

## 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
<b>Children (0 to 14 years)</b>				
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***
<b>Youth (15 to 24 years)</b>				
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
<b>Adults (25 to 64 years)</b>				
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**
<b>Older people (65 years &amp; over)</b>				
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***
<b>All ages</b>				
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 185 for the definition of admission) of patients with all types of cancer, and those with lung cancer specifically are mapped, but admissions resulting from cancer of the prostate are not mapped, as there were too few cases at the small area level from which to calculate reliable rates. The number of variables analysed and mapped was also constrained by the size of the atlas. Therefore the variables mapped are those that represent a significant proportion of the activity for the topic; are known to be more prevalent among a particular population group; or are known to have a distribution which varies regionally.

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

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

## Gaps and deficiencies in the data

### Data collections

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

An important development is that hospital inpatient data at the small area level are now largely available from a single source (the Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database). This contrasts with the situation in producing the first edition of the atlas when hospital data were collected directly from State and Territory health authorities. Further, only New South Wales, Queensland, South Australia and Western Australia had complete collections at that time<sup>1</sup>. There are, however, relatively small but significant deficiencies in the database. These deficiencies are described under *Deficiencies in the admissions data* (page 193).

As was the case in 1992, only the age and sex of the patients of GPs are available to be mapped. There is, for example, no information at a small area level of consultations with GPs which includes other client characteristics, such as reason for attendance (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).

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

Some of these issues are discussed elsewhere in this chapter and details on statistics for cancer incidence and screening are included. As regards the data for termination of pregnancy, terminations are undertaken both in hospitals and in clinics which are not hospitals. These clinics are not, therefore, included in the State and Territory hospital data collections. In an attempt to obtain a complete dataset, details of the age and area of residence of women undergoing a pregnancy termination other than in a hospital were obtained from Health Insurance Commission data and added to the hospitals' dataset. This combined dataset was compared with the data from States with complete coverage in their hospital collections, to see if it provided an accurate picture. Unfortunately the combined dataset was inconsistent with data from the other sources and 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 193).

# Admissions to hospitals

## Introduction

There were almost 4.8 million admissions (see the box below) to hospitals in Australia in 1995/96 (1.6 million admissions in New South Wales), providing a major database of information for examining the more serious health problems faced by Australians, subject to the qualifications discussed below (*Deficiencies in the admissions data*, page 193).

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

### Recording details for a hospital episode (admissions)

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

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

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

## Differences in admission rates for specific population groups

### Differences related to socioeconomic status

Those who are socioeconomically disadvantaged have higher admission rates than the population in general. Esterman et al. (1990) examined admissions by postcode of usual residence, and compared standardised admission rates of residents of

postcodes categorised as low, medium and high income (based on household income). They found that when **Adelaide** postcodes were divided into three categories according to household income, hospital admissions were found to be 34 per cent more frequent for residents of the poorest than for the most affluent category. No condition showed a consistent upward trend in admission rates with increasing affluence, whereas the poorer areas had higher rates for a wide range of diseases and conditions, including ischaemic heart disease; infectious diseases; stroke; digestive system disorders; hypertension; cancer; skin diseases; respiratory diseases; genito-urinary conditions; injuries; musculoskeletal conditions; diabetes mellitus; nutritional, immunity and other endocrine disorders; perinatal disorders; and metabolic disorders.

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

### Differences for Aboriginal people

The Australian Bureau of Statistics and the Australian Institute of Health and Welfare have published age-standardised admission ratios for admissions of Indigenous Australians (ABS/AIHW 1999), highlighting the higher rates of admission of 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 hospitals<sup>1</sup>, by cause, Australia, 1996/97**

Cause	Admissions identified as Indigenous		Age-standardised admission ratio <sup>2</sup>		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
<b>All causes (excluding dialysis)</b>	<b>49,293</b>	<b>63,454</b>	<b>1.4</b>	<b>1.4</b>	<b>78.4</b>	<b>77.7</b>
<b>All causes (including dialysis)</b>	<b>62,838</b>	<b>81,626</b>	<b>1.7</b>	<b>1.7</b>	<b>100.0</b>	<b>100.0</b>

<sup>1</sup>Excludes admissions to the Darwin Private Hospital

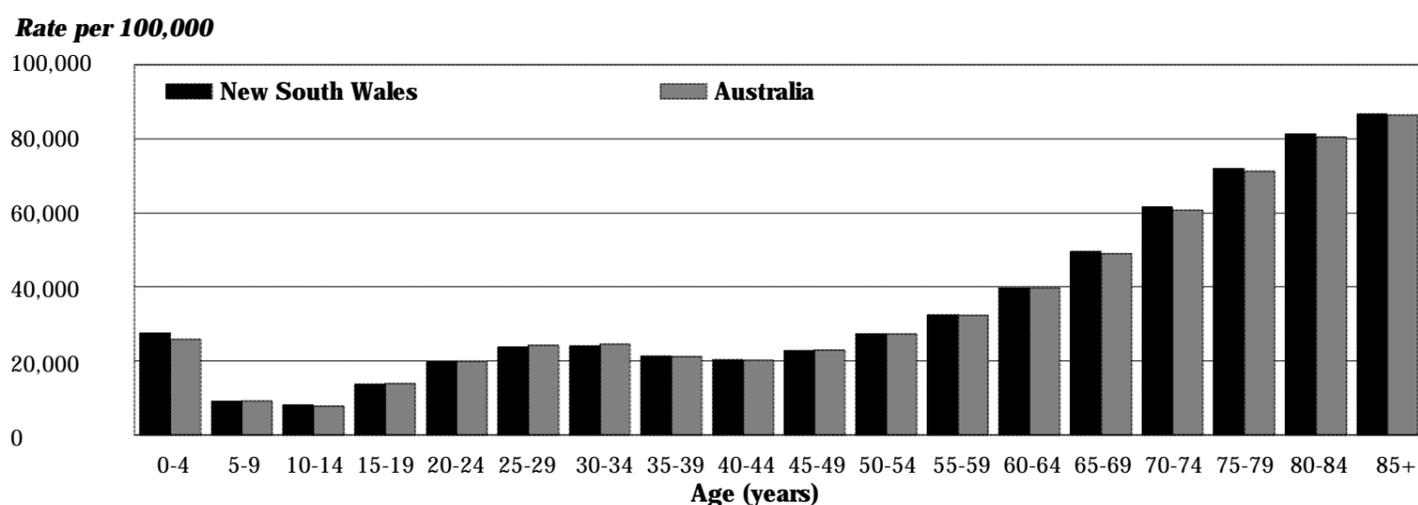
<sup>2</sup>Age-standardised hospital admission ratio is equal to hospital admissions identified as being of Indigenous people, divided by expected admissions, based on all-Australian rates

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

### Differences between New South Wales and Australia

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

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



Source: See Data sources, Appendix 1.3

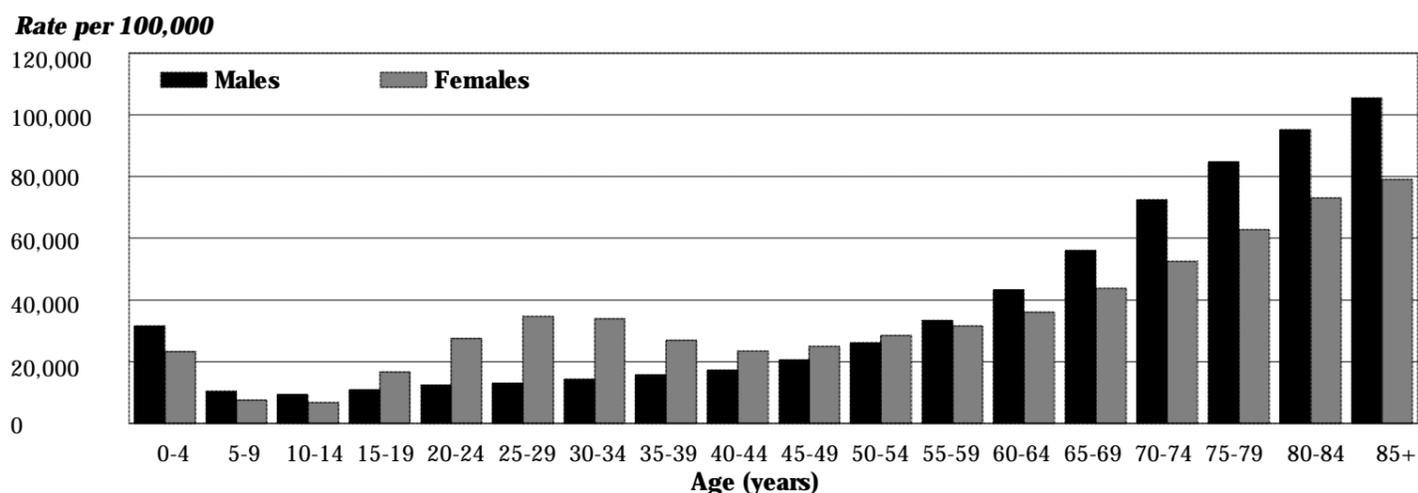
## Differences related to age, sex, and, hospital type

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 New South Wales admitted to a hospital.

Females accounted for 54.8 per cent of admissions, 17.4 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 2.7 times that for males. Female rates in the 20 to 24 (2.2 times), 30 to 34 (2.4 times) and 35 to 39 (1.7 times) year age groups were still well above those for males. These higher rates largely reflect episodes of hospitalisation for childbirth and associated admissions. The rates for males were higher than for females among those aged 0 to 4, 5 to 9 and 10 to 15 years (1.4 times as high), and from age 55 (the greatest disparity being the rate for 70 to 74 and 75 to 79 year old males) averaging 1.4 times higher than the corresponding female rate.

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



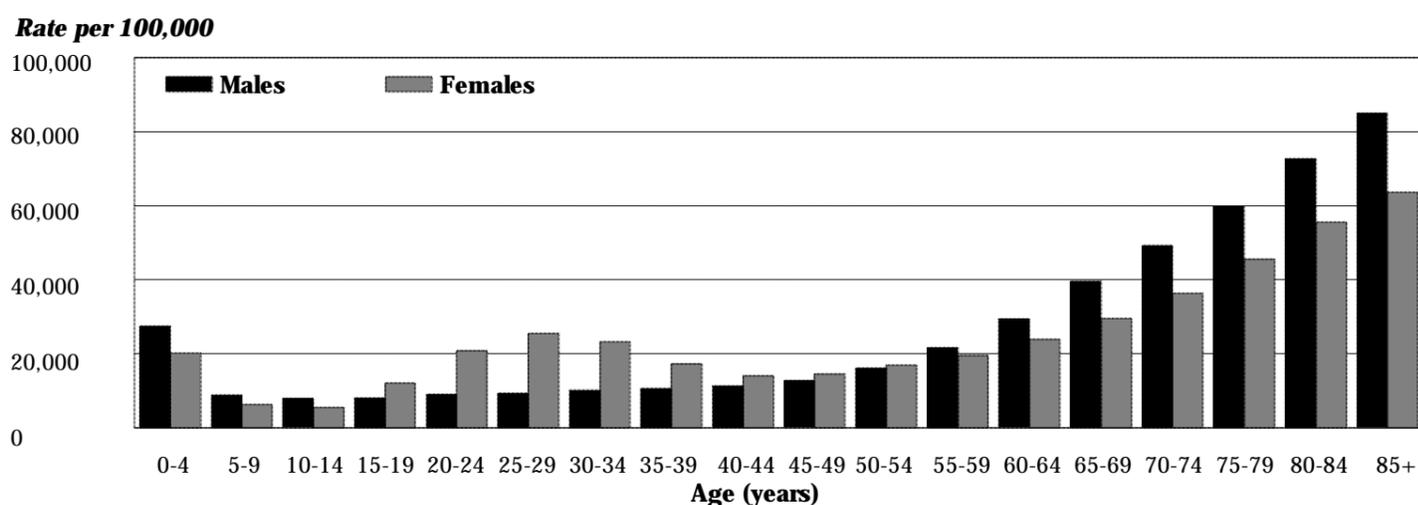
Source: See Data sources, Appendix 1.3

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 50 to 54 year age group. Male rates are higher at the youngest ages, and again from the 55 to 59 year age group onwards.

Overall, private hospitals accounted for 29.4 per cent of the admissions analysed for New South Wales. Females make

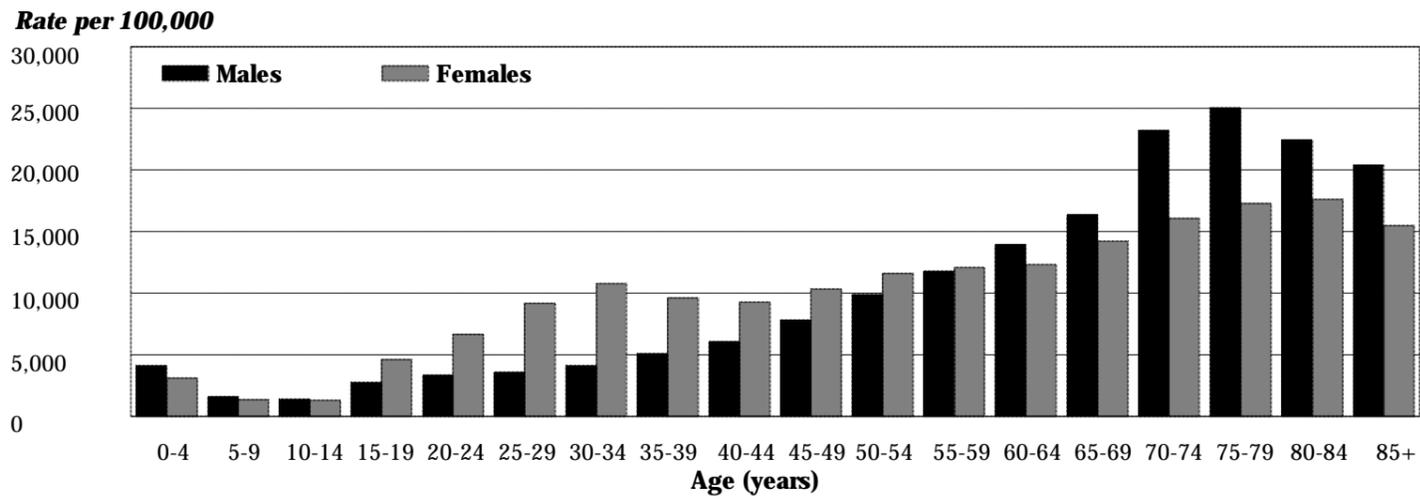
greater use of private hospitals than males, with admissions to private hospitals representing 30.2 per cent of all female admissions studied (compared with 28.5 per cent for males) and accounting for 56.2 per cent of private hospital admissions (53.8 per cent in public acute hospitals). The pattern of admissions to private hospitals by age and sex (Figure 6.4) is again similar to that in the previous graphs. The most noticeable differences are the lower overall rates of admission and the lower admission rates for males above 80 years of age.

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



Source: See Data sources, Appendix 1.3

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

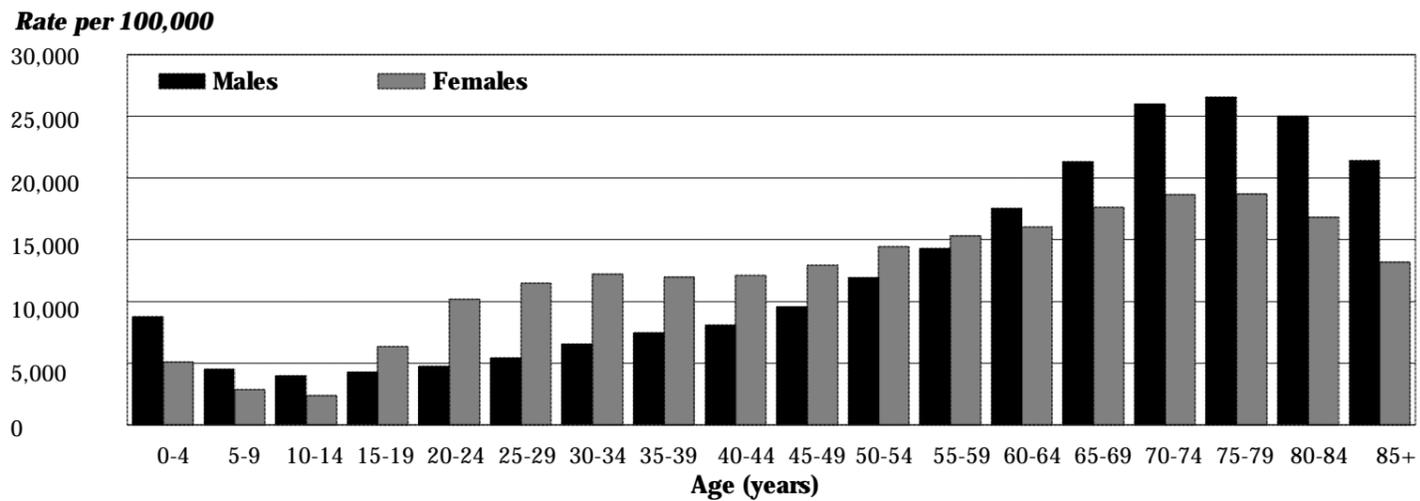


Source: See Data sources, Appendix 1.3

The general pattern of higher admission rates among females aged from 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 80 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, by age and sex, New South Wales, 1995/96**

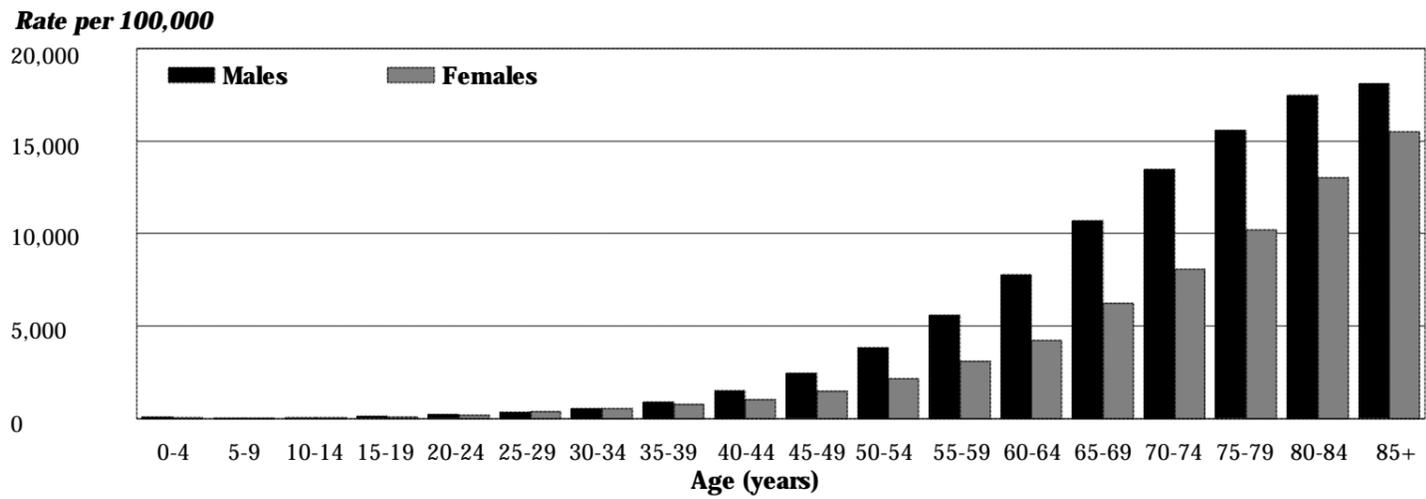


Source: See Data sources, Appendix 1.3

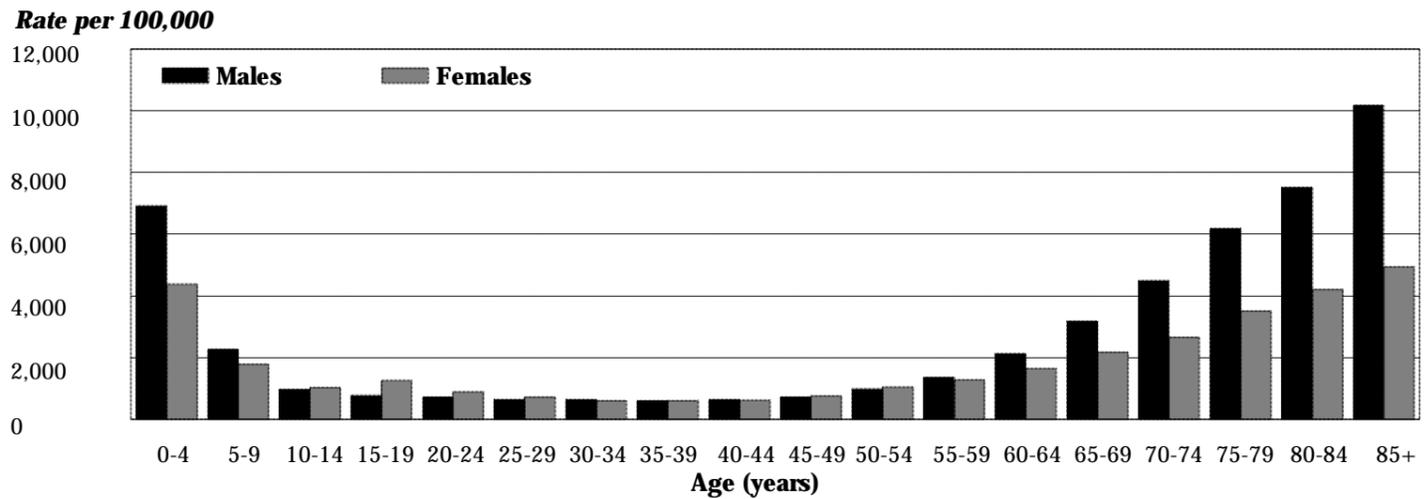
Figure 6.6 and Figure 6.7 show admissions for circulatory and respiratory system diseases, respectively. Figure 6.6 highlights the steep rise in hospital admissions for circulatory system diseases from the age of 30 years, with males predominating across the age groups. Admission rates for respiratory system

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

**Figure 6.6: Admissions for circulatory system diseases, by age and sex, New South Wales, 1995/96**



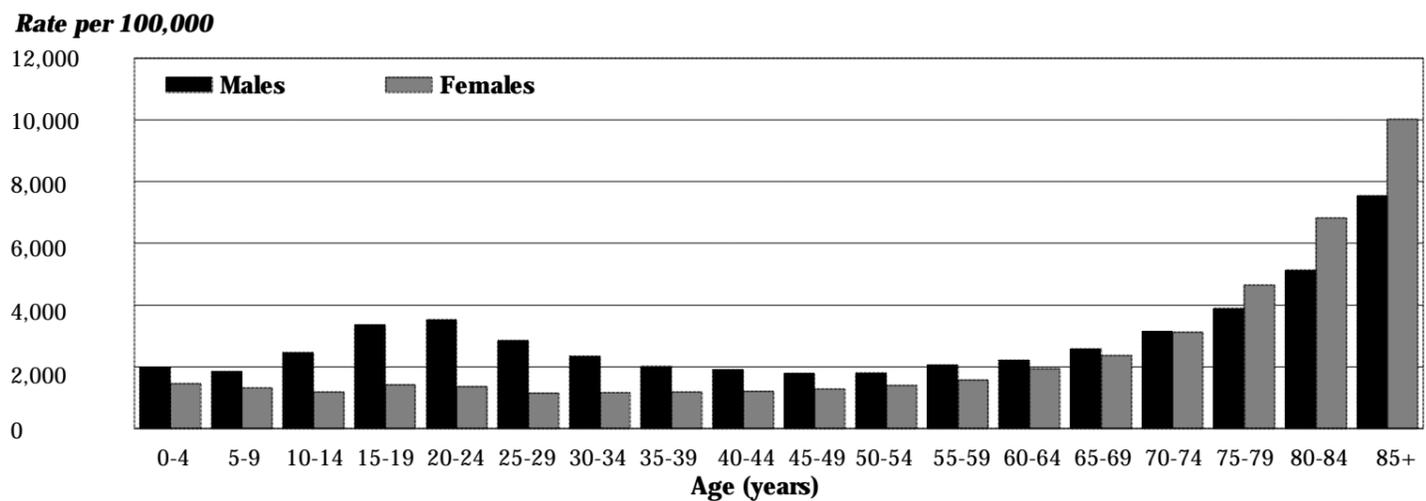
**Figure 6.7: Admissions for respiratory system diseases, by age and sex, New South Wales, 1995/96**



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 39 years.

Female admission rates are consistent across most of the age groups until around the 65 to 69 year age group, after which the rates begin to increase steadily, and to exceed eventually those for males.

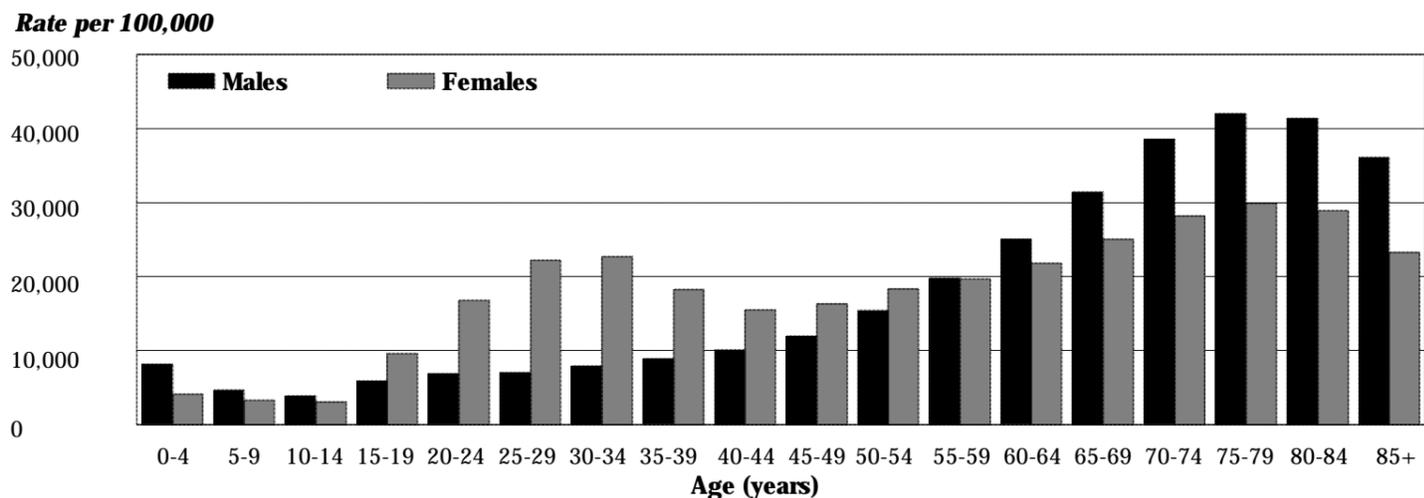
**Figure 6.8: Admissions from accidents, poisonings and violence, by age and sex, New South Wales, 1995/96**



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 49 years.

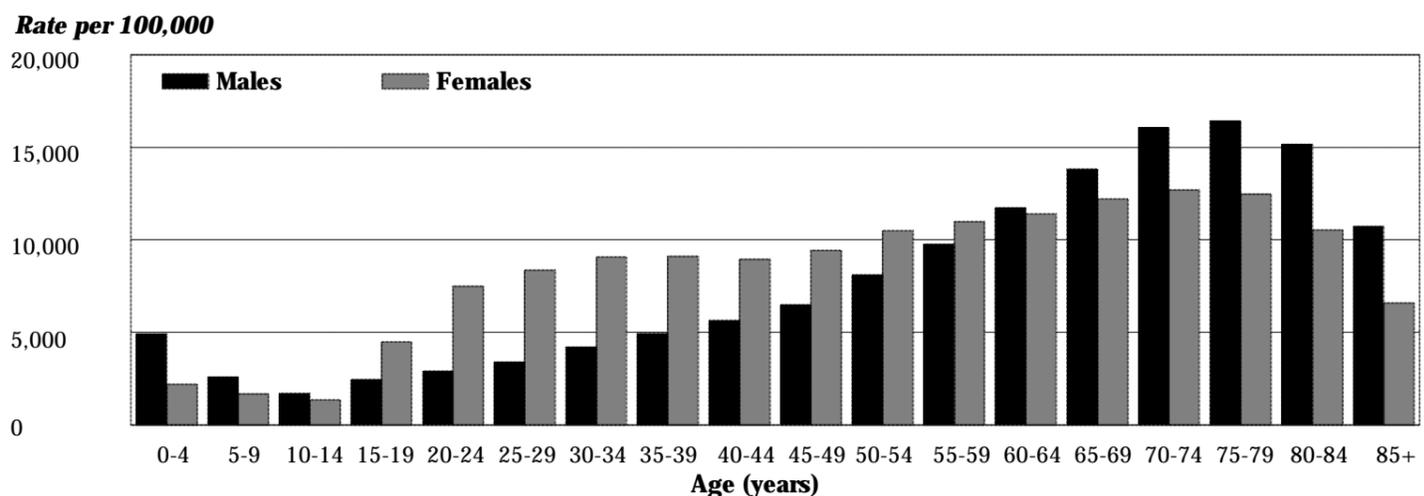
Within this age span, rates for same day admissions of females for a surgical procedure increased rather than decreased, as they did for total surgical admissions.

**Figure 6.9: Admissions for a surgical procedure, by age and sex, New South Wales, 1995/96**



Source: See Data sources, Appendix 1.3

**Figure 6.10: Same day admissions for a surgical procedure, by age and sex, New South Wales, 1995/96**



Source: See Data sources, Appendix 1.3

### Differences related to area of residence

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

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

#### *Isolation and distance*

Factors such as distance and isolation of people living in these, often remote, areas are important. In country areas, people are

more likely to be admitted 'for observation' than be sent home if their homes are a significant distance from the hospital.

#### *Higher risks faced*

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

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

In the absence of community based care, respite care and other services, hospitals in country areas often have a 'surrogate' caring role. This includes, in some instances, admitting people who would otherwise go to specialist psychiatric hospitals; and providing the respite care found in other types of institutions in

major urban centres for the aged and younger people with physical and intellectual disabilities. There are also occasions where the circumstances of individuals or families are such that they do not have adequate resources and/or support available which result in hospital admissions. For example, a child of a single parent, living in a country town where there are limited family or community support services, may be more likely to be admitted to hospital for a minor condition, or for observation. This type of situation is often referred to as a 'social admission'.

#### *Ready availability of beds*

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

#### *Higher rates of admission of Aboriginal people*

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

## Explanatory notes

### Classification of hospitals

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

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

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

Psychiatric hospitals mainly provide treatment and care to patients with psychiatric, mental or behavioural disorders. Public psychiatric hospitals treat people with the most severe psychiatric conditions: this group tends to be mainly older people, and to have longer lengths of stay. Public acute and private acute hospitals and private psychiatric hospitals treat people with less severe psychiatric conditions<sup>2</sup>.

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

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

## Coverage

Hospital admissions data presented in this atlas includes episodes of hospitalisation in public acute and private (acute and psychiatric) hospitals. To enhance consistency, admissions of long stay nursing home type patients (patients with a length of stay in hospital of 35 days or longer and not considered to be 'acute' patients) have been excluded because the proportion of these patients in public hospitals varies between, and within, the States and Territories. Almost two thirds (62.1 per cent) of bed days for patients in this category in New South Wales 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 occurring among same day patients (in particular those requiring chemotherapy or renal dialysis).

## Data issues

### Data mapped

The analysis of admissions has been restricted to examining admissions for all causes (separately for public acute and private hospitals, and for females and males), and selected diagnoses (based on the patient's principal diagnosis) and selected procedures (based on the patient's principal procedure), which are major contributors to variations in the pattern of distribution of hospitalisation at the regional and small level, and are known to be associated with socioeconomic status. These admissions (**Table 6.3**) represent 93.6 per cent of total acute admissions for 1995/96.

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

Table 6.3: Public acute and private hospital admissions included in the analysis<sup>1</sup>, New South Wales, 1995/96

Principal diagnosis/procedure	Same day		Overnight		Total	
	No.	% <sup>2</sup>	No.	% <sup>2</sup>	No.	% <sup>2</sup>
<b>Principal diagnosis</b>						
<b>Infectious and parasitic diseases</b>	9,462	1.5	22,407	2.2	31,869	1.9
<b>Cancer</b>						
lung cancer	897	0.1	3,965	0.4	4,862	0.3
cancer of the female breast	1,008	0.2	4,382	0.4	5,390	0.3
<b>Total cancer</b>	24,910	4.0	54,405	5.4	79,315	4.8
<b>Mental disorders</b>						
psychosis	9,798	1.6	21,616	2.1	31,114	1.9
neurotic, personality or other mental disorders	15,549	2.5	19,980	2.0	35,529	2.2
<b>Total mental disorders</b>	25,059	4.0	41,682	4.1	66,741	4.1
<b>Circulatory system diseases</b>						
ischaemic heart disease	9,774	1.6	47,079	4.6	56,852	3.5
<b>Total circulatory diseases/disorders</b>	27,583	4.4	120,696	11.9	148,279	9.0
<b>Respiratory system diseases</b>						
bronchitis, emphysema or asthma	2,658	0.4	23,893	2.3	26,551	1.6
<b>Total respiratory diseases/disorders</b>						
0 to 4 year olds	2,845	0.5	22,145	2.2	24,990	1.5
all ages	11,130	1.8	92,108	9.1	103,238	6.3
<b>Accidents, poisonings and violence</b>	30,502	4.9	99,718	9.8	130,219	7.9
<b>All causes (excl. renal dialysis)</b>						
Females	340,468	54.3	560,069	55.1	900,537	54.8
Males	287,040	45.7	456,676	44.9	743,716	45.2
<b>Public acute hospitals (excl. renal dialysis)</b>	368,491	58.7	792,384	77.9	1,160,875	70.6
<b>Private acute &amp; psychiatric hospitals (excl. renal dialysis)</b>	259,017	41.3	224,362	22.1	483,379	29.4
<b>Total admissions (excl. renal dialysis)</b>	627,508	100.0	1,016,746	100.0	1,644,254	100.0
<b>Total admissions</b>						
Admissions for renal dialysis	111,065	15.0	1,146	0.1	112,211	6.4
All other admissions	627,508	85.0	1,016,746	99.9	1,644,254	93.6
<b>Total admissions (incl. renal dialysis)</b>	738,573	100.0	1,017,892	100.0	1,756,465	100.0
<b>Principal procedure</b>						
Tonsillectomy	105	0.02	10,023	2.2	10,128	1.1
Myringotomy	5,786	1.4	613	0.1	6,399	0.7
Caesarean section	35	0.01	15,050	3.2	15,085	1.7
Hysterectomy	7	0.00	11,010	2.4	11,017	1.2
Hip replacement	2	0.00	5,005	1.1	5,007	0.6
Lens insertion	17,429	4.2	16,662	3.6	34,091	3.8
Endoscopy	117,687	28.0	18,979	4.1	136,666	15.4
<b>Total (incl. all other) procedures</b>	420,342	100.0	465,261	100.0	885,603	100.0

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

<sup>2</sup>Percentage of Total admissions for Principal diagnosis and of Total procedures for Principal procedures

Source: See *Data sources*, Appendix 1.3

## Deficiencies in the admissions data

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

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

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

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

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

The lack of a unique patient identifier represents a major deficiency in analysing data for individuals rather than admissions. Although many hospitals have unique identifiers for patients within their hospitals, such identifiers do not exist between hospitals<sup>3</sup>. Thus the data includes repeat admissions and is, therefore, of limited value in describing patterns of hospitalisation for individuals. These issues also apply to many other collections of service utilisation data.

## Differences in data treatment between editions

In the first edition of the atlas all same day patients were excluded from the analysis, and were not mapped. The decision to exclude this group of patient episodes was based on a concern that their inclusion could distort the pattern of admission at the SLA level. This could occur because the measure mapped is the

<sup>3</sup>Although 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.

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 111,065 admissions in 1995/96, 6.4 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 New South Wales in relation to those for the other States could well have been explained (and, at least in part, removed). For example, in 1989-90, the standardised admission ratio (SAR) for both male and female residents of New South Wales was 80. The equivalent ratios for South Australians were 104 for males and 102 for females. For both males and females this represents a differential of just over 25 per cent.

In 1989-90, same day patients accounted for some 27.8 per cent of all admissions in New South Wales and a lower 22.7 per cent in South Australia (1989) (**Table 6.4**)<sup>4</sup>. 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.

<sup>4</sup>The 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 editions<sup>1</sup>**

Admission type	1989 <sup>2</sup>		1995/96	
	Number	Per cent	Number	Per cent
<b>South Australia</b>				
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
<b>New South Wales</b>				
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

<sup>1</sup> 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

<sup>2</sup>1989-90 for New South Wales

Source: See *Data sources*, Appendix 1.3

There were 1,644,254 admissions to hospital of residents of New South Wales in 1995/96, of which 97.2 per cent were admissions to hospitals within the State, 1.15 per cent were to hospitals in Queensland, 0.77 per cent were to Victorian hospitals and 0.67 were to hospitals in the Australian Capital Territory (**Table 6.5**).

Variations in the proportions of residents of New South Wales admitted to hospitals outside of the State are largely related to

the location of their residence. For example, residents of Tweed (situated on the State's northern border) frequently go to a hospital in the Gold Coast; and residents of Queanbeyan use hospitals in adjacent Canberra.

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 New South Wales by State/Territory of location of hospital, 1995/96**

	Location of hospital								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
Number	1,598,531	12,732	18,860	2,288	419	161	189	11,073	1,644,254
Per cent	97.22	0.77	1.15	0.14	0.03	0.01	0.01	0.67	100.00

Source: See *Data sources*, Appendix 1.3

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

## Capital city comparison (Australia as the Standard)

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

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

**Table 6.6: Admissions to public acute hospitals and private<sup>1</sup> hospitals, capital cities**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Includes acute and psychiatric hospitals and day surgery facilities

<sup>2</sup>Includes Queanbeyan (C)

<sup>3</sup>Includes same day admissions, other than for renal dialysis

<sup>4</sup>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

## Sydney (New South Wales as the Standard)

There were 990,594 admissions to public acute and private hospitals of residents of **Sydney**, 1 per cent fewer admissions than were expected from the State rates (an SAR of 99\*\*). Females accounted for 55.1 per cent of these admissions.

A majority of the SLAs in **Sydney** had ratios in the middle range mapped, 5 per cent above or below the level expected, and more than half (51.1 per cent) were below the level expected. Only five SLAs had SARs in the highest range mapped, and there were none in the lowest range.

The highest standardised admission ratio, of 181\*\*, was recorded in the SLA of Sydney, indicating that there were 81 per cent more admissions than were expected from the State rates. The remaining four SLAs with SARs in the highest range - Concord (with an SAR of 122\*\*), South Sydney (119\*\*), Camden (115\*\*) and Drummoyne (115\*\*) - all had around twenty per cent more admissions than expected.

The SLAs of Kogarah, Hornsby and Baulkham Hills had the lowest SARs for this variable, each with 13 per cent fewer admissions than were expected from the State rates. Low ratios were also recorded in a number of SLAs to the north of **Sydney**, including, Ku-ring-gai, Willoughby, Ryde, North Sydney and Lane Cove.

The largest number of admissions to public acute and private hospitals was recorded in Blacktown, with 59,347 admissions (and an SAR of 109\*\*). High numbers were also recorded for residents of Sutherland (an SAR of 103\*\* and 54,647 admissions), Bankstown (102\*\* and 46,166), Gosford (105\*\* and 43,617) and Fairfield (88\*\* and 40,290).

There was a weak association evident in the correlation analysis at the SLA level with the indicators of socioeconomic disadvantage, including an inverse correlation of meaningful significance with the variable for female labour force participation (-0.53) and a correlation of meaningful significance with the variable for dwellings with no motor vehicle (0.55). Correlations of similar statistical significance were evident with the variables for premature deaths of males (0.63), from accidents, poisonings and violence (0.70), and of females (0.72). Correlations of substantial significance were recorded with many of the other variables for admissions mapped in this chapter.

## Newcastle

Residents of **Newcastle** had 116,558 admissions, 9 per cent fewer admissions than expected from the State rates (an SAR of 91\*\*). The largest number of admissions was recorded in Lake Macquarie (42,325) and the smallest number in Maitland (12,053).

All of the SLAs, except Cessnock with a ratio of 110\*\*, recorded SARs of below 100, ranging from 88\*\* in both Lake Macquarie and Port Stephens to 93\*\* in Maitland.

## Wollongong

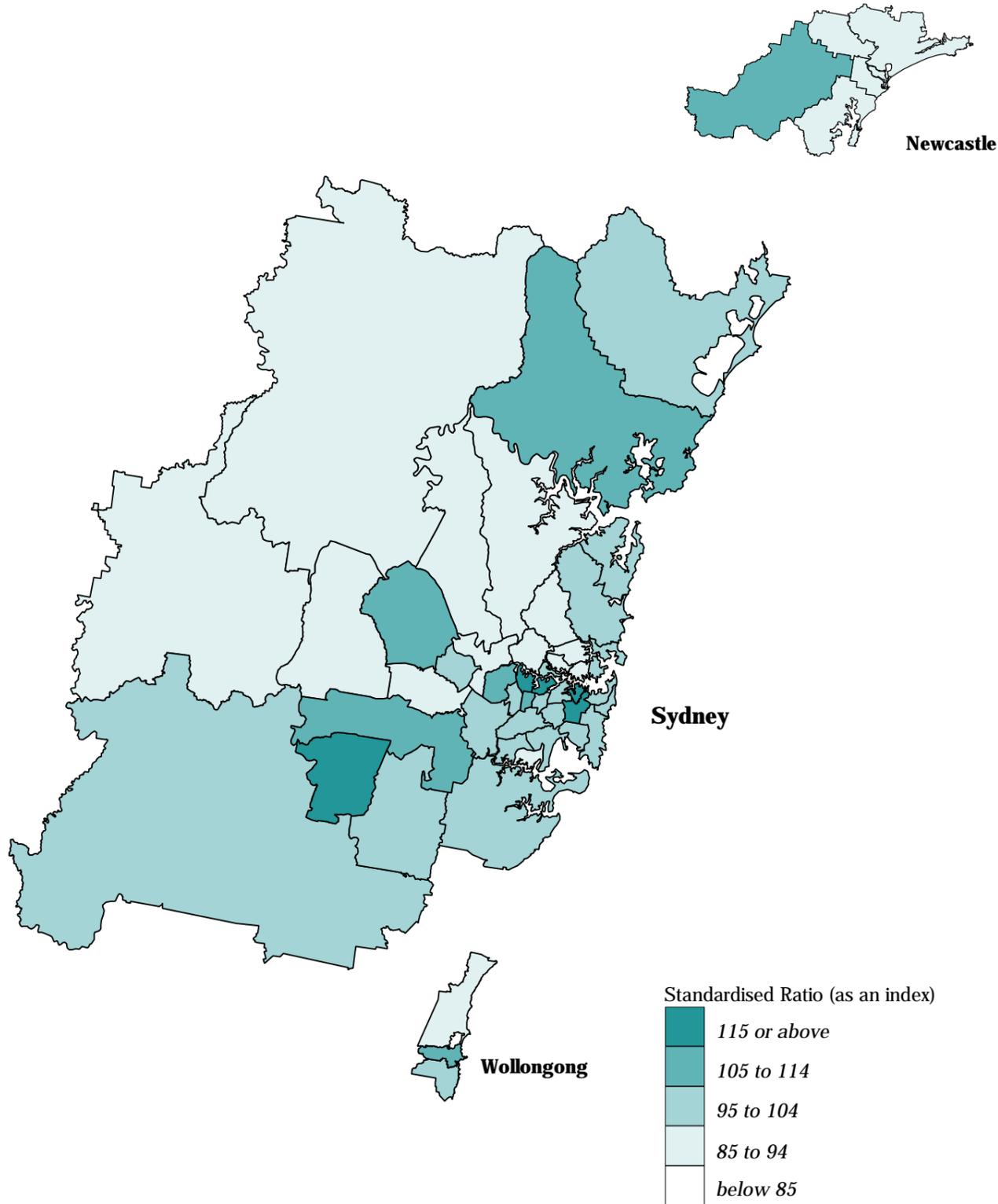
There were 3 per cent fewer hospital admissions than were expected from the State rates (an SAR of 97\*\*) in **Wollongong**.

An elevated ratio of 113\*\* was recorded for residents of Shellharbour, while the SLAs of Kiama and the City of Wollongong recorded fewer admissions than expected, with SARs of 96\*\* and 93\*\* respectively.

### Map 6.1

## Admissions to public acute hospitals and private hospitals, Sydney, Newcastle and Wollongong, 1995/96

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



Standardised Ratio (as an index)

- 115 or above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

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

Source: See Data sources, Appendix 1.3

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

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

## State/Territory comparison (Australia as the Standard)

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

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

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

**Table 6.7: Admissions to public acute hospitals and private<sup>1</sup> hospitals, State/Territory**  
**Age-sex standardised admission ratios**

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
<b>1995/96<sup>2</sup></b>									
Capital city	99**	97**	98**	101**	88**	102**	101	70**	97**
Other major urban centres <sup>3</sup>	94**	83**	97**	..	..	..	..	.. <sup>4</sup>	94**
Rest of State/Territory	107**	105**	111**	118**	112**	92**	123**	..	108**
Whole of State/Territory	101**	99**	103**	105**	95**	96**	113**	69**	100
<b>1989<sup>5</sup></b>									
Rest of State/Territory	118**	..	123**	136**	151**	..	172**	..	127**

<sup>1</sup>Includes acute and psychiatric hospitals and day surgery facilities

<sup>2</sup>Includes same day admissions, other than for renal dialysis

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

<sup>4</sup>Data unreliable: included with ACT total

<sup>5</sup>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 (New South Wales as the Standard)

There were 470,999 admissions of country residents to public acute and private hospitals in 1995/96, 6 per cent more than were expected from the State rates (an SAR of 106\*\*). The elevated ratio is in contrast to the lower than expected rate of admissions of city residents.

Two thirds of the State's SLAs had more admissions than were expected, with only one tenth mapped in the lowest range. SLAs with ratios elevated by 30 per cent or more were mainly situated to the north-west of **Sydney** (**Map 6.2**). The most highly elevated ratio was recorded in Brewarrina, with almost three times the number of admissions than were expected from the State rates (an SAR of 296\*\*). In total, 25 SLAs were mapped in the highest range, including Bourke (with an SAR of 246\*\*), Central Darling (240\*\*), Coonamble (163\*\*), Balranald (156\*\*), Walgett (155\*\*), and Barraba (155\*\*). All of the ratios mapped in this range were highly and significantly elevated.

Residents of Dumaresq (with an SAR of 17\*\*), Nymboida (60\*\*), Inverell [Part A] (65\*\*), Copmanhurst (65\*\*) and Parry (69\*\*), all located to the north of **Sydney**, recorded the lowest ratios for this variable. Other ratios mapped in this range were in Windouran (52\*\*) and Conargo (56\*\*), located in the south-west; Mulwaree (65\*\*), Tallaganda (66\*\*), Yarrowlumla (67\*\*) and Snowy River (68\*\*), situated in the south; and Cabonne [Part A] (61\*\*) and Unincorporated Far West (69\*\*).

The largest numbers of admissions were recorded for residents of Shoalhaven (with 23,249 admissions), Hastings (17,114 admissions) and Coffs Harbour (14,693 admissions).

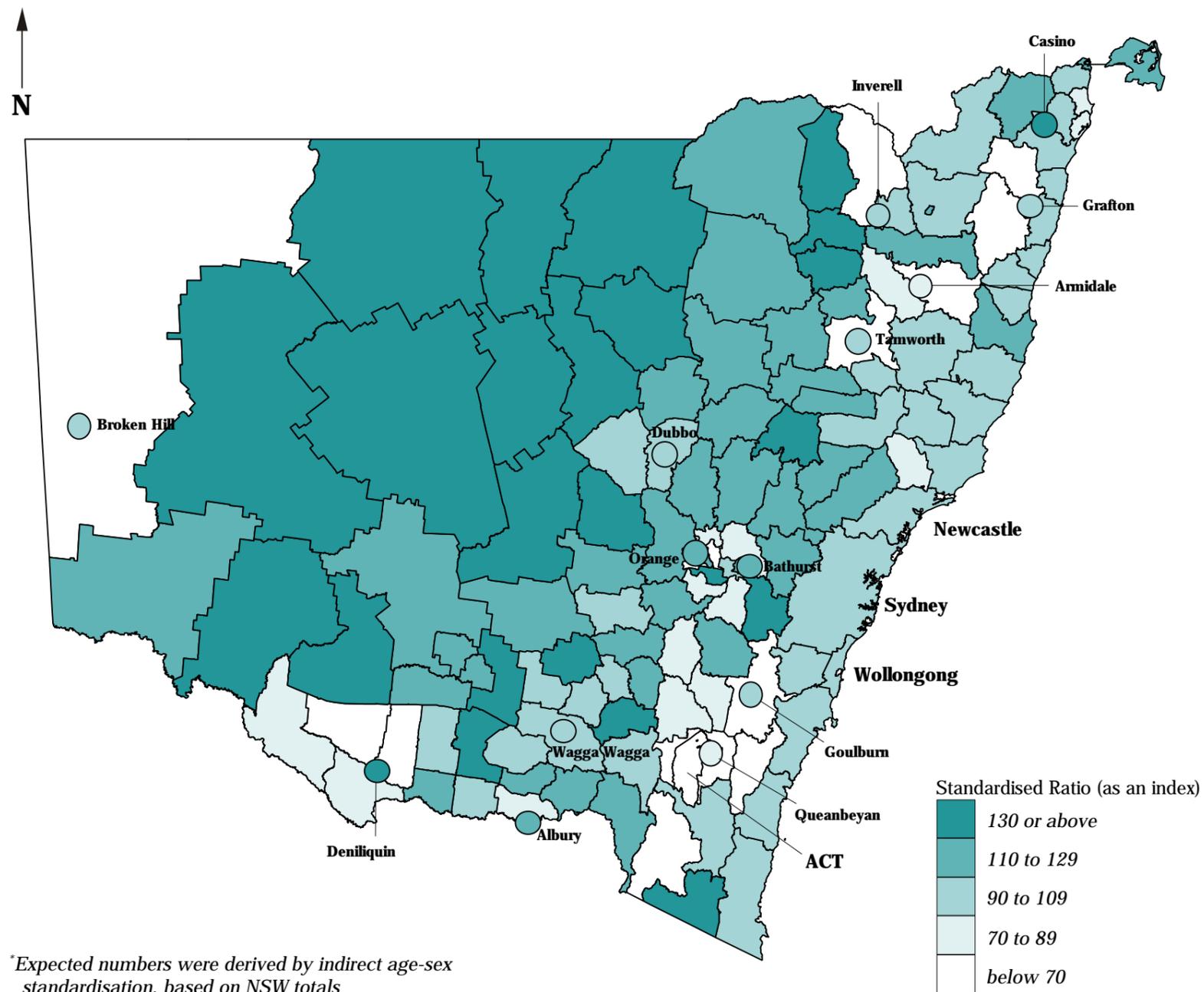
The results of the correlation analysis revealed a positive association at the SLA level with the following indicators of socioeconomic disadvantage: Aboriginal and Torres Strait Islander people (0.72), dwellings with no motor vehicle (0.67) and children aged from 0 to 4 years (0.51). The inverse correlation with the IRSD (-0.63) also indicates a positive association at the SLA level between high rates of admission to hospitals and socioeconomic disadvantage. A correlation of meaningful significance was also recorded with the variable for years of potential life lost (0.67).

There was no evidence of an association at the SLA level in the non-metropolitan areas of New South Wales between high rates of admission to hospital and socioeconomic status.

## Map 6.2

### Admissions to public acute hospitals and private hospitals, New South Wales, 1995/96

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

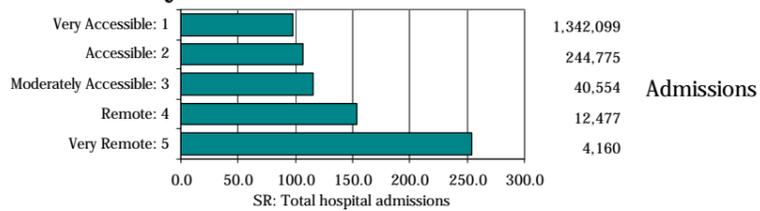


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



Standardised admission ratios increase steadily, from an SAR of 98 in the Very Accessible ARIA category to 115 in the Moderately Accessible category, and then increase substantially to an SAR of 154 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 191 for a definition of this hospital type) in Australia, including admissions of same day patients (other than for renal dialysis), whether to a hospital or to a same day surgical unit.

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

**Table 6.8: Admissions to public acute hospitals<sup>1</sup>, capital cities, 1995/96**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Includes same day admissions other than for renal dialysis

<sup>2</sup>Includes 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 70.6 per cent of the State's admissions in 1995/96. The remaining 29.4 per cent of admissions were to private (acute or psychiatric) hospitals. For metropolitan residents, the proportion was 67.7 per cent and for non-metropolitan residents, it was a substantially higher 77.8 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 (54.2 per cent of inpatient admissions) and male admissions is graphed in **Figure 6.3**, page 187. 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.

## Sydney (New South Wales as the Standard)

There were 672,760 admissions to public acute hospitals in **Sydney** in 1995/96, 5 per cent fewer than were expected from the State rates (an SAR of 95\*\*). Of the 672,760 admissions, females accounted for over half (361,853 admissions, 53.8 per cent).

The pattern of distribution of SARs at the small area level reveals a strong association between SLAs whose residents are high users of public acute hospitals and those whose residents are of lower socioeconomic status, as described in Chapter 3. The highest ratios were recorded in the inner city areas, and extending to the western regions, while the lowest were recorded in areas to the north of the Parramatta River (**Map 6.3**).

By far the highest SAR, of 181\*\*, was recorded for residents in the City of Sydney, indicating that there were 81 per cent more admissions than were expected from the State rates. Ratios elevated by 15 per cent or more were also recorded in the SLAs of Concord (an SAR of 137\*\*), South Sydney (131\*\*), Camden (125\*\*), Blacktown (122\*\*) and Auburn (119\*\*).

In total, eight SLAs were mapped in the middle range, with SARs of between 95 and 104. Within this class interval, statistically significant ratios were recorded for residents of Wollondilly (104\*\*), Ashfield (103\*\*), Blue Mountains (103\*\*), Strathfield (103\*\*), Rockdale (96\*\*) and Gosford (95\*\*).

Residents of Ku-ring-gai had half the number of admissions to public acute hospitals that were expected from the State rates, an SAR of 50\*\*. Relatively low ratios were also recorded in Woollahra (60\*\*) and Waverley (79\*\*), located in the east; in Baulkham Hills (60\*\*), Mosman (63\*\*), Hornsby (66\*\*), North Sydney (71\*\*), Willoughby (77\*\*), Lane Cove (77\*\*), Hunter's Hill (77\*\*) and Manly, all situated to the north of the Parramatta River; and in Kogarah (73\*\*), located in the south.

In 1995/96 the largest number of admissions to public acute hospitals was recorded for residents of Blacktown, with 47,505 admissions. More than 28,000 admissions were also recorded for residents of Bankstown (34,182 admissions), Sutherland (32,097 admissions), Fairfield (29,516 admissions) and Gosford (28,122 admissions).

The correlation analysis revealed a positive association between high rates of admission to public acute hospitals and the variables for low income families (0.65), single parent families (0.56), dwellings rented from the State housing authority (0.55) and Indigenous Australians (0.50). The inverse correlation with the IRSD (-0.63) also indicates the existence of a positive association at the SLA level between high rates of admission to public acute hospitals and socioeconomic disadvantage.

## Newcastle

Residents of **Newcastle** had 15 per cent fewer admissions to public acute hospitals than were expected from the State rates (an SAR of 85\*\*, and a total of 76,534 admissions). The only elevated ratio was recorded for residents of Cessnock, an SAR of 129\*\*. The remaining SARs ranged from 75\*\* in Lake Macquarie to 92\*\* in Maitland.

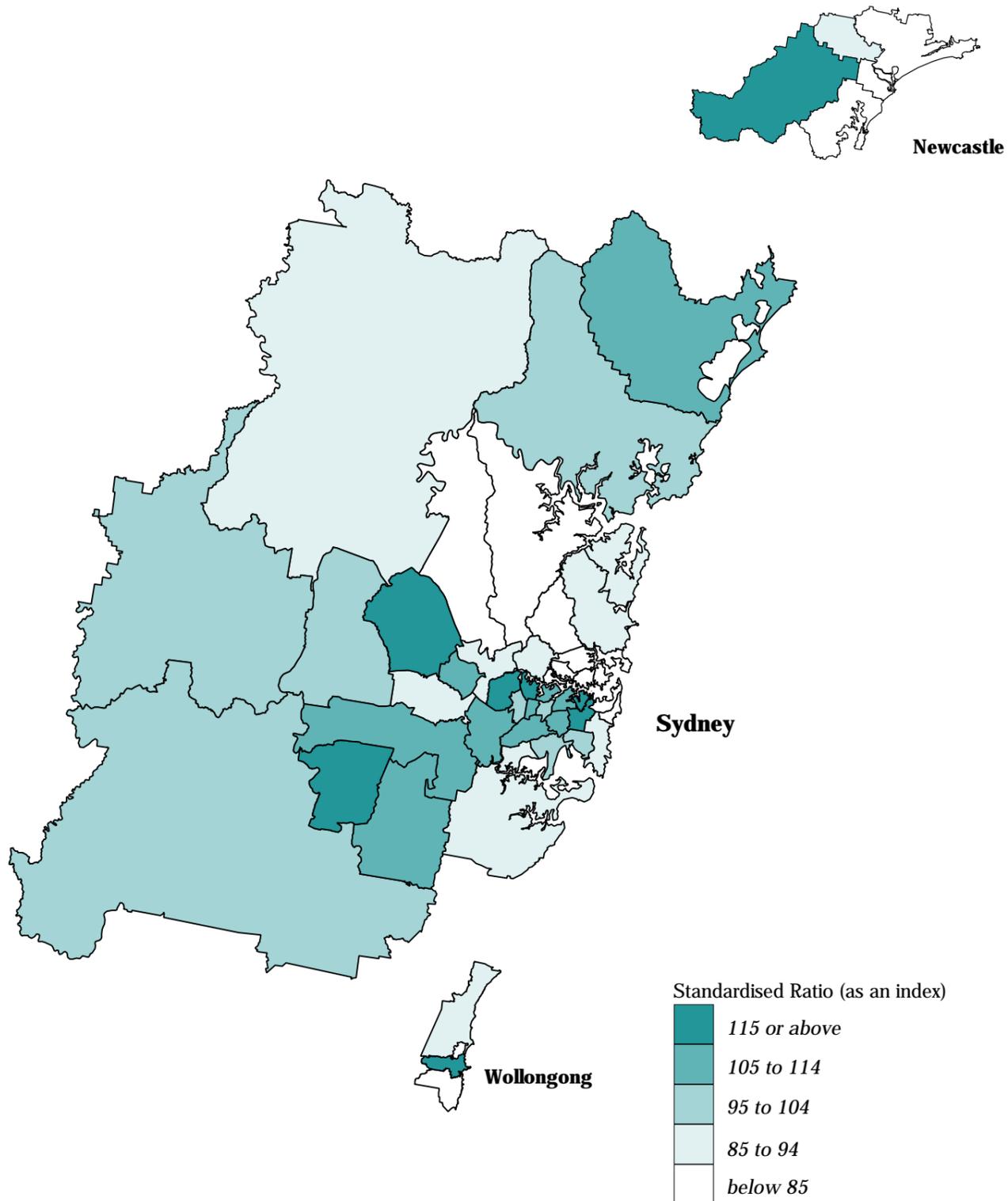
## Wollongong

In 1995/96, there were 45,350 admissions to public acute hospitals of residents of **Wollongong**, 5 per cent fewer than were expected from the State rates (an SAR of 95\*\*). Ratios below the level expected were recorded in Kiama (83\*\*) and the City of Wollongong (90\*\*), while an elevated ratio of 119\*\* was recorded for residents of Shellharbour.

### Map 6.3

## Admissions to public acute hospitals, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions to public acute hospitals, 1995/96

## State/Territory comparison (Australia as the Standard)

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

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

**Table 6.9: Admissions to public acute hospitals<sup>1</sup>, 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 <sup>2</sup>	93**	89**	73**	..	..	..	..	..	86**
Rest of State/Territory	123**	122**	110**	149**	139**	80**	159**	- <sup>3</sup>	121**
Whole of State/Territory	105**	96**	96**	108**	102**	80**	126**	78**	100

<sup>1</sup>Includes same day admissions, other than for renal dialysis

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

The relative availability of public acute hospitals and the lack of private hospitals throughout the non-metropolitan areas of New South Wales is evident from the high rate of use of public compared with private hospitals. Country residents had 17 per cent more admissions to public acute hospitals than expected from the State rates and 20 per cent fewer private hospital inpatient admissions. Some reasons for the substantially higher rates, compared with those in **Sydney**, are given on page 191. It should be noted that, although country residents use hospitals in **Sydney** (and occasionally in another State or Territory), the admissions are mapped to the SLA of usual residence of the patient.

