

## 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 183 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 191).

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).

<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 191).

# Admissions to hospitals

## Introduction

There were almost 4.8 million admissions (see the box below) to hospitals in Australia in 1995/96 (1.2 million admissions in Victoria), 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 191)

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

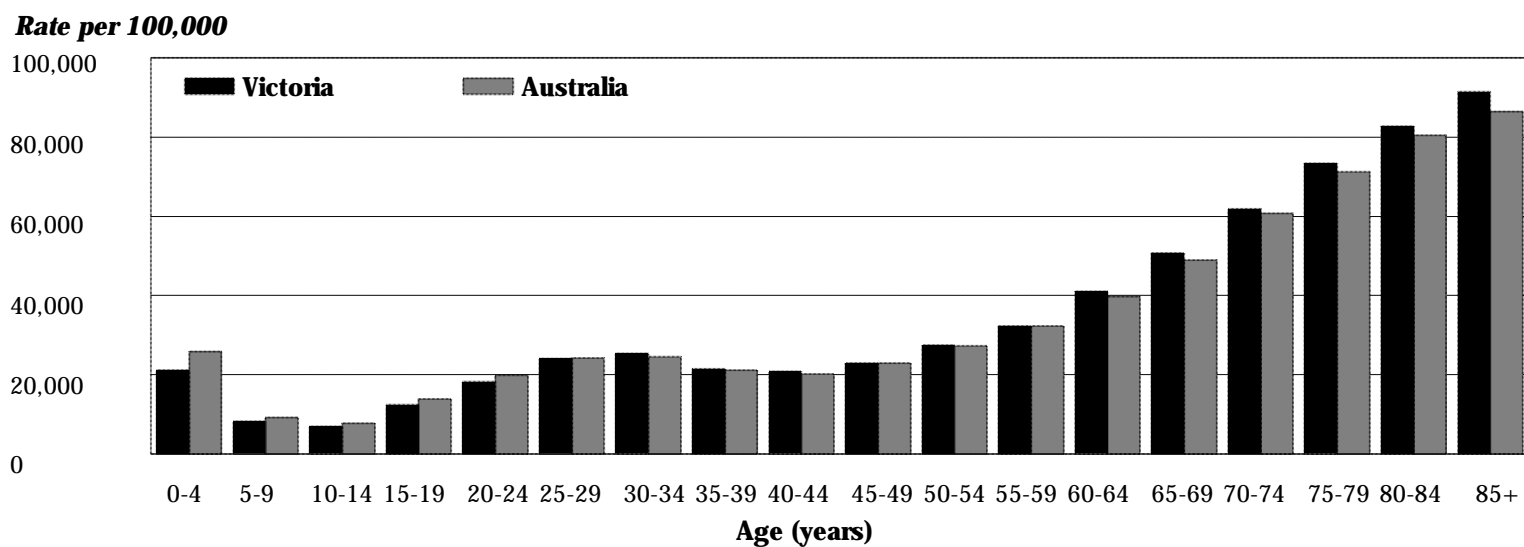
<sup>2</sup> Age-standardised hospital admission ratio is equal to hospital admissions identified as being of Indigenous people, divided by expected admissions, based on all-Australian rates

