions (2,600 admissions, or 58.7 per cent).

The standardised admission ratio for **Adelaide** was 88**, indicating a substantially lower rate of hospitalisation from these causes than for country residents (with an SAR of 134**). This is in contrast to the higher rate of episodes of psychosis among metropolitan residents (page 228).

The pattern of distribution of admissions for these causes is similar to that for psychosis, an impression supported by the correlation between the two variables (a correlation coefficient of 0.85), although there were fewer SLAs with elevated ratios for this variable (**Map 6.21**). This indicates a strong association between the distribution of the population admitted to hospital diagnosed as having neurotic, personality or mental other disorders and those with admissions for psychosis.

Ratios elevated by 15 per cent or more were recorded in the inner SLAs of Walkerville (226**), Adelaide (195**), St. Peters (134*), and Thebarton (121); to the north in Enfield [Part A] (143**) and Elizabeth (124**); and Glenelg (138**) situated in the south. The only other SLA to record more admissions than expected was Prospect, with an SAR of 109. A number of these areas have large concentrations of boarding houses and hostels.

Although the lowest ratio of 45** was recorded for residents of East Torrens, this represented a total of only 14 admissions (when 32 expected). Highly significant ratios below the level expected were also recorded in Happy Valley (56**), Mitcham (65**), Payneham (67**), Munno Para (68**) and Brighton (69**).

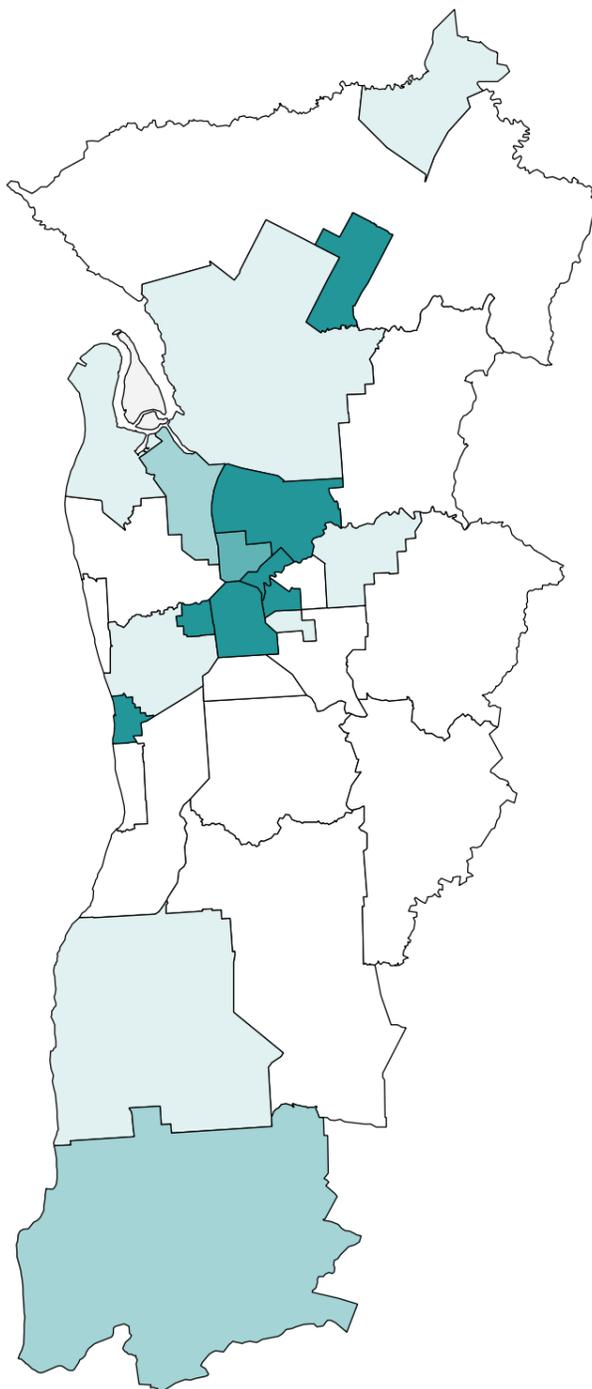
In 1995/96, residents of Salisbury (475 admissions) had the largest number of admissions for neurotic, personality or other mental disorders, followed by Noarlunga, Tea Tree Gully and Hindmarsh and Woodville, with 374, 337 and 319 admissions, respectively.

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admission for neurotic, personality or other mental disorders and socioeconomic status.

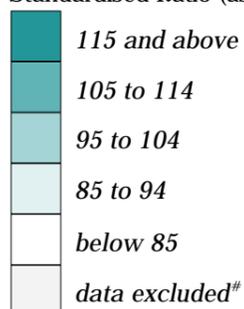
Map 6.21

Admissions for neurotic, personality or other mental disorders, Adelaide, 1995/96

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



Standardised Ratio (as an index)



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

#Data have been excluded when the population of the SLA is less than 100

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

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 2,340 admissions for neurotic, personality or other mental disorders (neurosis) of residents of the non-metropolitan areas of South Australia, 34 per cent more than expected from the State rates (an SAR of 134**). This represents a substantial difference in the rate of hospitalisation between residents of the non-metropolitan areas and those of **Adelaide**. There were similar numbers of admissions for females (1,222) and males (1,118).

More than half of the SLAs in the non-metropolitan areas of South Australia had elevated ratios, many of which were highly elevated, including:

- to the north of **Adelaide** – in Eudunda, with an SAR of 467** (29 admissions); Port Broughton, 260** (16); and Blyth-Snowtown, 239** (22);
- in the Riverland – in Barmera, an SAR of 345** (68 admissions); Berri, 319** (100); Renmark, 248** (85); and Loxton, 229** (71);
- in the Murray Mallee – in the SLAs of Meningie, an SAR of 235** (40 admissions); Mannum, 208** (29); Murray Bridge, 207** (154); and Lameroo, 204* (11); and further north – in Unincorporated Flinders Ranges, an SAR of 226** (22 admissions) and Port Augusta, 204** (131).

All of the SLAs mapped in the lowest range (of 30 per cent or more below the level expected) had 20 or fewer admissions. The lowest of these were in the SLAs of Mount Gambier (DC) and Minlaton, both with an SAR of 19*; Kimba, an SAR of 35; and Port MacDonnell, with an SAR of 35*. Mallala (with an SAR of 72 and 23 admissions), Port Elliot and Goolwa (87 and 31 admissions), Onkaparinga (90 and 34 admissions) and Northern Yorke Peninsula (92 and 33 admissions) were the only SLAs with more than 20 admissions to record ratios below the level expected from the State rates.

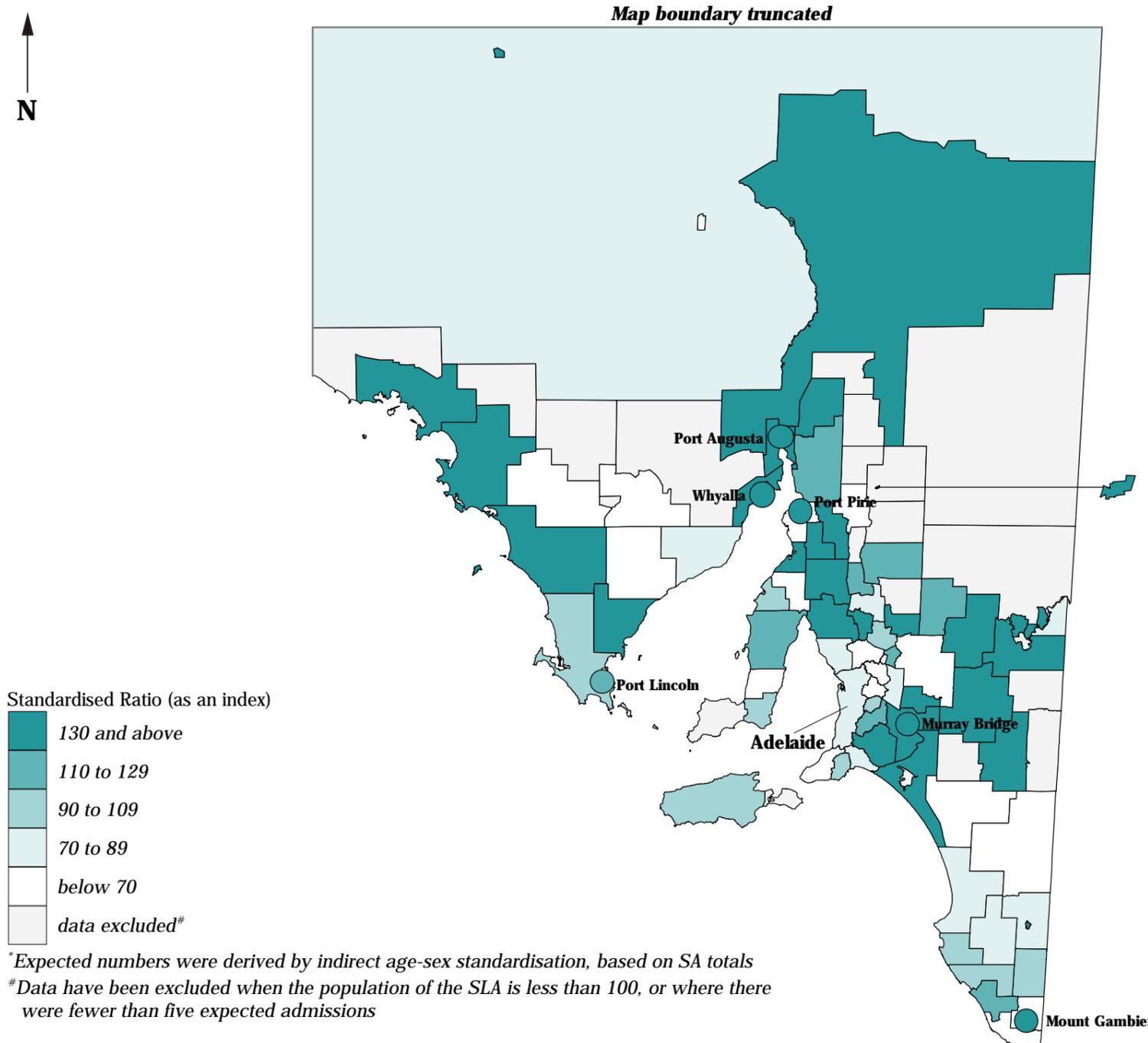
The largest numbers of admissions for neurotic, personality or other mental disorders were in the towns of Mount Gambier, with 160 admissions; Murray Bridge, 154; Whyalla, 139; and Port Augusta, 131.

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

Map 6.22

Admissions for neurotic, personality or other mental disorders, South Australia, 1995/96

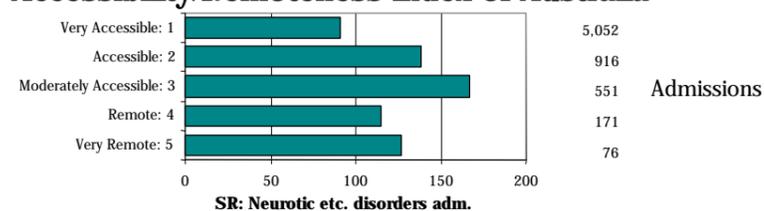
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for neurotic, personality or other mental disorders show two distinct patterns across the ARIA categories. The first, across the 'accessible' categories, is from an SAR of 91 in the Very Accessible areas to 167 in the Moderately Accessible areas; and the second is from an SAR of 115 in the Remote areas to 127 in the Very Remote areas.

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

Admissions for circulatory system diseases, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Admissions for circulatory system diseases in South Australia accounted for 9.1 per cent of admissions in this analysis. They include admissions for ischaemic heart disease, other forms of heart disease and cerebrovascular disease.

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

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

Adelaide (South Australia as the Standard)

There were 27,574 admissions for circulatory system diseases of residents of **Adelaide** in 1995/96, three per cent fewer admissions than were expected from the State rates (an SAR of 97**). Males accounted for 15,184 admissions (55.1 per cent) and females for 12,390 (44.9 per cent).

The spatial distribution of SARs shows the highest ratios were concentrated in the northern and southern areas of **Adelaide**, while the lowest were generally in SLAs located in the east (Map 6.23). The most highly elevated ratios were in Elizabeth (with 47 per cent more admissions for circulatory system diseases than expected from State rates, an SAR of 147**) and Salisbury (with 15 per cent more admissions, an SAR of 115**). Other statistically significant ratios above the level expected were in Willunga (an SAR of 114*), Munno Para (112**), Enfield [Part B] (109*) and Noarlunga (106**).

The majority of SLAs with ratios of five per cent above or below the level expected were located to the west of the city. They included Port Adelaide, with an SAR of 103; West Torrens (99); and Hindmarsh and Woodville (98).

In total, 17 SLAs (56.7 per cent) recorded below average ratios for this variable. Residents of Prospect (an SAR of 62**), Burnside and East Torrens (both 72**) and Payneham and Stirling (both 76**) had the lowest SARs from circulatory system diseases.

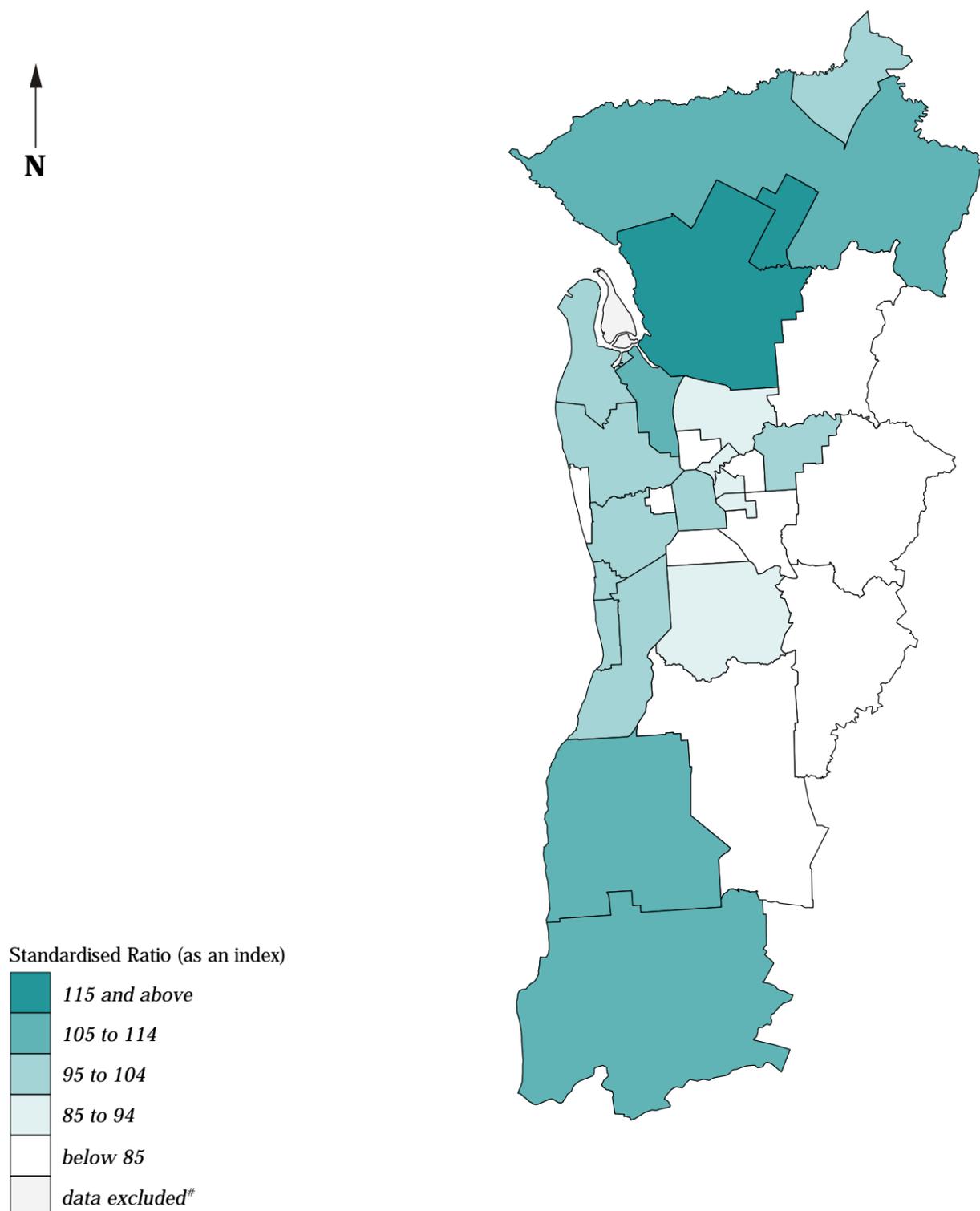
The largest numbers of admissions for circulatory system diseases were recorded for residents of Hindmarsh and Woodville (2,745 admissions), Marion (2,425), Salisbury (2,242) and Noarlunga (1,920).

There was a correlation of substantial significance with the variable for unskilled and semi-skilled workers (0.71), and of meaningful significance with unemployed people (0.70), single parent families (0.69), early school leavers (0.67), low income families (0.65), dwellings rented from the State housing authority (0.61) and the Indigenous population (0.57). The inverse correlation of meaningful significance with the IRSD (-0.69) also indicates an association at the SLA level between high rates of admission for circulatory system diseases and socioeconomic disadvantage.

Map 6.23

Admissions for circulatory system diseases, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for circulatory system diseases, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources, Appendix 1.3*

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

Rest of State (South Australia as the Standard)

There were 11,064 admissions of residents of the non-metropolitan areas of South Australia from circulatory system diseases in 1995/96, 10 per cent more than expected from the State rates (an SAR of 110**). Males accounted for 55.9 per cent of these admissions.

SLAs with elevated standardised admission ratios for circulatory system diseases were more frequently located in the northern and western parts of the State (**Map 6.24**), in areas with relatively high populations of Aboriginal people (see comment on page 187 as to higher rates of admissions for Aboriginal people). SLAs with the highest ratios were recorded:

- in the west, in Unincorporated West Coast (an SAR of 329**), Ceduna (214**) and Kimba (133);
- in the north, in Coober Pedy (an SAR of 188**), Kanyaka-Quorn (169**), Hawker (160**), Unincorporated Pirie (153), Crystal Brook-Redhill (143**), and Burra Burra (142**);
- in the Murray Lands, in Meningie (an SAR of 188**) and Mannum (141**);
- in and around northern Spencer Gulf, in Port Augusta (an SAR of 165**) and Port Pirie (133**);
- on Yorke Peninsula in Port Broughton (an SAR of 149**) and Central Yorke Peninsula (140**); and
- in Mount Pleasant (an SAR of 154**) and Port Lincoln (132**).

SLAs with standardised admission ratios for circulatory system diseases falling within the range of 10 per cent above or below the expected number of admissions were widespread throughout the State, in no notable pattern. Of the 27 areas in this class interval, no SLA had a statistically significant ratio.

The highest ratio for this category was recorded in Peterborough (an SAR of 108), while Kapunda had the lowest (92).

The lowest ratios in SLAs with at least twenty admissions were recorded in Light (56**), Morgan (57**) and Le Hunte (59**). There were 78 per cent fewer admissions than expected in Naracoorte, an SAR of 22** and nine admissions.

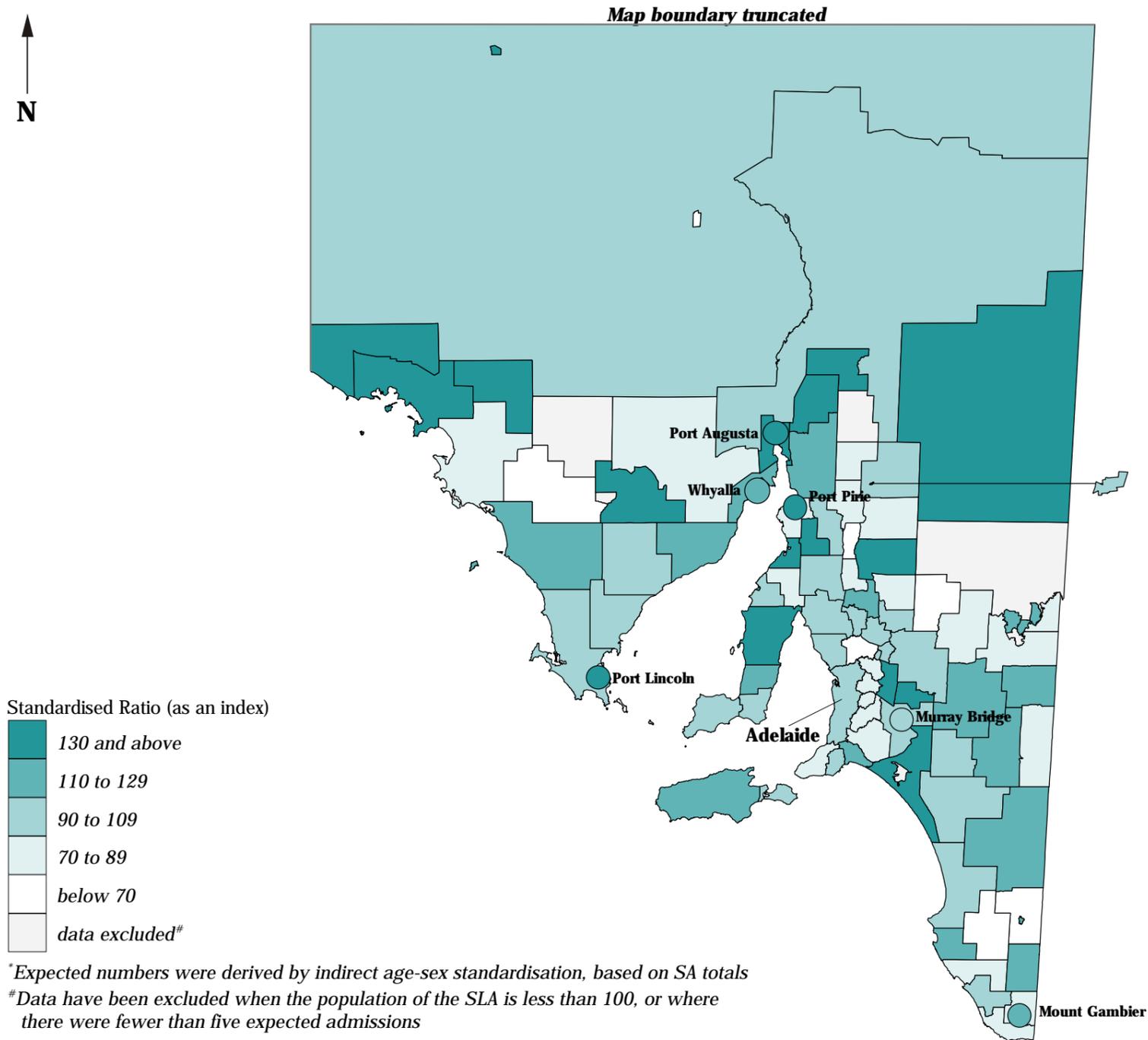
The largest numbers of admissions for circulatory system diseases in the non-metropolitan areas of South Australia were recorded in the towns of Whyalla (658), Mount Gambier (602), Port Pirie (527) and Port Augusta (491).

There was a correlation of meaningful significance with the variable for the Indigenous population (0.58) and of lesser significance with single parent families (0.45), as well as weak inverse correlations with indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.40), indicate the existence of an association between high rates of admission for circulatory system diseases and socioeconomic disadvantage.

Map 6.24

Admissions for circulatory system diseases, South Australia, 1995/96

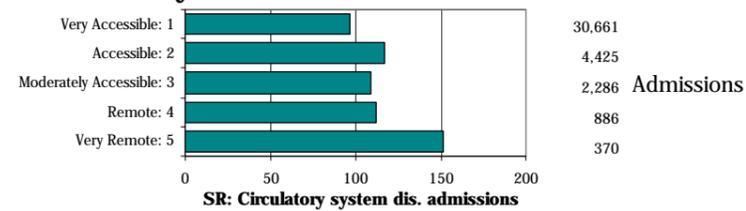
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for circulatory system diseases are below the level expected from the State rates in the Very Accessible ARIA category, with an SAR of 97. The other ARIA categories all have elevated ratios, rising from SARs of 117, 109 and 112 in the three middle categories to an SAR of 151 in the Very Remote category. The highly elevated rate of admissions of residents of the Very Remote areas is likely to reflect admissions of the Indigenous population.

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

Admissions for ischaemic heart disease, 1995/96

Capital city comparison (Australia as the Standard)

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

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

Table 6.30: Admissions with a principal diagnosis of ischaemic heart disease, capital cities

	<i>Age-sex standardised admission ratios</i>								
	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 3.2 per cent of all admissions for South Australian residents and 35.3 per cent of admissions for all circulatory system diseases.

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

families (0.61), housing authority rented dwellings (0.57) and the Indigenous population (0.51). Inverse correlations were recorded with the variables for female labour force participation (-0.75) and managers and administrators, and professionals (-0.70). The inverse correlation with the IRSD (-0.67) also indicates an association between high rates of admission for ischaemic heart diseases and socioeconomic disadvantage.

Adelaide (South Australia as the Standard)

There were three per cent fewer admissions for ischaemic heart disease of residents of **Adelaide** than were expected from the State rates (an SAR of 97^{**}). Of the 9,738 admissions in 1995/96, nearly two thirds were males (6,271 admissions).

The pattern of distribution was similar to that for all circulatory system diseases, but with more SLAs recording ratios in the highest and lowest ranges mapped (Map 6.25). The most highly elevated ratios (ratios at least fifteen per cent higher than expected from State rates) were in SLAs located to the north and south of the city. Those in the north included Elizabeth (with a ratio of 184^{**}) Munno Para (142^{**}) and Salisbury (127^{**}), and to the south were Willunga (124^{**}) and Noarlunga (119^{**}).

The majority (70.0 per cent) of SLAs in **Adelaide** had standardised admission ratios for ischaemic heart disease below the level expected from the State rates. The lowest ratios (of 15 per cent or more below the level expected from the State rates) were recorded in or adjacent to the city centre (in Thebarton, Prospect, Walkerville, Kensington and Norwood and Unley); to the east (in Burnside, East Torrens, Payneham and Stirling); and in Henley and Grange, and Enfield [Part A]. These ratios ranged from a low of 48^{**} in Stirling to a high of 80 in Enfield [Part A].

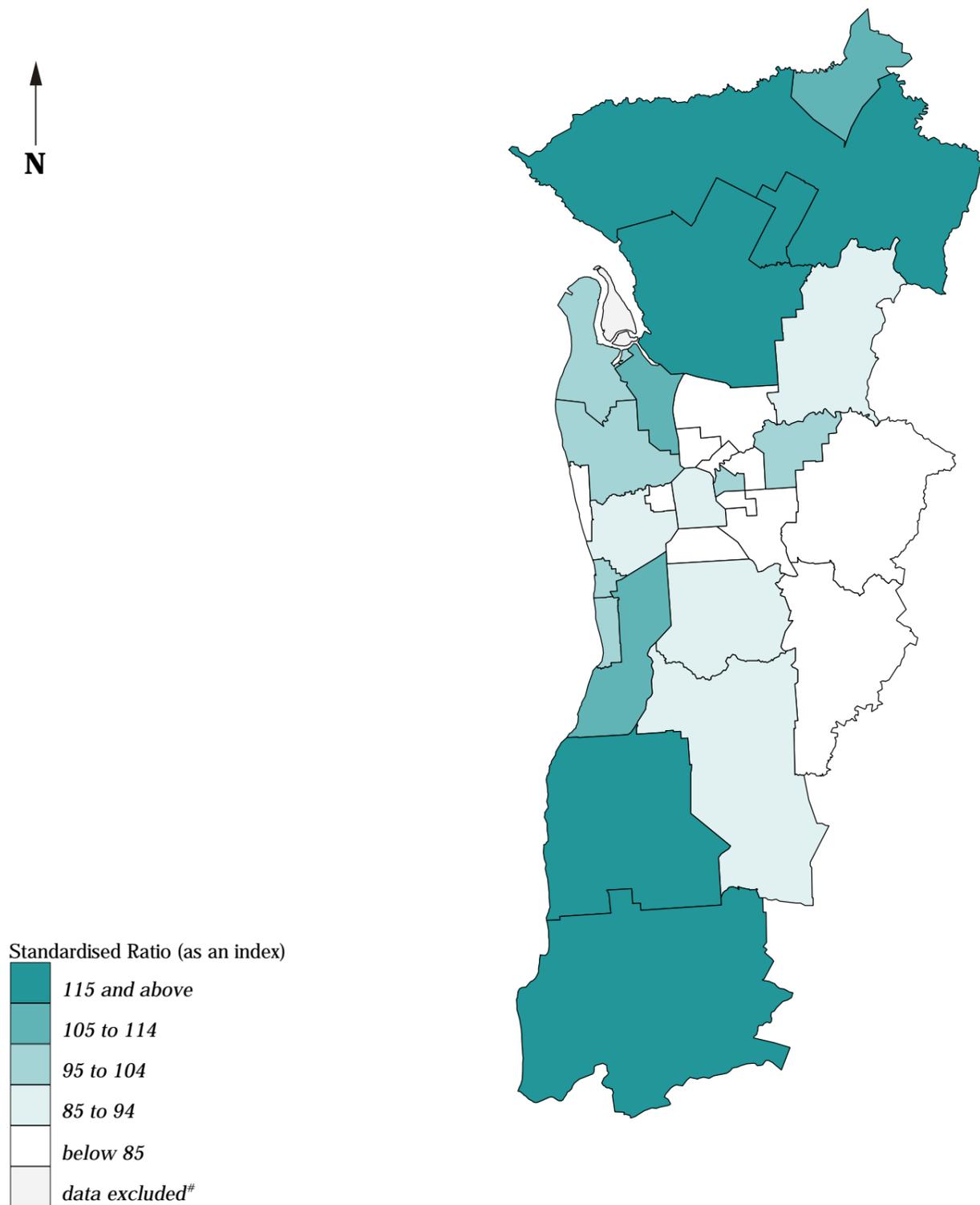
The largest numbers of admissions for this cause were recorded for residents of Hindmarsh and Woodville (961 admissions), Marion (946), Salisbury (889) and Noarlunga (759).

There were correlations of substantial significance with the variables for unskilled and semi-skilled workers (0.74) and early school leavers (0.76), and of meaningful significance with single parent families (0.66), unemployed people (0.64), low income

Map 6.25

Admissions for ischaemic heart disease, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for ischaemic heart disease, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

Admissions for ischaemic heart disease accounted for more than one third (35.2 per cent) of all admissions for circulatory system diseases for non-metropolitan residents, a total of 3,895 admissions. Residents of the non-metropolitan areas of South Australia were more likely to be hospitalised for this disease than was expected from the State rates, recording a standardised admission ratio of 107^{**}. Almost two thirds (64.4 per cent) of the admissions were of males.

Standardised admission ratios for ischaemic heart disease elevated by at least thirty per cent were recorded:

- in the Murray Lands - in Meningie, with an SAR of 236^{**}; Mannum (145^{**}); and Renmark (132^{**});
- in the south-east - in Penola (an SAR of 199^{**}); Robe (159^{*}); and Mount Gambier (142^{**});
- on the west coast - in Ceduna (an SAR of 197^{**});
- in the north - in Mount Pleasant (an SAR of 189^{**}); Burra Burra (142); Port Pirie (139^{**}); Port Augusta (131^{**}) and Pirie (130);
- on Yorke Peninsula - in Port Broughton (an SAR of 186^{**}); Central Yorke Peninsula (176^{**}); and Minlaton (134^{*}); and
- on Eyre Peninsula - in Port Lincoln (an SAR of 161^{**}) and Lower Eyre Peninsula (130).

Only three of the SLAs mapped in the lowest range had more than 20 admissions for ischaemic heart disease over the period analysed. Waikerie and Onkaparinga had the lowest ratios in this category, with 46 per cent fewer admissions than expected, both with an SAR of 54^{**}.

The next lowest ratio was in Tanunda, with an SAR of 65^{*}. Overall, residents of Naracoorte (DC) had the lowest SAR of 13^{**}; however this represented only two admissions (when 16 were expected from the State rates).