In 1995/96, there were 366,230 admissions to public acute hospitals, of which 199,660 were admissions of females (54.4 per cent).

Just under half of the SLAs (48.5 per cent) in the non-metropolitan areas of New South Wales recorded ratios in the highest range mapped. Highly elevated SARs were recorded for admissions to public acute hospitals of residents of Brewarrina (an SAR of 392\*\*), Bourke (325\*\*), Central Darling (324\*\*) and Balranald (209\*\*). Relatively high ratios were also recorded in the far north-western SLAs of Walgett (198\*\*), Coonamble (195\*\*), Cobar (174\*\*), Warren (174\*\*) and Bogan (170\*\*); in the northern areas of Barraba (195\*\*), Casino (181\*\*) and Yallaroi (172\*\*); in the central western SLAs of Lachlan (193\*\*) and Oberon (176\*\*); and in the south-western areas of Narrandera (190\*\*), Deniliquin (187\*\*) and Hay (176\*\*).

With more than three quarters of the SLAs recording ratios above the level expected, very few SLAs had ratios lower than expected. The lowest of these was recorded for residents of Dumaresq, with 80 per cent fewer admissions than expected (an SAR of 20\*\*).

The next lowest ratios were recorded in Hastings (29\*\*), Windouran (51\*\*), Conargo (58\*\*), Cabonne [Part A] and Cabonne [Part B] (each with an SAR of 63\*\*). Nymboida (74\*\*), Dungog (77\*\*), Copmanhurst (77\*\*), Parry (79\*\*), Inverell [Part A] (80\*\*) and Great Lakes (82\*\*), all of which were located north of **Sydney**; Tallaganda (82\*\*) and Yarrawlumla (84\*\*), situated in the south-east; and Unincorporated Far West (84\*\*); were the only SLAs to record ratios in the second lowest range mapped.

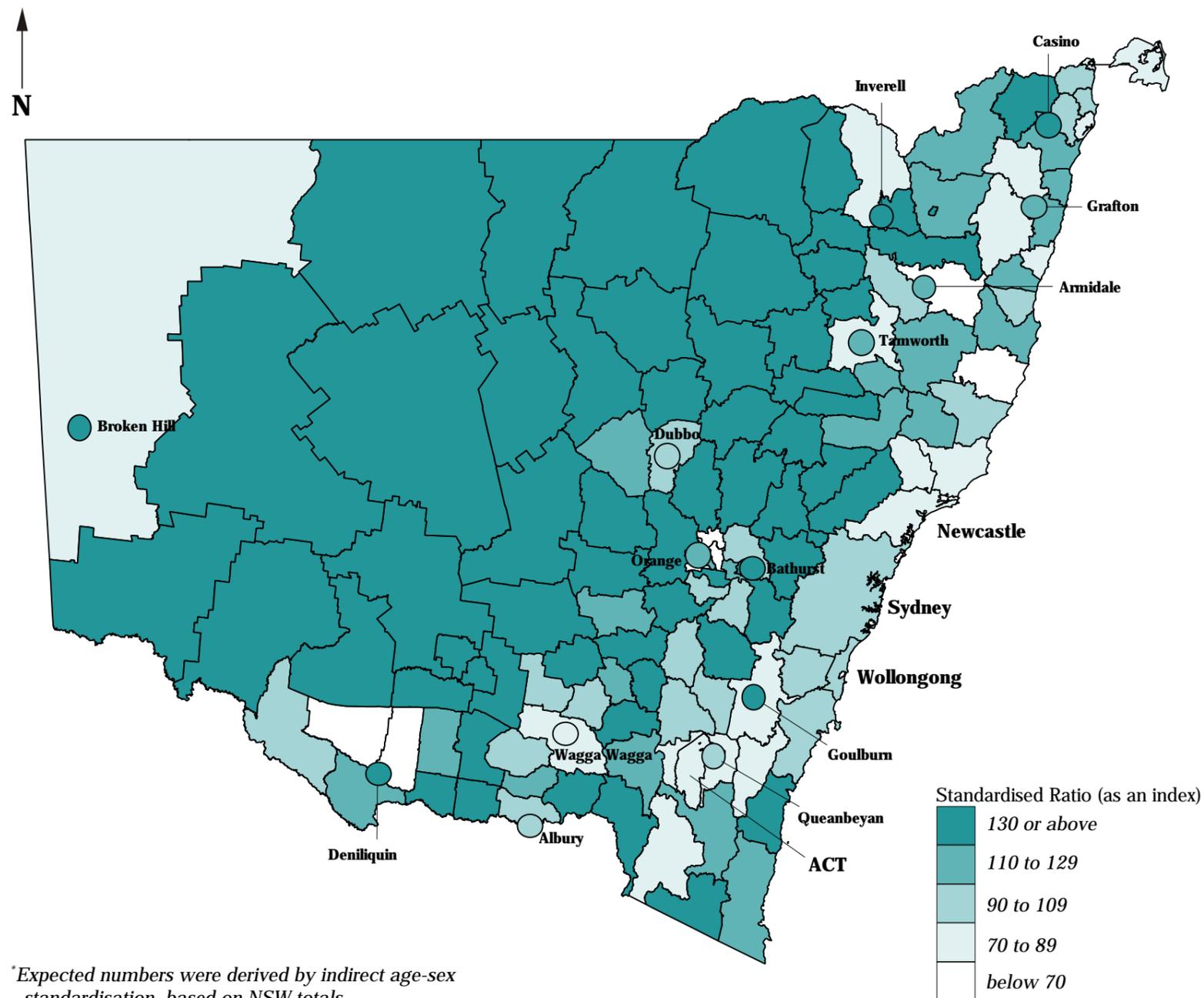
The largest numbers of admissions to public acute hospitals in the non-metropolitan areas of New South Wales were recorded in Shoalhaven, with 16,249 admissions; Greater Taree, 9,771 admissions; Coffs Harbour, 9,554 admissions and Eurobodalla, 9,250 admissions.

There were correlations of meaningful significance with the variables for the Indigenous population (0.73) and dwellings with no motor vehicle (0.63). The inverse correlation with the IRSD (-0.59) also indicates 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, New South Wales, 1995/96

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

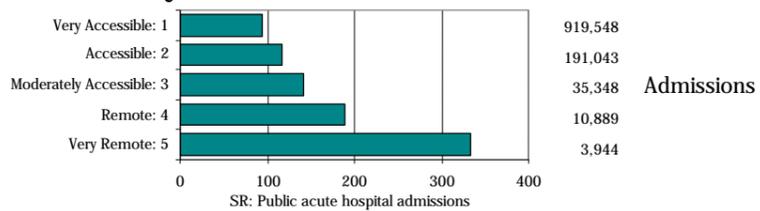


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions to public acute hospitals increase more markedly between the ARIA categories than do those for total admissions, and to a higher overall ratio for residents of areas in the Very Remote category, an SAR of 334.

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

# Admissions to private hospitals, 1995/96

## Capital city comparison (Australia as the Standard)

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

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

**Table 6.10: Admissions to private<sup>1</sup> hospitals, capital cities, 1995/96**  
*Age-sex standardised admission ratios*

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

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

<sup>2</sup>Includes 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 29.4 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 70.6 per cent were admissions to public acute hospitals. For metropolitan residents, the proportion was higher, at 32.3 per cent, and for non-metropolitan residents, it was a substantially lower 22.2 per cent.

Females make greater use of private hospitals than males, with admissions to private hospitals representing 30.2 per cent of all female admissions studied (compared with 28.5 per cent for males) and accounting for 56.2 per cent of private hospital admissions (53.8 per cent in public acute hospitals).

The age profile for admissions of females and males is graphed in **Figure 6.4**, page 188. 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.

## Sydney (New South Wales as the Standard)

Reflecting the largely metropolitan location of private hospitals, the standardised admission ratio was 8 per cent higher than expected in relation to the State rates (an SAR of 108\*\* and 317,834 admissions).

Just as the use of public hospitals had a distribution strongly associated with the location of residents of lower socioeconomic status postcodes, 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.

SLAs with ratios in excess of one and a half times the expected number of admissions were recorded for residents of Woollahra (with an SAR of 200\*\*), Mosman (194\*\*), Sydney (183\*\*), Ku-ring-gai (180\*\*), Manly (158\*\*) and Hunter's Hill (151\*\*). Also mapped in the highest range were the northern SLAs of Baulkham Hills (147\*\*), North Sydney (140\*\*), Hornsby (137\*\*), Pittwater (136\*\*), Lane Cove (134\*\*), Warringah (133\*\*), Gosford (127\*\*) and

Willoughby (120\*\*); and the SLAs of Waverley (147\*\*), Sutherland (144\*\*), Hurstville (124\*\*), Kogarah (121\*\*) and Drummoyne (118\*\*), located south of the Parramatta River.

The lowest standardised admission ratios were in three locations – in the north-western areas of Blue Mountains (an SAR of 55\*\*), Penrith (60\*\*), Blacktown (75\*\*), Fairfield (81\*\*) and Parramatta (82); in the outer southern SLAs of Wollondilly (70\*\*) and Campbelltown (79\*\*); and in the inner city areas of Auburn (70\*\*), Marrickville (74\*\*) and Leichardt (83\*\*).

The largest numbers of admissions to private hospitals were recorded in the SLAs of Sutherland (with 22,550 admissions), Ku-ring-gai (16,286), Gosford (15,495) and Hornsby (15,154).

Correlations of substantial significance were recorded with the variables for high income families (0.74) and managers and administrators, and professionals (0.71). The positive correlation with the IRSD (0.72) also indicates a positive association at the SLA level between high rates of admission to private hospitals and high socioeconomic status.

## Newcastle

There were 40,023 (17,604 males and 22,419 females) admissions to private hospitals in **Newcastle** in 1995/96, 7 per cent more than were expected from the State totals (an SAR of 107\*\*). Ratios above the level expected were recorded in Lake Macquarie (119\*\*), Newcastle (111\*\*) and Port Stephens (101), while Maitland (94\*\*) and Cessnock (63\*\*) had fewer admissions than expected from the State rates.

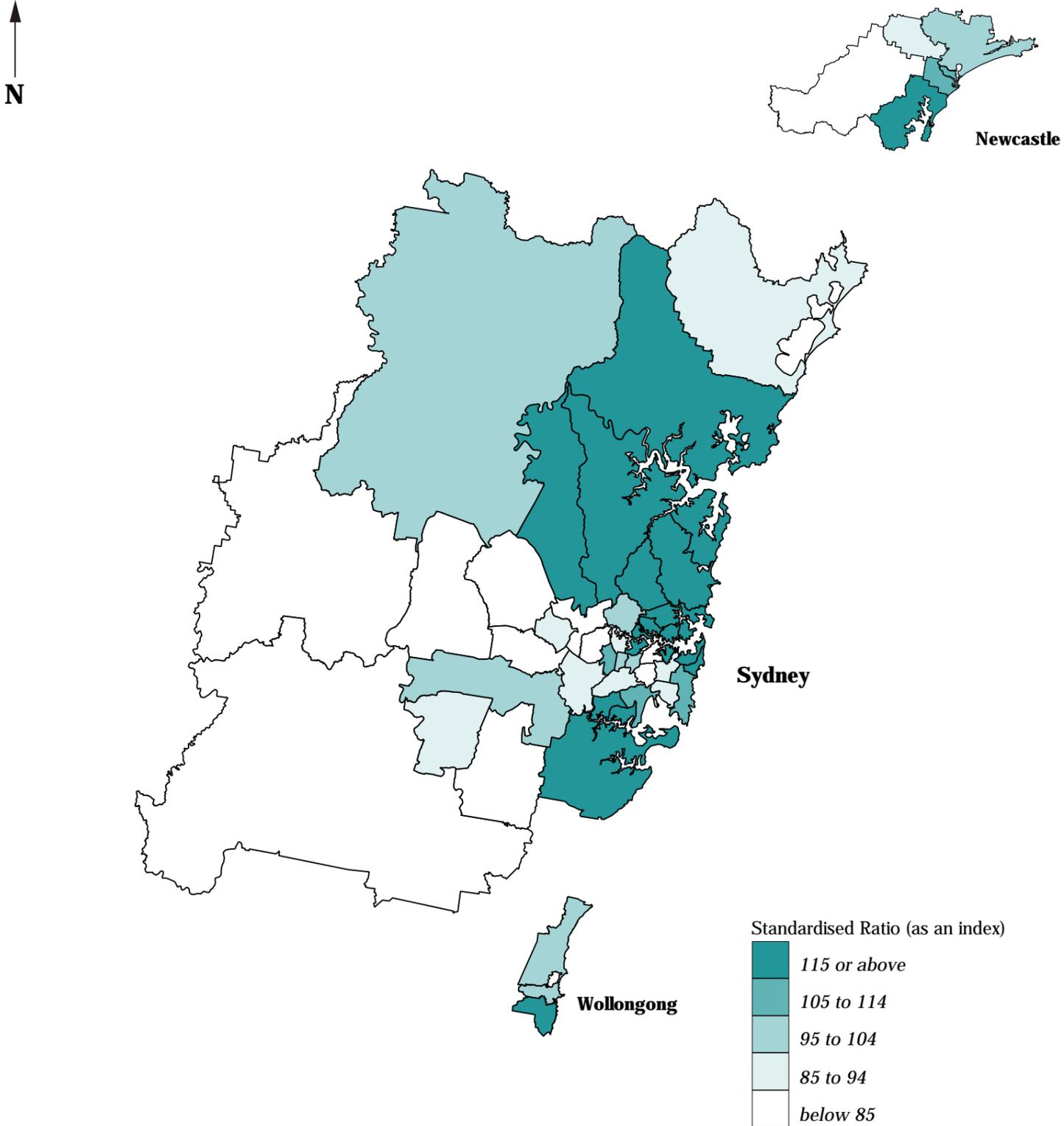
## Wollongong

In 1995/96, there were 4 per cent more admissions to private hospitals than were expected from the State rates (an SAR of 104\*\*), a total of 20,753 (10,620 admissions of females and 10,133 admissions of males). Average or above average ratios were recorded in each of the SLAs, ranging from 100 in Shellharbour to 130\*\* in Kiama.

### Map 6.5

## Admissions to private hospitals, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions to private hospitals, 1995/96

## State/Territory comparison (Australia as the Standard)

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

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

**Table 6.11: Admissions to private<sup>1</sup> 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 <sup>2</sup>	96**	72**	147**	..	..	..	..	..	113**
Rest of State/Territory	73**	69**	113**	55**	55**	118**	39**	- <sup>3</sup>	81**
Whole of State/Territory	91**	106**	119**	100	80**	131**	84**	48**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

The lack of private hospitals and the relative availability of public hospitals throughout country New South Wales is evident from the low rate of use of private compared with public hospitals. Country residents had 104,769 admissions to private hospitals, 20 per cent fewer admissions than expected from the State rates (an SAR of 80\*\*). They also had 17 per cent more admissions to public acute hospitals.

Only one tenth of the SLAs in the non-metropolitan areas of New South Wales had standardised admission ratios at or above the level expected. By far the highest of these ratios was recorded for residents of Hastings, with two and half times more admissions than were expected from the State rates (an SAR of 260\*\*). The remaining elevated ratios were recorded in the northern SLAs of Tweed Heads (176\*\*), Great Lakes (134\*\*), Coffs Harbour (113\*\*) and Lord Howe Island (110); in the central western areas of Orange (116\*\*) and Cabonne [Part B] (106); and the southern SLAs of Albury (115\*\*), Culcairn (108), Wagga Wagga (105\*\*), Lockhart (104), Shoalhaven (103) and Holbrook (100).

Fewer than half the expected number of admissions were recorded in more than one third of the non-metropolitan SLAs, however the number of admissions in each of these SLAs were quite small. The lowest of these, with more than 200 admissions, were recorded in Eurobodalla (an SAR of 20\*\* and 592 admissions), Cooma-Monaro (26\*\* and 205), Armidale (26\*\* and 424), Goulburn (27\*\* and 452), Bathurst (27\*\* and 568), Queanbeyan (28\*\* and 551), Inverell [Part B] (29\*\* and 271), Broken Hill (31\*\* and 601), Tumut (37\*\* and 337), Greater Lithgow (38\*\* and 595), Narrabri (43\*\* and 463), Forbes (46\*\* and 377), Parry (47\*\* and 468), Mudgee (47\*\* and 654), Yass (48\*\* and 354), Cowra (48\*\* and 503) and Brewarrina (48\*\* and 70).

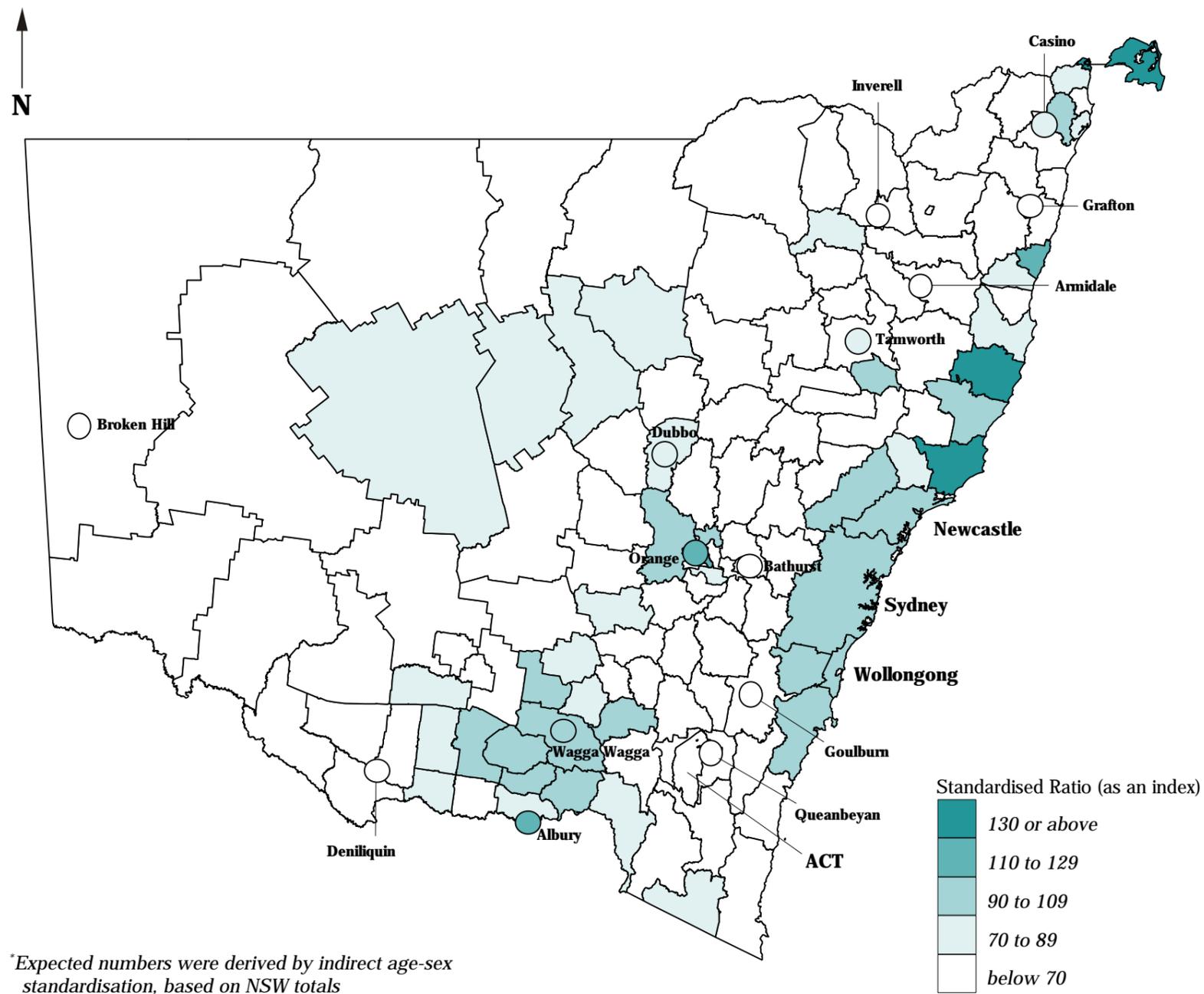
The largest number of admissions to private hospitals was in Hastings, with 13,484 admissions. More than 3,000 admissions were recorded for residents of Shoalhaven (7,000 admissions), Tweed Heads (6,063), Coffs Harbour (5,139), Wagga Wagga (4,304), Great Lakes (3,792), Albury (3,654), Greater Taree (3,486), Lismore (3,074) and Orange (3,028).

There was no consistent evidence in the correlation analysis of an association at the SLA level in the non-metropolitan areas of New South Wales between high rates of admission to private hospitals and socioeconomic status.

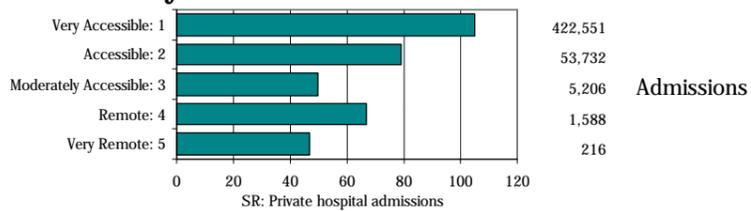
## Map 6.6

### Admissions to private hospitals, New South Wales, 1995/96

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



### Accessibility/Remoteness Index of Australia



Residents of the Very Accessible areas under the ARIA classification had an elevated standardised admission ratio for admissions to private hospitals of 105, 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 47 in the Very Remote ARIA category. Private hospital beds were only located in the Very Accessible and 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<sup>\*\*</sup>) and **Perth** (89<sup>\*\*</sup>).

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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	101 <sup>**</sup>	96 <sup>**</sup>	98 <sup>**</sup>	101 <sup>*</sup>	89 <sup>**</sup>	102 <sup>**</sup>	101	68 <sup>**</sup>	97 <sup>**</sup>
1989 <sup>3</sup>	80 <sup>**</sup>	..	101 <sup>**</sup>	104 <sup>**</sup>	91 <sup>**</sup>	..	103 <sup>*</sup>	..	89 <sup>**</sup>

<sup>1</sup>Includes Queanbeyan (C)

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

<sup>3</sup>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

Males account for 45.2 per cent of all admissions of New South Wales residents (which includes admissions to public acute and private hospitals, private psychiatric hospitals and same day surgery facilities, but excludes admissions of same day patients for renal dialysis and long stay nursing home type patients). For metropolitan residents the proportion was similar, at 44.9 per cent of admissions.

### Sydney (New South Wales as the Standard)

There were 444,440 admissions of males resident in **Sydney**, the same number of admissions as was expected from the State rates (an SAR of 100<sup>\*</sup>). The distribution of standardised admission ratios for males produced a pattern consistent with that for many of the measures of socioeconomic status (Chapter 3).

The four SLAs with ratios in the highest range mapped stood out, in marked contrast to the pattern of generally low to average ratios. These were Sydney (with an SAR of 215<sup>\*\*</sup>), South Sydney (153<sup>\*\*</sup>), Concord (118<sup>\*\*</sup>) and Drummoyne (117<sup>\*\*</sup>). The next highest SARs for male admissions were in the SLAs of Burwood, Camden, Blacktown, Wyong, Leichhardt, Strathfield, Woollahra, Liverpool and Gosford, with ratios ranging from 114<sup>\*\*</sup> to 105<sup>\*\*</sup>.

Of the remaining thirty two SLAs, only one was mapped in the lowest range, with the majority (18 SLAs) recording ratios in the middle range, of 5 per cent above or below the level expected.

Residents of Baulkham Hills had the lowest SAR for this variable, with 16 per cent fewer male hospital admissions than were expected from the State rates (an SAR of 84<sup>\*\*</sup>). Other higher socioeconomic SLAs of Willoughby and Hornsby (both with an SAR of 86<sup>\*\*</sup>), Ku-ring-gai, Kogarah and Hunter's Hill (each with an SAR of 88<sup>\*\*</sup>) all had similarly low ratios.

The largest numbers of admissions were recorded for male residents of Blacktown (26,108 admissions) and Bankstown (21,640), situated in the west; Sutherland (24,631), located in the south; and Gosford (20,019), in the north.

There were correlations of meaningful significance with the variables for female labour force participation (an inverse correlation of -0.51) and dwellings with no motor vehicle (a positive correlation of 0.69, and weaker correlations with most of the indicators of socioeconomic disadvantage). These results, together with the weak inverse correlation with the IRSD (-0.19), suggest the existence of an association between high rates of admission for males and socioeconomic disadvantage.

### Newcastle

In **Newcastle** there were 51,453 admissions, 11 per cent fewer admissions of males than expected from the State rates, an SAR of 89<sup>\*\*</sup>. The majority of these admissions were of residents of the SLAs of Lake Macquarie (18,519 admissions) and Newcastle (16,192 admissions). Cessnock was the only SLA to record an elevated ratio, with an SAR of 106<sup>\*\*</sup>. Other ratios ranged from 83<sup>\*\*</sup> in Lake Macquarie to 91<sup>\*\*</sup> in both Maitland and the City of Newcastle.

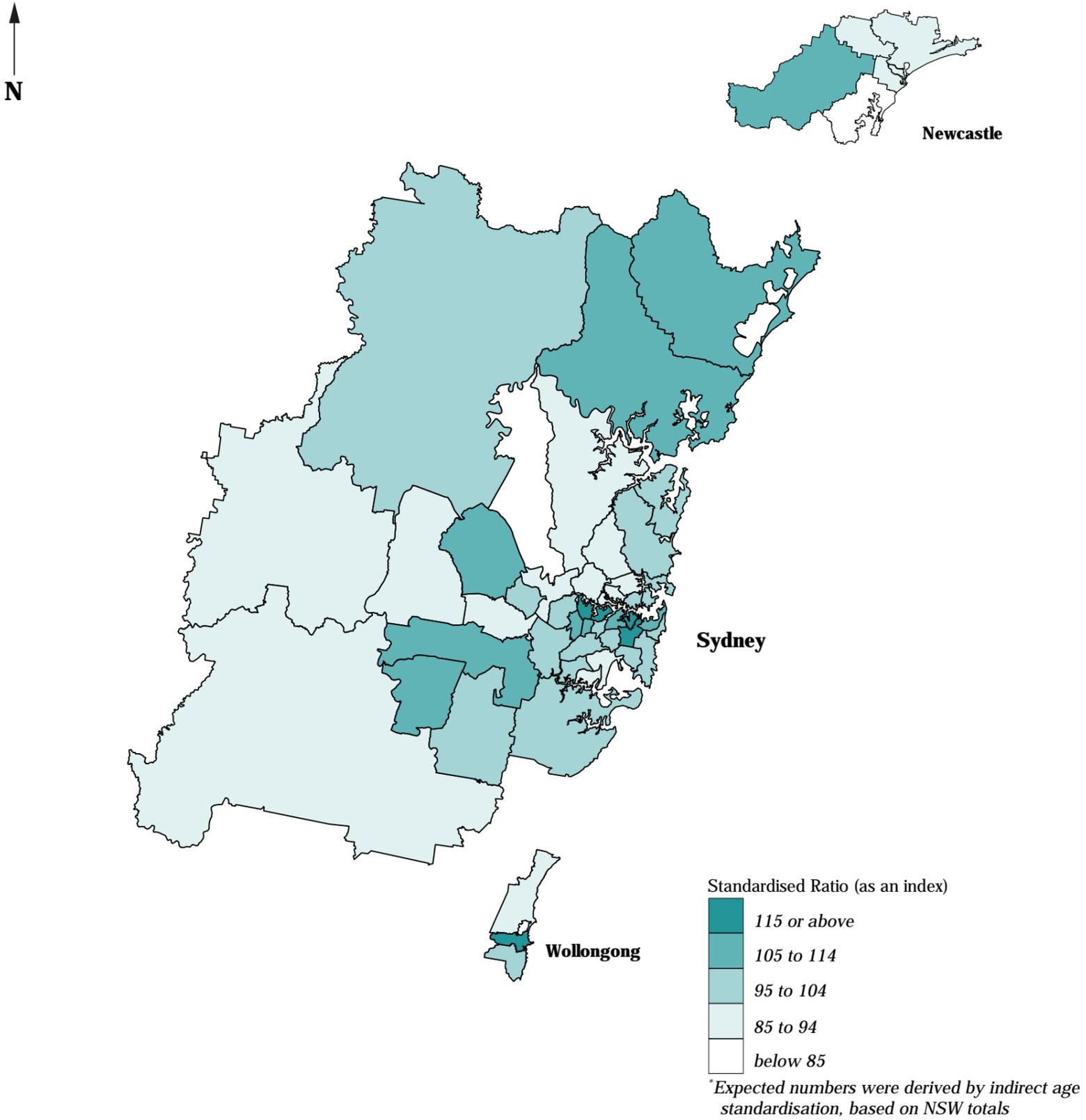
### Wollongong

**Wollongong** had marginally fewer admissions of males than expected from the State rates, an SAR of 99<sup>\*</sup> (and a total of 30,778 admissions). Residents of Shellharbour had an elevated SAR (116<sup>\*\*</sup>) and those in the City of Wollongong had a lower than expected ratio (94<sup>\*\*</sup>).

### Map 6.7

## Admissions of males, Sydney, Newcastle and Wollongong, 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  
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
<b>1995/96<sup>1</sup></b>									
Capital city	101**	96**	98**	101*	89**	102**	101	68**	97**
Other major urban centres <sup>2</sup>	93**	81**	99*	..	..	..	..	..	94**
Rest of State/Territory	106**	102**	113**	116**	108**	90**	120**	- <sup>3</sup>	107**
Whole of State/Territory	101**	98**	104**	105**	94**	95**	111**	67**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	116**	..	123**	134**	142**	..	176**	..	124**

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

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 217,044 admissions of males resident in country areas of New South Wales, 4 per cent more admissions than were expected from the State rates (an SAR of 104\*\*). The elevated ratio is in contrast to the lower than expected ratio for city residents. Some comments as to the possible reasons for the generally higher standardised admission ratios for residents of country areas are provided on page 191.

Several SLAs had standardised admission ratios in the highest range mapped, the highest being in the SLA of Brewarrina (with more than two and a half times the number of male admissions that were expected from the State rates, an SAR of 284\*\*). As can be seen from **Map 6.8**, a large proportion of the north-west of the State was mapped in the highest range, in SLAs that included Bourke (with an SAR of 237\*\*), Central Darling (237\*\*), Balranald (158\*\*), Coonamble (158\*\*), Lachlan (151\*\*), Walgett (149\*\*), Bogan (148\*\*), Narrandera (141\*\*), Cobar (139\*\*) and Hay (139\*\*).

There were 45 SLAs in country New South Wales that were mapped in the middle range, of 10 per cent above or below the level expected. The highest ratio, of 109\*\*, was recorded in the SLAs of Cootamundra, Corowa and Griffith, while there were 10 per cent fewer admissions than expected from the State rates in Jerilderie (an SAR of 90), Murray and Nambucca (both with an SAR of 90\*\*).

Dumaresq (with an SAR of 18\*\*), Windouran (49\*\*) and Cabonne [Part A] (50\*\*) had the lowest SARs. Although Windouran had a very low ratio for this variable, it also had the smallest number of admissions, with 28 when 58 were expected from the State rates. Nymboida, Copmanhurst, Inverell [Part A] and Parry, situated in the north and Mulwaree, Snowy River, Yarrowlumla and Gunning, located in the south, were also mapped in the lowest range.

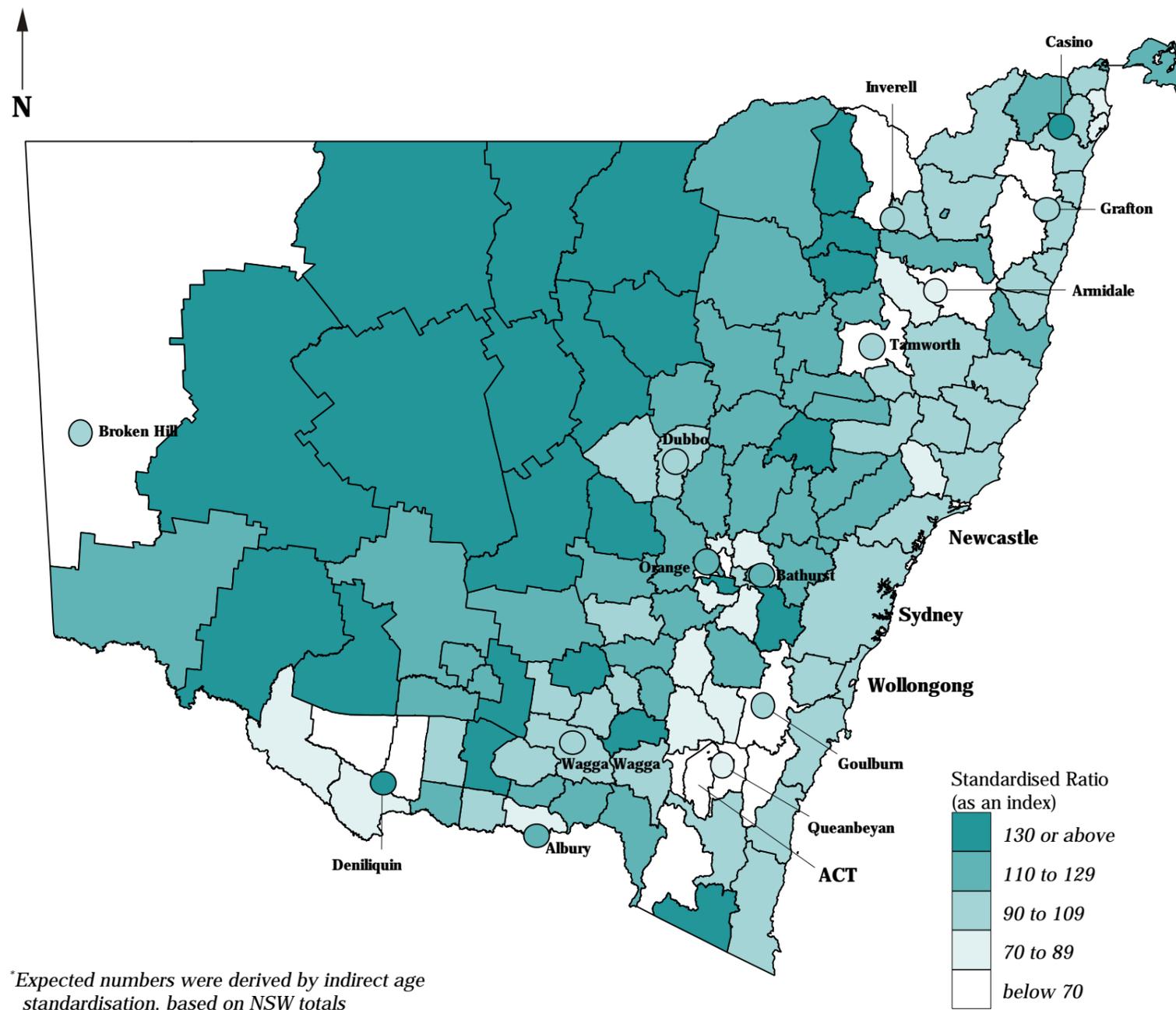
The largest numbers of admissions of males resident in the non-metropolitan areas of New South Wales were from Shoalhaven (11,171 admissions), Hastings (7,980) and Coffs Harbour (6,692).

There were correlations of meaningful significance at the SLA level with the variables for Aboriginal and Torres Strait Islander people (0.70) and dwellings with no motor vehicle (0.69). The inverse correlation of meaningful significance recorded with the IRSD (-0.65) also indicates a positive association at the SLA level between high admission rates for males and socioeconomic disadvantage. Substantially significant correlations were recorded with a number of the variables mapped in this chapter, including admissions from the combined causes of accidents, poisonings and violence (0.91) and admissions for respiratory system diseases (0.91).

## Map 6.8

### Admissions of males, New South Wales, 1995/96

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

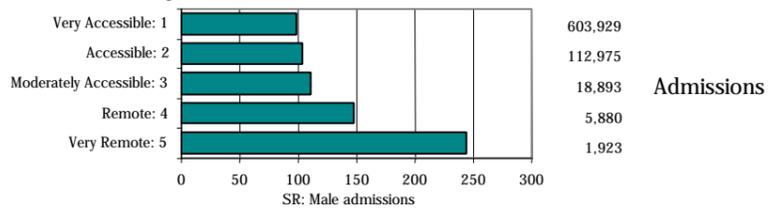


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for males closely follow the pattern evident for total admissions, with ratios of 99, 104 and 111 in the three 'accessible' categories, increasing substantially to SARs of 147 and 244 in the Remote and Very Remote categories, respectively. Again, the highly elevated ratio in the Very Remote category is based on a relatively small number of admissions.

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

## Admissions of females, 1995/96

### Capital city comparison (Australia as the Standard)

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

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

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

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

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

<sup>1</sup>Includes Queanbeyan (C)

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

<sup>3</sup>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

Females accounted for 55.1 per cent of all admissions of residents of **Sydney** and the other major urban centres and for 53.9 per cent of admissions of non-metropolitan residents. Overall, females had higher admission rates than males: 29,089 admissions per 100,000 population for females, compared with 24,322 admissions per 100,000 population for males.

### Sydney (New South Wales as the Standard)

There were 546,154 admissions of females resident in **Sydney**, two per cent fewer admissions than were expected from the State rates (an SAR of 98\*\*).

The distribution of standardised admission ratios for females across **Sydney** was very similar to that recorded for males. No SLA had a standardised admission ratio in the lowest range, and only three SLAs had ratios in the highest range of 15 per cent or more higher than expected.

The SLA of Sydney had the highest ratio for this variable, its SAR of 149\*\* indicating that there were 49 per cent more admissions of females than expected from the State rates. Concord (with an SAR 125\*\*), situated in the inner suburbs, and Camden (117\*\*), located in the south-west, were also mapped in the highest range.

Residents of Kogarah, Hornsby and Blue Mountains (each with an SAR of 87\*\*), Penrith (with an SAR of 88\*\*) and Parramatta, North Sydney and Baulkham Hills (each with an SARs of 89\*\*) had the lowest ratios for this variable.

The largest numbers of admissions were recorded for female residents of Blacktown (33,239 admissions), Sutherland (30,016) and Bankstown (24,525). In contrast, females in Sydney had 1,618 admissions, in Hunter's Hill had 2,195 and in Wollondilly had 4,207.

There were weak correlations between high rates of admission of females and many of the indicators of socioeconomic disadvantage.

### Newcastle

**Newcastle** had an SAR of 94\*\*, indicating that there were 6 per cent fewer admissions of females than were expected from the State rates (65,104 admissions). Maitland, Port Stephens, Lake Macquarie and the City of Newcastle all had fewer admissions than expected. By contrast, female residents of Cessnock recorded more admissions than expected, with an SAR of 113\*\*.

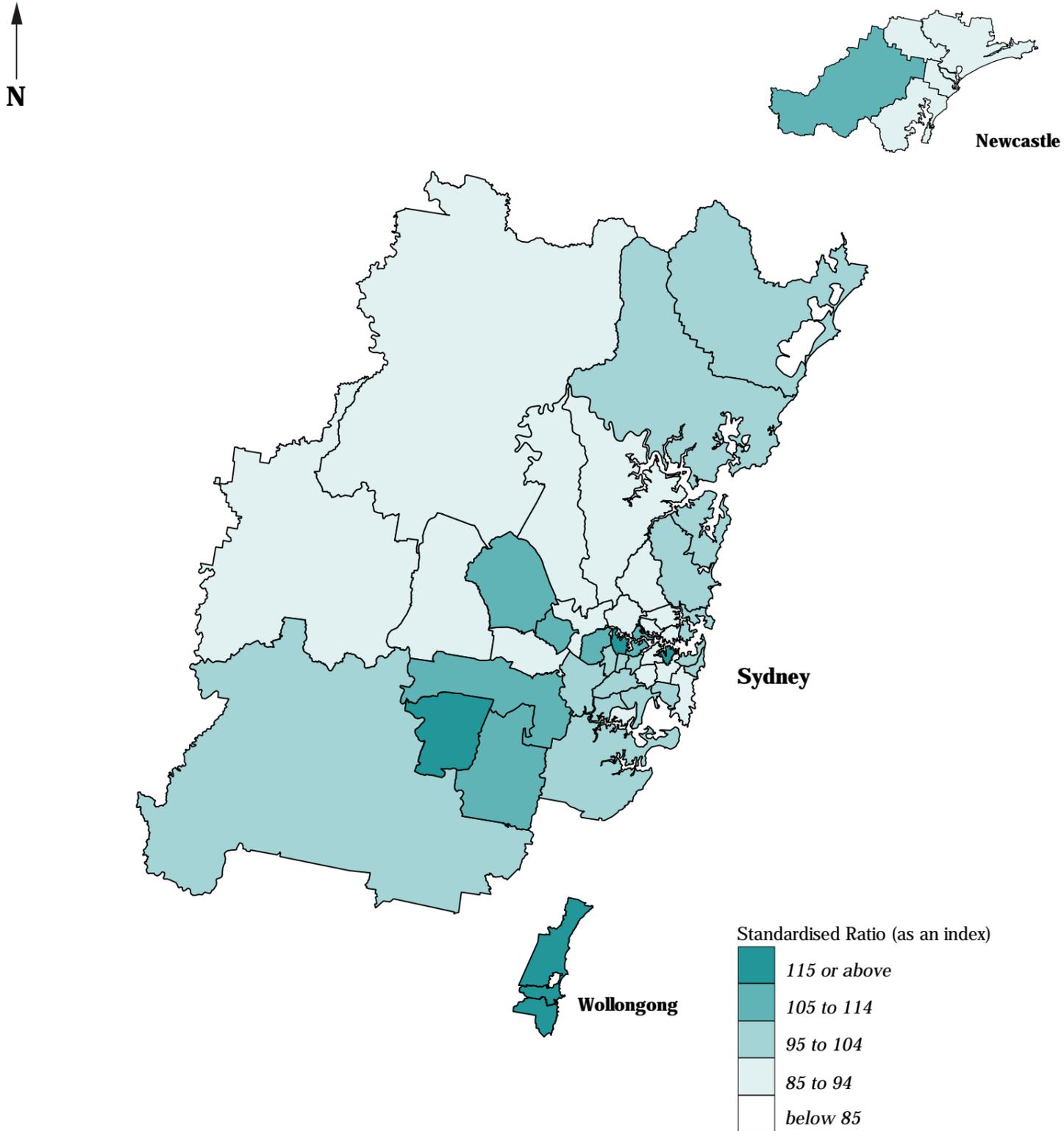
### Wollongong

There were 35,325 admissions of female residents of **Wollongong**, an SAR of 96\*\*. Shellharbour had an SAR of 111\*\*, while Kiama (with an SAR of 96\*) and the City of Wollongong (92\*\*) had fewer admissions of females than expected from the State rates.

### Map 6.9

## Admissions of females, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

## Admissions of females, 1995/96

### State/Territory comparison (Australia as the Standard)

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

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

In all of the States and Territories for which data 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
<b>1995/96<sup>1</sup></b>									
Capital city	98**	98**	98**	101**	88**	103**	102	71**	97**
Other major urban centres <sup>2</sup>	95**	85**	96**	..	..	..	..	..	94**
Rest of State/Territory	108**	107**	109**	121**	116**	94**	126**	- <sup>3</sup>	109**
Whole of State/Territory	100	100	102**	106**	95**	98**	114**	70**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	120**	..	124**	138**	159**	..	169**	..	128**

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

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 253,954 admissions of females resident in country areas of New South Wales, 8 per cent more than expected from the State rates (a ratio of 108\*\*). Some comments on the possible reasons for the generally higher standardised admission ratios for residents of country areas are provided on page 191.

As for males, the highest SAR was recorded for female residents of Brewarrina, with 853 admissions, more than three times the number of admissions that were expected from the State rates (an SAR of 306\*\*).

In total, 29 SLAs were mapped in the highest range, with SARs elevated by 30 per cent or more. The highest of these ratios were in Bourke (254\*\*), Central Darling (243\*\*) and Coonamble (167\*\*). Narrandera (166\*\*) and Deniliquin (158\*\*), in the south-west and Warren (165\*\*), Walgett (160\*\*) and Cobar (158\*\*), in the far north-west had similarly highly elevated ratios. It can be seen from **Map 10** that many other SLAs with highly elevated ratios were spread across most of the western part of the State.

There were 34 SLAs with SARs in the range of 10 per cent above or below the expected level. Within this range, the highest SARs were in Coonabarabran (109\*\*) and Corowa and Inverell [Part B] (both with an SAR of 107\*\*) and the lowest were in Ballina (90\*\*) and Hume (91\*\*).

Dumaresq and Conargo had the lowest SARs, of 17\*\* and 56\*\* respectively. Low ratios were also recorded in the SLAs of Tallaganda, Nymboida, Inverell [Part A], Unincorporated Far West, Yarrowlunla, Mulwaree and Copmanhurst. Although Windouran had a low ratio for this variable, with 43 per cent fewer admissions of females than were expected, there were only 26 admissions.

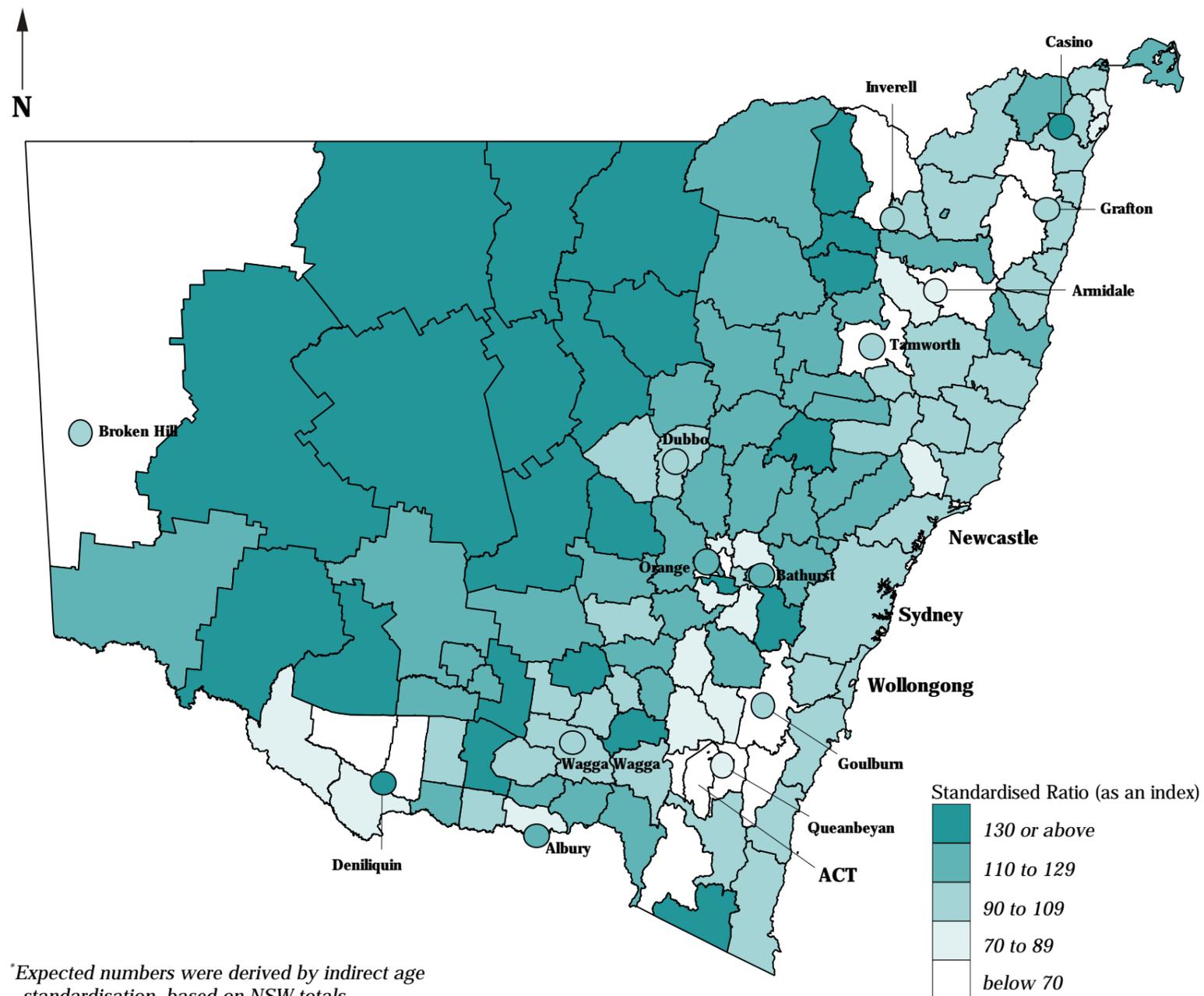
The largest numbers of admissions of females were recorded for residents of Shoalhaven, with 12,078 admissions; Hastings, with 9,134 admissions; and Coffs Harbour, with 8,001.

There were correlations of meaningful significance with the variables for the Indigenous population (0.71), dwellings with no motor vehicle (0.64) and children aged from 0 to 4 years (0.52). The inverse correlation of meaningful significance recorded with the IRSD (-0.60) also indicates a positive association at the SLA level between high admission rates for females and socioeconomic disadvantage. There were also correlations of substantial significance at the SLA level, with a number of the variables mapped in this chapter, including admissions from the combined causes of accidents, poisonings and violence (0.91).

# Map 6.10

## Admissions of females, New South Wales, 1995/96

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

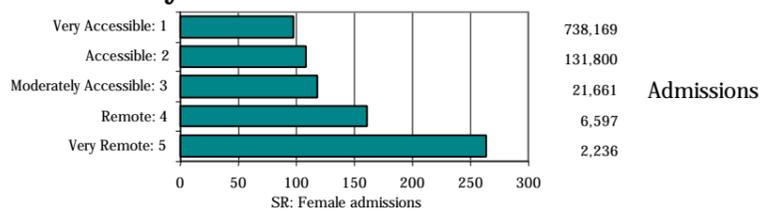


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for females also closely follow the pattern evident for total admissions, with ratios of 98, 108 and 118 in the three 'accessible' categories, increasing substantially to SARs of 161 and 263 in the Remote and Very Remote categories, respectively. 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 (more so in the two 'remote' categories).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

## Same day admissions, 1995/96

### Capital city comparison (Australia as the Standard)

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

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

**Table 6.16: Same day admissions<sup>1</sup>, capital cities, 1995/96**  
*Age-sex standardised admission ratios*

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

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

<sup>2</sup>Includes 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 38.2 per cent of all admissions in 1995/96 of New South Wales residents, with similar percentages recorded for males (38.6 per cent) and females (37.8 per cent). Same day admissions represented a higher proportion of all admissions in **Sydney** and the other major urban centres (41.5 per cent) than in the rest of the State (29.9 per cent).

### Sydney (New South Wales as the Standard)

In 1995/96 there were 415,336 same day admissions (other than for renal dialysis) of residents of **Sydney**, 8 per cent more than were expected from the State rates (an SAR of 108\*\*). The total number of same day admissions was comprised of 226,128 females (54.4 per cent) and 189,208 males (45.6 per cent).

Residents of the SLA of Sydney had the highest SAR for this variable, with just under twice the number of same day admissions expected from the State rates, an SAR of 194\*\*. It can be seen from **Map 11** that ratios elevated by 15 per cent or more were also recorded in the SLAs of Concord (167\*\*), Drummoyne (150\*\*), South Sydney (145\*\*), Camden (133\*\*), Burwood (133\*\*), Woollahra (126\*\*), Strathfield (124\*\*), Hurstville (122\*\*), Mosman (121\*\*), Holroyd (120\*\*), Sutherland (119\*\*), Waverley (119\*\*), Pittwater (118\*\*) and Rockdale (115\*\*).

Several SLAs had ratios in the middle range mapped, of 5 per cent above or below the expected level. Residents of Kogarah recorded the highest SAR in this range (104\*\*), while those in Willoughby recorded the lowest (97\*\*).

There were 22 per cent fewer same day admissions than expected in the Blue Mountains SLA, a ratio of 78\*\*. Low ratios were also recorded in the outer western SLAs of Fairfield (88\*\*), Penrith (88\*\*) and Hawkesbury (91\*\*).

More than 20,000 same day admissions were recorded for residents of the SLAs of Sutherland (with 24,371 admissions) and Blacktown (22,737 admissions). In contrast, there were 1,361 admissions recorded from Hunter's Hill, 1,575 from Sydney and 3,356 from Lane Cove.

The correlation analysis revealed a weak positive association with indicators of socioeconomic disadvantage, reflecting the mix of high and low socioeconomic status SLAs with high SARs for this variable. There were, however, correlations of meaningful significance at the SLA level with the variables for dwellings with no motor vehicle (0.50), deaths of females aged from 15 to 64 years (0.51) and Years of Potential Life Lost (0.55).

### Newcastle

There were 12 per cent fewer same day admissions in **Newcastle** than were expected from the State rates, an SAR of 88\*\* (42,817 same day admissions). Residents of the SLA of Newcastle had the highest ratio, of 92\*\*, while the lowest ratio was recorded for residents of Port Stephens (an SAR of 80\*\*).

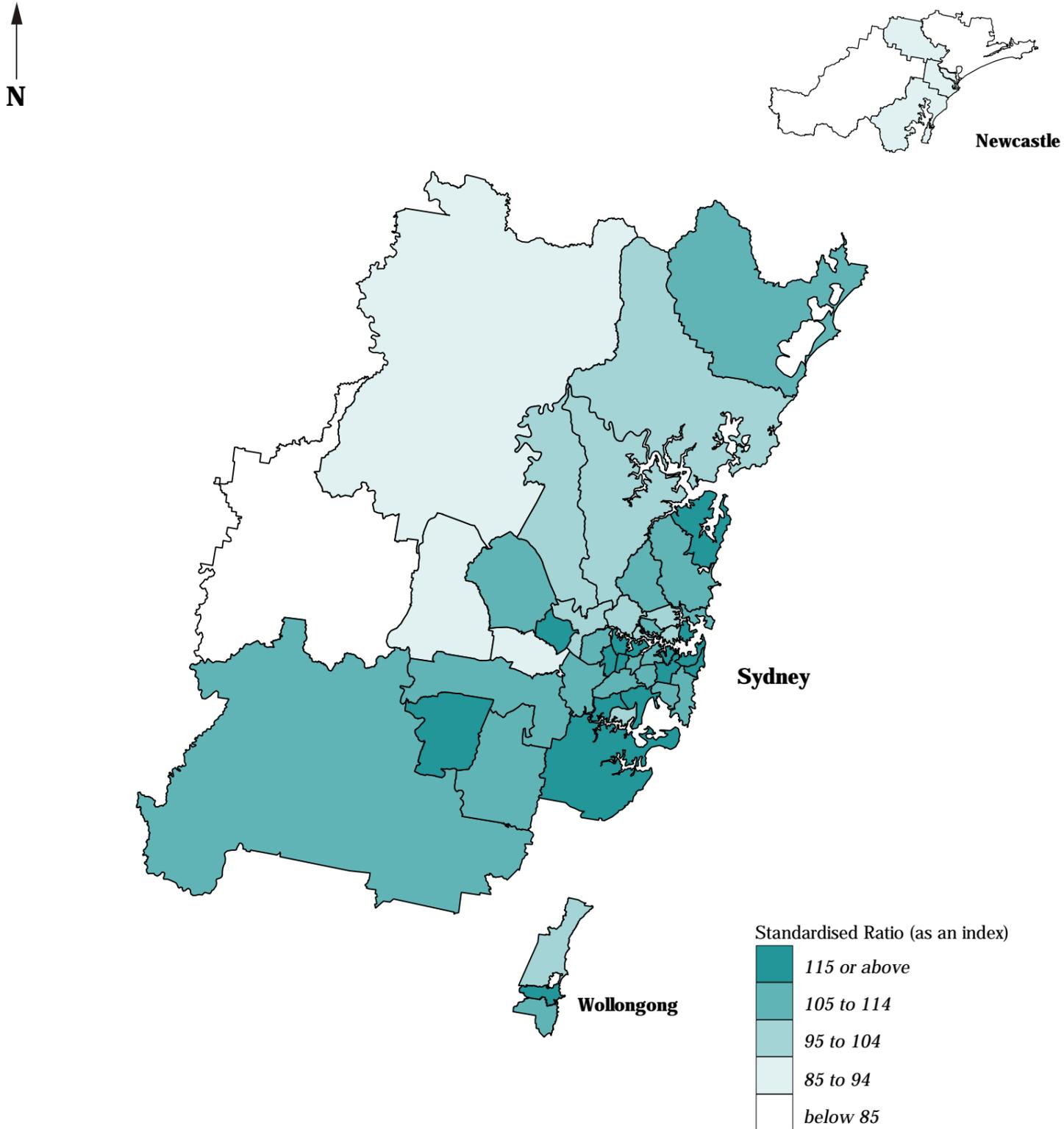
### Wollongong

There were 28,592 same day admissions in **Wollongong**, 10 per cent more than expected from the State rates (an SAR of 110\*\*). Kiama (113\*\*) and Shellharbour (136\*\*) had the highest SARs while the ratio in the City of Wollongong was only marginally elevated (a ratio of 103\*\*).

### Map 6.11

## Same day admissions, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

## Same day admissions, 1995/96

### State/Territory comparison (Australia as the Standard)

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

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

**Table 6.17: Same day admissions<sup>1</sup>, 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 <sup>2</sup>	97**	71**	103**	..	..	..	..	..	97**
Rest of State/Territory	84**	94**	97**	89**	79**	77**	58**	- <sup>3</sup>	89**
Whole of State/Territory	101**	108**	102**	95**	88**	85**	62**	61**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

In the non-metropolitan areas of New South Wales, there were 17 per cent fewer same day admissions than were expected from the State rates, a ratio of 83\*\*. Females accounted for 53.6 per cent of the total 140,764 admissions, while males accounted for 46.4 per cent.

The distribution of standardised admission ratios for same day patients (**Map 12**) was in marked contrast with those recorded for total admissions (admissions to public acute hospitals plus private hospitals). Only two SLAs had SARs in the highest range mapped, compared with 25 SLAs for total admissions.

The ratio recorded for residents of Brewarrina, located in the far north-west, was the highest, at 174\*\* indicating that there were 74 per cent more same day admissions than were expected from the State rates (a total of 348 admissions). The SLA of Central Darling also had a ratio in the highest range mapped, with 55 per cent more admissions than expected.

Only five other SLAs had ratios elevated by 10 per cent or more. These were the SLAs of Singleton (with an SAR of 123\*\*), Tweed Heads (120\*\*), Narrandera (113\*\*), Wingecarribee (112\*\*) and Albury (111\*\*).

By far the lowest ratio for same day admissions was recorded in the SLA of Dumaresq, with 89 per cent fewer admissions than

were expected from the State rates (an SAR of 11\*\*). Residents of Wakool, Murray, Inverell [Part A] and Wentworth also recorded low ratios for this variable, with 69 per cent, 64 per cent, 60 per cent and 59 per cent fewer admissions than expected, respectively. In total, 42 SLAs recorded standardised admission ratios in the lowest range mapped.

The largest numbers of same day admissions were recorded in the SLAs of Shoalhaven (7,890 same day admissions), Tweed Heads (5,210) and Hastings (5,130).

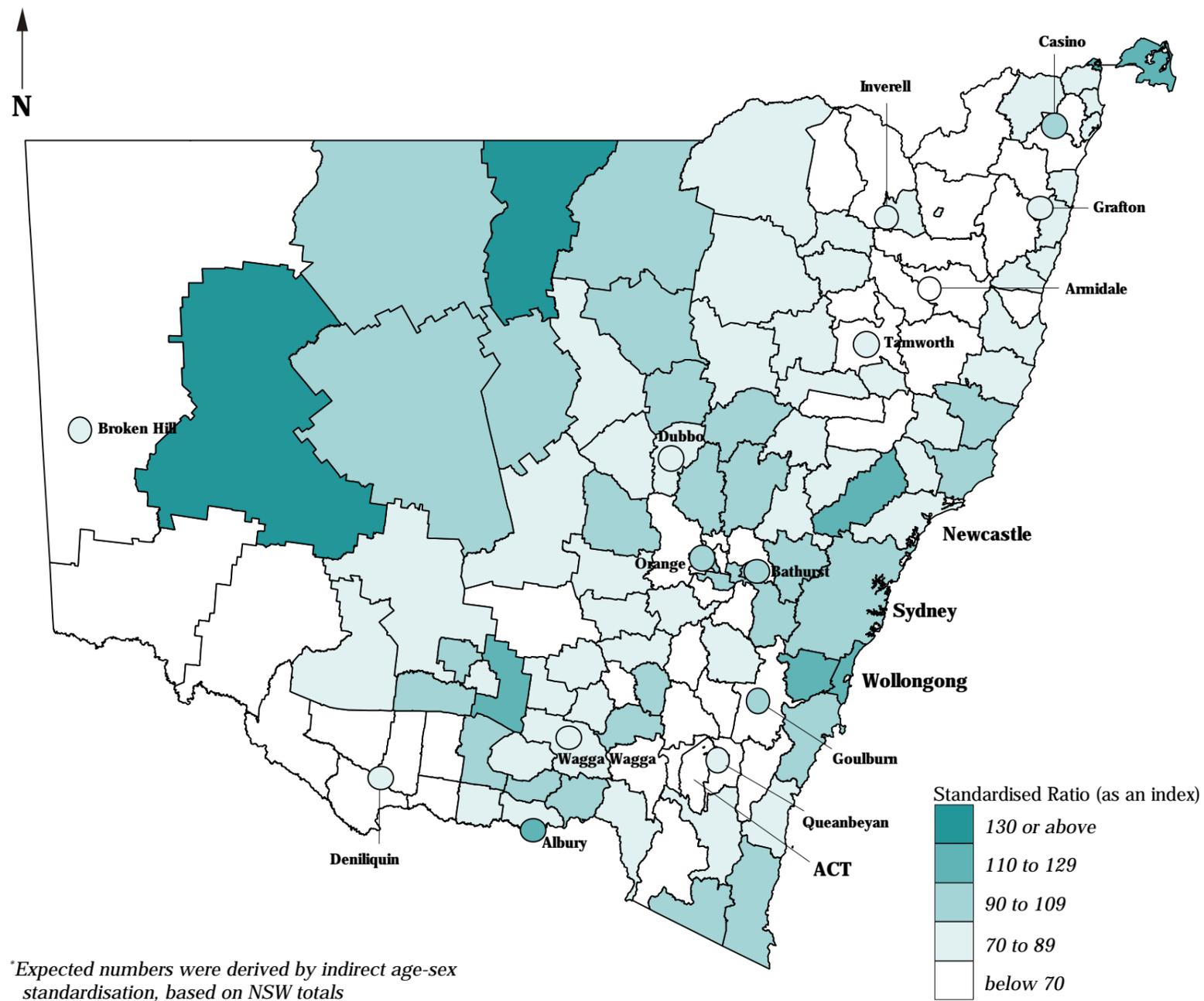
The largest numbers of same day admissions were recorded in the SLAs of Shoalhaven (7,890 same day admissions), Tweed Heads (5,210) and Hastings (5,130).