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

### Differences between Victoria and Australia

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

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



Source: See Data sources, Appendix 1.3

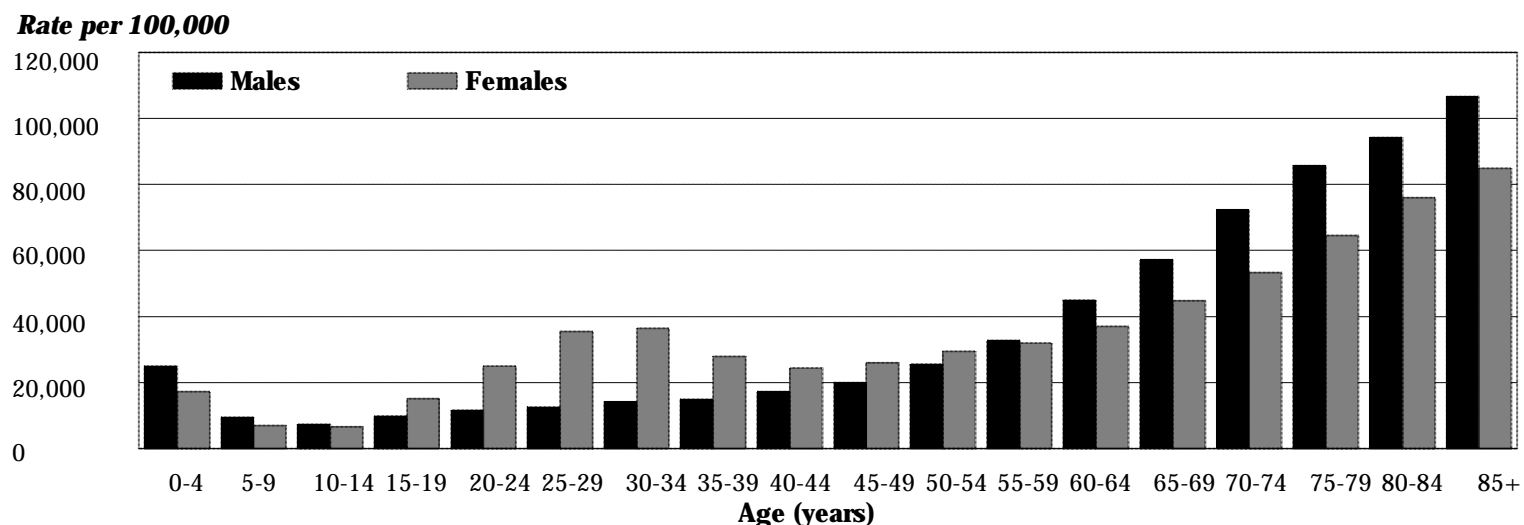
## Differences related to age, sex and hospital type

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 Victoria admitted to a hospital.

Females accounted for 56.1 per cent of admissions, 21.8 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 2.8 times that for males. Female rates in the 20 to 24 (2.2 times), 30 to 34 (2.6 times) and 35 to 39 (1.9 times) year age groups were still well above those for males. These higher rates largely reflect episodes of hospitalisation for childbirth and associated admissions. The rates for males were higher than for females among those aged 0 to 4 years (1.5 times as high), and from age 55 (the greatest disparity being the rate for 70 to 74 year old males, 1.4 times higher than the corresponding female rate).