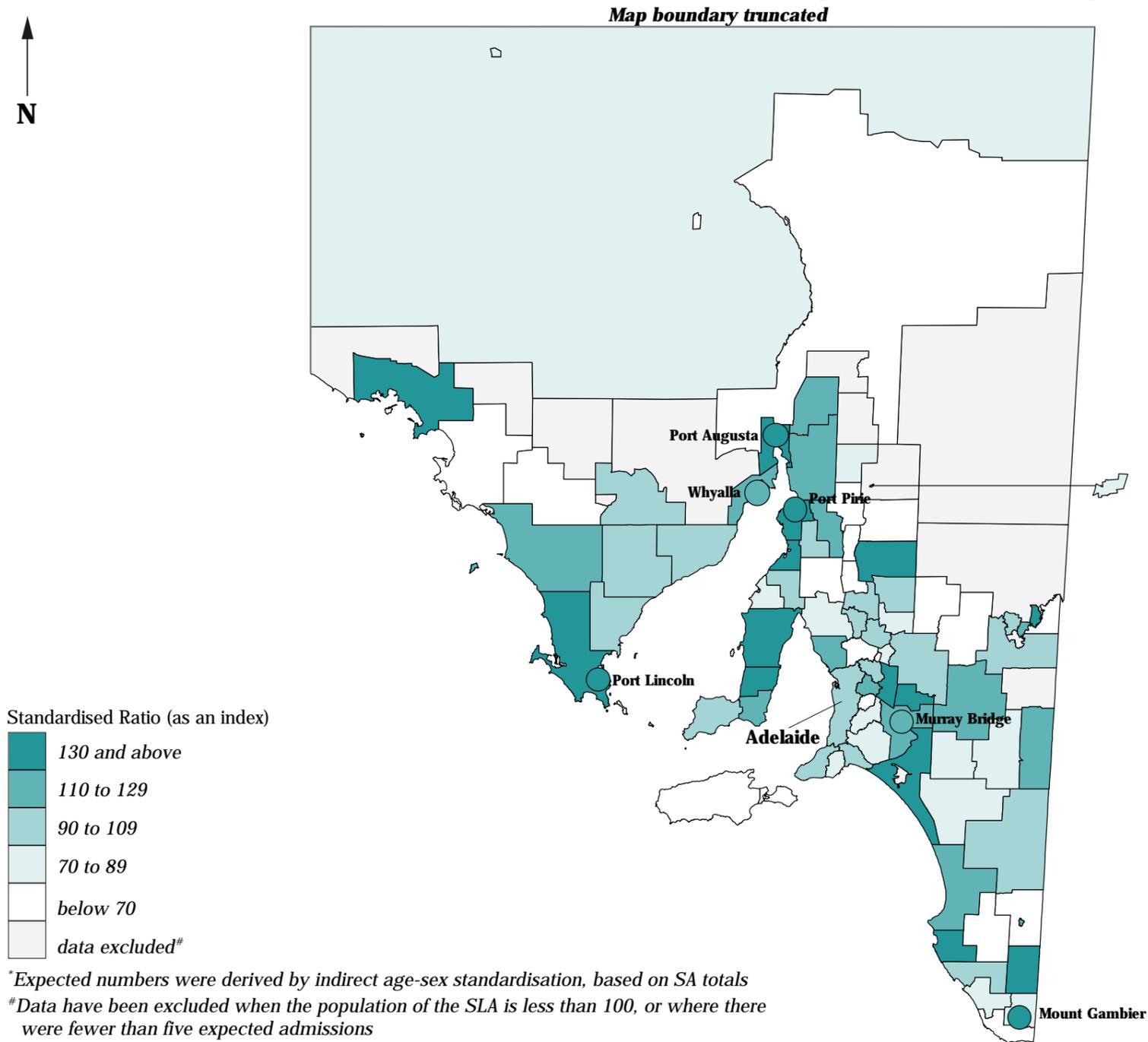
More than 150 admissions were recorded in Mount Gambier, with 261 admissions; Whyalla, 240; Port Pirie, 199; Port Lincoln, 176; and Murray Bridge, 171.

The correlation analysis revealed a weak positive association with the indicators of socioeconomic disadvantage, the strongest being with the variables for early school leavers (0.30), dwellings rented from the State housing authority (0.29) and dwellings with no motor vehicle (0.28). These results, together with the weak inverse correlation with the IRSD (-0.32), suggest the existence of an association at the SLA level between high rates of admission for ischaemic heart disease and socioeconomic disadvantage.

Map 6.26

Admissions for ischaemic heart disease, South Australia, 1995/96

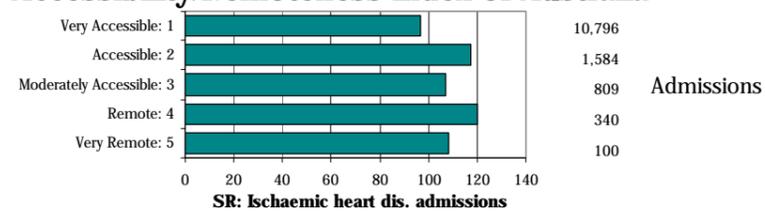
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for ischaemic heart disease vary across the ARIA categories, from the lowest ratio in the Very Accessible areas (an SAR of 97), to elevated ratios of 117 and 120 in the Accessible and Remote categories. There were ratios of 107 and 108 in the Moderately Accessible and Very Remote categories.

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

Admissions for respiratory system diseases, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Respiratory system diseases include the diseases of pneumonia, influenza, bronchitis, emphysema and asthma. This category includes people with chronic obstructive pulmonary disease – a persistent obstruction of bronchial air flow, manifesting as asthma, chronic bronchitis, and chronic emphysema – as well as acute respiratory infections. Admissions from these diseases represented 7.5 per cent of all admissions analysed for South Australian residents; 7.0 per cent of residents of **Adelaide** and 8.6 per cent in the non-metropolitan areas.

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

Adelaide (South Australia as the Standard)

There were 20,885 admissions for respiratory system diseases recorded for residents of **Adelaide**, nine per cent fewer admissions than expected from the State rates (an SAR of 91**). Males comprised 54.2 per cent of these admissions.

The three SLAs with ratios elevated above the level expected were situated to the north of the city (Map 6.27). Residents of Elizabeth had the highest SAR for this variable, with 25 per cent more admissions than expected, an SAR of 125**. This was followed by Enfield [Part B] and Salisbury with SARs of 118** and 113** respectively.

More than one third (40.0 per cent) of the SLAs in **Adelaide** were mapped in the second to lowest range of admissions for respiratory system diseases, with SARs ranging from 93 in Gawler to 85** in Noarlunga. Within this class interval, highly significant SARs were also recorded in the SLAs of Campbelltown (91**), Hindmarsh and Woodville (88**), Marion (87**) and Tea Tree Gully (87**).

Nine SLAs had ratios in the lowest range mapped (of at least 15 per cent lower than expected from the State rates), the majority of which were of statistical significance. These ratios generally occurred in inner and near suburban SLAs, extending to the east of the city.

Prospect had the lowest ratio of 70**, indicating that there were 30 per cent fewer admissions for respiratory system diseases than were expected from the State rates. Other SLAs in this range were Thebarton (with an SAR of 71**), Mitcham (73**), Burnside and Happy Valley (both 75**), Stirling (78**), Payneham (79**), Unley (83**) and East Torrens (83).

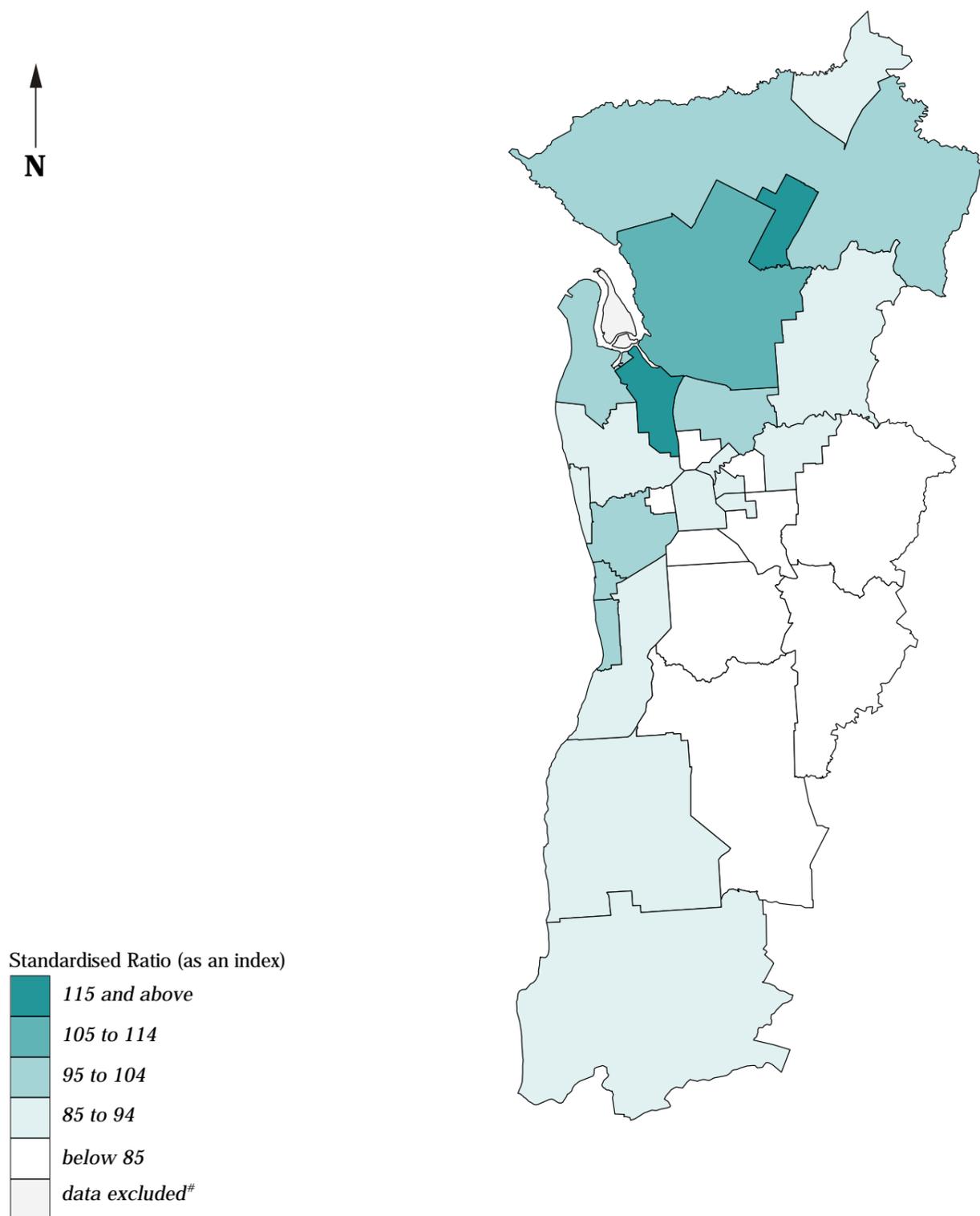
The largest number of admissions for respiratory system diseases was in Salisbury, with 2,567 admissions. More than 1,000 admissions were also recorded in Hindmarsh and Woodville (1,706), Noarlunga (1,669), Tea Tree Gully (1,628), Marion (1,480) and Enfield [Part A] (1,006).

There were correlations of substantial significance with the variables for unskilled and semi-skilled workers (0.74), dwellings rented from the State housing authority (0.75), unemployed people (0.75) and Indigenous people (0.71). The inverse correlation of substantial significance recorded with the IRSD (-0.74) also indicates a positive association at the SLA level between high rates of admission for respiratory system diseases and socioeconomic disadvantage.

Map 6.27

Admissions for respiratory system diseases, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

Admissions for respiratory system diseases, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 10,758 admissions of residents of the non-metropolitan areas of South Australia for respiratory system diseases in 1995/96. This was a substantial 24 per cent more admissions than expected from the State rates (an SAR of 124**) and comprised 8.6 per cent of all admissions of non-metropolitan residents analysed. Males accounted for 54.0 per cent of these admissions.

Some 60 per cent of the non-metropolitan SLAs had elevated ratios for respiratory system diseases, with the most highly elevated ratios in SLAs located in the northern and western parts of the State (**Map 6.28**). Those with the highest ratios were recorded:

- on Eyre Peninsula, in Unincorporated West Coast (an SAR of 311**) and Ceduna (229**);
- in the Yorke Peninsula and lower north SLAs of Port Broughton (an SAR of 301**), Blyth-Snowtown (167**), Wakefield Plains (156**) and Central Yorke Peninsula (156**);
- in the north - in Coober Pedy (an SAR of 270**), Kanyaka-Quorn (227**), Port Pirie (207**), Port Augusta (201**), Hawker (181**) and Whyalla (158**);
- in the south-east in Tatiara (an SAR of 208**);
- in the Adelaide Hills and Murray Mallee SLAs of Mount Pleasant (an SAR of 191**), Meningie (191**), and Karoonda-East Murray (167**); and
- in the Riverland, in Barmera (an SAR of 164**) and Morgan (153**).

SLAs with standardised admission ratios mapped in the middle range (within 10 per cent of the level expected) were widespread throughout the State, with the highest ratio in Kapunda and Strathalbyn (both with an SAR of 109).

A total of 13 SLAs were mapped in the lowest range: those with more than 20 admissions for respiratory system diseases were Roxby Downs (48**), Mount Gambier (DC) and Yankalilla (both 59**), Barossa (65**) and Light (67**).

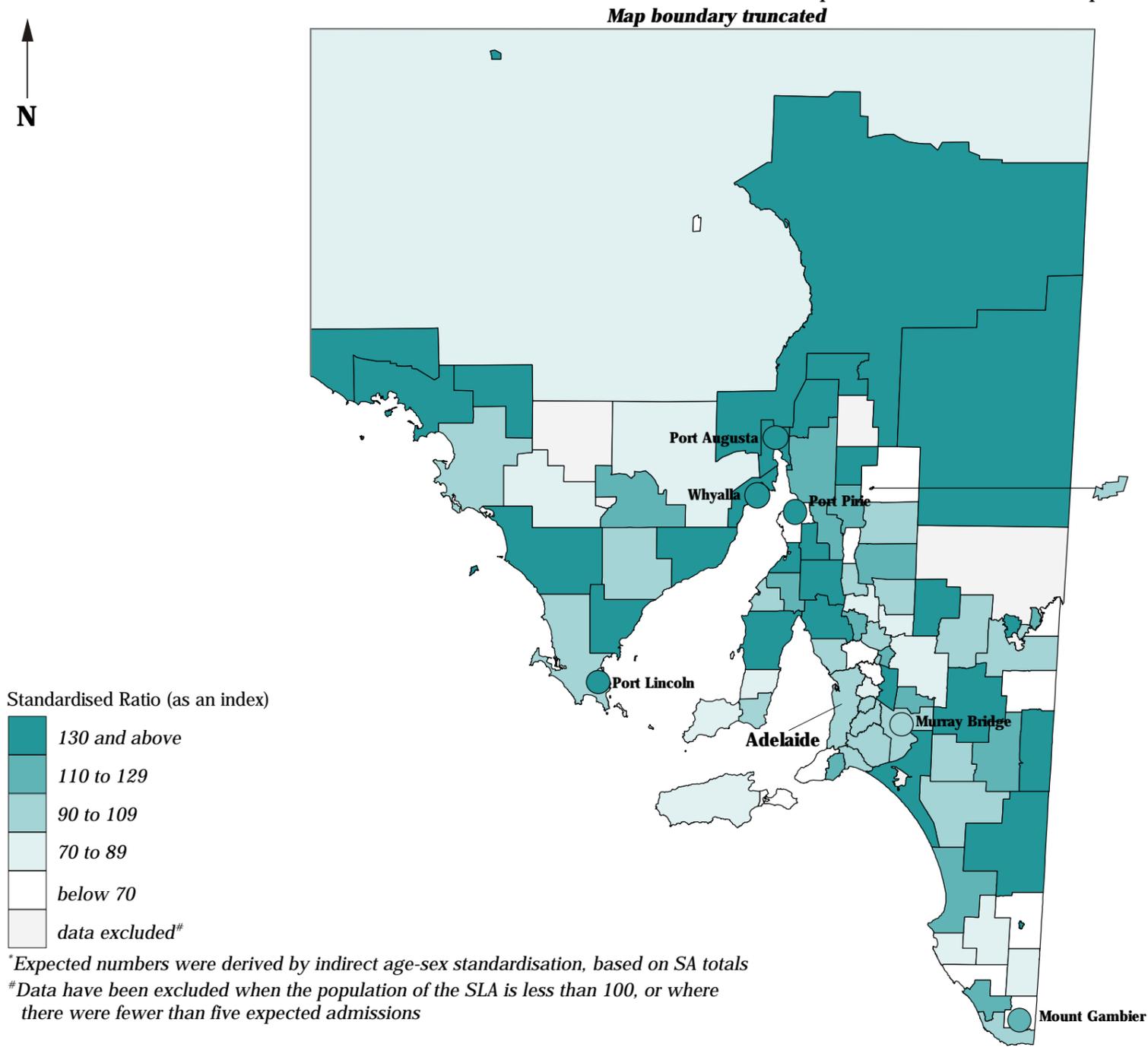
The largest numbers of admissions for respiratory system diseases were recorded in the towns of Whyalla, with 820 admissions; Port Pirie, 668 admissions; Port Augusta, 609 admissions and Mount Gambier, 540 admissions.

The correlation analysis revealed a weak association with indicators of socioeconomic disadvantage, the strongest being with the variables for the Indigenous population (0.41), dwellings with no motor vehicle (0.39) and single parent families (0.27). These results, together with the weak inverse correlation with the IRSD (-0.37), suggest the existence of an association at the SLA level between high rates of admission for respiratory system diseases and socioeconomic disadvantage.

Map 6.28

Admissions for respiratory system diseases, South Australia, 1995/96

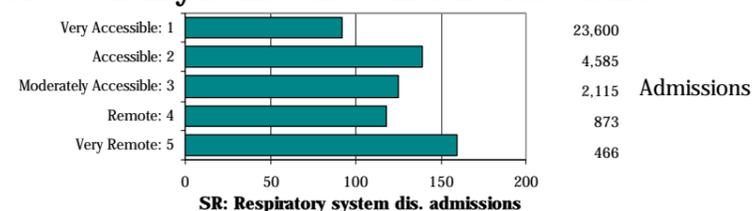
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for respiratory system diseases show a strong relationship with remoteness. The ratios increase by almost three quarters (72.8 per cent), from an SAR of 92 in the Very Accessible areas to 159 in the Very Remote areas. The second highest ratio is in the Accessible areas (139), with ratios of 125 and 118 in the Moderately Accessible and Remote categories, respectively. The highly elevated rate of admissions of residents of the Very Remote areas is likely to reflect admissions of the Indigenous population.

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

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

Capital city comparison (Australia as the Standard)

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

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

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

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1995/96 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 (21.2 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.

Adelaide (South Australia as the Standard)

There were 4,396 admissions for respiratory system diseases of residents of **Adelaide** aged from 0 to 4 years, seven per cent fewer admissions than expected from the State rates (an SAR of 93**). Males comprised 63.3 per cent of these admissions.

Despite the lower than expected number of admissions of children aged from 0 to 4 years resident in **Adelaide**, a distinctive pattern of distribution of SARs was evident (**Map 6.29**). The most striking features were the concentration of the most highly elevated ratios in the SLAs to the north of the city, and the low ratios in SLAs to the south and south-east.

Elevated ratios to the north of the city were recorded in Enfield [Part B], with an SAR of 128*, Enfield [Part A] (123**), Salisbury (121**), and Elizabeth (118*). West Torrens was also mapped in this highest range, with an SAR of 115, indicating that there were 15 per cent more admissions of children aged from 0 to 4 years for respiratory system diseases than were expected from the State rates.

More than three quarters of all SLAs had ratios below the level expected, with the lowest in Brighton, an SAR of 46**, indicating that there were 54 per cent fewer admissions than were expected. Highly significant ratios mapped in the lowest range were also recorded for residents of the southern SLAs of Mitcham (68**), Happy Valley (72**) and Noarlunga (76**); to the south-east in Stirling (49**); in the outer north in Gawler (70**); and closer to the city in Unley (68**).

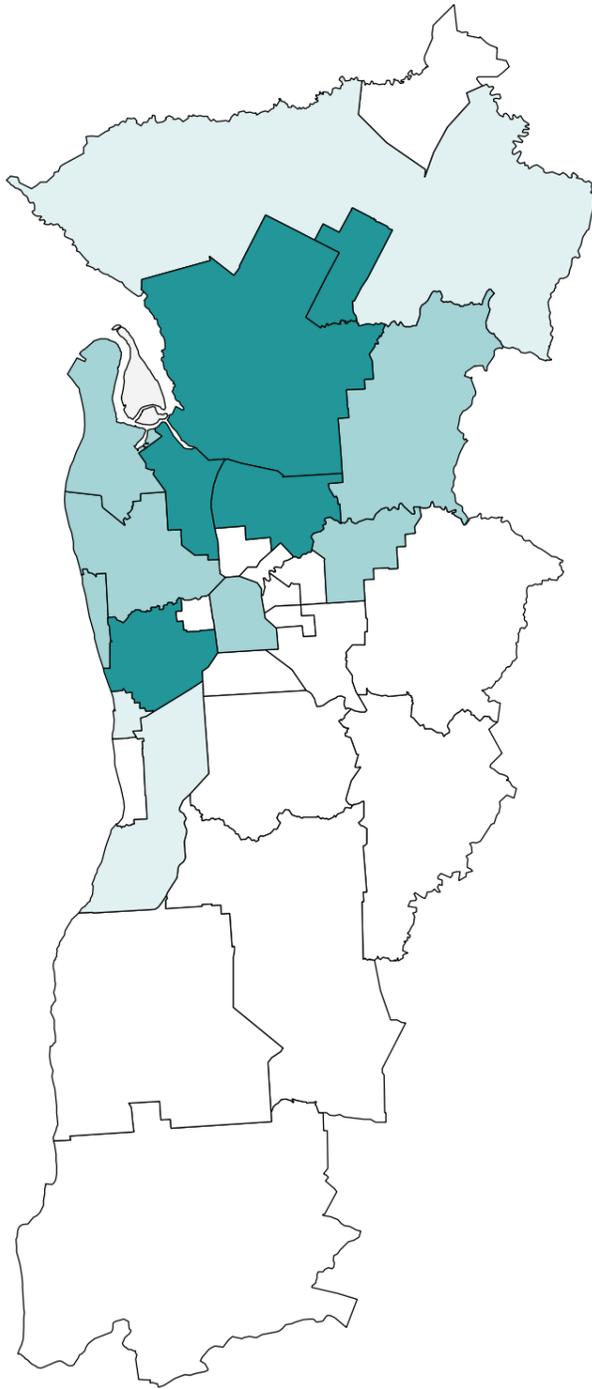
The largest number of admissions for respiratory system diseases of children aged from 0 to 4 years was in Salisbury, with 755 admissions. More than 300 admissions were also recorded in Tea Tree Gully, with 428; Noarlunga, with 393; and Hindmarsh and Woodville, with 333.

There were correlations of meaningful significance with many of the indicators of socioeconomic disadvantage. This was supported by the inverse correlation of substantial significance recorded with the IRSD (-0.69), which indicates a positive association at the SLA level between high rates of admissions of young children for respiratory system diseases and socioeconomic disadvantage.

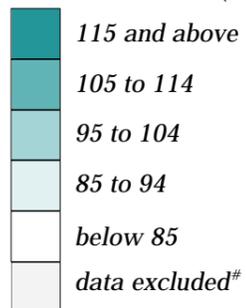
Map 6.29

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

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



Standardised Ratio (as an index)



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

[#]Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

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

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See Data sources, Appendix 1.3

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

Rest of State (South Australia as the Standard)

Children aged from 0 to 4 years accounted for just under one quarter (21.6 per cent) of all admissions of non-metropolitan residents with respiratory system diseases in 1995/96. The total of 2,326 admissions was 16 per cent more than was expected from the State rates, an SAR of 116**. Males comprised 62.8 per cent of these admissions.

SLAs with the highest ratios were similar to those listed for admissions for all ages, although far more areas were mapped as having no data (SLAs with fewer than five expected cases) (**Map 6.30**). Ratios elevated by 30 per cent or more (in SLAs with more than 20 admissions) were:

- in the far north - in Coober Pedy (an SAR of 275**); Unincorporated Flinders Ranges (236**); Port Augusta (195**); and Whyalla (139**);
- in the Adelaide Hills and Murray Mallee SLAs of Mount Pleasant (an SAR of 252**) and Meningie (147); and Victor Harbor (145*);
- in the south-east - in Tatiara (an SAR of 234**); Naracoorte (M) (163**); and Penola (140);
- in the mid north in Port Pirie (an SAR of 206**) and Wakefield Plains (132);
- on Eyre Peninsula in Port Lincoln (an SAR of 182**) and Ceduna (160**); and
- in the Yorke Peninsula and lower north SLAs of Wallaroo (an SAR of 173*); and Central Yorke Peninsula (172**).

Twenty three SLAs had ratios of 30 per cent or more below the State average, although many were of statistical significance, they generally had a small number of cases. Of SLAs with more than 20 admissions, Renmark had the lowest SAR (of 59**, and 24 admissions).

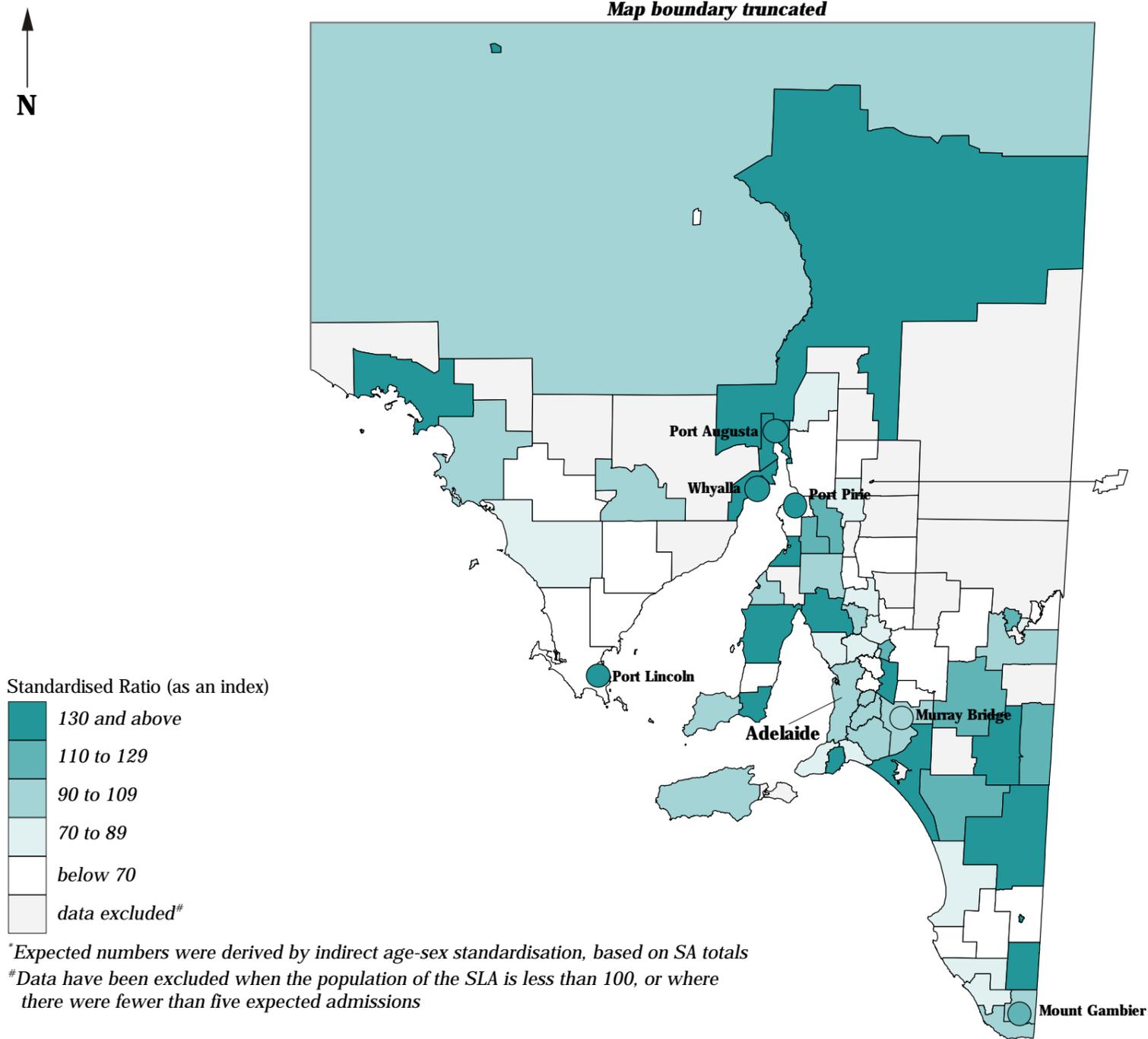
The largest numbers of admissions for respiratory system diseases among this age group were recorded in the towns of Whyalla, with 196 admissions; Port Augusta, with 154 admissions; Port Pirie, with 150 admissions; and Mount Gambier with 140.

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

Map 6.30

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

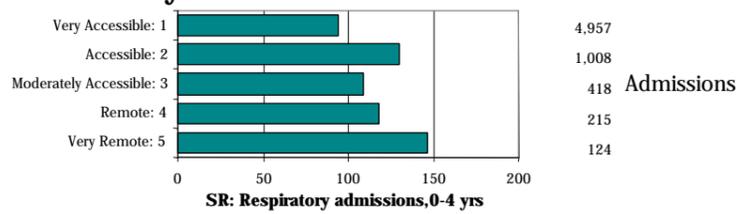
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for respiratory system diseases among young children reveal a relationship with remoteness. The ratios increase by over fifty per cent (55.3 per cent), from an SAR of 94 in the Very Accessible areas to an SAR of 146 in the Very Remote areas. The second highest ratio is in the Accessible areas (130), with ratios of 109 and 118 in the Moderately Accessible and Remote categories.

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

Admissions for bronchitis, emphysema or asthma, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources, Appendix 1.3*

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

Bronchitis, emphysema and asthma are grouped together as chronic obstructive pulmonary diseases in the International Classification of Diseases (ICD-9), which is used to code causes of admissions. However, although they are of a similar nature, they are distinct conditions, affecting different age groups in the population. Admissions for asthma and bronchitis occur at all ages, more frequently among children and older people, whereas those from emphysema (contributing the smallest numbers to this group) are almost exclusively of older people, more frequently males. For example, almost one quarter (23.0 per cent) of admissions for cystic fibrosis, bronchitis, emphysema or asthma in 1995/96 was of children aged from 0 to 4 years. Males had substantially higher admission rates in the age groups under 10 years, and marginally higher rates from 65 years (but substantially higher among those aged 85 years and over), while females had slightly higher rates in the other age groups.

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 27.5 per cent of admissions for all respiratory system diseases of South Australian residents; 26.7 per cent of residents of **Adelaide** and 29.1 per cent in the non-metropolitan areas.

Adelaide (South Australia as the Standard)

As was the case for all respiratory system diseases, there were fewer admissions for this group of diseases than expected from the State rates (11 per cent fewer an SAR of 89**) in **Adelaide**. In total, there were 5,580 admissions for these diseases, of which 2,909 were males and 2,671 were females.

The distinctive pattern at the SLA level evident from the socioeconomic status analysis was again clearly present in this distribution, in particular for SLAs north of the city (**Map 6.31**). These SLAs are Elizabeth, Salisbury, Enfield [Part A] and Enfield [Part B], with SARs for these diseases of 130**, 129**, 111 and 114 respectively. The only SLA outside of this area with a similarly elevated ratio was Glenelg, with an SAR of 123*.

Many of the SLAs mapped in the lowest range were situated in the inner, eastern or southern SLAs of **Adelaide**. Those in the south were the SLAs of Happy Valley (an SAR of 54**), Mitcham (67**), Marion (77**) and Brighton (79); in the east were East Torrens (64*), Burnside (69*), Campbelltown (73**) and Stirling (82); and located in the inner areas were Thebarton (63*), St Peters (64*), Unley (67**), Walkerville and the City of Adelaide (both 67*), and Prospect (75*).

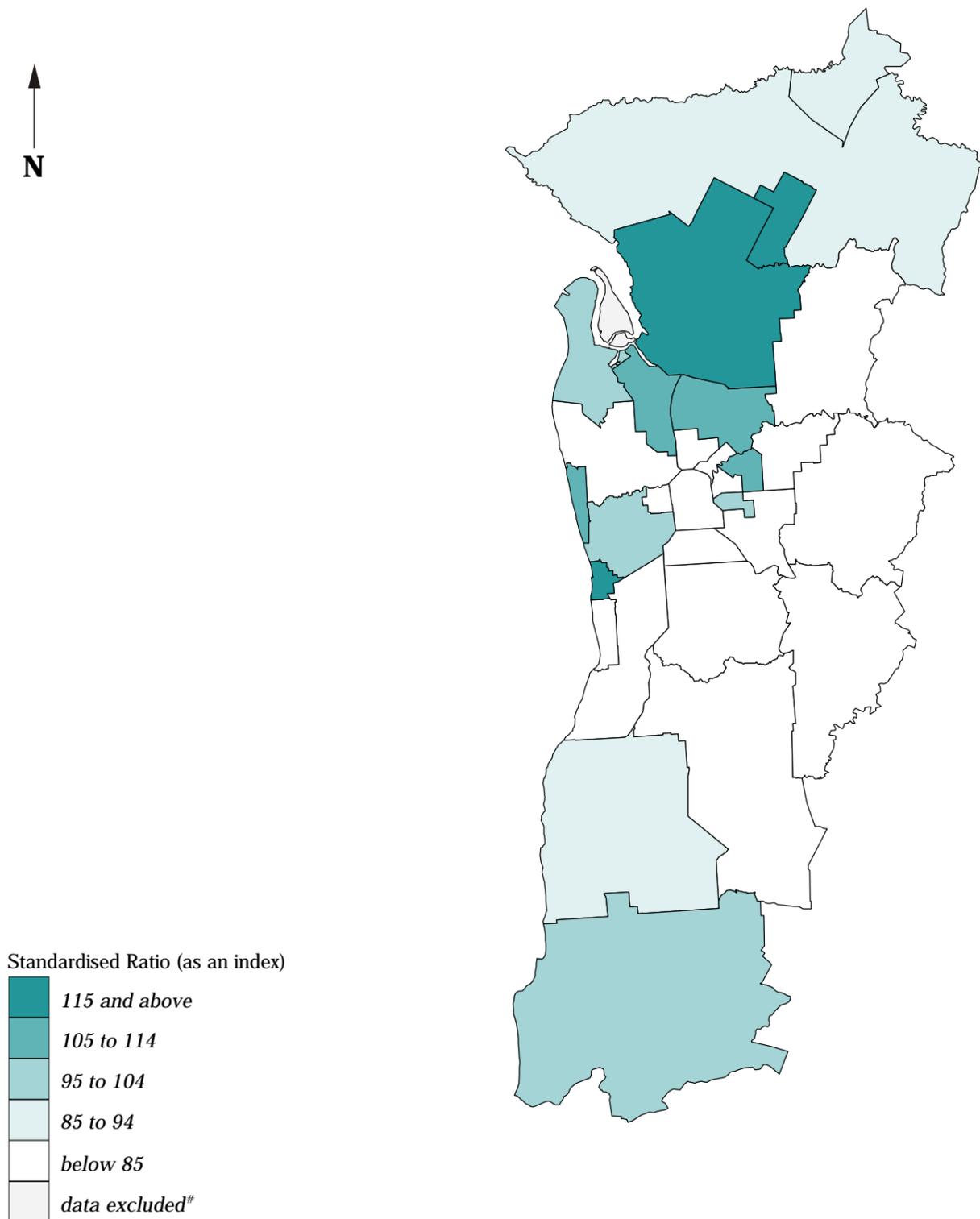
The largest number of admissions for bronchitis, emphysema or asthma was in Salisbury with 831. More than 400 admissions were recorded in Noarlunga (470 admissions), Hindmarsh and Woodville (427) and Tea Tree Gully (410).