There was a weak association in the correlation analysis with the indicators of socioeconomic disadvantage, the strongest of these being with the variables for dwellings with no motor vehicle (0.55), housing authority rented dwellings (0.49) and single parent families and the Indigenous population (0.46). These results, together with the weak inverse correlation with the IRSD (-0.45), suggest the existence of an association at the SLA level between high rates of same day admissions and socioeconomic status.

# Map 6.12

## Same day admissions, New South Wales, 1995/96

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

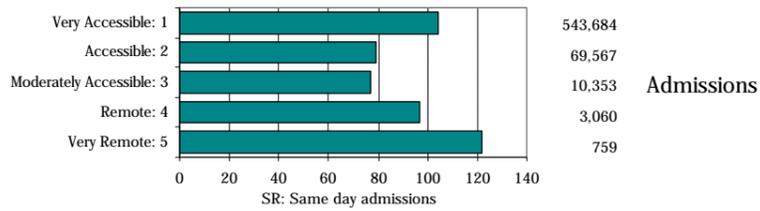


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for same day admissions drop off sharply, from an SAR of 104 in the Very Accessible category to SARs of 79 in the Accessible and 77 in the Moderately Accessible categories. Although reflecting relatively small numbers of admissions, the ratios in the two ARIA 'remote' categories were higher, at 97 in the Remote and 122 (the most highly elevated ratio) in the Very Remote categories.

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

# Admissions for infectious and parasitic diseases, 1995/96

## Capital city comparison (Australia as the Standard)

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

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

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

<sup>1</sup>Includes Queanbeyan (C)

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

<sup>3</sup>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

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 (24.9 admissions per thousand population for males and 22.6 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 1.9 per cent of all admissions of New South Wales residents.

## Sydney (New South Wales as the Standard)

There were 20,216 admissions for infectious diseases of residents of **Sydney**, 4 per cent more admissions than expected from the State rates (an SAR of 104\*\*). Males accounted for 11,701 (57.9 per cent) of the admissions.

Nearly one third (31.1 per cent) of the SLAs mapped for this variable had elevated ratios (**Map 13**), ten of which were in the highest range mapped. The highest of these were in the SLAs of Sydney (with an SAR of 635\*\*) and South Sydney (607\*\*), both with six times more admissions than were expected from the State rates. Highly elevated ratios were also recorded for

residents of Waverley (175\*\*), Leichhardt (158\*\*), Woollahra (139\*\*), Burwood (136\*\*), Marrickville (119\*\*), Blacktown (117\*\*), Pittwater (117\*\*) and North Sydney (116\*\*).

As noted above, the majority of SLAs had below average ratios, many of which were statistically significant. Ratios mapped in the lowest range were generally clustered in the south-eastern and northern SLAs. Areas with the lowest ratios included Baulkham Hills (62\*\*), Hawkesbury (63\*\*), Parramatta (65\*\*), Ryde (67\*\*), Manly (70\*\*), Hornsby (71\*\*), Willoughby (72\*\*) and Warringah (75\*\*).

The largest numbers of admissions for inpatients with infectious diseases were of residents of the SLAs of South Sydney (1,963), Blacktown (1,491), Sutherland (1,060) and Fairfield (1,018).

There was a generally weak association at the SLA level with indicators of socioeconomic disadvantage, other than a correlation of substantial significance with the variable for dwellings with no motor vehicle (0.75). Other correlations of note were with the variables for deaths of 15 to 64 year olds – of males and females from all causes (0.91 and females 0.74, respectively), from the combined causes of accidents, poisonings and violence (0.80), and from cancer (0.75).

## Newcastle

There were 1,720 admissions for infectious diseases of residents of **Newcastle**, 29 per cent fewer than expected from the State rates. The western SLA of Cessnock had the highest SAR, of 131\*\*, with the remaining SLAs recording rates that were lower than expected.

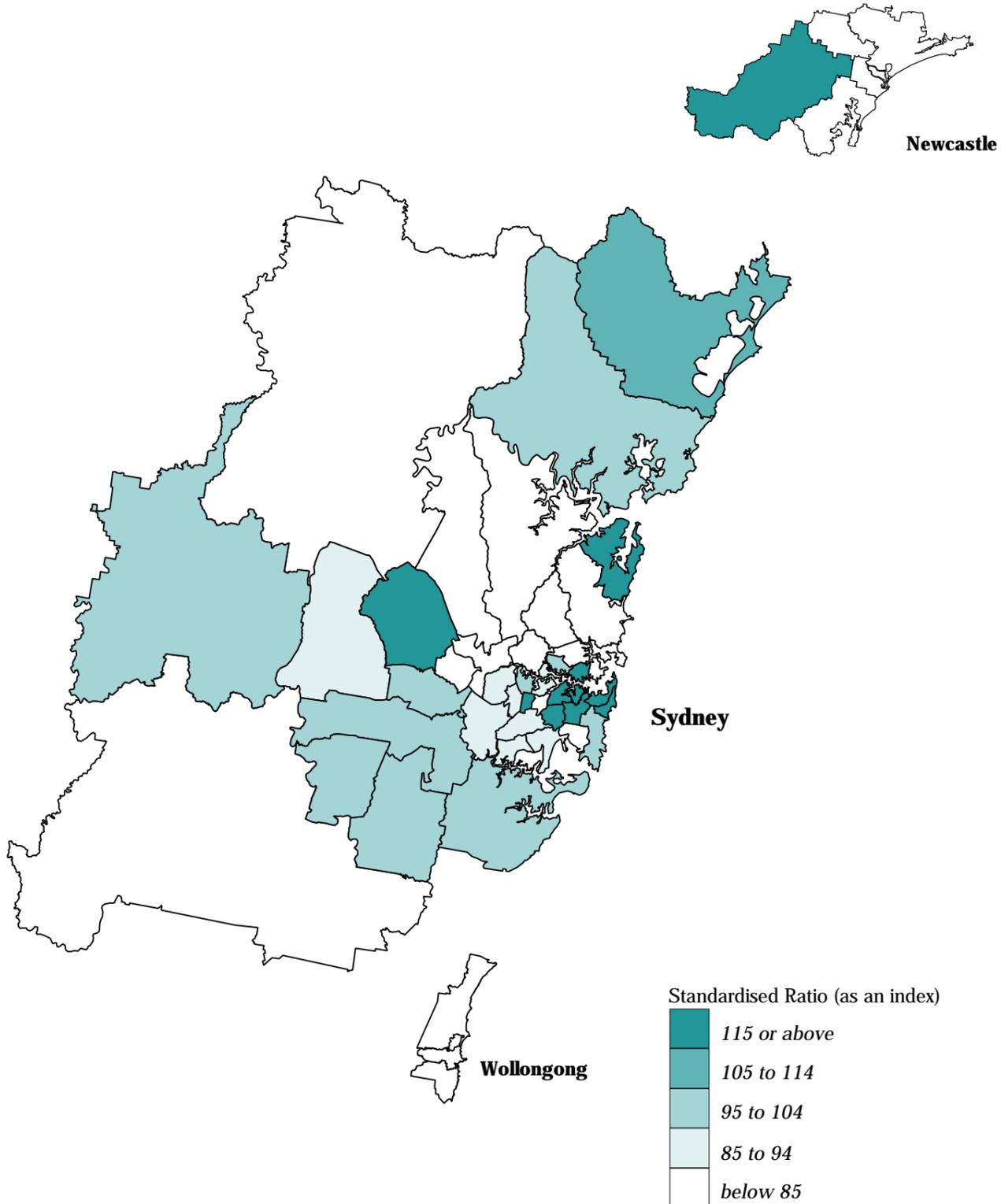
## Wollongong

There were 45 per cent fewer hospital admissions for infectious diseases of residents of **Wollongong** than expected from the State rates, an SAR of 55\*\* (729 admissions). All three SLAs in **Wollongong** had fewer admissions than expected, with the highest in the City of Wollongong (57\*\*) and the lowest in Kiama (36\*\*).

### Map 6.13

## Admissions for infectious and parasitic diseases, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for infectious and parasitic diseases, 1995/96

## State/Territory comparison (Australia as the Standard)

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

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

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

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
<b>1995/96<sup>1</sup></b>									
Capital city	116**	71**	84**	108**	78**	75**	106	66**	92**
Other major urban centres <sup>2</sup>	73**	83**	93**	..	..	..	..	..	81**
Rest of State/Territory	118**	93**	126**	134**	153**	85**	305**	- <sup>3</sup>	121**
Whole of State/Territory	111**	77**	103**	115**	99	81**	219**	66**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	147**	..	162**	136**	170**	..	547**	..	164**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 9,204 admissions for infectious and parasitic diseases for residents of the non-metropolitan areas of New South Wales, 6 per cent more than expected from the State rates, an SAR of 106\*\*. Females and males accounted for almost equal proportions of the admissions (4,610 admissions of females and 4,595 of males).

Highly elevated ratios (at least twice the level expected from the State rates) were recorded in twelve SLAs (**Map 14**). These included Bourke (with an SAR of 534\*\*), Central Darling (330\*\*), Walgett (260\*\*) and Brewarrina (256\*\*), situated in the far north-west; Barraba (480\*\*), Yallaroi (312\*\*) and Glen Innes (200\*\*), located in the north; Casino (292\*\*) and Richmond River (204\*\*), in the north-east; in the central western SLAs of Lachlan (232\*\*) and Blayney (219\*\*); and in Tumbarumba (202\*\*), located in the south-east.

In total, 30 SLAs were mapped in the middle range, with SARs of 10 per cent above or below the level expected. Within this range 8 per cent more admissions than expected were recorded in Goulburn, and 10 per cent fewer were recorded in Evans [Part B], Corowa and Armidale.

Fewer than expected admissions were recorded in a number of SLAs (all with very small numbers of admissions), with the lowest being in Dumaresq (with an SAR of 6\*\* and one admission when 19 were expected from the State rates) and Nundle (28), located in the north; and Conargo (27), situated in the south-west. SARs of below 50 were also recorded in Nymboida, Windouran, Yarrowlunla and Wakool.

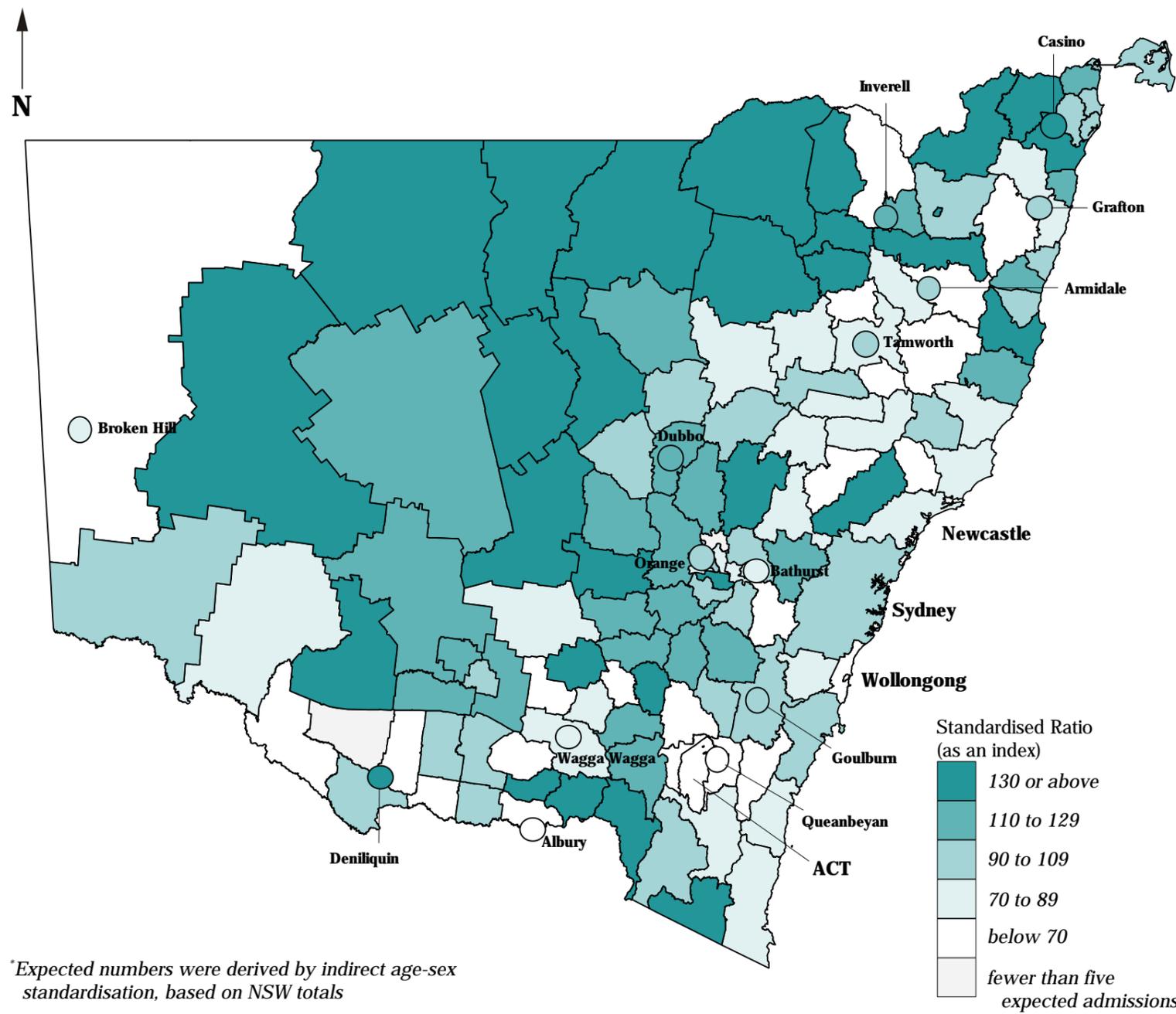
The largest numbers of admissions for infectious and parasitic diseases over this period were recorded for residents of Shoalhaven, with 384 admissions; Hastings (365), Coffs Harbour (318), Lismore (244), Wagga Wagga (233), Dubbo (228) and Kempsey (213).

There was a weak association evident in the correlation analysis at the SLA level with the indicators of socioeconomic disadvantage. However, the only correlations of substantial significance were recorded with the variables for admissions for respiratory system diseases (0.72), admissions of males (0.71) and admissions for respiratory system diseases of children aged from 0 to 4 years (0.74). However, correlations of meaningful significance were recorded with many of the other hospital variables mapped in the chapter, including total admissions (0.70), admissions from the combined causes of accidents, poisonings and violence (0.69), admissions of females (0.68), admissions for bronchitis, emphysema or asthma (0.64), admissions for a neurotic, personality or other mental disorder (0.55) and admissions for circulatory system diseases (0.52).

### Map 6.14

## Admissions for infectious and parasitic diseases, New South Wales, 1995/96

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

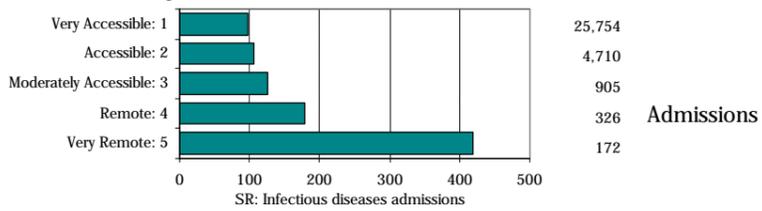


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for infectious diseases are near the level expected from the State rates in both the Very Accessible and Accessible ARIA categories, with SARs of 97 and 106 respectively. The other categories have elevated ratios, rising from an SAR of 127 in the Moderately Accessible areas, to 179 in the Remote areas and to a highly elevated SAR of 418 in the Very Remote areas.

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

## Admissions for cancer, 1995/96

### Capital city comparison (Australia as the Standard)

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

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

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

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

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Admissions to hospital for cancer (malignant neoplasms) accounted for 4.8 per cent of all the admissions analysed for New South Wales residents; 4.8 per cent of residents of **Sydney** and the other major urban centres and 5.0 per cent in the non-metropolitan areas.

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

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

### Sydney (New South Wales as the Standard)

There were 46,831 admissions of residents of **Sydney** for cancer in 1995/96, the same number as expected from the State rates (an SAR of 100). Males accounted for 25,723 admissions (54.9 per cent).

SLAs with ratios elevated by 15 per cent or more (**Map 6.15**) were found in the inner SLAs of Sydney (with an SAR of 215\*\*), South Sydney (145\*\*), Mosman (126\*\*), Rockdale (120\*\*), Leichhardt (120\*\*), Drummoyne (119\*\*) and Randwick (115\*\*); and to the south-west of the city in Camden (124\*\*), Wollondilly (121\*\*) and Campbelltown (120\*\*).

The areas with the lowest ratios formed a band extending out from the west of the city, with four of these SLAs mapped in the lowest range. Highly significant ratios below the level expected were recorded in Parramatta (with a ratio of 77\*\*), Fairfield (80\*\*), Blacktown (82\*\*), Lane Cove (85\*\*), Penrith (87\*\*), Hornsby (88\*\*), Auburn (89\*\*), Holroyd (90\*\*), Canterbury (91\*\*) and Bankstown (93\*\*).

The largest numbers of admissions were recorded for residents of Sutherland (2,628), Gosford (2,236), Bankstown (2,155), Warringah (1,945) and Wyong (1,827).

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

### Newcastle

**Newcastle** had 6,275 admissions for cancer, 2 per cent fewer admissions than were expected from the State rates (an SAR of 98). Males accounted for 3,523 admissions (56.1 per cent). The SARs were generally in the range of 10 per cent above or below the level expected, ranging from 90\*\* in Lake Macquarie to 115\*\* in Cessnock.

### Wollongong

In 1995/96, there were 2,788 admissions for cancer of residents of **Wollongong**, 15 per cent fewer than expected from the State rates (an SAR of 85\*\*). Of the 2,788 admissions, 1,486 were males (53.3 per cent). Residents of Shellharbour had the highest ratio for this variable (an SAR of 102) with fewer admissions than expected in both Kiama (96) and the City of Wollongong (79\*\*).

### Map 6.15

## Admissions for cancer, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

## Admissions for cancer, 1995/96

### State/Territory comparison (Australia as the Standard)

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

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

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

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
<b>1995/96<sup>1</sup></b>									
Capital city	95**	103**	121**	105**	89**	87**	106	78**	101*
Other major urban centres <sup>2</sup>	90**	87**	106**	..	..	..	..	..	95**
Rest of State/Territory	99	99	109**	104**	84**	90**	79**	- <sup>3</sup>	100
Whole of State/Territory	96**	102**	114**	104**	88**	89**	92**	77**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	107**	..	107**	105**	91**	..	73**	..	..

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 23,421 admissions for cancer of residents of the non-metropolitan areas of New South Wales, 4 per cent more admissions than were expected from the State rates (an SAR of 104\*\*). In total, there were 13,497 admissions of males (57.6 per cent) and 9,924 females (42.4 per cent).

Despite an overall standardised admission ratio just above the level expected, some SLAs had highly elevated ratios (**Map 6.16**). Those elevated by 30 per cent or more were recorded:

- in the far north-west, in Central Darling (with an SAR of 174\*\*), Bogan (157\*\*), Cobar (148\*\*), Unincorporated Far West (144) and Broken Hill (144\*\*);
- in the north, in Bingara (168\*\*), Singleton (147\*\*), Barraba (141\*\*), Quirindi (138\*\*), Gloucester (137\*\*), Tamworth (137\*\*), Maclean (134\*\*) and Manilla (130\*);
- in the south-west, in Temora (145\*\*), Hay (140\*) and Culcairn (132\*\*); and
- in Casino (133\*\*) and Gundagai (133\*).

Of the 39 SLAs mapped in the middle range (10 per cent above or below the expected level), none were of statistical significance. Eight per cent more admissions were recorded for residents of Warren, and 9 per cent fewer were recorded in Gunning, Tumbarumba, Coolamon, Wakool and Leeton.

A number of SLAs had ratios in the lowest range mapped, however Dumaresq, with an SAR of 13\*\* (seven admissions when 51 were expected) and Carrathool, with an SAR of 50\*\* (18 admissions when 36 were expected) recorded small numbers of admissions. The lowest ratio (in SLAs with at least twenty admissions) was recorded in Inverell [Part A], with just over half

the number of admissions expected from the State rates, a standardised ratio of 51\*\*. Low ratios were also recorded for residents of Gilgandra (with an SAR of 53\*\*), Snowy River (54\*\*), Evans [Part B] (56\*\*) and Narromine (58\*\*).

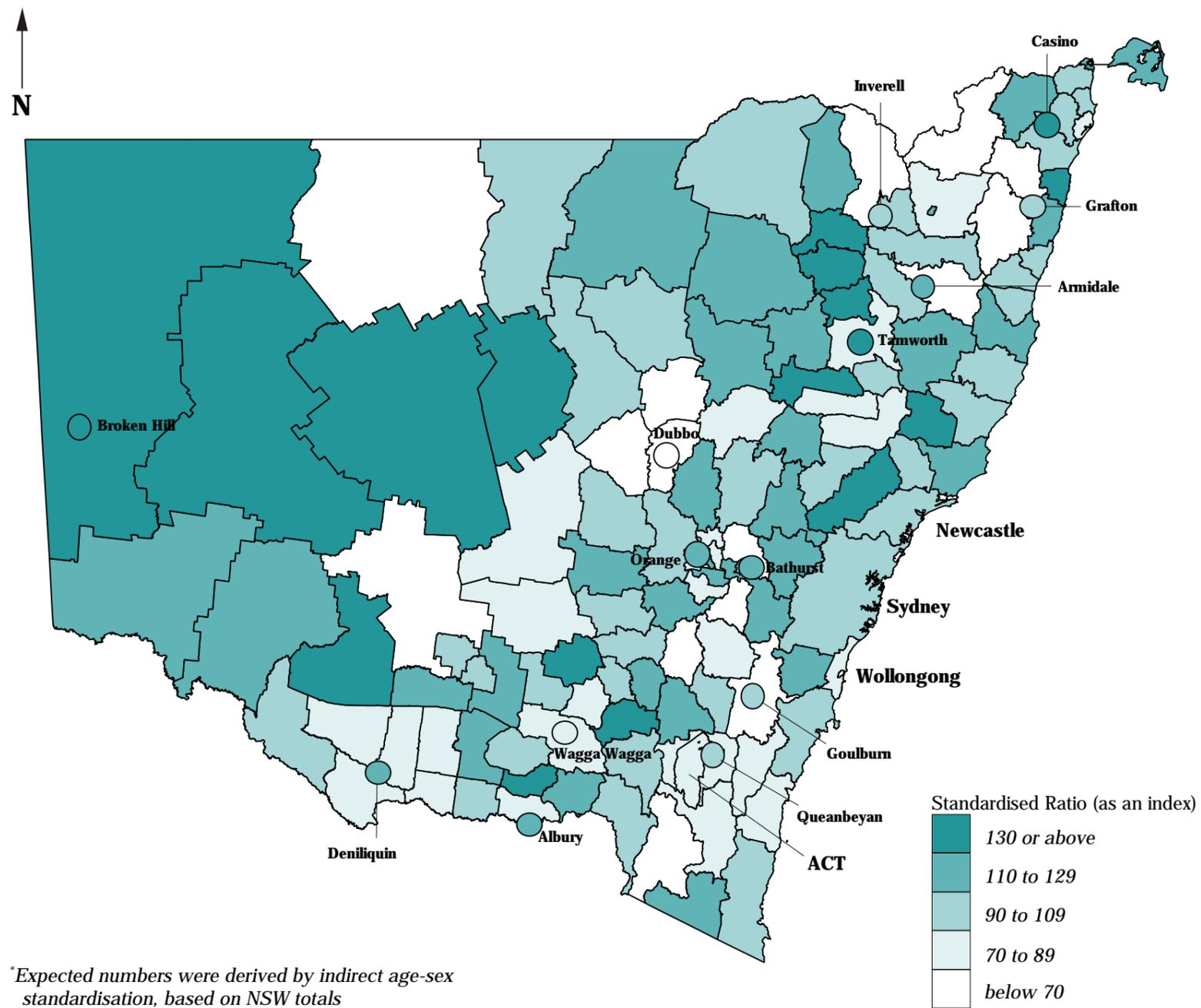
The largest numbers of admissions for cancer in the non-metropolitan areas of New South Wales were recorded for residents of Shoalhaven, with 1,290 admissions; Hastings, 1,086 admissions; Tweed Heads, 890 admissions; Coffs Harbour, 798 admissions; Greater Taree, 736 admissions; and Great Lakes, 666 admissions.

There was a weak association evident in the correlation analysis at the SLA level with the indicators of socioeconomic disadvantage. The inverse correlation of -0.39 with the IRSD also indicates the existence of a weak association at the SLA level between high rates of admission for cancer and socioeconomic disadvantage.

# Map 6.16

## Admissions for cancer, New South Wales, 1995/96

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

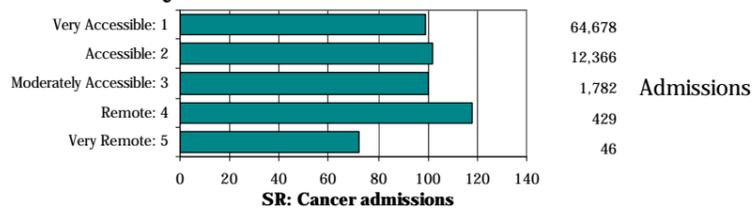


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for cancer were close to the level expected from the State rates in the three ARIA 'accessible' categories, 18 per cent higher than expected from the State rates in the Remote category (an SAR of 118) and lowest (28 per cent lower than expected) in the Very Remote category (72). The number of admissions of residents of the two 'remote' categories were very small.

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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	88**	99	121**	121**	89**	95	100	54**	98
1989 <sup>3</sup>	82**	..	154**	119**	77**	..	162**	..	100

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Hospital admissions for lung cancer, which includes cancers of the trachea, bronchus and lung, accounted for 5.9 per cent of all admissions for cancer in 1995/96. However, lung cancer accounted for only 0.3 per cent of all admissions analysed for New South Wales residents.

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

## Sydney (New South Wales as the Standard)

In 1995/96 there were 2,789 admissions of residents of **Sydney** for lung cancer, one per cent fewer admissions than were expected from the State rates (an SAR of 99). Males accounted for two thirds of these admissions (67.9 per cent).

SLAs mapped in the highest range were clustered in two distinct areas, to the south-west of the city and in the inner city (**Map 6.17**). The highly elevated ratios recorded in south-western SLAs were in Wollondilly (168\*\*), Liverpool (152\*\*), Campbelltown (125) and Fairfield (118); and those in inner SLAs were in South Sydney (220\*\*), Leichhardt (200\*\*), Hunter's Hill (142), Marrickville (141\*\*), Randwick (140\*\*), Ashfield (133), Botany (128), Auburn (128), Ryde (124\*) and Sydney (115).

In total, only six SLAs were mapped in the middle range of 5 per cent above or below the level expected. They were in Willoughby (with an SAR of 102), Pittwater (101), Drummoyne (97), Blacktown (97), Waverley (95) and Warringah (95).

Residents of Woollahra had the lowest ratio for this variable, with 53 per cent fewer hospital admissions than were expected from the State rates, an SAR of 47\*\*. Low ratios north of Sydney Harbour were recorded in Lane Cove (52\*), Ku-ring-gai (59\*), Hornsby (62\*\*) and North Sydney (66\*).

The largest numbers of admissions for cancer were recorded for residents of Bankstown (166 admissions), Randwick (132 admissions), Wyong (131 admissions) and Fairfield (129 admissions).

Correlations of meaningful significance were recorded with the variables for single parent families (0.50) and dwellings rented from the State housing authority (0.55) and, of lesser significance, with the Indigenous population (0.55), low income families (0.39) and unemployment (0.33). These results, together with the inverse correlation with the IRSD (-0.42) suggest the existence of an association at the SLA level between high rates of admission for lung cancer and socioeconomic disadvantage

## Newcastle

The SAR recorded in **Newcastle** was the lowest among the major urban centres, with 33 per cent fewer admissions than were expected from the State rates (an SAR of 67\*\*). All of the SLAs, except Port Stephens (with an SAR of 119), recorded ratios below the expected level, ranging from 39\*\* in Maitland to 78 in Cessnock.

There were 87 admissions recorded in both the city of Newcastle and Lake Macquarie and only 13 of **Newcastle's** 268 admissions, in Maitland.

## Wollongong

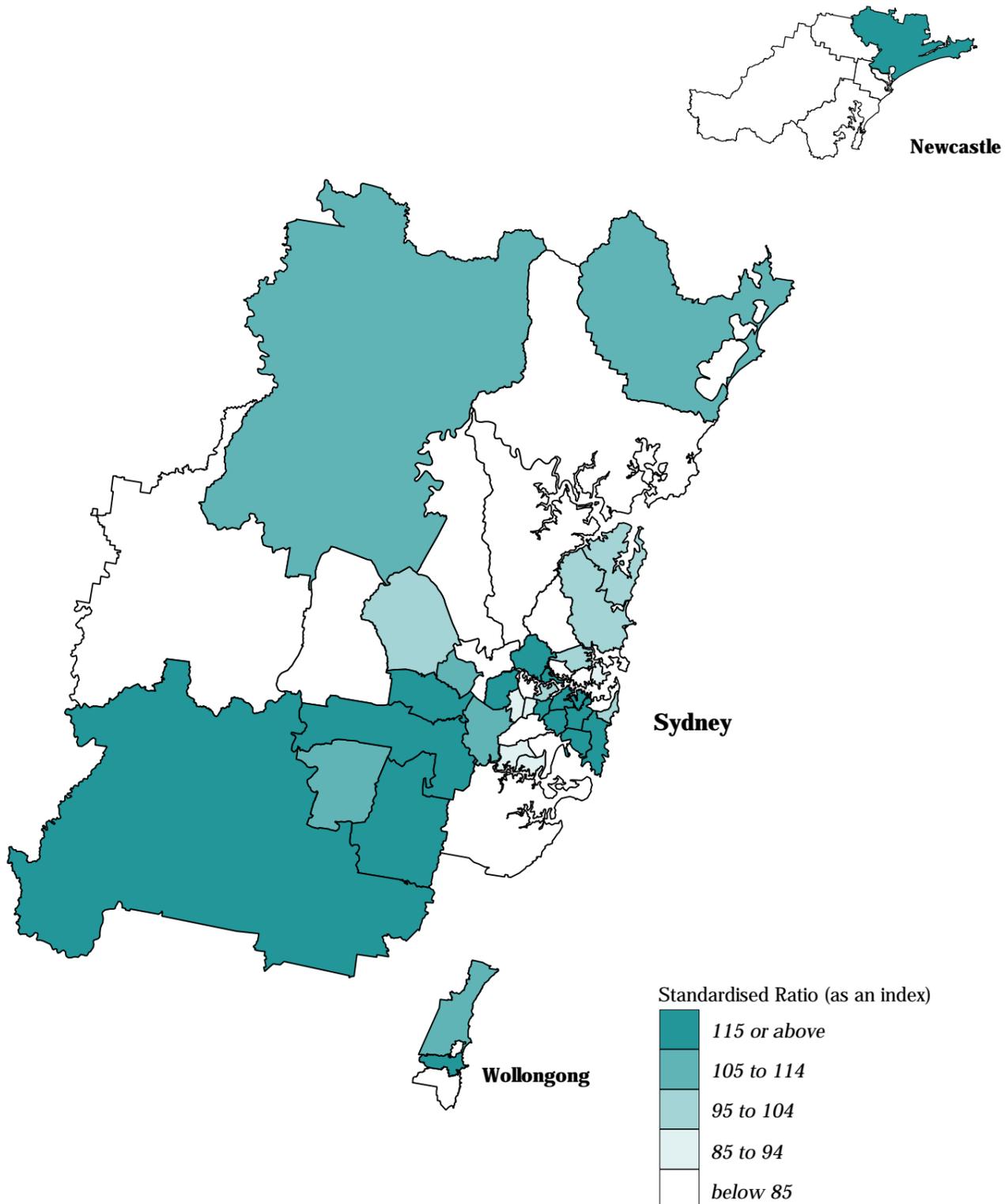
There were 6 per cent more admissions for lung cancer recorded in **Wollongong** than were expected from the State rates, an SAR of 106. The ratios ranged from 22\*\* in Kiama to 151\*\* in Shellharbour.

Of the total 219 admissions in **Wollongong**, 164 admissions were of residents of the City of Wollongong, more than three times the 51 admissions recorded for Shellharbour.

### Map 6.17

## Admissions for lung cancer, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for lung cancer, 1995/96

## State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for lung cancer (described on the previous text page) 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 6.23**).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.23**.

**Table 6.23: Admissions with a principal diagnosis of lung cancer, State/Territory**  
*Age-sex standardised admission ratios*

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
<b>1995/96<sup>1</sup></b>									
Capital city	88**	99	121**	121**	89**	95	100	54**	98
Other major urban centres <sup>2</sup>	72**	116	92	..	..	..	..	..	83**
Rest of State/Territory	99	105	117**	135**	91	114*	116	- <sup>3</sup>	108**
Whole of State/Territory	89**	102	114**	125**	90**	106	108	42**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	94**	..	121**	126**	87*	..	119	..	106**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 1,586 admissions for lung cancer of residents of the non-metropolitan areas of New South Wales, 11 per cent more than expected from the State rates (an SAR of 111\*\*). Of these, 1,130 admissions (71.2 per cent) were of males.

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 with at least five admissions, the highest ratios were located throughout the State in no notable pattern (see **Map 6.18**). As the number of admissions for this variable is particularly low, particular care should be taken to refer to the absolute numbers as well as to the relative values.

The most highly elevated standardised admission ratios (elevated by 30 per cent or more) were recorded:

- in the south-west in Cootamundra (272\*\*, 20 admissions), Narrandera (196\*, 13 admissions), Cowra (191\*\*, 23 admissions) Wentworth (155, 9 admissions) Leeton (150, 13 admissions) and Deniliquin (134, 10 admissions);
- in the far north-west in Walgett (249\*\*, 15 admissions) and Narromine (140, 8 admissions);
- in the central west in Greater Lithgow (233\*\*, 36 admissions), Parkes (204\*\*, 27 admissions), Bland (198\*, 13 admissions) and Forbes (156, 14 admissions);
- in the north in Moree Plains (212\*\*, 19 admissions), Narrabri (171\*, 18 admissions), Glen Innes (168, 11 admissions), Tamworth (155\*\*, 42 admissions), Gunnedah (154, 16 admissions) and Inverell [Part B] (142, 15 admissions);
- in the south-east in Queanbeyan (211\*\*, 31 admissions), Cooma-Monaro (174\*, 14 admissions), Goulburn (166\*\*, 27 admissions) and Kyogle (146, 13 admissions);

- on the mid north coast in Maclean (208\*\*, 40 admissions) and Kempsey (177\*\*, 43 admissions); and
- in the far north-east in Casino (193\*\*, 21 admissions), Tweed [Part B] (177\*\*, 38 admissions) and Tweed Heads (158\*\*, 77 admissions).

In total, only ten SLAs were mapped in the middle range of 10 per cent above or below the expected number. There were nine per cent more admissions recorded in Wingecarribee, while Bellingen had four per cent fewer admissions than were expected from the State rates.

With such small numbers overall, Tenterfield (18\*) was the only SLA with a standardised admission ratio of statistical significance in the lowest range mapped. However, Dungog, Cabonne [Part C], Singleton, Hume, Lachlan and Richmond River all recorded ratios of 50 per cent or more lower than expected from the State rates. The only SLA with a ratio below the expected level to record more than 50 hospital admissions was Shoalhaven, with a ratio of 87 and 76 admissions.

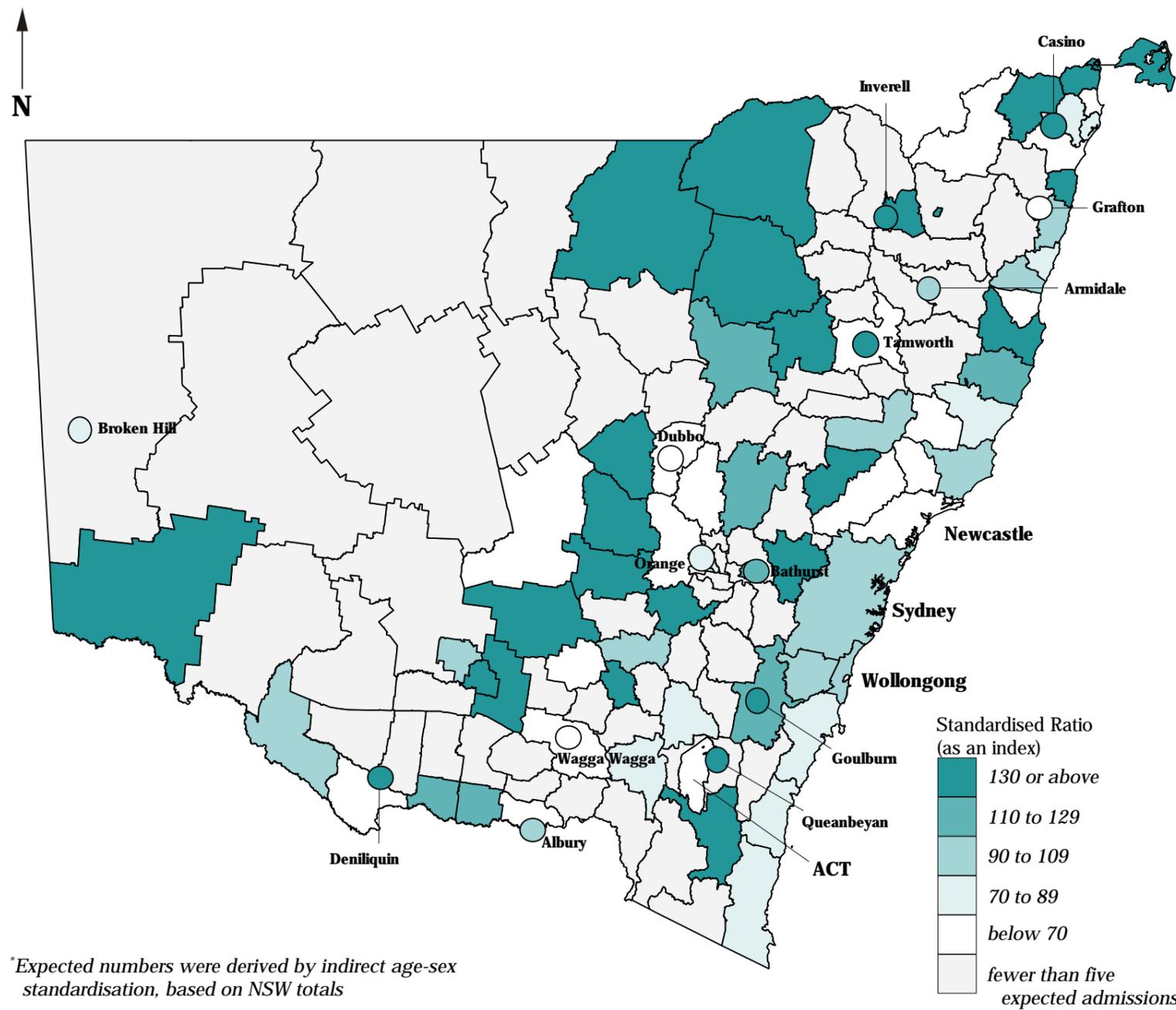
Only Hastings (89 admissions), Tweed Heads (77) and Shoalhaven (76) had more than 75 admissions for lung cancer.

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

### Map 6.18

### Admissions for lung cancer, New South Wales, 1995/96

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

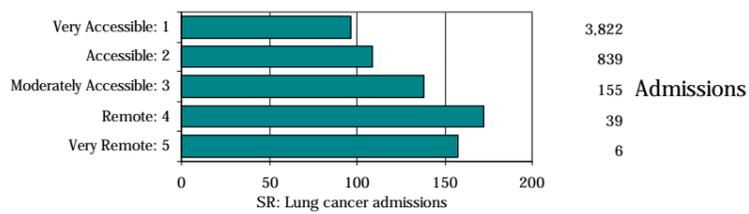


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for lung cancer increase markedly, from ratios of 97 in the Very Accessible and 109 in the Accessible categories, to ratios of 138 (and 155 admissions) and 172 (39 admissions) in the Moderately Accessible and Remote categories, respectively.

Source: Calculated on ARIA classification, DHAC 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 6.24).

The SARs in **Sydney** have remained consistent for both periods shown in Table 6.24 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 6.24: Admissions of females aged 40 years and over<sup>1</sup> with a principal diagnosis of breast cancer, capital cities**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Data for '1989' is of females of all ages

<sup>2</sup>Includes Queanbeyan (C)

<sup>3</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>4</sup>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

Breast cancer is the most common cancer notified for females in New South Wales. 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 0.3 per cent of all admissions analysed and 6.8 per cent of admissions for cancer of New South Wales 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.

## Sydney (New South Wales as the Standard)

In 1995/96, there were 3,010 admissions for cancer of the breast for female residents of **Sydney** (aged 40 years and over). This was consistent with the number expected from the State rates, an SAR of 100.

The SLA of Randwick had the highest ratio for this variable, with 66 per cent more admissions than were expected from the State rates, an SAR of 166\*\*. Wollondilly (with an SAR of 163\*\*), in the outer south-west; Rockdale (156\*\*) and Kogarah (151\*\*), situated in the south; and Lane Cove (155\*\*) and North Sydney (138\*), located to the north of **Sydney**, also recorded relatively high and statistically significant SARs.

In total, eleven SLAs were mapped in the lowest range, the majority of which were situated in the western suburbs. The lowest ratios were recorded for residents of Fairfield (61\*\*), Liverpool (64\*\*) and the Blue Mountains (74\*). Other statistically significant ratios lower than expected were recorded in Parramatta, with an SAR of 75\*\*; Penrith, 75\*; Blacktown, 76\*\*; and Bankstown, 84\*.

More than 125 female admissions for breast cancer were recorded for residents of Randwick (164 admissions), Sutherland (155), Rockdale (129), Ku-ring-gai (129) and Gosford (126).

There was a weak positive association evident in the correlation analysis at the SLA level with the variables for high income

families, female labour force participation, managers and administrators and professionals.

These correlations support the contention (above) that the incidence of cancer of the female breast is higher among women in the most advantaged areas.

## Newcastle

There were 348 admissions of females for breast cancer in **Newcastle**, 12 per cent fewer admissions than were expected based on the State rates, an SAR of 88\*.

Maitland had the highest ratio for this variable, with 6 per cent more admissions than expected from the State rates, while Cessnock had the lowest ratio, of 73. The only statistically significant ratio was recorded for residents of Lake Macquarie (79\*\*).

## Wollongong

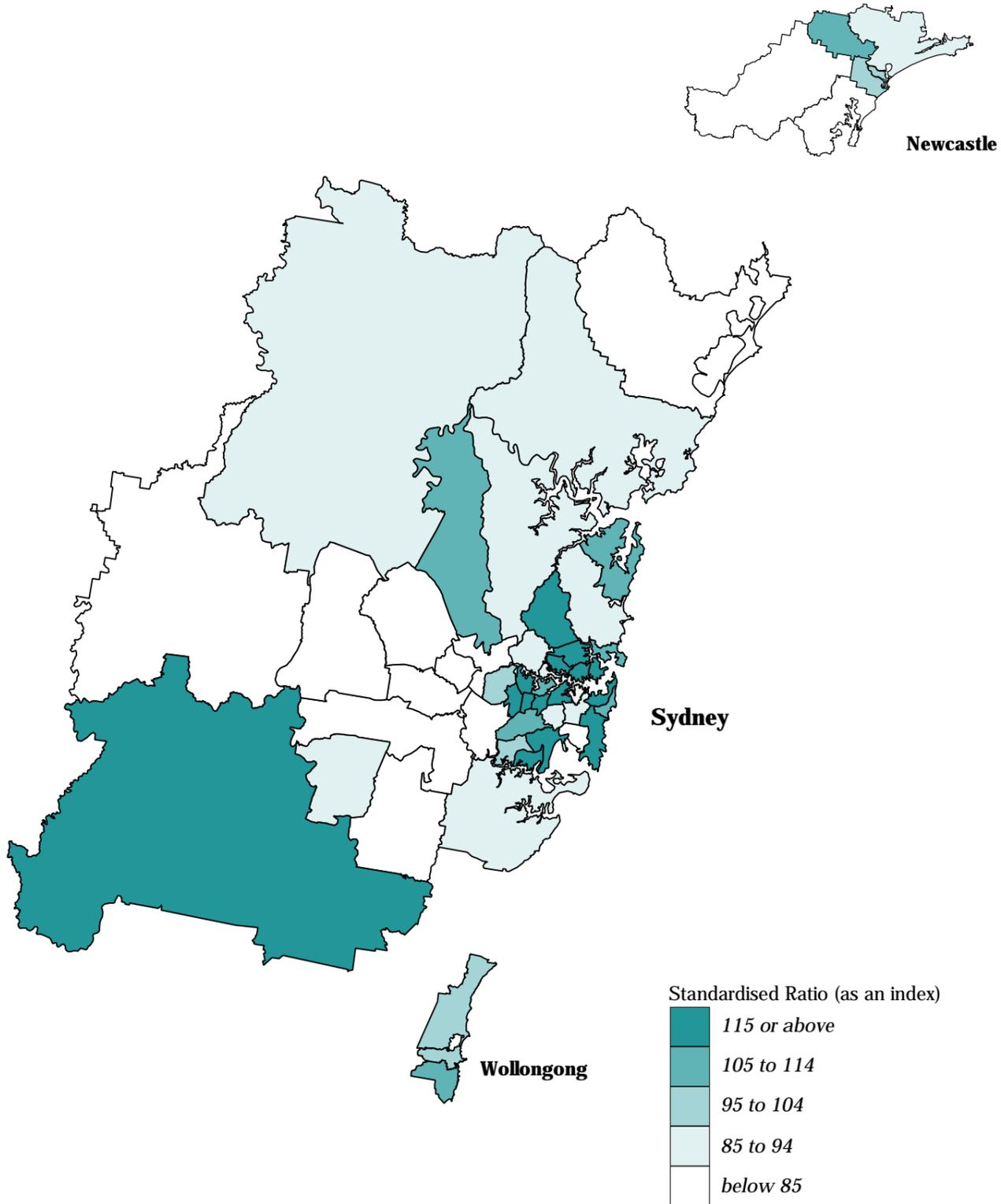
In 1995/96, 201 admissions for breast cancer were recorded for female residents of **Wollongong** aged 40 years and over, 2 per cent fewer admissions than were expected from the State rates (an SAR of 98). The majority of these admissions were recorded in the City of Wollongong (144 admissions).

Ratios ranged from 110 in Kiama to 95 in Wollongong, with a ratio of 104 in Shellharbour.

**Map 6.19**

**Admissions of females aged 40 years and over for breast cancer, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

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

## 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 6.25: Admissions of females aged 40 years and over<sup>1</sup> with a principal diagnosis of breast cancer, State/Territory Age-sex standardised admission ratios**

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
<b>1995/96<sup>2</sup></b>									
Capital city	97	125**	93*	94	81**	71**	129	90	102*
Other major urban centres <sup>3</sup>	89**	118	95	..	..	..	..	..	93*
Rest of State/Territory	101	101	94	122**	72**	87	81	- <sup>4</sup>	97
Whole of State/Territory	97*	118**	94**	101	79**	81**	106	89	100
<b>1989<sup>5</sup></b>									
Rest of State/Territory	115**	..	114**	100	80**	..	65	..	109**

<sup>1</sup>Data for '1989' is of females of all ages

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>4</sup>Data unreliable: included with ACT total

<sup>5</sup>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 (New South Wales as the Standard)

There were 1,435 admissions for breast cancer of females resident in the non-metropolitan areas of New South Wales, 4 per cent more than were expected from the State rates (an SAR of 104).

**Map 6.20** shows the spatial distribution of hospital admissions for breast cancer among females aged 40 years and over. 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. The majority of those mapped (those where five or more admissions were expected from the State rates) were situated either in coastal regions, or in the less remote areas. As the number of admissions for this variable is particularly low, care should be taken to refer to the absolute numbers as well as to the relative values.

Elevated ratios were found in just over half of the SLAs (51.4 per cent), with the highest occurring in Wentworth and Inverell [Part B]. Both of these SLAs recorded more than twice the number of hospital admissions expected from the State rates, with ratios of 251\*\* (and 14 admissions) and 217\*\* (and 24 admissions), respectively. Other statistically significant ratios in this highest range were recorded in Yass (183\*), Mudgee (174\*\*), Wellington (173\*), Goulburn (148\*) and Kempsey (147\*).

There were 17 SLAs with SARs in the range of 10 per cent above or below the level expected. Within this range, the highest ratios were in Dubbo (109), Greater Lithgow (107), Ballina (105) and Corowa (105). Forbes had the lowest ratio of 90, followed by Gunnedah and Moree Plains, each with a ratio of 92.

Residents of Tumut, Narromine, Cabonne [Part C] and Leeton had the lowest SARs for breast cancer among females aged 40 years and over. Tumut had 69 per cent fewer admissions than expected from the State rates, with an SAR of 31\* (three admissions, when the State rates would indicate ten). Narromine, Cabonne [Part C] and Leeton recorded ratios of 35, 47 and 47 respectively.

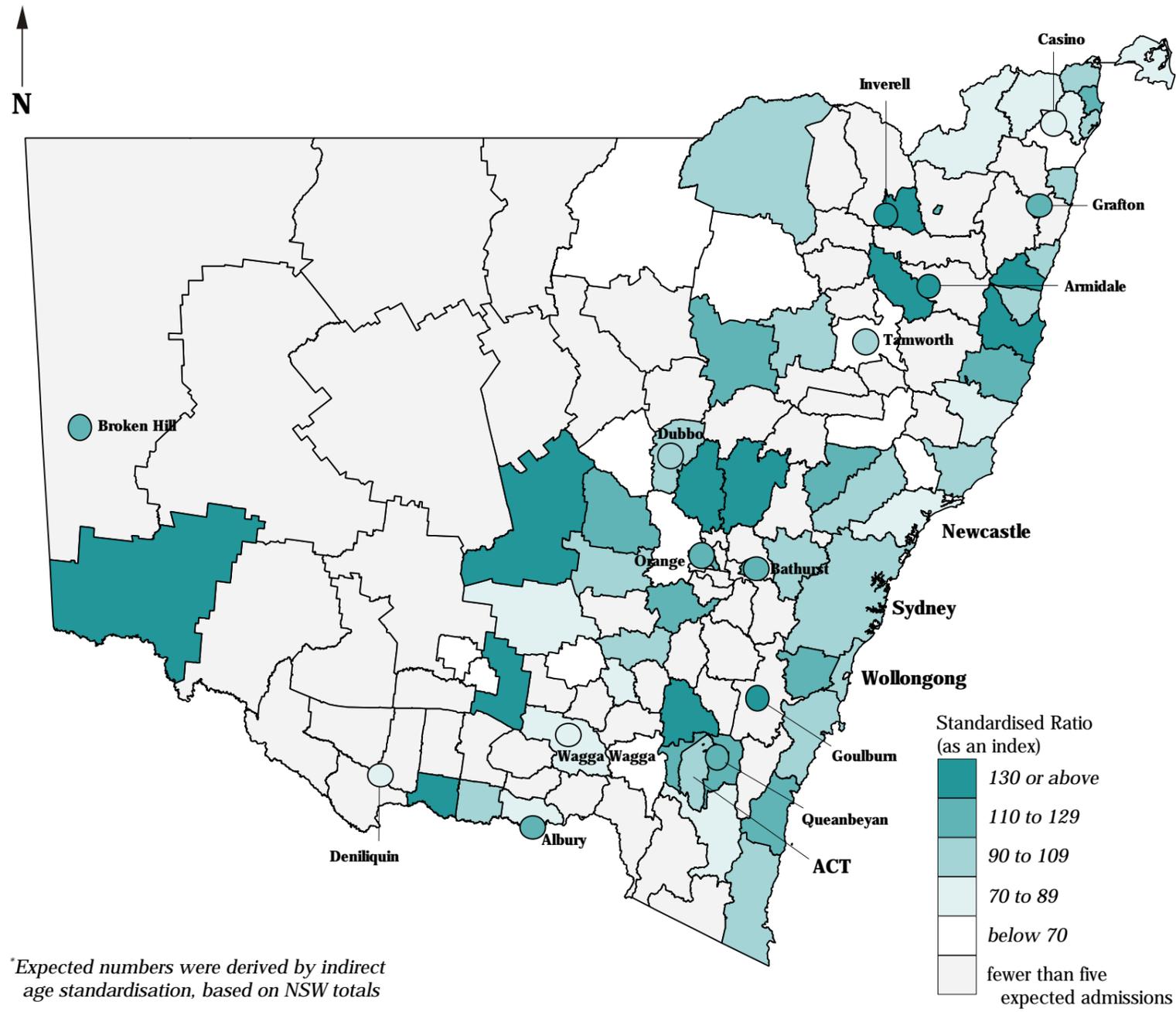
The SLA of Shoalhaven had the largest number of admissions of females aged 40 years and over from breast cancer in the non-metropolitan areas of New South Wales (79 admissions), with 76 admissions from Hastings, 50 from Coffs Harbour and 41 from Eurobodalla and Albury.

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

**Map 6.20**

**Admissions of females aged 40 years and over for breast cancer, New South Wales, 1995/96**

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

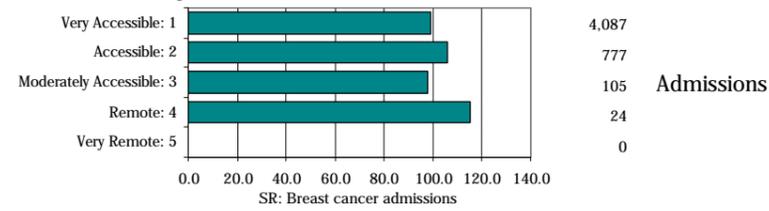


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



There was relatively little variation between the ARIA categories in standardised admission ratios for cancer of the female breast. The highest ratio, an SAR of 115 for females living in areas in the Remote category, was based on just 24 admissions. There were no admissions from the Very Remote category.

Source: Calculated on ARIA classification, DHAC 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 6.26). **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 6.26: Admissions<sup>1</sup> with a principal diagnosis of psychosis, capital cities, 1995/96**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>2</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

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

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

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

Hospital admissions for psychosis accounted for 1.9 per cent of all admissions analysed for New South Wales residents, with similar proportions recorded for males (2.1 per cent and a rate of 502.2 per 100,000 population) and females (1.7 per cent and a rate of 509.0 per 100,000 population).

## Sydney (New South Wales as the Standard)

There were 21,364 admissions for psychosis of residents of **Sydney**, 11 per cent more admissions than expected from the State rates, an SAR of 111\*\*. There were equal proportions of admissions of males and females.

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'.

Exactly half of **Sydney's** SLAs had elevated standardised admission ratios. The SLAs with the highest ratios (**Map 6.21**) included Concord, with a ratio of 475\*\*, indicating that there were over four times the expected number of admissions (612 admissions); Burwood (371\*\*); the City of Sydney (282\*\*); Ashfield (230\*\*); South Sydney (210\*\*) and Drummoyne (201\*\*). Other SLAs with highly elevated ratios included Manly (195\*\*), Mosman (195\*\*), Holroyd (164\*\*), Hawkesbury (156\*\*), North Sydney (155\*\*), Marrickville (155\*\*) and Canterbury (155\*\*).

In total, thirteen SLAs were mapped in the lowest range, with at least 15 per cent fewer admissions than were expected from the State rates: the lowest of these were recorded in Wollondilly (with an SAR of 33\*\*), Camden (37\*\*), Campbelltown (55\*\*), Pittwater (57\*\*), Fairfield (64\*\*), Penrith (66\*\*), Blue Mountains (71\*\*) and Kogarah (80\*\*).

The largest numbers of admissions were recorded for residents of Canterbury (1,065 admissions, an SAR of 155\*\*), Parramatta (1,036, an SAR of 144\*\*) and Blacktown (885, an SAR of 89\*\*). 50 admissions were recorded in both Camden and Wollondilly.

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

## Newcastle

There were 2,154 admissions for psychosis of residents of **Newcastle**, 11 per cent fewer admissions than were expected from the State rates (an SAR of 89\*\*). The city of Newcastle was the only SLA to recorded more admissions than expected, with an SARs of 116\*\*. Lake Macquarie had the lowest ratio of 72\*\*, followed by Port Stephens with an SAR of 74\*\*.

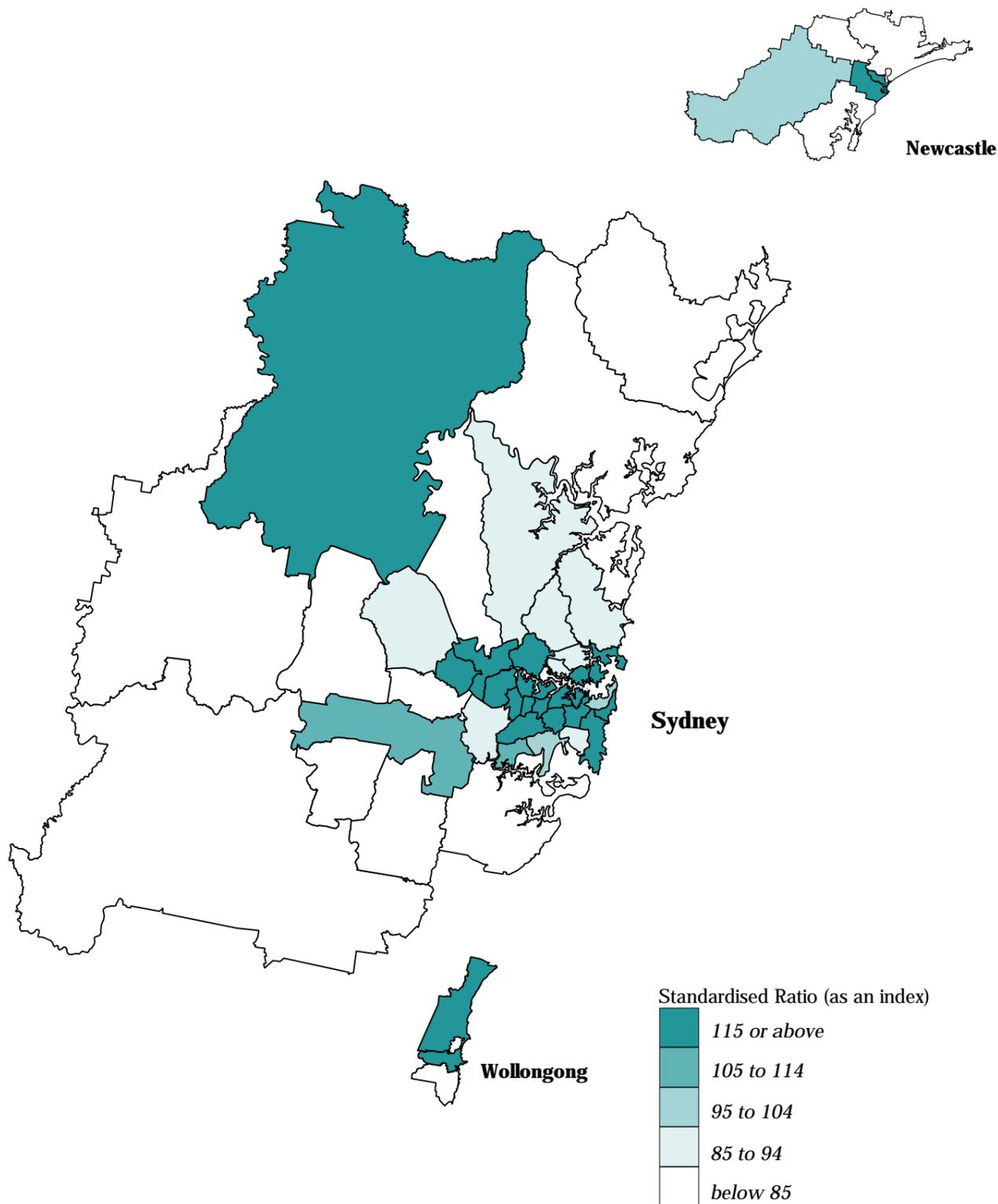
## Wollongong

Residents of **Wollongong** had 20 per cent fewer admissions for psychosis (1,016 admissions) than expected from the State rates, an SAR 80\*\*. The City of Wollongong (with an SAR of 86\*\*), Shellharbour (67\*\*) and Kiama (56\*\*) all had ratios below the level expected.