There were correlations of meaningful significance with a number of indicators of socioeconomic disadvantage, including low income families (0.65), unemployed people (0.64), single parent families (0.62), unskilled and semi-skilled workers (0.60), early school leavers (0.56), Indigenous people (0.54) and dwellings rented from the State housing authority (0.52). The inverse correlation with the IRSD (-0.64) also indicated a positive association between high rates of admissions for bronchitis, emphysema and asthma and socioeconomic disadvantage.

Map 6.31

Admissions for bronchitis, emphysema or asthma, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA 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 for bronchitis, emphysema or asthma, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

Almost one third (29.1 per cent) of admissions for respiratory system diseases of residents of the non-metropolitan areas were for the diseases of bronchitis, emphysema or asthma. The elevated SAR (129**) is consistent with that for admissions for all respiratory system diseases described above. There were almost equal numbers of admissions of males (1,572) and of females (1,558).

SLAs with highly elevated ratios (and with at least 20 admissions) were recorded:

- in the Yorke Peninsula and lower northern SLAs of Port Broughton (an SAR of 479**), Wallaroo (214**), Wakefield Plains (199**), Crystal Brook-Redhill (189**), Blyth-Snowtown (186**), Clare (139') and Central Yorke Peninsula (131);
- in the far north in Coober Pedy (an SAR of 362**), Kanyaka-Quorn (318**), Port Augusta (189**) and Whyalla (177**);
- in the mid north in Port Pirie (an SAR of 308**);
- in the Adelaide Hills and Murray Land SLAs of Mount Pleasant (an SAR of 290**), Meningie (238**) and Barmera (159**);
- in the south-east in Tatiara (an SAR of 208**) and Millicent (130'); and
- on the west coast in Streaky Bay (an SAR of 196**) and Port Lincoln (170**); and
- in Kapunda (an SAR of 149') and Strathalbyn (135').

A total of 13 SLAs were mapped in the middle range of 10 per cent above or below the level of admissions for bronchitis, emphysema or asthma expected from the State rates (**Map 6.32**). The SARs in this class interval ranged from 109 in Unincorporated Flinders Ranges to 90 in Yorketown.

Light, on the outskirts of **Adelaide**, had the lowest ratio among the SLAs with more than 20 admissions for bronchitis, emphysema or asthma, and an SAR of 68 which indicated that there were 32 per cent fewer admissions than were expected (23 admissions compared in an expected 34). Mallala (33 admissions), Renmark (37 admissions) and Tanunda (21 admissions) also recorded relatively low ratios, with SARs of 75, 77 and 80 respectively.

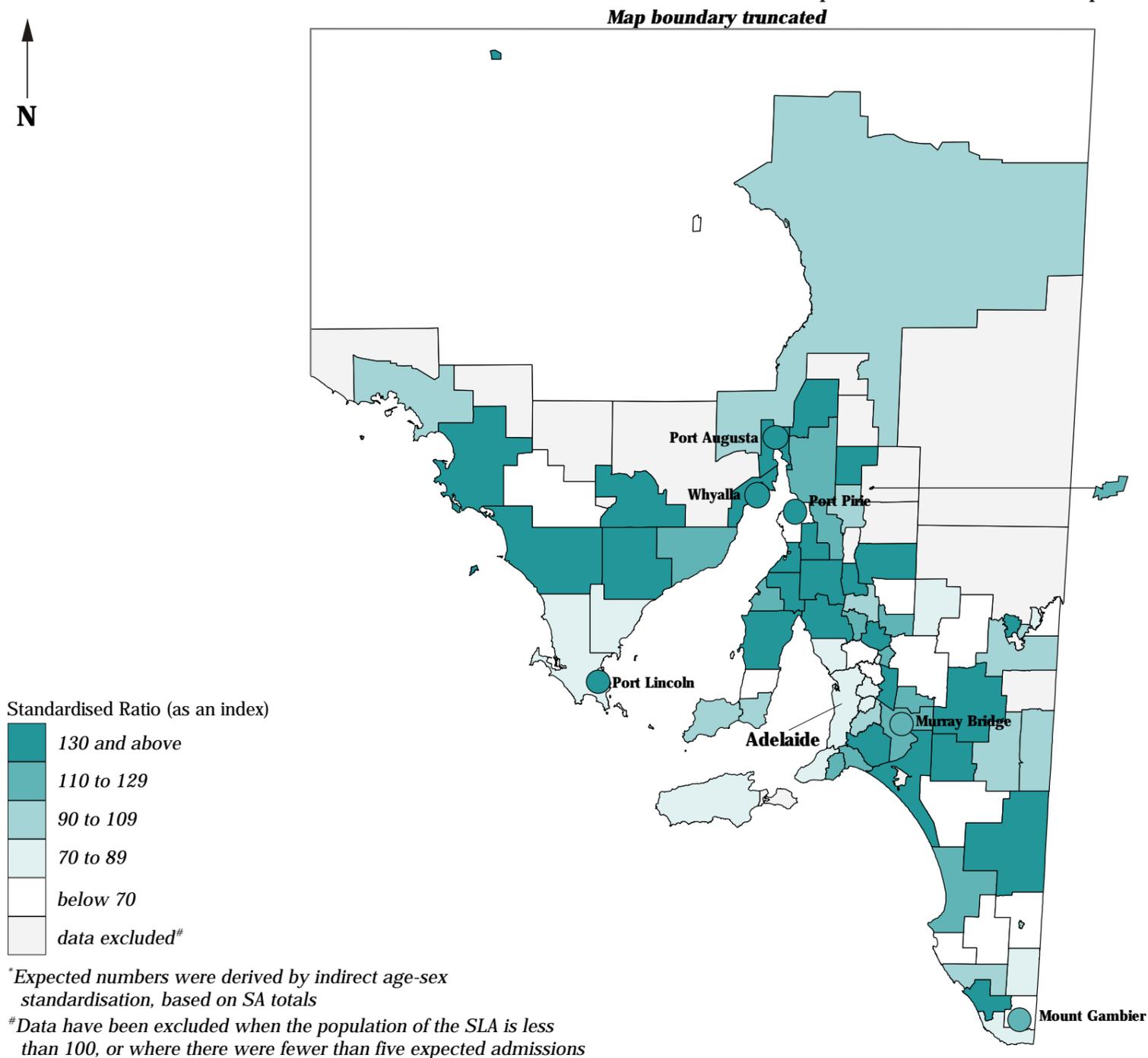
Residents of Port Pirie had the largest number of admissions for these causes (277 admissions); followed by Whyalla (C), with 260 admissions; Port Augusta, with 161; Mount Gambier (C), with 153; Port Lincoln, with 134; Mount Barker, with 126; and Murray Bridge, with 113.

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

Map 6.32

Admissions for bronchitis, emphysema or asthma, South Australia, 1995/96

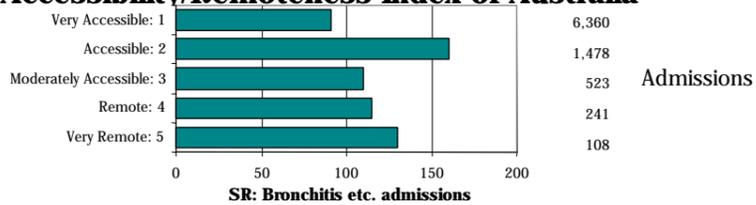
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for bronchitis, emphysema or asthma also show a strong relationship with remoteness. The ratios increase from an SAR of 92 in the Very Accessible category to an SAR of 130 in the Very Remote category. However the highest ratio is in the Accessible areas, an SAR of 160.

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

Admissions from accidents, poisonings and violence, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

¹Includes Queanbeyan (C)

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

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

Source: See *Data sources*, Appendix 1.3

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

Accidents, poisonings and violence are a major cause of hospitalisation, accounting for 8.1 per cent of all admissions analysed for South Australian residents; 10.4 per cent of male admissions and 6.3 per cent of female admissions. Admissions arising from accidents, poisonings and violence are classified according to the external cause, that is, according to the circumstances of the accident or violence that produced the injury, as well as by the nature of the injury.

Accidents accounted for 93.8 per cent of admissions from these external causes, and were largely accidental falls (21.5 per cent of all admissions from these external causes) and motor vehicle traffic accidents (5.1 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 external causes are affected by socioeconomic status. They reported that, for postcode areas in Adelaide, "compared with the highest income areas, admission rates were 10% higher in the middle category and 26% higher in the poorest areas".

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

Adelaide (South Australia as the Standard)

There were 22,606 admissions of residents of **Adelaide** from the combined causes of accidents, poisonings and violence, 11 per cent fewer than expected from the State rates (an SAR of 89**). Males accounted for 55.9 per cent of the admissions.

There is a clear pattern in the distribution of standardised admission ratios. SLAs to the north of the city recorded the highest ratios and those to the east, west and south generally had the lowest (Map 6.33).

The City of Adelaide, with an SAR of 148** (48 per cent more admissions than expected from the State rates), and Elizabeth with an SAR of 135** had the most highly elevated ratios. The other northern SLAs of Gawler, Salisbury and Munno Para also had elevated, although much lower, SARs of 106, 106** and 102 respectively.

Almost half (46.7 per cent) of the SLAs had ratios of 15 per cent below the level expected. Residents of Thebarton had the lowest SAR for this variable, with 41 per cent fewer admissions than were expected from the State rates (an SAR of 59**). Relatively low ratios were also recorded in the SLAs of Happy Valley (an SAR of 68**), Burnside (72**), Tea Tree Gully (75**), East Torrens (76**), Henley and Grange (77**), Prospect and Stirling (both 79**).

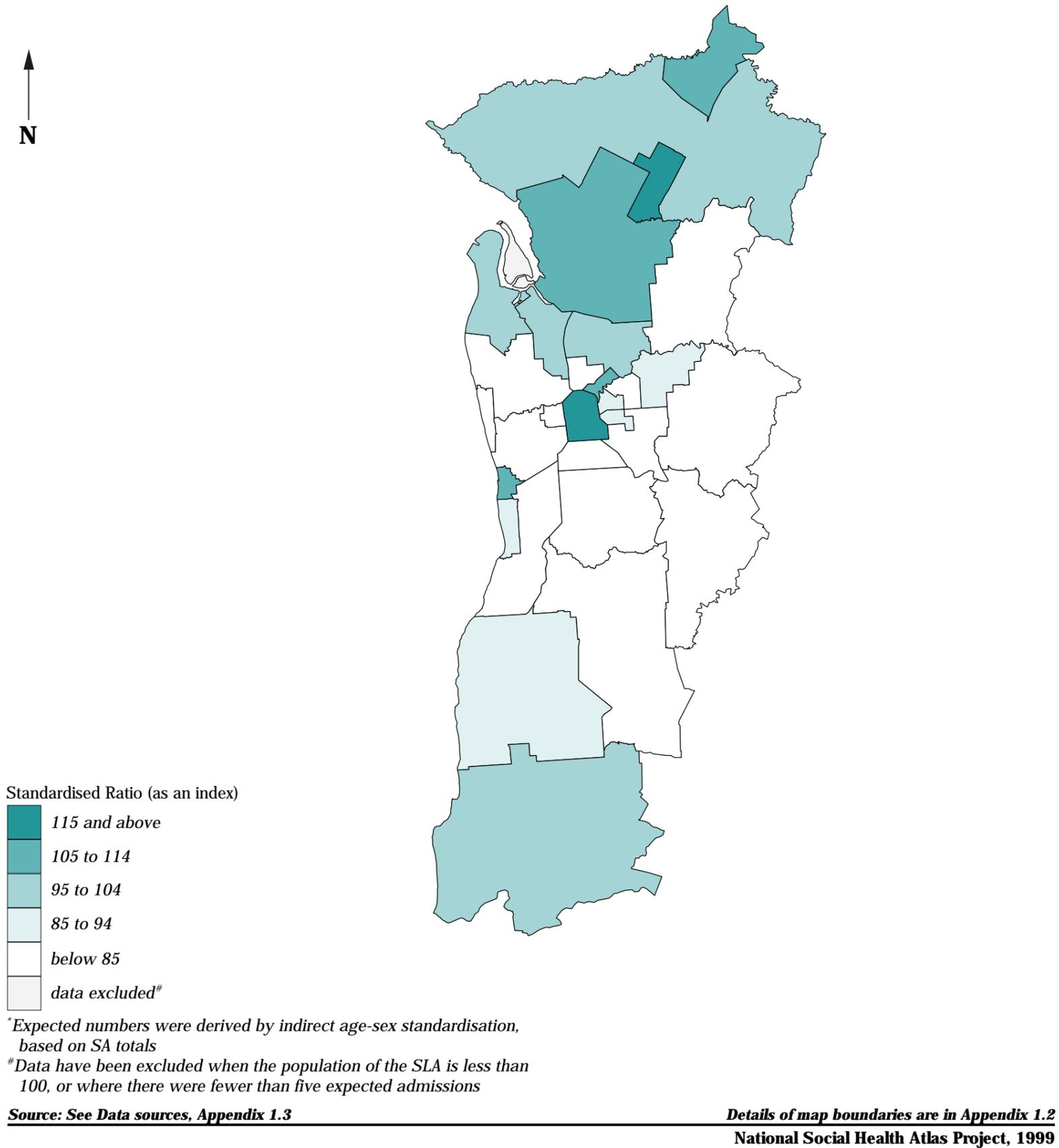
The largest numbers of admissions from accidents, poisonings and violence were recorded for residents of Salisbury (2,593 admissions) and Tea Tree Gully (1,572) in the north; Noarlunga (1,767) in the south; and Hindmarsh and Woodville (1,732) in the western suburbs.

There was an inverse correlation of meaningful significance at the SLA level with the variable for female labour force participation (-0.57) and weak correlations with the indicators of socioeconomic disadvantage, including with the Indigenous population (0.47), housing authority rented dwellings (0.46) and unemployment (0.45). These results, together with the weak inverse correlation with the IRSD (-0.37), suggest the existence of an association at the SLA level between high rates of admission from the external causes of accidents, poisonings and violence and socioeconomic disadvantage.

Map 6.33

Admissions from accidents, poisonings and violence, Adelaide, 1995/96

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



Admissions from accidents, poisonings and violence, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 11,760 admissions of residents of the non-metropolitan areas of South Australia from the combined causes of accidents, poisonings and violence, 31 cent more than expected from the State rates (an SAR of 131**). The relatively higher rates of hospitalisation of people in the non-metropolitan areas in general and from these causes are discussed on page 187. In addition the relatively higher rates of hospitalisation of Indigenous people from these causes (see comments on page 181) may be an influence in the high standardised admission ratios recorded for some of the more remote areas. Males accounted for 59.7 per cent of the admissions.

As many of the SARs in **Map 6.34** are very high, the ranges mapped have been changed to enhance the pattern of differentiation in the map. The highest and lowest ranges have been set at 30 per cent variation from the standard, rather than 15 per cent as in the map of **Adelaide** for this variable. As can be seen in the map (**Map 6.34**), the majority of areas had elevated ratios, with just over half of the SLAs mapped in the highest range. Those with ratios elevated by at least sixty per cent and at least 20 admissions were:

- on Eyre Peninsula, in Unincorporated West Coast (an SAR of 325**), Ceduna (240**) and Port Lincoln (179**);
- in the far north, in Coober Pedy (an SAR of 301**) and Port Augusta (201**);
- in the lower north SLAs of Port Broughton (an SAR of 223**); Blyth-Snowtown (192**); Riverton (184**); Burra Burra (177**); Central Yorke Peninsula (171**) and Eudunda (160**);

- in the south-east in Naracoorte (M) (an SAR of 200**) and Tatiara (184**);
- in the Murray Mallee SLAs of Meningie (an SAR of 181**) and Mannum (169**); and
- in Kingscote (an SAR of 223**), on Kangaroo Island.

The SAR of 105 in Unincorporated Far North was surprisingly low, given its higher population of Indigenous people and their generally higher rates of hospitalisation from these causes. The lowest ratio from the combined causes of accidents, poisonings and violence was recorded in the SLA of Pirie (and SAR of 52**, and 16 admissions). Ratios of below 70 were also recorded in Beachport (with an SAR of 63; 23 admissions) and Light (64**; 84 admissions).

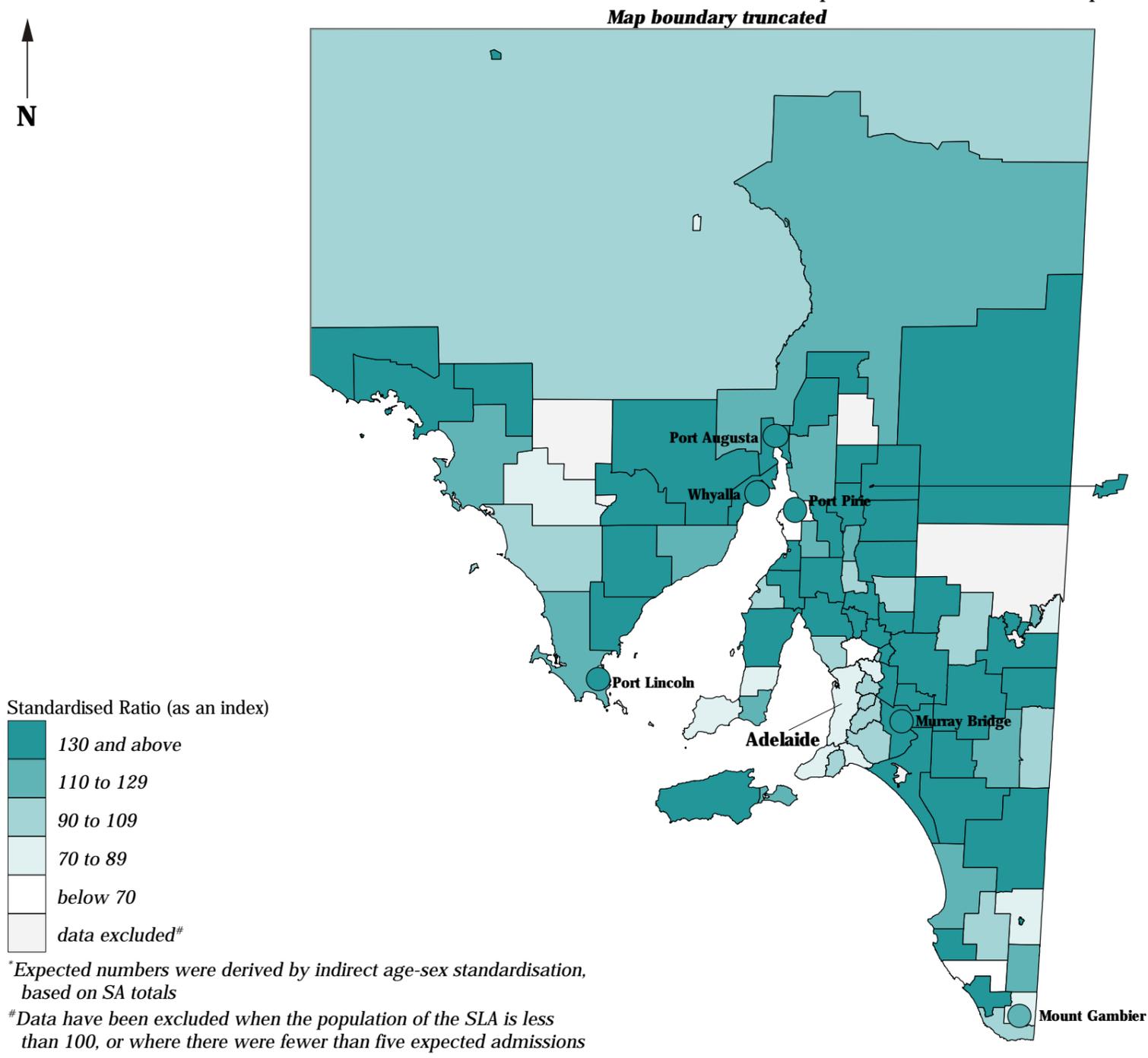
The largest numbers of admissions from accidents, poisonings and violence were recorded in the towns of Whyalla (with 741 admissions), Mount Gambier (642), Port Augusta (633), Murray Bridge (523) and Port Lincoln (508).

The results of the correlation analysis revealed a weak association at the SLA level with indicators of socioeconomic disadvantage. The strongest correlations were recorded with the variables for single parent families and Indigenous Australians (both with a correlation coefficient of 0.44). These results, together with the weak inverse correlation of meaningful significance with the IRSD (-0.37), suggest the existence of an association at the SLA level between high rates of admission from the external causes of accidents, poisonings and violence and socioeconomic disadvantage.

Map 6.34

Admissions from accidents, poisonings and violence, South Australia, 1995/96

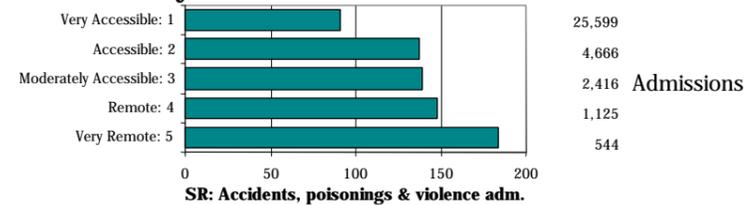
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions from the external causes of accidents, poisonings and violence increase across the ARIA categories in a step wise fashion. Ratios increase from an SAR of 91 in the Very Accessible areas to 137 and 139 in the Accessible and Moderately Accessible areas, respectively. There is a further increase to the Remote areas, with an SAR of 148, and a larger increase to the Very Remote category, with an SAR of 184.

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

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Principal procedures for admitted patients

Introduction

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

Data mapped

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

⁷A 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 it varies widely spatially, and often with a spatial pattern that is the inverse of that for tonsillectomies.

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

In most cases, the procedure is the principal procedure, the most significant procedure for treatment of the principal diagnosis. The exception is the variable for lens insertion, for which all recorded procedures were examined, as the extraction of the old lens is often the principal procedure.

South Australia has a higher standardised admission rate than the average of the other States for about half of these procedures, with the most highly elevated being for tonsillectomy, hysterectomy and caesarean section (**Table 6.40**). Rates for lens insertion and endoscopy were well below the *Other States*' rate.

Table 6.40
Admission rates¹ for selected sentinel procedures, public and private hospitals, 1996/1997

Sentinel procedure	Standardised admission rates ¹		
	South Australia	Other States	Difference
Appendicectomy	1.34	1.43	-6.0**
Coronary artery bypass graft	0.88	0.91	-3.4
Angioplasty	0.87	0.71	22.6**
Caesarean section	3.19	2.76	15.9**
Cholecystectomy	2.42	2.16	11.9**
Endoscopy	19.99	24.36	-17.9**
Hip replacement	1.09	0.99	10.4**
Hysterectomy	2.26	1.81	25.2**
Lens insertion	3.84	5.18	-25.8**
Myringotomy	3.83	2.17	76.5**
Tonsillectomy	2.49	1.80	38.1**

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 6.41**. Standardised admission ratios in South Australia were higher (relative to the Australian rates) in 1996/97 than they were in 1986 for appendicectomy, Caesarean section, hysterectomy and tonsillectomy; and lower for cholecystectomy, hip replacement and lens insertion.

Table 6.41: Standardised admission ratios¹ for selected surgical procedures, South Australia

Procedure	1986	1996/97
Appendicectomy	83.8	93.7
Caesarean section	102.1	114.3
Cholecystectomy	120.2	111.0
Hip replacement	129.1	109.0
Hysterectomy	100.1	122.8
Lens insertion	87.2	76.0
Tonsillectomy	70.8	133.9

¹Admission rates 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 from Australian Hospital Statistics, Australian Institute of Health & Welfare, June 1998

Context

Australia

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

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

South Australia

In 1995/96, there were 230,374 admissions of residents of South Australia to public acute and private hospitals (including day surgery facilities), 9.3 per cent of all admissions in Australia, at which at least one surgical procedure was performed. These admissions involving a procedure represented 54.5 per cent of all admissions of residents of South Australia in this analysis (which includes all acute admissions, other than for renal dialysis). Almost three quarters (74.4 per cent) of the admissions were residents of **Adelaide** (which comprises 73.2 per cent of the State's population) and 25.6 per cent were of residents of the non-metropolitan areas of South Australia. Females accounted for 57.4 per cent of admissions, varying from 58.0 per cent of admissions for residents of **Adelaide** to 55.4 of non-metropolitan residents. Again less than half (42.7 per cent) of the procedures were performed on a same day basis, with males having slightly more of their principal procedures on a same day basis (44.1 per cent of all male principal procedures compared with 41.7 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 6.42: Admissions¹ for surgical procedures, capital cities, 1995/96
Standardised separation ratios

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Just over a half (54.5 per cent) of admissions to acute hospitals of residents of South Australia in 1995/96 involved a surgical procedure. Females accounted for 57.4 per cent of such admissions, and males for 42.6 per cent. For females, admission rates were highest in the 25 to 34 year age groups and again from age 70, while for males, rates were most common among those aged from their late fifties, increasing with each age group (**Figure 6.8**, page 186).

The correlation analysis revealed a weak positive association with the indicators of socioeconomic disadvantage, the strongest being with the variables for unskilled and semi-skilled workers (0.29) and dwellings rented from the State housing authority (0.27). These results, together with the weak inverse correlation with the IRSD (-0.26), suggest the existence of an association at the SLA level between high rates of admission for surgical procedures and socioeconomic disadvantage.

Adelaide (South Australia as the Standard)

In 1995/96 there were 171,401 admissions of residents of **Adelaide** for surgical procedures, marginally above the level expected from the State rates (an SAR of 101**). Females accounted for 58.0 per cent of these admissions (99,492 admissions), and males for 42.0 per cent.

There was little variation evident in standardised admission ratios at the SLA level, with only three SLAs falling within the highest range mapped and two in the lowest (**Map 6.35**). The most highly elevated ratio of 121** was recorded for residents of Glenelg, indicating that there were 21 per cent more admissions for surgical procedures than the level expected. A cluster of SLAs to the south of **Adelaide** also had relatively high SARs. These were Brighton (with an SAR of 115**), Marion (108**), and Willunga and Noarlunga (both 106**). The remaining SLAs mapped in the top two ranges included Elizabeth (115**) and Salisbury (105**), located in the north; West Torrens (108**), Enfield [Part B] and Port Adelaide (both 106**), situated in the west; and the City of Adelaide (105**).

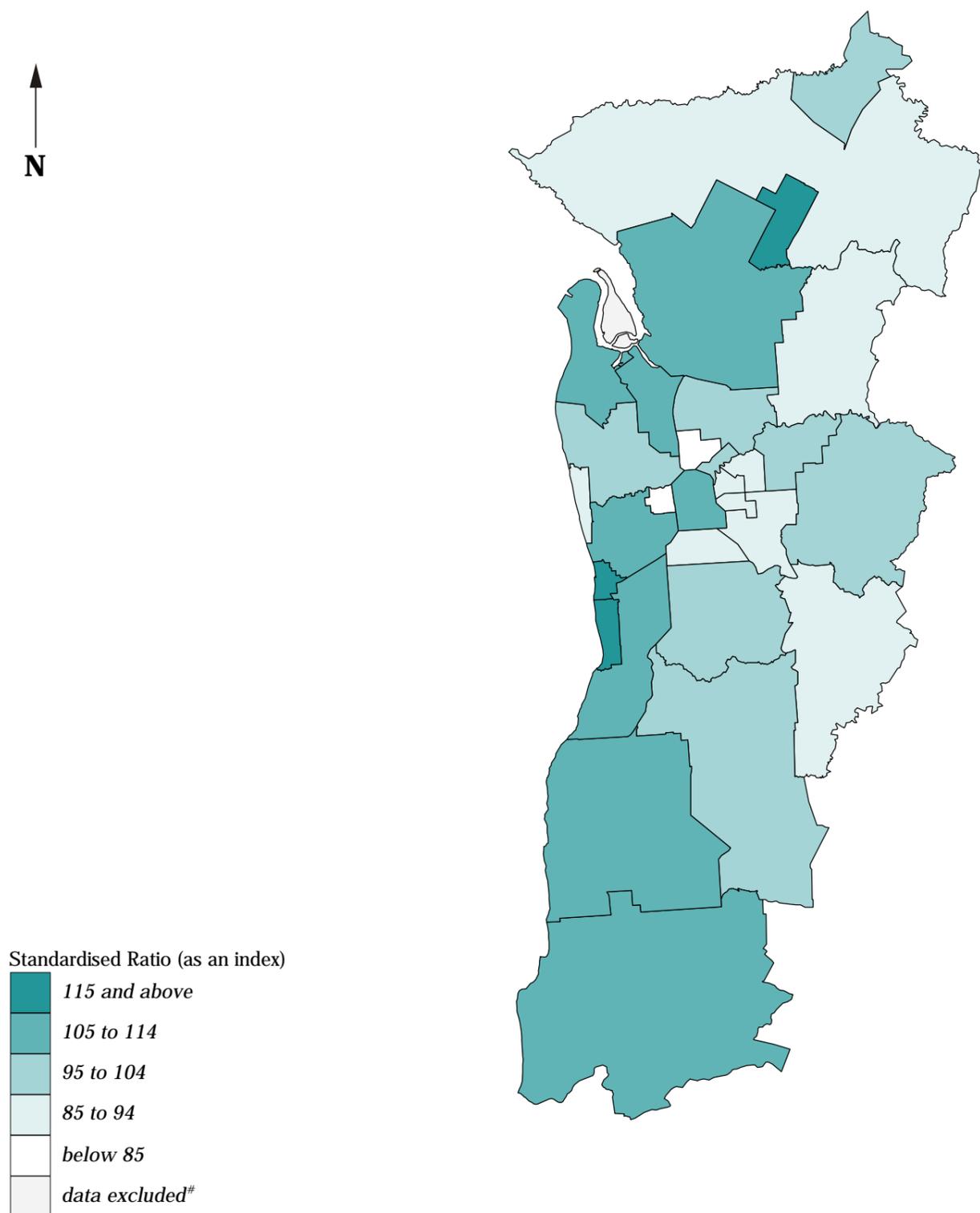
Thebarton had the lowest ratio for this variable with 25 per cent fewer admissions than expected, an SAR of 75**. A relatively low ratio was also recorded in the inner SLA of Prospect, with an SAR of 83**. The majority of SLAs in the second lowest range mapped were situated in eastern (and north-eastern and south-eastern) SLAs: the exception was the western SLA of Henley and Grange.

The largest numbers of admissions involving a surgical procedure were in the northern SLAs of Salisbury (with 16,701 admissions) and Tea Tree Gully (12,409); in the western SLA of Hindmarsh and Woodville (14,565); and the southern SLAs of Noarlunga (14,237), Marion (13,744) and Mitcham (10,207).

Map 6.35

Admissions for surgical procedures, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA 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 for surgical procedures, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 58,973 admissions of residents of the non-metropolitan areas of South Australia in 1995/96 for surgical procedures, two per cent fewer admissions than expected from the State rates (an SAR of 98**). Females accounted for 55.4 per cent (32,651) of these admissions, and males for 44.6 per cent.

As can be seen from the map, the majority of SLAs have been mapped in the three middle ranges, with only four and eight SLAs mapped in the highest and lowest ranges respectively (**Map 6.36**). Ratios elevated by 30 per cent or more were recorded:

- in the northern SLAs of, Unincorporated West Coast, with an SAR of 181**; Unincorporated Pirie (147**); and Port Augusta (133**); and
- in the south-eastern SLA of Naracoorte (M) (154**).

Highly significant elevated ratios were also recorded in Port Lincoln (an SAR of 129**), Crystal Brook-Redhill (125**), Lameroo (120**), Jamestown and Whyalla (both 117**), Berri, Renmark and Port Pirie (each with 116**), Millicent (113**) and Barmera (110**).

Only eight SLAs were mapped in the lowest range. By far the lowest ratio was recorded in Unincorporated Riverland, with 75 per cent fewer admissions than expected (an SAR of 25** and six admissions). The remaining seven SLAs all had more than twenty admissions each and included Robertstown, with an SAR of 50**; Naracoorte (DC) (51**); Pirie (53**); Roxby Downs (59**); Light (61**); Dudley (68**); and Lower Eyre Peninsula (69**).

The largest numbers of admissions for a surgical procedure were recorded for residents of Whyalla, with 4,141 admissions; Mount Gambier, 3,287; Mount Barker, 2,836 and Port Augusta, 2,772.

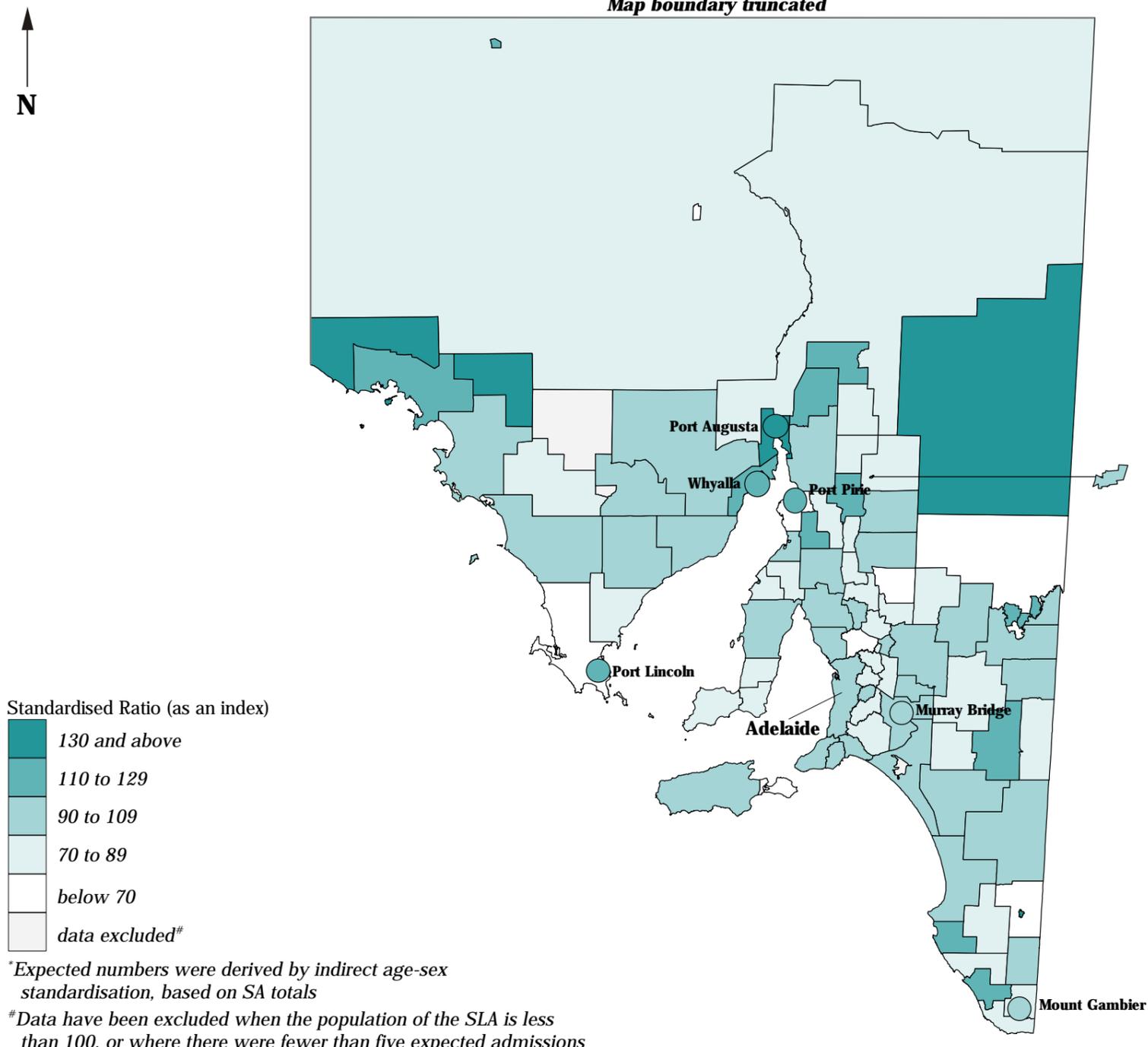
There were weak correlations at the SLA level with most of the indicators of socioeconomic disadvantage which, together with the weak inverse correlation with the IRSD (-0.29), suggest the existence of an association at the SLA level between high rates of admissions for a surgical procedure and socioeconomic disadvantage.

Map 6.36

Admissions for surgical procedures, South Australia, 1995/96

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

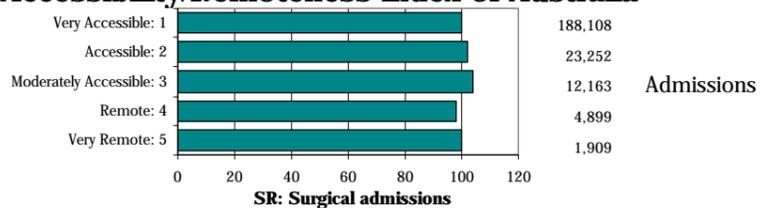
Map boundary truncated



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a surgical procedure are close to the level expected from the State rates across all of the ARIA categories, with a marginally higher ratio of 104 in the Moderately Accessible category and a marginally lower ratio in the Remote category (with an SAR of 98).

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

Same day admissions for surgical procedures, 1995/96

Capital city comparison (Australia as the Standard)

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

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

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Just under half (42.7 per cent) of all admissions of residents of South Australia in 1995/96 involving a surgical procedure were same day admissions. Females accounted for over half (55.9 per cent) of same day admissions. Admission rates were higher for females than for males in the age groups from 15 to 19 years through to 50 to 59 years (**Figure 6.10**, page 186). For males, the largest differentials over the rates for females were in the 0 to 14 year age groups and from age 60 years.

Adelaide (South Australia as the Standard)

There were 74,705 same day admissions of residents of **Adelaide** for surgical procedures in 1995/96, three per cent more than were expected from the State rates (an SAR of 103**). Females accounted for 42,583 of these same day admissions (57.0 per cent) while 32,122 (43.0 per cent) were of males.

The distribution of the highest standardised admission ratios for same day surgical procedures follows a distinct pattern in an area largely to the south-west and south of the city centre, while those with the lowest ratios were situated in a number of the inner and outer northern SLAs (**Map 6.37**). Only two SLAs were mapped in the lowest range.

The most highly elevated ratio, of 132**, was recorded for residents of Glenelg, indicating that there were 32 per cent more admissions than expected from the State rates. Other SLAs with ratios elevated by 15 per cent or more were the southern SLAs of Brighton, with an SAR of 128**; and Marion (118**); and the western SLAs of Enfield [Part B] (117**); and West Torrens (116**).

In all, ten SLAs had SARs in the range of five per cent above or below the expected level, including Enfield [Part A] (an SAR of 104) and Campbelltown, Hindmarsh and Woodville, and St Peters (each with SARs of 103).

Thebarton had the lowest ratio for this variable, with 24 per cent fewer admissions than expected, an SAR of 76**. To the north of the city, Tea Tree Gully, Munno Para and Gawler recorded low ratios of 83**, 88** and 93' respectively. Prospect, with an SAR of 86**, Henley and Grange (90**), and Burnside (94**) were also mapped in the second lowest range.

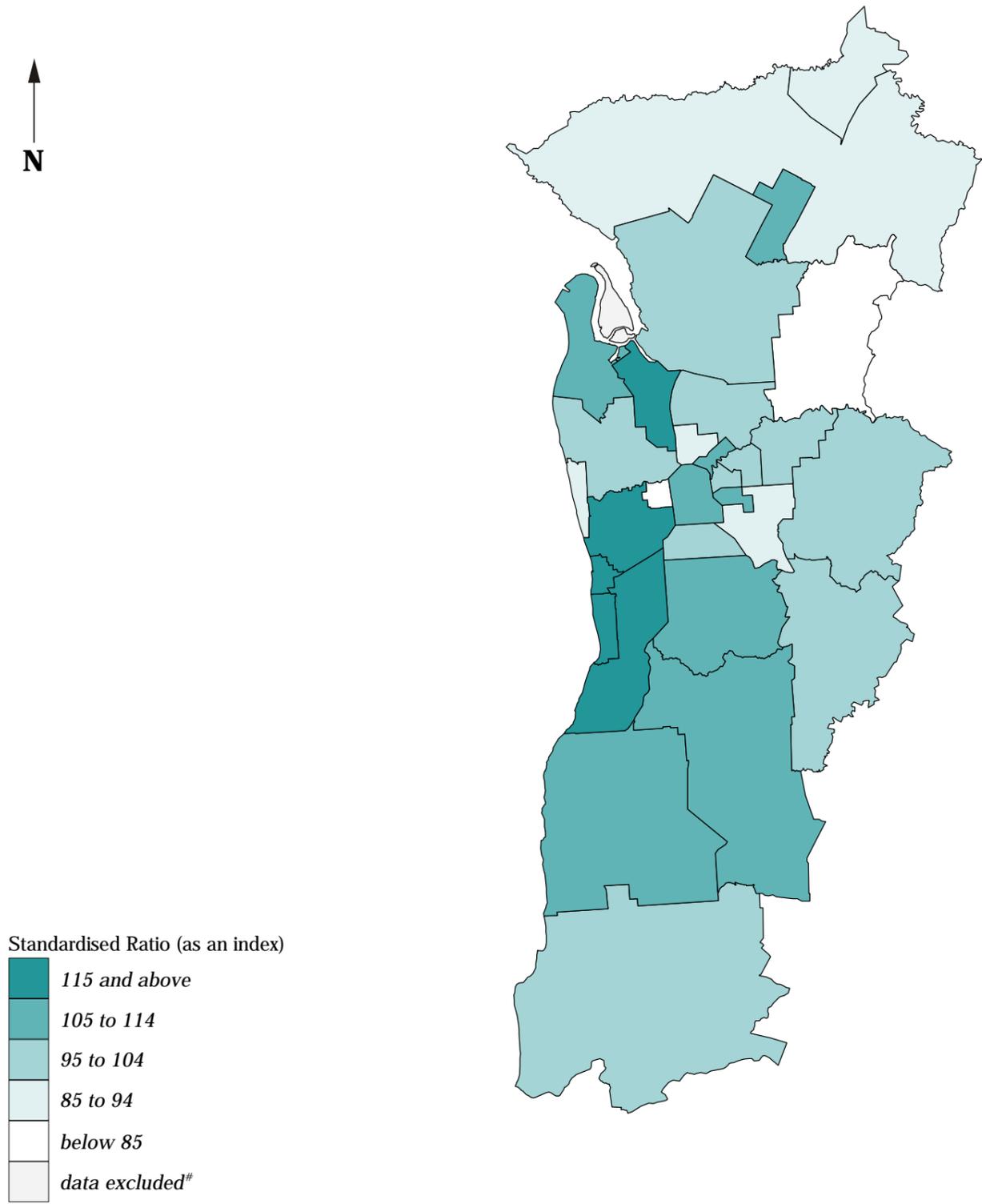
The largest number of same day admissions were in the northern SLAs of Salisbury (with 6,804 same day admissions) and Tea Tree Gully (5,017); in the western SLA of Hindmarsh and Woodville (6,400); and the southern SLAs of Marion (6,409), Noarlunga (6,229) and Mitcham (4,702).

The correlation analysis revealed a weak positive association with a number of the indicators of socioeconomic disadvantage, the strongest being with the variable for dwellings with no motor vehicle (0.20). There were correlations of substantial significance with a number of the other variables for admissions.

Map 6.37

Same day admissions for surgical procedures, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA 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

Same day admissions for surgical procedures, 1995/96

State/Territory comparison (Australia as the Standard)

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

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

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

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

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 23,699 same day admissions of residents of the non-metropolitan areas of South Australia for a surgical procedure in 1995/96, eight per cent fewer than were expected from the State rates (an SAR of 92**). Females represented 52.6 per cent of same day admissions (12,458) and 47.4 per cent were males (11,240). Although still higher than for males, the proportion of females is not as high as in **Adelaide**.

As can be seen from **Map 6.38**, a large number of SLAs have been mapped in the lowest ranges, with only three SLAs mapped in the highest range. Ratios elevated by 10 per cent or more were recorded:

- in the south-eastern SLAs of Naracoorte (M) (an SAR of 169**), and Millicent (117**);
- in the northern SLAs of Unincorporated Pirie (an SAR of 140**), Crystal Brook-Redhill (125**), Whyalla (119**), Port Pirie (115**), Hawker (114) and Port Augusta (111**);
- in the Murray Mallee and Riverland SLAs of Lameroo (an SAR of 133**), Renmark (119**), Browns Well (117), Berri (114**), and Barmera (110); and
- on the Eyre Peninsula, in Port Lincoln (an SAR of 115**).

Of the SLAs mapped in the middle range, only one was of statistical significance. The town of Mount Gambier had an SAR of 109**, indicating that there were 9 per cent more same day admissions for surgical procedures than were expected from the State rates.

Areas with low ratios were widespread throughout South Australia, especially to the north of **Adelaide**. The lowest ratio (of areas where more than 20 same day admissions were recorded) of 37** was in the SLAs of Pirie and Unincorporated West Coast, with low ratios also occurring in Eudunda (with an SAR of 46**),

Roxby Downs (49**), Tumby Bay (50**), Warooka (51**), Pinnaroo (52**), Dudley (53**), Unincorporated Far North (54**) and Cleve (55**).

The largest numbers of same day admissions for a surgical procedure in the non-metropolitan areas of South Australia were recorded in Whyalla (C), with 1,834 same day admissions; Mount Gambier, 1,605 same day admissions; Mount Barker, 1,215 same day admissions and Port Pirie, 1,125 same day admissions.

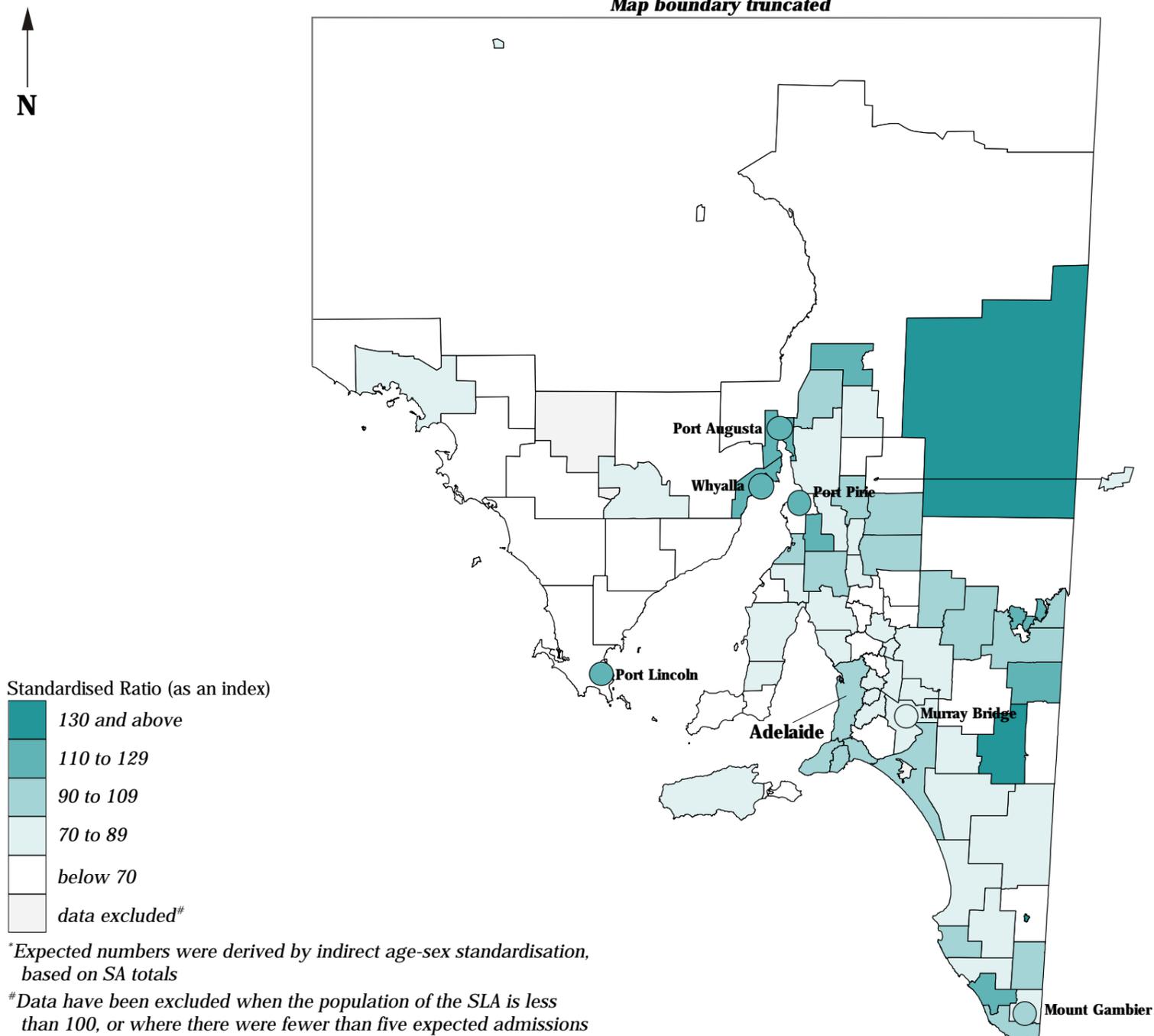
There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of same day admissions for surgical procedures and socioeconomic status.

Map 6.38

Same day admissions for surgical procedures, South Australia, 1995/96

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

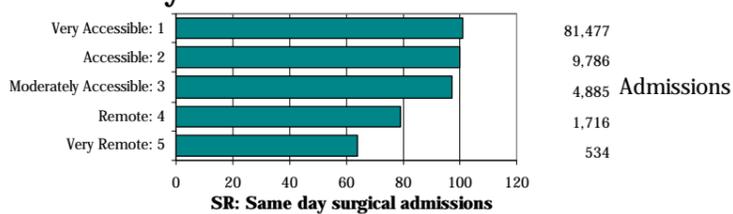
Map boundary truncated



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for same day admissions involving a surgical procedure show a markedly different pattern to that evident for all surgical admissions, with lower ratios associated with increasing remoteness reflecting the lack of these services outside of the most accessible areas. Ratios decline from a high of 101 in the Very Accessible areas (and near-expected ratios in the other two 'accessible' categories), to lows of 69 and 79 in the Very Remote and Remote areas, respectively.

Source: Calculated on ARIA classification, DHAC

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

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

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

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

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

A majority of admissions for these procedures of residents of South Australia were of people 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 1138.9 procedures per one hundred thousand females and 1138.8 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 545.3 admissions per 100,000 females compared with 743.4 admissions per 100,000 males) and with substantially higher rates than for males in the age groups from 10 to 24 years. Overall, 55.2 per cent of admissions were females.

Data for Australia published by the AIHW (1998) showed the tonsillectomy and/or adenoidectomy rate in South Australia to be 38.1 per cent above that in the other States for which data were available (Table 6.40, page 261).

Adelaide (South Australia as the Standard)

In 1995/96, there were 2,425 admissions for tonsillectomies and/or adenoidectomies in **Adelaide**, 1,333 admissions of females (55.0 per cent) and 1,092 males (45.0 per cent). This was marginally fewer than expected from the State rates (an SAR of 99).

The distribution of SARs across **Adelaide** was quite striking, with highly elevated ratios across the northern and western suburbs and generally low ratios in the southern and inner regions (Map 6.39).

Residents of the northern SLAs of Elizabeth (176**), Munno Para (132**), Tea Tree Gully (121**), Gawler (118) and Campbelltown (117) all had around twenty per cent or more admissions than would be expected. Other SLAs with highly elevated ratios, situated to the west of the city, included Glenelg (121), Thebarton (118), West Torrens (118) and Brighton (115).

SLAs with ratios in the lowest range mapped were located in two distinct areas, one to the south of the city and the other adjacent to the city, with the exception of Henley and Grange and Port

Adelaide, which are located to the west. The SLAs located adjacent to the City of Adelaide (which had an SAR of 72) include Payneham (with an SAR of 62*), Prospect (70) and Kensington and Norwood (81); and those to the south were Noarlunga (with an SAR of 72**), Happy Valley (74**) and Stirling (79).

The SARs in this section for **Adelaide** have been calculated using the State rates as the standard (ie. South Australia as 100), to highlight variations, at the small area level, from the State rates. Had the ratios for SLAs in **Adelaide** been standardised to the Australian rates (ie. Australia as 100), then the SAR in Elizabeth would have been 259**, more than two and a half times the number of admissions expected for an SLA of this size and with this age/sex profile. The ratio in lowest ranked Payneham, with an SAR of 62* (when South Australia was the standard) would have been 93*, just seven per cent fewer admissions than expected from the Australian rates. These calculations highlight the extent to which admission rates for tonsillectomies and/or adenoidectomies are substantially elevated when compared with the average for Australia.

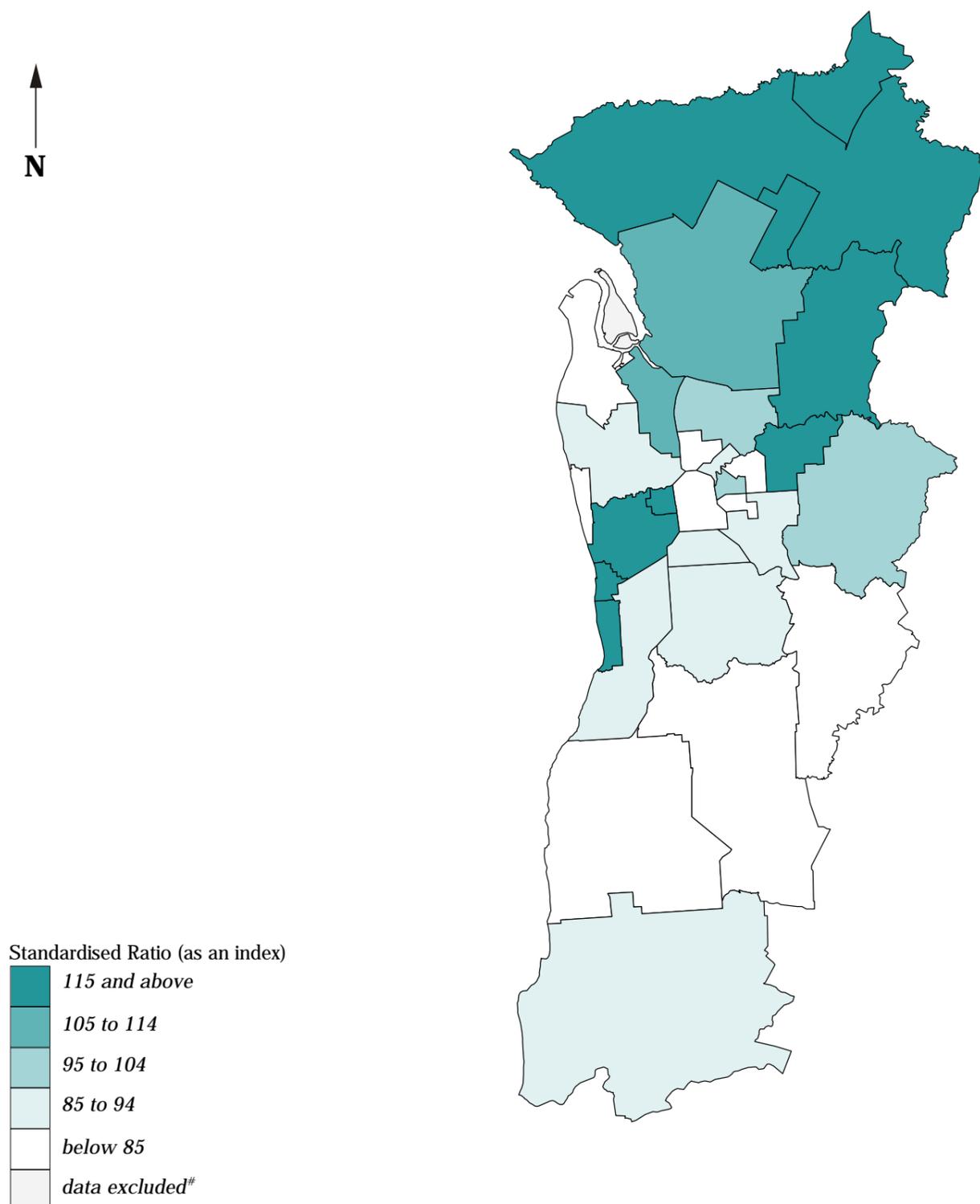
Residents of Salisbury had the largest number of admissions for a tonsillectomy and/or adenoidectomy in 1995/96, with 319 admissions. The next largest numbers were recorded for residents of Tea Tree Gully (286 admissions), Noarlunga (179), Hindmarsh and Woodville (158) and Munno Para (150).

There were correlations of meaningful significance with the variables for unskilled and semi-skilled workers (0.53), unemployment (0.52) and early school leavers (0.50), and weaker correlations with low income families and housing authority rented dwellings (0.48), single parent families (0.47) and the Indigenous population (0.46). An inverse correlation of meaningful significance was recorded with the variable for female labour force participation (-0.54). These results, together with the inverse correlation of meaningful significance with the IRSD (-0.52), indicate the existence of an association at the SLA level between high rates of admissions for tonsillectomies and/or adenoidectomies and socioeconomic disadvantage.

Map 6.39

Admissions for a tonsillectomy and/or adenoidectomy, Adelaide, 1995/96

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



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

[#]Data have been excluded when the population of the SLA 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 for a tonsillectomy and/or adenoidectomy, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for the procedures of tonsillectomy and/or adenoidectomy (described on the previous text page) varied widely between the States and Territories, including across the non-metropolitan areas of Australia (Table 6.47). The range was from a low of 35** for the non-metropolitan areas of Northern Territory to a high of 141** in the non-metropolitan areas of South Australia. There were 10,042 of these procedures performed as a principal procedure on residents of the non-metropolitan areas.

Table 6.47: Admissions¹ with a principal procedure of tonsillectomy and/or adenoidectomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	89**	109**	101	136**	95*	71**	71**	65**	100
Other major urban centres ²	100	147**	106	..	..	..	..	..	106**
Rest of State/Territory	101	115**	84**	141**	92*	67**	35**	— ³	99
Whole of State/Territory	94**	112**	94**	137**	94**	68**	50**	66**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

With only 1,001 admissions (559 females and 442 males) for a tonsillectomy and/or adenoidectomy in 1995/96, the numbers for many non-metropolitan SLAs were quite small (as noted previously, the absolute numbers should be viewed in conjunction with the standardised admission ratios). The SAR recorded for the non-metropolitan areas of South Australia was 103.

Despite this near average ratio, a small number of SLAs had highly elevated ratios (Map 6.40). Those with more than 20 admissions were located:

- in the north in Port Augusta, with an SAR of 178** (66 admissions when 37 were expected) and Port Pirie (an SAR of 115 and 40 admissions);
- on and nearby the Fleurieu Peninsula in Victor Harbor (an SAR of 146; and 26 admissions); and Onkaparinga (140; and 29);
- in the south-east in Mount Gambier (an SAR of 143**; and 83 admissions) and Millicent (114; and 23);
- on the Eyre Peninsula, in Port Lincoln (an SAR of 140*; and 45 admissions); and
- in the Murray Lands, in Renmark (an SAR of 120; and 23 admissions).

Ratios of 10 per cent above or below the level expected were recorded in 11 SLAs, all with very small numbers of admissions. The largest number of admissions in this range were recorded in the SLAs of Mount Barker and Murray Bridge, with 65 and 45 admissions respectively.

The only SLA with a ratio lower than expected (and recording more than 20 admissions) was Whyalla, with 54 admissions and an SAR of 85. There were 10 or more admissions recorded in each of Port Elliot and Goolwa (an SAR of 92), Mallala (92), Loxton (84) Strathalbyn and Tatiara (both 83) and Wakefield Plains and Gumeracha (both 82).

None of the SLAs had more than 100 admissions for a tonsillectomy and/or adenoidectomy in 1995/96: the largest numbers were recorded in Mount Gambier, with 83 admissions; Port Augusta, with 66; Mount Barker, with 65; and Whyalla, with 54.

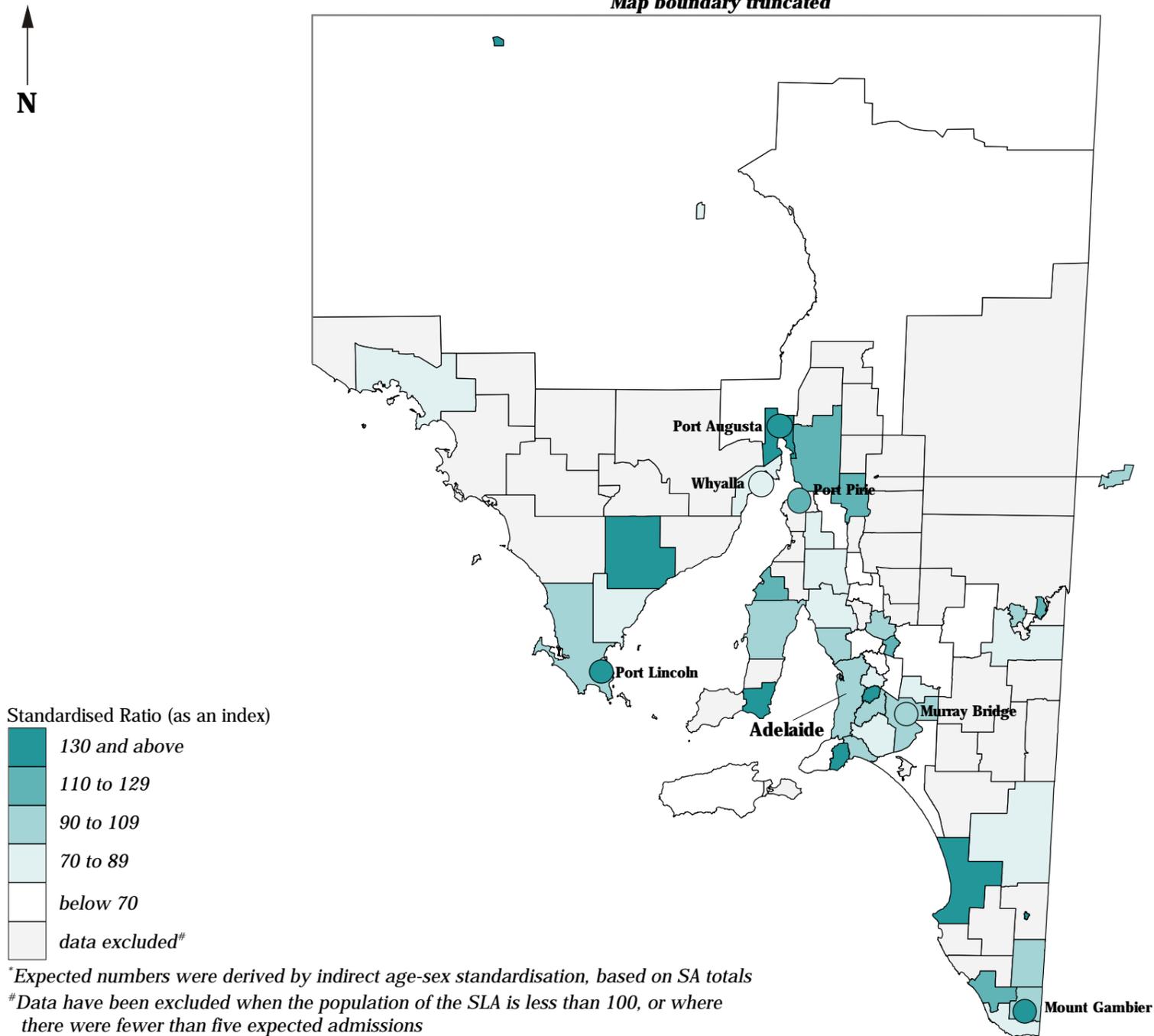
The correlation analysis was not undertaken as there were too many areas with small numbers of cases.

Map 6.40

Admissions for tonsillectomy and/or adenoidectomy, South Australia, 1995/96

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

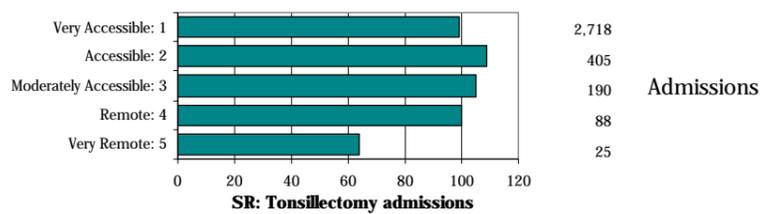
Map boundary truncated



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a tonsillectomy and/or adenoidectomy generally decrease with increasing remoteness. There are three levels in the distribution, with the highest ratios in the Accessible and Moderately Accessible ARIA categories (SARs of 109 and 105, respectively); average ratios in the Very Accessible and Remote categories (101 and 100, respectively); and a notably lower ratio of 64 in the Very Remote category.

Source: Calculated on ARIA classification, DHAC

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 6.48), 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 6.48: 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 (88.2 per cent) of admissions of South Australian residents for this procedure were of people under 10 years of age, the SLA data have been standardised to the totals for those ages.

Children aged from 0 to 4 years accounted for just over half (57.2 per cent) of the admissions for this procedure, with most of the remainder (31.0 per cent) in the 5 to 9 year age group. Males accounted for over half (57.9 per cent) of all admissions for myringotomies and slightly fewer (59.2 per cent) in the 0 to 4 year age group.

Data for Australia published by the AIHW (1998) showed the myringotomy rate in South Australia to be 76.5 per cent above that in the other States for which data were available (Table 6.40, page 261).

Adelaide (South Australia as the Standard)

In 1995/96, there were 2,809 admissions for a myringotomy of residents of **Adelaide** under 10 years of age, seven per cent more admissions than were expected from the State rates (an SAR of 107**). Males accounted for over half (59.7 per cent) of the admissions. The vast majority (91.2 per cent) of these admissions were performed on a same day basis.