### Map 6.21

## Admissions for psychosis, Sydney, Newcastle and Wollongong, 1995/96

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



Standardised Ratio (as an index)

- 115 or above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

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

Source: See Data sources, Appendix 1.3

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

# Admissions for psychosis, 1995/96

## State/Territory comparison (Australia as the Standard)

In all cases, there were relatively more admissions for psychosis of people who were residents of the capital cities than of the non-metropolitan areas, with the widest variations being in Tasmania, Queensland and Western Australia (Table 6.27). 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 6.27: Admissions<sup>1</sup> 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 <sup>2</sup>	89**	103	82**	..	..	..	..	..	88**
Rest of State/Territory	83**	70**	81**	118**	80**	69**	74**	- <sup>3</sup>	81**
Whole of State/Territory	103**	80**	108**	133**	109**	87**	79**	64**	100

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

In 1995/96, there were 6,580 admissions for psychosis of residents of the non-metropolitan areas of New South Wales, 3,423 females (a rate of 422.8 admissions per 100,000 females) and 3,157 males (386.7 admissions per 100,000 males). This was 20 per cent fewer admissions than expected from the State rates, an SAR of 80\*\*.

Almost 40 per cent of the non-metropolitan SLAs (52 SLAs) had ratios in the lowest range mapped, of at least 30 per cent fewer admissions than expected. More admissions than expected from the State rates were recorded in a quarter (23.6 per cent) of the SLAs, some with highly elevated ratios.

The most highly elevated SARs were recorded for residents in:

- the far north-west of the State, in Central Darling, 712\*\* (84 admissions); Brewarrina, 253\*\* (22); and Gilgandra, 146\* (39);
- the central west, in Rylstone, 169\*\* (35); and Lachlan, 136\* (50);
- the south-west in Narrandera, 156\*\* (56); Murrumbidgee, 155 (17); Deniliquin, 142\*\* (61); and Urana 130 (9); and
- in the north in Barraba, 144 (20).

A number of SLAs had ratios in the middle range of 10 per cent above or below the expected level. The highest SARs, in this range were recorded in Cobar (108), Cabonne [Part C] (107) and Goulburn (107), and lowest SARs in Jerilderie (93), Broken Hill (94) and Manilla (94). However, none of the standardised admission ratios for SLAs in this class was statistically significant.

Many SLAs had standardised admission ratios that were lower than expected, however these ratios reflected relatively small numbers of admissions. By the far the lowest ratio was recorded in Dumaresq, where there were 99 per cent fewer admissions for psychosis, an SAR of 1\*\* (no admissions when 19 were expected from the State rates). There were 90 per cent fewer admissions than expected recorded in Copmanhurst (2 admissions), with an SAR of 10\*\*; Evans [Part B] (2 admissions), with an SAR of 10\*\*;

Walcha (3 admissions), with an SAR of 17\*\*; Snowy River (5 admissions), with an SAR of 17\*\*; and Gunning (2 admissions), with an SAR of 19\*\*. SARs (with at least 50 admissions) in the lowest range mapped were recorded in Wagga Wagga (an SAR of 55\*\* and 147 admissions), Orange (55\*\* and 93 admissions), Greater Lithgow (56\*\* and 57 admissions), Griffith (59\*\* and 62 admissions), Ballina (61\*\* and 122 admissions), Singleton (62\*\* and 58 admissions), Dubbo (66\*\* and 109 admissions), Wingecarribee (67\*\* and 127 admissions), Tweed [Part B] (69\*\* and 89 admissions) and Nambucca (69\*\* and 68 admissions). Many of the SARs recorded in the lowest range mapped had statistically significant differences from the NSW average.

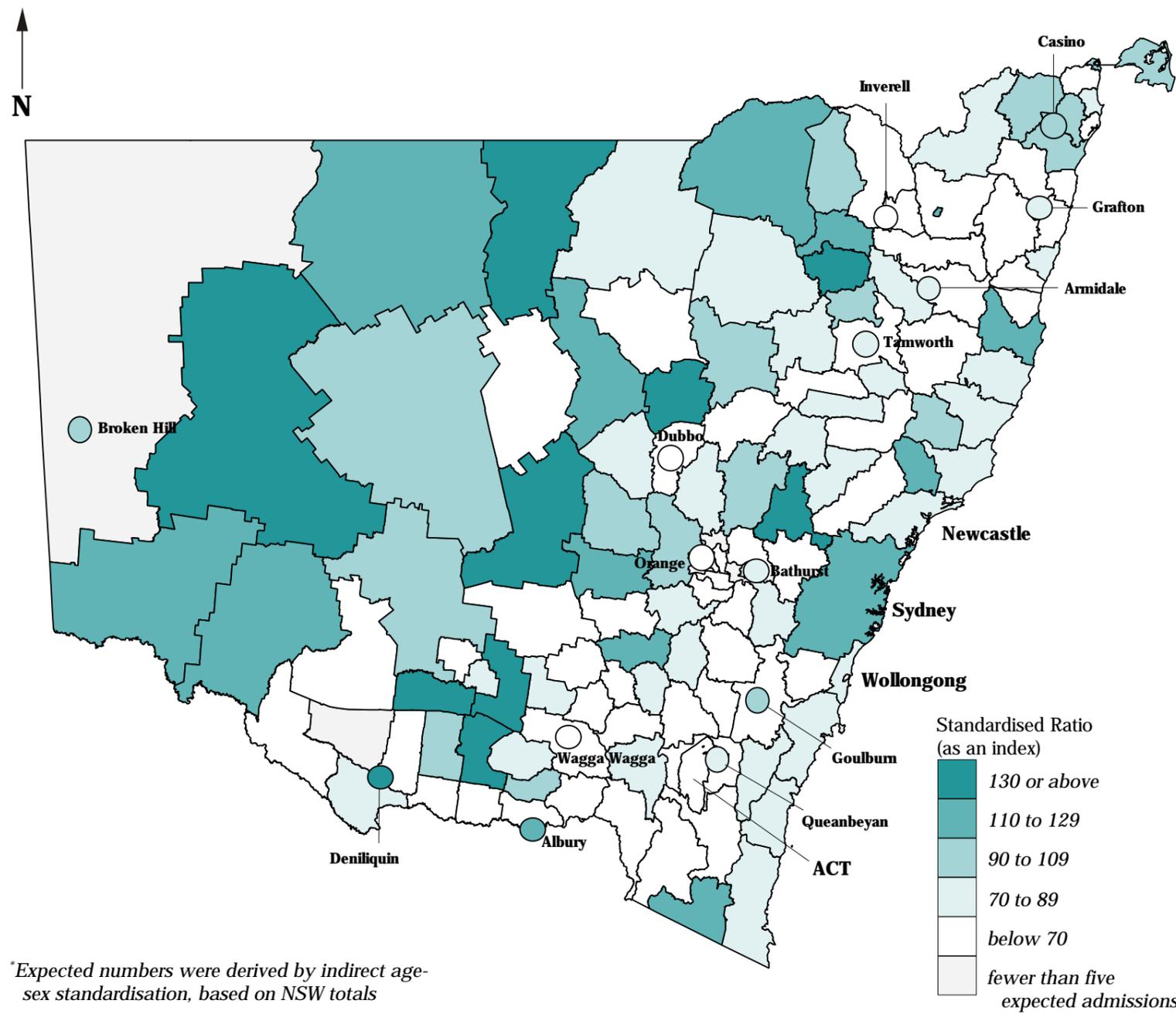
The largest numbers of admissions for psychosis were of residents of Shoalhaven (320 admissions, an SAR of 76\*\*); Hastings (274, an SAR of 84\*\*); Albury (241, an SAR of 117\*\*); Coffs Harbour (230, an SAR of 80\*\*); and Lismore (226, an SAR of 103).

There was a correlation of meaningful significance with the variable for the Indigenous population (0.52) and of lesser significance dwellings with no motor vehicle (0.45), early school leavers (0.31) and single parent families (0.29). These results, together with the inverse correlation with the IRSD (-0.45), suggest the existence of an association between high rates of admission for psychosis and socioeconomic disadvantage. There was also a correlation of meaningful significance with the summary measure of premature death, Years of Potential Life Lost (0.52).

## Map 6.22

### Admissions for psychosis, New South Wales, 1995/96

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

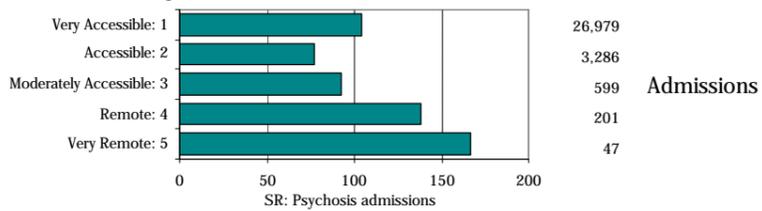


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for psychosis dropped from an SAR of 104 in the Very Accessible category to a low 77 in the Accessible category, before increasing to highs of 138 and 167 in the Remote and Very Remote categories, respectively. Again, the numbers of admissions in the most remote categories are relatively 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 6.28). 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 6.28: Admissions<sup>1</sup> 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 <sup>2</sup>	All capitals
140**	61**	122**	86**	103*	135**	59**	44**	103**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>2</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

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

The variable under discussion here includes admissions of people diagnosed as having a neurotic, personality or other mental disorder. They are distinguished from those with psychosis (see page 236) by the fact that a neurosis arises as a result of stressors and anxieties in the person's environment. The most common are anxiety states, reactive depression and obsessive-compulsive disorders.

Males had a higher overall rate of admissions for neurotic personality or other mental disorders than did females (642.8 admissions per 100,000 population compared with 512.7) and higher rates at almost all ages, in particular from 10 through to 14 years of age. Admissions to hospital for neurotic, personality or other mental disorders accounted for 2.2 per cent of all the admissions analysed for New South Wales residents (2.4 per cent of admissions for residents of **Sydney** and the other major urban centres).

## Sydney (New South Wales as the Standard)

There were 25,058 admissions for neurotic, personality or other mental disorders of residents of **Sydney**, 14 per cent more admissions for these mental disorders than were expected from the State rates (an SAR of 114\*\*). This is a substantially higher rate of hospitalisation from these causes than for country residents, for whom the SAR was 83\*\*. This is in line with the higher rate of episodes of psychosis among metropolitan residents (page 236). Males accounted for over half (57.8 per cent) of these admissions.

Standardised admission ratios elevated by 15 per cent or more were recorded in 50 per cent of the SLAs, which were distributed throughout the inner, western and north-western suburbs (Map 6.23). The most highly elevated ratios were recorded in the inner SLAs of Burwood (with an SAR of 237\*\*), South Sydney (220\*\*), Concord (214\*\*), Sydney (195\*\*), Drummoyne (192\*\*), Waverley

(173\*\*), Leichhardt (167\*\*) and Marrickville (165\*\*). High ratios in the west were recorded in Parramatta (an SAR of 179\*\*), Holroyd (175\*\*) and Blacktown (159\*\*); and those situated in the north-west included Hawkesbury (157\*\*).

The lowest ratio, an SAR of 38\*\*, was recorded for residents of Wollondilly, with 74 admissions. Highly significant ratios below the level expected were also recorded in Campbelltown (an SAR of 50\*\*), Kogarah (54\*\*), Fairfield (55\*\*), Wyong (57\*\*), Auburn (63\*\*), Sutherland (72\*\*), Botany (73\*\*) and Camden (75\*\*).

In 1995/96, residents of Blacktown had the largest number of admissions for these mental disorders (2,088 admissions), followed by Parramatta (1,432), Bankstown (1,361) and Penrith (1,128).

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.

## Newcastle

Residents of **Newcastle** had 1,823 admissions for neurotic, personality or other mental disorders, 33 per cent fewer admissions than were expected from the State rates, an SAR of 67\*\*.

All five SLAs had fewer than the expected number of admissions, ranging from 8 per cent fewer in the SLA of Newcastle (an SAR of 92\*) to 54 per cent fewer in Port Stephens (46\*\*).

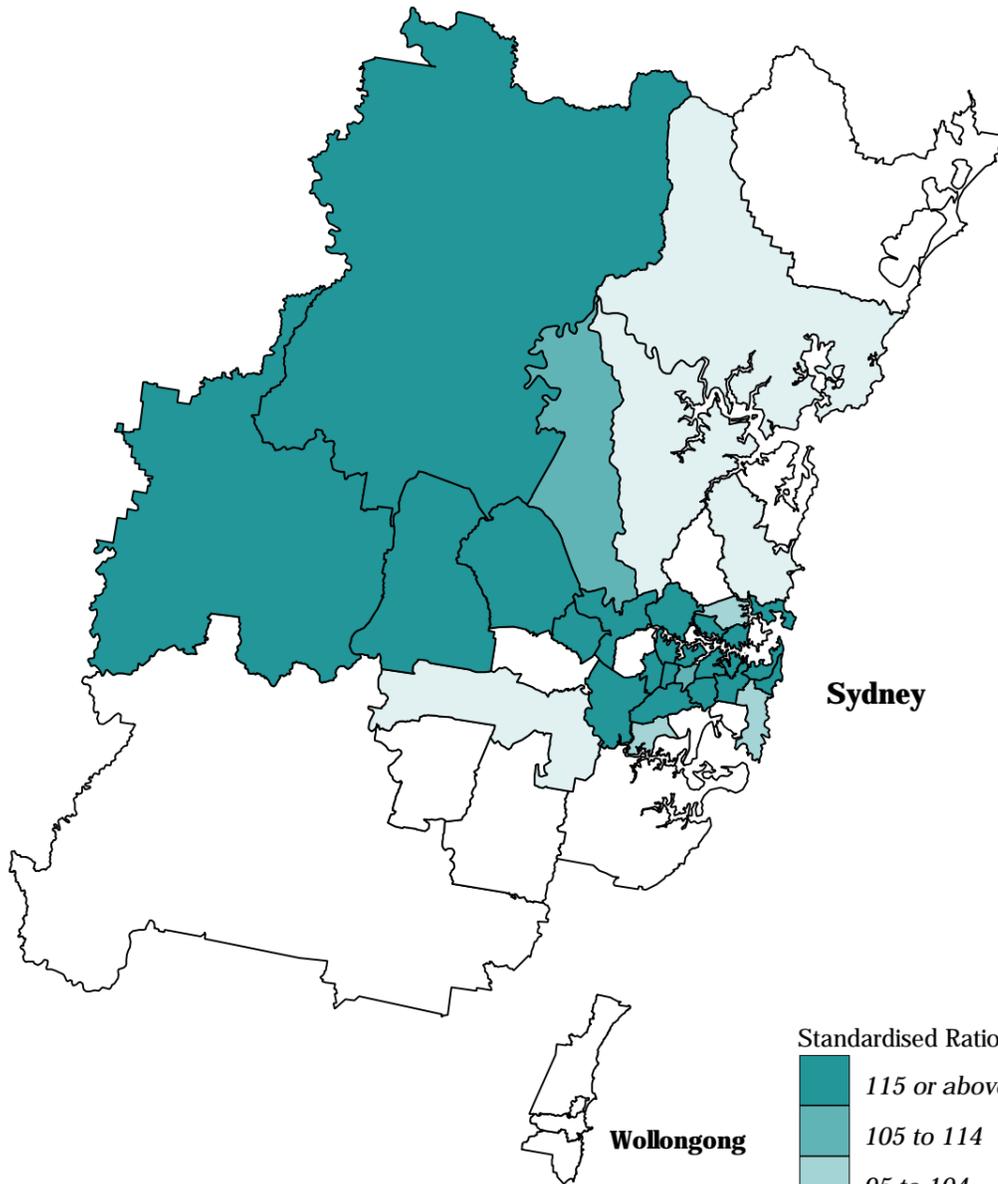
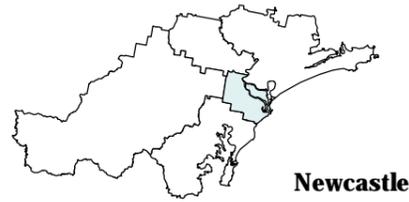
## Wollongong

**Wollongong** had the lowest SAR among the major urban centres, with a ratio of 60\*\*, with 878 admissions. Again, all SLAs had ratios below the level expected, with the highest recorded in Shellharbour (with a ratio of 82\*\*). The lowest SAR was recorded for residents of Kiama (40\*\*), with an SAR of 56\*\* for residents of the City of Wollongong.

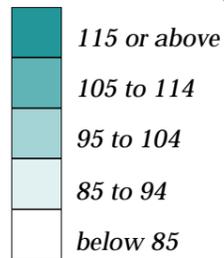
**Map 6.23**

**Admissions for neurotic, personality or other mental disorders, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for neurotic, personality or other mental 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 6.29). In New South Wales, Queensland and Tasmania capital city ratios were higher, with the reverse applying in South Australia, Western Australia, Victoria and the Northern Territory.

**Table 6.29: Admissions<sup>1</sup> 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 <sup>2</sup>	81**	60**	84**	..	..	..	..	..	80**
Rest of State/Territory	104**	70**	107**	130**	112**	79**	67**	- <sup>3</sup>	98**
Whole of State/Territory	124**	63**	111**	98	105**	102	64**	42**	100

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 7,770 admissions for neurotic, personality or other mental disorders of residents of the non-metropolitan areas of New South Wales, 17 per cent fewer than expected from the State rates (an SAR of 83\*\*). This represents a substantial difference in the rate of hospitalisation between residents of the non-metropolitan areas and those of **Sydney**.

Just under one third (30.2 per cent) of the SLAs in the non-metropolitan areas of New South Wales had elevated standardised admission ratios (Map 6.24). The most highly elevated were in:

- the far north-west in Central Darling, with an SAR of 657\*\* (98 admissions); Brewarrina, 427\*\* (49); Walgett, 375\*\* (172); Bourke, 316\*\* (74); Wellington, 202\*\* (108); Warren, 172\*\* (36); Coonamble, 161\*\* (46) and Gilgandra, 153\*\* (44);
- the south-west in Balranald, 329\*\* (56); Narrandera, 161\*\* (65); and Junee, 155\*\* (54);
- the central west in Lachlan, 190\*\* (81); and Forbes, 154\*\* (92); and
- the north in Merriwa, 172\*\* (24); Narrabri, 171\*\* (139); and Tenterfield, 169\*\* (68).

Many of the SLAs mapped in the lowest range (of 30 per cent or more lower than expected) recorded 50 or fewer admissions. The lowest of these included Gunning, with a ratio of 10\*\*;

Mulwaree, with a ratio of 13\*\*; Unincorporated Far West, with a ratio of 13\*; and Nymboida, with a ratio of 16\*\*.

Albury (with an SAR of 42\*\* and 100 admissions), Goulburn (42\*\* and 54 admissions), Greater Taree (44\*\* and 113 admissions), Wagga Wagga (47\*\* and 152 admissions) and Great Lakes (49\*\* and 82 admissions) were among the few SLAs with more than 50 admissions to record ratios in the lowest range mapped.

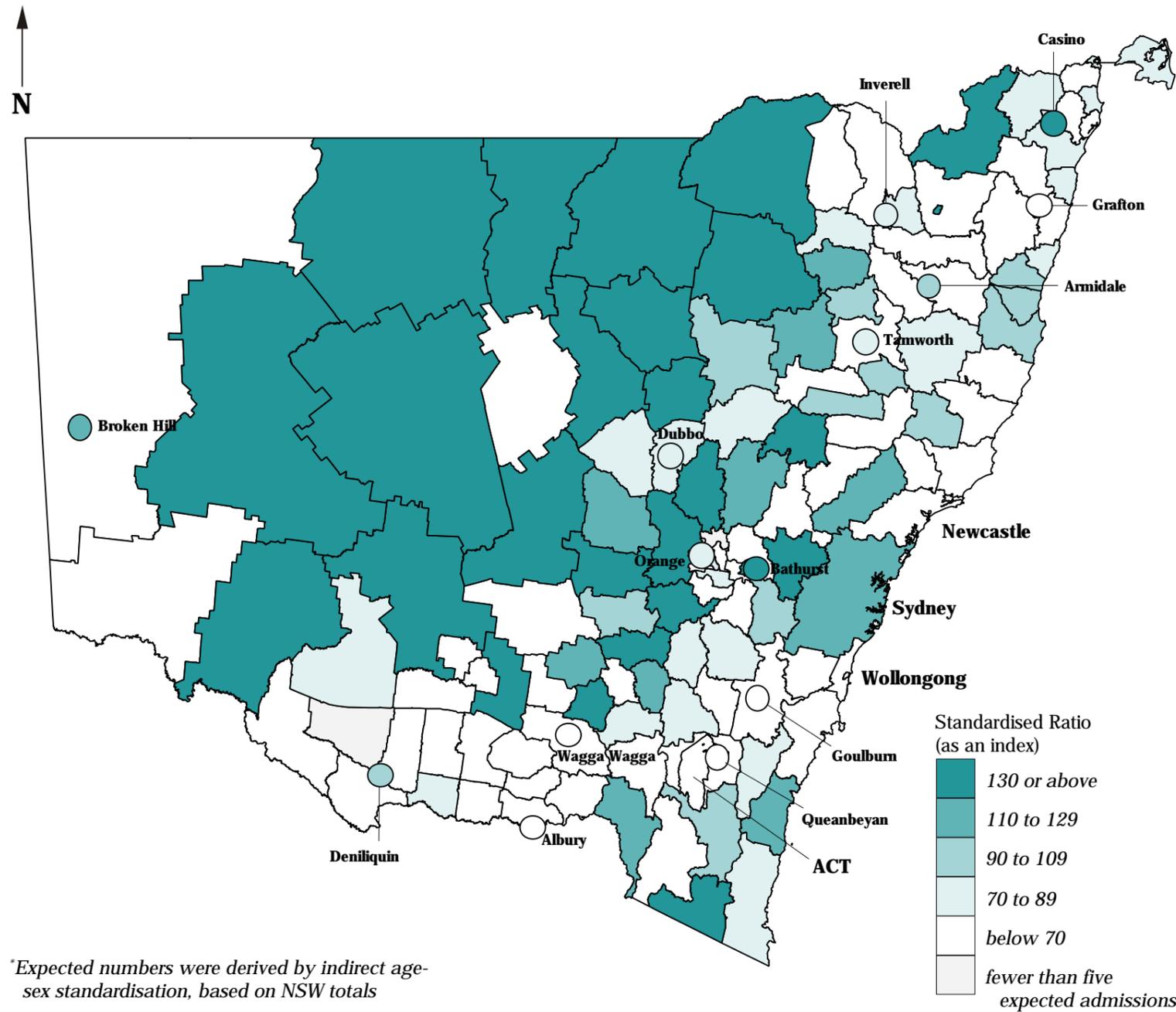
The largest numbers of admissions for neurotic, personality and other mental disorders were of residents of Coffs Harbour, with 285 admissions; Shoalhaven, 269; Bathurst, 240; and Eurobodalla, 209.

The results of the correlation analysis revealed a positive association at the SLA level with the variables for the Indigenous population (0.71) and dwellings with no motor vehicle (0.60), as well as correlations of lesser significance with a number of other variables. The inverse correlation with the IRSD (-0.54) also indicates a positive association at the SLA level between high rates of admission for these mental disorders and socioeconomic disadvantage. Correlations of meaningful significance were also recorded with the variables for deaths of males and females aged between 15 and 64 years (0.65 and 0.51 respectively), Years of Potential Life Lost (0.63) and female sole parent pensioners (0.51).

**Map 6.24**

**Admissions for neurotic, personality or other mental disorders, New South Wales, 1995/96**

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

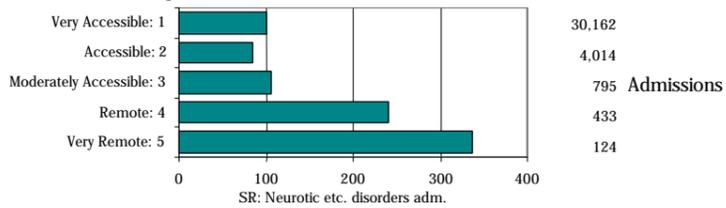


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for neurotic, personality or other mental disorders were close to the level expected from the State rates in the Very Accessible (with an SAR of 101) and Moderately Accessible (106) ARIA categories, and somewhat lower in the Accessible category (84). The ratios in the remaining ARIA categories, although based on relatively small numbers of admissions, were both highly elevated, with an SAR of 240 in the Remote category and 336 in the Very Remote category.

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 6.30).

Both **Brisbane** and **Perth** had lower ratios in the later period shown in Table 6.30, 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 6.30: Admissions with a principal diagnosis of circulatory system diseases, capital cities**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Admissions for circulatory system diseases in New South Wales accounted for 9.0 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).

## Sydney (New South Wales as the Standard)

There were 84,246 admissions for circulatory system diseases of residents of **Sydney** in 1995/96, 4 per cent fewer admissions than were expected from the State rates (an SAR of 96\*\*). Males accounted for 47,303 admissions (56.1 per cent) and females for 36,943 admissions (43.9 per cent).

The spatial distribution of SARs shows the highest ratios were concentrated in the far northern and south-western areas of **Sydney**, while the lowest were located just north of the city (Map 6.25). The most highly elevated ratios were in the SLAs of Sydney (with 47 per cent more admissions for circulatory system diseases than expected from State rates, a ratio of 147\*\*) and Blacktown (132\*\*). Other ratios in the highest range mapped were recorded in Camden (129\*\*), Wyong (116\*\*), Liverpool (115\*\*) and Campbelltown (115\*\*).

The majority of SLAs with ratios within 5 per cent of the level expected were concentrated to the south-west of the city. Those with average or above average ratios included Bankstown, with

an SAR of 104\*, Hawkesbury (103) and Holroyd, Canterbury and Sutherland (each with SARs of 100).

In total, 30 SLAs (two thirds of all SLAs in **Sydney**) had below average ratios for this variable. Residents of Willoughby (71\*\*), Kogarah (71\*\*), Mosman (72\*\*) and Ku-ring-gai (72\*\*) had the lowest SARs from circulatory system diseases.

More than 4,000 admissions were recorded for residents of Blacktown (4,977 admissions), Sutherland (4,693), Gosford (4,556), Bankstown (4,494) and Wyong (4,092).

There were correlations with most of the indicators of socioeconomic disadvantage, in particular the variables for single parent families (0.66), the Indigenous population and housing authority rented dwellings (both 0.60) and low income families (0.57). There were inverse correlations of meaningful significance with female labour force participation (-0.66) and high income families (-0.55). These results, together with the inverse correlation (-0.59) with the IRSD, suggest the existence at the SLA level of an association between high rates of admissions for circulatory system diseases and socioeconomic disadvantage.

## Newcastle

Residents of **Newcastle** had 10 per cent fewer admissions for circulatory system diseases than were expected from the State rates. Cessnock was the only SLA with more admissions than expected, with a ratio of 115\*\*, while the other ratios ranged from 86\*\* in the City of Newcastle to 96 in Maitland.

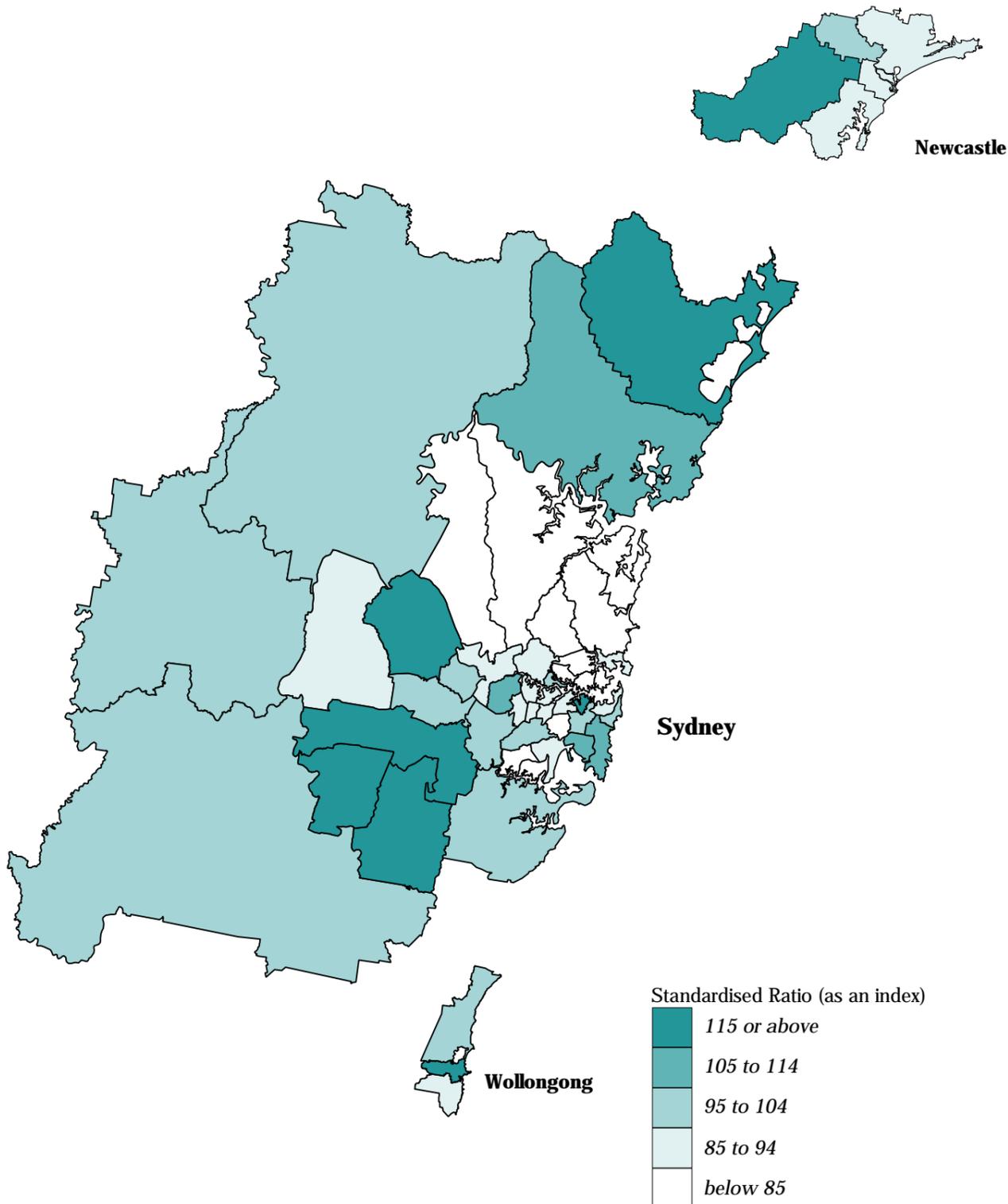
## Wollongong

Residents of **Wollongong** (with 6,187 admissions for circulatory system diseases) had 1 per cent more admissions than expected from the State rates, an SAR of 101. The highest SAR was recorded in Shellharbour (an SAR of 125\*\*), while the City of Wollongong (97\*) and Kiama (93) had fewer admissions than expected.

### Map 6.25

## Admissions for circulatory system diseases, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for circulatory system diseases, 1995/96

## State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for diseases of the circulatory system (described on the previous text page) of residents of the non-metropolitan areas were, with the exception of Tasmania (with an SAR of 95\*\*), relatively uniform across the States and Territories (**Table 6.31**). 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 6.31** with the greatest change being the decrease shown for Western Australia.

**Table 6.31: 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
<b>1995/96<sup>1</sup></b>									
Capital city	99**	94**	92**	102**	84**	97*	94	80**	95**
Other major urban centres <sup>2</sup>	97**	91**	99	..	..	..	..	..	97**
Rest of State/Territory	116**	113**	106**	115**	103**	95**	108**	- <sup>3</sup>	111**
Whole of State/Territory	104**	100	98**	105**	89**	96**	101	78**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	118**	..	110**	117**	113**	..	102	..	115**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 47,063 admissions of residents of the non-metropolitan areas of New South Wales from circulatory system diseases in 1995/96, 12 per cent more admissions than expected from the State rates (an SAR of 112\*\*).

SLAs with elevated standardised admission ratios were more frequently located in the northern and western parts of the State (**Map 6.26**). Those with the highest ratios were recorded in:

- the far north-west in Brewarrina (291\*\*), Bourke (185\*\*), Coonamble (181\*\*), Bogan (175\*\*), Warren (160\*\*), Central Darling (158\*\*), Walgett (157\*\*) and Cobar (151\*\*);
- the south-west, in Gundagai (176\*\*), Balranald (167\*\*) and Berrigan (143\*\*);
- the north, in Manilla (171\*\*), Yallaroi (167\*\*) and Barraba (144\*\*); and
- the central west, in Parkes (161\*\*), Lachlan (152\*\*), Oberon (149\*\*) and Bland (146\*\*).

SLAs with standardised admission ratios falling within 10 per cent of the level expected were widespread throughout the State, and in no notable pattern. Of the 30 areas in this class interval, only six SLAs had a statistically significant ratios. These included Nambucca (with an SAR of 108'), Tweed [Part B] (108'), Bega Valley (108'), Lismore (94'), Great Lakes (94') and Byron (91').

Only eleven SLAs were mapped in the lowest range. By far the lowest ratio was recorded in Dumaresq (9\*\*), with 91 per cent fewer admissions than expected; however there were only 8 admissions, when the State rates indicated 93 admissions.

The lowest ratios (in SLAs with at least twenty admissions) were recorded in Nymboida (39\*\*), Cabonne [Part A] (48\*\*), Mulwarree (59\*\*), Severn (61\*\*), Inverell [Part A] (64\*\*), Wakool (66\*\*), Uralla (66\*\*) and Copmanhurst (68\*\*).

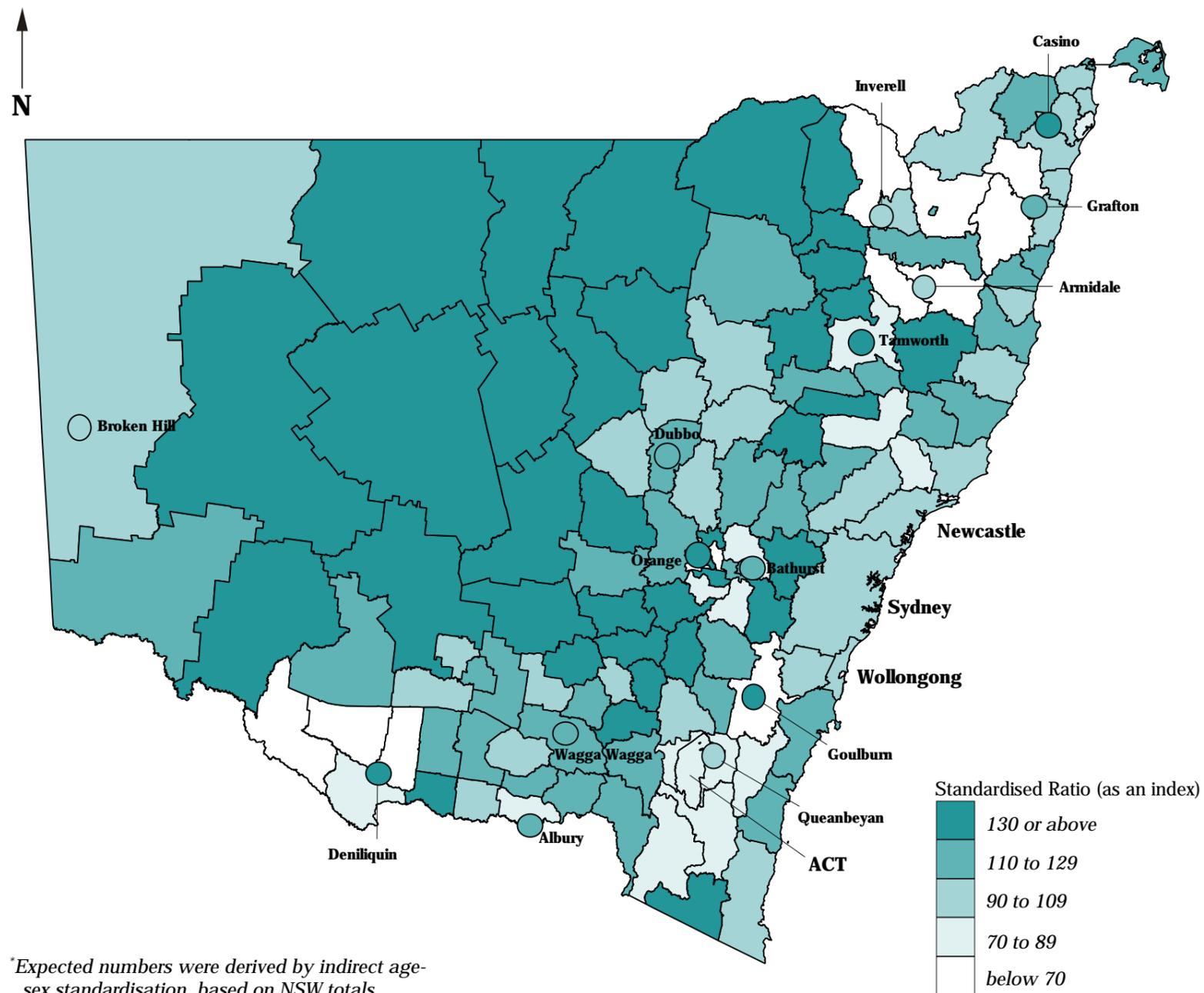
The largest numbers of admissions for circulatory system diseases in the non-metropolitan areas of New South Wales were recorded for residents of Shoalhaven (2,810), Hastings (1,984), Coffs Harbour (1,747) and Tweed Heads (1,556).

There were correlations of meaningful significance with the variables for the Indigenous population (0.57) and dwellings with no motor vehicle (0.59). These results, together with the inverse correlation (-0.52) with the IRSD, suggest the existence at the SLA level of an association between high rates of admissions for circulatory system diseases and socioeconomic disadvantage.

### Map 6.26

## Admissions for circulatory system diseases, New South Wales, 1995/96

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

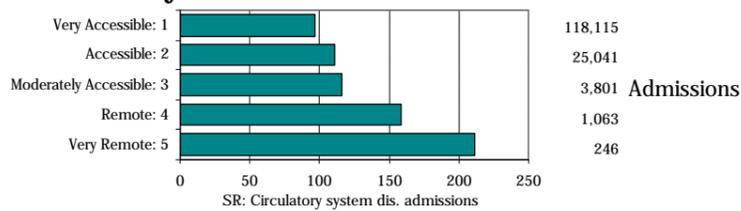


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for 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 111 and 116 in the Accessible and Moderately Accessible categories to highly elevated SARs of 211 and 159 in the Very Remote and Remote categories, respectively.

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<sup>\*</sup>) to the lowest in **Perth** (86<sup>\*\*</sup>) (Table 6.32).

**Brisbane**, **Adelaide** and **Perth** each had lower ratios in the later period shown in Table 6.32, 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 6.32: 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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	103 <sup>**</sup>	93 <sup>**</sup>	93 <sup>**</sup>	98 <sup>*</sup>	86 <sup>**</sup>	105 <sup>*</sup>	87 <sup>*</sup>	91 <sup>**</sup>	96 <sup>**</sup>
1989 <sup>3</sup>	95 <sup>**</sup>	..	105 <sup>**</sup>	106 <sup>**</sup>	90 <sup>**</sup>	..	44 <sup>**</sup>	..	98 <sup>**</sup>

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

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 3.5 per cent of admissions of New South Wales residents and 38.3 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.

## Sydney (New South Wales as the Standard)

There were 3 per cent fewer admissions for ischaemic heart disease of residents of **Sydney** than were expected from the State rates, an SAR of 97<sup>\*\*</sup>. Of the 32,359 admissions in 1995/96, nearly two thirds were males (21,243 admissions, 65.6 per cent).

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 6.27). The most highly elevated ratios (ratios at least fifteen per cent higher than expected from State rates) were located to the far north and south-west of the city. Those in the south-west were in Camden (with a ratio of 138<sup>\*\*</sup>), Liverpool (131<sup>\*\*</sup>) and Campbelltown (128<sup>\*\*</sup>), and in the north in Wyong (126<sup>\*\*</sup>). Blacktown, located in the north-west, and Sydney, Botany and Randwick, situated in the inner suburbs, were also mapped in the highest range, with ratios of 146<sup>\*\*</sup>, 142<sup>\*\*</sup>, 131<sup>\*\*</sup> and 115<sup>\*\*</sup> respectively.

More than half (60.0 per cent) the SLAs in **Sydney** had ratios below the level expected from the State rates. The lowest ratios were recorded in SLAs located near to the city centre. These ratios ranged from 51<sup>\*\*</sup> in Mosman to 74<sup>\*\*</sup> in South Sydney.

The largest numbers of admissions for this disease were recorded for residents of Blacktown (2,094), Sutherland (1,926), Gosford (1,768) and Wyong (1,725).

There were correlations of meaningful significance with the variables for early school leavers (0.69), single parent families (0.64) and the Indigenous population (0.62); and inverse correlations with the variables for managers and administrators, and professionals (-0.68), high income families (-0.66) and female labour force participation (-0.64).

These results, together with the inverse correlation with the IRSD (-0.65), suggest the existence at the SLA level of an association between high rates of admissions for ischaemic heart disease and socioeconomic disadvantage.

## Newcastle

Admissions for ischaemic heart disease in **Newcastle** (4,427 admissions) were 4 per cent lower than expected from the State rates, an SAR of 96<sup>\*</sup>.

The SLAs of Cessnock, Maitland and Port Stephens recorded average or above average ratios, with SARs of 116<sup>\*\*</sup>, 115<sup>\*\*</sup> and 100 respectively. There were 8 per cent fewer admissions recorded in Lake Macquarie (an SAR of 92<sup>\*\*</sup>), with the lowest ratio (90<sup>\*\*</sup>) in the City of Newcastle.

## Wollongong

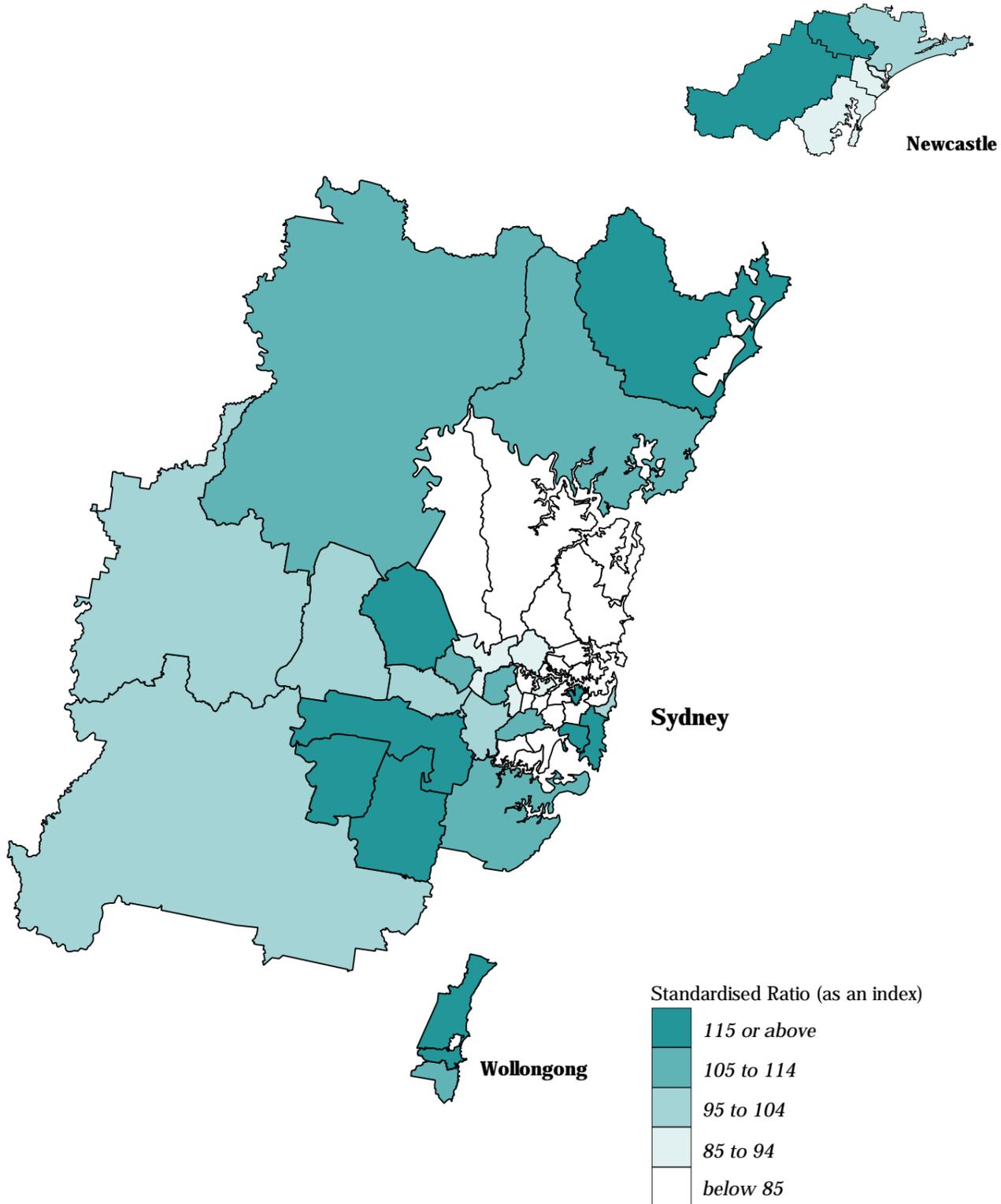
**Wollongong** had an SAR of 125<sup>\*\*</sup>, indicating that there were 25 per cent more admissions for ischaemic heart disease than were expected from the State rates, with a total of 2,969 admissions.

The SLA of Shellharbour and the City of Wollongong had ratios in the highest range mapped, of 163<sup>\*\*</sup> and 117<sup>\*\*</sup> respectively, with a lower ratio of 110 in Kiama.

**Map 6.27**

**Admissions for ischaemic heart disease, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for ischaemic heart disease, 1995/96

## State/Territory comparison (Australia as the Standard)

As was the case for circulatory system diseases, standardised admission ratios (SARs) for admissions for ischaemic heart disease (described on the previous text page) were, with the exception of Tasmania (with an SAR of 95<sup>\*</sup>) and Northern Territory (87<sup>\*</sup>), higher for residents of the non-metropolitan areas than in the capital cities (**Table 6.33**). The most highly elevated ratios were in New South Wales (112<sup>\*\*</sup>) and Victoria (111<sup>\*\*</sup>).

There was relatively little change in the ratios for the non-metropolitan areas between the periods shown in **Table 6.33** 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 6.33: 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
<b>1995/96<sup>1</sup></b>									
Capital city	103 <sup>**</sup>	93 <sup>**</sup>	93 <sup>**</sup>	98 <sup>*</sup>	86 <sup>**</sup>	105 <sup>*</sup>	87 <sup>*</sup>	91 <sup>**</sup>	96 <sup>**</sup>
Other major urban centres <sup>2</sup>	114 <sup>**</sup>	95	101	..	..	..	..	..	108 <sup>**</sup>
Rest of State/Territory	112 <sup>**</sup>	111 <sup>**</sup>	99	108 <sup>**</sup>	90 <sup>**</sup>	95 <sup>*</sup>	87 <sup>*</sup>	- <sup>3</sup>	106 <sup>**</sup>
Whole of State/Territory	107 <sup>**</sup>	98 <sup>**</sup>	96 <sup>**</sup>	101	87 <sup>**</sup>	99	87 <sup>**</sup>	89 <sup>**</sup>	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	111 <sup>**</sup>	..	95 <sup>**</sup>	100	86 <sup>**</sup>	..	53 <sup>**</sup>	..	101 <sup>*</sup>

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

Admissions for ischaemic heart disease accounted for more than one third (36.3 per cent) of all admissions for circulatory system diseases for non-metropolitan residents, a total of 17,098 admissions. Residents of the non-metropolitan areas of New South Wales were more likely to be hospitalised for this disease than expected from the State rates, recording a standardised ratio of 104<sup>\*\*</sup>. Males accounted for 64.8 per cent of the admissions.

Standardised admission ratios elevated by at least thirty per cent were recorded (**Map 6.28**):

- in the northern SLAs of Bingara (with an SAR of 180<sup>\*\*</sup>) and Nambucca (131<sup>\*\*</sup>);
- in the central west in Parkes (171<sup>\*\*</sup>), Blayney [Part A] (157<sup>\*\*</sup>) and Orange (136<sup>\*\*</sup>);
- in the far north-west in Brewarrina (155<sup>\*</sup>), Walgett (148<sup>\*\*</sup>), Bogan (147<sup>\*\*</sup>), Cobar (140<sup>\*</sup>), Warren (140<sup>\*</sup>) and Bourke (132);
- in the south-west in Balranald (153<sup>\*\*</sup>) and Berrigan (142<sup>\*\*</sup>);
- in the north-east in Casino (137<sup>\*\*</sup>) and Tweed Heads (134<sup>\*\*</sup>); and
- in the south-east in Goulburn (142<sup>\*\*</sup>) and Junee (131<sup>\*</sup>).

Only three of the SLAs mapped in the lowest range recorded more than 50 admissions for ischaemic heart disease over the period analysed. Tenterfield and Parry had the lowest ratios in this category, with 33 per cent fewer admissions than expected, both with an SAR of 67<sup>\*\*</sup>. Scone also recorded more than 50 admissions, with a ratio of 69<sup>\*\*</sup>. Overall, residents of Dumaresq recorded the lowest SAR (of 12<sup>\*\*</sup>), with four admissions (when the State rates indicated 37 admissions).

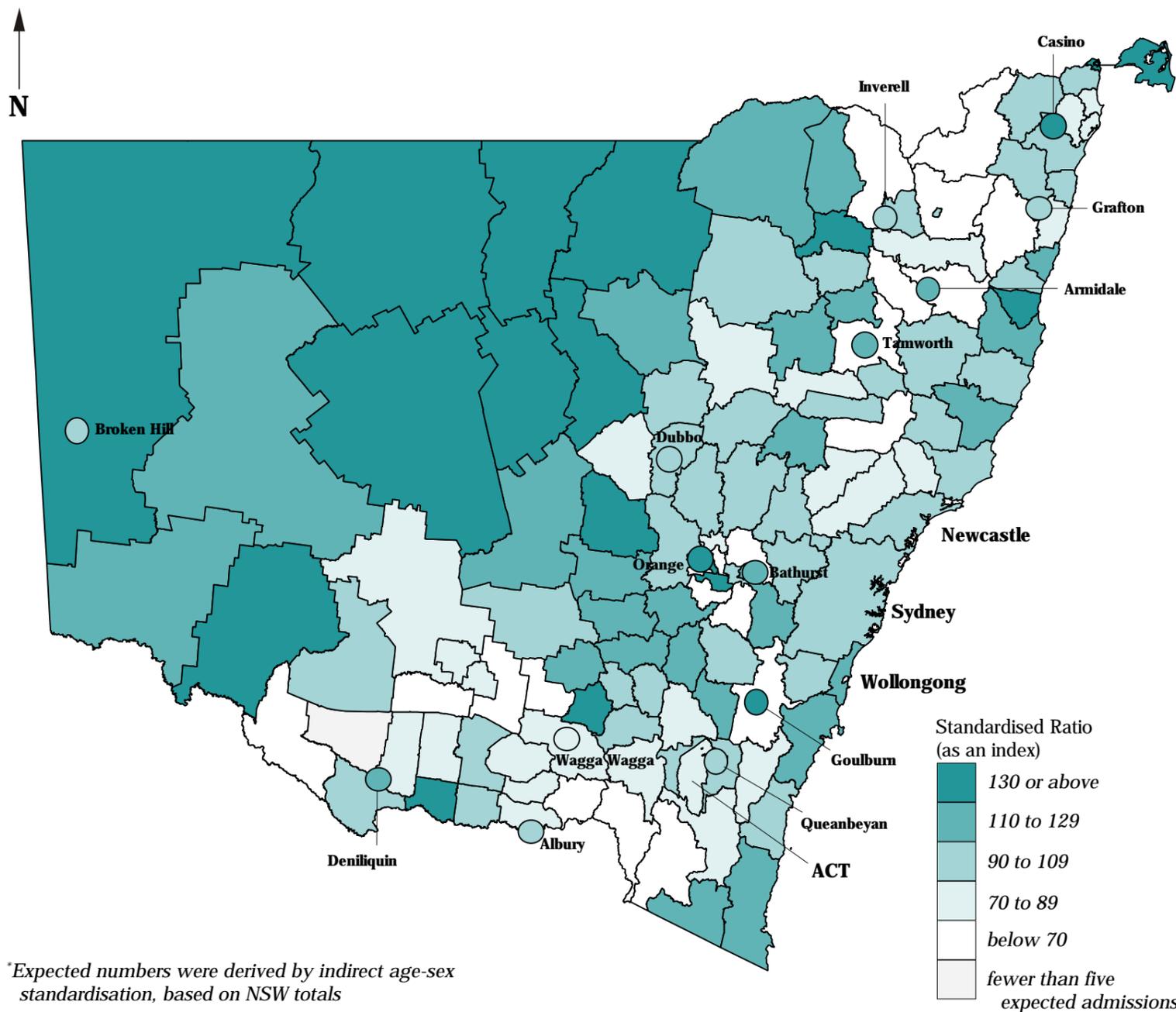
The largest numbers of admissions were recorded in Shoalhaven, with 1,227 admissions; Hastings, 803 admissions; Tweed Heads, 707 admissions; Coffs Harbour, 649 admissions; and Greater Taree, 617 admissions.

The correlation analysis revealed a weak positive association with most of the indicators of socioeconomic disadvantage. The weak inverse correlation with the IRSD (-0.45) supports the existence of an association at the SLA level between high rates of admissions for circulatory system diseases and socioeconomic disadvantage.

### Map 6.28

## Admissions for ischaemic heart disease, New South Wales, 1995/96

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

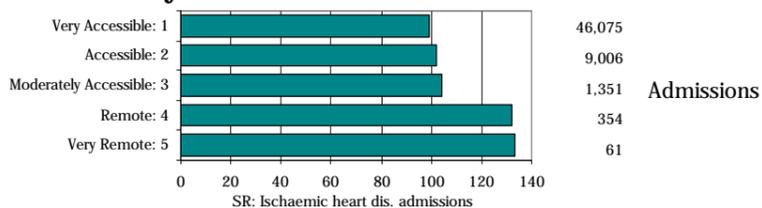


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for ischaemic heart disease are near the level expected from the State rates in the three 'accessible' categories, with elevated ratios in the Very Remote (with an SAR of 133) and Remote (an SAR of 132) 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 6.34). 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 6.34: Admissions with a principal diagnosis of respiratory system diseases, capital cities**  
*Age-sex standardised admission ratios*

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

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Respiratory system diseases include the diseases of pneumonia, influenza, bronchitis, emphysema and asthma. This category includes people with chronic obstructive pulmonary disease – a persistent obstruction of bronchial air flow, manifesting as asthma, chronic bronchitis, and chronic emphysema – as well as acute respiratory infections. Admissions from these diseases represented 6.3 per cent of all admissions analysed for New South Wales residents: 5.7 per cent of residents of **Sydney** and the other major urban centres and 7.6 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).

## Sydney (New South Wales as the Standard)

There were 57,026 admissions for respiratory system diseases of residents of **Sydney**, 8 per cent fewer admissions than expected from the State rates. Males accounted for 54.7 per cent of the admissions (31,203 admissions).

The three SLAs mapped in the highest range (with ratios elevated by 15 per cent or more) were situated in inner SLAs and to the north-west of the city (Map 6.29). Residents of Sydney had the highest SAR for this variable, with just under twice the number of admissions expected, a ratio of 198\*\*. The two other SLAs of Blacktown and South Sydney both had a ratio of 117\*\*.

One third of the SLAs in **Sydney** were mapped in the second to lowest range, with ratios ranging from 94\*\* in Penrith to 85\*\* in Willoughby and Hawkesbury.

Twelve SLAs had ratios in the lowest range mapped (of 15 per cent or more below the level expected from the State rates), all of which were highly significant. These SLAs were located just north of the city, and in the outer south and east, and included Baulkham Hills (with an SAR of 69\*\*), Wollondilly (70\*\*): Hornsby (73\*\*); Kogarah (74\*\*); and Ku-ring-gai (75\*\*).

The largest number of admissions for respiratory system diseases was in Blacktown, with 4,329 admissions. More than 2,500 admissions were also recorded in Gosford (2,781 admissions), Bankstown (2,720 admissions), Fairfield (2,635 admissions) and Sutherland (2,633 admissions).

There were correlations of meaningful significance with the variables for dwellings with no motor vehicle (0.64), single parent families (0.53) and dwellings rented from the State housing authority (0.52). An inverse correlation of meaningful significance was recorded with the variable for female labour force participation (-0.62). These results, together with the inverse correlation with the IRSD (-0.35), suggest the existence at the SLA level of an association between high rates of admission for respiratory system diseases and socioeconomic disadvantage.

## Newcastle

Residents of **Newcastle** had 18 per cent fewer admissions for respiratory system diseases than were expected from the State rates, an SAR of 82\*\*. There were 6,575 admissions, of which 3,613 were males and 2,962 females.

By far the highest ratio was recorded in Cessnock, with an SAR of 134\*\*, this was the only SLA to record more admissions than expected. Ratios in the other SLAs ranged from 69\*\* in Lake Macquarie to 82\*\* in the City of Newcastle.

## Wollongong

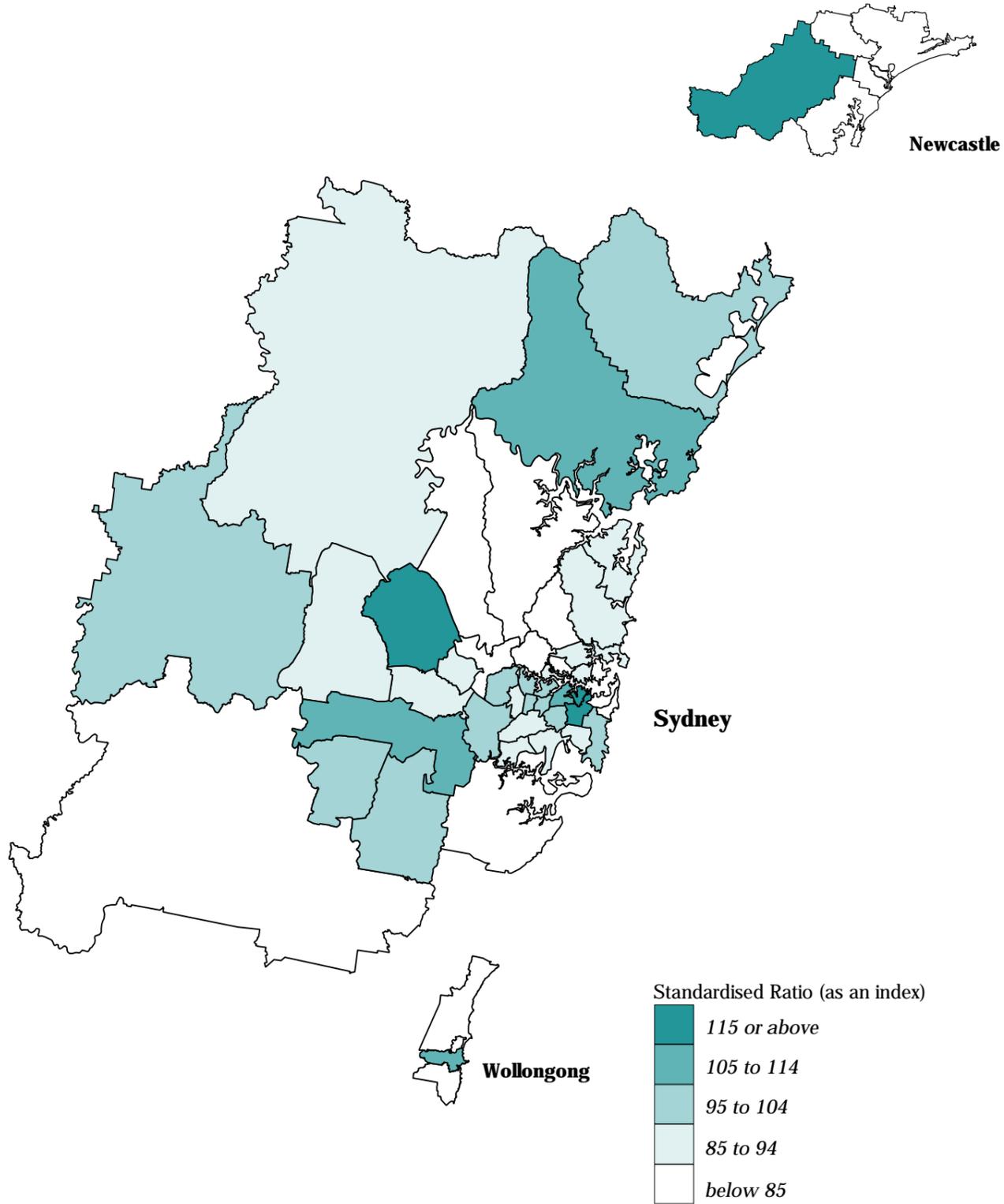
**Wollongong** had 3,627 admissions for respiratory system diseases in 1995/96, 15 per cent fewer than expected (an SAR of 85\*\*).