SLAs with the most highly elevated ratios were clustered in three distinct areas: in the south, to the west of the city and within the inner region (Map 6.41). Those located within the inner region were Kensington and Norwood (with an SAR of 187**), St. Peters (141), Walkerville (135), Burnside (132**), the City of Adelaide (130) and Prospect (120); those to the south of the city were Happy Valley (147**), Unley (125) and Brighton (115); and those situated in the west were Glenelg (134), Mitcham (127**), Henley and Grange (120), and West Torrens (115). Also mapped in the highest range was the SLA of Tea Tree Gully, with 33 percent more admissions than expected (an SAR of 133**).

In total, 8 SLAs (26.7 per cent of all SLAs) had average or below average ratios for this variable. SLAs mapped in the second

lowest range included Munno Para (with an SAR of 88) located in the north and Port Adelaide (86) situated in the west.

Although the lowest ratio was recorded in Enfield [Part A], with an SAR of 64*, this represented only 28 admissions. Also mapped in the lowest range was Thebarton (an SAR of 67, and 10 admissions), Elizabeth (an SAR of 78*, and 71 admissions), Willunga (an SAR of 78, and 34 admissions), Hindmarsh and Woodville (an SAR of 83*, and 156 admissions) and Noarlunga (an SAR of 84**, and 244 admissions).

The SARs in this section for **Adelaide** have been calculated using the State rates as the standard (ie. South Australia as 100), to highlight variations, at the small area level, from the State rates. Had the ratios for SLAs in **Adelaide** been standardised to the Australian rates (ie. Australia as 100), then the SAR in Kensington and Norwood would have been 330**, more than three times the number of admissions expected for an SLA of this size and with this age/sex profile. The ratio in lowest ranked Enfield [Part B], with an SAR of 64* (when South Australia was the standard) would have been 113*, indicating 13 per cent more admissions for this procedure than expected from the Australian rates.

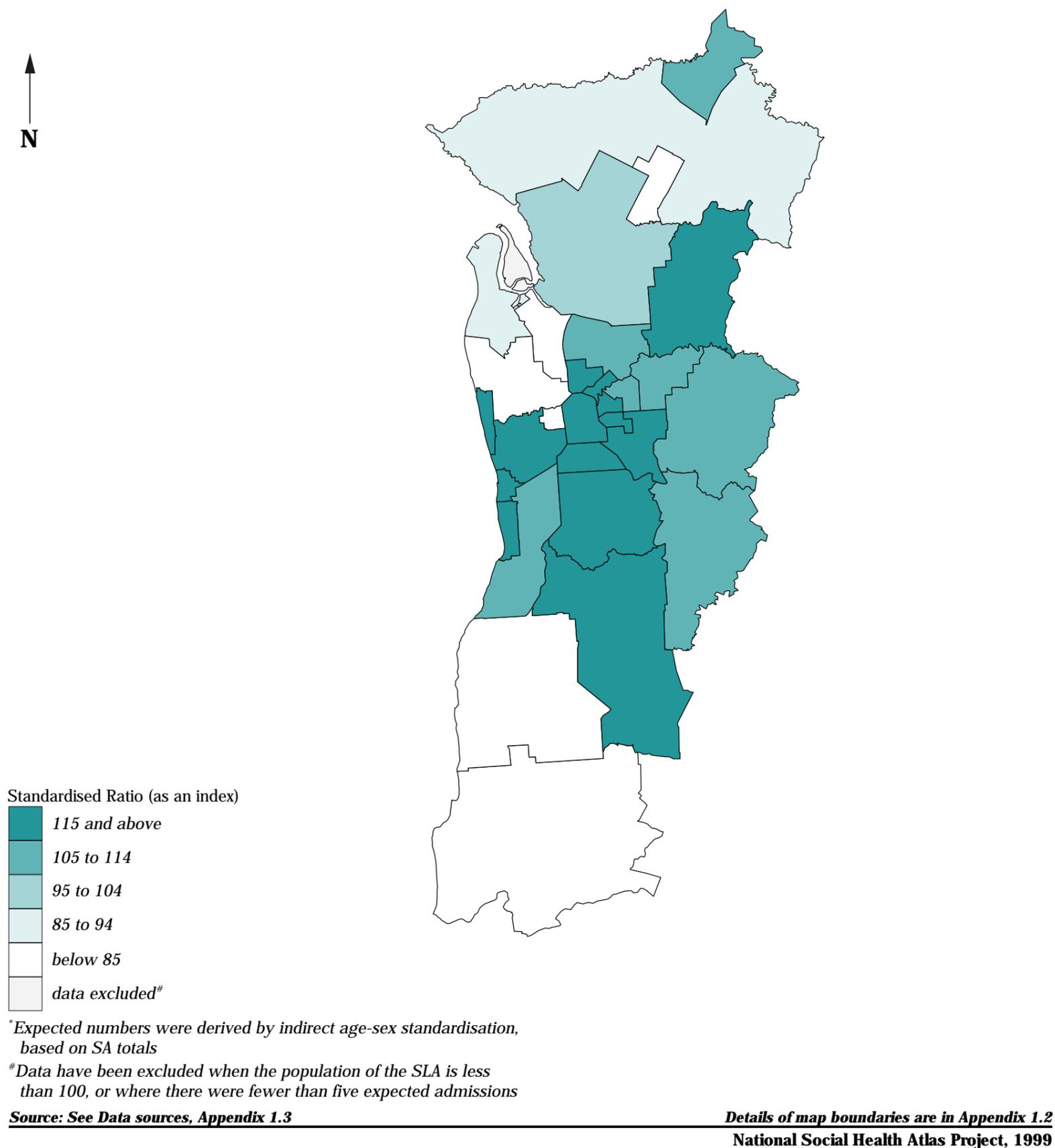
The largest numbers of admissions for a myringotomy were of residents in the SLAs of Salisbury, with 358 admissions; Tea Tree Gully, 326; Noarlunga, 244; and Marion, 206.

There were correlations of substantial significance at the SLA level with the variables for high income families (0.73) and female labour force participation (0.71), and of meaningful significance with managers and administrators, and professionals (0.67). Inverse correlations of substantial significance were recorded with the variables for unskilled and semi-skilled workers (-0.75), low income families (-0.71) and early school leavers (-0.70); and of meaningful significance with the Indigenous population (-0.66) and unemployed people (-0.66). These correlations, and the positive correlation with the IRSD (0.72), indicate an association at the SLA level between high rates of admission for a myringotomy and high socioeconomic status.

Map 6.41

Admissions of children aged 0 to 9 years for a myringotomy, Adelaide, 1995/96

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



Admissions of children aged 0 to 9 years for a myringotomy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 6,989 procedures for myringotomy (described on the previous text page) performed as a principal procedure on children aged from 0 to 9 years and resident in the non-metropolitan areas of Australia. As was the case for the capital cities, standardised admission ratios (SARs) for these procedures varied markedly across the non-metropolitan areas (**Table 6.49**), from lows of 44** in the Northern Territory and 59** in Queensland, to a highly elevated 163** in South Australia.

Table 6.49: Admissions¹ of children aged 0 to 9 years with a principal procedure of myringotomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	78**	125**	103	205**	130**	119**	84	59**	112**
Other major urban centres ²	70**	133**	91*	..	..	..	..	..	85**
Rest of State/Territory	64**	116**	59**	163**	82**	68**	44**	- ³	82**
Whole of State/Territory	73**	123**	82**	192**	114**	88*	60**	61**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 978 admissions of children under 10 years of age and resident in the non-metropolitan areas of South Australia for a myringotomy, 15 per cent fewer than expected from the State rates (an SAR of 85**). More than half of these admissions were males (59.9 per cent), while females accounted for 40.1 per cent (392 admissions). A total of 84.3 per cent of these admissions (824 admissions) were performed on a same day basis.

As can be seen from **Map 6.42**, data for a number of SLAs have not been mapped for this variable, as there were considered to be too few cases from which to calculate reliable rates.

Of those that did record data for this variable only 29 per cent had average, or above average ratios. The highest standardised admission ratio was recorded for residents of Loxton, with 85 per cent more admissions than expected, a highly significant SAR of 185**. The remaining SLAs mapped in the highest range all had less than 20 admissions and included Roxby Downs, with an SAR of 162* (17 admissions); Tanunda (133, 14 admissions); Barmera (131, 16 admissions); Coober Pedy (130, 8 admissions); and Tumby Bay (130, 9 admissions).

The majority of SLAs (38.7 per cent of SLAs) were mapped in the lowest range, with SARs of less than 70. However, only two of these SLAs recorded more than twenty admissions: Murray Bridge with a ratio of 58** (and 28 admissions) and Mount Barker with a ratio of 69** (50 admissions). Ratios lower than expected and with more than 10 admissions were recorded for the SLAs of Berri (an SAR of 58), Unincorporated Far North (an SAR of 53*), Mallala (45**) and Port Pirie (34**).

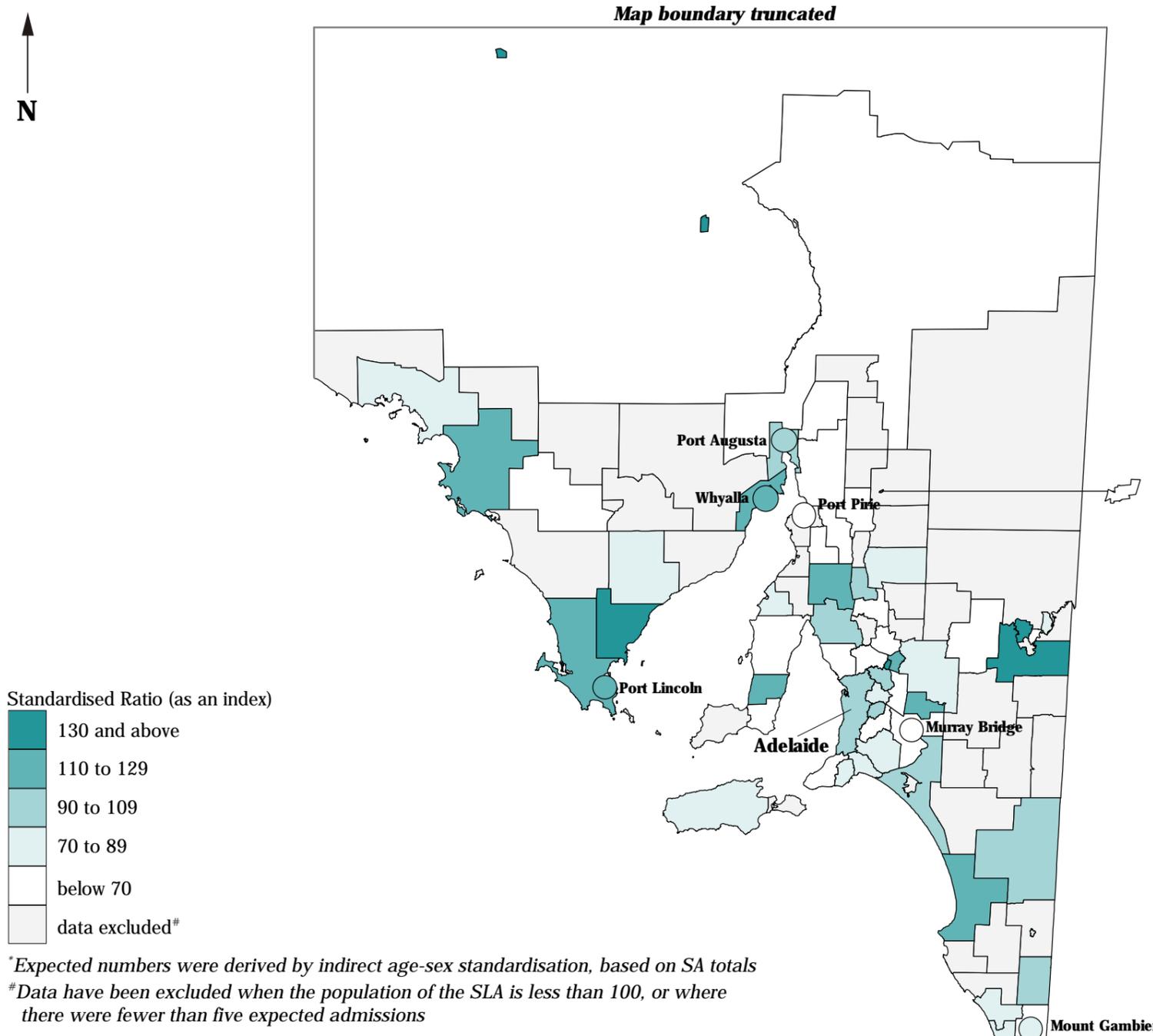
Residents of Whyalla had the largest number of admissions in the non-metropolitan areas of South Australia for a myringotomy, with 91 admissions. More than 40 admissions were also recorded for residents of Mount Gambier (C) (58), Mount Barker (50), Port Lincoln and Port Augusta (both 47).

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

Map 6.42

Admissions of children aged 0 to 9 years for a myringotomy, South Australia, 1995/96

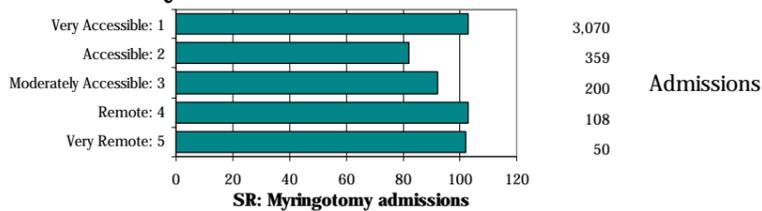
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a myringotomy are similar in the Very Accessible, Remote and Very Remote categories (SARs of 103, 103 and 102, respectively). The lowest ratios were recorded for residents of the Accessible and Moderately Accessible ARIA categories, with SARs of 82 and 92.

Source: Calculated on ARIA classification, DHAC 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 6.50: Admissions¹ of females aged 15 to 44 years with a principal procedure of Caesarean section, capital cities, 1995/96
Standardised admission ratios

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ²	All capitals
92**	92**	118**	107**	92**	100	115*	90**	97**

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

²Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Caesarean sections are performed to intervene in the birth process where the medical practitioner attending the birth perceives that the life of the mother or child is at risk without such an intervention. As Caesarean sections are generally performed on women aged from 15 to 44 years, this age range has been used in standardising the data.

Data for Australia published by the AIHW (1998) showed the Caesarean section rate in South Australia to be 15.9 per cent above that in the other States for which data were available (**Table 6.40**, page 261).

Adelaide (South Australia as the Standard)

In 1995/96 there were 2,964 admissions for Caesarean sections of female residents of **Adelaide** aged between 15 and 44 years. This was four per cent fewer than were expected from the State rates, an SAR of 96*.

The pattern of distribution for these admissions showed that high ratios were recorded in the northern and southern areas and generally lower ratios in many inner and western areas (**Map 6.43**).

The most highly elevated ratios to the north of the city were recorded for residents of Elizabeth (156**), Gawler (140**), Salisbury (129**) and Munno Para (120*); similarly high ratios were also recorded in the southern SLAs of Willunga (128) and Happy Valley (124*).

More than two thirds (70 per cent) of the SLAs in **Adelaide** recorded fewer admissions than expected. Of those mapped in the second lowest range, none were of statistical significance.

The majority of SLAs with ratios in the lowest range mapped were recorded for female residents of the inner and western areas of **Adelaide**. Those situated in the west included Thebarton, with an SAR of 42**; Henley and Grange (44**); Port Adelaide (67**); Hindmarsh and Woodville (67**); Glenelg (71); and Enfield [Part B] (75). The City of Adelaide (with an SAR of 46**), Kensington and Norwood (49**), Walkerville (59), Prospect (70*) and Unley (80*), all located in or nearby the city, were also mapped in the lowest range.

The largest number of admissions for Caesarean sections were of female residents of Salisbury (458 admissions), Noarlunga (312), Tea Tree Gully (241), Marion (226), Hindmarsh and Woodville (159), and Munno Para (149).

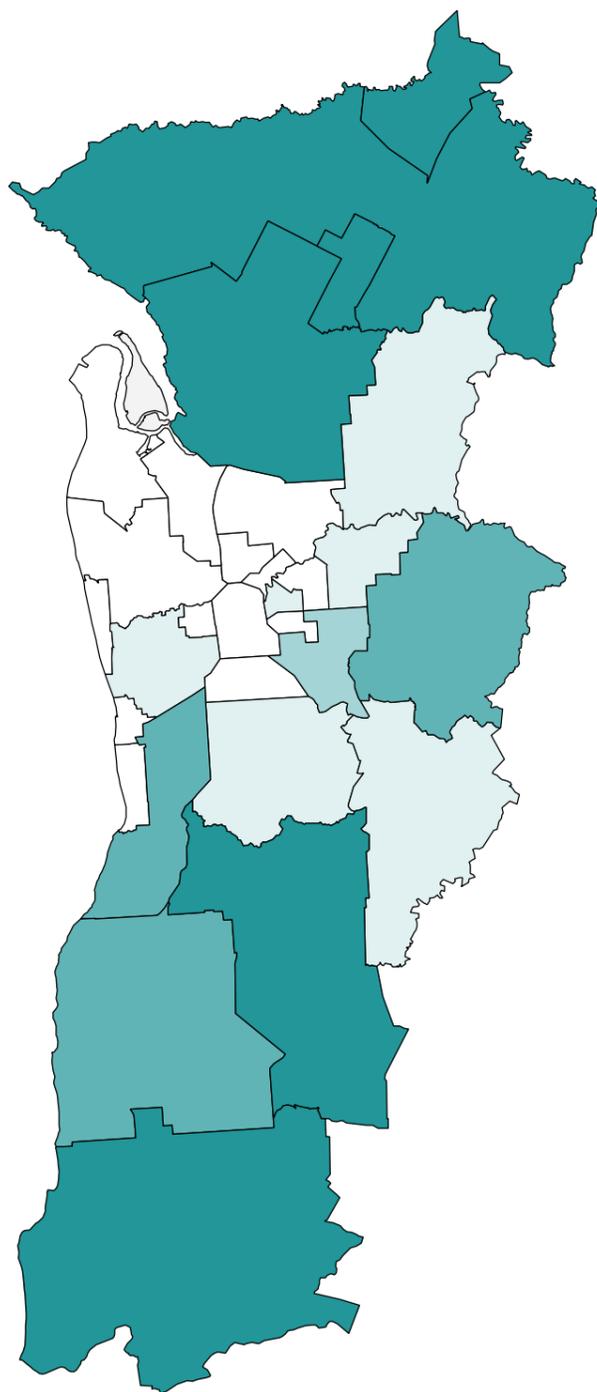
A correlation of substantial significance was recorded at the SLA level with the variable for children aged from 0 to 4 years (0.74) and an inverse correlation of meaningful significance with the variable for dwellings with no motor vehicles (-0.51).

There was also a correlation of meaningful significance with the variable for early school leavers (0.50), and weaker correlations with unskilled and semi-skilled workers (0.48) and single parent families (0.29). These results, together with the weak inverse correlation with the IRSD (-0.25), suggest the existence of an association at the SLA level between high rates of admissions for a Caesarean section and socioeconomic disadvantage.

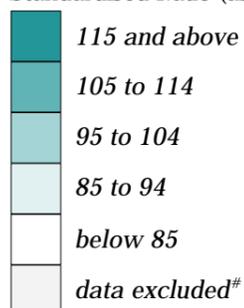
Map 6.43

Admissions of females aged 15 to 44 for a Caesarean section, Adelaide, 1995/96

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



Standardised Ratio (as an index)



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

#Data have been excluded when the population of the SLA 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 of females aged 15 to 44 years for a Caesarean section, 1995/96

State/Territory comparison (Australia as the Standard)

There were 13,966 Caesarean sections (described on the previous text page) performed as a principal procedure on female residents of the non-metropolitan areas of Australia. There were elevated standardised admission ratios (SARs) for this variable in most of the non-metropolitan areas other than in Western Australia (with an SAR of 99), with the most highly elevated ratios in the Northern Territory (142**) and South Australia (123**).

Table 6.51: Admissions¹ of females aged 15 to 44 years with a principal procedure of Caesarean section, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	92**	92**	118**	107**	92**	100	115*	90**	97**
Other major urban centres ²	95*	78**	106	..	..	..	..	..	97
Rest of State/Territory	105**	107**	109**	123**	99	104	142**	- ³	108**
Whole of State/Territory	96**	95**	112**	111**	94**	102	130**	87**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

Female residents of the non-metropolitan areas of South Australia aged from 15 to 44 years had 1,129 admissions for Caesarean sections in 1995/96, 11 per cent more than expected from the State rates (an SAR of 111**).

As can be seen from **Map 6.44**, data for a number of SLAs have not been mapped for this variable, as there were considered to be too few cases from which to calculate reliable rates.

Ceduna and Ridley-Truro had the highly elevated ratios for this variable, with SARs of 174* and 167 respectively. However, both of these SLAs had fewer than 20 admissions - Ceduna with 17 admissions and Ridley-Truro with 12. SLAs with elevated ratios (and with at least 20 cases) were located:

- in the south-east, in Naracoorte (an SAR of 179**), Tatiara (148*), Mount Gambier (C) (118) and Millicent (113);
- in the Murray Lands, in Renmark (an SAR of 167**), Murray Bridge (116) and Berri (105);
- in the north, in Port Pirie (an SAR of 166**), Port Augusta (166**) and Unincorporated Far North (127);
- on the outskirts of **Adelaide** in the Barossa (an SAR of 143), Gumeracha (128) and Mallala (127); and
- on the Eyre Peninsula, in Port Lincoln (an SAR of 137*).

The only other SLAs with more than 20 admissions were Onkaparinga (with an SAR of 92); Mount Barker (90); and Whyalla (C) (89).

By far the lowest ratio was recorded for female residents of Coober Pedy (an SAR of 33 and two admissions).

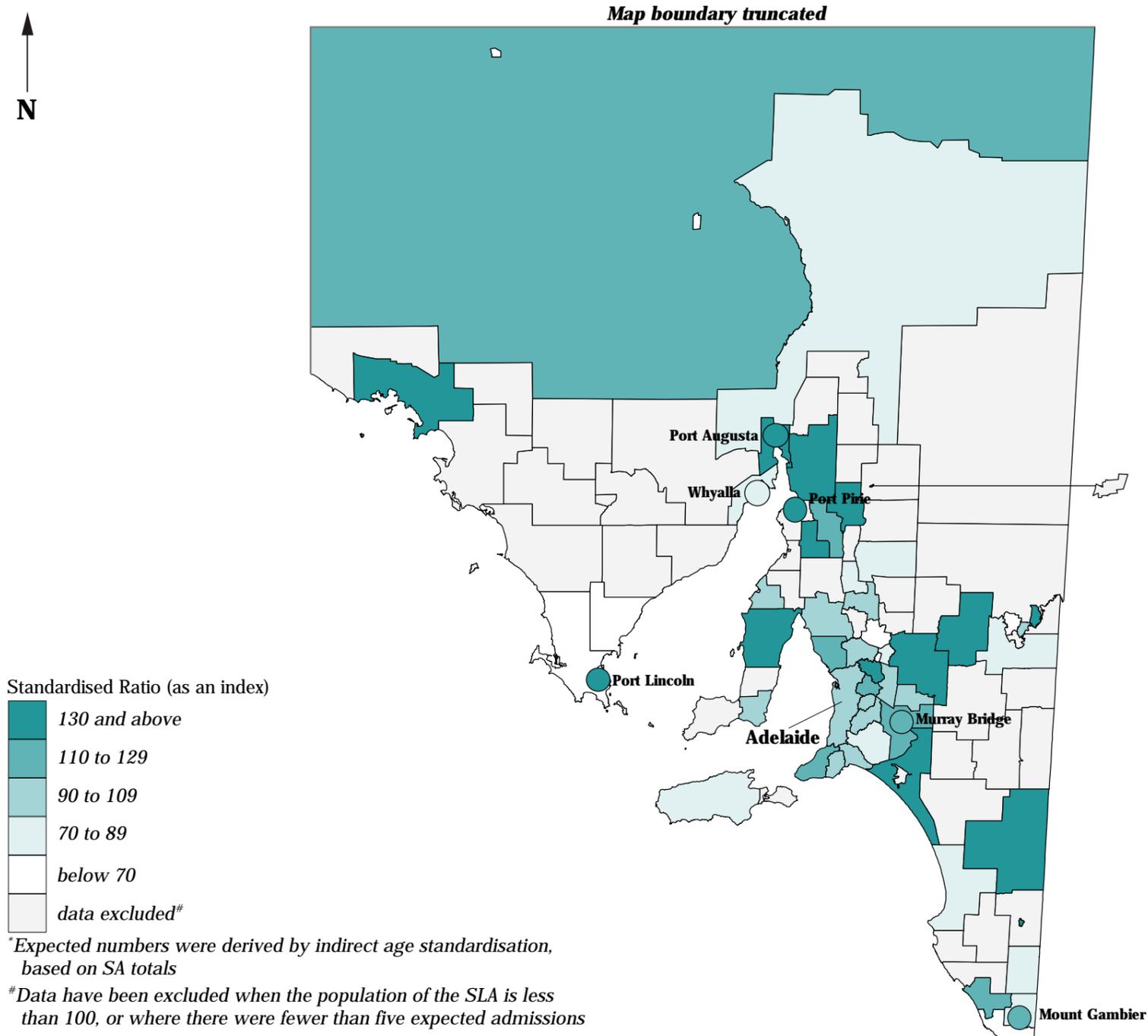
No SLA had more than 100 admissions: the largest numbers were recorded in the towns of Mount Gambier (81 admissions), Port Augusta (68), Whyalla (62) and Port Pirie (61).

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

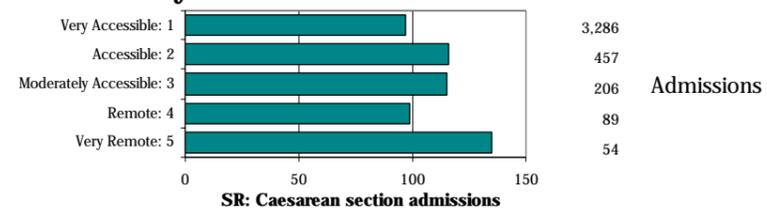
Map 6.44

Admissions of females aged 15 to 44 for a Caesarean section, South Australia, 1995/96

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



Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions of females aged 15 to 44 years involving a Caesarean section increase from an SAR of 97 and 99 in the Very Accessible and Remote areas to a high of 135 in the Very Remote ARIA category. The Accessible and Moderately Accessible areas had SARs of 116 and 115, respectively.

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

Admissions of females aged 30 years and over for an hysterectomy, 1995/96

Capital city comparison (Australia as the Standard)

There were 19,868 hysterectomies (described below) performed as a principal procedure on female residents aged 30 years and over of the capital cities and an additional 2,610 on females resident in the other major urban centres. Most capital cities had either low or near average standardised admission ratios (SARs) for this variable, with the most highly elevated ratio being recorded for females in **Darwin** (with an SAR of 135^{**}); other elevated ratios were in **Hobart** (with an SAR of 115^{**}) and **Brisbane** (106^{**}).

Table 6.52: 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: 607 admissions and a rate of 1114.2 per one hundred thousand females; 45 to 49 years: 697 admissions and a rate of 1332.1 per one hundred thousand females). As relatively few hysterectomies are performed on women younger than 30 years, the age range used in standardising this data are for women aged from 30 years.

Data for Australia published by the AIHW (1998) showed the hysterectomy rate in South Australia to be 25.2 per cent above that in the other States for which data were available (**Table 6.40**, page 261).

Adelaide (South Australia as the Standard)

Female residents of **Adelaide** aged 30 years and over had 2,104 admissions for hysterectomy, eight per cent fewer admissions than were expected from the State rates (an SAR of 92^{**}).

Low standardised admission ratios were generally mapped in the inner and western regions, while the highest ratios were to the north and south of the city (**Map 6.45**). The majority of SLAs (63.3 per cent) recorded ratios lower than expected, while only five SLAs were mapped in the highest class interval.

The largest number of SLAs with highly elevated SARs were in the north, including Gawler (an SAR of 154^{**}), Elizabeth (151^{**}) and Salisbury (119^{**}). In the south, Noarlunga recorded an SAR of 117^{*}. Glenelg (with an SAR of 131) also had an elevated ratio.

Residents of Thebarton recorded the lowest SAR for this variable, with a ratio of 34^{*} and five admissions. Ratios in the lowest range mapped (and with more than 20 admissions) were recorded for the inner SLAs of Prospect (an SAR of 59^{*}), Burnside (61^{**}) and Unley (79) and in the western SLAs of Port Adelaide (71^{**}) and Hindmarsh and Woodville (75^{**}).

Other statistically significant ratios below the level expected (in areas where there were more than 20 admissions) were recorded in Campbelltown, with an SAR of 77^{*}; Tea Tree Gully, with an SAR of 80^{**}; Mitcham, with an SAR of 81^{*}; and Marion, with an SAR of 83^{*}.

The SARs in this section for **Adelaide** have been calculated using the State rates as the standard (ie. South Australia as 100), to highlight variations, at the small area level, from the State rates. Had the ratios for SLAs in **Adelaide** been standardised to the Australian rates (ie. Australia as 100), then the SAR in Gawler would have been 196^{**}, almost twice the number of admissions expected for an SLA of this number of females aged 30 years and over. The ratio in the lowest ranked Campbelltown, with an SAR of 77^{*} (when South Australia was the standard) would have been 94^{*}, six per cent fewer admissions than expected for an SLA with this number of females aged 30 years and over.

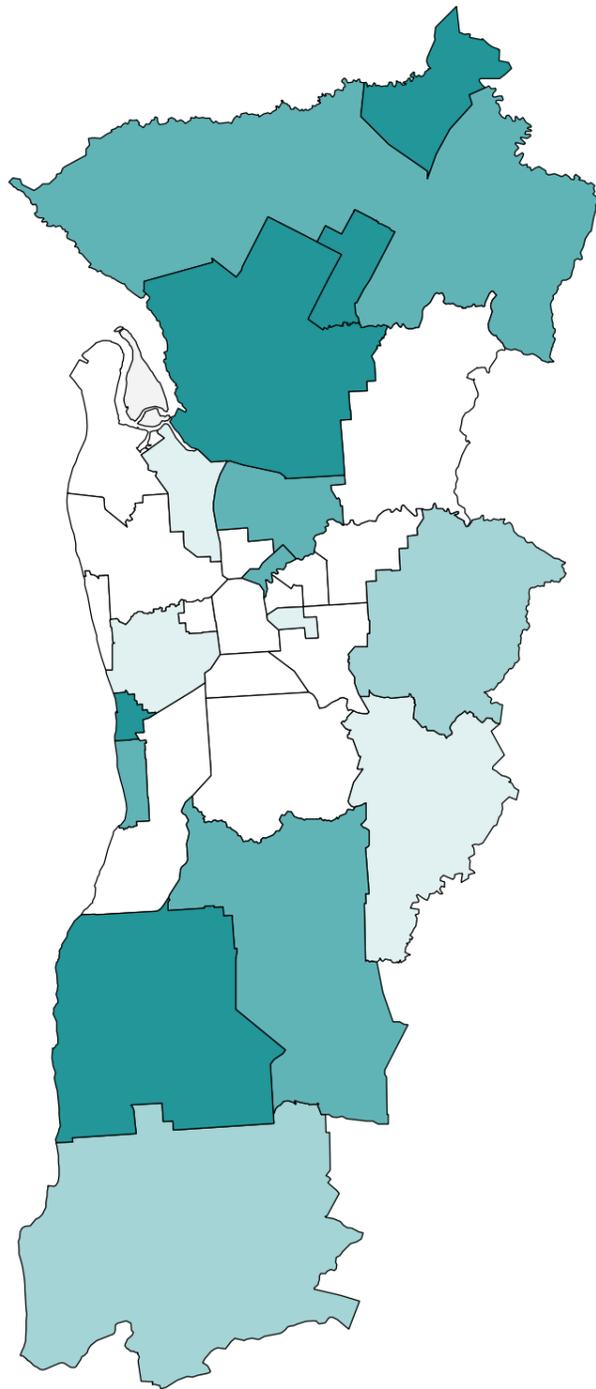
In 1995/96, the largest numbers of admissions for an hysterectomy were recorded in Salisbury, with 260 admissions; Noarlunga, with 223 admissions; Tea Tree Gully, with 166 admissions; Marion, with 142 admissions; and Hindmarsh and Woodville, with 141 admissions.

The correlation analysis revealed a weak positive association at the SLA level with a number of the indicators of socioeconomic disadvantage, including with the variables for early school leavers (0.44) and single parent families (0.35). An inverse correlation of meaningful significance was recorded with the variable for people born in predominantly non-English speaking countries and resident for 5 years or more (-0.52), and of lesser significance with female labour force participation (-0.42). The weak inverse correlation with the IRDSD (-0.29) supports the existence of an association at the SLA level between high rates of admission for hysterectomy and socioeconomic disadvantage.

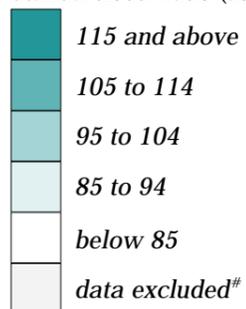
Map 6.45

Admissions of females aged 30 years and over for an hysterectomy, Adelaide, 1995/96

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



Standardised Ratio (as an index)



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

#Data have been excluded when the population of the SLA 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 of females aged 30 years and over for an hysterectomy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 10,657 hysterectomies (described on the previous text page) performed as a principal procedure on female residents of the non-metropolitan areas of Australia aged 30 years and over. Elevated standardised admission ratios (SARs) were recorded in the non-metropolitan areas of all States, with the most highly elevated ratios in South Australia (135**) and Tasmania (120**).

Table 6.53: Admissions¹ of females aged 30 years and over with a principal procedure of hysterectomy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	86**	91**	106**	102	100	115**	135**	87**	94**
Other major urban centres ²	125**	103	98	..	..	..	..	..	114**
Rest of State/Territory	113**	108**	102	135**	106	120**	92	- ³	110**
Whole of State/Territory	98*	95**	104**	110**	101	118**	113*	83**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

With only 963 admissions for hysterectomies in 1995/96, the numbers for many non-metropolitan SLAs are quite small, and few of the ratios for this procedure are of statistical significance. However, overall there were 22 per cent more admissions of non-metropolitan residents than were expected from the State rates, an SAR of 122**.

As can be seen from **Map 6.46** the majority of the northern region was mapped in the highest range, with ratios of 130 or above. Data for a number of SLAs have not been mapped for this variable, as there were considered to be too few cases from which to calculate reliable rates.

SLAs with ratios above the level expected (and with at least twenty admissions) were recorded:

- in the north, in Port Augusta (an SAR of 302**), Port Pirie (125) and Whyalla (C) (112);
- on Eyre and Yorke Peninsula, in Port Lincoln (an SAR of 166**) and Northern Yorke Peninsula (161*);
- in the Murray Lands, in Loxton (an SAR of 159*), Murray Bridge (152**) and Renmark (152*);
- on the outskirts of **Adelaide** in Mallala (an SAR of 141); and
- south of **Adelaide** in Millicent (an SAR of 133) and Victor Harbor (128).

Only two SLAs with ratios below the level expected had more than twenty admissions: they were Mount Barker, with an SAR of 84 and Mount Gambier (C) (95). The lowest ratio of 30 was recorded in Yorketown, but with only two admissions (when seven were expected).

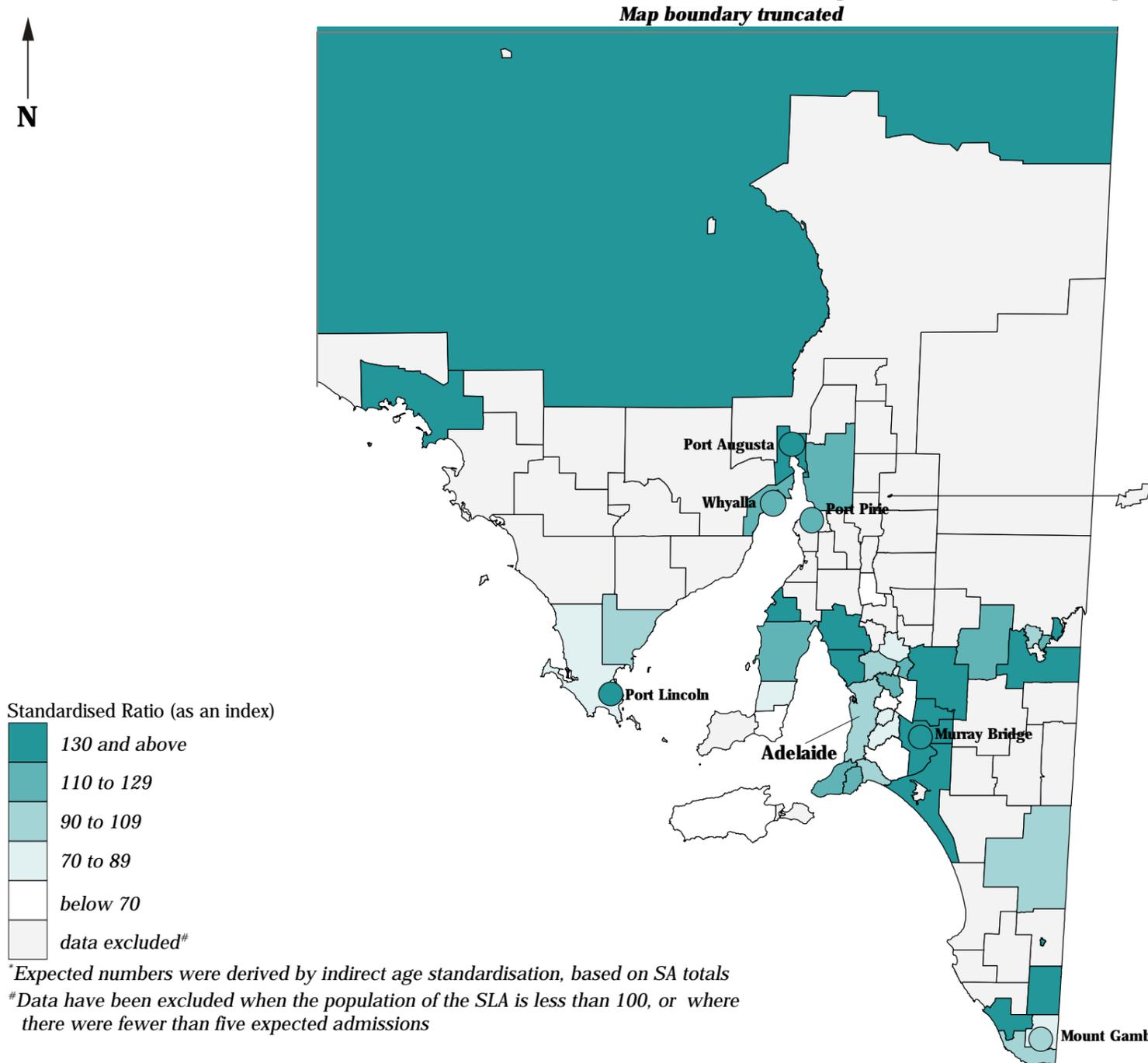
The largest numbers of admissions were recorded in the towns of Port Augusta, with 84 admissions; Murray Bridge, with 51; Whyalla, with 51; Mount Gambier, with 42; Port Lincoln, with 40; and Port Pirie, with 38.

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

Map 6.46

Admissions of females aged 30 years and over for an hysterectomy, South Australia, 1995/96

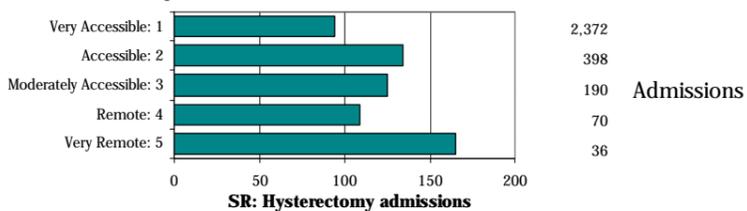
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



There were fewer admissions of females aged 30 years and over involving an hysterectomy than expected from the State rates in the Very Accessible category (an SAR of 94); the SARs then increase to 134 in the Accessible areas, before declining to 109 in the Remote category. The highest SAR (of 165) is in the Very Remote areas.

Source: Calculated on ARIA classification, DHAC
 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 6.54: 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 more than half (56.1 per cent) the admissions for a hip replacement in South Australia in 1995/96. However, the admissions rate is higher for males than females at most ages, with the exception of the 55 to 69 year age groups and again from 85 years and over. Rates for 55 to 59 year olds are 150.1 per 100,000 population for females and 132.5 for males; for 60 to 64 year olds, rates are 251.2 and 247.4 respectively; for 64 to 69 year olds, they are 365.9 and 327.1 respectively; and for those aged 85 years and over, they are 402.2 and 296.1 respectively. For females, three quarters (75.5 per cent) of the admissions for a hip replacement were for those aged 65 years and over, whereas for males they represented only two thirds (67.8 per cent) of admissions.

Data for Australia published by the AIHW (1998) showed the hip replacement rate in South Australia to be 10.4 per cent above that in the other States for which data were available (**Table 6.40**, page 261).

Adelaide⁸ (South Australia as the Standard)

In 1995/96, there were 940 admissions of residents of **Adelaide** for hip replacements, seven per cent fewer than were expected from the State rates (an SAR of 93⁸). Of the 940 admissions, 560 were females and 380 were males.

The distribution of ratios across **Adelaide** was an unusual one in the context of this atlas, with no distinct patterns in either the highest or lowest ratios mapped (**Map 647**).

Ratios elevated by 15 per cent or more were recorded for residents of Stirling (an SAR of 168⁸ and 18 admissions);

⁸As there were relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of South Australia, the data have not been mapped. A summary of the main features is on page 301.

Walkerville (an SAR of 146 and 13 admissions); Willunga (an SAR of 134 and 15 admissions); Glenelg (an SAR of 131 and 25 admissions); Gawler (an SAR of 126 and 20 admissions); Campbelltown (an SAR of 121 and 55 admissions); and the City of Adelaide (an SAR of 118 and 13 admissions).

SLAs with ratios in the lowest range mapped all had very few admissions. Ratios in this category and with more than 20 admissions were recorded in the SLAs of Hindmarsh and Woodville (an SAR of 81, and 83 admissions), Elizabeth (79, and 21 admissions), Enfield [Part A] (77, and 42 admissions), Salisbury (77, and 50 admissions) and Tea Tree Gully (77, and 46 admissions).

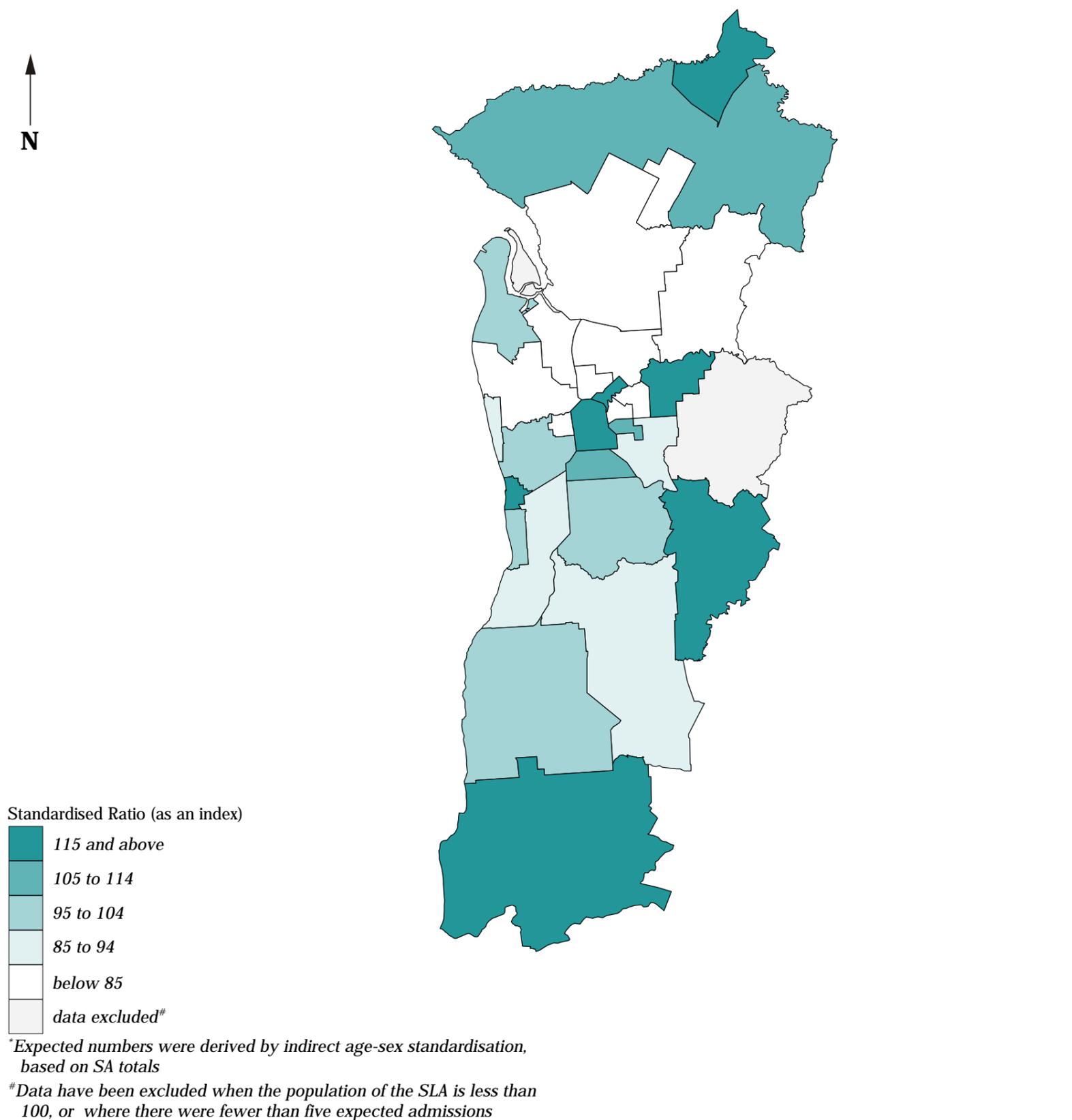
With only 940 admissions for hip replacements in **Adelaide**, there were relatively few admissions in any one SLA. Hindmarsh and Woodville had the largest number, with 83 admissions, with 81 in Marion and 69 in Mitcham.

There were inverse correlations of meaningful significance at the SLA level with the variables for people born in predominantly non-English speaking countries and resident for five years or more (-0.55) and those reporting poor proficiency in English (-0.54), indicating that these groups are less likely to have an admission for a hip replacement. There were also weak correlations with indicators of high socioeconomic status and weak inverse correlations with the indicators of socioeconomic disadvantage. These results, together with the weak correlation with the IRSD (0.41), suggest the existence of an association at the SLA level between high rates of admissions for hip replacements and high socioeconomic status.

Map 6.47

Admissions for a hip replacement, Adelaide, 1995/96

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



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 6.55: 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 South Australia to be 25.8 per cent below that in the other States for which data were available (**Table 6.40**, page 261).

Adelaide (South Australia as the Standard)

In 1995/96, there were 5,950 admissions of residents of **Adelaide** involving a lens insertion, with an SAR of 100. Females comprised 63.0 per cent of these admissions (3,751 admissions) and males 37.0 per cent (2,199 admissions).

As **Map 6.48** shows, the majority of SLAs were mapped in the middle ranges, with only two SLAs in the highest class interval and six in the lowest. Generally, above average ratios for this procedure were concentrated in the eastern and western suburbs, while lower ratios predominated in SLAs situated in and around the city, extending to the western and outer northern regions.

The two SLAs mapped in the highest range were Walkerville and Glenelg, with SARs of 132^{*} and 115 respectively. The only other statistically significant ratios of above 100 was recorded for residents of Burnside (with an SAR of 112^{*}), West Torrens (111^{*}) and Mitcham (110^{*}).

Several SLAs recorded SARs in the middle range mapped, ranging from 103 in East Torrens, Brighton and Unley to 95 in both Willunga and Enfield [Part B].

The lowest ratios recorded for this variable were in the SLAs of Thebarton, with an SAR of 66^{*} and Gawler (75^{*}). The next lowest SARs were recorded in the City of Adelaide (with an SAR of 78); the northern SLAs of Elizabeth and Munno Para (both 84); and in the western area of Henley and Grange (80^{*}).

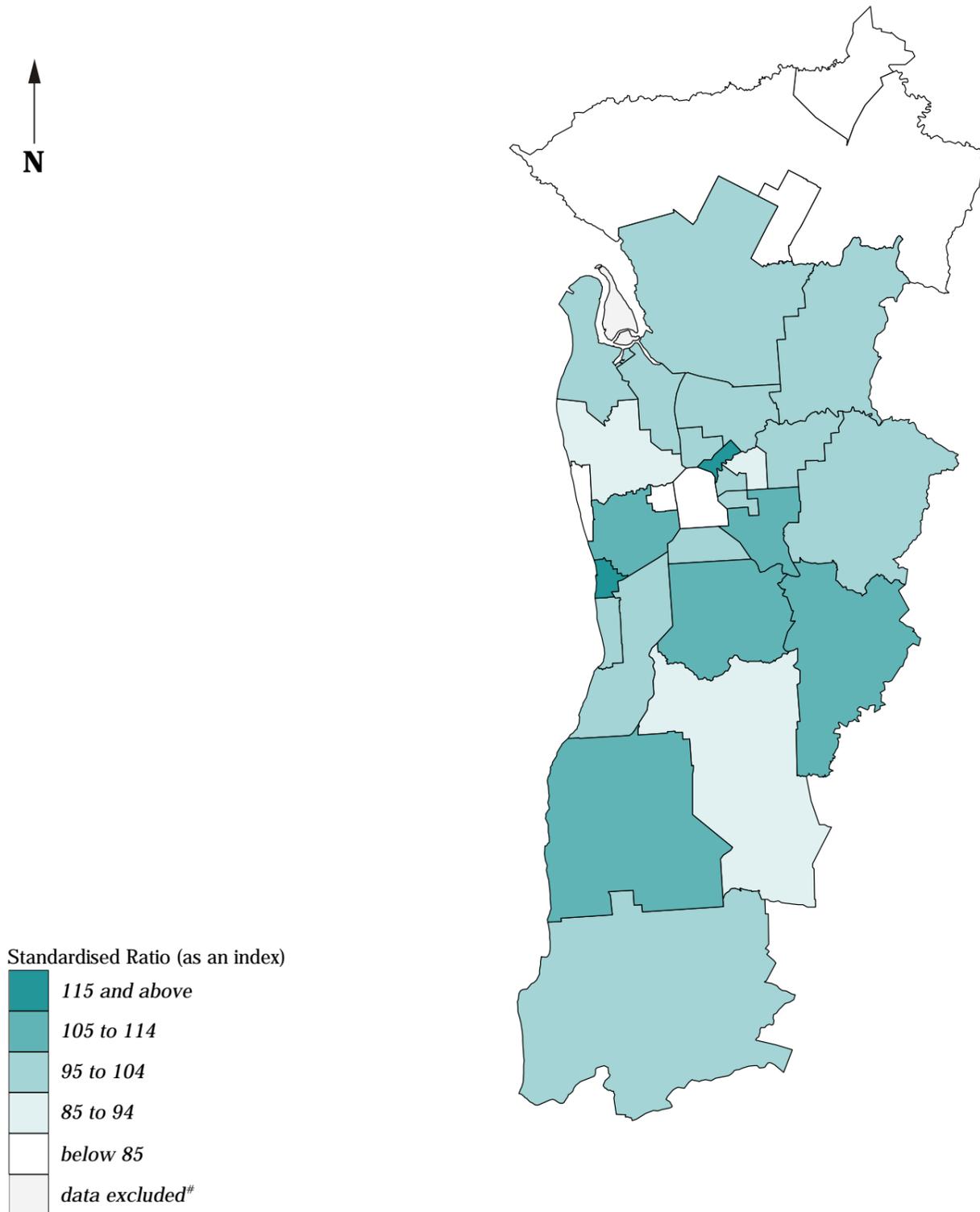
The largest numbers of admissions involving a lens insertion in **Adelaide** were recorded for residents of Hindmarsh and Woodville, with 566 admissions; Marion, 505; Mitcham, 469; West Torrens, 404; and Burnside, 362.

There were weak correlations with indicators of high socioeconomic status and weak inverse correlations with the indicators of socioeconomic disadvantage; the strongest of these were the inverse correlations with the variables for low income families and unemployed people (both -0.42). These results, together with the weak correlation with the IRSD (0.41), suggest the existence of an association at the SLA level between high rates of admissions for lens insertion and high socioeconomic status.

Map 6.48

Admissions for a lens insertion, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA 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 for a lens insertion, 1995/96

State/Territory comparison (Australia as the Standard)

There were 28,332 admissions for which a lens insertion (described on the previous text page) was undertaken on residents of the non-metropolitan areas of Australia. Females accounted for 58.1 per cent of these admissions, reflecting their longer life expectancy. Standardised admission ratios (SARs) varied across the non-metropolitan areas of Australia, with the highest ratios in Queensland and New South Wales (SARs of 119** and 112** respectively) and low ratios in Victoria and Tasmania (SARs of 78** and 82** respectively).

Table 6.56: Admissions¹ for a lens insertion, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	102**	97**	105**	93**	84**	99	130**	36**	97**
Other major urban centres ²	103	73**	163**	..	..	..	..	..	120**
Rest of State/Territory	112**	78**	119**	93**	89**	82**	104	- ³	101*
Whole of State/Territory	105**	91**	119**	93**	85**	89**	117**	35**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources, Appendix 1.3*

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

Rest of State (South Australia as the Standard)

Residents of the non-metropolitan areas of South Australia had 1,997 admissions involving a lens insertion, of which 1,116 (55.9 per cent) were females and 881 (44.1 per cent) were males. This was marginally higher than the level expected from the State rates, a standardised admission ratio of 101.

As can be seen from **Map 6.49**, data for a number of SLAs have not been mapped for this variable, as there were considered to be too few cases from which to calculate reliable rates.

SLAs with above average ratios (and with at least 20 admissions) were recorded:

- in the north, in Crystal Brook-Redhill (with an SAR of 232**), Port Pirie (202**), Port Augusta (193**), Whyalla (160**) and Mount Remarkable (129);
- in the south-east, in Naracoorte (M) (an SAR of 153**) and Millicent (102);
- on the outskirts on **Adelaide**, in Clare (an SAR of 135), Kapunda (115) and Mallala (111);
- on and nearby the Fleurieu Peninsula in Yankalilla (an SAR of 129), Port Elliot and Goolwa (119) and Victor Harbor (114);
- on the Eyre Peninsula, in Tumby Bay (an SAR of 123); and
- in the Riverland, in Renmark (an SAR of 120), Barmera (119), Berri (106) and Waikerie (102).

Excluding SLAs with fewer than 20 admissions, the lowest SARs occurred in Northern Yorke Peninsula and Mount Barker, with ratios of 48** and 63** respectively. Also in this class interval were the SLAs of Central Yorke Peninsula, with an SAR of 64*; and Tanunda, with an SAR of 65.

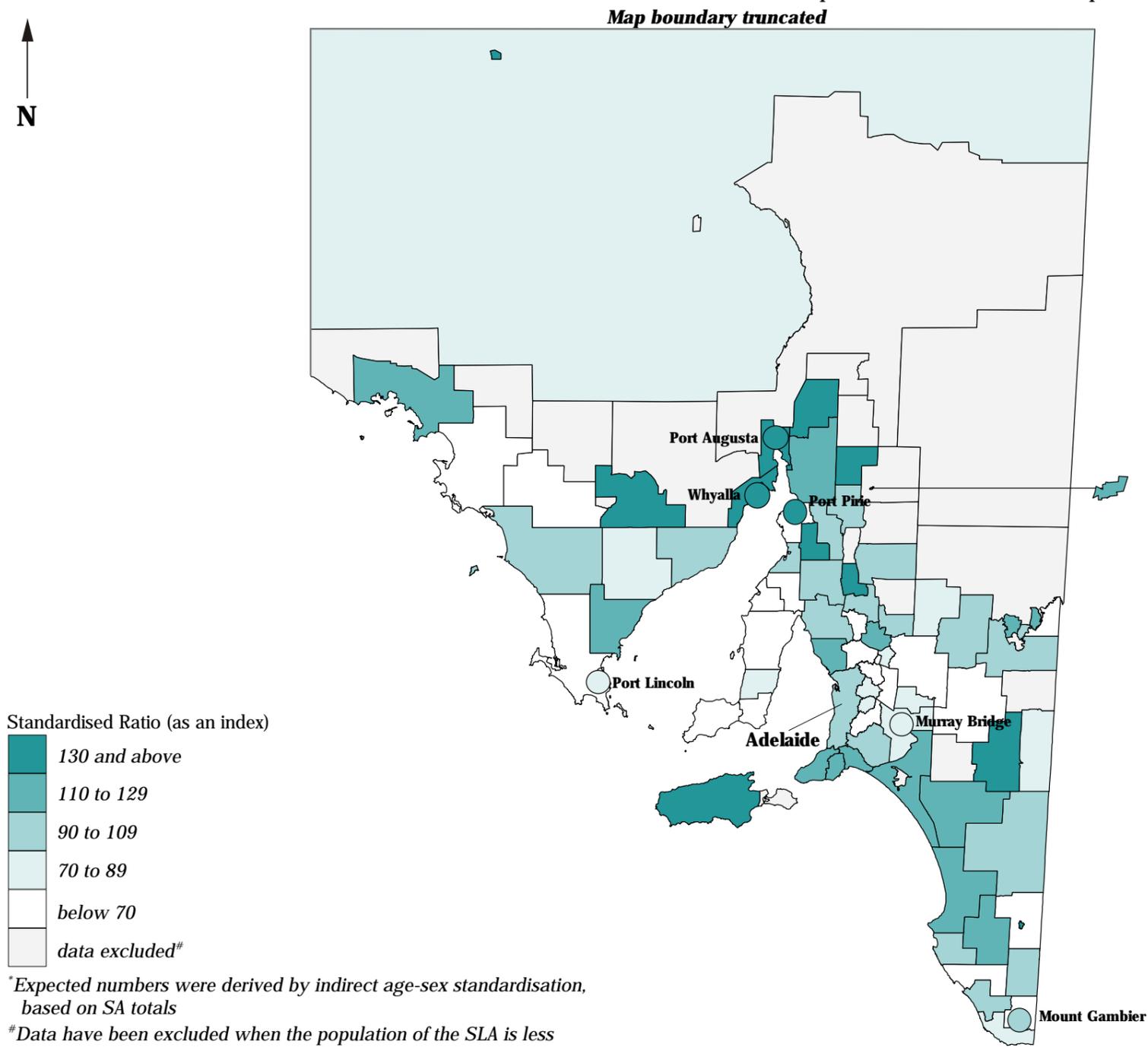
In 1995/96, the largest number of admissions for lens insertion was recorded for residents of Port Pirie, with 164 admissions. More than 100 admissions were also recorded in Whyalla (145 admissions), Victor Harbor (111 admissions), Mount Gambier (C) (106 admissions) and Port Augusta (103 admissions).

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

Map 6.49

Admissions for a lens insertion, South Australia, 1995/96

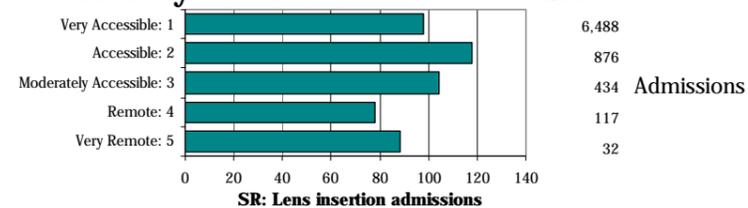
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



Only the Accessible and Moderately Accessible areas had elevated standardised admission ratios for admissions involving a lens insertion. Ratios increased from 98 in the Accessible category to 118 in the Moderately Accessible category, before dropping to a low of 78 in the Remote areas. There was a ratio of 88 in Very Remote category.

Source: Calculated on ARIA classification, DHAC
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 6.57: 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 South Australia to be 17.9 per cent below that in the other States for which data were available (**Table 6.40**, page 261).

Adelaide (South Australia as the Standard)

There were 19,682 admissions of residents of **Adelaide** for endoscopies in 1995/96, seven per cent more admissions than were expected from the State rates (an SAR of 107**). Of the 19,682 admissions, 10,625 were females (54.0 per cent) and 9,057 were males (46.0 per cent). The vast majority (16,154 admissions, or 82.1 per cent) of all endoscopies were performed on a same day basis.

The highest standardised admissions ratios were generally mapped in eastern and southern SLAs, while those in the lowest ranges were located to the north and west of the city (**Map 6.50**). This pattern of distribution differs in some notable ways from the pattern of socioeconomic disadvantage.

Just under half of the SLAs (43.3 per cent) were mapped in the highest range, with ratios elevated by 15 per cent or more. The highest of these was recorded for residents of Glenelg (an SAR of

137**). Also located in the south were the SLAs of Brighton, with an SAR of 135**; Marion (135**) and Happy Valley (123**). The remaining SLAs mapped in the highest range were the City of Adelaide (an SAR of 136**), Walkerville (134**), Mitcham (125**), East Torrens (124**), Payneham, Unley and West Torrens (each with 122**), Campbelltown (117**) and St Peters (116).

Ratios at or just below the level expected from the State rates were recorded in Stirling, and Elizabeth, both with an SAR of 100, and the SLA of Hindmarsh and Woodville, with an SAR of 95*.

There were only four SLAs mapped in the lowest range. These were Gawler, with 54 per cent fewer admissions than expected (an SAR of 46**), Tea Tree Gully (73**), Thebarton (75**), and Munno Para (78**). The only other highly significant ratio lower than expected was recorded for residents of Salisbury (an SAR of 89**).

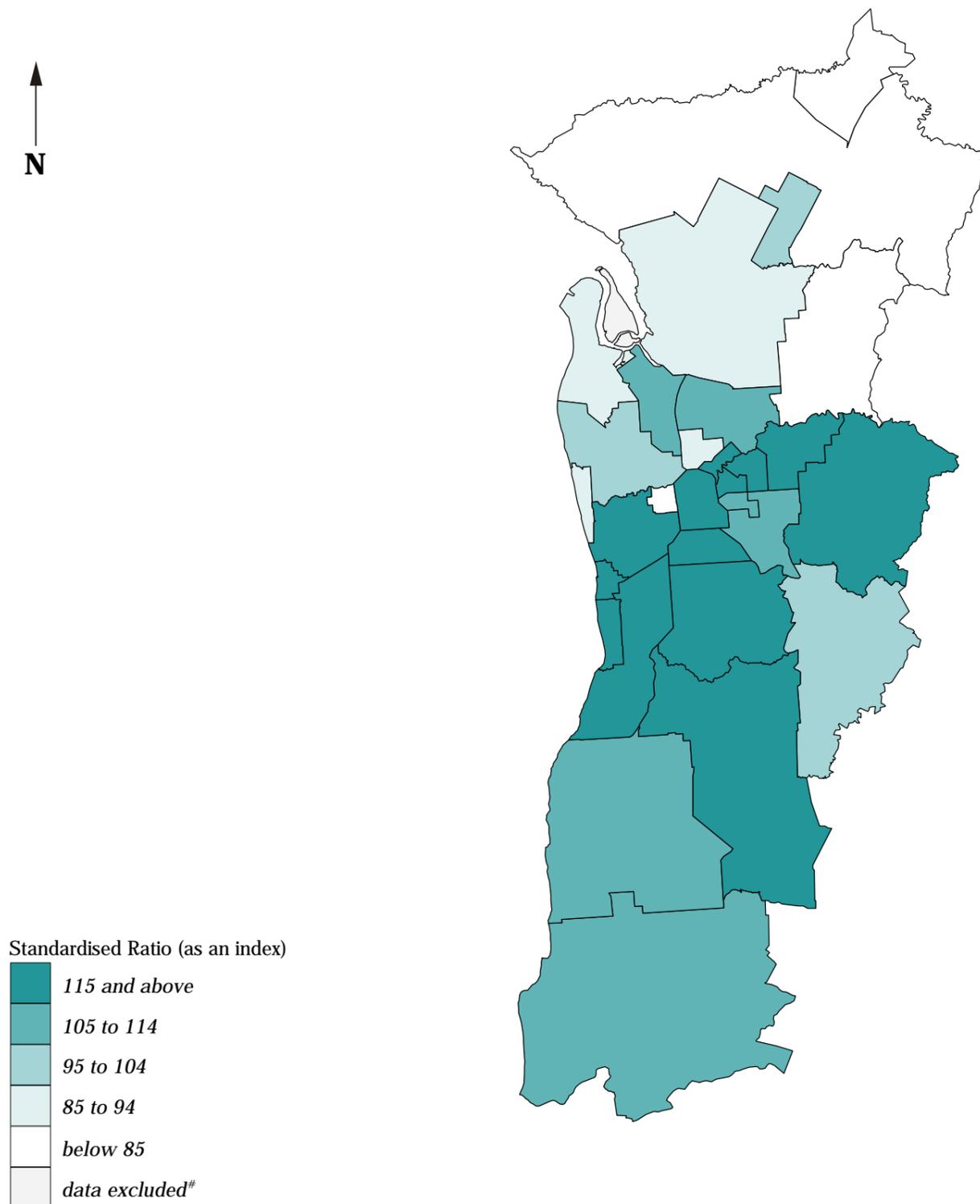
In 1995/96, more than 1,000 admissions for endoscopies were recorded in Marion, with 1,961 admissions; Hindmarsh and Woodville, 1,608; Noarlunga, 1,498; Mitcham, 1,485; Salisbury, 1,371; West Torrens, 1,100; and Tea Tree Gully, 1,034.

There was an inverse correlation of meaningful significance with the variable for early school leavers (-0.51), and weaker inverse correlations with the other indicators of socioeconomic disadvantage. Weak positive correlations were recorded with the variables for managers and administrators, and professionals and high income families (both 0.41). These results, together with the correlation with the IRSD (0.35), suggest the existence of an association at the SLA level between high rates of admissions for endoscopies and high socioeconomic status.

Map 6.50

Admissions for an endoscopy, Adelaide, 1995/96

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



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

#Data have been excluded when the population of the SLA 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 for an endoscopy, 1995/96

State/Territory comparison (Australia as the Standard)

There were 106,877 endoscopies (described on the previous text page) performed as a principal procedure on residents of the non-metropolitan areas. Just over half (52.5 per cent) of these admissions were females, compared with 61.5 per cent in the capital cities.

With the exception of Tasmania and the Northern Territory, the standardised admission ratios (SARs) at the *Whole of State/Territory* and *Rest of State/Territory* levels largely followed the direction of the ratios for the capital cities, although they are somewhat closer to the Australian rates. In both Tasmania (an SAR of 77**) and the Northern Territory (66**), ratios were substantially below the level expected from the Australian rates. The only elevated SARs were in Victoria (104**) and Queensland (101*).