A standardised admission ratio elevated by 8 per cent was recorded in Shellharbour (a ratio of 108\*), with 20 per cent and 31 per cent fewer admissions than expected in the City of Wollongong (80\*\*) and Kiama (69\*\*).

**Map 6.29**

**Admissions for respiratory system diseases, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for respiratory system diseases, 1995/96

## State/Territory comparison (Australia as the Standard)

Standardised admission ratios (SARs) for admissions for respiratory system diseases (described on the previous text page) were higher, and often substantially higher, for residents of the non-metropolitan areas than of the capital cities (**Table 6.35**). 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 6.35**). The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. 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 6.35: 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
<b>1995/96<sup>1</sup></b>									
Capital city	91**	87**	92**	114**	83**	77**	102	67**	91**
Other major urban centres <sup>2</sup>	82**	85**	86**	..	..	..	..	..	84**
Rest of State/Territory	123**	116**	115**	156**	147**	80**	180**	- <sup>3</sup>	123**
Whole of State/Territory	99**	95**	101	125**	101	79**	146**	66**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	135**	..	130**	169**	176**	..	164**	..	143**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 36,010 admissions of residents of the non-metropolitan areas of New South Wales 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 7.6 per cent of all admissions of non-metropolitan residents, 54.4 per cent of which were males.

Some 75 per cent of the non-metropolitan SLAs had elevated SARs, with the most highly elevated ratios in SLAs located across much of the central and western parts of New South Wales (**Map 6.30**). Those with more than twice the number of admissions expected were recorded in:

- the far north-west in Brewarrina (542\*\*), Bourke (403\*\*), Central Darling (401\*\*), Walgett (248\*\*), Coonamble (235\*\*), Bogan (234\*\*), Warren (229\*\*) and Cobar (216\*\*);
- the north in Yallaroi (375\*\*), Barraba (294\*\*), Guyra (215\*\*) and Manilla (205\*\*);
- the south-west in Balranald (308\*\*), Deniliquin (261\*\*), Gundagai (245\*\*), Hay (237\*\*), Berrigan (226\*\*) and Narrandera (225\*\*); and
- the SLAs of Casino (237\*\*), Lachlan (226\*\*) and Crookwell (204\*\*).

SLAs with SARs mapped in the middle range within 10 per cent of the level expected were widespread throughout the State, with the highest ratios in Tweed Heads (with a ratio of 109) and Goulburn (108).

In total, 12 SLAs were mapped in the lowest range: those with more than 20 admissions were Dungog (38\*\*), Yarrowlumla (51\*\*), Tallaganda (59\*\*), Nymboida (59\*\*), Copmanhurst (61\*\*), Blayney [Part B] (63) and Gloucester (67\*\*).

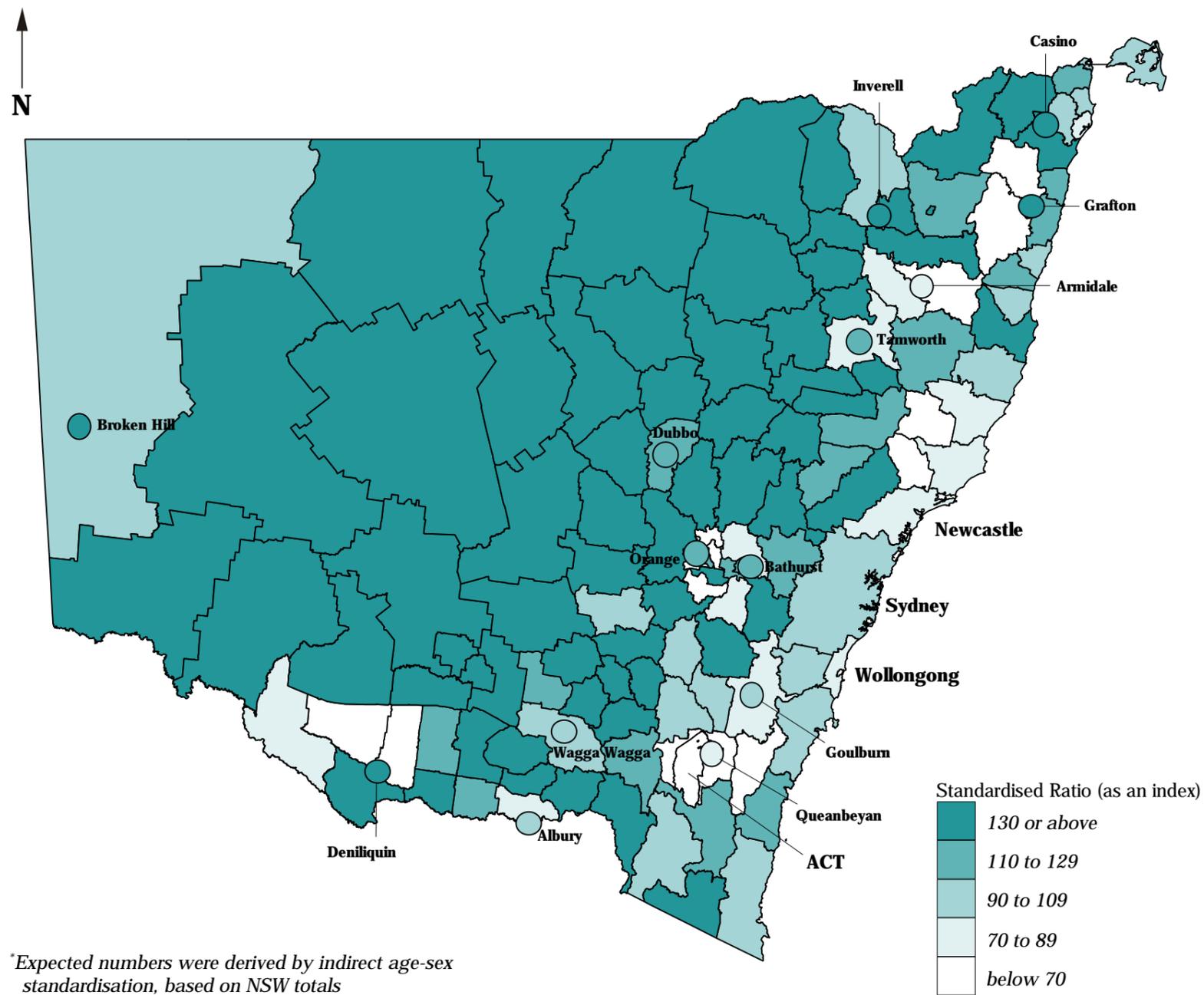
The largest numbers of admissions were recorded in Shoalhaven, with 1,457 admissions; Hastings, 1,141 admissions; Coffs Harbour, 993 admissions; and Wagga Wagga, 964 admissions.

There were correlations of meaningful significance with the variables for the Indigenous population (0.68) and dwellings with no motor vehicle (0.55), and weaker inverse correlations with female labour force participation (-0.43) and high income families (-0.32). The inverse correlation of substantial significance recorded with the IRSD (-0.57) also indicates a positive association at the SLA level between high rates of admission for respiratory system diseases and socioeconomic disadvantage.

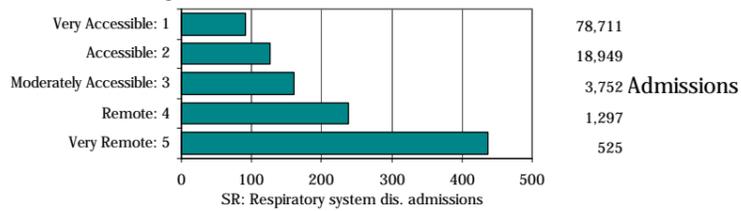
### Map 6.30

## Admissions for respiratory system diseases, New South Wales, 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 for respiratory system diseases show a strong relationship with remoteness. The ratios increase by around one third from ARIA category 1 to category 2, by around 50 per cent between categories 3 and 4, and by around 75 per cent between categories 4 and 5. The highly elevated SAR of 437 in the Very Remote category indicates that the 525 admissions for respiratory system diseases were in excess of four times the number expected from the State rates.

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 6.36**). 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 6.36: 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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	95**	68**	99	118**	91**	71**	88*	80**	89**
1989 <sup>3</sup>	67**	..	90**	123**	79**	..	38**	..	80**

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>Data 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 (24.2 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.

## Sydney (New South Wales as the Standard)

There were 13,753 admissions for respiratory system diseases of residents of **Sydney** aged from 0 to 4 years. This was 8 per cent fewer admissions than expected from the State rates.

The two SLAs with elevated ratios in the highest range mapped (**Map 6.31**) were recorded in Blacktown (with an SAR of 124\*\*) and Blue Mountains (116\*\*). The only other statistically significant ratio above the level expected from the State rates was recorded for residents of Liverpool (110').

More than three quarters of all SLAs had ratios below the level expected. The lowest was in Mosman, an SAR of 57\*\*, indicating that there were 43 per cent fewer admissions than were expected. Highly significant ratios mapped in the lowest range were also recorded for residents of the inner SLAs of Concord (61\*\*), Waverley (63\*\*), Woollahra (63\*\*), Kogarah (66\*\*), Burwood (68\*\*), Hurstville (69\*\*), Ryde (72\*\*), Marrickville (75\*\*), Leichhardt (77\*\*), Ashfield (78\*\*) and Randwick (82\*\*); to the west in Wollondilly (66\*\*) and Parramatta (77\*\*); in the north in Baulkham Hills (67\*\*), Hornsby (74\*\*) and Ku-ring-gai (84\*\*); and in the south in Sutherland (72\*\*).

The largest number of admissions for respiratory system diseases of children aged from 0 to 4 years was in Blacktown, with 1,514 admissions. More than 800 admissions were also recorded for residents of Campbelltown, with 899; Penrith, with 805; and Fairfield, with 802.

Correlations of meaningful significance at the SLA level were recorded with the variables for single parent families (0.53) and Aboriginal and Torres Strait Islander people (-0.50) and at a lower level of significance with housing authority rented dwellings (0.45) and low income families and the Indigenous population (both 0.36). These results, together with the inverse correlation (-0.39) with the IRSD, suggest the existence at the SLA level of an association between high rates of admission of young children for respiratory system diseases and socioeconomic disadvantage

## Newcastle

In 1995/96 there were 1,456 admissions for respiratory system diseases of children aged from 0 to 4 years in **Newcastle**, 21 per cent fewer admissions than expected from the State rates (an SAR of 79\*\*).

Young residents of Cessnock had the highest, and only elevated, ratio in **Newcastle**, with an SAR of 140\*\*. Port Stephens (90), Maitland (72\*\*), the city of Newcastle (71\*\*) and Lake Macquarie (66\*\*) all had ratios below the level expected from the State rates.

## Wollongong

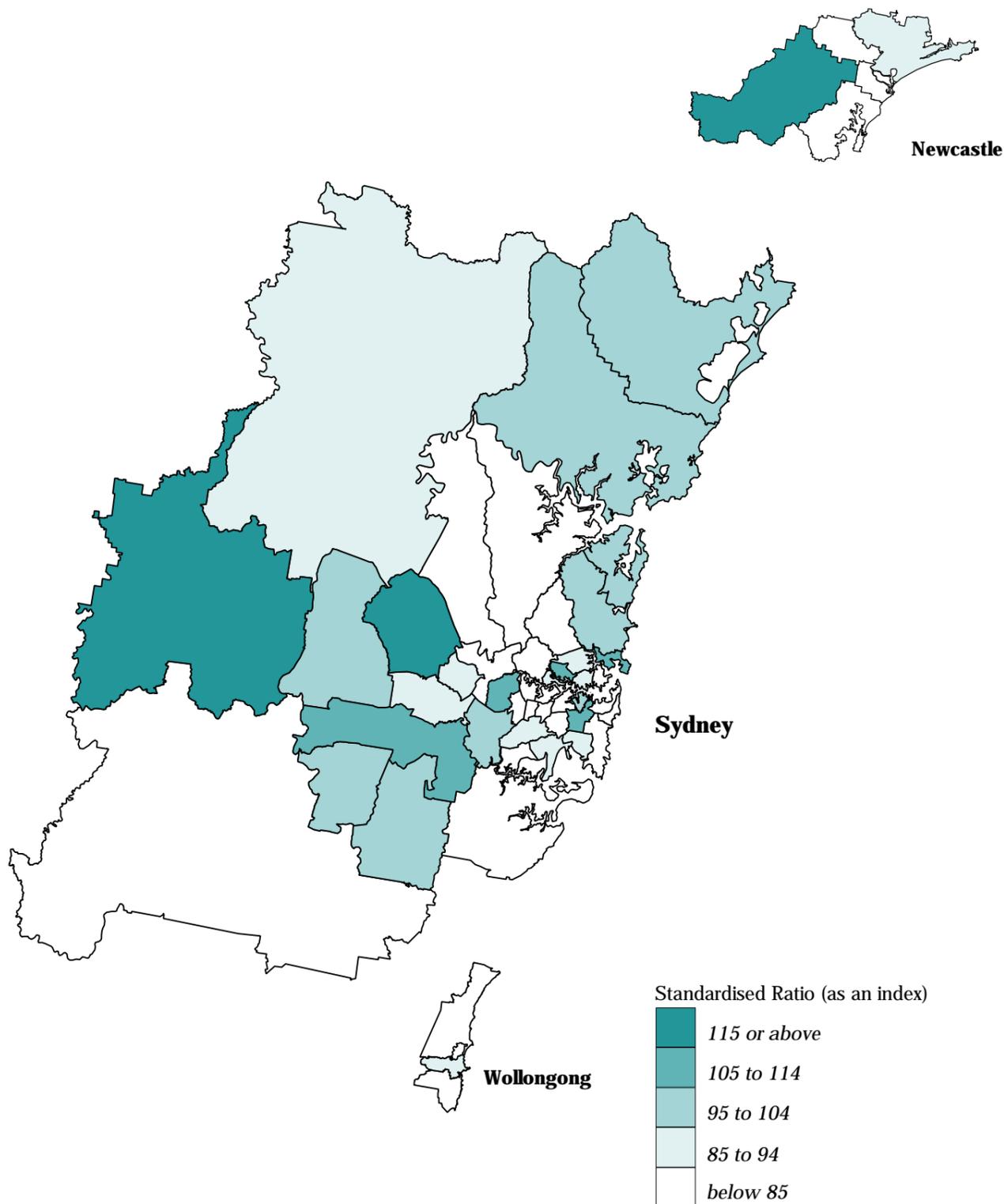
There were 786 admissions of young children with respiratory system diseases in **Wollongong**, which had the lowest SAR among the major urban centres, with 25 per cent fewer admissions than were expected from the State rates (an SAR of 75\*\*).

The highest ratio was recorded in the SLA of Shellharbour (an SAR of 94), and the lowest in the City of Wollongong (68\*\*) and Kiama (72').

### Map 6.31

## Admissions of children aged 0 to 4 years for respiratory system diseases, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

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

## State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions for respiratory system diseases (described on the previous text page) were higher, in most cases substantially so, for residents of the non-metropolitan areas than in the capital cities (**Table 6.37**). 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 6.37**). The lower ratios in the later period suggest a decline (relative to the Australian rates) in admissions of non-metropolitan residents over this period. SARs in the Northern Territory, however, increased over this period, from 163\*\* in 1987 to 212\*\* in 1995/96.

**Table 6.37: 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
<b>1995/96<sup>1</sup></b>									
Capital city	95**	68**	99	118**	91**	71*	88*	80**	89**
Other major urban centres <sup>2</sup>	81**	92	85**	..	..	..	..	..	83**
Rest of State/Territory	132**	103*	116**	146**	165**	68**	212**	- <sup>3</sup>	125**
Whole of State/Territory	104**	78**	105**	126**	114**	69**	162**	81**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	138**	..	121**	180**	177**	..	163**	..	142**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>Data 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 (New South Wales as the Standard)

Children aged from 0 to 4 years accounted for a quarter (25.0 per cent) of all admissions of non-metropolitan residents with respiratory system diseases in 1995/96. There were 8,996 admissions of 0 to 4 year olds resident in the non-metropolitan areas of New South Wales, 27 per cent more than were expected from the State rates (an SAR of 127\*\*).

SLAs with the highest ratios were similar (**Map 6.32**) to those listed for admissions for all ages, with almost half (46.8 per cent) recording ratios elevated by 30 per cent or more. Those with more than twice the expected number of admissions were recorded in:

- the north in Barraba (537\*\*), Yallaroi (350\*\*), Murrurundi (238\*\*) and Guyra (225\*\*);
- the far north-west in Central Darling (506\*\*), Bourke (489\*\*), Brewarrina (468\*\*), Gilgandra (291\*\*), Warren (289\*\*), Walgett (273\*\*), Coonamble (247\*\*), Cobar (241\*\*) and Wellington (237\*\*);
- the south-west in Balranald (366\*\*), Temora (273\*\*), Wentworth (243\*\*), Gundagai (236\*\*), Carrathool (227\*\*), Deniliquin (220\*\*), Berrigan (215\*\*) and Narrandera (208\*\*);
- the north-east in Casino (286\*\*); and
- the central west in Lachlan (243\*\*).

Fifteen SLAs had ratios of 30 per cent or more below the level expected from the State rates: although many were of statistical significance, they generally had a small number of cases. The only SLAs with SARs in the lowest range and more than 20 admissions were Parry, with an SAR of 66\* (33 admissions, when 50 would be expected from the State rates); Queanbeyan, with an SAR of 66\*\* (91 admissions, when the State rates would indicate 138); Great Lakes, with an SAR of 67\*\* (65 admissions, when 97 were indicated); and Corowa, with an SAR of 67 (23 admissions, when 34 were indicated).

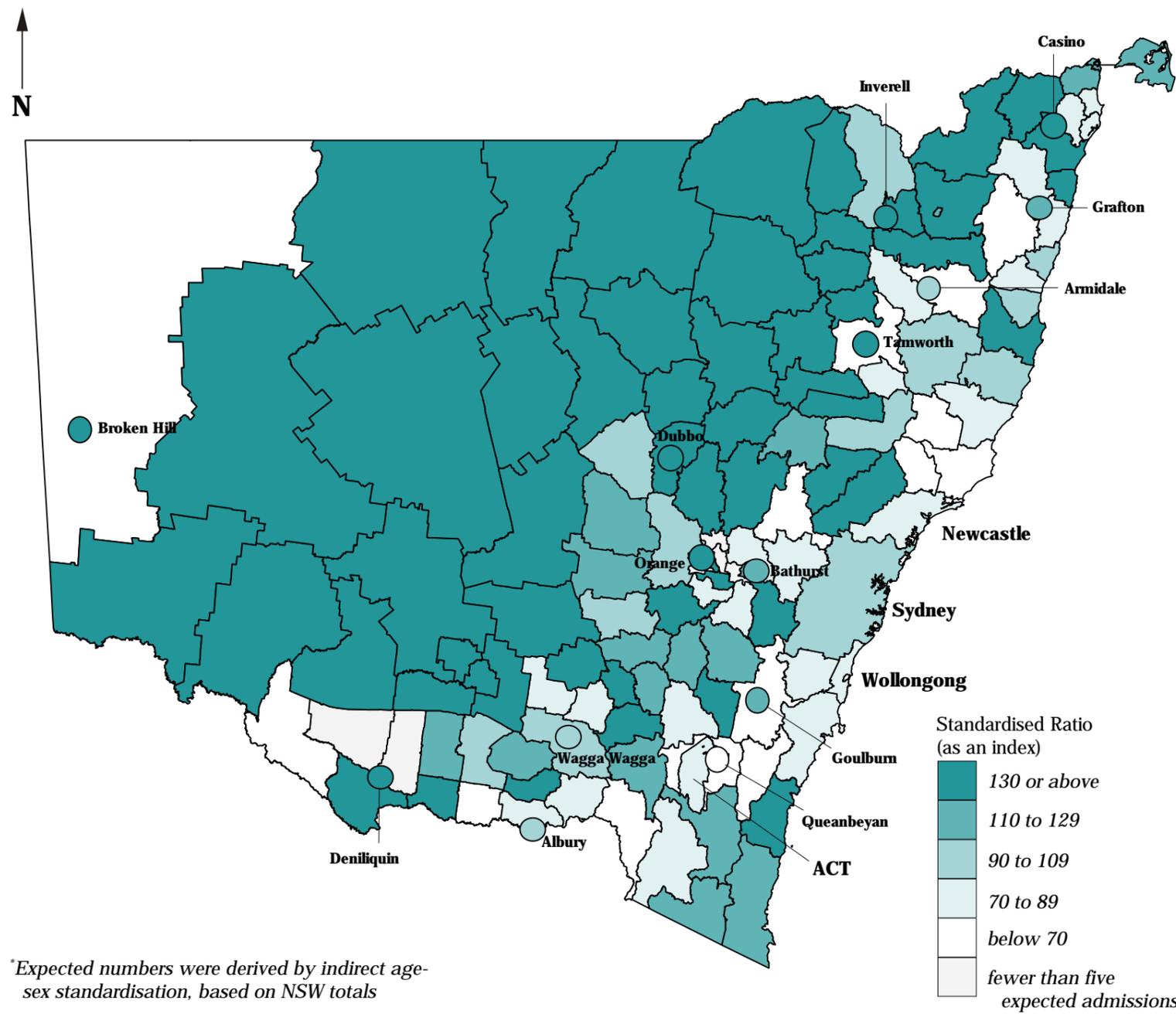
The largest numbers of admissions for respiratory system diseases among this age group were recorded in the SLAs of Dubbo (with 314 admissions), Shoalhaven (292 admissions), Wagga Wagga, (271 admissions) and Tamworth (235 admissions).

There were correlations of meaningful significance with the variables for the Indigenous population (0.63) and dwellings with no motor vehicle (0.51) and of lesser significance with the other indicators of socioeconomic disadvantage. The inverse correlation of substantial significance recorded with the IRSD (-0.52) supports the existence of an association at the SLA level between high rates of admission of young children for respiratory system diseases and socioeconomic disadvantage.

**Map 6.32**

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

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

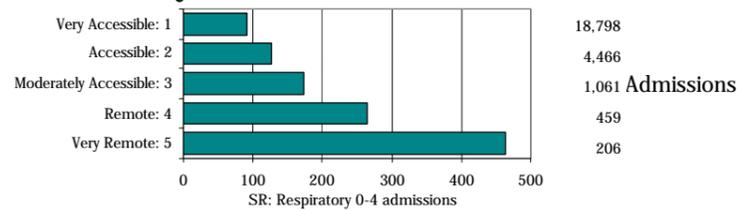


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



SARs for respiratory system diseases among young children show an even stronger relationship with remoteness. The ratios increase by around one third from ARIA 1 to 2, by around 50 per cent between categories 3 and 4, and by around 75 per cent between 4 and 5. The highly elevated SAR of 464 in the Very Remote areas indicates that the 206 admissions of young children for respiratory system diseases were around four and a half times more admissions than were expected from the State rates.

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 6.38). 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 6.38: 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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	99	70**	105**	123**	90**	70**	80**	60**	91**
1989 <sup>3</sup>	67**	..	103*	103*	81**	..	44**	..	81**

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Bronchitis, emphysema and asthma are grouped together as chronic obstructive pulmonary diseases in the International Classification of Diseases (ICD-9), which is used to code causes of admissions. However, although they are of a similar nature, they are distinct conditions, affecting different age groups in the population. Admissions for asthma and bronchitis occur at all ages, more frequently among children and older people, whereas those from emphysema (contributing the smallest numbers to this group) are almost exclusively of older people, more frequently males. For example, more than one quarter (27.4 per cent) of admissions for cystic fibrosis, bronchitis, emphysema or asthma in 1995/96 were of children aged from 0 to 4 years. Males had substantially higher admission rates in the age groups under 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 25.7 per cent of admissions for all respiratory system diseases of New South Wales residents; 26.3 per cent in **Sydney** and the other major urban centres and 24.6 per cent in the non-metropolitan areas.

## Sydney (New South Wales as the Standard)

There were 15,354 admissions for bronchitis, emphysema or asthma in **Sydney**, 3 per cent fewer admissions than expected from the State rates (an SAR of 97\*\*). Just over half (52.1 per cent) of the admissions were males.

It can be seen in **Map 6.33** that the inner city SLAs of Sydney (with an SAR of 227\*\*), Leichhardt (151\*\*) and South Sydney (137\*\*); the SLAs of Blacktown (146\*\*) and Bankstown (117\*\*) located to the west of the city; and the north-eastern SLAs of Gosford (127\*\*) and Wyong (126\*\*), were all mapped in the highest range.

Many of the SLAs mapped in the lowest range were situated in the inner, southern or northern SLAs of **Sydney**. Those situated in the north were the SLAs of Baulkham Hills (59\*\*), Ku-ring-gai (67\*\*), Hornsby (77\*\*), Willoughby (79\*\*), Lane Cove (80\*\*) and Ryde (82\*\*); in the south were Wollondilly (59\*\*), Kogarah (67\*\*) and Sutherland (73\*\*); and located in the inner areas were Mosman (61\*\*), Woollahra (67\*\*) and Waverley (76\*\*).

The largest number of admissions for bronchitis, emphysema or asthma was in Blacktown with 1,441. More than 700 admissions were recorded for residents of Gosford (866), Bankstown (848), Wyong (732) and Fairfield (726).

There were correlations of meaningful significance with a number of indicators of socioeconomic disadvantage, including dwellings with no motor vehicle (0.62), single parent families (0.57), dwellings rented from the State housing authority (0.57), low income families (0.51) and female labour force participation (an inverse correlation of -0.56). These results, together with the weaker inverse correlation with the IRSD (-0.42), suggest the existence at the SLA level of an association between high rates of admissions for bronchitis, emphysema or asthma and socioeconomic disadvantage.

## Newcastle

Residents of **Newcastle** had 1,582 admissions for bronchitis, emphysema or asthma, 23 per cent fewer admissions than expected from the State rates (an SAR of 77\*\*). Cessnock had the only elevated ratio, an SAR of 120\*\*, with other ratios ranging from 56\*\* in Lake Macquarie to 89\*\* in the City of Newcastle.

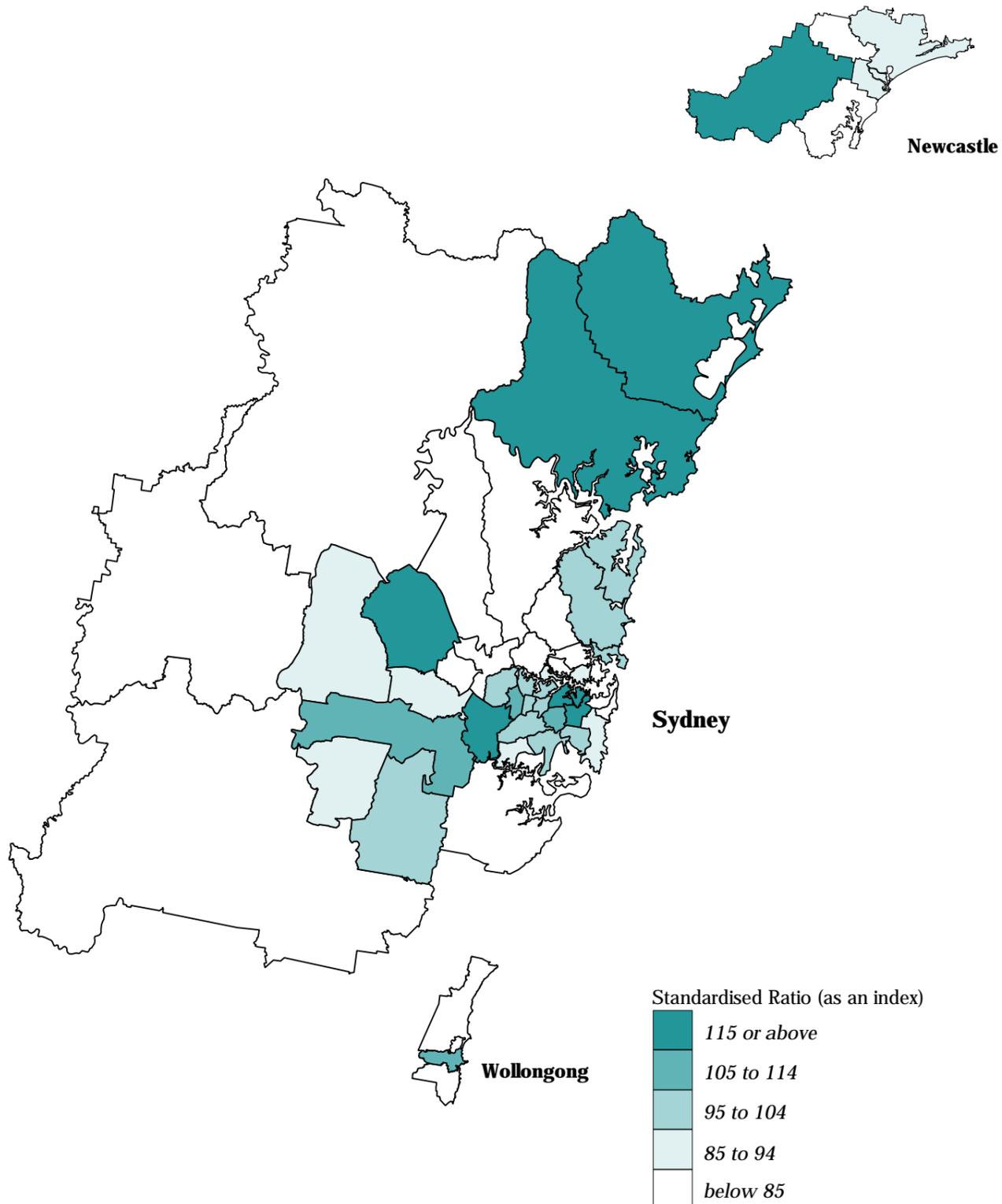
## Wollongong

There were 762 admissions of residents of **Wollongong** for bronchitis, emphysema or asthma, 31 per cent fewer admissions than expected from the State rates (an SAR of 69\*\*). Shellharbour had the highest ratio, of 112, while the Kiama and the City of Wollongong had SARs of 43\*\* and 60\*\* respectively.

### Map 6.33

## Admissions for bronchitis, emphysema or asthma, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

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

## State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions for bronchitis, emphysema or asthma (described on the previous text page) were higher (and often substantially so) for residents of the non-metropolitan areas than in the capital cities (**Table 6.39**). 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 6.39**. 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 6.39: 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
<b>1995/96<sup>1</sup></b>									
Capital city	99	70**	105**	123**	90**	70**	80**	60**	91**
Other major urban centres <sup>2</sup>	76**	74**	77**	..	..	..	..	..	76**
Rest of State/Territory	121**	117**	111**	182**	167**	62**	98	- <sup>3</sup>	123**
Whole of State/Territory	102**	83**	104**	139**	112**	65**	90	60**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	130**	..	145**	181**	157**	..	83**	..	142**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

Almost one quarter (24.6 per cent) of admissions for respiratory system diseases was for the diseases of bronchitis, emphysema or asthma. These diseases were substantially more prevalent among residents in country areas than would be expected from the State rates, with an SAR of 118\*\*. This elevated ratio is in line with that for admissions for all respiratory system diseases, described above.

A number of SLAs had highly elevated SARs for these diseases (**Map 6.34**). SLAs with more than twice the number of admissions than were expected from the State rates were in:

- the north in Yallaroi (an SAR of 620\*\*), Guyra (274\*\*), Murrurundi (241\*\*) and Barraba (222\*\*);
- the far north-west in Central Darling (493\*\*), Bourke (466\*\*), Warren (365\*\*), Brewarrina (360\*\*), Walgett (225\*\*), Cobar (209\*\*) and Coonamble (205\*\*);
- the south-west in Balranald (347\*\*), Berrigan (285\*\*), Culcairn (227\*\*) and Narrandera (207\*\*);
- the south-east in Harden (313\*\*);
- the north-east in Casino (310\*\*) and Kyogle (265\*\*);
- the north in Manilla (308\*\*), Inverell [Part B] (209\*\*) and Moree Plains (208\*\*); and
- the central areas of Blayney [Part A] (202\*\*), Coolah (201\*\*) and Bland (201\*\*).

In total, 17 SLAs were mapped in the middle range (within 10 per cent of the level expected from the State rates), with SARs ranging from 90 in Murrumbidgee to 109 in Bellingen.

Parry, Queanbeyan, Yass, Ballina, Goulburn and Tumut were the only SLAs in the lowest range mapped to record more than 20 admissions for bronchitis, emphysema or asthma. Parry, with the lowest SAR in this category, had 54 per cent fewer admissions than were expected (25 admissions, when 55 were expected from the State rates), an SAR of 46\*\*. Bega Valley (97 admissions), Hume (22) and Byron (96) also had relatively low ratios, with SARs of 71\*\*, 75 and 79\* respectively.

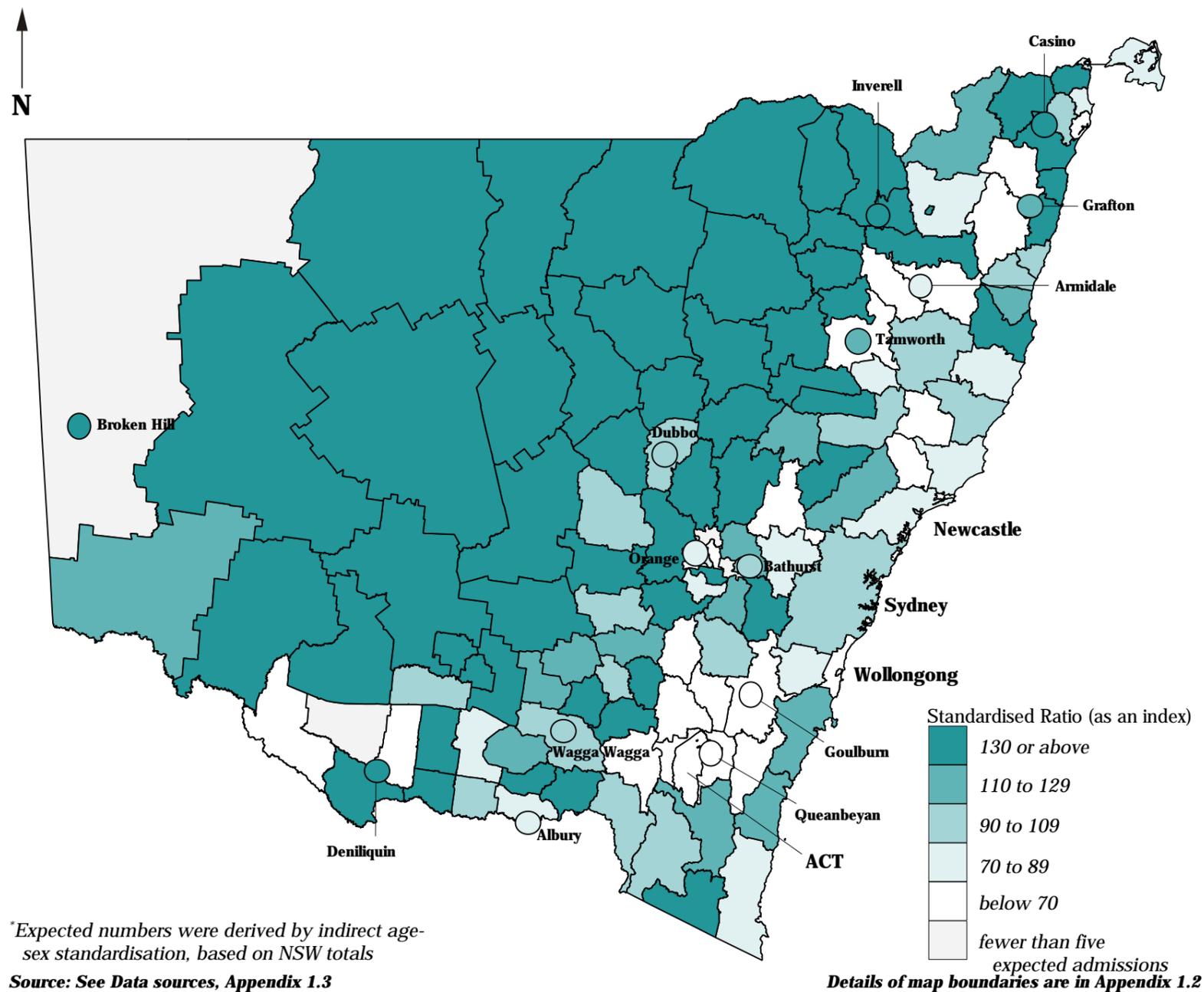
Residents of Shoalhaven had the largest number of admissions (433 admissions), followed by Coffs Harbour (255), Hastings (241), Wagga Wagga (232), Greater Taree (212), Kempsey (192) and Tamworth (192).

There was a correlation of meaningful significance with variable for the Indigenous population (0.50) and correlations of lesser significance with dwellings with no motor vehicle (0.40) and early school leavers (0.31). These results, together with the inverse correlation with the IRSD (-0.49), suggest the existence at the SLA level of an association between high rates of admissions for bronchitis, emphysema or asthma and socioeconomic disadvantage

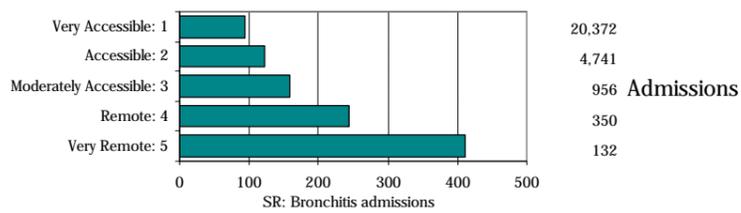
### Map 6.34

## Admissions for bronchitis, emphysema or asthma, New South Wales, 1995/96

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



### Accessibility/Remoteness Index of Australia



SARs for bronchitis, emphysema or asthma show a similarly strong relationship with remoteness to that noted for admissions for all respiratory system diseases. The gradients are also similar, with increases of around one third from ARIA categories 1 to 2, of around 50 per cent between categories 3 and 4, and of around 70 per cent between categories 4 and 5. The SAR of 410 in the Very Remote areas indicates that the 132 admissions for bronchitis, emphysema or asthma were just over four times the number expected from the State rates.

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 6.40).

Both **Adelaide** and **Perth** had substantially lower ratios in the later period shown in Table 6.40, 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 6.40: 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 <sup>1</sup>	All capitals
1995/96 <sup>2</sup>	92**	84**	95**	94**	86**	112**	111**	60**	90**
1989 <sup>3</sup>	78**	..	85**	114**	101	..	101	..	88**

<sup>1</sup>Includes Queanbeyan (C)

<sup>2</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

<sup>3</sup>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

Accidents, poisonings and violence are a major cause of hospitalisation, accounting for 7.9 per cent of all admissions analysed for New South Wales residents; 10.2 per cent of male admissions and 6.1 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 92.5 per cent of admissions from these external causes, and were largely accidental falls (23.8 per cent of all admissions from these external causes) and motor vehicle traffic accidents (6.2 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).

## Sydney (New South Wales as the Standard)

There were 5 per cent fewer admissions of residents of **Sydney** from the combined causes of accidents, poisonings and violence than were expected from the New South Wales rates (an SAR of 95\*\*). Males accounted for 57.4 per cent of the 75,750 admissions.

Six SLAs had ratios in the highest range mapped. These were the inner SLAs of Sydney (an SAR of 206\*\*) and South Sydney (117\*\*); Wyong (121\*\*) and Gosford (117\*\*), located in the north-east; Camden (118\*\*), situated in the south-west; and Pittwater (115\*\*), situated to the north of the Parramatta River.

Residents of Kogarah had the lowest SAR for this variable, with 22 per cent fewer admissions than were expected from the State rates (an SAR of 78\*\*). Relatively low ratios were also recorded in the SLA of Canterbury, with an SAR of 79\*\*, and Botany and Parramatta, both with an SAR of 80\*\*.

The largest numbers of admissions from accidents, poisonings and violence were recorded for residents of Blacktown (4,985 admissions) and Bankstown (3,259) in the west; Sutherland (4,283) in the south; and Gosford (3,721) in the northern suburbs.

There was a weak inverse correlation at the SLA level with the variable for female labour force participation (-0.49) and weak associations with most of the indicators of socioeconomic disadvantage.

## Newcastle

In **Newcastle** there were 8,899 admissions from the combined causes of accidents, poisonings and violence, 11 per cent fewer than were expected from the State rates (an SAR of 89\*\*). Cessnock was the only SLA to record a ratio above the level expected, with an SAR of 114\*\*. Other ratios ranged from 81\*\* in Lake Macquarie to 89\*\* in Port Stephens.

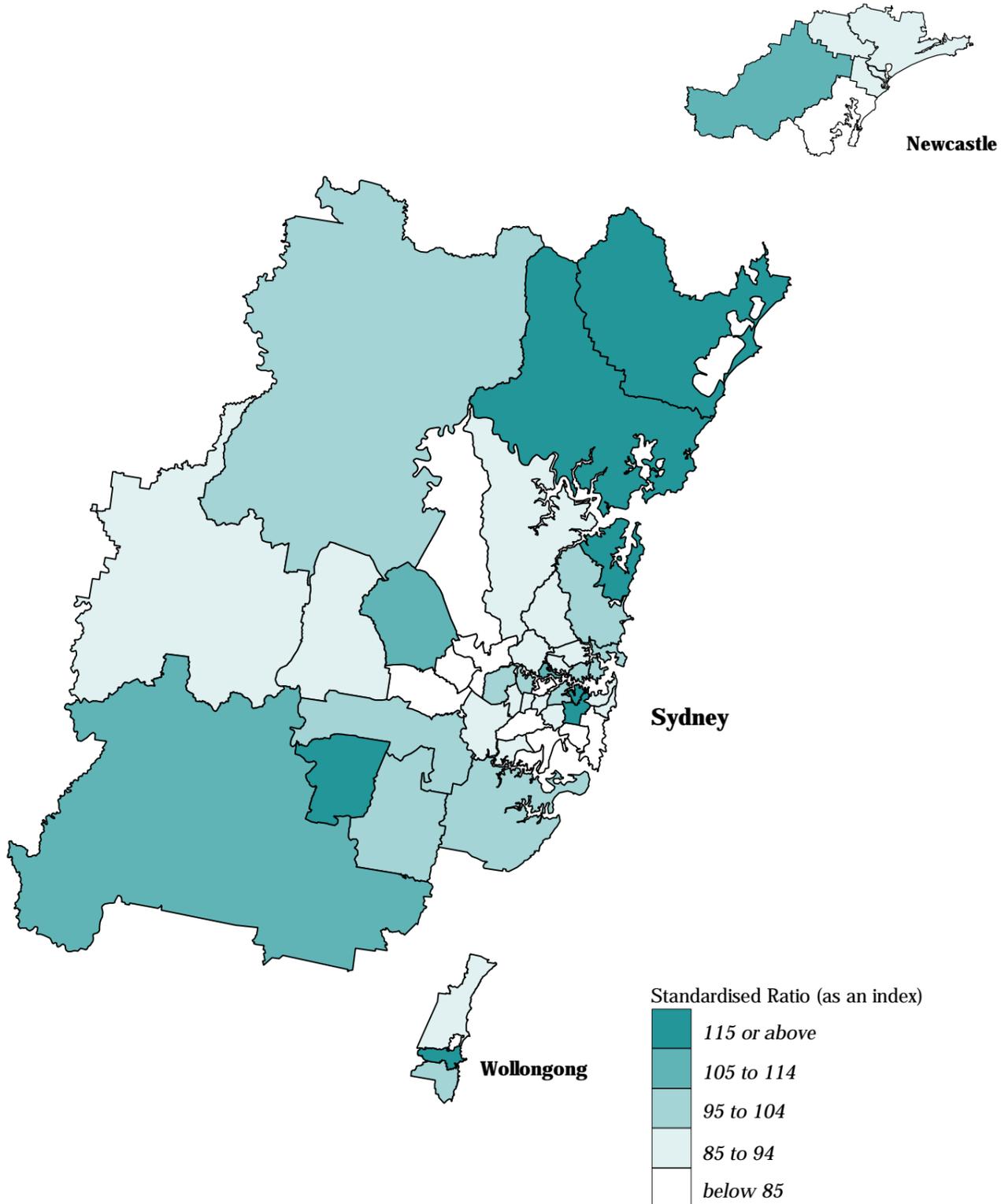
## Wollongong

There were 5,062 admissions of residents of **Wollongong**, an SAR of 95\*\*. Residents of Shellharbour had the highest ratio (118\*\*), with fewer admissions than expected in the City of Wollongong (an SAR of 88\*\*).

**Map 6.35**

**Admissions from accidents, poisonings and violence, Sydney, Newcastle and Wollongong, 1995/96**

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



Standardised Ratio (as an index)

- 115 or above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

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

Source: See Data sources, Appendix 1.3

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

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

## State/Territory comparison (Australia as the Standard)

With the exception of Tasmania, standardised admission ratios (SARs) for admissions from the external causes of accidents, poisonings and violence (described on the previous text page) were higher, and often substantially higher, for residents of the non-metropolitan areas than of the capital cities (**Table 6.41**). 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 6.41**, 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 6.41: 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
<b>1995/96<sup>1</sup></b>									
Capital city	92**	84**	95**	94**	86**	112**	111**	60**	90**
Other major urban centres <sup>2</sup>	89**	87**	96**	..	..	..	..	..	91**
Rest of State/Territory	114**	106**	147**	138**	146**	86**	166**	- <sup>3</sup>	124**
Whole of State/Territory	98**	90**	117**	106**	102**	97**	141**	60**	100
<b>1989<sup>4</sup></b>									
Rest of State/Territory	112**	..	128**	139**	171**	..	204**	..	129**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals, including admissions of same day patients

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

<sup>3</sup>Data unreliable: included with ACT total

<sup>4</sup>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 (New South Wales as the Standard)

There were 40,508 admissions of residents of the non-metropolitan areas of New South Wales from the combined causes of accidents, poisonings and violence, 16 per cent more than expected from the State rates (an SAR of 116\*\*). The relatively higher rates of hospitalisation of people from the non-metropolitan areas in general and from these causes are discussed on page 191. In addition, the higher rates of hospitalisation of Indigenous people from these causes (see comments on page 185) may be an influence in the high standardised admission ratios recorded for some of the more remote areas.

As many of the SARs in **Map 6.36** 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 **Sydney** for this variable.

As can be seen in the map (**Map 6.36**), the majority of areas had elevated ratios, with more than one third of the SLAs mapped in the highest range. Those with ratios elevated by at least sixty per cent were in:

- the far north-west in Brewarrina (an SAR of 363\*\*); Bourke (334\*\*); Central Darling (305\*\*); Cobar (195\*\*); Walgett (194\*\*) and Coonamble (186\*\*);
- the north in Yallaroi (202\*\*); Barraba (184\*\*); Narrabri (183\*\*); Moree Plains (165\*\*) and Nundle (163\*\*);
- the south-west in Narrandera (192\*\*); Hay (179\*\*); Balranald (172\*\*); and Deniliquin (169\*\*);

- the central west in Lachlan (167\*\*) and Oberon (165\*\*); and
- the north-east in Kyogle (165\*\*).

The lowest ratio from the combined causes of accidents, poisonings and violence was recorded in the SLA of Dumaresq, with 78 per cent fewer admissions than were expected from the State rates (an SAR of 22). However there were only 18 admissions, when 79 admissions were expected from the State rates. Ratios of below 70 were also recorded in Windouran (four admissions when the State rates indicated nine admissions), with an SAR of 49, Gunning (29 admissions compared with an expected 48), with an SAR of 61\*\*, Cabonne [Part A] (26 admissions compared with an expected 39), with an SAR of 67\* and Conargo (20 admissions compared with an expected 29), with an SAR of 69.

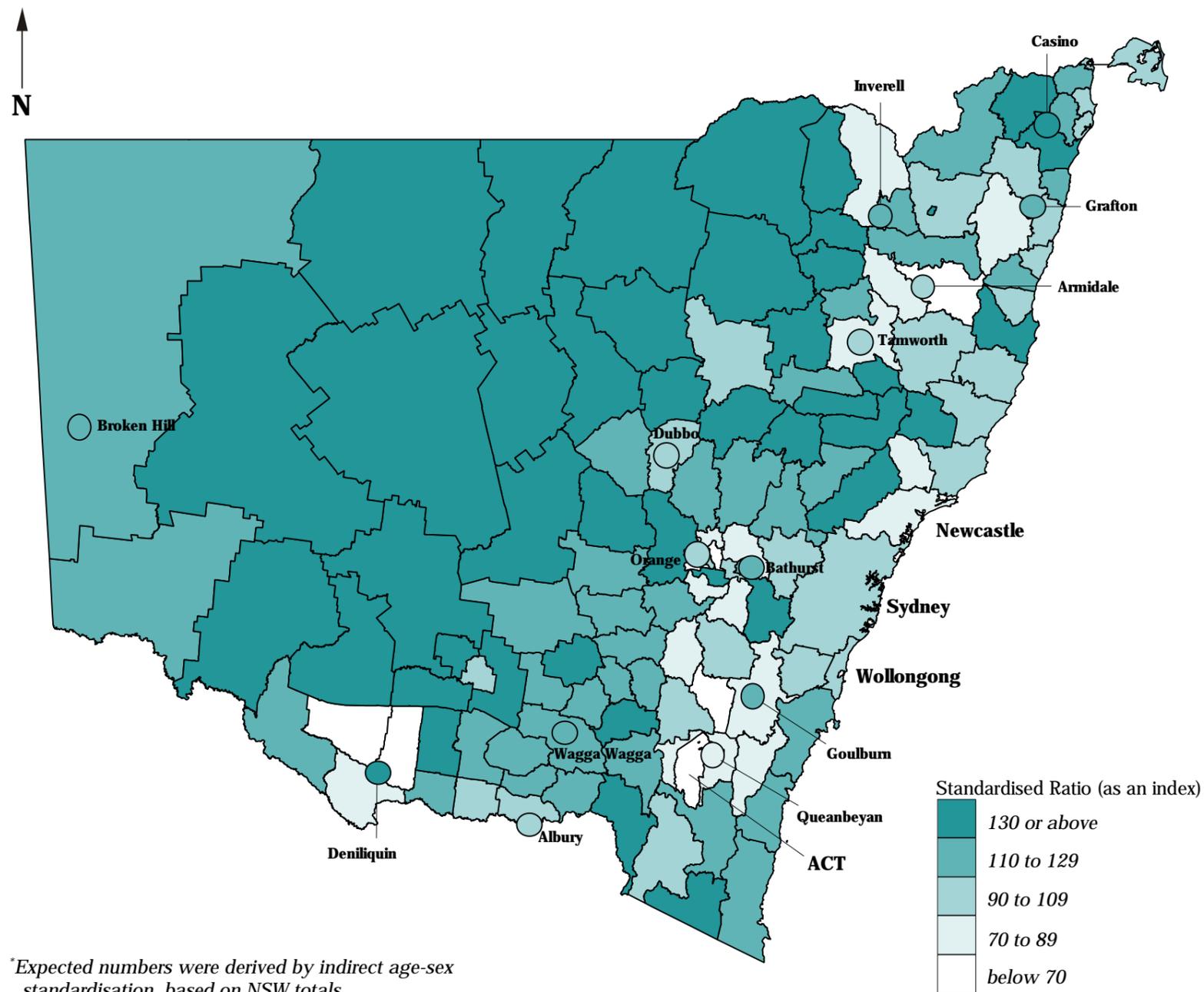
The largest numbers of admissions from accidents, poisonings and violence were recorded in the SLAs of Shoalhaven (with 2,157 admissions), Wagga Wagga (1,315), Hastings (1,287), Coffs Harbour (1,223) and Lismore (1,057).

Correlations were recorded at the SLA level with the variable for the Indigenous population (of substantial significance, 0.73) and dwellings with no motor vehicle (of meaningful significance, 0.61) and of lesser significance with the other indicators of socioeconomic disadvantage. These results, together with the inverse correlation with the IRSD (-0.58), suggest the existence at the SLA level of an association between high rates of admissions for accidents, poisonings and violence and socioeconomic disadvantage.

### Map 6.36

## Admissions from accidents, poisonings and violence, New South Wales, 1995/96

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

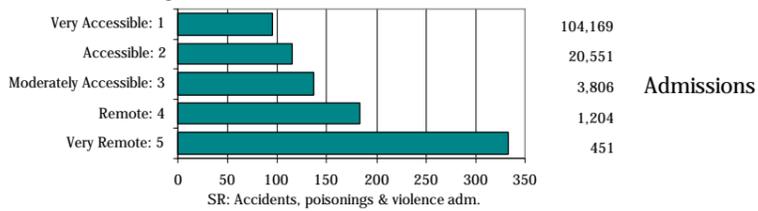


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions from the external causes of accidents, poisonings and violence increase steadily across the three 'accessible' ARIA categories, from an SAR of 96 in the Very Accessible areas, to 115 in Accessible and to 137 in Moderately Accessible. More substantial increases are evident to the Remote (with an SAR of 184) and Very Remote (333) categories.

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 procedures<sup>5</sup> 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 6.42** lists a number of sentinel

<sup>5</sup>A 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).

procedures for which data have been published over some years. All but three of these procedures (coronary artery bypass graft, angioplasty and cholecystectomy) are mapped in the following pages. The variable for myringotomy is not one of the nationally published sentinel procedures but has been included in this analysis because rates vary widely at the spatial level.

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

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

New South Wales has a standardised admission rate higher than the average of the other States for about half of these procedures, with the most highly elevated being for coronary artery bypass graft, endoscopy and cholecystectomy (**Table 6.42**). Rates for myringotomy, tonsillectomy and angioplasty were well below the *Other States*' rate.

**Table 6.42: Admission rates for selected sentinel procedures, public and private hospitals, 1996/1997**

Sentinel procedure	Standardised admission rates <sup>1</sup>		
	New South Wales	Other States	Difference
Appendicectomy	1.39	1.44	-3.3*
Coronary artery bypass graft	1.03	0.84	22.3**
Angioplasty	0.67	0.75	-9.9**
Caesarean section	2.65	2.86	-7.5**
Cholecystectomy	2.24	2.15	4.1**
Endoscopy	25.15	23.39	7.5**
Hip replacement	0.94	1.03	-9.5**
Hysterectomy	1.76	1.89	-7.2**
Lens insertion	5.10	5.02	1.6*
Myringotomy	1.84	2.53	-27.1
Tonsillectomy	1.60	1.99	-19.7**

<sup>1</sup>Admission 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 6.43**. Standardised admission ratios in New South Wales were higher (relative to the Australian rates) in 1996/97 than they were in 1986 for all of the procedures shown in the table.

**Table 6.43: Standardised admission ratios<sup>1</sup> for selected surgical procedures, New South Wales**

Procedure	1986	1996/97
Appendicectomy	108.2	97.2
Caesarean section	97.5	95.0
Cholecystectomy	104.6	102.8
Hip replacement	94.4	94.0
Hysterectomy	99.8	95.7
Lens insertion	111.8	101.0
Tonsillectomy	98.7	86.0

<sup>1</sup>Admission ratios are age- and sex-standardised to the Australian population

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

## Context

### Australia

There were 2,593,937 admissions to public acute and private hospitals (including day surgery facilities) in Australia at which at least one surgical procedure was performed. These 2.5 million admissions represented 54.3 per cent of all admissions studied in this project (which includes all acute admissions, other than for renal dialysis). Nearly two thirds (63.0 per cent) of the admissions involving a procedure were of residents of the capital cities (which comprise 62.8 per cent of Australia's population).

A further 7.2 per cent were of residents of the other major urban centres and 29.8 per cent were of residents of the non-metropolitan areas. Females accounted for 57.3 per cent of admissions, varying from 58.2 per cent of admissions of residents of the capital cities to 55.7 of non-metropolitan residents. Less than half (46.3 per cent) of these principal procedures were performed on a same day basis, with males having slightly more procedures on a same day basis (47.2 per cent of all male principal procedures, compared with 45.6 per cent for females).

### New South Wales

In 1995/96, there were 885,603 admissions of residents of New South Wales to public acute and private hospitals (including day surgery facilities), 34.1 per cent of all admissions in Australia, at which at least one surgical procedure was performed. These admissions involving a procedure represented 53.9 per cent of all admissions of residents of New South Wales in this analysis (which includes all acute admissions, other than for renal dialysis). Almost two thirds (61.1 per cent) of the admissions were for residents of **Sydney** (which comprises 62.0 per cent of the State's population), 12.3 per cent were of residents of the other major urban centres and 26.6 per cent were of residents of the non-metropolitan areas of New South Wales. Females accounted for 57.1 per cent of the admissions, varying from 57.9 per cent of admissions of residents of **Sydney**, to 56.6 per cent of residents of the major urban centres and 55.5 of non-metropolitan residents. Again, less than half (47.5 per cent) of the procedures were performed on a same day basis, with males having slightly more principal procedures on a same day basis (47.8 per cent of all male principal procedures compared with 47.2 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 6.44: Admissions<sup>1</sup> for surgical procedures, capital cities, 1995/96**  
*Standardised separation ratios*

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

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

<sup>2</sup>Includes 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 (53.9 per cent) of the admissions to acute hospitals of residents of New South Wales in 1995/96 involved a surgical procedure. Females accounted for 57.1 per cent of such admissions, and males for 42.9 per cent. For females, admission rates were highest in the 25 to 34 year age groups and again from age 60, while for males, they were most common among those aged from their late fifties, increasing with each age group (**Figure 6.9**, page 190).

## Sydney (New South Wales as the Standard)

In 1995/96, there were 540,906 admissions of residents of **Sydney** for surgical procedures, the level expected from the State rates (an SAR of 100\*\*). Females accounted for 57.9 per cent of the admissions and males for 42.1 per cent.

There was little variation evident in standardised admission ratios at the SLA level, with only four SLAs mapped in the highest range and one in the lowest (**Map 6.37**). The most highly elevated ratio, of 161\*\*, was recorded for residents of the SLA of Sydney, indicating that there were 61 per cent more admissions for surgical procedures than were expected. Camden (with an SAR of 123\*\*), neighbouring Liverpool (117\*\*) and Woollahra (116\*\*) were the remaining SLAs mapped in the highest range.

The SLA of Blue Mountains had the lowest ratio for this variable, with 16 per cent fewer admissions than were expected from the State rates, an SAR of 84\*\*. There were 14 per cent fewer admissions recorded for residents of Penrith (86\*\*) and 11 per cent fewer recorded in Parramatta (89\*\*) Hornsby (89\*\*) and Ryde (89\*\*).

The largest numbers of admissions were recorded in the SLAs of Sutherland (with 31,239 admissions), Blacktown (29,804), Bankstown (24,852), Fairfield (23,212), Gosford (23,153), Warringah (20,818) and Campbelltown (20,286).

The correlation analysis revealed a weak positive association at the SLA level between high rates of admissions for a surgical procedure and socioeconomic disadvantage.

## Newcastle

In 1995/96 there were 70,762 admissions of residents of **Newcastle** for a surgical procedure, three per cent more than expected (an SAR of 103\*\*). Females accounted for 56.8 per cent of the admissions.

All SLAs had more admissions than expected, with an SAR of 106\*\* in Maitland, 105\*\* in Cessnock, 104\*\* in the City of Newcastle, 103\*\* in Lake Macquarie and 101 in Port Stephens.

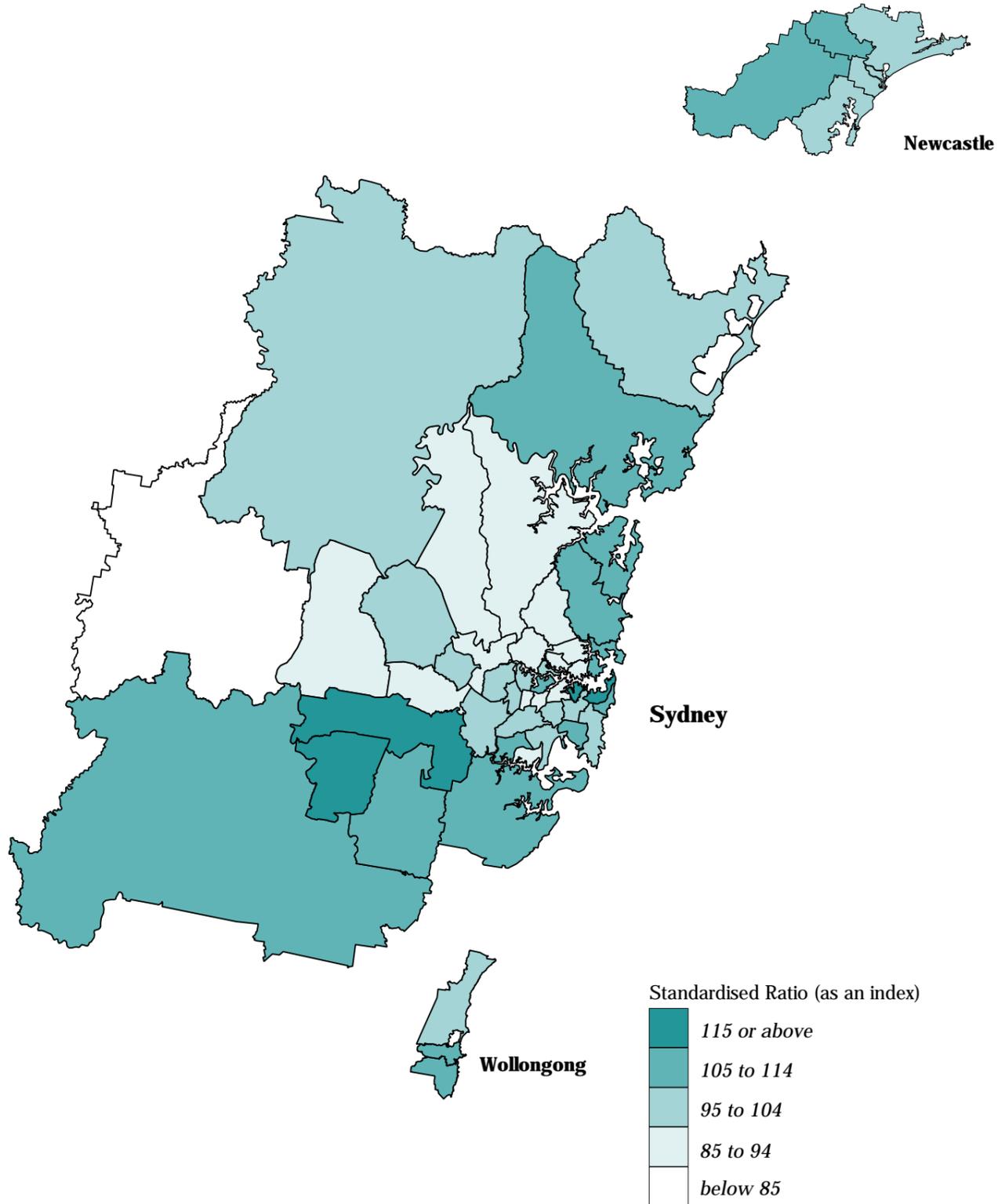
## Wollongong

**Wollongong** had the highest SAR among the major urban centres, with a ratio of 104\*\*. There were 38,019 admissions for a surgical procedure in 1995/96, of which 56.0 per cent were females. Again, all ratios were above the level expected, ranging from 111\*\* in Shellharbour and 108\*\* in Kiama, to 101\* in the City of Wollongong.

**Map 6.37**

**Admissions for surgical procedures, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for surgical procedures, 1995/96

## State/Territory comparison (Australia as the Standard)

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

**Table 6.45: Admissions<sup>1</sup> 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 <sup>2</sup>	103**	90**	102**	..	..	..	..	..	102**
Rest of State/Territory	99**	104**	98**	104**	96**	95**	95**	- <sup>3</sup>	100*
Whole of State/Territory	100	102**	100	106**	96**	100	101	70**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 235,916 admissions for surgical procedures of residents of the non-metropolitan areas of New South Wales in 1995/96 (an SAR of 99\*\*) of which 55.5 per cent were females.

The correlation analysis revealed a weak positive association at the SLA level between high rates of admission for a surgical procedure and socioeconomic disadvantage.

As can be seen from the map opposite (**Map 6.38**), the majority of SLAs have been mapped in the three middle ranges, with only one SLA mapped in the highest range and 13 SLAs mapped in the lowest. Ratios elevated by 10 per cent or more were recorded in:

- the south-western SLAs of Urana, with a standardised admission ratio of 130\*\*, Murrumbidgee (128\*\*), Albury (119\*\*), Narrandera (115\*\*), Griffith (114\*\*), Gundagai (114\*\*) and Deniliquin (113\*\*);
- the central west in Orange (126\*\*), Parkes (120\*\*), Bathurst (118\*\*) and Blayney [Part A] (116\*\*);
- to the north of **Sydney** in Bingara (124\*\*), Singleton (122\*\*), Nundle (119\*\*), Merriwa (113') and Greater Taree (112\*\*);
- in the north-east in Casino (122\*\*) and Tweed Heads (116\*\*);
- in the far north-west in Bogan (119\*\*), Coonamble (119\*\*) and Bourke (116\*\*); and
- in the south in Wingecarribee (118\*\*) and Bombala (113\*\*).

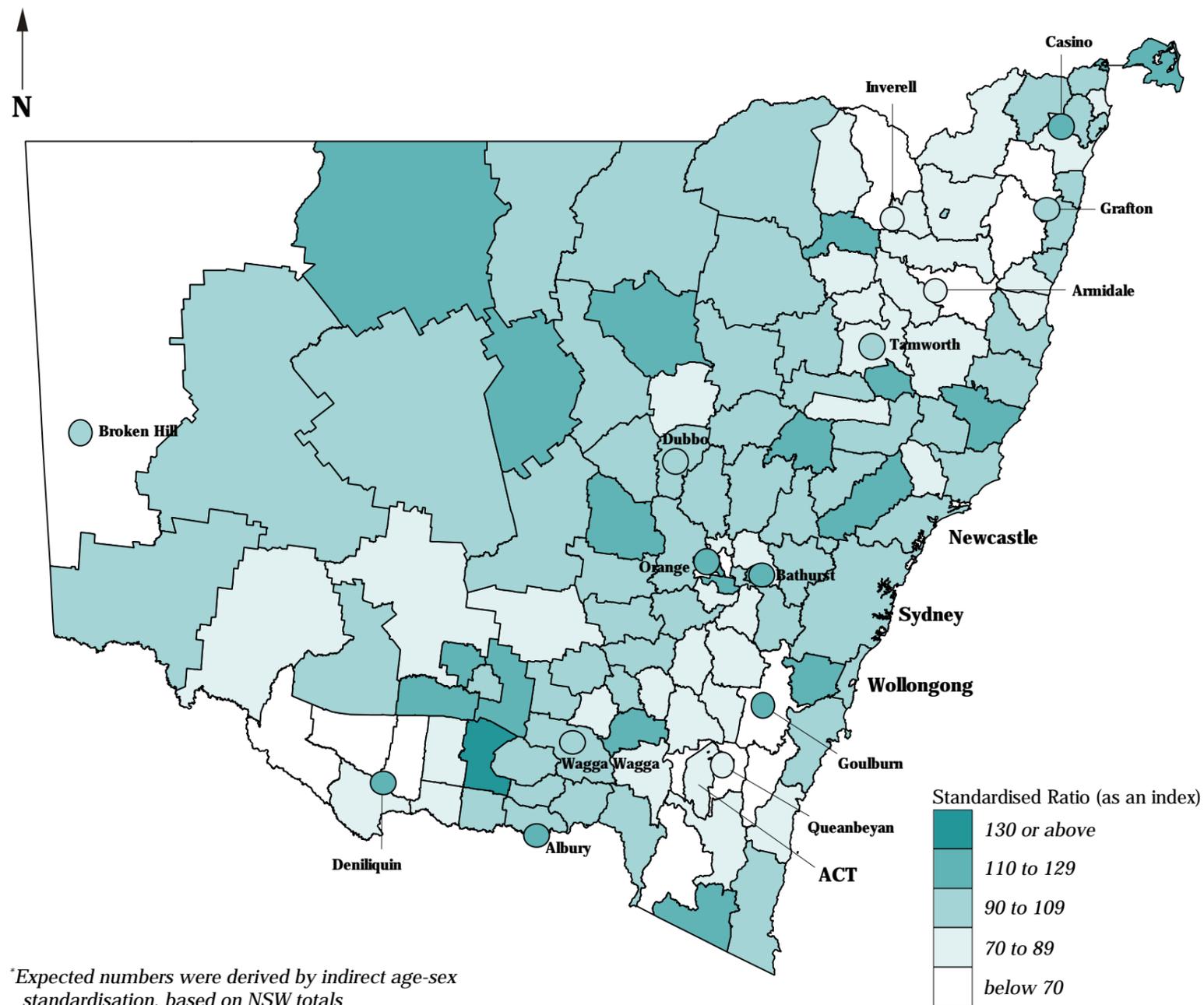
Only 13 SLAs were mapped in the lowest range. By far the lowest ratio was recorded in Dumaresq, with 83 per cent fewer admissions than expected (an SAR of 17\*\*), and 96 admissions. Low SARs were also recorded in Inverell [Part A], with a ratio of 51\*\*; Cabonne [Part A] (57\*\*); Windouran (58\*\*); Conargo (60\*\*); Mulwaree (61\*\*); Nymboida (62\*\*); Unincorporated Far West (62\*\*); Snowy River (64\*\*) and Tallaganda (64\*\*).

The largest numbers of admissions for a surgical procedure in the non-metropolitan areas of New South Wales were recorded for residents of Shoalhaven (with 12,587 admissions), Hastings (9,970), Coffs Harbour (7,920) and Wagga Wagga (7,796).

### Map 6.38

## Admissions for surgical procedures, New South Wales, 1995/96

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

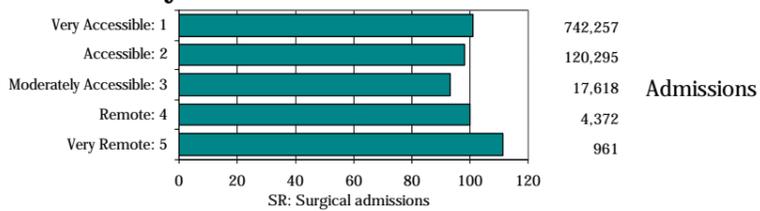


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving a surgical procedure were close to the level expected from the State rates across ARIA categories 1 (Very Accessible) to 4 (Remote), with the lowest ratio in the Moderately Accessible category, an SAR of 93. The highest ratio was in the Very Remote category, an SAR of 111.

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 6.44**), standardised admission ratios (SARs) for same day admissions involving a surgical procedure (**Table 6.46**) 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 6.46: Same day admissions<sup>1</sup> for surgical procedures, capital cities, 1995/96**  
*Standardised admission ratios*

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

<sup>1</sup>Includes admissions to public acute hospitals, private hospitals and day surgery facilities

<sup>2</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

Just under half (47.5 per cent) of all admissions of residents of New South Wales in 1995/96 involving a surgical procedure were same day admissions. Females accounted for over 50 per cent (56.8 per cent) of same day admissions. Admission rates were higher for females than for males in the age groups from 15 to 19 years through to 50 to 59 years (**Figure 6.10**, page 190). For males, the largest differentials over the rates for females were in the 0 to 14 year age groups and from age 60 years.

### Sydney (New South Wales as the Standard)

There were 260,685 same day admissions of residents of **Sydney** for surgical procedures in 1995/96, one per cent more than were expected from the State rates. Females accounted for 150,043 of the admissions (57.6 per cent) while 110,642 (42.4 per cent) were for males.

The distribution of the highest SARs for same day surgical procedures follows a distinct pattern in an area largely to the south-west and within **Sydney's** inner SLAs, while those with the lowest ratios were situated in a number of the northern and western areas (**Map 6.39**). Two SLAs were mapped in the lowest range.

The most highly elevated ratio, of 157\*\*, was recorded for residents of the SLA of Sydney, indicating that there were 57 per cent more admissions than expected. The other SLAs with ratios elevated by 15 per cent or more were recorded in the south-western SLAs of Camden (with an SAR of 138\*\*) Campbelltown (120\*\*) Wollondilly (116\*\*) and Liverpool (115\*\*); and in the inner SLAs of Woollahra (with an SAR of 139\*\*), Waverley (120\*\*), Drummoyne (120\*\*), Randwick (118\*\*), Mosman (118\*\*), Botany (118\*\*) and Hurstville (115\*\*).

There were twelve SLAs with SARs in the range of 5 per cent above or below the level expected, with a ratio of 104<sup>†</sup> in both South Sydney and Kogarah and 96 in Hunter's Hill.

The SLA of Blue Mountains and Penrith recorded the lowest ratios for this variable, with 18 per cent fewer admissions than expected, both with an SAR of 82\*\*. Ratios of below 90 were also recorded in Ryde (85\*\*), Parramatta (87\*\*), Hornsby (88\*\*), Willoughby (89\*\*) and Hawkesbury (89\*\*).

More than 10,000 admissions were recorded for a same day surgical procedure for residents of Sutherland (with 15,651 admissions), Blacktown (13,416), Bankstown (11,593), Fairfield (11,122), Campbelltown (10,586) and Warringah (10,313).

The correlation analysis revealed a weak positive association at the SLA level between high rates of same day admissions for a surgical procedure and socioeconomic disadvantage.

### Newcastle

Residents of **Newcastle** had 6 per cent more admissions for a same day surgical procedure than were expected from the State rates, an SAR of 106\*\*. There were 34,490 admissions, of which 57.5 per cent (19,848 admissions) were females and 42.5 per cent (14,641 admissions) were males.

There were 8 per cent more admissions than expected from the State rates recorded in both Lake Macquarie and the City of Newcastle, while Port Stephens had an SAR of 100.

### Wollongong

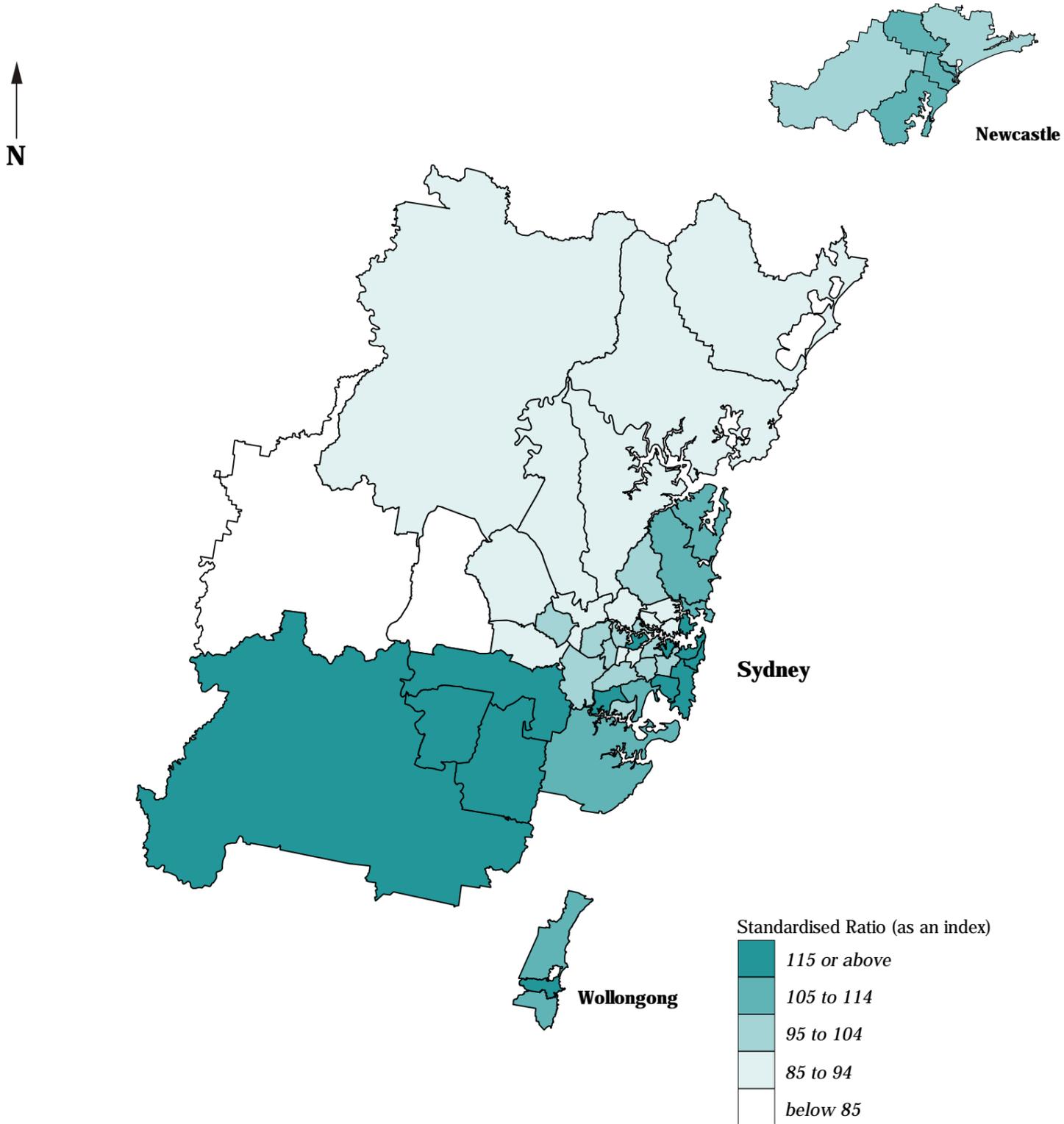
In 1995/96 there were 19,131 admissions of residents of **Wollongong**, an SAR of 110\*\*, and 55.0 per cent were females.

All SLAs had more admissions than expected, with ratios ranging from 107\*\* in the City of Wollongong to 117\*\* in Shellharbour.

**Map 6.39**

**Same day admissions for surgical procedures, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

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

### State/Territory comparison (Australia as the Standard)

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

Standardised admission ratios (SARs) in the *Rest of State/Territory* category in **Table 6.47** 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 6.47: Same day admissions<sup>1</sup> 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 <sup>2</sup>	110**	79**	109**	..	..	..	..	..	107**
Rest of State/Territory	96**	105**	88**	90**	84**	81**	62**	— <sup>3</sup>	93**
Whole of State/Territory	102**	108**	97**	98**	90**	84**	67**	63**	100

<sup>1</sup>Includes admissions to public acute hospitals, private hospitals and day surgery facilities

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 106,037 same day admissions of residents of the non-metropolitan areas of New South Wales for surgical procedures in 1995/96, 6 per cent fewer than were expected from the State rates (an SAR of 94\*\*). Of the 106,037 admissions, 55.0 per cent were females (58,269 admissions) and 45.0 per cent were males (47,768 admissions).

As can be seen from **Map 6.40**, a large number of SLAs have been mapped in the lowest ranges, with only 3 SLAs mapped in the highest range. Ratios elevated by 10 per cent or more were recorded:

- just south of Sydney in the SLA of Wingecarribee, with an SAR of 138\*\*;
- in the northern SLAs of Singleton (135\*\*), Greater Taree (115\*\*) and Great Lakes (110\*\*);
- in the central west in Bathurst (134\*\*), Orange (115\*\*), Parkes (115\*\*), Evans [Part A] (114), Oberon (112'), Greater Lithgow (111\*\*) and Blayney [Part A] (110);
- in the south-west in Urana (129\*\*), Albury (124\*\*), Murrumbidgee (118'), Griffith (116\*\*), Gundagai (114'), Narrandera (113\*\*) and Holbrook (110);
- in the north-east in Tweed Heads (123\*\*) and Casino (117\*\*); and
- in the far north-west in Bogan (125\*\*), Coonamble (111') and Mudgee (111\*\*).

Of the SLAs mapped in the middle range, only twelve had highly significant SARs. Goulburn recorded an SAR of 109\*\*, indicating that there were 9 per cent more admissions than were expected. Statistically significant ratios below the level expected were recorded in Tweed [Part B] (with an SAR of 94\*\*); Coffs Harbour (94\*\*); Ballina (92\*\*); Shoalhaven (92\*\*); Narrabri (91\*\*); Muswellbrook (91\*\*); Maclean (91\*\*); and Leeton (90\*\*).

Areas with low ratios were widespread throughout New South Wales, with clusters in the north-east and south of the State. The lowest ratio (where more than 20 admissions were recorded) of 13\*\* occurred in the SLA of Dumaresq, with low ratios also in Wakool (with an SAR of 20\*\*), Balranald (21\*\*), Wentworth (22\*\*) and Conargo (25\*\*).

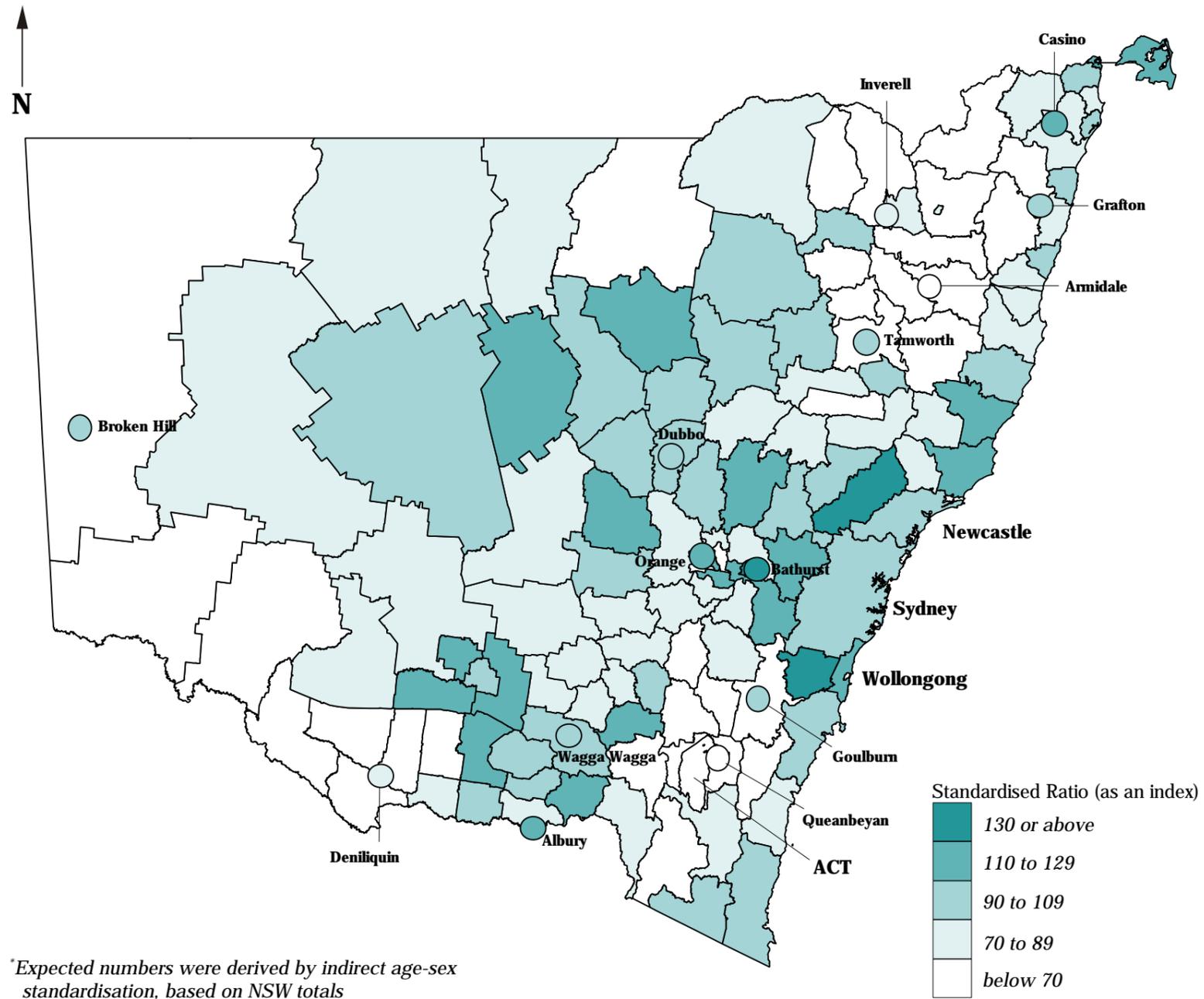
In the non-metropolitan areas of New South Wales the largest numbers of admissions for a same day surgical procedure were recorded in Shoalhaven, with 5,370 admissions; Hastings, 4,523 admissions; Coffs Harbour, 3,743 admissions, Greater Taree, 3,715 admissions, Wingecarribee, 3,574 admissions and Tweed Heads, 3,558 admissions.

The results of the correlation analysis revealed a weak positive association with indicators of socioeconomic disadvantage.

# Map 6.40

## Same day admissions for surgical procedures, New South Wales, 1995/96

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

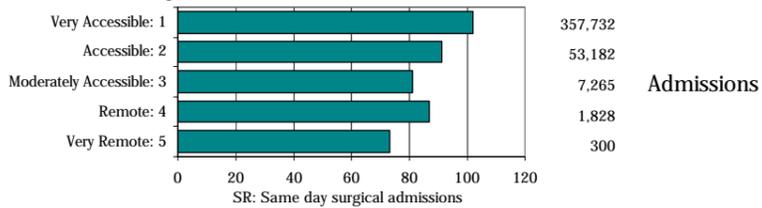


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for same day admissions involving a surgical procedure show a markedly different pattern, with lower ratios generally being associated with increasing remoteness, reflecting the lack of these services outside of the most accessible areas. Ratios decline from a high of 102 in the Very Accessible category to a low of 73 in the Very Remote category.

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

**Table 6.48: Admissions<sup>1</sup> with a principal procedure of tonsillectomy and/or adenoidectomy, capital cities, 1995/96**  
*Standardised admission ratios*

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

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

<sup>2</sup>Includes 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 New South Wales were aged under 30 years. The largest number and rate of admissions for a tonsillectomy and/or adenoidectomy was for the 5 to 9 year age group, with 758.3 admissions per one hundred thousand females and 732.1 admissions 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 435.1 admissions per 100,000 females compared with 590.8 admissions per 100,000 males) and with substantially higher rates than for males in the age groups from 10 to 24 years. Overall, 54.6 per cent of admissions were females.

Data for Australia published by the AIHW (1998) showed the tonsillectomy and/or adenoidectomy rate in New South Wales to be 19.7 per cent below that in the other States (Table 6.42, page 269).

## Sydney (New South Wales as the Standard)

There were 5,796 admissions for tonsillectomies and/or adenoidectomies in **Sydney** in 1995/96, 3,104 admissions of females (53.6 per cent) and 2,692 males (46.4 per cent). This was 5 per cent fewer admissions than were expected from the State rates, an SAR of 95\*\*.

The distribution of SARs across **Sydney** is shown in **Map 6.41**, with highly elevated standardised admission ratios to the south-west and north of the city and low ratios generally within the inner SLAs.

Although the SLA of Camden had the highest ratio for this variable, with 48 per cent more admissions than were expected from the State rates (an SAR of 148\*\*), there were only 79 admissions compared with an expected 54. Other SLAs with highly elevated ratios included Liverpool (an SAR of 137\*\* and 285 admissions), Sydney (135 and 12 admissions), Manly (129\* and 59 admissions), Pittwater (128\* and 95 admissions), Warringah (127\*\* and 233 admissions) and Campbelltown (120\*\* and 390 admissions).

SLAs with standardised admission ratios in the lowest range mapped were mainly located in the inner and northern suburbs. Highly significant ratios within this category were recorded in South Sydney (60\*\*), Kogarah (68\*\*), Leichhardt (70\*\*), Blue Mountains (71\*\*), Marrickville (72\*\*), Randwick (73\*\*), Parramatta (74\*\*), Canterbury (75\*\*), Sutherland (80\*\*), Baulkham Hills (81\*\*) and Hornsby (81\*\*). The SLA of Strathfield had 53 per cent fewer admissions than expected (a ratio of 47\*\*), with 18 admissions, compared with an expected 38.

Residents of Campbelltown and Blacktown had the largest number of admissions for these procedures, with 390 admissions each. The next largest numbers were recorded for residents of Fairfield (380 admissions), Penrith (372), Liverpool (285), Sutherland (266) and Gosford (258).

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

## Newcastle

**Newcastle** had 6 per cent fewer admissions than expected in 1995/96, a ratio of 94. More than half of the 721 admissions were for females (400 admissions, 55.5 per cent).

Residents of Cessnock had the highest SAR (of 128\*), with lower ratios in Port Stephens (98), the City of Newcastle (93), Maitland (87) and Lake Macquarie (86\*).

## Wollongong

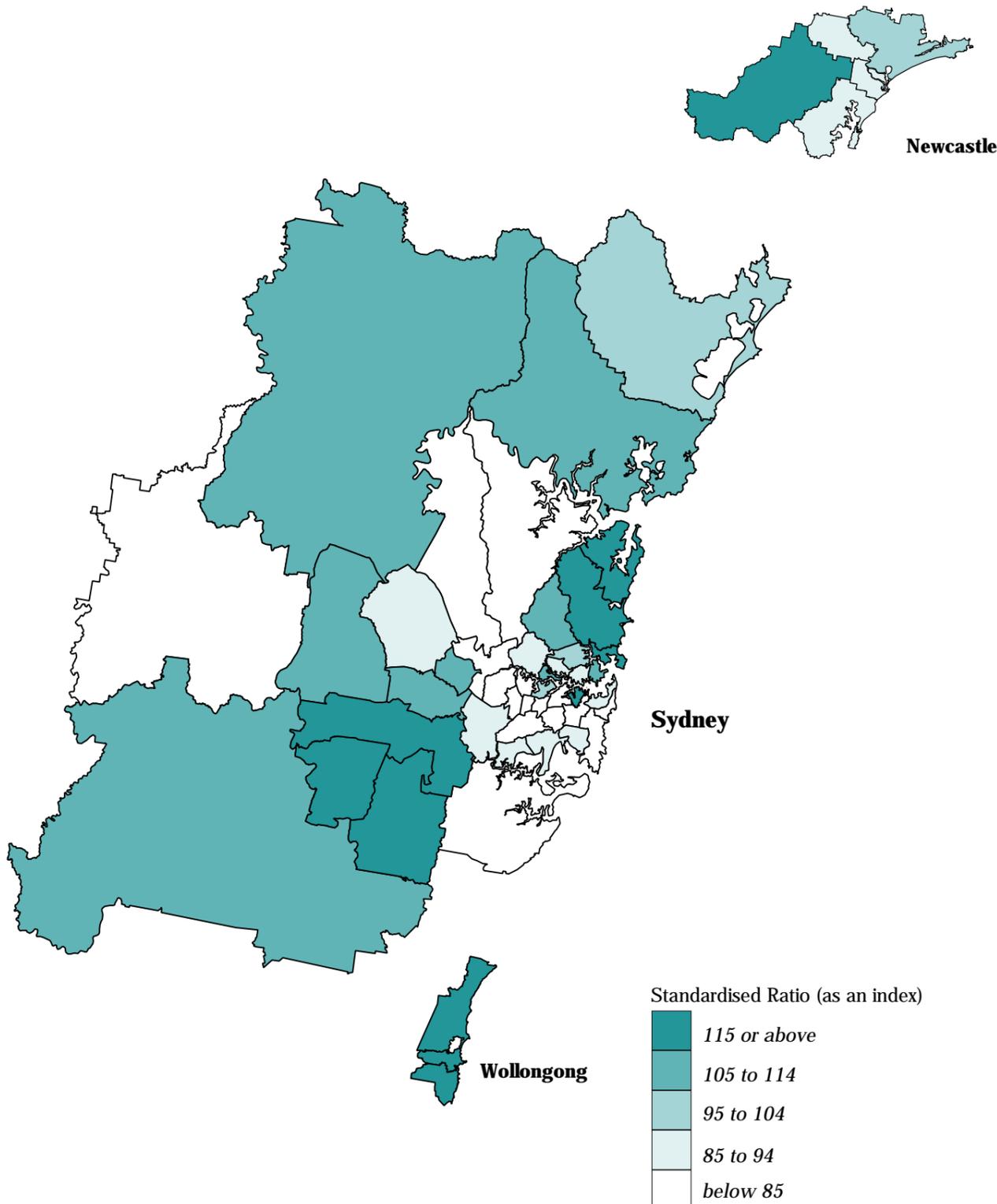
**Wollongong** had the highest SAR among the major urban centres, with 30 per cent more admissions than expected (a ratio of 130\*\*). Again females accounted for an above average proportion of the 548 admissions, with 56.2 per cent (308 admissions).

All of the SLAs in **Wollongong** had ratios of above 100, ranging from 123\*\* in the City of Wollongong to 159\*\* in Kiama.

**Map 6.41**

**Admissions for a tonsillectomy and/or adenoidectomy, Sydney, Newcastle and Wollongong, 1995/96**

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



Standardised Ratio (as an index)

- 115 or above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

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

Source: See Data sources, Appendix 1.3

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

# Admissions for a 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 6.49). 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 6.49: Admissions<sup>1</sup> 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 <sup>2</sup>	100	147**	106	..	..	..	..	..	106**
Rest of State/Territory	101	115**	84**	141**	92*	67**	35**	– <sup>3</sup>	99
Whole of State/Territory	94**	112**	94**	137**	94**	68**	50**	66**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 3,063 admissions (1,715 females and 1,348 males) for tonsillectomies and/or adenoidectomies in 1995/96, 8 per cent more admissions than expected from the State rates (an SAR of 108\*\*). As the numbers in many non-metropolitan SLAs were quite small, the absolute numbers should be used in conjunction with the ratios.

In total, 33 SLAs were mapped in the highest range for this variable, with 20 of these recording 20 or more admissions. It can be seen in Map 6.42 that the SLAs in this category were:

- the south-western SLAs of Cootamundra (56 admissions for tonsillectomies when 14.5 were expected, an SAR of 385\*\*), Leeton (40 admissions, 201\*\*), Wagga Wagga (170 admissions, 154\*\*) and Deniliquin (20 admissions, 133);
- the north-eastern SLAs of Casino (48 admissions, 236\*\*) and Tweed Heads (64 admissions, 130\*);
- the northern SLAs of Grafton (61 admissions, 196\*\*), Glen Innes (20 admissions, 186\*\*), Tenterfield (21 admissions, 171\*), Narrabri (44 admissions, 168\*\*), Kempsey (77 admissions, 160\*\*), Gunnedah (36 admissions, 146\*) and Hastings (121 admissions, 145\*\*);
- the south-eastern SLAs of Yass (29 admissions, 172\*\*) and Eurobodalla (66 admissions, 142\*\*); and
- in the central western SLAs of Cowra (36 admissions, 167\*\*), Forbes (29 admissions, 156\*) and Orange (94 admissions, 144\*\*) and in the SLAs of Walgett (24 admissions, 161\*) and Broken Hill (52 admissions, 133\*).

Ratios within 10 per cent of the level expected were recorded in 15 SLAs. There were 8 per cent more admissions recorded in Parkes and Tamworth (both with an SAR of 108) and 9 per cent fewer were recorded in Tumut (an SARs of 91).

SLAs with standardised admission ratios in the lowest range (and more than twenty admissions) were recorded in Byron, with a ratio of 49\*\* (22 admissions); Bega Valley, with a ratio of 51\*\* (25 admissions); Armidale, with a ratio of 57\*\* (27 admissions);

Queanbeyan, with a ratio of 63\*\* (33 admissions); Lismore, with a ratio of 67\*\* (56 admissions); Tweed [Part B], with a ratio of 68\* (33 admissions); and Greater Taree, with a ratio of 69\*\* (53 admissions).

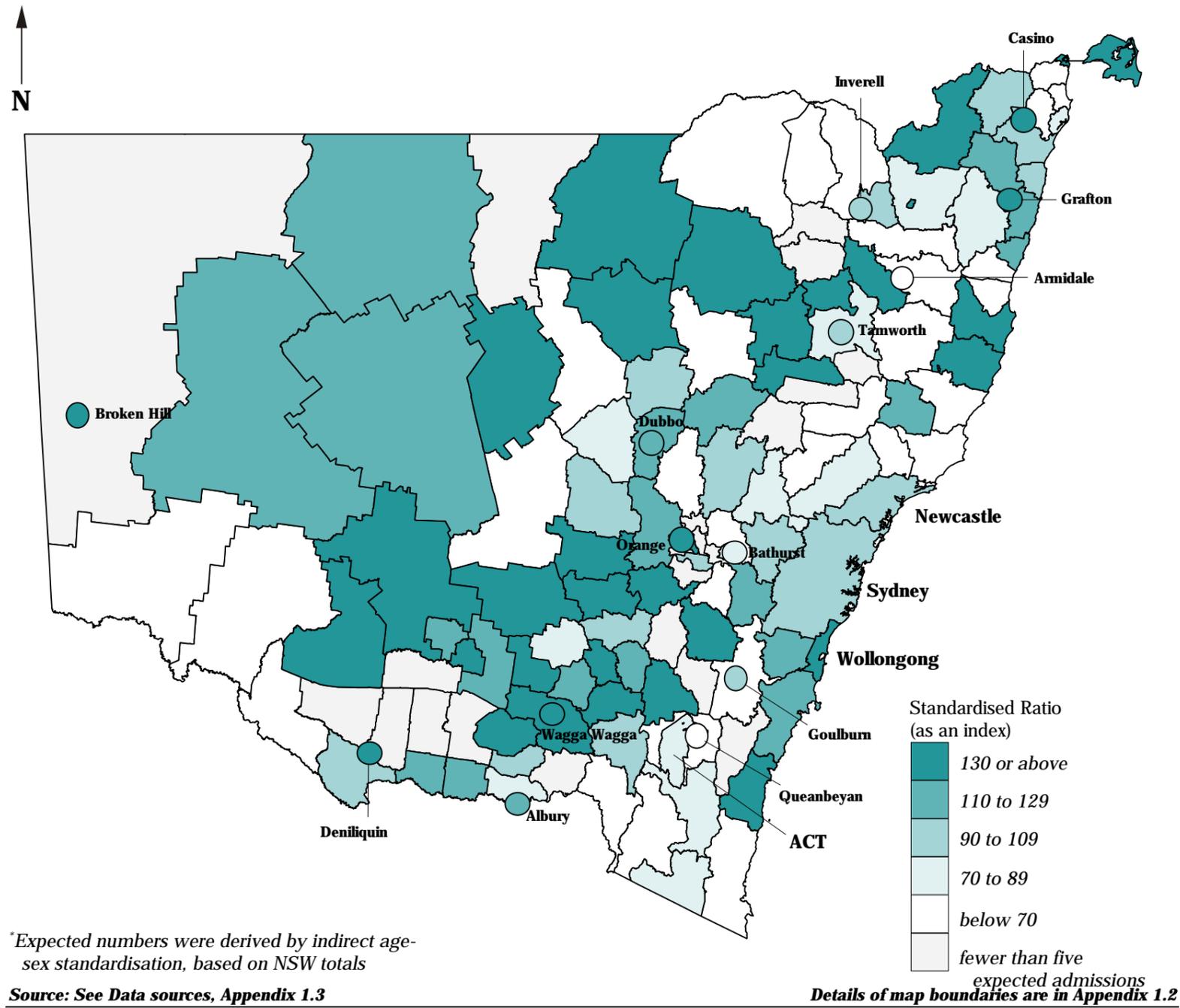
Only four SLAs had more than 100 admissions for tonsillectomies and/or adenoidectomies in 1995/96: they were Wagga Wagga (with 170 admissions), Shoalhaven (151), Hastings (121) and Coffs Harbour (121).

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

**Map 6.42**

**Admissions for tonsillectomy and/or adenoidectomy, New South Wales, 1995/96**

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

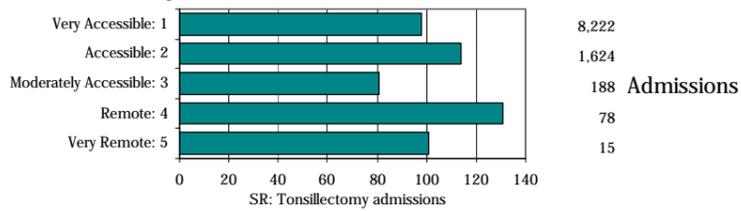


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



The pattern of distribution of standardised admission ratios for admissions involving a tonsillectomy and/or adenoidectomy is unlike those described earlier in this chapter. The lowest ratios are in the Very Accessible and Very Remote categories (with SARs of 98 and 101, respectively), and the highest in the Remote and Accessible categories (SARs of 131 and 114, respectively). The Moderately Accessible category had an SAR of 81, the lowest of these five ARIA categories.

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 6.50**), 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 6.50: Admissions<sup>1</sup> 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 <sup>2</sup>	All capitals
78**	125**	103	205**	130**	119**	84	59**	112**

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

<sup>2</sup>Includes 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 (83.3 per cent) of admissions of New South Wales residents for this procedure were of children under 10 years of age, the SLA data have been standardised to the total population for those ages.

Children aged from 0 to 4 years accounted for just over half (51.9 per cent) of the admissions for this procedure, with most of the remainder (31.5 per cent) in the 5 to 9 year age group. Males accounted for over half (58.3 per cent) of all admissions for myringotomies and slightly more (62.1 per cent) in the 0 to 4 year age group.

Data for Australia published by the AIHW (1998) showed the tonsillectomy and /or adenoidectomy rate in New South Wales to be 27.1 per cent below that in the other States (**Table 6.42**, page 269).

## Sydney (New South Wales as the Standard)

In 1995/96, residents of **Sydney** had 7 per cent more admissions for a myringotomy (an SAR of 107\*\*) than were expected from the State rates. Males accounted for almost two thirds (61.0 per cent) of the 4,062 admissions. The vast majority of the admissions (93.4 per cent, 3,792 admissions) were performed on a same day basis.

SLAs with the most highly elevated ratios were clustered in three distinct areas: in the far south, to the north of the city and within the inner region (**Map 6.43**). Those located within the inner region included Drummoyne (with an SAR of 236\*\*), Mosman (225\*\*), Woollahra (176\*\*), Waverley (172\*\*), Manly (170\*\*), Hunter's Hill (166), Willoughby (156\*\*), Concord (156\*\*), Lane Cove (151\*), North Sydney (145\*), Strathfield (144\*) and Randwick (126\*). Those located to the north of the city included Pittwater (237\*\*), Warringah (195\*\*), Ku-ring-gai (194\*\*), Gosford (134\*\*) and Hornsby (115); and those situated in the far south were Camden (183\*\*), Campbelltown (126\*\*), Wollondilly (118), Liverpool (116), Sutherland (116\*) and Hornsby (115).

SLAs with the lowest standardised admission ratios were Fairfield (with an SAR of 41\*\*), Parramatta (58\*\*), Marrickville (61\*\*), Blue Mountains (64\*\*), Auburn (71\*), Holroyd (75\*), Canterbury (75\*\*) and Penrith (76\*\*). All but Marrickville were situated to the west of the city.

SLAs with more than 200 admissions of children aged 0 to 9 years for a myringotomy were Blacktown (280 admissions), Campbelltown (276 admissions), Sutherland, (238 admissions), Warringah (210 admissions) and Gosford (207 admissions).

There were correlations of meaningful significance with the variables for high income families (0.68), female labour force participation (0.64), and managers and administrators, and professionals (0.61). The correlation with the IRSD (0.70) also indicates a strong association at the SLA level between high rates of admission for a myringotomy and high socioeconomic status. The inverse correlations of meaningful significance with the variables for unemployment (-0.68), low income families (-0.67), unskilled and semi-skilled workers (-0.67) and early school leavers (-0.56) reinforce the findings above.

## Newcastle

Residents of **Newcastle** had 16 per cent fewer admissions than expected, an SAR of 84\*. Of the 403 admissions, 248 were males (61.5 per cent) and 155 were females (38.5 per cent).

Although still below the level expected, the highest ratio was recorded in Port Stephens, with 8 per cent fewer admissions (an SAR of 92). The only statistically significant SAR was recorded in the City of Newcastle, with a ratio of 77\*.

## Wollongong

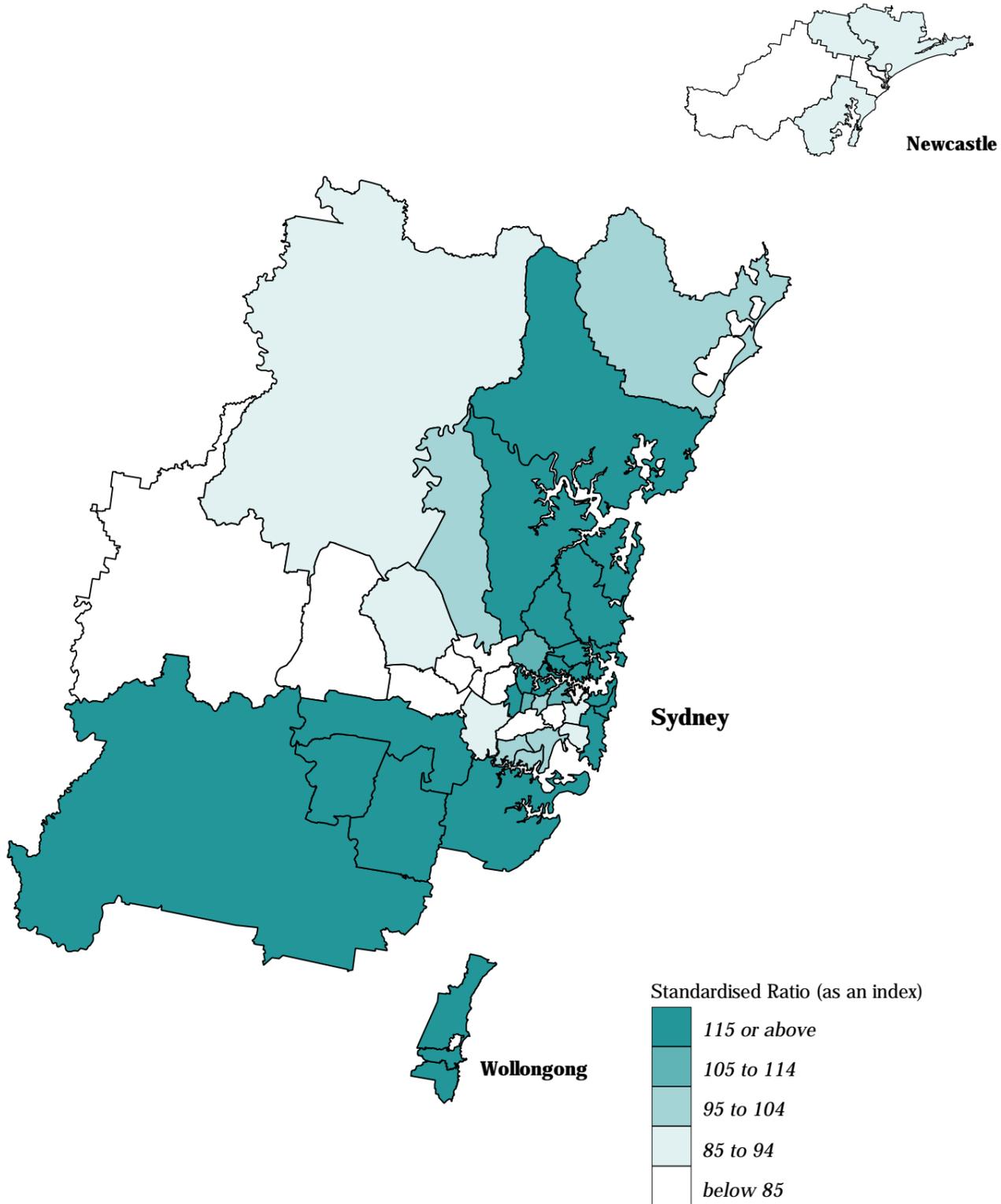
An SAR of 117\*\* was recorded for residents of **Wollongong**, indicating that there were 17 per cent more admissions than expected. In total 313 admissions were recorded, of which 56.5 per cent were males.

All ratios were above the level expected, ranging from 115\* in the City of Wollongong to 123 in Shellharbour.

**Map 6.43**

**Admissions of children aged 0 to 9 years for a myringotomy, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions of children aged 0 to 9 years for a myringotomy, 1995/96

## 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 6.51**), from lows of 44\*\* in the Northern Territory and 59\*\* in Queensland, to a highly elevated 163\*\* in South Australia.

**Table 6.51: Admissions<sup>1</sup> 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 <sup>2</sup>	70**	133**	91*	..	..	..	..	..	85**
Rest of State/Territory	64**	116**	59**	163**	82**	68**	44**	- <sup>3</sup>	82**
Whole of State/Territory	73**	123**	82**	192**	114**	88**	60**	61**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

In the non-metropolitan areas of New South Wales, there were 1,621 admissions of children aged 0 to 9 years for a myringotomy in 1995/96, 13 per cent fewer than expected from the State rates (a ratio of 87\*\*). Almost two thirds of these admissions were males (61.1 per cent), with females accounting for only 38.9 per cent (630 admissions). The majority (82.0 per cent) of these admissions were performed on a same day basis (1,329 same day admissions).

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.

The highest SAR was in Coonabarabran, with an SAR of 232\*\* (with 19 admissions, when 8 were expected from the State rates). Elevated ratios in the highest range mapped and with more than 20 admissions were recorded in Parkes (with an SAR of 193\*\*), Shoalhaven (191\*\*), Orange (167\*\*), Tamworth (152\*\*), Dubbo (150\*\*), Gunnedah (146), Cowra (138) and Albury (132').

The majority of SLAs (45.5 per cent) were mapped in the lowest range with ratios of below 70. The only SLAs with more than twenty admissions in this group were Coffs Harbour (with an SAR of 45\*\*), Wagga Wagga (53\*\*), Hastings (53\*\*), Greater Taree (65') and Lismore (69').

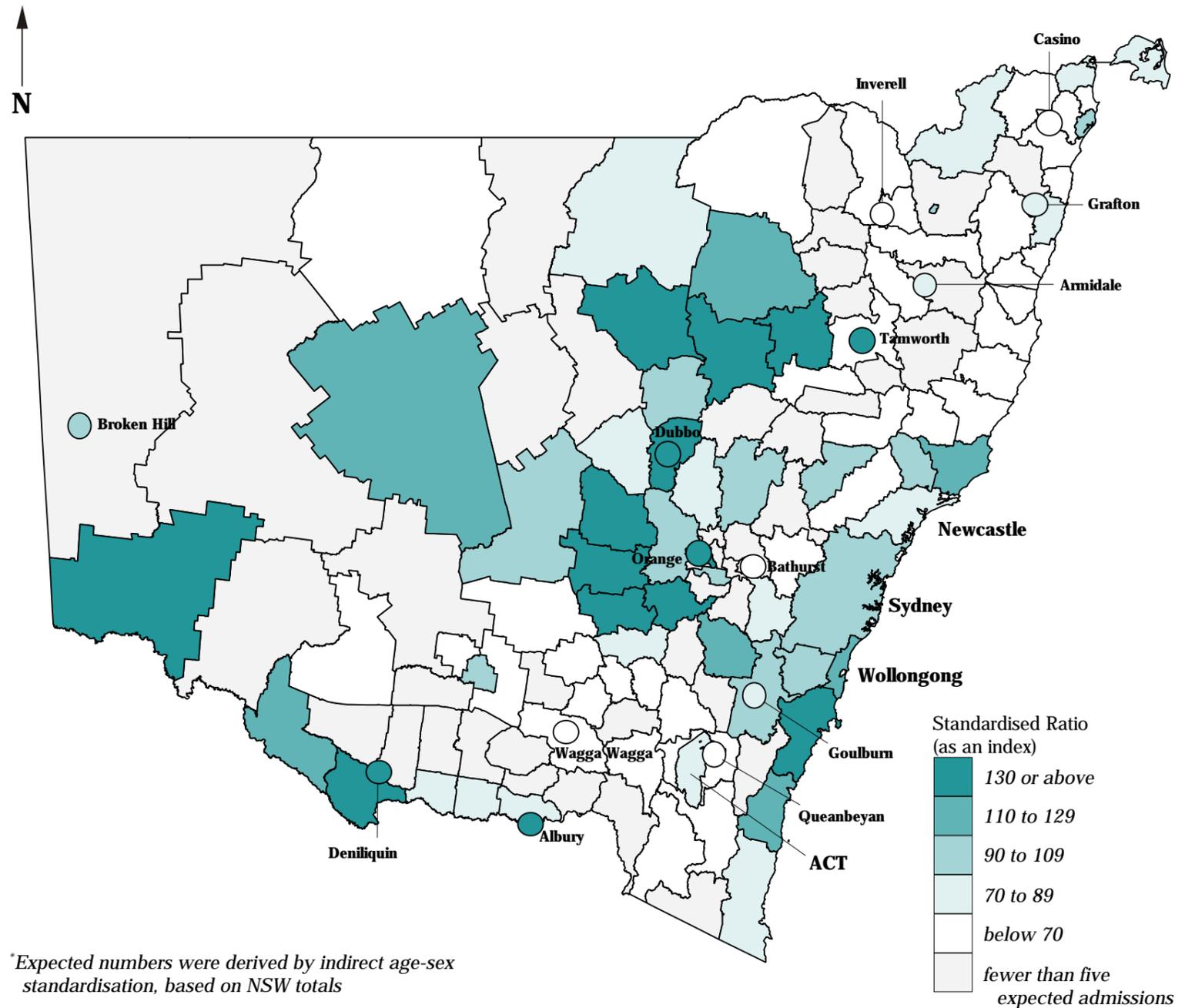
By far the largest number of admissions was recorded for residents of Shoalhaven (171 admissions). Relatively high numbers of admissions were also recorded in Dubbo, with 72 admissions; Orange, with 70 admissions; and Tamworth, with 66 admissions.

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

**Map 6.44**

**Admissions of children aged 0 to 9 years for a myringotomy, New South Wales, 1995/96**

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

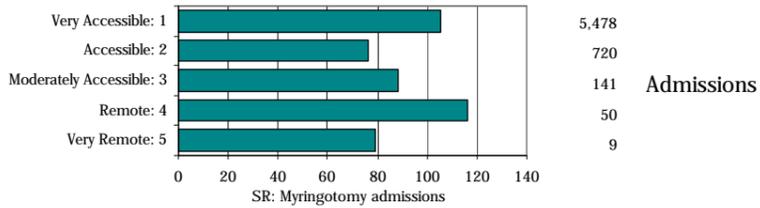


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Elevated standardised admission ratios for admissions involving a myringotomy were recorded for children aged from 0 to 9 years in the Remote (with an SAR of 116) and Very Accessible (105) ARIA categories. The remaining ARIA categories (all with small numbers of admissions) had ratios below the level expected from the State rates, an SAR of 88 in the Moderately Accessible areas, 79 in Very Remote and 76 in Accessible.

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 6.52: Admissions<sup>1</sup> 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 <sup>2</sup>	All capitals
92**	92**	118**	107**	92**	100	115*	90**	97**

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

<sup>2</sup>Includes 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 New South Wales to be 7.5 per cent below that in the other States (Table 6.42, page 269).

## Sydney (New South Wales as the Standard)

In 1995/96 there were 9,494 admissions for Caesarean sections of female residents of **Sydney** aged between 15 and 44 years. This was 3 per cent fewer than were expected in comparison to the State rates, an SAR of 97\*\*.

The pattern of distribution of the SARs is of high standardised admission ratios to the north, south-west and in around the city areas, with many lower ratios also nearby the city centre and in the western region (see Map 6.45).

The most highly elevated ratios in SLAs to the north of the city were recorded for residents of Gosford (with an SAR of 143\*\*), Wyong (135\*\*) and Pittwater (115); similarly high ratios were also recorded in and around the city in Mosman (138\*\*), Botany (137\*\*), Auburn (126\*\*) and Rockdale (115\*) and in the south-western SLAs of Sutherland (123\*\*) and Liverpool (118\*\*).

All SLAs with ratios in the lowest range mapped were in the inner and western regions, with the exception of Ku-ring-gai (84), Wollondilly (83) and North Sydney (75\*\*) located in the north. Those situated near the city included South Sydney (with an SAR of 48\*\*); Woollahra (57\*\*); Waverley (61\*\*); Leichhardt (64\*\*); Marrickville (71\*\*); and Randwick (73\*\*). The inner western SLAs of Drummoyne (76\*), Ashfield (77\*\*) and Strathfield (81) and the outer western SLAs of Blue Mountains (72\*\*) and Penrith (78\*\*), were also mapped in the lowest range.

Admissions for Caesarean sections were highest among female residents of Blacktown (704 admissions in 1995/96), Sutherland (590), Fairfield (455), Gosford (449) and Canterbury (387).

There was a weak association evident in the correlation analysis at the SLA level with a number of the indicators of socioeconomic disadvantage, indicating higher rates of admission for this procedure among socioeconomically disadvantaged populations. The strongest of these were the inverse correlations with the variables for managers and administrators, and professionals (-0.40), high income families (-0.30) and female labour force participation (-0.28); positive correlations were recorded with the variables for unskilled and semi-skilled workers (0.35) and low income families (0.25).

## Newcastle

There were 4 per cent more admissions for Caesarean sections in **Newcastle** than were expected from the State rates (an SAR of 104), a total of 1,141 admissions.

Residents of Maitland and Cessnock had the highest ratios for this variable, with SARs of 128\*\* and 117 respectively. Port Stephens (with a ratio of 105) and Lake Macquarie (with a ratio of 103) also had more admissions than expected, while the city of Newcastle recorded the lowest ratio, of 92.

## Wollongong

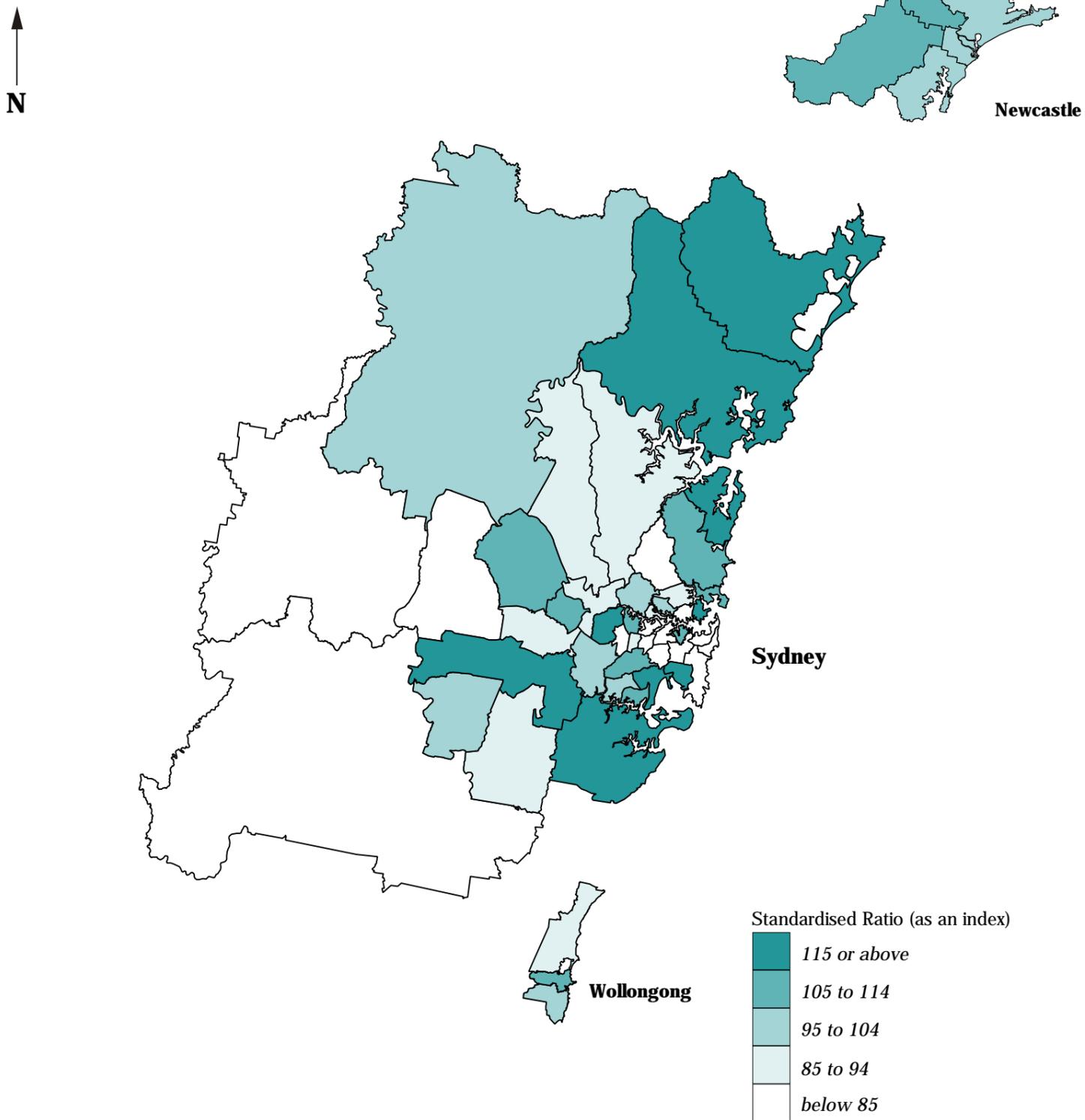
**Wollongong** had the lowest SAR among the major urban centres, with 10 per cent fewer admissions than expected (a ratio of 90\* and 554 admissions).