Table 6.58: Admissions¹ with a principal procedure of endoscopy, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	110**	111**	115**	81**	82**	111**	92**	58**	104**
Other major urban centres ²	97**	70**	104**	..	..	..	..	..	97**
Rest of State/Territory	92**	104**	101*	62**	80**	77**	66**	- ³	93**
Whole of State/Territory	104**	108**	108**	76**	82**	108**	78**	58**	100

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

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were 5,350 admissions of residents of the non-metropolitan areas of South Australia for endoscopies in 1995/96, 19 per cent fewer than expected from the State rates (an SAR of 81**). Males accounted for 51.3 per cent of these admissions. A large proportion of all endoscopies (78.3 per cent and 4,187 admissions) were performed on a same day basis.

As can be seen from **Map 6.51** the majority of SLAs (44.6 per cent) were mapped in the lowest range: these SLAs were more frequently located in the south-eastern parts of the State and along the west coast. Ratios in the highest range mapped were widespread throughout the State in no distinct pattern.

SLAs with elevated ratios (and with more than 20 admissions) were recorded:

- in the south-east, in Naracoorte (M) (an SAR of 172**) and Robe (134);
- in the north, in Jamestown (an SAR of 165**), Crystal Brook-Redhill (156**), Blyth-Snowtown (154**), Port Pirie (128**) and Mount Remarkable (111);
- on the Yorke Peninsula, in Port Broughton (an SAR of 153**), Minlaton (111), Central Yorke Peninsula (108) and Wallaroo (106);
- in the Murray Lands, in Renmark (an SAR of 149**), Lameroo (143*), Paringa (116) and Morgan (105); and
- to the south of **Adelaide** in Port Elliot and Goolwa (an SAR of 122**) and Victor Harbor (115*).

SLAs with SARs falling within 10 per cent above or below the expected number of admissions were widespread throughout the State, although in no notable pattern. Of the 14 areas in this class interval, no SLA recorded a statistically significant ratio.

The lowest ratios (in SLAs with at least twenty admissions) were recorded in Light (23**), Barossa (28**), Lower Eyre Peninsula (30**) and Tanunda (38**). There were 87 per cent fewer admissions than expected in Roxby Downs (an SAR of 13** and three admissions).

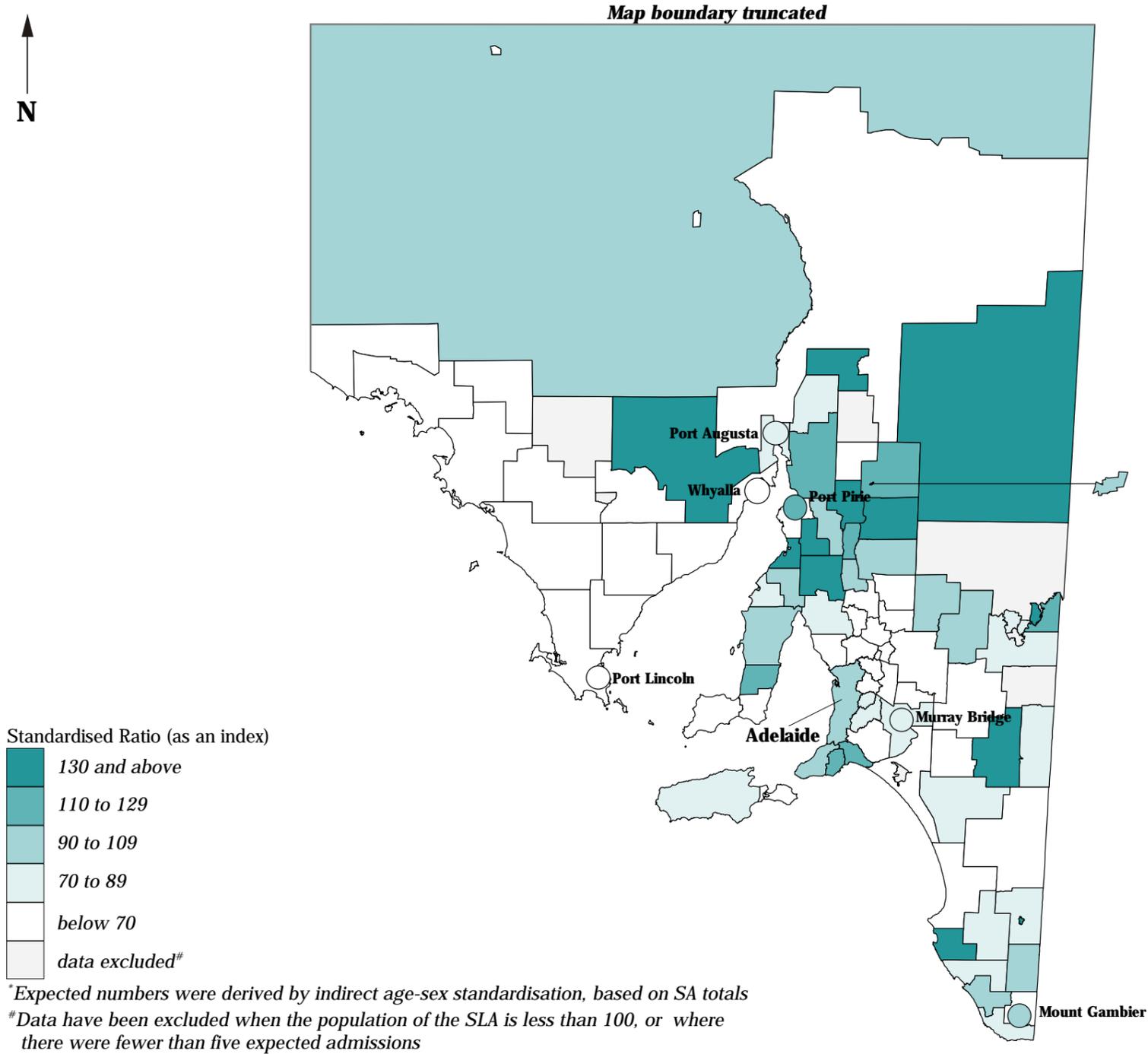
The largest numbers of admissions for endoscopies in the non-metropolitan areas of South Australia were recorded in Mount Gambier (336), Port Pirie (326), Victor Harbor (252), Whyalla (243) and Mount Barker (232).

The correlation analysis revealed a weak positive association with a majority of the indicators of socioeconomic disadvantage, the strongest being with the variables for dwellings with no motor vehicle (0.24) and low income families (0.22). These results, together with the weak inverse correlation with the IRSD (-0.28), suggest the existence of an association at the SLA level between high rates of admissions for endoscopies and socioeconomic disadvantage. This is in contrast to the association found at the SLA level in **Adelaide** with high socioeconomic status.

Map 6.51

Admissions for an endoscopy, South Australia, 1995/96

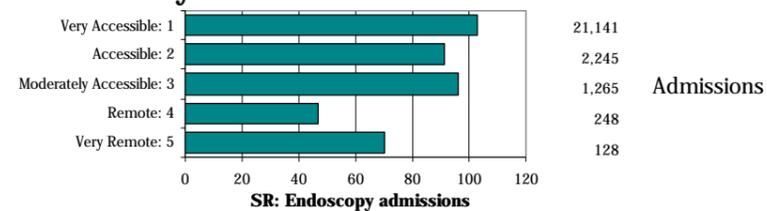
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected*



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



The highest standardised admission ratios (SARs) for admissions involving an endoscopy, and the only elevated ratio, was in the Very Accessible areas (an SAR of 103). The next highest ratios were in the Accessible (91) and Moderately Accessible (96) areas, with the lowest ratios in the Remote (47) and Very Remote (70) categories.

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

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The information on these three pages provides summary details for variables where it was considered that there were too few cases to map the data at the SLA level. Where SLA data is available it is in the tables in Volume 5.1.

Admissions for lung cancer, 1995/96

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for lung cancer (described on page 224) of residents of the non-metropolitan areas were relatively uniform across the States and Territories, with the exception of higher ratios in South Australia, Queensland, Tasmania and the Northern Territory (Table 6.59).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in Table 6.59.

Table 6.59: Admissions with a principal diagnosis of lung cancer, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96¹									
Capital city	88**	99	121**	121**	89**	95	100	54**	98
Other major urban centres ²	72**	116	92	..	..	..	..	..	83**
Rest of State/Territory	99	105	117**	135**	91	114*	116	– ³	108**
Whole of State/Territory	89**	102	114**	125**	90**	106	108	42**	100
1989⁴									
Rest of State/Territory	94**	..	121**	126**	87*	..	119	..	106**

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

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

³Data unreliable: included with ACT total

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

Source: See Data sources, Appendix 1.3

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

Rest of State (South Australia as the Standard)

There were only 512 admissions for lung cancer of residents of the non-metropolitan areas of South Australia, nine per cent more than were expected from the State rates (an SAR of 109). Males represented 71.3 per cent of admissions for lung cancer (365 admissions).

SLAs with ratios elevated by 30 per cent or more were located:

- in the Murray Lands – in Berri (an SAR of 229**, 17 admissions), Loxton (179*, 16 admissions), Mannum (173, nine admissions) and Barmera (150, nine admissions);
- on the Yorke Peninsula – in Central Yorke Peninsula (an SAR of 223**, 20 admissions) and Northern Yorke Peninsula (145, 20 admissions);
- to the north of **Adelaide** – in Whyalla (C) (an SAR of 176**, 42 admissions), Clare (136, seven admissions) and Port Pirie (135, 25 admissions);
- in the lower south-east – in Millicent (an SAR of 165, 14 admissions) and the town of Mount Gambier (145*, 34 admissions);

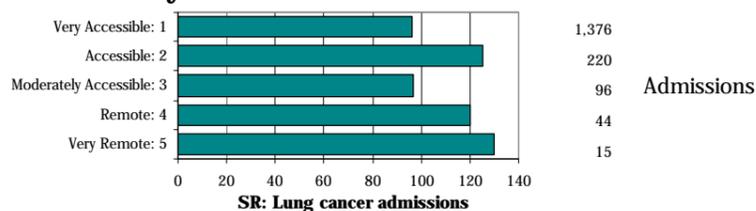
- on the outskirts of **Adelaide** – in Light (an SAR of 163, nine admissions) and Gumeracha (162, 10 admissions); and
- and on Eyre Peninsula – in Port Lincoln (an SAR of 140, 20 admissions).

With such small numbers overall, the only SLAs with low standardised admission ratios of statistical significance were Waikerie, with an SAR of 17* (1 admission), Renmark, 31* (3 admission) and Mount Barker, 46* (9 admission). Other SLAs with ratios of 30 per cent or more lower than expected from the State rates (but not of statistical significance) were Yorketown, Port Augusta, Mount Gambier (DC), Naracoorte (M), Tatiara and Murray Bridge.

Only Whyalla (42 admissions), Mount Gambier (34) and Port Pirie (25) had more than 20 admissions for lung cancer.

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

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for lung cancer are below the level expected from the State rates in the Very Accessible and Moderately Accessible ARIA categories (with SARs of 96 and 97, respectively), with elevated ratios in the Very Remote, Accessible and Remote (130, 125 and 120, respectively).

Source: Calculated on ARIA classification, DHAC

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

State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for breast cancer of female residents of the non-metropolitan areas, who were aged 40 years and over, were most notably higher than expected in South Australia (122**) and lower than expected in a number of jurisdictions, including Western Australia (72**) and the Northern Territory (81). SARs in the other States were near average. In general, the differentials in the ratios between the two periods shown suggest lower rates of admission in the later period.

Table 6.60: Admissions of females aged 40 years and over¹ with a principal diagnosis of breast cancer, State/Territory
Age-sex standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995/96²									
Capital city	97	125**	93*	94	81**	71**	129	90	102*
Other major urban centres ³	89**	118	95	..	..	..	..	..	93*
Rest of State/Territory	101	101	94	122**	72**	87	81	- ⁴	97
Whole of State/Territory	97*	118**	94**	101	79**	81**	106	89	100
1989⁵									
Rest of State/Territory	115**	..	114**	100	80**	..	65	..	109**

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

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

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

⁴Data unreliable: included with ACT total

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

Source: See *Data sources*, Appendix 1.3

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

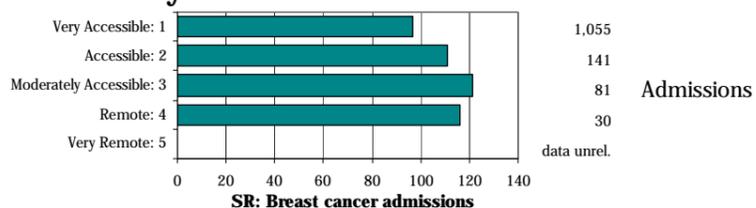
Rest of State (South Australia as the Standard)

There were 403 admissions for breast cancer of females aged 40 years and over and resident in the non-metropolitan areas of South Australia, 21 per cent more admissions than were expected from the State rates (an SAR of 121**). At the SLA level, there were more than twice the number of admissions expected in Renmark and Central Yorke Peninsula, with ratios of 216** (14 admissions) and 245** (14 admissions) respectively. Ratios elevated by 30 per cent or more were recorded for female residents of Victor Harbor (23 admissions), Port Elliot and Goolwa (16), the town of Mount Gambier (28), Port Pirie (21), Gumeracha (7) and Port Lincoln (14).

Angaston, with an SAR of 30, Port Augusta (47), and Strathalbyn (48), all recorded ratios in the lowest range mapped (of at least 30 per cent below the level expected from the State rates).

The town of Mount Gambier recorded the largest number of hospital admissions of females aged 40 years and over for breast cancer in the non-metropolitan areas of South Australia (28 admissions). A high number of admissions were also recorded in Victor Harbor and Whyalla (both 23) and Port Pirie (21).

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for cancer of the female breast increased from an SAR of 97 in the Very Accessible areas to 121 in the Moderately Accessible areas, before dropping to 116 in the Remote areas. As there were fewer than five expected admissions in the Very Remote areas, the SAR was not calculated.

Source: Calculated on ARIA classification, DHAC

Admissions for hip replacement, 1995/96

State/Territory Comparison (Australia as the Standard)

There were 4,955 hip replacements (described on page 288) performed as a principal procedure on residents of the non-metropolitan areas of Australia. Females accounted for 48.6 per cent of these admissions, lower than the 57.4 per cent in the capital cities. The higher proportion for males may in part reflect the occupations held by men in rural Australia and the need for such a procedure. Standardised admission ratios (SARs) varied across the non-metropolitan areas of Australia, with elevated ratios in all but Queensland and the Northern Territory. The highest ratio was in Victoria (an SAR of 129**) and the lowest ratio (82**) was in Queensland.

Table 6.61: Admissions¹ with a principal procedure of hip replacement, State/Territory, 1995/96
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	91**	103	75**	99	90**	135**	51**	112	94**
Other major urban centres ²	96	118	86**	..	..	..	..	..	95
Rest of State/Territory	122**	129**	82**	125**	107	120**	91	- ³	113**
Whole of State/Territory	100	111**	80**	106*	94*	127**	71*	103	100

¹Includes admissions to public acute hospitals, private (acute and psychiatric) hospitals

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

³Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

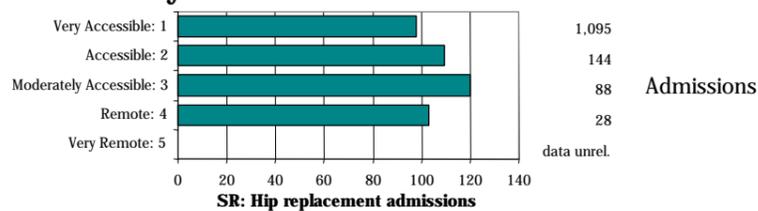
There were 419 admissions of residents of the non-metropolitan areas of South Australia for hip replacements in 1995/96, 19 per cent more than expected from the State rates (an SAR of 119**).

There were at least twice the number of admissions that were expected from the State rates in Strathalbyn and Naracoorte (M), with ratios of 237** (15 admissions) and 200* (10). Ratios

elevated by 30 per cent or more were recorded for residents of Tatiara (11 admissions), Onkaparinga (13 admissions), Victor Harbor (30), Angaston (13), Central Yorke Peninsula (12), Millicent (11) and Mount Barker (20).

Port Augusta, with an SAR of 69; Berri (73); and Renmark (85); all had fewer of these procedures than expected from the State rates.

Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions for a hip replacement increased from an SAR of 98 in the Very Accessible areas (the lowest ratio) to a high of 120 in the Moderately Accessible ARIA category, before dropping to a ratio of 103 in the Remote category. As there were fewer than five expected admissions in the Very Remote areas, the SAR was not calculated

Source: Calculated on ARIA classification, DHAC

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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 8.2 million unreferral attendances (called services in this atlas)⁹ by GPs in South Australia, an average of 5.6 services for each person enrolled with Medicare. Total Medicare payments to GPs for these services were \$190 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 6.62** includes details of the operations of this service, some of which are GP type services).

⁹At each consultation, a GP may provide one or more service. One of these services will be the consultation itself: additional services, such as a minor surgical procedure or immunisation, may also be provided, and are recorded separately in Medicare statistics. It is estimated that there are, on average, 1.1 services per consultation.

National data are not available for the number of attendances at accident and emergency departments of public hospitals that are for primary health care services: that is, services that could have been provided by a GP. A study in South Australia in 1993/94 found that up to one third of such attendances were of this kind. This represents the equivalent of approximately 1.3 per cent of GP attendances recorded in the Medicare statistics collection for that year. These attendances are again likely to be predominantly of people of lower socioeconomic status.

Similarly, the exclusion of data for attendances at community health centres is also unlikely to change the spatial patterns of distribution evident in the maps. Not only do these centres account for a relatively small number of attendances, their clients are also predominantly of lower socioeconomic status.

The impact on the data of services provided by Aboriginal Medical Services is of particular relevance in rural and remote areas. Details of the number of services provided through Aboriginal Medical Services by GPs, Aboriginal workers, etc. are not currently available. The Office of Aboriginal and Torres Strait Islanders Health is currently undertaking a collection of this information which may, in time, fill an important gap in the available data.

Missing data

In the dataset provided for the atlas, there were 103,695 records (0.1 per cent of all records for Australia) for which the postcode was not able to be allocated to an SLA using the postcode to SLA converter from the ABS (see Chapter 2 for details of this conversion process). The postcode associated with these records was either not valid (four fifths) or was not on the postcode to SLA conversion list (one fifth). This latter group includes postcodes for businesses and post office boxes, as well as valid residential postcodes that do not appear in the ABS conversion table (eg. where there are two postcodes in a Collection District (CD), the whole CD is allocated to just one postcode and this is shown in the conversion table; the other postcode does not appear).

Other gaps and deficiencies

The data presented here are only of services provided by general practitioners and not by specialist medical practitioners. The spatial patterns of distribution of services of specialist medical practitioners would be of value in informing strategic policy and planning activities. They cannot, however, be mapped as details of the large number of such services provided through public hospitals outpatient departments (and the lesser number through public hospital accident and emergency departments) are not available by SLA. Details of such services provided outside of public hospitals by specialist medical practitioners (and billed through Medicare) are available, but to map just this set of the whole would provide a biased view of the distribution at the small area level.

Table 6.62: Location of Royal Flying Doctor Service bases and number of services, 1997

Operational organisation	Remote consultations		Patients attended				Patient transport		Clinics	Patient contacts	Doctors	Nurses
	Radio	Telephone	Field clinics	Other clinics	Inpatient services	Immuni-sations	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

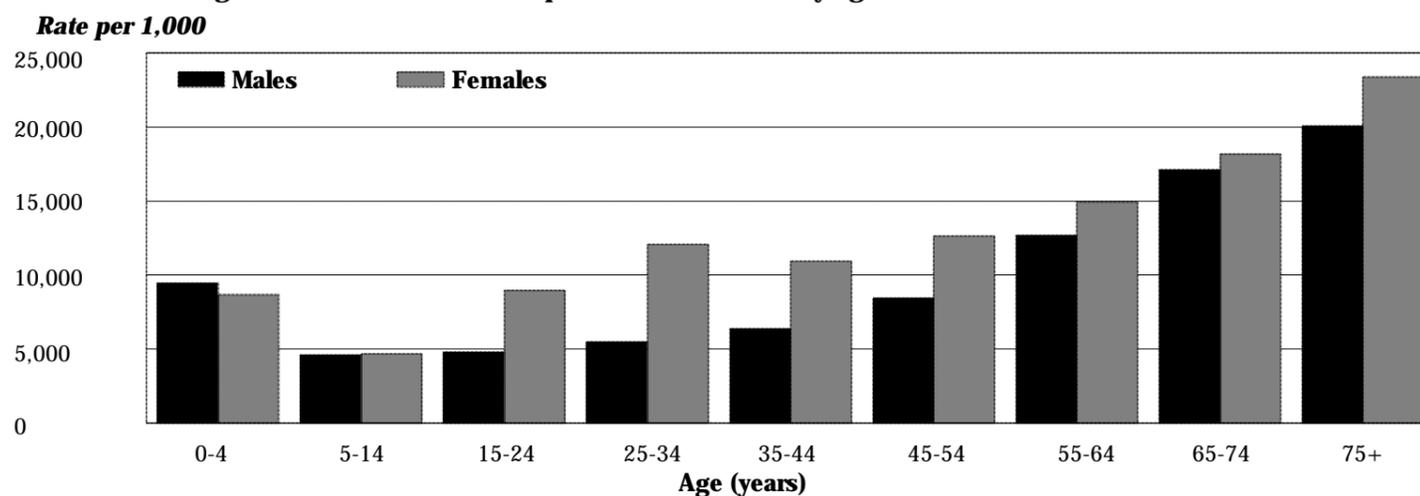
Source: Annual Report 1996 Royal Flying Doctor Service of Australia

GP services by age and sex of patient

Females used GP services more than males, accounting for 58.8 per cent of services in South Australia in 1996. Females accounted for more services per patient at each age group from the 15 to 24 year age group right through to 75 years and over,

with males accounting for more services only in the 0 to 4 year age group (Figure 6.11). Females and males had similar rates in the 5 to 14 year age group.

Figure 6.11: General medical practitioner services, by age and sex, South Australia, 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 6.63: General medical practitioner services to males, capital cities
Standardised ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1996	125**	113**	106**	107**	101**	90**	80**	87**	113**
1989	124**	99**	111**	106**	91**	101**	84**	86**	108**

¹Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Adelaide (South Australia as the Standard)

Male residents of **Adelaide** received 2,658,975 services from GPs in 1996. This is eight per cent more than expected from the State rates (a standardised ratio of 108**). The age distribution of males receiving these services is shown in **Figure 6.11** on page 304.

As can be seen from **Map 6.52**, SLAs with the highest ratios were distributed throughout the northern and western regions, while those with the lowest were located in the inner, eastern and southern areas.

The most highly elevated ratio for this variable was recorded for males in Enfield [Part A], with 41 per cent more GP services than were expected from the State rates (an SR of 141**). Highly elevated ratios were also recorded in the northern SLAs of Elizabeth (140**), Munno Para (132**) and Salisbury (120**); and in the western SLAs of Thebarton (134**), Port Adelaide (134**) and Hindmarsh and Woodville (116**).

Half of **Adelaide's** SLAs were mapped in the middle range. Those with above average ratios included Campbelltown (109**), Payneham and Prospect (both 105**), West Torrens (103**), Tea Tree Gully (102**) and Marion (101**), while below average ratios were recorded in Willunga (99*), East Torrens (98**), Brighton (96**), Henley and Grange (95**), Mitcham and Unley (both 92**) and Glenelg (90**).

The lowest ratio, of 74**, was recorded for residents of the City of Adelaide, indicating that there were 26 per cent fewer services from GPs than the level expected from the State rates. Relatively low ratios were also recorded in the inner city areas of Walkerville (an SR of 87**) and St Peters (89**); in the eastern SLAs of Burnside (87**) and Stirling (89**); and to the south in Happy Valley (88**).

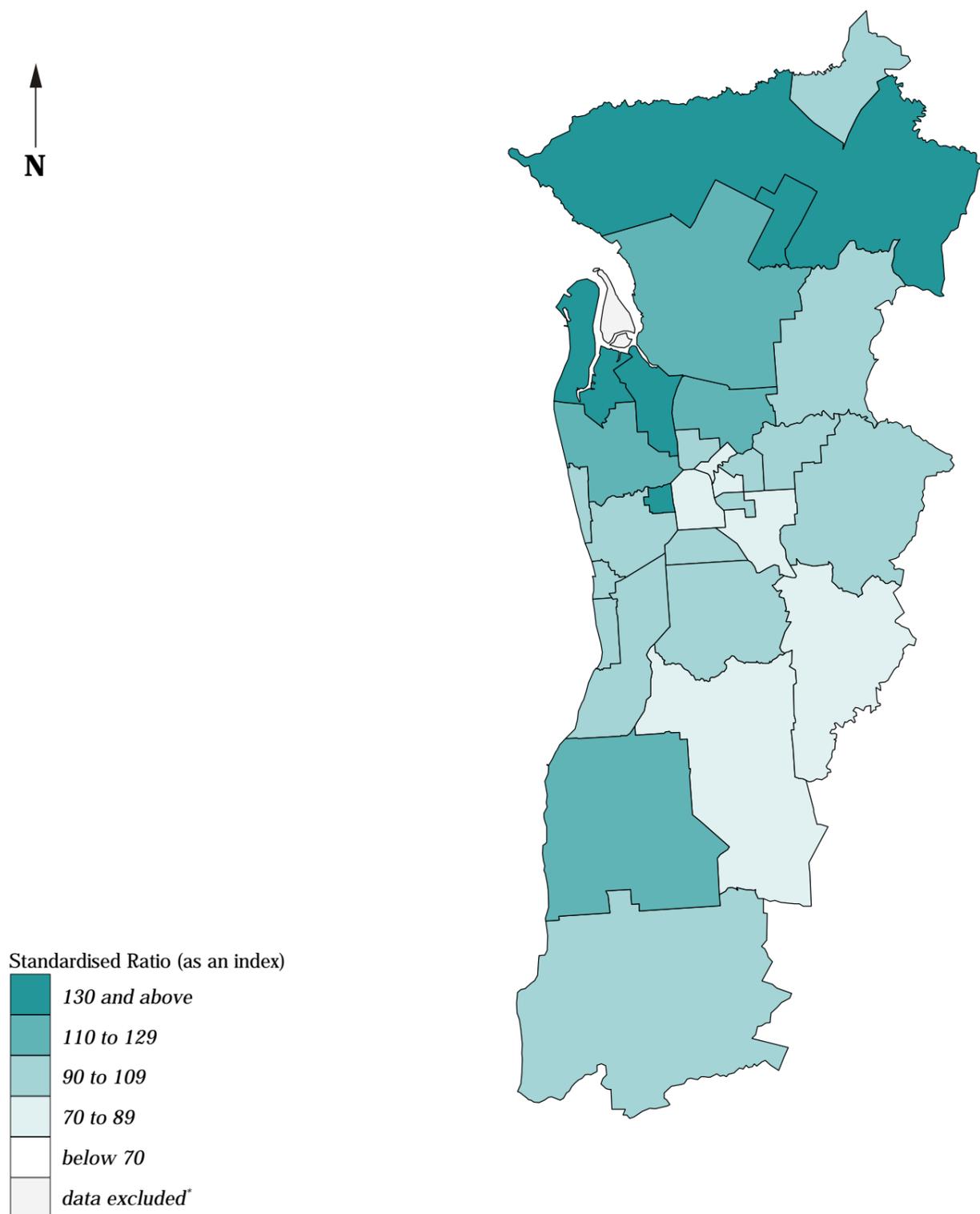
More than 200,000 services from GPs were recorded for male residents of Salisbury (300,769 services), Hindmarsh and Woodville (244,948 services), Noarlunga (234,065 services) and Tea Tree Gully (212,370 services).

Correlations of substantial significance at the SLA level were recorded with the variables for unskilled and semi-skilled workers (0.87), low income families (0.84), unemployed people (0.83), early school leavers (0.82), the Indigenous population (0.82), single parent families (78) and dwellings rented from the State housing authority (0.74), while inverse correlations were recorded with high income families (-0.84), managers and administrators, and professionals (-0.78) and female labour force participation (-0.74). The inverse correlation with the IRSD (-0.88) also indicates a positive association between high rates of GP services to males and socioeconomic disadvantage.

Map 6.52

General medical practitioner services to males, Adelaide, 1996

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

General medical practitioner services to males, 1996

State/Territory comparison (Australia as the Standard)

Standardised ratios (SRs) for GP services to males were lower in the non-metropolitan areas than in the capital cities, some substantially so. SRs ranged from a high of 83** in Tasmania (the State with the smallest differential between the capital city and *Rest of State* rate) to a very low 31** in the rural and remote areas of the Northern Territory. Readers should be aware of the notes on page 303, under *Data limitations*, as to the gaps in the data which are particularly likely to be contributing to the low rates in the Northern Territory and, to a lesser extent, Western Australia. The information in Chapter 7 as to the numbers and distribution of GPs in these areas is also of relevance.

With the exception of Victoria, SRs declined (relative to the Australian rate) in the non-metropolitan areas of all the States and the Northern Territory. The largest declines were in the Northern Territory, New South Wales and Tasmania,

Table 6.64: General medical practitioner services to males, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1996									
Capital city	125**	113**	106**	107**	101**	90**	80**	87**	113**
Other major urban centres ²	99**	90**	97**	..	..	..	..	..	97**
Rest of State/Territory	74**	76**	79**	79**	61**	83**	31**	- ²	74**
Whole of State/Territory	108**	103**	93**	99**	90**	86**	53**	88**	100
1989									
Rest of State/Territory	87**	76**	85**	80**	63**	95**	44**	- ²	81**

¹Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

²Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

Male residents living in the non-metropolitan areas of South Australia had significantly fewer services from GPs in 1996 than expected from the State rates, an SR of 80**; these low rates of use are in line with the lower levels of access to GPs in non-metropolitan areas (see Chapter 7 for details of the distribution of GPs). Overall, there were 758,488 GP services to males.

With the exception of Port Broughton (with an SR of 116**), Wallaroo (110**), Ororoo (109**), Victor Harbor (103**), Meningie (102*) and Yankalilla (101), all SLAs had standardised ratios below the level expected. The highest of these were recorded on the Yorke Peninsula in the SLA of Northern Yorke Peninsula (98*); in the Murray Lands in Murray Bridge (96**) and Peake (90*); on the outskirts of **Adelaide** in Mount Barker (94**), Kapunda (93**), Onkaparinga (93**) and Port Elliot and Goolwa (90*); and in the northern areas of Peterborough (93**), Port Augusta (92**) and Kanyaka-Quorn (91**).

At the other end of the scale, 73 per cent fewer GP services than expected were recorded for residents of Port MacDonnell (1,453 GP services), an SR of 23*. Relatively low ratios were also recorded in Unincorporated Far North (an SR of 24* and 4,068 GP services), Mount Gambier (28* and 3,476), Unincorporated Flinders Ranges (36* and 1,991), Unincorporated Pirie (38* and 402), Browns Well (39* and 275), Morgan (43* and 1,909), Hawker (44* and 580) and Lucindale (49* and 1,513). See Chapter 7 for details of the levels of provision of GP services in these areas.

There were 48 SLAs mapped in the second lowest class interval, with ratios ranging from 70* in Franklin Harbor to 89* in Burra Burra, Minlaton, Naracoorte and Wakefield Plains.

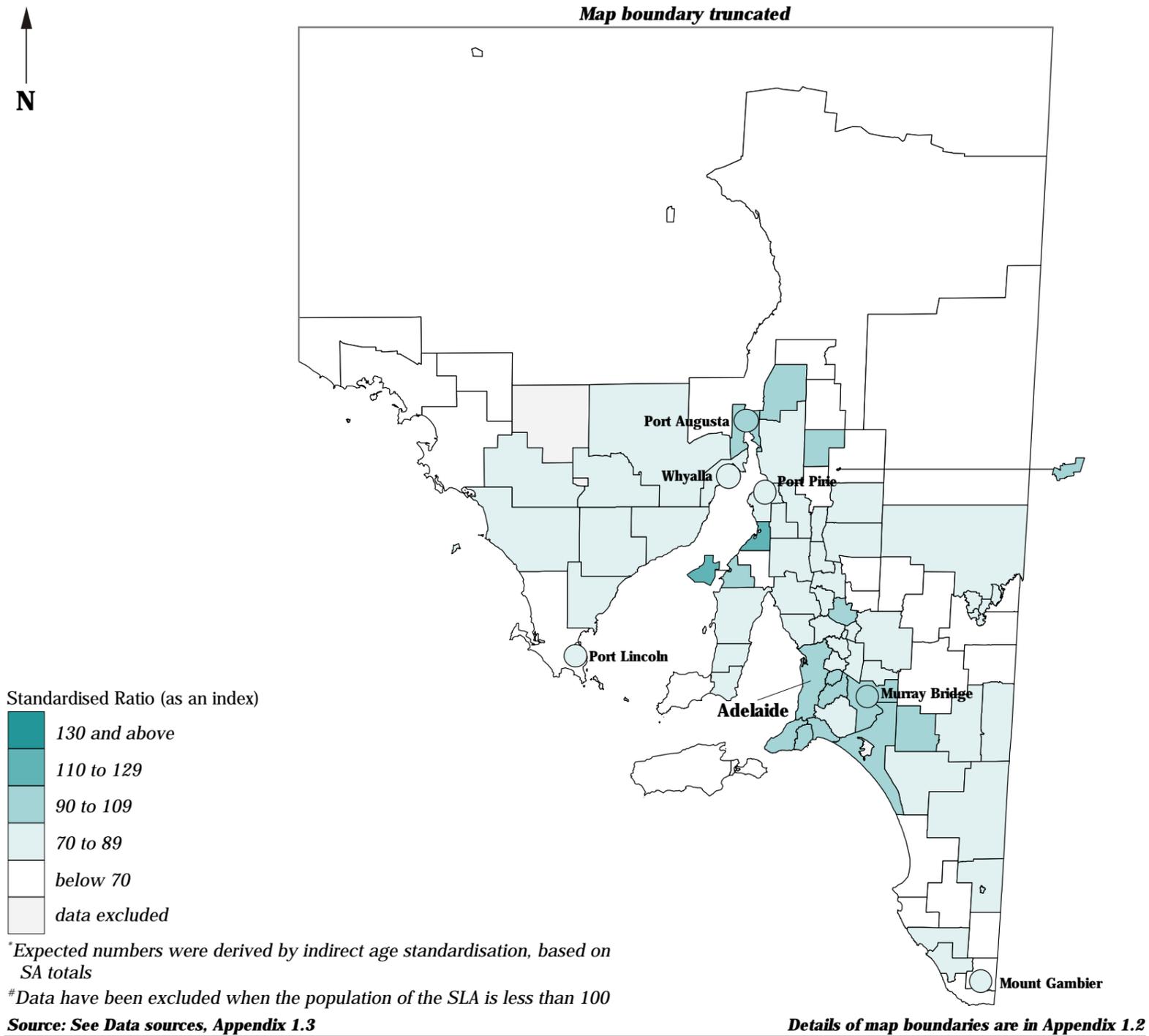
In 1996, the largest numbers of GP services were recorded in the towns of Whyalla (50,307 services), Mount Gambier (40,210 services), Murray Bridge (37,380 services), Port August (31,654 services) and Port Pirie (28,805 services).

The correlation analysis revealed a weak association at the SLA level between high rates of GP services to males and the indicators of socioeconomic disadvantage, the strongest being with the variables for low income families (0.25) and unemployed people (0.23).

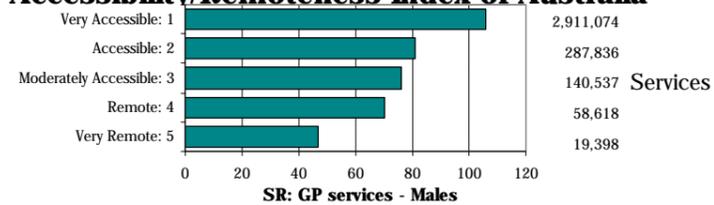
Map 6.53

General medical practitioner services to males, South Australia, 1996

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



Accessibility/Remoteness Index of Australia



Males in areas included in the Accessible category had the highest rate of use of GP services, using 6 per cent more GP services than expected from the State rates (an SR of 106). Ratios in the other categories dropped away to SRs of 81, 76 and 70 in the middle categories, before declining to a very low SR of 47 in the Very Remote category (53 per cent fewer GP services to males than were expected from the State rates). Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

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

General medical practitioner services to females, 1996

Capital city comparison (Australia as the Standard)

As was the case for GP services to males, the level of GP services received by females resident in the capital cities closely mirrored population size. There was, however, a lower differential (of 44.4 per cent) between the highest ratio, of 117** in **Sydney**, and the lowest, of 81** in **Darwin**, than was evident for males (56.2 per cent).

Between 1989 and 1996 SRs declined (relative to the Australian rates) in five of the capital cities, with the largest declines being in **Darwin** and **Hobart**.

Table 6.65: General medical practitioner services to females, capital cities
Standardised admission ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra ¹	All capitals
1996	117**	110**	107**	105**	102**	96**	81**	88**	110**
1989	120**	99**	110**	103**	92**	102**	88**	89**	107**

¹Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

As noted in the introductory text, females use more general medical practitioner (GP) services than males, 6.7 services per female and 4.9 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 20 to 50 year age groups. The age distribution of women receiving these services is shown in **Figure 6.11** on page 304.

Adelaide (South Australia as the Standard)

Female residents of **Adelaide** received 3,839,651 services from GPs in 1996, six per cent more than expected from the State rates (an SR of 106**).

The distribution of SRs for GP services to females across SLAs in **Adelaide** was very similar to that recorded for males, with the highest ratios located in the northern and western regions and the lowest in the inner, eastern and southern areas (**Map 6.54**).

The most highly elevated ratios were recorded in the northern SLAs of Elizabeth (an SR of 138**), Munno Para (135**) and Salisbury (121**); and in the western areas of Enfield [Part B] (134**), Port Adelaide (129**) and Thebarton (121**). Ratios elevated by at least ten per cent were also recorded in Enfield [Part A] (an SR of 113**), Noarlunga (113**) and East Torrens (111**).

In total, 15 SLAs recorded ratios in the middle range mapped. Within this class interval, ratios above the level expected were recorded in Hindmarsh and Woodville (an SR of 109**), Campbelltown and Payneham (both 105**), Prospect (103**), Marion (102**), Tea Tree Gully (101**) and Willunga (101).

The City of Adelaide recorded the lowest ratio for this variable, with 21 per cent fewer services from GPs than expected from the State rates (an SR of 79**). Relatively low ratios were also recorded in the eastern SLAs of Walkerville (an SR of 82**), Burnside (87**) and Stirling (88**); in the inner city areas of Unley (89**), St Peters (89**) and Kensington and Norwood (91**); and in the southern SLAs of Mitcham (90**), Happy Valley (90**), Brighton (92**) and Glenelg (94**). As for male residents of **Adelaide**, none of the SRs was very low.

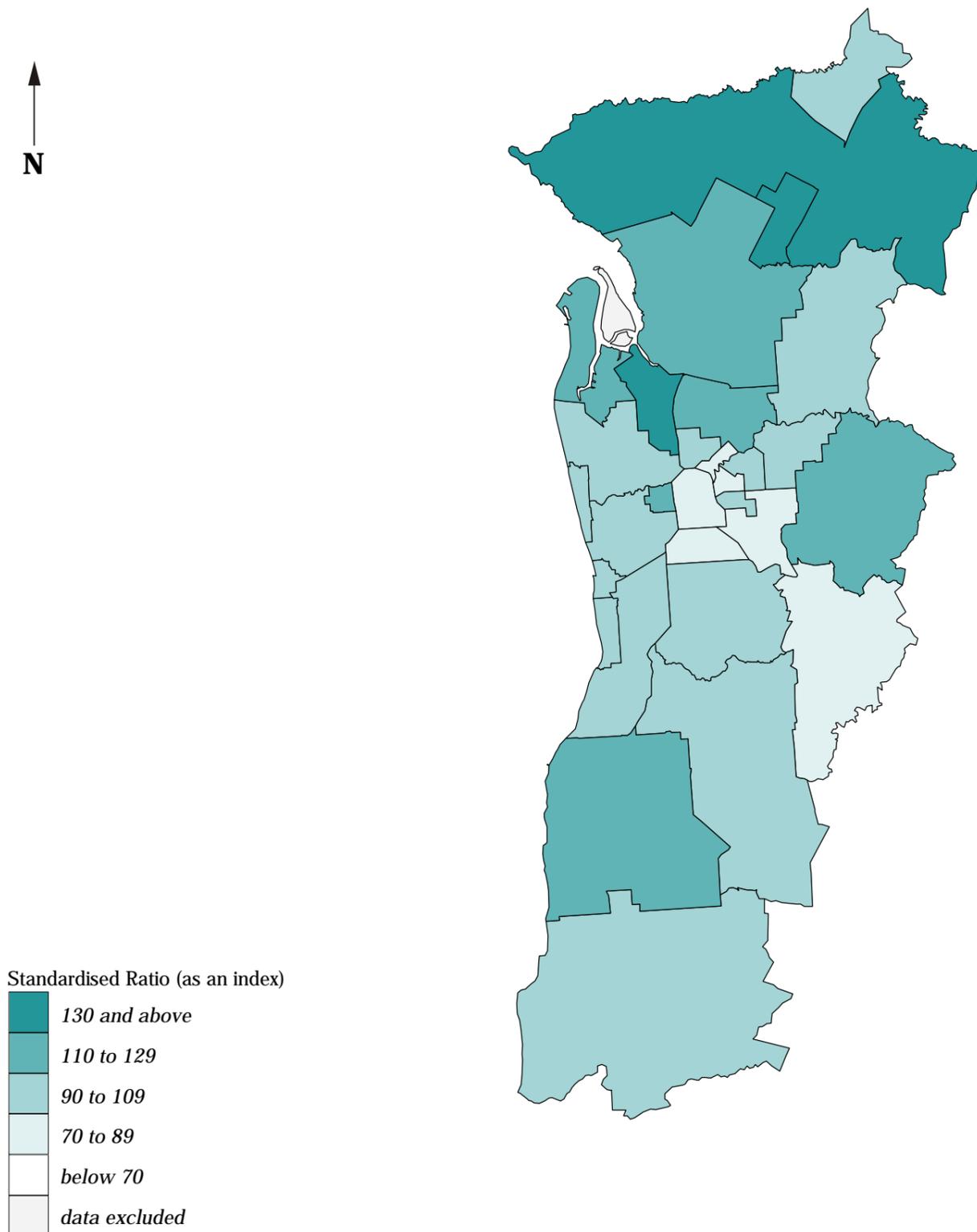
The largest number of GP services was recorded for female residents of Salisbury (414,049 services), followed by Hindmarsh and Woodville (335,712 services), Noarlunga (327,555 services), Tea Tree Gully (298,702 services) and Marion (272,074 services).

GP services to females were strongly correlated at the SLA level with the variables for unskilled and semi-skilled workers (0.89), early school leavers (0.86), the Indigenous population (0.84), unemployed people (0.80), low income families (0.80), single parent families (0.74) and dwellings rented from the State housing authority (0.72) and inversely with the variables for high income families (-0.84), managers and administrators, and professionals (-0.80) and female labour force participation (-0.77). The inverse correlation with the IRSD (-0.86) also indicates a positive association between high rates of GP services to females and socioeconomic disadvantage.

Map 6.54

General medical practitioner services to females, Adelaide, 1996

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



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

#Data have been excluded when the population of the SLA is less than 100

Source: See Data sources, Appendix 1.3

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

General medical practitioner services to females, 1996

State/Territory comparison (Australia as the Standard)

As for males, standardised ratios (SRs) for GP services for females were lower in the *Rest of State/Territory* areas than in the capital cities for all the States and the Northern Territory. SRs were, however, generally higher than those for males. Again, SRs ranged from the highest in Tasmania (89**) to the lowest in the Northern Territory (33**). The data limitations for these rural and remote areas should be borne in mind when using this data (see page 303). The information in Chapter 7 as to the numbers and distribution of GPs in these areas is also of relevance.

There was less movement in the SRs between 1989 and 1996 than was evident for GP services to males. The largest declines in GP service use were in the ratios for Queensland and the Northern Territory.

Table 6.66: General medical practitioner services to females, State/Territory
Standardised admission ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1996									
Capital city	117**	110**	107**	105**	102**	96**	81**	88**	110**
Other major urban centres ¹	98**	92**	97**	..	..	..	..	..	97**
Rest of State/Territory	78**	81**	82**	82**	70**	89**	33**	- ²	79**
Whole of State/Territory	105**	102**	95**	99**	94**	93**	55**	89**	100
1989									
Rest of State/Territory	88**	79**	100	81**	70**	95**	46**	- ²	87**

¹Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

²Data unreliable: included with ACT total

Source: See *Data sources*, Appendix 1.3

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

Rest of State (South Australia as the Standard)

As for male residents living outside of the major urban centres, females had significantly fewer services from GPs in 1996 than were expected from the State rates, an SR of 83**; these low rates of use are in line with the lower levels of access to GPs in the non-metropolitan areas (see Chapter 7 for details of the distribution of GPs). This represented a total of 1,027,857 GPs services.

The majority of SLAs had standardised ratios below the level expected, the exceptions being in Unincorporated Riverland (an SR of 142**), Port Broughton (119**), Wallaroo (111**), Meningie, Orroroo (104*), Yankalilla (104**), Carrieton (103) and Victor Harbor (101). The next highest ratios were recorded in Murray Bridge (99*), Northern Yorke Peninsula (99*), Mount Barker and Onkaparinga (both 97**), Port Augusta (96**), Kapunda, Pirie, and Wakefield Plains (all with 94**), Blyth-Snowtown and Burra Burra (both 93**), Tumby Bay (91**), Beachport, Clare, Light, and Port Elliot and Goolwa (all with 90**).

Just over half (53.7 per cent) of the SLAs in the non-metropolitan areas of South Australia recorded ratios of between 70 and 89 (**Map 6.55**). Within this class interval, ratios ranged from 70** in Warooka to 89** in Central Yorke Peninsula, Cleve, Kimba, Minlaton and Peake.

The lowest ratio was recorded in the SLA of Port MacDonnell, with 76 per cent fewer admissions than were expected from the State rates (an SR of 24**). Relatively low ratios were also recorded in the south-eastern SLAs of Mount Gambier (DC) (29**) and Luncindale (53**): in the far northern SLAs of Unincorporated Far North (32**), Unincorporated Flinders Ranges (45**), Hawker (45**), Unincorporated Pirie (54**) and Coober Pedy (59**); and in Browns Well (38**), Morgan (49**) and Paringa (58**), all of which are located in the Riverland.

See Chapter 7 for details of the levels of provision of GP services in these areas.

The largest numbers of GP services were recorded in the towns of Whyalla (65,510 services), Mount Gambier (57,473 services), Murray Bridge (52,770 services), Port Augusta (43,320 services) and Port Pirie (40,101 services).

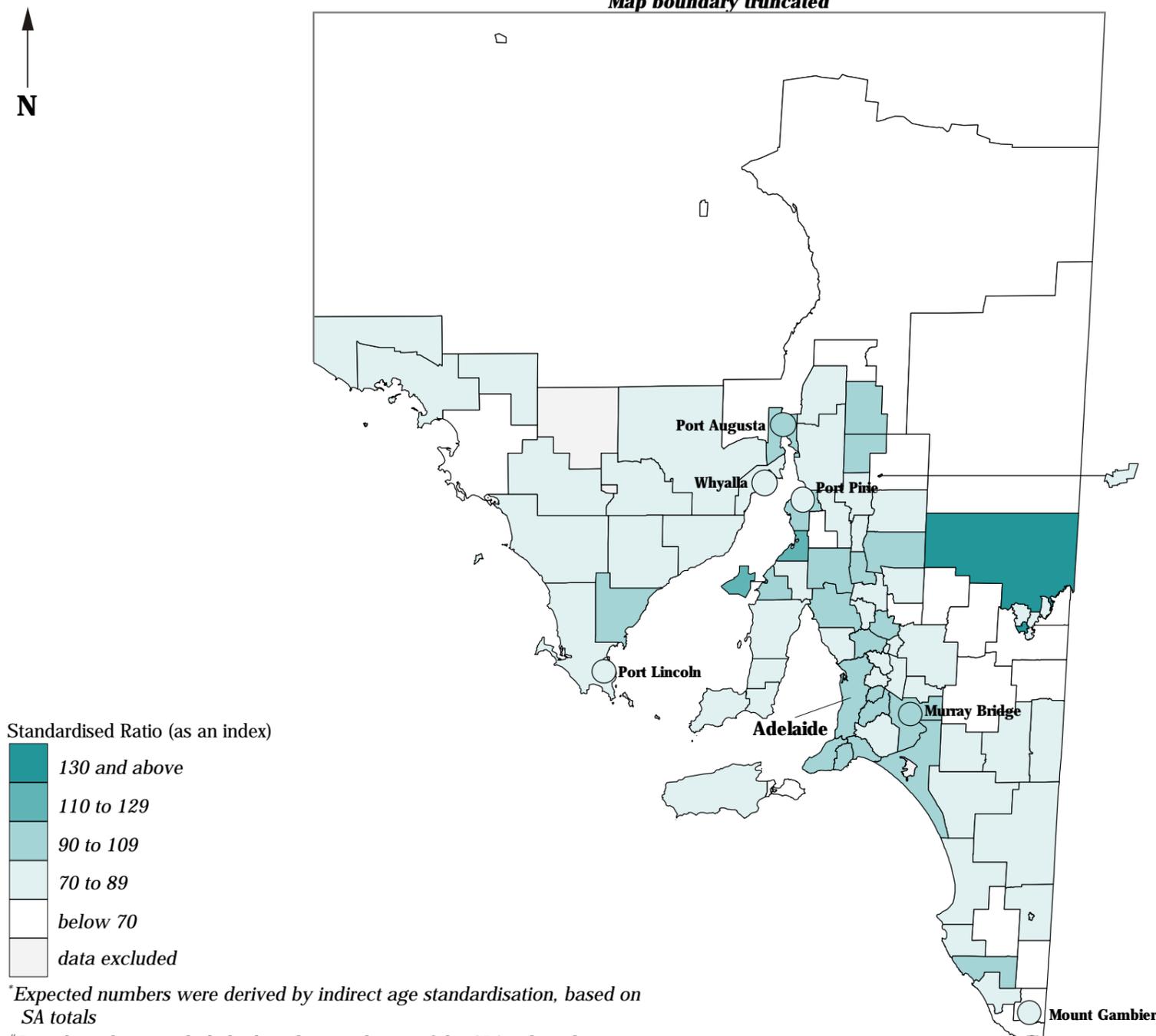
The correlation analysis revealed a weak, but consistent, association at the SLA level between high rates of GP services to males and the indicators of socioeconomic disadvantage, the strongest being with the variables for dwellings with no motor vehicle (0.33) and single parent families (0.32).

Map 6.55

General medical practitioner services to females, South Australia, 1996

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

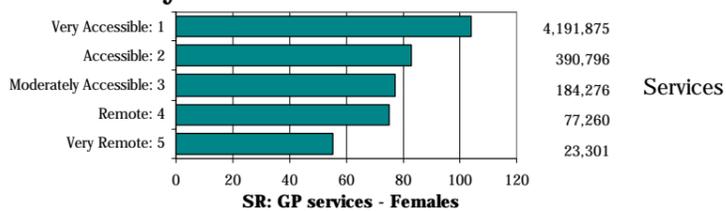
Map boundary truncated



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



As for males, females in areas included in the Accessible category had the highest rate of use of general medical practitioner (GP) services, using 4 per cent more GP services than expected from the State rates (an SR of 104). Ratios in the three middle categories were 83, 77 and 75, respectively, with a lower ratio of 55 in the Very Remote category. Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Immunisation status of children at 12 months of age, 1998

Capital city comparison

Immunisation data are collected by the Health Insurance Commission which maintains the Australian Childhood Immunisation Register (ACIR). The ACIR, a project funded by the Commonwealth Government through the Commonwealth Department of Health and Aged Care, provides comprehensive information on the immunisation status of children under seven years of age in Australia. These data are used to provide a measure of coverage at a National, State/Territory and local level and to provide an effective management tool for monitoring immunisation coverage and service delivery. The register was commenced in 1996 and by mid 1998 had sufficient coverage of the immunisation status of children at twelve months of age to be used for this analysis. Hull et al (1999) reported that 80.1 per cent of vaccinations recorded in the ACIR for New South Wales were provided by GPs, 8.4 per cent by municipal councils and 11.5 per cent by other providers (eg. Government operated community health centres, Aboriginal health services and the Royal Flying Doctor services).

The data shown here are the proportion of children born between 1 October 1996 and 30 September 1997 who were registered with Medicare and who were shown on the ACIR at 31 December 1998 as being fully immunised. Children who were fully immunised at 12 months of age were those who had been immunised for three doses of DTP (diphtheria, tetanus and pertussis), three doses of OPV (oral polio vaccine) and three doses of Hib (*Haemophilus influenzae* type b). The calculations shown in the tables and maps were made by the National Centre for Immunisation Research and Surveillance (NCIRS).

Immunisation rates for the capital cities were all close to the *All capitals* average of 82.5 per cent, ranging from 79.7 per cent in **Sydney** to 86.9 per cent in **Canberra**.

Table 6.67: Proportion of children who were fully immunised at 12 months of age, capital cities, 1998

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

Adelaide

In 1998, 13,013 children in **Adelaide** aged 12 months were fully immunised, 84.5 per cent of children at this age.

The highest immunisation rates were in the outer northern SLA of Tea Tree Gully (91.3 per cent) (**Map 6.56**). Proportions of 85 per cent or higher were also recorded in Happy Valley (89.3 per cent), Mitcham (85.5 per cent) and Marion (85.3 per cent), located south of the city; Port Adelaide (86.2 per cent) and Henley and Grange (85.8 per cent), located in the west; Prospect (85.6 per cent) and Enfield [Part A] (85.0 per cent), situated north of the city centre; and Campbelltown (85.5 per cent) to the east.

The SLA of Thebarton had the lowest proportion of fully immunised children in 1998, with 74.2 per cent of 12 month old children in this category. The next lowest proportions were in Willunga (75.2 per cent), St Peters (77.8 per cent), Walkerville (78.8 per cent) and Elizabeth (79.6 per cent).

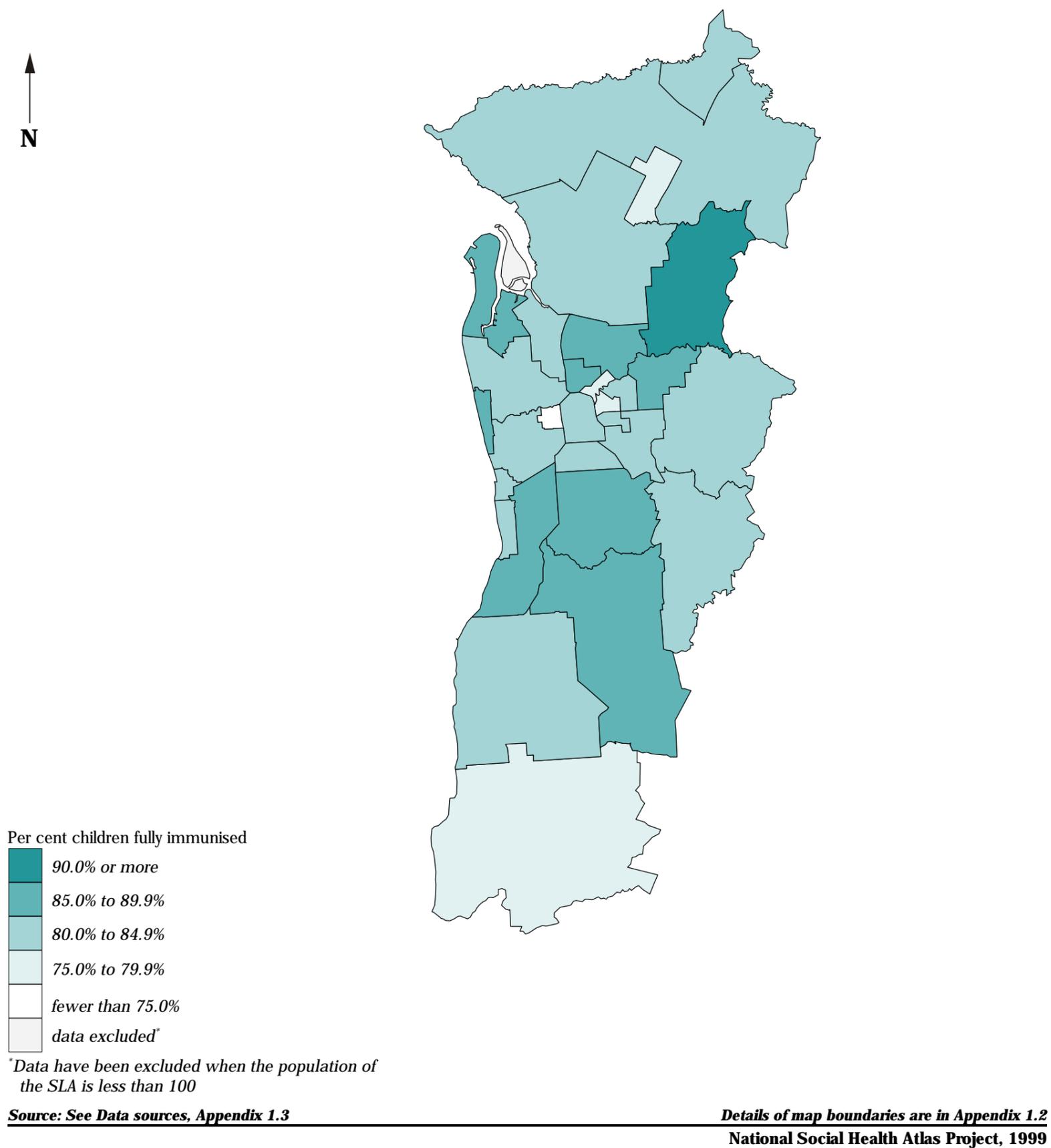
The largest numbers of fully immunised children were recorded in Salisbury (1,689 children), Noarlunga (1,308 children), Tea Tree Gully (1,257 children), Hindmarsh and Woodville (989 children), Marion (815 children) and Munno Para (712 children).

There were weak inverse correlations at the SLA level with the variables for dwellings with no motor vehicle and unemployed people (both -0.36) and single parent and low income families (both of -0.30). These results, together with the weak correlation with the IRSD (0.23), suggest the existence of an association at the SLA level between low immunisation rates for infants and socioeconomic disadvantage.

Map 6.56

Immunisation status of children at 12 months of age, Adelaide, 1998

as a percentage of all children at 12 months of age in each Statistical Local Area



Immunisation status of children at 12 months of age, 1998

State/Territory comparison

Details of the information described below are on the previous text page. Immunisation rates were higher in the *Rest of State/Territory* areas than in the capital cities in a number of States, with the highest rates in Queensland and Victoria. With the exception of the Northern Territory, immunisation rates for the non-metropolitan areas of Australia were all close to the *Rest of State/Territory* average of 83.6 per cent. The low rate reported for the Northern Territory reflects a number of factors, including difficulties in transmitting accurate data on levels of immunisation in the Territory: it is unclear whether the real rate is lower than in other parts of Australia.

Table 6.68: Proportion of children who were fully immunised at 12 months of age, State/Territory, 1998
Per cent

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total ¹
Capital city	79.7	84.0	85.4	84.5	81.2	84.0	80.0	86.9 ¹	82.5
Other major urban centres ²	86.0	86.9	84.2	..	..	..	..	..³	85.4
Rest of State/Territory	81.8	86.0	86.1	83.6	80.6	84.5	62.8	.. ³	83.6
Whole of State/Territory	81.0	84.6	85.5	84.2	81.0	84.3	70.6	86.8	83.0

¹Includes Queanbeyan (C)

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

³Data included with ACT total

Source: See *Data sources, Appendix 1.3*

Rest of State

In 1998, 5,401 children in the non-metropolitan areas of South Australia were fully immunised at the age of 12 months, 83.6 per cent of children at this age.

As can be seen from the map (**Map 6.57**), the highest rates of immunisation were recorded in SLAs distributed throughout the lower half of the State, whereas those with the lowest rates were generally located in the far north.

Several SLAs in the non-metropolitan areas recorded proportions of 100.0 per cent. These areas included Coonalpyn Downs, Eudunda, Hallett, Orroroo, Peake, Peterborough (M) and Robertstown. Care should be taken in interpreting such high results when the data have been derived from postcode estimates (see page 80, Chapter 4 for further details of the limitations of data gained from postcode estimates).

Excluding the SLAs mentioned above, the highest percentage of children fully immunised at 12 months of age was from Beachport (97.5 per cent). Proportions of 94.0 per cent and above were also recorded in Tanunda (96.4 per cent), Blyth-Snowtown (95.5 per cent), Millicent (95.5 per cent), Cleve (95.5 per cent), Burra Burra (95.1 per cent), Ridley-Truro (94.3 per cent) and Kimba (94.3 per cent).

There were 30 SLAs mapped in the middle range with proportions of between 80.0 and 85.0 per cent. The highest of these were recorded in Strathalbyn (84.7 per cent), Whyalla (84.5 per cent) and Mount Gambier (84.4 per cent), followed by Waikerie and Murray Bridge (both 84.3 per cent). At the other end of the scale, 80.0 per cent of children in Mount Pleasant and Pinnaroo were fully immunised.

Proportions of less than 75.0 per cent were generally found in SLAs located in the far north, in areas which included Unincorporated Pirie (60.0 per cent), Port Augusta (64.0 per cent), Coober Pedy (67.6 per cent), Kanyaka-Quorn (72.0 per cent), Unincorporated Flinders Ranges (72.7 per cent), Unincorporated West Coast (73.2 per cent) and Unincorporated Far North (74.2 per cent).

Also mapped in the lowest range were the SLAs of Elliston (51.6 per cent), Franklin Harbor (62.5 per cent), Lower Eyre Peninsula (62.7 per cent) and Ceduna (73.4 per cent), all located on the Eyre Peninsula; and Morgan (33.4 per cent), Bute (70.0 per cent) and Kingscote (70.0 per cent).

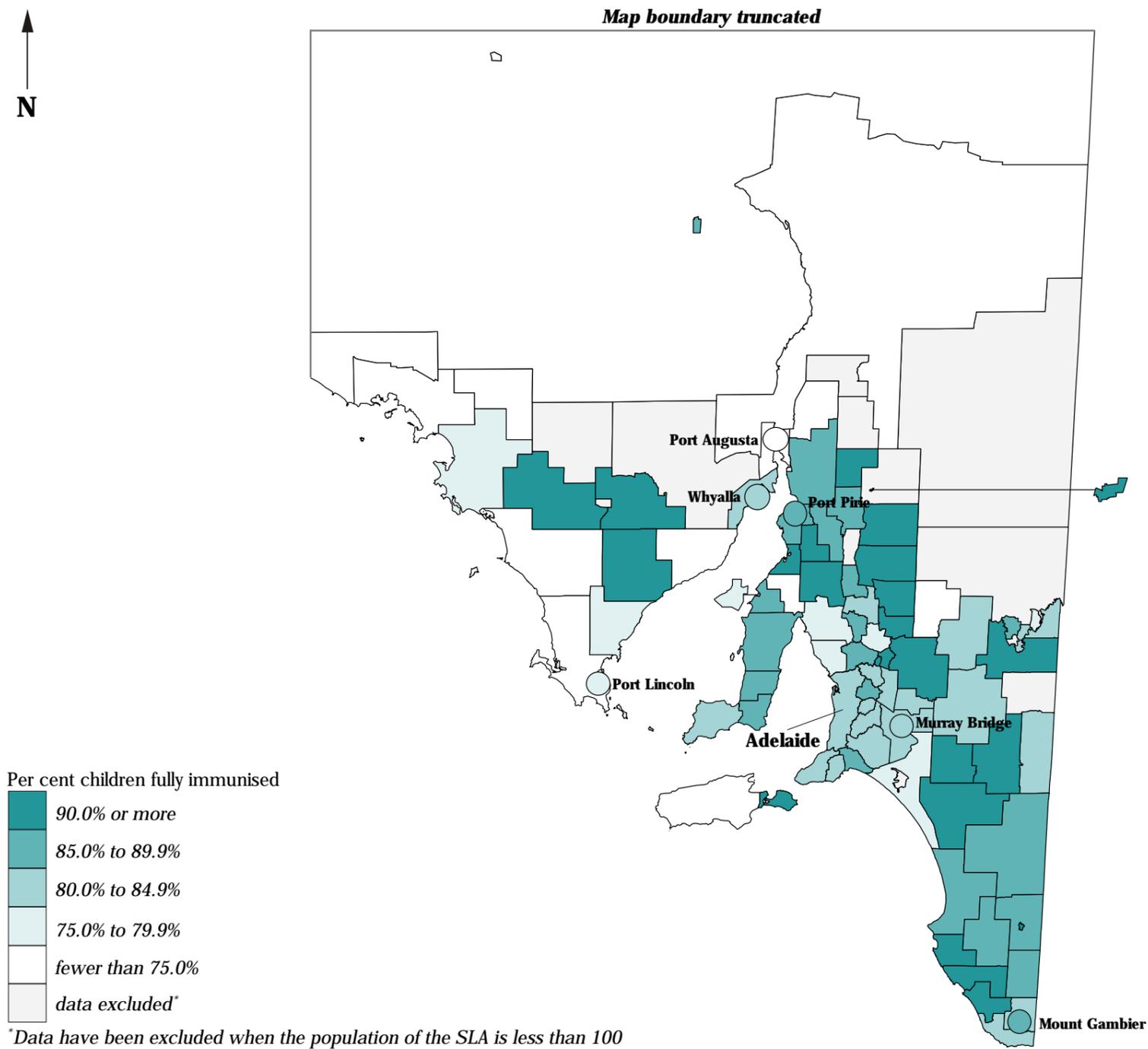
The largest number of fully immunised children in the non-metropolitan areas of South Australia was recorded in of Mount Gambier, a total of 407 children. More than 200 fully immunised children were also recorded in Mount Barker (346 children), Whyalla (342 children), Murray Bridge (256 children), Port Pirie (238 children) and Port Lincoln (219 children).

There was no evidence in the correlation analysis of an association at the SLA level between low immunisation rates for infants and socioeconomic status.

Map 6.57

Immunisation status of children at 12 months of age, South Australia, 1998

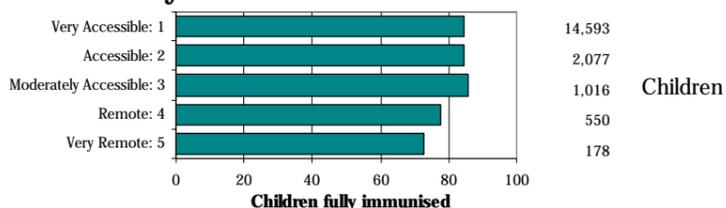
as a percentage of all children at 12 months of age in each Statistical Local Area



Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia



There is little variation in recorded immunisation rates across the first three ARIA categories, with between 84.5 per cent and 85.9 per cent of 12 month old children being fully immunised. Lower rates, of 77.8 per cent and 72.7 per cent were recorded in the Remote and Very Remote categories, respectively.

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

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