Ratios at or above the level expected were recorded in both Shellharbour, with an SAR of 111, and Kiama, with an SAR of 100. The only statistically significant ratio was recorded for residents of the City of Wollongong (84\*\*), with 16 per cent fewer admissions than expected.

**Map 6.45**

**Admissions of females aged 15 to 44 years for a Caesarean section, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: Calculated on data from ABS 1996 Census

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 6.53: Admissions<sup>1</sup> 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 <sup>2</sup>	95*	78**	106	..	..	..	..	..	97
Rest of State/Territory	105**	107**	109**	123**	99	104	142**	— <sup>3</sup>	108**
Whole of State/Territory	96**	95**	112**	111**	94**	102	130**	87**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

Female residents of the non-metropolitan areas of New South Wales aged from 15 to 44 years had 3,896 admissions for Caesarean sections in 1995/96. This was 10 per cent more than expected from the State rates, a standardised admission ratio of 110\*\*.

As can be seen from **Map 6.46**, 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.

Murrumbidgee and Boorowa had the most highly elevated ratios for this variable, with SARs of 239\*\* and 191\* respectively. However, both of these SLAs had fewer than 20 admissions: Murrumbidgee with 12 admissions (compared with an expected five) and Boorowa with 10 (compared with an expected five). Other SLAs with highly elevated ratios (and with at least twenty admissions) were located:

- in the central west in Parkes (with an SAR of 181\*\*), Lachlan (166\*\*), Cowra (147\*), Cabonne [Part C] (142), Greater Lithgow (141\*\*), Bathurst (135\*\*) and Forbes (132);
- on the mid north coast in Grafton (160\*\*), Bellingen (145\*) and Maclean (137);
- in the north in Narrabri (160\*\*), Tamworth (148\*\*), Dungog (143) and Singleton (141\*\*);
- in the south-west in Leeton (156\*\*), Wentworth (154\*), Narrandera (152\*) and Griffith (148\*\*); and
- in the south-east in Queanbeyan (130\*\*).

There were 28 SLAs mapped in the middle range, with ratios of 10 per cent above or below the level expected: however no ratios in this range were of statistical significance.

Only two SLAs in the lowest range mapped recorded more than 20 admissions: Wingecarribee, with an SAR of 64\*\* and 52 admissions, and Armidale, with an SAR of 54\*\* and 33 admissions.

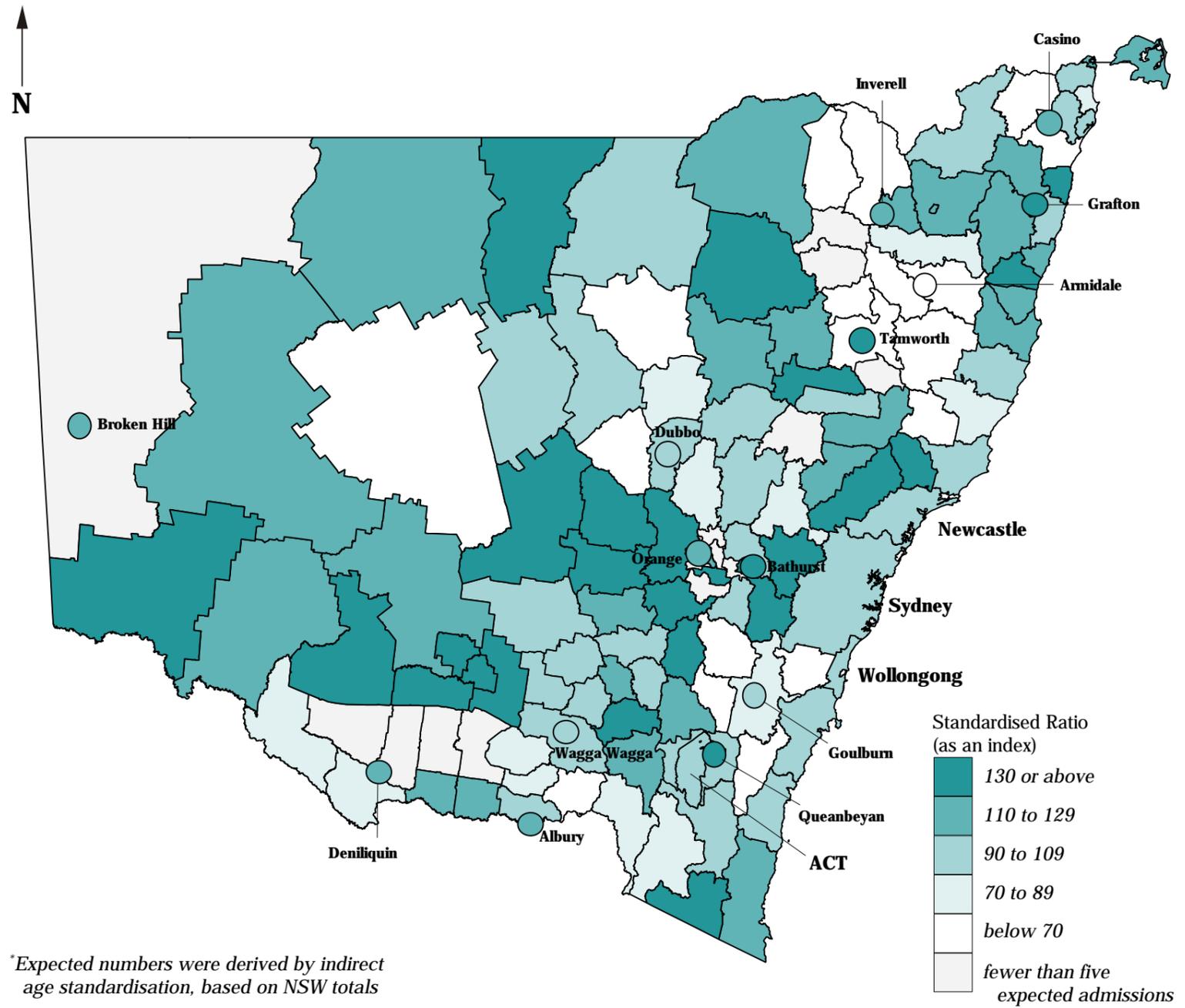
In 1995/96 there were more than 100 admissions for Caesarean sections of female residents from the following areas: Shoalhaven, with 159 admissions; Coffs Harbour, with 148 admissions; Wagga Wagga, with 146 admissions; Tamworth, with 127 admissions; Albury, with 116 admissions; Hastings, with 110 admissions; and Queanbeyan, with 105 admissions.

Although not consistent, there appears to be a weak association evident in the correlation analysis at the SLA level between high rates of admission for a Caesarean section and many of the indicators of socioeconomic disadvantage.

**Map 6.46**

**Admissions of females aged 15 to 44 years for a Caesarean section, New South Wales, 1995/96**

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

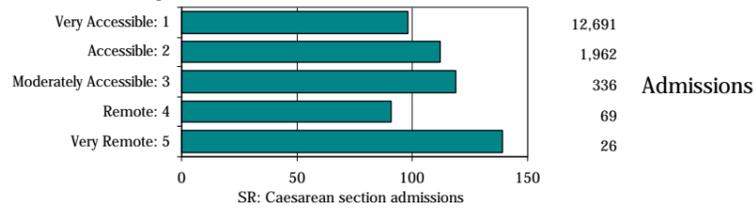


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: Calculated on data from ABS 1996 Census

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for admissions of females aged from 15 to 44 years involving a Caesarean section ranged from an SAR of 98 in the Very Accessible ARIA category to an elevated SAR of 139 in Very Remote. The lowest ratio was recorded for residents of areas in the Remote category, an SAR of 91.

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<sup>\*\*</sup>): other elevated ratios were in **Hobart** (with an SAR of 115<sup>\*\*</sup>) and **Brisbane** (106<sup>\*\*</sup>).

**Table 6.54: Admissions<sup>1</sup> 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 <sup>2</sup>	All capitals
86 <sup>**</sup>	91 <sup>**</sup>	106 <sup>**</sup>	102	100	115 <sup>**</sup>	135 <sup>**</sup>	87 <sup>**</sup>	94 <sup>**</sup>

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

<sup>2</sup>Includes 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: 2,290 admissions and a rate of 1029.3 per one hundred thousand females; 45 to 49 years: 2,434 admissions and a rate of 1155.0 per one hundred thousand females). As relatively few hysterectomies are performed on women younger than 30 years, the age range used in standardising this data is for women aged from 30 years.

Data for Australia published by the AIHW (1998) showed the hysterectomy rate in New South Wales to be 7.2 per cent below that in the other States (**Table 6.42**, page 269).

## Sydney (New South Wales as the Standard)

Female residents of **Sydney**, aged 30 years and over, had 6,034 admissions for an hysterectomy, 12 per cent fewer admissions than were expected from the State rates (an SAR of 88<sup>\*\*</sup>).

Low standardised admission ratios were recorded in SLAs in the inner and western regions, while the highest ratios were in SLAs to the north and south-west of the city (**Map 6.47**). The majority of SLAs (77.3 per cent) recorded ratios lower than expected, while only nine SLAs were mapped in the two highest ranges.

The largest number of SLAs with highly elevated ratios were in the south-west, in Camden (with an SAR of 153<sup>\*\*</sup>), Wollondilly (124) and Campbelltown (122<sup>\*\*</sup>). The other SLA in the highest range was Wyong, with 30 per cent more admissions than expected (an SAR of 130<sup>\*\*</sup>).

Residents of Sydney had the lowest ratio for this variable, a standardised ratio of 54, however there were only six admissions (compared with an expected 11). Highly significant ratios in the lowest range mapped were recorded in the SLAs of Leichhardt (an SAR of 58<sup>\*\*</sup>), Willoughby (61<sup>\*\*</sup>), Blue Mountains (65<sup>\*\*</sup>), Rockdale (66<sup>\*\*</sup>), Parramatta (67<sup>\*\*</sup>), Woollahra (68<sup>\*\*</sup>), Marrickville (68<sup>\*\*</sup>), South Sydney (71<sup>\*\*</sup>), Pittwater (73<sup>\*\*</sup>), Waverley (74<sup>\*\*</sup>), Randwick (76<sup>\*\*</sup>), Ryde (76<sup>\*\*</sup>), Fairfield (76<sup>\*\*</sup>), Canterbury (78<sup>\*\*</sup>), Ku-ring-gai (80<sup>\*\*</sup>), Hornsby (81<sup>\*\*</sup>) and Baulkham Hills (82<sup>\*\*</sup>).

In 1995/96, the largest numbers of female admissions for an hysterectomy were recorded in Blacktown, with 398 admissions; Sutherland, with 394 admissions; Gosford, with 305 admissions; and Campbelltown, with 301 admissions.

Correlations of meaningful significance at the SLA level were recorded with the variables for children aged from 0 to 4 years (0.58) and the Total Fertility rate (0.55). There were also weak positive correlations with the indicators of socioeconomic disadvantage and weak inverse correlations with all of the indicators of high socioeconomic status. These results suggest the existence at the SLA level of an association between high rates of admissions for hysterectomy procedures and socioeconomic disadvantage.

## Newcastle

Admissions for an hysterectomy of female residents of **Newcastle** were substantially higher than were expected from the State rates, an SAR of 135<sup>\*\*</sup>. In total, there were 1,132 such admissions recorded for female residents aged 30 years and over.

All of the SLAs were mapped in the highest range, with ratios ranging from 159<sup>\*\*</sup> in Port Stephens to 128<sup>\*\*</sup> in Lake Macquarie.

## Wollongong

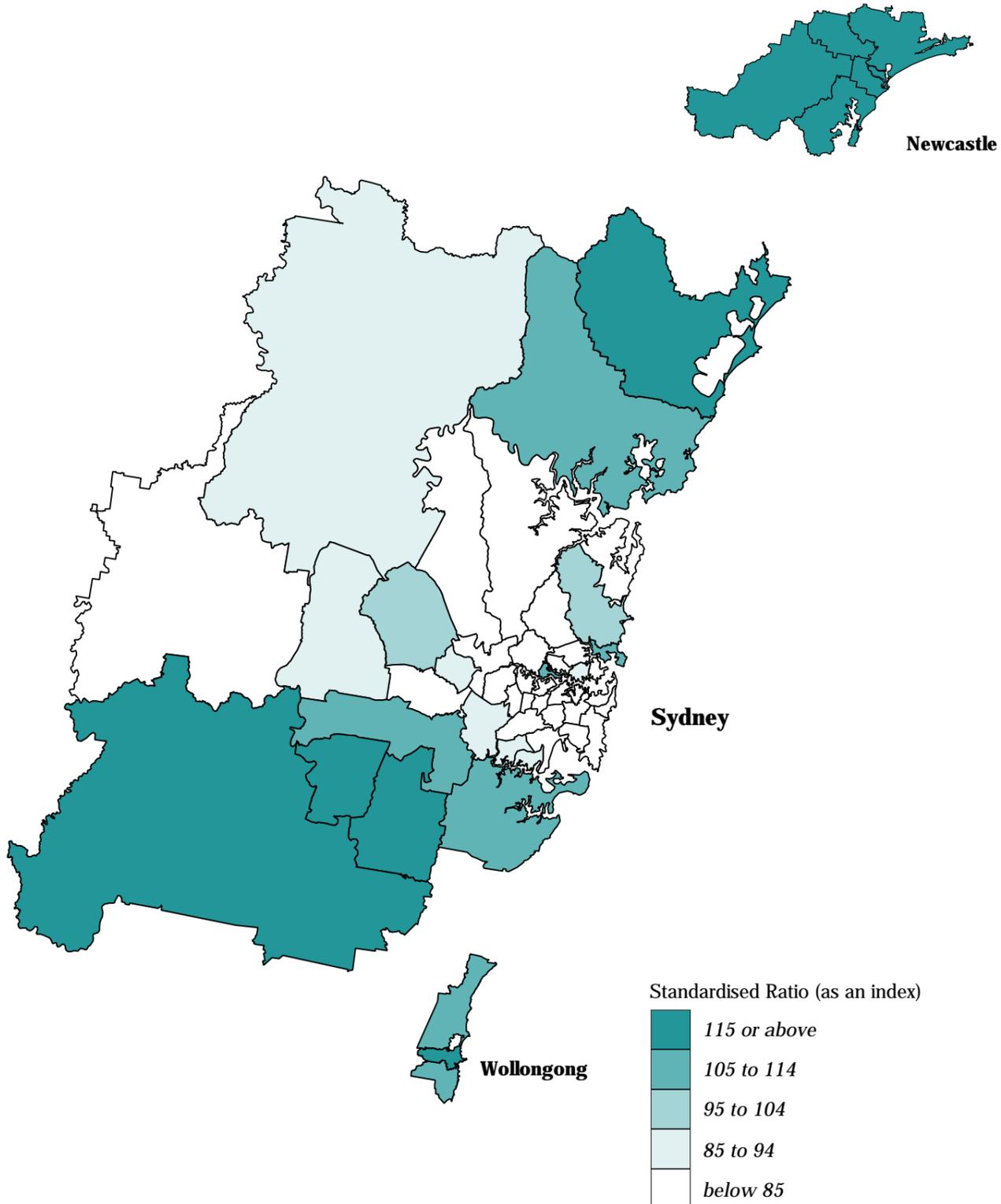
**Wollongong** had 511 admissions for an hysterectomy in 1995/96, 15 per cent more than expected (an SAR of 115<sup>\*\*</sup>).

There were 24 per cent more admissions than expected in Shellharbour (a ratio of 124<sup>\*</sup>), with 13 per cent and 8 per cent more than expected in the city of Wollongong (113<sup>\*</sup>) and Kiama (108), respectively.

**Map 6.47**

**Admissions of females aged 30 years and over for an hysterectomy, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions of females aged 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 6.55: Admissions<sup>1</sup> 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 <sup>2</sup>	125**	103	98	..	..	..	..	..	114**
Rest of State/Territory	113**	108**	102	135**	106	120**	92	- <sup>3</sup>	110**
Whole of State/Territory	98*	95**	104**	110**	101	118**	113*	83**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 3,340 admissions for hysterectomies of female residents of the non-metropolitan areas of New South Wales, 15 per cent more than were expected from the State rates (an SAR of 115\*\*).

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.

As can be seen from **Map 6.48**, a number of areas to the north and south-west of the city were mapped in the highest range, with ratios of 130 or above. SLAs with ratios in the highest range mapped and with at least twenty admissions were recorded:

- in the central west in Weddin (with an SAR of 265\*\*), Orange (165\*\*), Parkes (158\*\*) and Forbes (137);
- in the south-west in Leeton (215\*\*), Temora (176\*), Deniliquin (172\*\*), Tumut (152\*), Griffith (151\*\*), Wagga Wagga (146\*\*) and Cootamundra (141);
- to the north of the city in Quirindi (205\*\*), Muswellbrook (202\*\*), Singleton (183\*\*), Tamworth (167\*\*), Gunnedah (164\*\*), Greater Taree (146\*\*), Dungog (145), Great Lakes (141\*\*), Grafton (138\*) and Scone (134);
- in the south-east in Goulburn (160\*\*) and Young (148\*); and
- in the north-east coast in Tweed Heads (136\*\*).

Only seven SLAs with standardised ratios in the two lowest ranges mapped had more than twenty admissions; Tweed [Part B], with an SAR of 45\*\*; Byron, with 70\*; Bega Valley, with 72\*; Broken Hill, with 73; Bathurst, with 83; Greater Lithgow, with 87; and Dubbo, with 89. By far the lowest ratio (an SAR of 13\*) was recorded for residents of Cobar: however only one admission was recorded, when eight were indicated by the State rates.

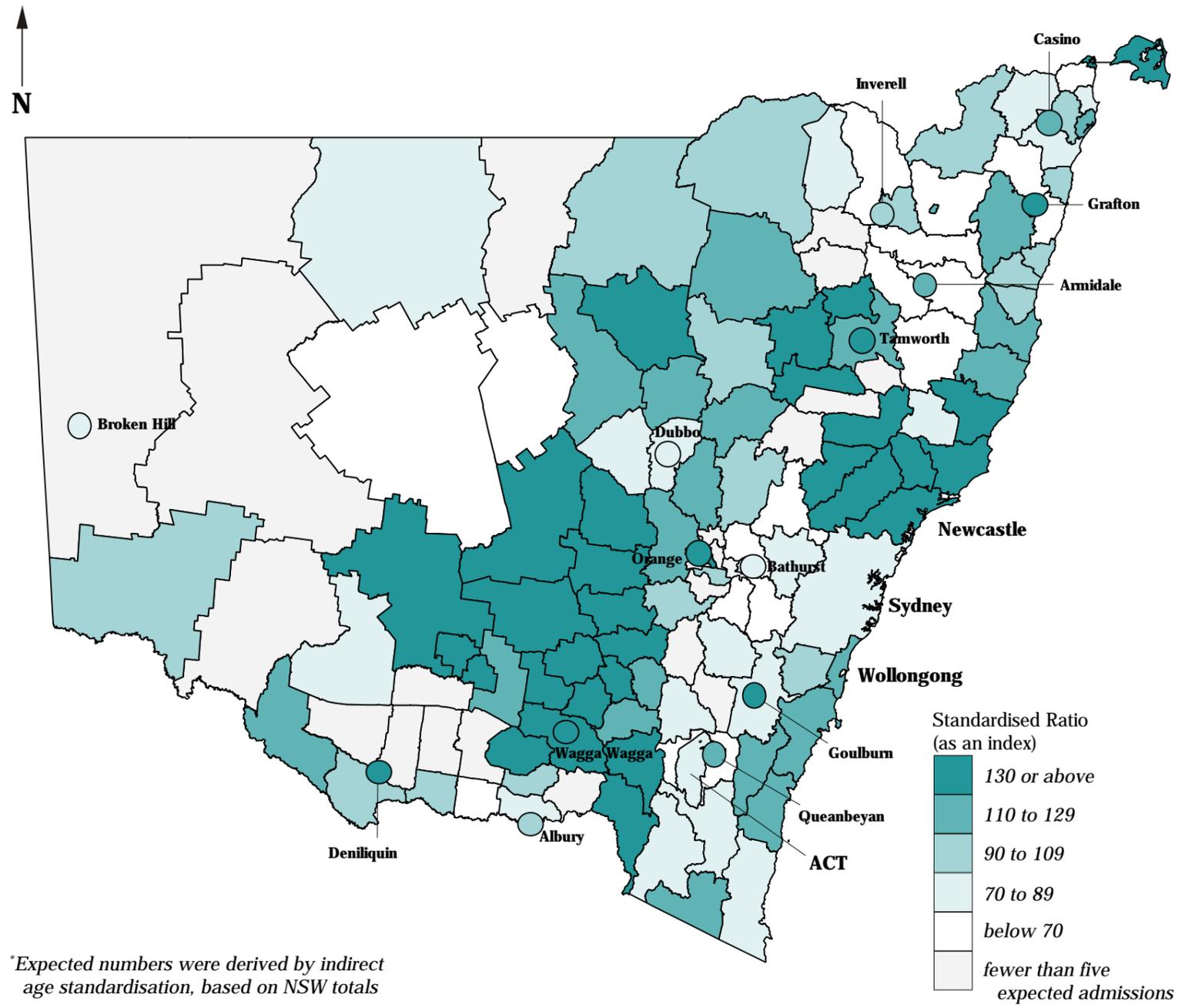
The largest numbers of admissions were recorded in the SLAs of Shoalhaven (with 163 admissions), Wagga Wagga (137), Greater Taree (124), Hastings (122), Tamworth (108) and Coffs Harbour (104).

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

**Map 6.48**

**Admissions of females aged 30 years and over for an hysterectomy, New South Wales, 1995/96**

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

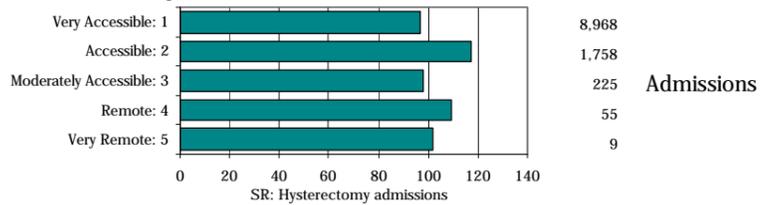


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for admissions of females aged 30 years and over involving an hysterectomy were similar across the five ARIA categories graphed, with the exception of the elevated ratio in the Accessible category (an SAR of 117) and, to a lesser extent, the SAR of 109 the Remote category.

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 6.56: Admissions<sup>1</sup> with a principal procedure of hip replacement, capital cities, 1995/96**  
**Standardised admission ratios**

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra <sup>2</sup>	All capitals
91**	103	75**	99	90**	135**	51**	112	94**

<sup>1</sup>Includes admissions to public acute hospitals and private hospitals

<sup>2</sup>Includes 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 just over half (53.0 per cent) the admissions for a hip replacement performed in New South Wales in 1995/96. However, the admission rate is higher for males than females at most ages, with the exception of the 65 to 69 and 75 to 84 year age groups. Rates for 65 to 69 year olds are 361.7 admissions per 100,000 population for females and 359.9 for males; for 75 to 79 year olds rates are 550.1 and 496.3 respectively; and for those aged 85 years and over, they are 343.1 and 348.8 respectively. Almost three quarters (72.2 per cent) of the admissions for hip replacements of females were for those aged 65 years and over, whereas for males they represented less than two thirds (59.9 per cent).

Data for Australia published by the AIHW (1998) showed the hip replacement rate in New South Wales to be 9.5 per cent below that in the other States (**Table 6.42**, page 269).

## Sydney (New South Wales as the Standard)

In 1995/96, there were 2,667 admissions of residents in **Sydney** for hip replacement, 10 per cent fewer than were expected from the State rates (an SAR of 90\*\*). Of the 2,667 admissions, 1,492 were females and 1,175 were males.

The most highly elevated ratios (**Map 6.49**) were recorded for residents of Sydney (12 admissions and an SAR of 203), Mosman (45 admissions and an SAR of 183\*\*), Pittwater (66 admissions and an SAR of 137), Woollahra (67 admissions and an SAR of 135), South Sydney (69 admissions and an SAR of 135) and Hunter's Hill (18 admissions and an SAR of 134).

SLAs with ratios in the lowest range mapped were generally distributed throughout the inner SLAs. Ratios in this category and with more than 20 admissions were recorded in the SLAs of Canterbury (with an SAR of 60\*\*), Fairfield (60\*\*), Kogarah (63\*\*), Parramatta (64\*\*), Ryde (69\*\*), Randwick (72\*\*), Blacktown (74\*\*), Drummoyne (75), Penrith (77), Bankstown (80), North Sydney (84) and Holroyd (84).

More than 100 admissions for hip replacement were recorded for residents of Sutherland (178), Gosford (166), Wyong (136), Warringah (126), Bankstown (120) and Ku-ring-gai (109).

There were correlations at the SLA level with the variables for managers, administrators and professionals (0.52) and high income families (0.44); and inverse correlations with unskilled and semi-skilled workers (-0.55), early school leavers (-0.44) and unemployment (-0.35). These results, together with the correlation with the IRSD (0.39), suggest the existence at the SLA level of an association between high rates of admission for hip replacement and high socioeconomic status. There were also notable inverse correlations with the variables for people born in predominantly non-English speaking countries: of meaningful significance with those resident for 5 years or more (-0.57), and of lesser significance with those reporting poor proficiency in English (-0.48) or resident for less than five years (-0.26). These latter correlations indicate that these groups are less likely to have high rates of admission for a hip replacement.

## Newcastle

Residents of **Newcastle** had 4 per cent fewer admissions than were expected from the State rates (an SAR of 96), with a total of 392 admissions.

Port Stephens and Cessnock had SARs of 109 and 104 respectively. Ratios below the level expected were recorded in Lake Macquarie (with an SAR of 97); Maitland (93); and Newcastle (88).

## Wollongong

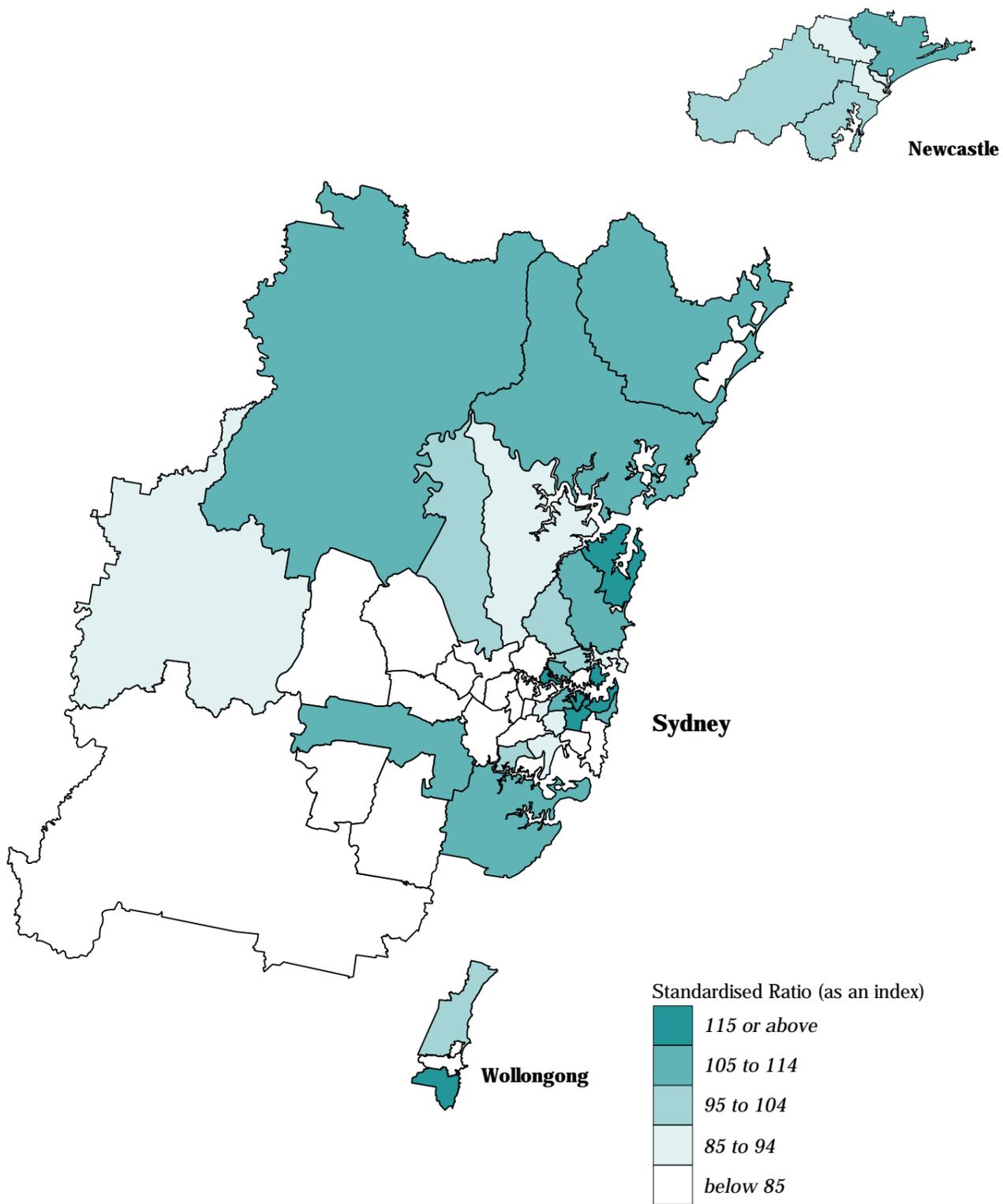
**Wollongong** had an SAR of 95, indicating that there were 5 per cent fewer admissions for hip replacement than were expected, with a total of 199 admissions.

The SLA of Shellharbour and the City of Wollongong had ratios of 73 and 97 respectively, while Kiama had an elevated ratio of 124.

**Map 6.49**

**Admissions for a hip replacement, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# Admissions for a hip replacement, 1995/96

## State/Territory Comparison (Australia as the Standard)

There were 4,955 hip replacements (described on the previous text page) performed as a principal procedure on residents of the non-metropolitan areas of Australia. Females accounted for 48.6 per cent of these admissions, lower than the 57.4 per cent in the capital cities. The higher proportion for males may in part reflect the occupations held by men in rural Australia and the need for such a procedure. Standardised admission ratios (SARs) varied across the non-metropolitan areas of Australia, with elevated ratios in all but Queensland and the Northern Territory. The highest ratio was in Victoria (an SAR of 129\*\*) and the lowest ratio (82\*\*) was in Queensland.

**Table 6.57: Admissions<sup>1</sup> 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 <sup>2</sup>	96	118	86**	..	..	..	..	..	95
Rest of State/Territory	122**	129**	82**	125**	107	120**	91	- <sup>3</sup>	113**
Whole of State/Territory	100	111**	80**	106*	94*	127**	71*	103	100

<sup>1</sup>Includes admissions to public acute hospitals, private (acute and psychiatric) hospitals

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 1,749 admissions for hip replacement recorded for residents of the non-metropolitan areas of New South Wales, 22 per cent more than were expected from the State rates (an SAR of 122\*\*). In contrast to **Sydney**, males accounted for a slightly larger proportion of these admissions, representing 52.0 per cent.

Almost two thirds (58.6 per cent) of the SLAs in the non-metropolitan areas of New South Wales had average or above average SARs, many of which were highly elevated (**Map 6.50**). Those which were elevated by at least thirty per cent and with at least twenty admissions were recorded:

- in the central west in Cabonne [Part C] (with an SAR of 261\*\*), Orange (174\*\*), Bathurst (153\*) and Parkes (147);
- in the north in Armidale (240\*\*), Kempsey (168\*\*), Tamworth (153\*\*) and Nambucca (144);
- in the south-east in Queanbeyan (215\*\*), Goulburn (169\*\*), Shoalhaven (146\*\*) and Wingecarribee (132);
- in the south-west in Wagga Wagga (154\*\*) and Griffith (130); and
- in the north-east in Tweed [Part B] (145\*).

Of the 14 SLAs mapped in the middle range, with ratios within 10 per cent of the level expected from the State rates, only seven had more than 20 admissions. These SLAs were Coffs Harbour (105), Tweed Heads (98), Great Lakes (97), Hastings (97), Byron (96) and Greater Taree (96), which were all situated along the coast north of **Sydney**.

The lowest ratio (with at least 20 admissions) was recorded for residents of Ballina, with 32 per cent fewer admissions than expected from the State rates, an SAR of 68\*. The only other SLA with more than 20 admissions, and mapped in the two lowest ranges, was Lismore, with a ratio of 84.

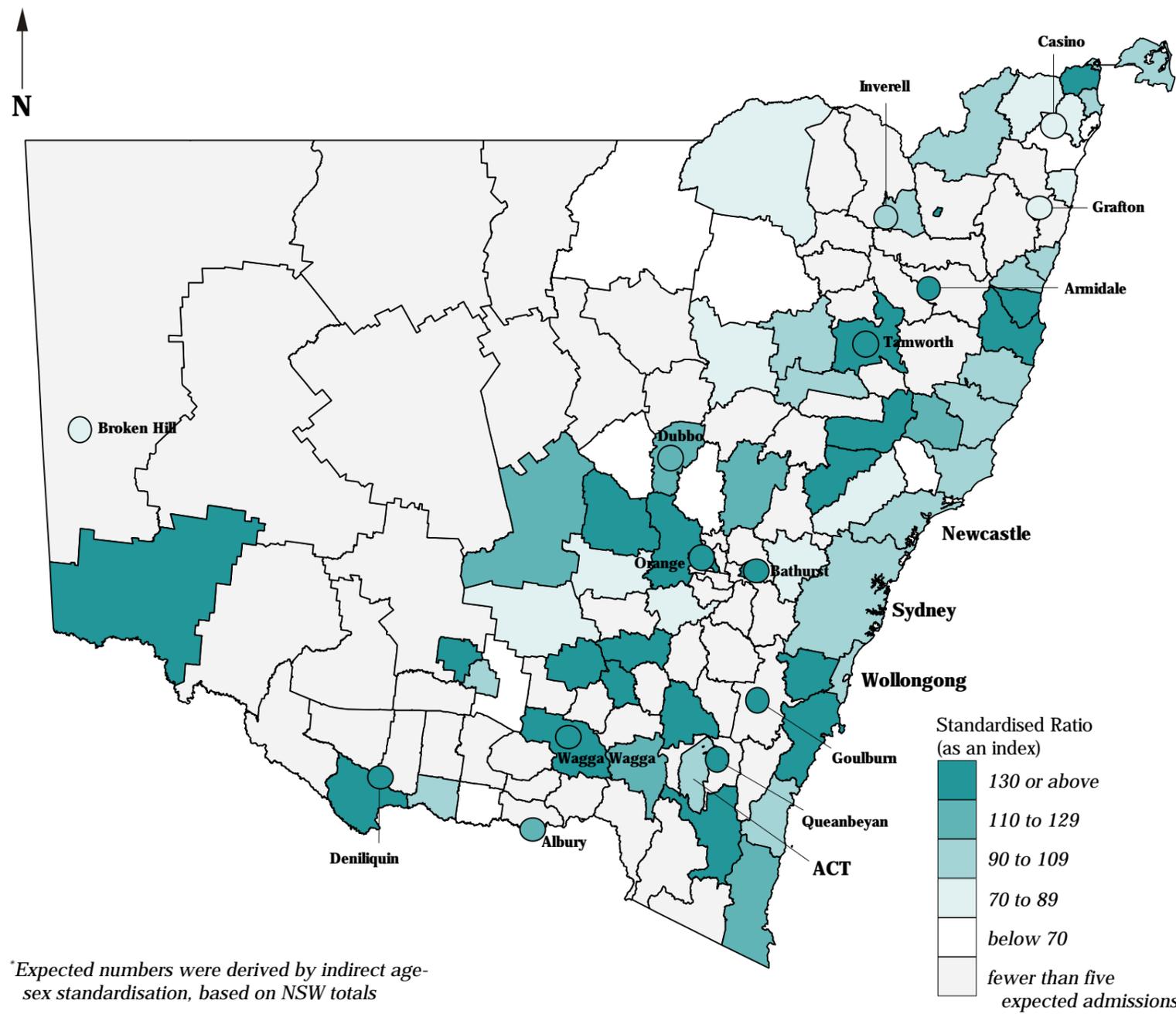
By far the largest number of admissions for hip replacement was recorded for residents of Shoalhaven, with 125. More than 50 admissions were recorded in Hastings (68 admissions), Wagga Wagga (57 admissions) and Coffs Harbour (52 admissions).

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

### Map 6.50

## Admissions for a hip replacement, New South Wales, 1995/96

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

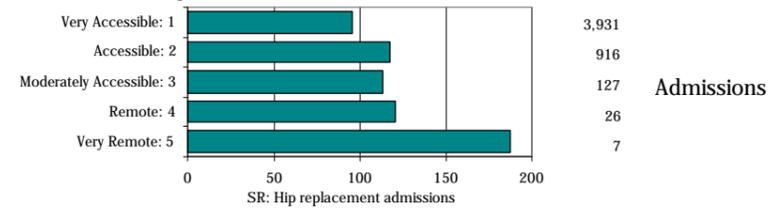


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



The lowest standardised admission ratios for admissions involving a hip replacement were in the areas included in the Very Accessible ARIA category, with an SAR of 96. The middle categories had similarly elevated ratios, of 118 in Accessible, 114 in Moderately Accessible and 121 in the Remote category, the highest ratio.

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

# Admissions for a lens insertion, 1995/96

## Capital city comparison (Australia as the Standard)

There were 55,446 admissions at which a lens insertion (described below) was undertaken on residents of the capital cities and an additional 8,263 on residents of the other major urban centres. Females accounted for 61.5 per cent of these admissions for residents of capital cities, reflecting their longer life expectancy. Most capital cities had either low or near average standardised admission ratios (SARs) for this variable, other than **Darwin** (with the highest ratio, an SAR of 130<sup>\*\*</sup>). The lowest SARs were in **Canberra**, with a very low SAR of 36<sup>\*\*</sup>, and Perth (84<sup>\*\*</sup>).

**Table 6.58: Admissions<sup>1</sup> for a lens insertion, capital cities, 1995/96**  
*Standardised admission ratios*

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra <sup>2</sup>	All capitals
102 <sup>**</sup>	97 <sup>**</sup>	105 <sup>**</sup>	93 <sup>**</sup>	84 <sup>**</sup>	99	130 <sup>**</sup>	36 <sup>**</sup>	97 <sup>**</sup>

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

<sup>2</sup>Includes 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 New South Wales to be 1.6 per cent above that in the other States (**Table 6.42**, page 269).

## Sydney (New South Wales as the Standard)

In 1995/96, there were 19,592 admissions involving a lens insertion in **Sydney**, representing 3 per cent fewer admissions than were expected from the State rates, an SAR of 97<sup>\*\*</sup>. Females comprised 61.3 per cent of these admissions (12,007 admissions), compared with 7,585 male admissions (38.7 per cent).

As **Map 6.51** shows, the majority of SLAs had ratios in the middle ranges, with only five mapped in the highest and 12 in the lowest class intervals. Generally, above average ratios for this procedure were concentrated in the inner suburbs, while lower ratios were predominantly located in SLAs situated in the outer regions.

Residents of Woollahra had 46 per cent more admissions than expected from the State rates (an SAR of 146<sup>\*\*</sup>). The other four SLAs mapped in the highest range were Sydney (with an SAR of 143<sup>\*\*</sup>), Auburn (138<sup>\*\*</sup>), Hurstville (127<sup>\*\*</sup>) and Botany (118<sup>\*</sup>).

Several SLAs had SARs in the middle range mapped, ranging from 104 in Blacktown to 95 in Kogarah.

There were 12 SLAs in which ratios were at least 15 per cent lower than expected. Of these, highly significant SARs were recorded in the SLAs of Manly (84<sup>\*\*</sup>), Hornsby (82<sup>\*\*</sup>), Parramatta (79<sup>\*\*</sup>), Burwood (78<sup>\*\*</sup>), Hawkesbury (76<sup>\*\*</sup>), Pittwater (75<sup>\*\*</sup>), Strathfield (73<sup>\*\*</sup>), Concord (67<sup>\*\*</sup>) Penrith (66<sup>\*\*</sup>) and Blue Mountains (61<sup>\*\*</sup>).

The largest numbers of admissions involving a lens insertion in **Sydney** were recorded for residents of Sutherland (with 1,160 admissions); Gosford (1,073); Bankstown (957); Warringah (840); and Randwick (791).

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admission for a lens insertion and socioeconomic status.

## Newcastle

A total of 2,826 admissions involving a lens insertion were recorded for residents of **Newcastle** (an SAR of 100). Females accounted for the larger proportion of these admissions, with 1,709 admissions (60.5 per cent).

Elevated ratios were recorded in the City of Newcastle and Maitland, with SARs of 111<sup>\*\*</sup> and 108 respectively. Fewer admissions than expected were recorded for residents of Port Stephens (with a ratio of 98), Lake Macquarie (92<sup>\*</sup>) and Cessnock (85<sup>\*</sup>).

## Wollongong

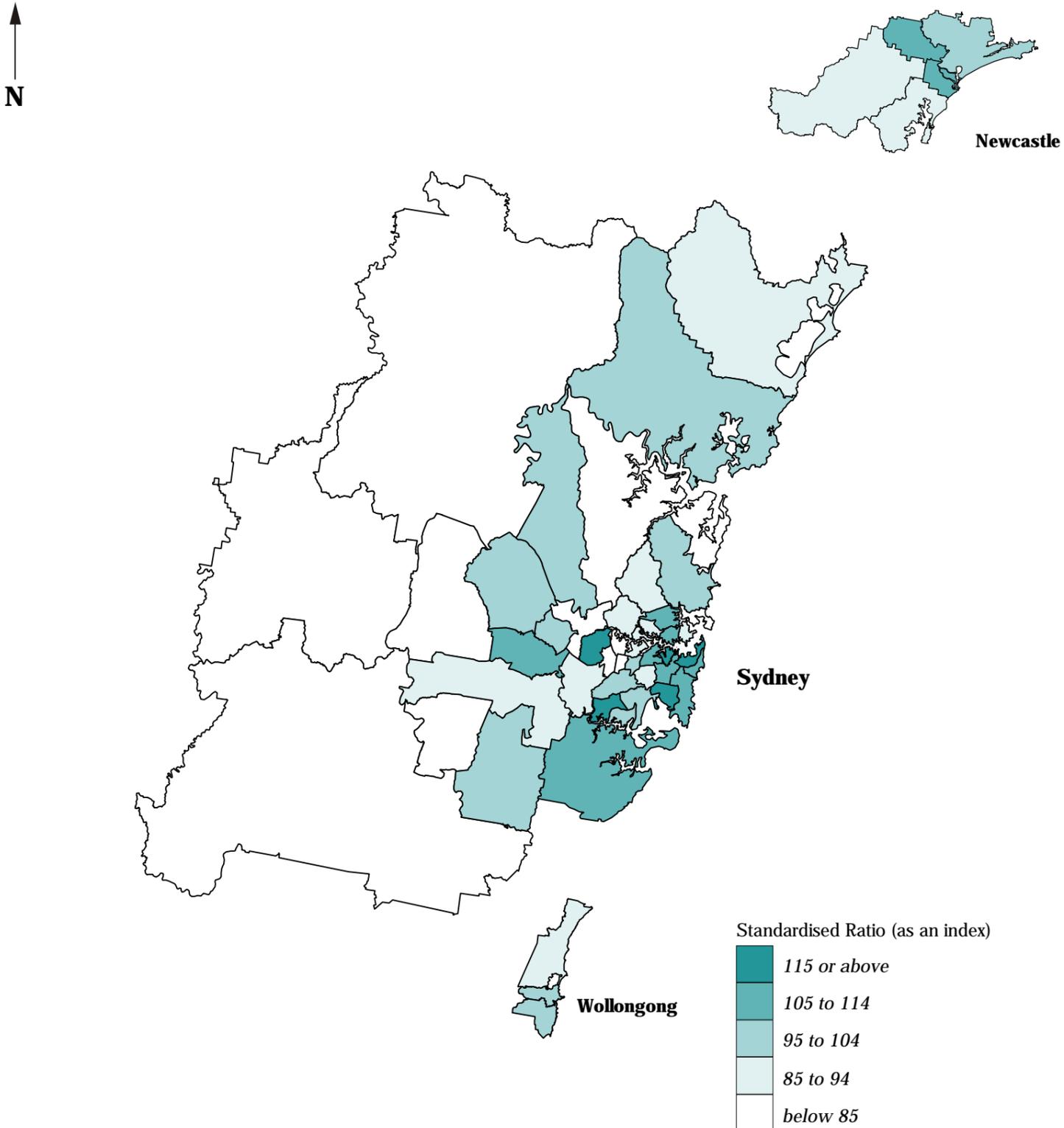
There were 7 per cent fewer admissions than expected from the State rates were recorded for residents of **Wollongong**, an SAR of 93<sup>\*\*</sup>. Of the 1,279 admissions, 758 were females and 521 were males.

The highest SAR was recorded in the SLA of Kiama, with an SAR of 100; followed by Shellharbour (an SAR of 98) and the City of Wollongong (an SAR of 91<sup>\*\*</sup>).

### Map 6.51

## Admissions for a lens insertion, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

## Admissions for a lens insertion, 1995/96

### 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 (78\*\* and 82\*\* respectively).

**Table 6.59: Admissions<sup>1</sup> for lens insertion, State/Territory, 1995/96**  
*Standardised admission ratios*

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	102**	97**	105**	93**	84**	99	130**	36**	97**
Other major urban centres <sup>2</sup>	103	73**	163**	..	..	..	..	..	120**
Rest of State/Territory	112**	78**	119**	93**	89**	82**	104	- <sup>3</sup>	101*
Whole of State/Territory	105**	91**	119**	93**	85**	89**	117**	35**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

In the non-metropolitan areas of New South Wales, there were 10,394 admissions involving a lens insertion, of which 6,020 admissions (57.9 per cent) were females and 4,374 admissions (42.1 per cent) were males. This was 7 per cent higher than expected from the State rates (an SAR of 107\*\*).

As can be seen from **Map 6.52** a number of the most highly elevated SARs were in SLAs located in a band through the centre of the State, while those with the lowest ratios were distributed throughout the State in no notable pattern.

SLAs with ratios elevated by thirty per cent or more (and with at least 20 admissions) were recorded:

- on the mid north coast in Kempsey (with an SAR of 226\*\*), Bellingen (199\*\*), Greater Taree (186\*\*), Coffs Harbour (172\*\*), Ulmarra (164\*\*), Nambucca (154\*\*) and Grafton (139\*\*);
- in the far north-west in Warren (219\*\*), Coonamble (215\*\*), Coolah (212\*\*), Bogan (209\*\*), Dubbo (207\*\*), Narromine (195\*\*), Cobar (154') and Gilgandra (147\*\*);
- in the north in Uralla (174\*\*), Gloucester (170\*\*), Guyra (168\*\*), Glen Innes (154\*\*), Armidale (151\*\*), Great Lakes (142\*\*), Inverell [Part B] (139\*\*), Bingara (130) and Barraba (130);
- in the north-east in Tweed Heads (161\*\*) and Tweed [Part B] (154\*\*); and
- in the central west in Forbes (143\*\*).

Almost two thirds of the SLAs (63.0 per cent) in the non-metropolitan areas of New South Wales had ratios that were lower than expected. Excluding SLAs with fewer than 20 admissions, the lowest SARs were in Broken Hill and Cootamundra, with ratios of 43\*\* and 45\*\* respectively.

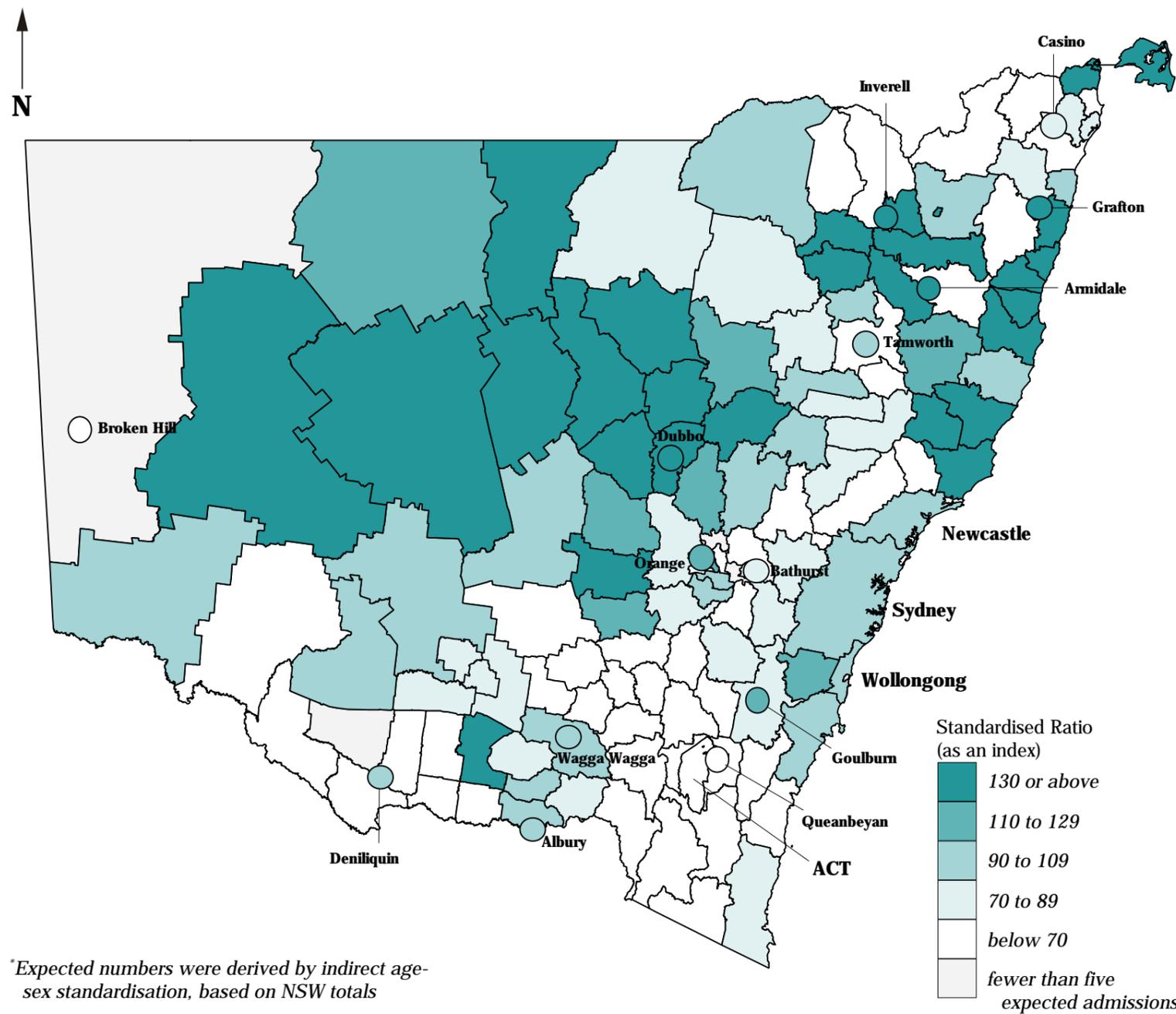
In 1995/96, the largest number of admissions involving a lens insertion was recorded for residents of Greater Taree and Shoalhaven, both with 567 admissions. Residents of Coffs Harbour (562 admissions), Tweed Heads (546 admissions), Hastings (467 admissions) and Great Lakes (400 admissions) all had 400 or more admissions.

There were weak correlations at the SLA level with the indicators of socioeconomic disadvantage, and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the inverse correlation with the IRSD (-0.44), suggest the existence at the SLA level of an association between high rates of admissions for lens insertion and socioeconomic disadvantage.

### Map 6.52

## Admissions for a lens insertion, New South Wales, 1995/96

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

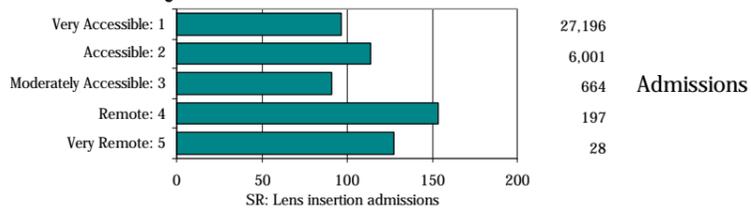


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



There was no consistent pattern across the five ARIA categories in the distribution of standardised admission ratios for admissions involving a lens insertion. The lowest ratios were in the Moderately Accessible (an SAR of 91) and Very Accessible (an SAR of 97) categories, with elevated ratios in the Moderately Accessible (114) and Very Remote (128) categories. The highest ratio was recorded for people living in areas in the Remote category, an SAR of 154.

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 6.60: Admissions<sup>1</sup> with a principal procedure of endoscopy, capital cities, 1995/96**  
*Standardised admission ratios*

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra <sup>2</sup>	All capitals
110**	111**	115**	81**	82**	111**	92**	58**	104**

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

<sup>2</sup>Includes 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 New South Wales to be 7.5 per cent above that in the other States (**Table 6.42**, page 269).

### Sydney (New South Wales as the Standard)

There were 88,044 admissions for endoscopies of residents of **Sydney** in 1995/96, 6 per cent more admissions than were expected from the State rates (an SAR of 106\*\*). Of the 87,986 admissions, 47,108 were females (53.5 per cent) and 40,936 were males (46.5 per cent).

Elevated standardised admissions ratios were generally mapped in the city and surrounding SLAs, while those in the lowest ranges were located to the north and west of the city (see **Map 6.53**). Only three SLAs were mapped in the lowest range, however none of these SARs were very low.

One third of the SLAs (33.3 per cent) were mapped in the highest range, with ratios elevated by 15 per cent or more. The highest of these, with 86 per cent more admissions than expected, was recorded for residents of Sydney (an SAR of 186\*\*). Elevated ratios in SLAs located adjacent to the city, were found in Woollahra (164\*\*), Waverley (155\*\*), Drummoyne (149\*\*), South Sydney (135\*\*), Concord (129\*\*), Randwick (126\*\*), Auburn (125\*\*), Marrickville (124\*\*), Hurstville (124\*\*), Pittwater (120\*\*), Strathfield (120\*\*), Rockdale (120\*\*), Botany (119\*\*) and Canterbury (119\*\*).

Nine SLAs were mapped in the middle range, with SARs of 5 per cent above or below the expected level. There were 3 per cent more admissions than expected from the State rates in Fairfield, and 5 per cent fewer in Gosford, Ryde, Hawkesbury and Wollondilly.

Low ratios to the north of the city were recorded in Wyong, with an SAR of 82\*\*; Hornsby, with an SAR of 92\*\*; and Willoughby, with an SAR of 93\*\*. Also mapped in the two lowest ranges were the SLAs of Blue Mountains (84\*\*), Penrith (84\*\*), Blacktown (88\*\*) and Parramatta (92\*\*), all of which were situated in the west.

In 1995/96 more than 3,500 admissions for endoscopies were recorded for residents of Sutherland (4,798); Bankstown (4,235); Fairfield (3,749); Blacktown (3,689); and Canterbury (3,572).

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

### Newcastle

Residents of **Newcastle** recorded 10,450 admissions (5,569 females and 4,881 males) for endoscopies in 1995/96, marginally fewer than expected, with a ratio of 98\*.

The SLA of Lake Macquarie recorded the highest, and only elevated, ratio for this variable. Its SAR indicated that there were 7 per cent more admissions than the level expected (an SAR of 107\*\*). Other ratios ranged from 76\*\* in Cessnock to 99 in the City of Newcastle.

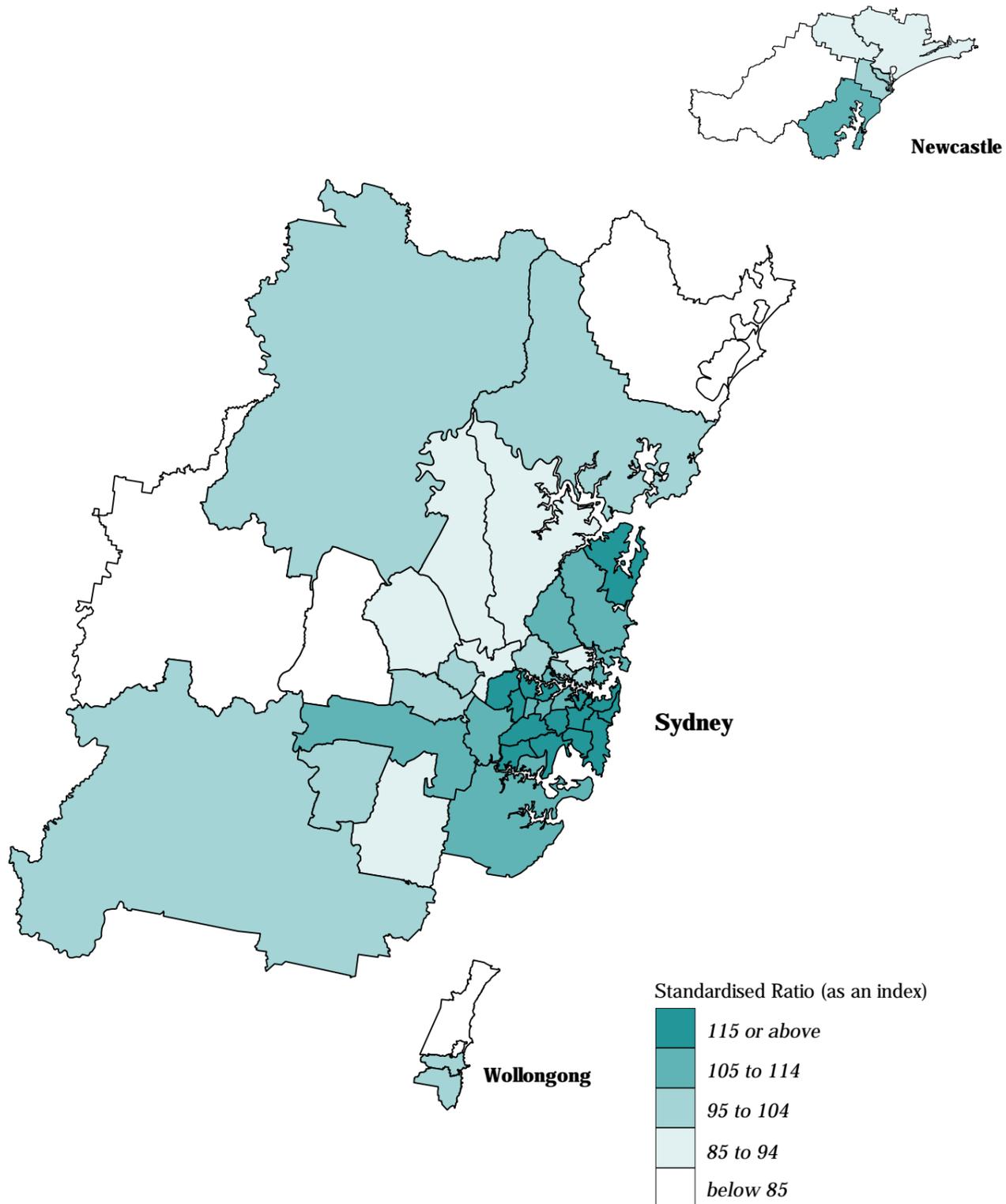
### Wollongong

**Wollongong** had the lowest ratio among the major urban centres, with 14 per cent fewer admissions for endoscopies than were expected from the State rates (an SAR of 86\*\*). Of the 4,892 admissions, 2,662 were females and 2,230 were males. Both Kiama, with an SAR of 100, and Shellharbour, with an SAR of 95, were mapped in the middle range. The only statistically significant ratio was recorded in the City of Wollongong, with an SAR of 82\*\*.

### Map 6.53

## Admissions for an endoscopy, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

## Admissions for an endoscopy, 1995/96

### 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 6.61: Admissions<sup>1</sup> 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 <sup>2</sup>	97**	70**	104**	..	..	..	..	..	97**
Rest of State/Territory	92**	104**	101*	62**	80**	77**	66**	- <sup>3</sup>	93**
Whole of State/Territory	104**	108**	108**	76**	82**	108**	78**	58**	100

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

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

<sup>3</sup>Data 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 (New South Wales as the Standard)

There were 33,281 admissions of residents of the non-metropolitan areas of New South Wales for endoscopies in 1995/96, 11 per cent fewer than expected from the State rates (an SAR of 89\*\*). Females accounted for 52.6 per cent of these admissions.

As can be seen from **Map 6.54**, more than one third (37.8 per cent) of the SLAs were mapped in the lowest range. These SLAs were more frequently located in the north-eastern and southern parts of the State, and along the western border. A number of ratios in the highest range were clustered in an area just north-west of **Sydney**.

SLAs with ratios elevated by at least ten per cent (the two highest ranges mapped) were recorded:

- in the far north-west in Coonamble (with an SAR of 159\*\*), Bogan (156\*\*), Dubbo (147\*\*), Warren (147\*\*), Gilgandra (136\*\*), Narromine (126\*\*), Bourke (126\*\*), Mudgee (125\*\*), Coonabarabran (121\*\*), Cobar (120\*), Brewarrina (115) and Coolah (113);
- in the south-west in Murrumbidgee (158\*\*), Gundagai (130\*\*), Albury (128\*\*) and Griffith (122\*\*);
- in the central west in Greater Lithgow (149\*\*), Bathurst (144\*\*), Evans [Part A] (127), Oberon (126\*), Parkes (126\*\*), Lachlan (120\*\*) and Orange (115\*\*);
- south of **Sydney** in Wingecarribee (147\*\*); and to the north of **Sydney** in Moree Plains (116\*\*) and Scone (114\*).

SLAs with SARs falling within the range of 10 per cent above or below the expected number of admissions were widespread throughout the State, and in no notable pattern. Of the 31 areas in this class interval, only two SLAs had a statistically significant ratio. These were Great Lakes (with an SAR of 108\*) and Eurobodalla (with an SAR of 91\*\*).

By far the lowest ratio was recorded in Dumaresq, with 95 per cent fewer admissions than expected (an SAR of 5\*\*). However there were only four admissions, when the State indicated 88. Low ratios with more than 20 admissions were recorded in Guyra (with a ratio of 31\*\*), Uralla (31\*\*), Armidale (33\*\*), Tumut (35\*\*) and Inverell [Part A] (35\*\*).

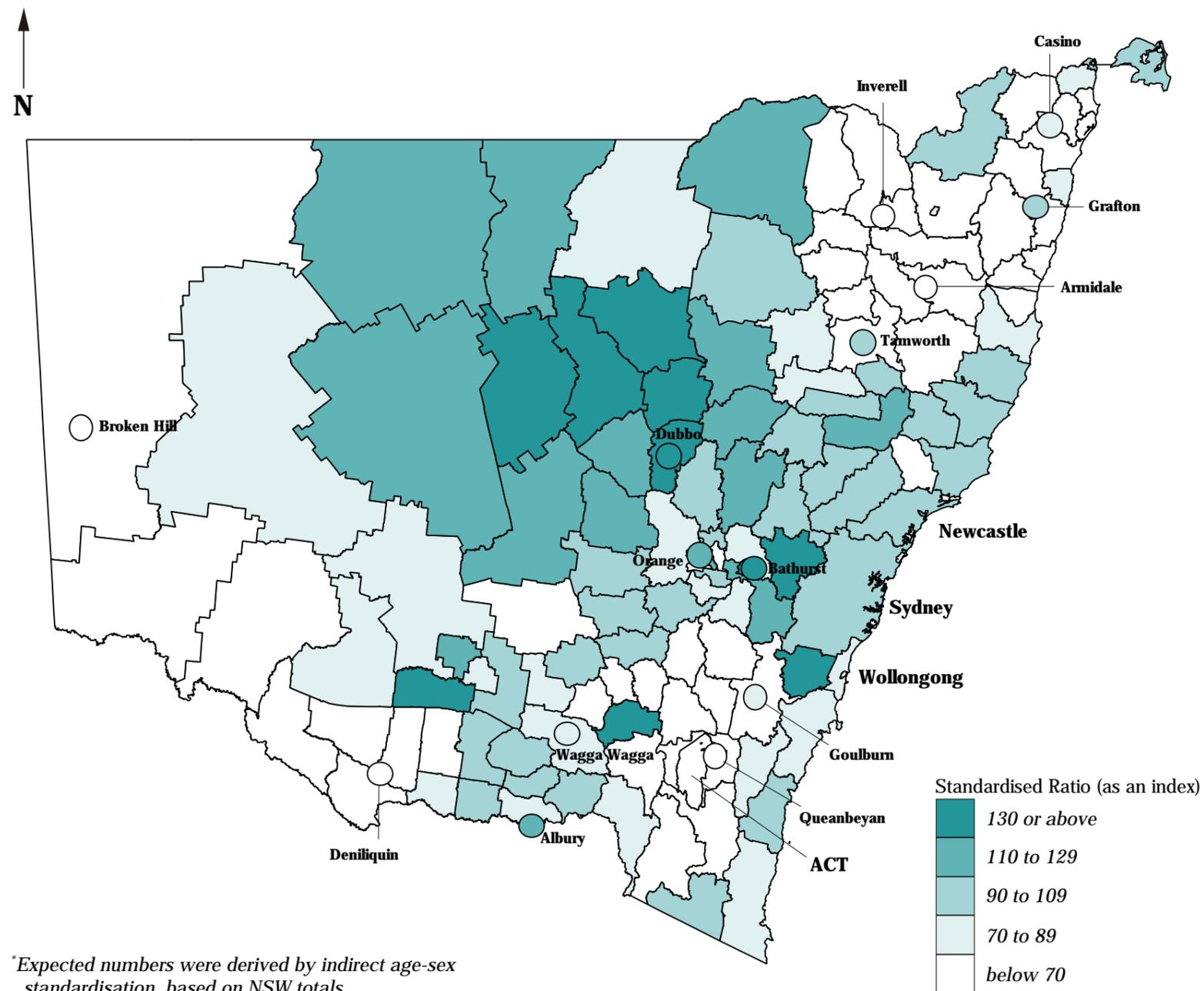
The largest numbers of admissions for endoscopies in the non-metropolitan areas of New South Wales were recorded in Shoalhaven (1,709 admissions), Hastings (1,604), Wingecarribee (1,252), Greater Taree (1,162), Albury (1,124), Dubbo (1,052) and Tweed Heads (1,014).

There were weak correlations at the SLA level with most of the indicators of socioeconomic disadvantage, and weak inverse correlations with the indicators of high socioeconomic status.

### Map 6.54

## Admissions for an endoscopy, New South Wales, 1995/96

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

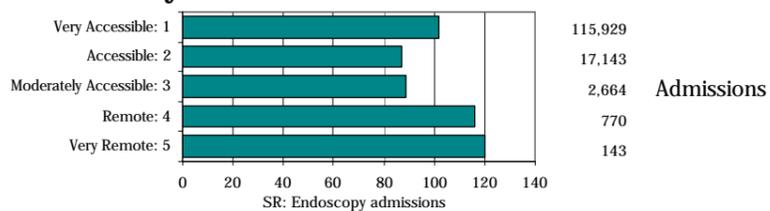


\*Expected numbers were derived by indirect age-sex standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



There were three distinct groupings of standardised admission ratios for admissions involving an endoscopy. The lowest SARs, of 87 and 89, were recorded for residents of the Accessible and Moderately Accessible categories, respectively. While areas in the Very Accessible category had an SAR of 102, elevated ratios, of 120 and 116, were recorded in the Very Remote and Remote categories.

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

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# General medical practitioner services

## Introduction

General medical practitioners (GPs) comprise the largest group of health professionals providing primary health care services. They are frequently the first point of contact with the health care system, for the 80 per cent of the population who visit them each year. As such, they are an essential part of the health care system.

## Background

In 1996/97, the Health Insurance Commission (which operates the national health insurance plan, Medicare) processed accounts for 36.9 million unreferral attendances (called services in this atlas)<sup>6</sup> by GPs in New South Wales, an average of 5.9 services for each person enrolled with Medicare. Total Medicare payments to GPs for these services were \$843 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).

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

<sup>6</sup>At each consultation, a GP may provide one or more service. One of these services will be the consultation itself: additional services, such as a minor surgical procedure or immunisation, may also be provided, and are recorded separately in Medicare statistics. It is estimated that there are, on average, 1.1 services per consultation.

been provided by a GP. A study in South Australia in 1993/94 found that up to one third of such attendances were of this kind. This represents the equivalent of approximately 1.3 per cent of GP attendances recorded in the Medicare statistics collection for that year. These attendances are again likely to be predominantly of people of lower socioeconomic status.

Similarly, the exclusion of data for attendances at some community health centres is also unlikely to change the spatial patterns of distribution evident in the maps. Not only do these centres account for a relatively small number of attendances, their clients are also predominantly of lower socioeconomic status.

The impact on the data of services provided by Aboriginal Medical Services is of particular relevance in rural and remote areas. Details of the number of services provided through Aboriginal Medical Services by GPs, Aboriginal workers, etc. are not currently available. The Office of Aboriginal and Torres Strait Islander Health is currently undertaking a collection of this information which may, in time, fill an important gap in the available data.

### Missing data

In the dataset provided for the atlas, there were 103,695 records (0.1 per cent of all records for Australia) for which the postcode was not able to be allocated to an SLA using the postcode to SLA converter from the ABS (see Chapter 2 for details of this conversion process). The postcode associated with these records was either not valid (four fifths) or was not on the postcode to SLA conversion list (one fifth). This latter group includes postcodes for businesses and post office boxes, as well as valid residential postcodes that do not appear in the ABS conversion table (eg. where there are two postcodes in a Collection District (CD), the whole CD is allocated to just one postcode and this is shown in the conversion table; the other postcode does not appear).

### Other gaps and deficiencies

The data presented here are only of services provided by general practitioners and not by specialist medical practitioners. The spatial patterns of distribution of services of specialist medical practitioners would be of value in informing strategic policy and planning activities. They cannot, however, be mapped as details of the large number of such services provided through public hospitals outpatient departments (and the lesser number through public hospital accident and emergency departments) are not available by SLA. Details of such services provided outside of public hospitals by specialist medical practitioners (and billed through Medicare) are available, but to map just this set of the whole would provide a biased view of the distribution at the small area level.

**Table 6.62: 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				
<b>Queensland</b>												
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	-	-
<b>Total</b>	<b>53</b>	<b>11,887</b>	<b>19,504</b>	-	-	-	<b>854</b>	<b>3,537</b>	<b>1,196</b>	<b>37,031</b>	<b>11</b>	<b>24</b>
<b>New South Wales</b>												
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	-	-
<b>Total</b>	<b>5</b>	<b>6,741</b>	<b>32,586</b>	<b>5,782</b>	-	<b>506</b>	<b>339</b>	<b>646</b>	<b>917</b>	<b>47,522</b>	<b>5</b>	<b>10</b>
<b>Central Section</b>												
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	-	-
<b>Total</b>	<b>72</b>	<b>8,890</b>	<b>7,234</b>	<b>9,361</b>	<b>3,683</b>	<b>648</b>	<b>2,712</b>	<b>3,523</b>	<b>800</b>	<b>36,923</b>	<b>6</b>	<b>25</b>
<b>Western Operations</b>												
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	-	-
<b>Total</b>	<b>261</b>	<b>11,830</b>	<b>17,029</b>	<b>8,667</b>	<b>3,310</b>	-	<b>948</b>	<b>4,145</b>	<b>1,258</b>	<b>47,448</b>	<b>10</b>	<b>25</b>
<b>Tasmania Section</b>												
Launceston	-	-	-	118	-	-	180	262	-	560	-	-
<b>All Sections</b>	<b>391</b>	<b>39,348</b>	<b>76,353</b>	<b>23,928</b>	<b>6,993</b>	<b>1,154</b>	<b>5,033</b>	<b>12,113</b>	<b>4,171</b>	<b>169,484</b>	<b>32<sup>2</sup></b>	<b>84<sup>2</sup></b>

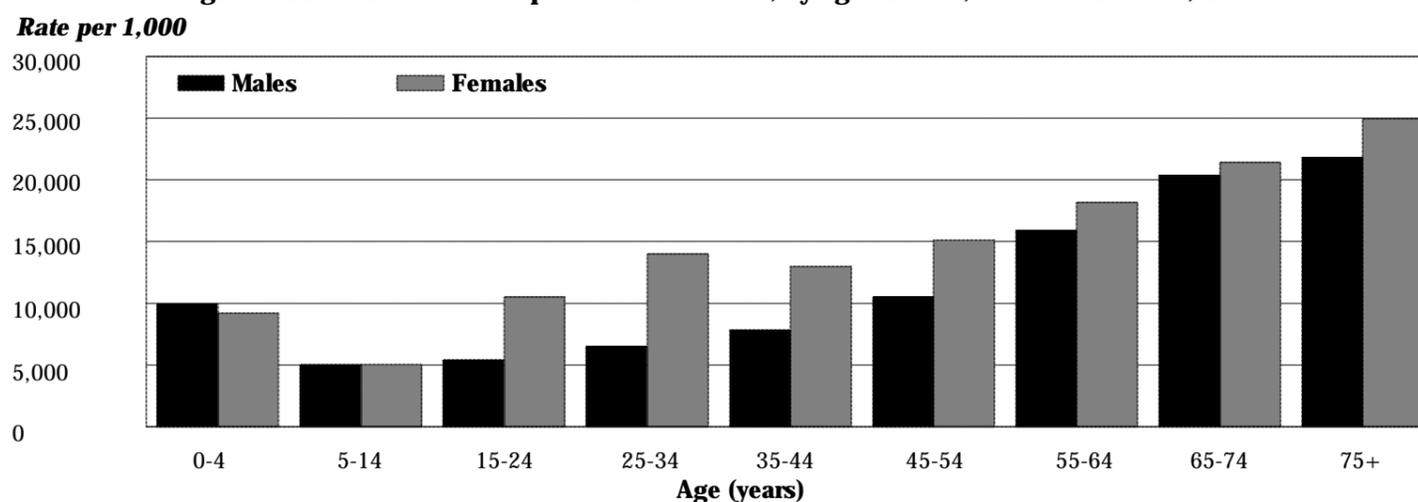
Source: Annual Report 1996 Royal Flying Doctor Service of Australia.

### GP services by age and sex of patient

Females used GP services more than males, accounting for 57.8 per cent of services in New South Wales 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, New South Wales, 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 <sup>1</sup>	All capitals
<b>1996</b>	<b>125**</b>	<b>113**</b>	<b>106**</b>	<b>107**</b>	<b>101**</b>	<b>90**</b>	<b>80**</b>	<b>87**</b>	<b>113**</b>
<b>1989</b>	<b>124**</b>	<b>99**</b>	<b>111**</b>	<b>106**</b>	<b>91**</b>	<b>101**</b>	<b>84**</b>	<b>86**</b>	<b>108**</b>

<sup>1</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

## Sydney (New South Wales as the Standard)

Male residents of **Sydney** received 11,011,686 services from GPs in 1996. This is 15 per cent more than expected from the State rates (a standardised ratio of 115\*\*). The age distribution of males receiving these services is shown in **Figure 6.11** on page 310.

As can be seen from **Map 6.55**, areas with the highest ratios were distributed throughout the inner city and central western regions, while those with the lowest were located north of the city centre.

Male residents of Fairfield recorded the highest ratio for this variable, with 53 per cent more GP services than were expected from the State rates (an SR of 153\*\*). Highly elevated ratios were also recorded in the central western SLAs of Auburn (151\*\*), Holroyd (140\*\*), Bankstown (138\*\*), Blacktown (131\*\*), Campbelltown (130\*\*), Liverpool (129\*\*), Penrith (126\*\*) and Parramatta (123\*\*); and in the inner city SLAs of Canterbury (142\*\*), Marrickville (134\*\*), Botany (130\*\*), Rockdale (127\*\*), Ashfield (124\*\*), Burwood (122\*\*) and South Sydney (120\*\*).

The majority of SLAs mapped in the middle range were distributed in the outer northern and south-western areas. Those located in the north included Warringah (102\*\*), Ryde (101\*\*), Wyong (101\*\*), Baulkham Hills (100), Gosford (99\*\*), Hornsby (97\*\*), Pittwater (95\*\*), Willoughby (95\*\*) and Manly (93\*\*).

Only one SLA had a ratio in the lowest range mapped: the lowest ratio, of 69\*\*, was recorded for residents of Hunter's Hill, indicating that there were 31 per cent fewer services from GPs than the level expected from the State rates. Mapped in the second lowest range were the SLAs of Hawkesbury (82\*\*), North Sydney (83\*\*), Mosman (86\*\*), Ku-ring-gai (86\*\*) and Lane Cove (89\*\*).

More than 500,000 services from GPs were recorded for male residents of Blacktown (761,344 services), Fairfield (704,579 services), Bankstown (571,201 services), Penrith (507,127 services) and Sutherland Shire (505,786 services).

Correlations of substantial significance were recorded with the variables for unemployed people (0.80) and unskilled and semi-skilled workers (0.78), while there were inverse correlations with high income families (-0.73) and managers and administrators and professionals (-0.72). Correlations of meaningful significance were also recorded with a number of other variables. These results, together with the inverse correlation with the IRSD (-0.82), indicate the existence of an association at the SLA level between high rates of GP services to males and socioeconomic disadvantage.

## Newcastle

Male residents of **Newcastle** had the lowest SR among the major urban centres, with 14 per cent fewer GP services than expected from the State rates (an SR of 86\*\*). There were 1,010,035 services overall. All five SLAs recorded ratios below the level expected, ranging from 72\*\* in Cessnock to 89\*\* in both Lake Macquarie and the City of Newcastle.

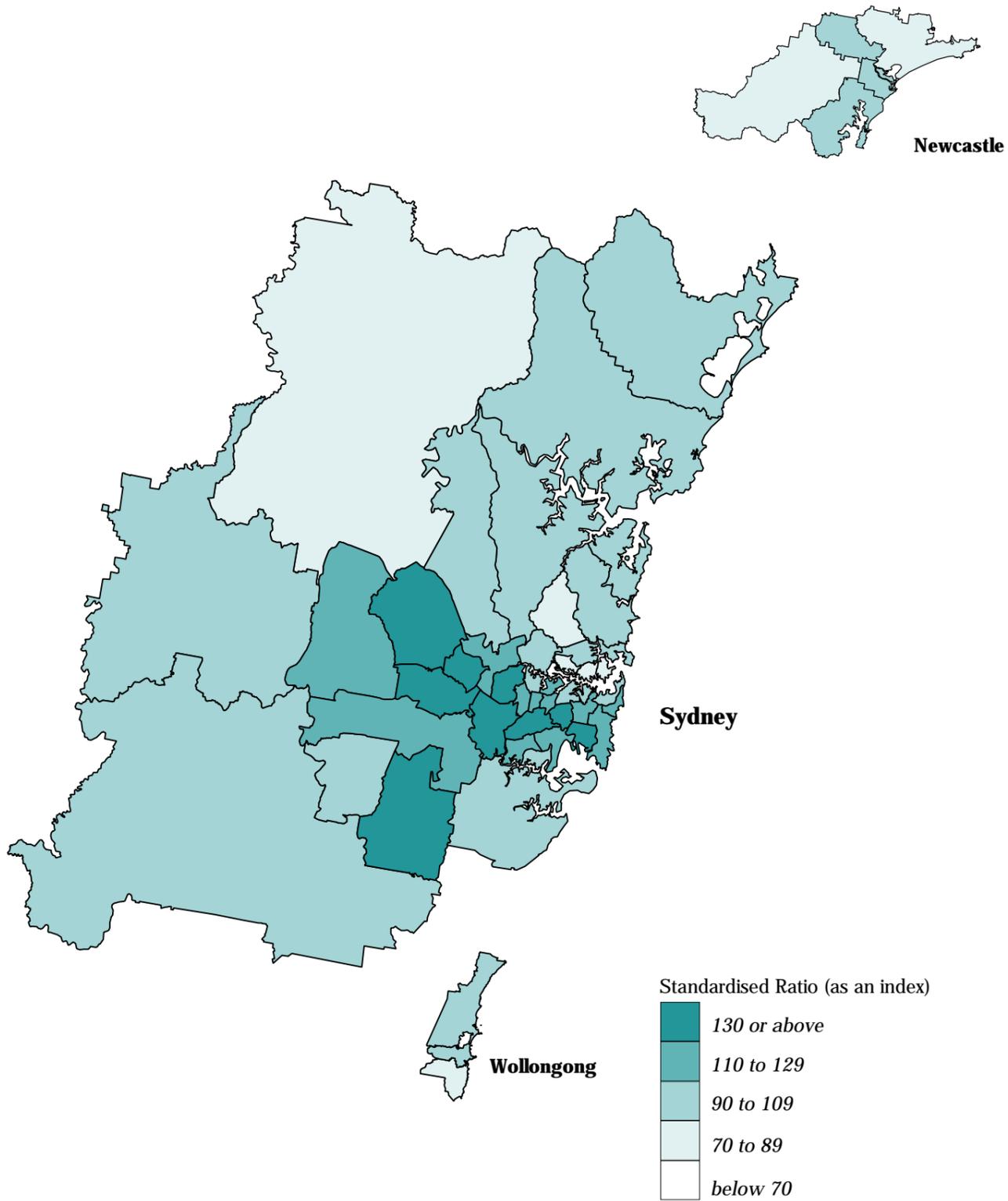
## Wollongong

There were 674,742 services from GPs in **Wollongong** in 1996, 4 per cent more than were expected from the State rates (an SR of 104\*\*). The City of Wollongong had the highest ratio (108\*\*), followed by Shellharbour (103\*\*) and Kiama (73\*\*).

### Map 6.55

## General medical practitioner services to males, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# General medical practitioner services to males, 1996

## State/Territory comparison (Australia as the Standard)

Standardised ratios (SRs) for GP services to males were lower in the non-metropolitan areas than in the capital cities, some substantially so. SRs ranged from a high of 83\*\* in Tasmania (the State with the smallest differential between the capital city and *Rest of State* rate) to a very low 31\*\* in the rural and remote areas of the Northern Territory. Readers should be aware of the notes on page 309, 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
<b>1996</b>									
Capital city	125**	113**	106**	107**	101**	90**	80**	87**	113**
Other major urban centres <sup>1</sup>	99**	90**	97**	..	..	..	..	..	97**
Rest of State/Territory	74**	76**	79**	79**	61**	83**	31**	- <sup>2</sup>	74**
Whole of State/Territory	108**	103**	93**	99**	90**	86**	53**	88**	100
<b>1989</b>									
Rest of State/Territory	87**	76**	85**	80**	63**	95**	44**	- <sup>2</sup>	81**

<sup>1</sup>Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

<sup>2</sup>Data 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 (New South Wales as the Standard)

Male residents living in the non-metropolitan areas of New South Wales had significantly fewer services from GPs in 1996 than expected from the State rates, an SR of 68\*\*; 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). Overall there were 2,983,757 GP services to males.

With the exception of Murrumbidgee (with an SR of 113\*\*), all SLAs had standardised ratios below the level expected (**Map 6.56**). The highest of these were recorded in the central western SLAs of Rylstone (95\*\*), Greater Lithgow (86\*\*), Weddin (85\*\*) and Cootamundra (88\*\*); in the northern areas of Glenn Innes (94\*\*), Bingara (90\*\*), Tweed Heads (87\*\*), Severn (87\*\*) and Richmond River (86\*\*); and in the north-western SLA of Brewarrina (93\*\*).

At the other end of the scale, 74 per cent fewer GP services than expected were recorded for residents of Snowy River (12,319 GP services) and Central Darling (2,151), both with an SR of 26\*\*. Relatively low ratios were also recorded in Oberon (an SR of 38\*\* and 4,836 GP services), Cooma-Monaro (41\*\* and 10,768), Copmanhurst (42\*\* and 4,571), Gunning (44\*\* and 2,653),

Wakool (45\*\* and 6,444), Narrandera (45\*\* and 8,995), Urana (48\*\* and 2,116), Holbrook (48\*\* and 3,409) and Hay (48\*\* and 4,975). See Chapter 7 for details of the levels of provisions of GP services in these areas.

There were 45 SLAs mapped in the second lowest class interval, with ratios ranging from 70\*\* in Wellington, Orange, Nambucca and Bombala to 84\*\* in Narrabri.

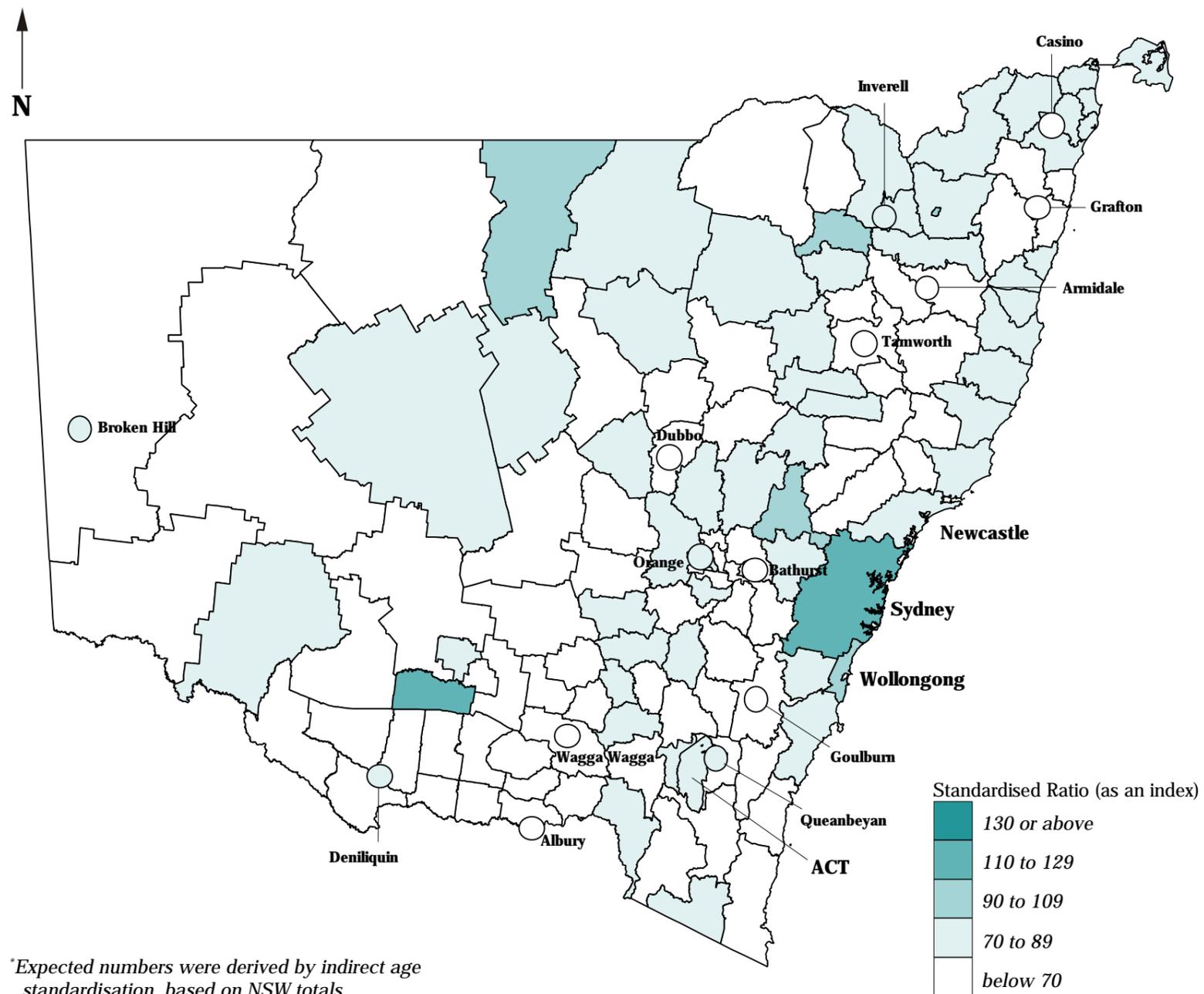
Of the towns mapped, the lowest standardised ratios were in Wagga Wagga (with an SR of 49\*\*) and Tamworth (57\*\*); and the highest were in Inverell [Part B] (with a ratio of 78\*\*) and Queanbeyan (74\*\*).

In 1996, more than 100,000 GP services were recorded for residents of Shoalhaven (166,403 services), Hastings (133,919 services), Coffs Harbour (124,000 services) and Tweed Heads (103,148 services).

### Map 6.56

## General medical practitioner services to males, New South Wales, 1996

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

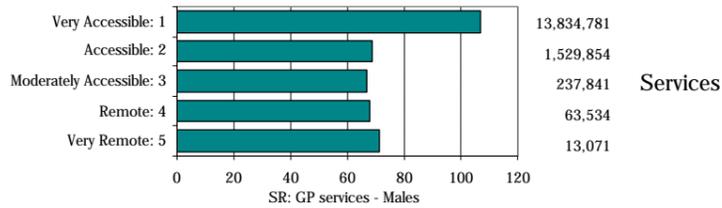


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Males in areas included in the Accessible category had the highest rate of use of general medical practitioner (GP) services, using 7 per cent more GP services than expected from the State rates (an SR of 107). Ratios in the other categories were all around 70 per cent of the level expected from the State rates.

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 <sup>1</sup>	All capitals
<b>1996</b>	<b>117**</b>	<b>110**</b>	<b>107**</b>	<b>105**</b>	<b>102**</b>	<b>96**</b>	<b>81**</b>	<b>88**</b>	<b>110**</b>
<b>1989</b>	<b>120**</b>	<b>99**</b>	<b>110**</b>	<b>103**</b>	<b>92**</b>	<b>102**</b>	<b>88**</b>	<b>89**</b>	<b>107**</b>

<sup>1</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

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

As noted in the introductory text, females use more general medical practitioner (GP) services than males, 6.6 services per female and 4.7 services 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 310.

## Sydney (New South Wales as the Standard)

Female residents of **Sydney** received 14,884,097 services from GPs in 1996, 12 per cent more than expected from the State rates (an SR of 112\*\*).

The distribution of SRs for GP services to females across SLAs in **Sydney** (**Map 6.57**) was very similar to that recorded for males, with the highest ratios located in the central western and inner regions and the lowest to the north of the city.

Ratios elevated by at least 20 per cent were recorded in the central western SLAs of Fairfield (with an SR of 143\*\*), Auburn (138\*\*), Holroyd (132\*\*), Campbelltown (131\*\*), Bankstown (130\*\*), Blacktown (129\*\*), Liverpool (128\*\*) and Penrith (127\*\*); and in the inner city areas of Canterbury (132\*\*), Botany (123\*\*) and Marrickville (120\*\*).

More than half of the SLAs (53.3 per cent) recorded ratios in the middle range mapped. Within this class interval, ratios ranged from 90\*\* in Woollahra, Mosman and Blue Mountains to 108\*\* in both Strathfield and Waverley.

Hunter's Hill, located just north of the Parramatta River, recorded the lowest ratio for this variable, with 19 per cent fewer services from GPs than expected from the State rates (an SR of 81\*\*). Kuring-gai (85\*\*), North Sydney (86\*\*) and Hawkesbury (87\*\*) were remaining SLAs mapped in the second lowest range. As for males, none of the SRs was very low.

The largest number of GP services was recorded for female residents of Blacktown (1,005,884 services), followed by Fairfield (872,630 services), Bankstown (743,451 services), Sutherland Shire (690,867 services) and Penrith (687,888 services).

GP services to females were strongly correlated at the SLA level with the variables for unskilled and semi-skilled workers (0.85) and unemployed people (0.80) and inversely with the variables for high income families (-0.73) and managers and administrators, and professionals (-0.72). Correlations of meaningful significance were also recorded with a number of other variables. These results, together with the inverse correlation with the IRSD (-0.84), indicate the existence of an association at the SLA level between high rates of GP services to females and socioeconomic disadvantage.

## Newcastle

Services from GPs in **Newcastle** (1,457,179 admissions) were 11 per cent lower than expected from the State rates, an SR of 89\*\*. Although still lower than expected, the highest ratios were recorded in Lake Macquarie (94\*\*), Maitland (91\*\*) and in the City of Newcastle (90\*\*). At the other end of the scale the lowest ratios were recorded in Cessnock (76\*\*) and Port Stephens (82\*\*).

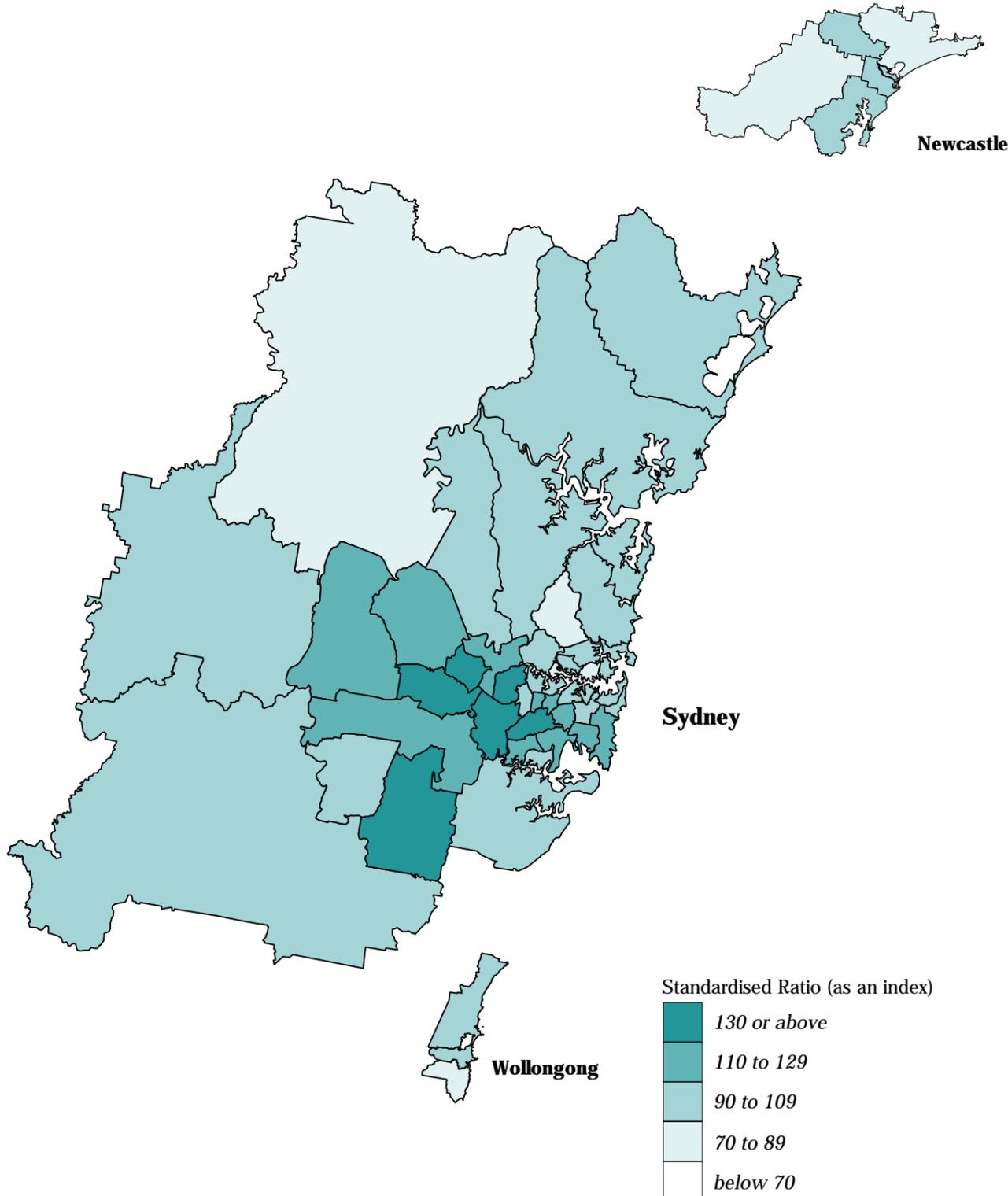
## Wollongong

There were 881,922 GP services in **Wollongong** in 1995/96, slightly more than expected from the State rates (an SR of 101\*\*). The City of Wollongong (104\*\*) and the SLA of Shellharbour (100\*) recorded ratios of near, or at, the level expected, while Kiama recorded a relatively low ratio, of 74\*\*.

**Map 6.57**

**General medical practitioner services to females, Sydney, Newcastle and Wollongong, 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 NSW totals

Source: See Data sources, Appendix 1.3

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

# General medical practitioner services to females, 1996

## State/Territory comparison (Australia as the Standard)

As for males, standardised ratios (SRs) for GP services for females were lower in the *Rest of State/Territory* areas than in the capital cities for all the States and the Northern Territory. SRs were, however, generally higher than those for males. Again, SRs ranged from the highest in Tasmania (89\*\*) to the lowest in the Northern Territory (33\*\*). The data limitations for these rural and remote areas should be borne in mind when using this data (see page 309). 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
<b>1996</b>									
Capital city	117**	110**	107**	105**	102**	96**	81**	88**	110**
Other major urban centres <sup>1</sup>	98**	92**	97**	..	..	..	..	..	97**
Rest of State/Territory	78**	81**	82**	82**	70**	89**	33**	- <sup>2</sup>	79**
Whole of State/Territory	105**	102**	95**	99**	94**	93**	55**	89**	100
<b>1989</b>									
Rest of State/Territory	88**	79**	100	81**	70**	95**	46**	- <sup>2</sup>	87**

<sup>1</sup>Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)

<sup>2</sup>Data 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 (New South Wales as the Standard)

As for male residents living outside of the major urban centres, females used significantly fewer GP services (4,248,820 GP services) in 1996 than were expected from the State rates, an SR of 74\*\*. These low rates of use are in line with the lower levels of access to GPs of residents of the non-metropolitan areas (see Chapter 7 for details of the distribution of GPs).

The majority of SLAs had ratios below the level expected (**Map 6.58**), the exceptions being in Murrumbidgee (with an SR of 127\*\*), Severn (114\*\*), Rylstone (109\*\*), Jervis Bay Territory (108\*\*), Brewarrina (105\*\*) and Glen Innes (103\*\*). The next highest ratios that were close to the level expected were recorded in Lord Howe Island (99), Weddin (98\*\*), Windouran (98), Richmond River (96\*\*), Walgett (96\*\*), Unincorporated Far West (96\*\*), Bingara (93\*\*), Greater Lithgow (91\*\*), Narramine (91\*\*) and Narrabri (90\*\*).

Of the towns mapped, the highest ratios were in Queanbeyan (with an SR of 81\*\*), Inverell [Part B] (79\*\*), Deniliquin (78\*\*), Broken Hill (75\*\*) and Orange (75\*\*).

Just over half (53.8 per cent) of the SLAs in the non-metropolitan areas of New South Wales recorded ratios of between 70 and 89. Within this class interval ratios ranged from 70\*\* in both Mulwaree and Bathurst to 89\*\* in Cootamundra and Cobar.

The lowest ratio was recorded in the SLA of Central Darling, with 69 per cent fewer services than were expected from the State rates (an SR of 31\*\*). Relatively low ratios were also recorded in the south-eastern SLAs of Snowy River (35\*\*), Cooma-Monaro (46\*\*), Gunning (49\*\*) and Holbrook (59\*\*); in the northern areas of Copmanhurst (50\*\*), Maclean (59\*\*), Armidale (59\*\*) and Tamworth (60\*\*); in the southern SLAs of Narrandera (51\*\*), Hay (52\*\*), Urana (53\*\*), Wakool (55\*\*), Wagga Wagga (56\*\*) and

Jerilderie (60\*\*); and in Oberon (47\*\*), Forbes (54\*\*), Cowra (59\*\*) and Dungog (59\*\*). See Chapter 7 for details of the levels of provisions of GP services in these areas.

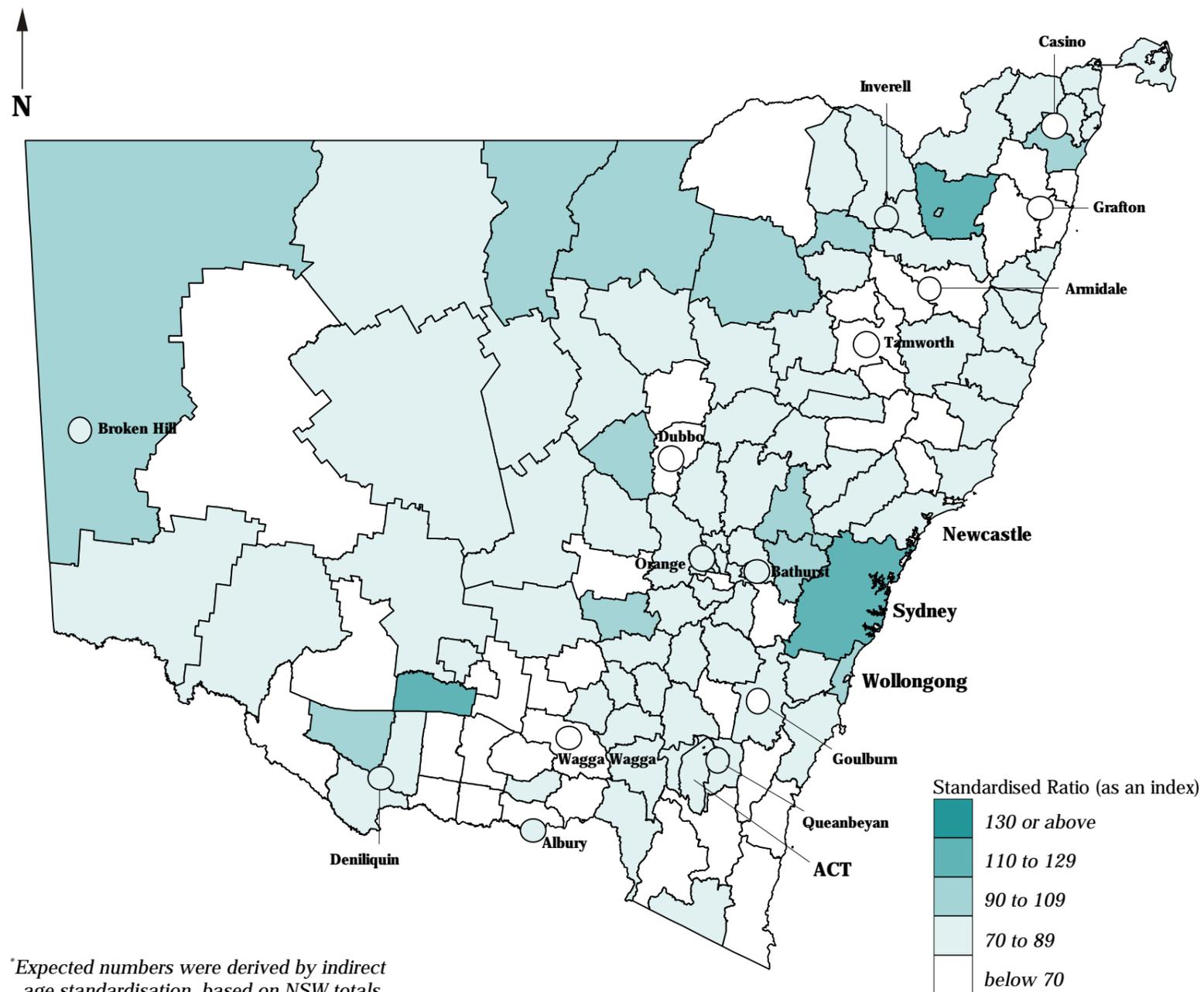
The largest numbers of GP services were recorded for residents of Shoalhaven (235,179 services), Hastings (193,438 services), Coffs Harbour (168,629 services), Tweed Heads (145,419 services), Greater Taree (125,666 services), Lismore (116,945 services), Ballina (112,819 services), Wagga Wagga (107,700 services), Albury (107,180 services) and Wingecarribee (100,003 services).

There were weak correlations at the SLA level with the indicators of socioeconomic disadvantage, and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the inverse correlation with the IRSD (-0.26), suggest the existence of an association at the SLA level between high rates of GP services to females and socioeconomic disadvantage.

### Map 6.58

## General medical practitioner services to females, New South Wales, 1996

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

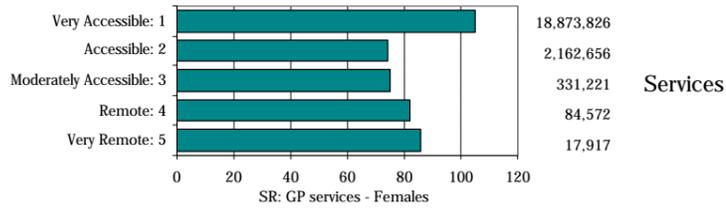


\*Expected numbers were derived by indirect age standardisation, based on NSW totals

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 5 per cent more GP services than expected from the State rates (an SR of 105). Ratios in the Accessible and Moderately Accessible categories were 74 and 75, respectively, with slightly higher ratios in the Remote and Very Remote categories, SRs of 82 and 86, respectively.

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

# Immunisation status of children at 12 months of age, 1998

## Capital city comparison

Immunisation data are collected by the Health Insurance Commission which maintains the Australian Childhood Immunisation Register (ACIR). The ACIR, a project funded by the Commonwealth Government through the Commonwealth Department of Health and Aged Care, provides comprehensive information on the immunisation status of children under seven years of age in Australia. These data are used to provide a measure of coverage at a National, State/Territory and local level and to provide an effective management tool for monitoring immunisation coverage and service delivery. The register was commenced in 1996 and by mid 1998 had sufficient coverage of the immunisation status of children at twelve months of age to be used for this analysis. Hull et al. (1999) reported that 80.1 per cent of vaccinations recorded in the ACIR for New South Wales were provided by GPs, 8.4 per cent by municipal councils and 11.5 per cent by other providers (eg. Government operated community health centres, Aboriginal health services and Royal Flying Doctor services).

The data shown here are the proportion of children born between 1 October 1996 and 30 September 1997 who were registered with Medicare and who were shown on the ACIR at 31 December 1998 as being fully immunised. Children who were fully immunised at 12 months of age were those who had been immunised for three doses of DTP (diphtheria, tetanus and pertussis), three doses of OPV (oral polio vaccine) and three doses of Hib (*Haemophilus influenzae* type b). The calculations shown in the tables and maps were made by the National Centre for Immunisation Research and Surveillance (NCIRS).

Immunisation rates for the capital cities were all close to the *All capitals* average of 82.5 per cent, ranging from 79.7 per cent in **Sydney** to 86.9 per cent in **Canberra**.

**Table 6.67: Proportion of children who were fully immunised at 12 months of age, capital cities, 1998**

Per cent								
Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra <sup>1</sup>	All capitals
79.7	84.0	85.4	84.5	81.2	84.0	80.0	86.9	82.5

<sup>1</sup>Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

## Sydney

In 1998, 79.7 per cent of **Sydney's** population aged 12 months was fully immunised, a total of 55,275 children.

Immunisation rates were highest in the outer northern and southern SLAs. The SLAs situated in the north included Wyong (86.9 per cent), Hawkesbury (85.8 per cent) and Gosford (83.6 per cent) and those located in the south were Wollondilly (85.1 per cent), Camden (83.9 per cent) and Campbelltown (82.4 per cent). Relatively high proportions were also recorded in the higher socioeconomic status areas of Warringah (82.7 per cent) and Lane Cove (82.5 per cent), located just north of Sydney Harbour.

The SLA of Sydney had the lowest proportion of fully immunised children in 1998, with 64.4 per cent of 12 month old children in this category. The remaining SLAs mapped in the lowest range were generally distributed in a band (see **Map 6.58**) extending along the Parramatta River and included Waverley (68.3 per cent), Woollahra (68.4 per cent), South Sydney (69.2 per cent), Botany (69.5 per cent), North Sydney (72.7 per cent), Mosman (72.8 per cent), Auburn (73.2 per cent), Strathfield (74.7 per cent) and Rockdale (75.8 per cent).

The largest numbers of fully immunised children were recorded in Blacktown (4,598 children), Fairfield (3,035 children), Penrith (2,811 children), Campbelltown (2,735 children), Sutherland Shire (2,662 children) and Bankstown (2,573 children).

Although the particular SLAs with high, and those with low, rates of immunisation suggest an association between immunisation rates and socioeconomic status, this is not reflected in the correlation analysis. As would be expected, the correlation analysis showed there to be a positive association at the SLA

level between high rates of immunisation and high proportions of young children (0.64). There was also an inverse correlation of meaningful significance with the variable for people born in non-English speaking countries and resident for less than five years (-0.60), and of lesser significance with those resident for more than five years (-0.32) and those reporting poor proficiency in English (-0.29): these results suggest that immunisation rates are lower among these groups.

## Newcastle

Infants in **Newcastle** had the highest rate of immunisation in the major urban centres, with a total of 6,143 children, 87.0 of the population at 12 months of age. Above average proportions were recorded in Maitland (90.4 per cent) and Lake Macquarie (89.2 per cent), while below average proportions were recorded in the City of Newcastle (86.8 per cent), Port Stephens (86.2 per cent) and Cessnock (76.0 per cent).

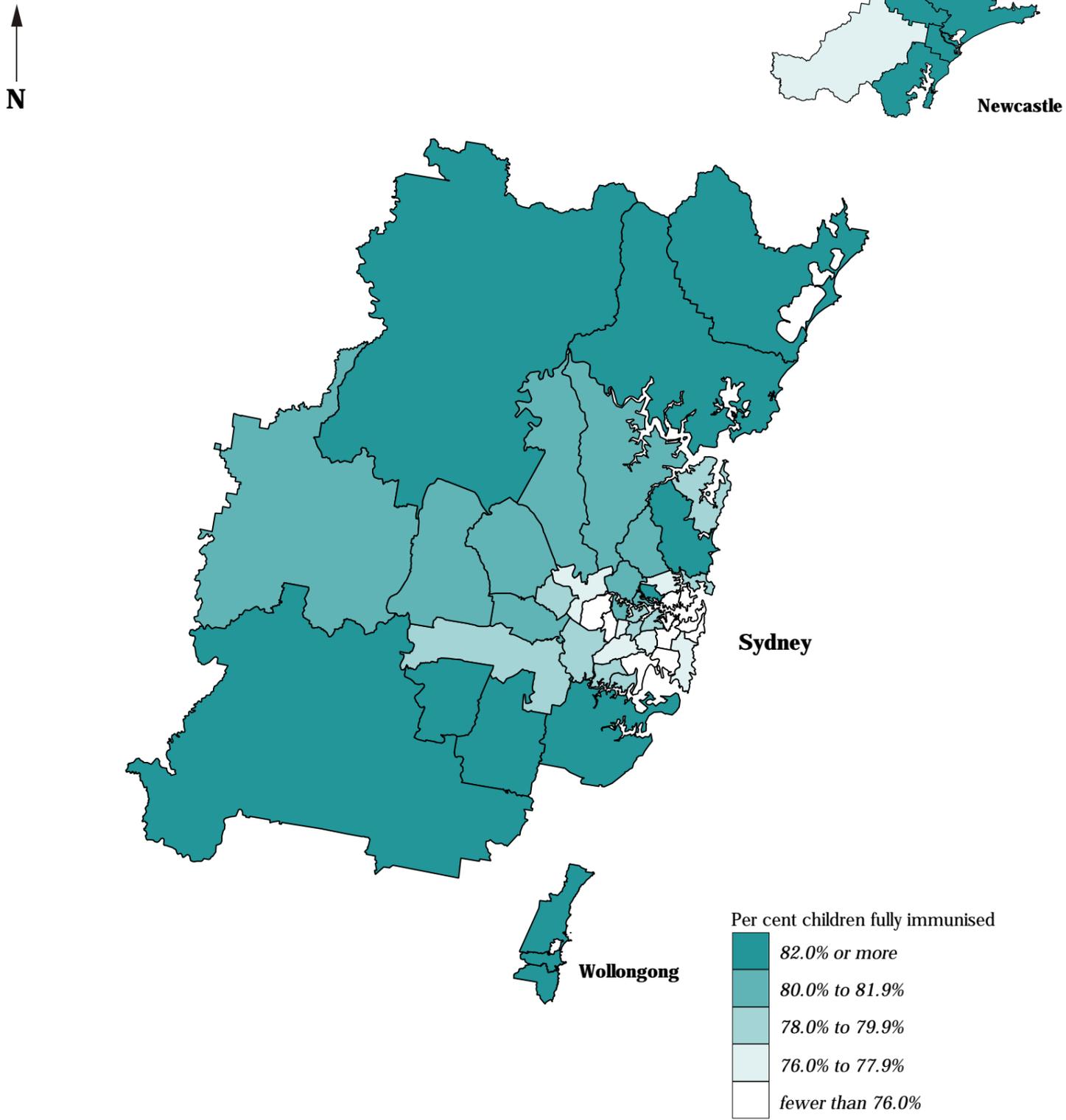
## Wollongong

In **Wollongong**, 84.3 per cent of children were fully immunised at 12 months of age, a total of 3,471 children. Proportions in the SLAs varied little from the **Wollongong** average, ranging from 83.8 per cent in Kiama to 84.6 in the City of Wollongong.

**Map 6.59**

**Immunisation status of children at 12 months of age, Sydney, Newcastle and Wollongong, 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**  
**National Social Health Atlas Project, 1999**

# Immunisation status of children at 12 months of age, 1998

## State/Territory comparison

Details of the information described below are on the previous text page. Immunisation rates were higher in the *Rest of State/Territory* areas than in the capital cities in a number of States, with the highest rates in Queensland and Victoria. As can be seen from the graph of the ARIA index (opposite page), these higher rates do not apply uniformly across the *Rest of State/Territory* areas. With the exception of the Northern Territory, immunisation rates for the non-metropolitan areas of Australia were all close to the *Rest of State/Territory* average of 83.6 per cent. The low rate reported for the Northern Territory reflects a number of factors, including difficulties in transmitting accurate data on levels of immunisation in the Territory: it is unclear whether the real rate is lower than in other parts of Australia.

**Table 6.68: Proportion of children who were fully immunised at 12 months of age, State/Territory, 1998**  
*Per cent*

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total <sup>1</sup>
Capital city	79.7	84.0	85.4	84.5	81.2	84.0	80.0	86.9 <sup>1</sup>	82.5
Other major urban centres <sup>2</sup>	86.0	86.9	84.2	..	..	..	..	..	85.4
Rest of State/Territory	81.8	86.0	86.1	83.6	80.6	84.5	62.8	— <sup>3</sup>	83.6
Whole of State/Territory	81.0	84.6	85.5	84.2	81.0	84.3	70.6	86.8	83.0

<sup>1</sup>Includes Queanbeyan (C)

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

<sup>3</sup>Data included with ACT total

Source: See *Data sources, Appendix 1.3*

## Rest of State

In 1998, 22,379 children living in the non-metropolitan areas of New South Wales were fully immunised at the age of 12 months, 81.8 per cent of the population.

As can be seen from the map (**Map 6.60**), there was no notable pattern in the distribution of SLAs with the highest rates of immunisation, whereas those with the lowest rates were generally located in the far north-west.

Residents of Balranald (94.9 per cent) had the highest proportion of children fully immunised at 12 months of age. Proportions of 90.0 per cent and above were also recorded in Gunning (94.7 per cent), Scone (94.1 per cent), Barraba (94.0 per cent), Bingara (93.4 per cent), Dungog (92.3 per cent), Tumbarumba (92.3 per cent), Manilla (92.0 per cent), Muswellbrook (91.7 per cent), Weddin (91.1 per cent), Wakool (90.6 per cent), Wellington (90.1 per cent), Young (90.1 per cent), Boorowa (90.0 per cent) and Narrabri (90.0 per cent).

There were 45 SLAs mapped in the middle range with proportions of between 80.0 and 85.0 per cent. The highest of these were recorded in Nundle, Tamworth and Mulwaree (each with a proportion of 84.8 per cent), followed by Goulburn and Wagga Wagga (both with 84.9 per cent). At the other end of the scale, 80.2 per cent of children were fully immunised in Tweed [Part B], Orange, Cabonne [Part B] and Mudgee.

SLAs with proportions of less than 75.0 per cent were generally located in the far north-west, in SLAs which included Central Darling (51.9 per cent), Bourke (58.4 per cent), Walgett (71.2 per cent), Unincorporated Far West (73.0 per cent), Cobar (73.9 per cent) and Broken Hill (74.5 per cent). Also mapped in the lowest range were the coastal areas of Lord Howe Island (57.1 per cent), Nambucca (66.4 per cent), Byron (68.9 per cent), Kempsey (72.7 per cent), Casino (73.6 per cent) and Bellingen (74.2 per cent); the south-western SLAs of Junee (62.9 per cent) and Urana (68.0 per cent); and the SLAs of Merriwa (67.6 per cent), Murrurundi (71.4 per cent), Quirindi (72.4 per cent), Blayney [Part A] (73.4 per cent) and Lachlan (73.5 per cent).

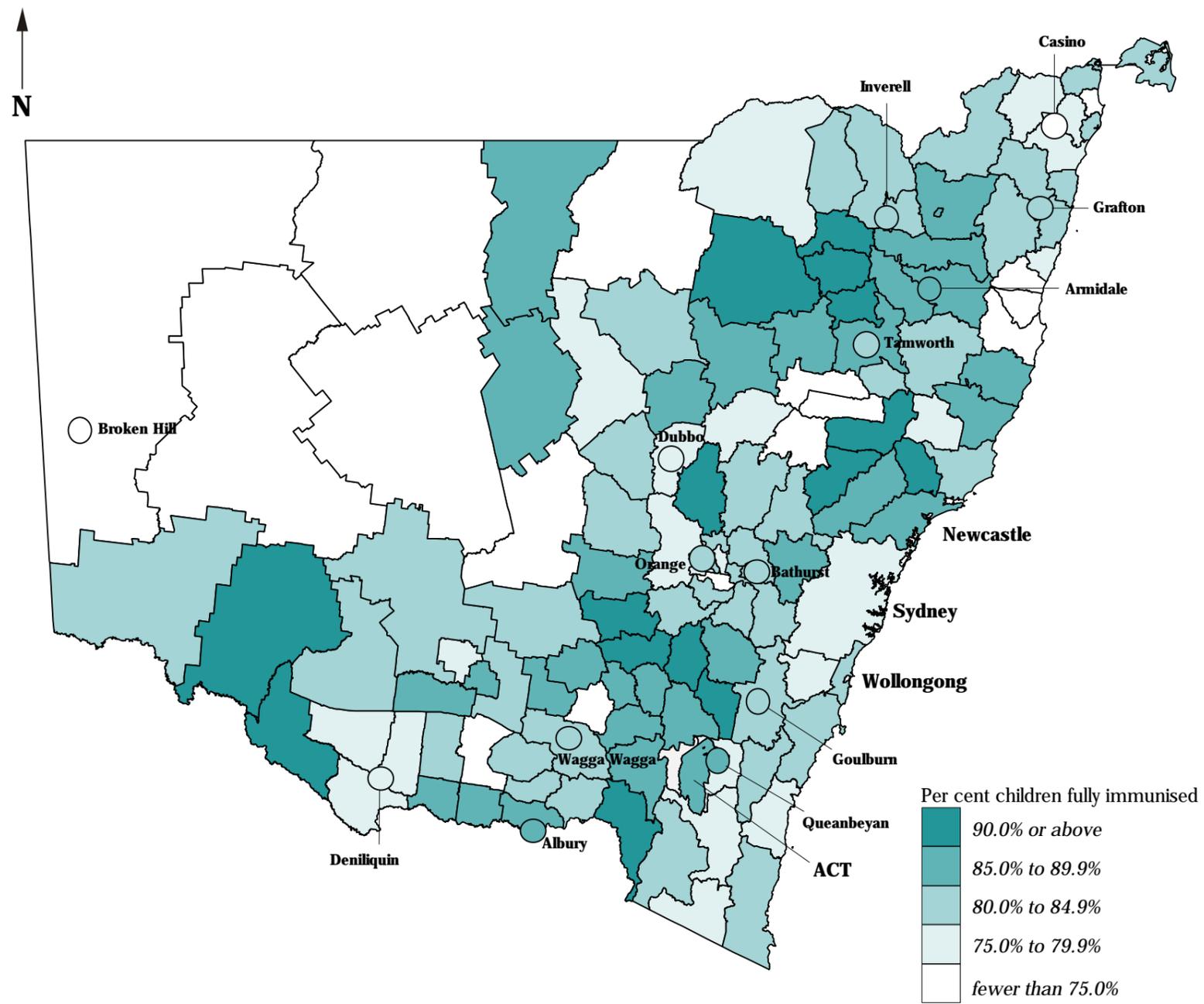
The largest numbers of fully immunised children in the non-metropolitan areas of New South Wales were in Shoalhaven, a total of 1,031 children. More than 600 fully immunised children were also recorded in Wagga Wagga (867 children), Coffs Harbour (848 children), Hastings (682 children), Albury (663 children) and Dubbo (637 children).

There was a weak inverse association evident in the correlation analysis at the SLA level with a number of the indicators of socioeconomic disadvantage (eg. single parent families, unemployment, Indigenous population), and a weak positive association with indicators of high socioeconomic status. These results, together with the correlation with the IRSD (0.24), suggest the existence of an association at the SLA level between low immunisation rates and socioeconomic disadvantage.

## Map 6.60

### Immunisation status of children at 12 months of age, New South Wales, 1998

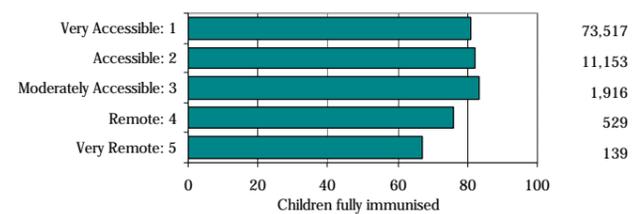
as a percentage of all children at 12 months of age in each Statistical Local Area



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Children fully immunised

Just over 80 per cent of 12 month old children in each of the three 'accessible' ARIA categories were fully immunised, with lower rates of 76.0 per cent in the Remote category and 67.1 per cent in the Very Remote category.

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

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