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



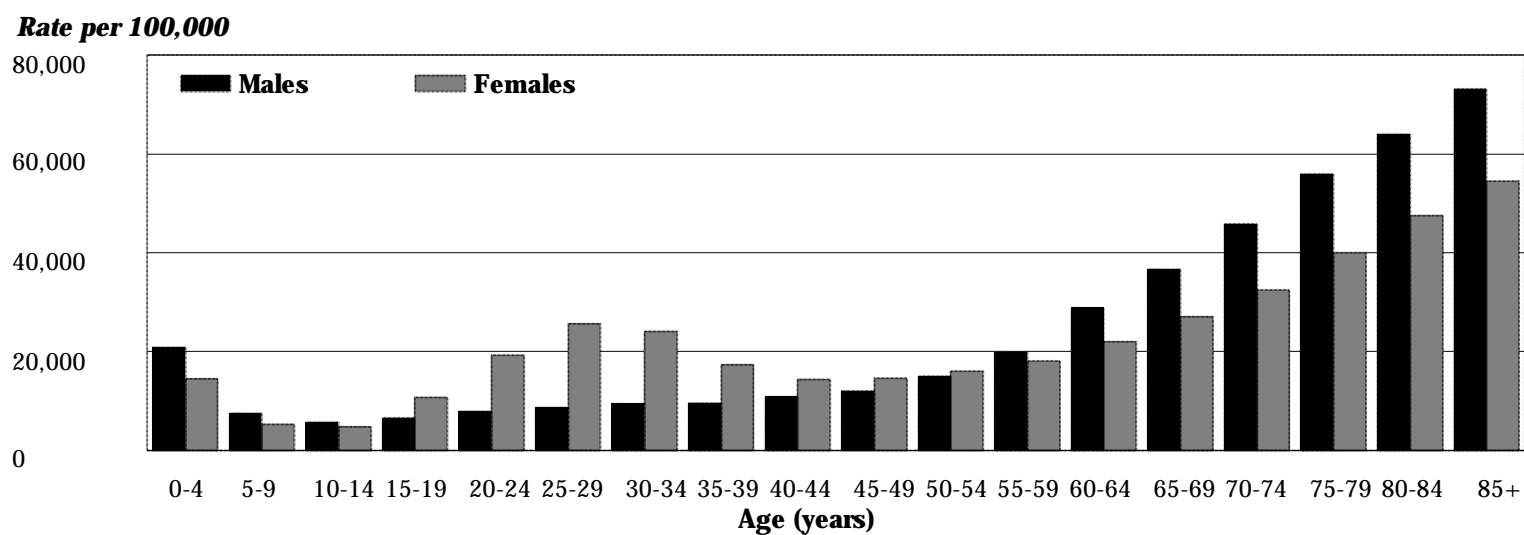
Source: See Data sources, Appendix 1.3

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 admission 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.

Overall, private hospitals accounted for 34.6 per cent of the admissions analysed for Victoria. Females make greater use of

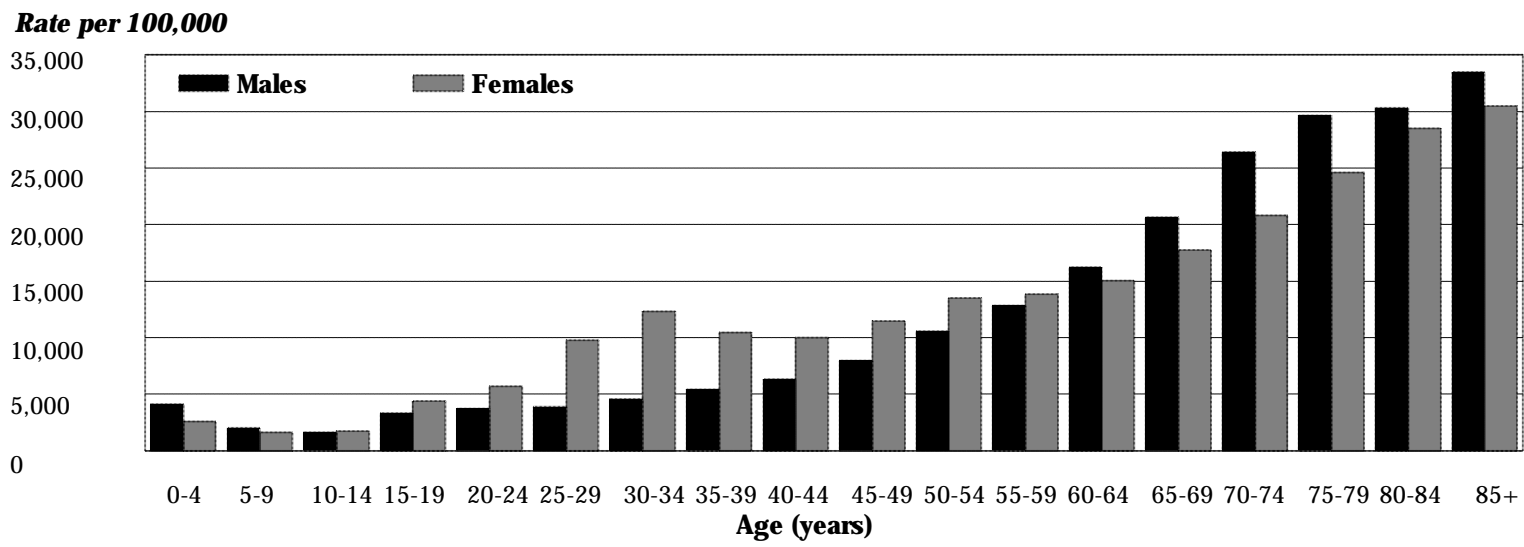
private hospitals than do males, with admissions to private hospitals representing 35.4 per cent of all female admissions studied (compared with 33.5 per cent for males) and accounting for 57.4 per cent of private hospital admissions (55.4 per cent in public acute hospitals). The pattern of admissions 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, Victoria, 1995/96



Source: See Data sources, Appendix 1.3

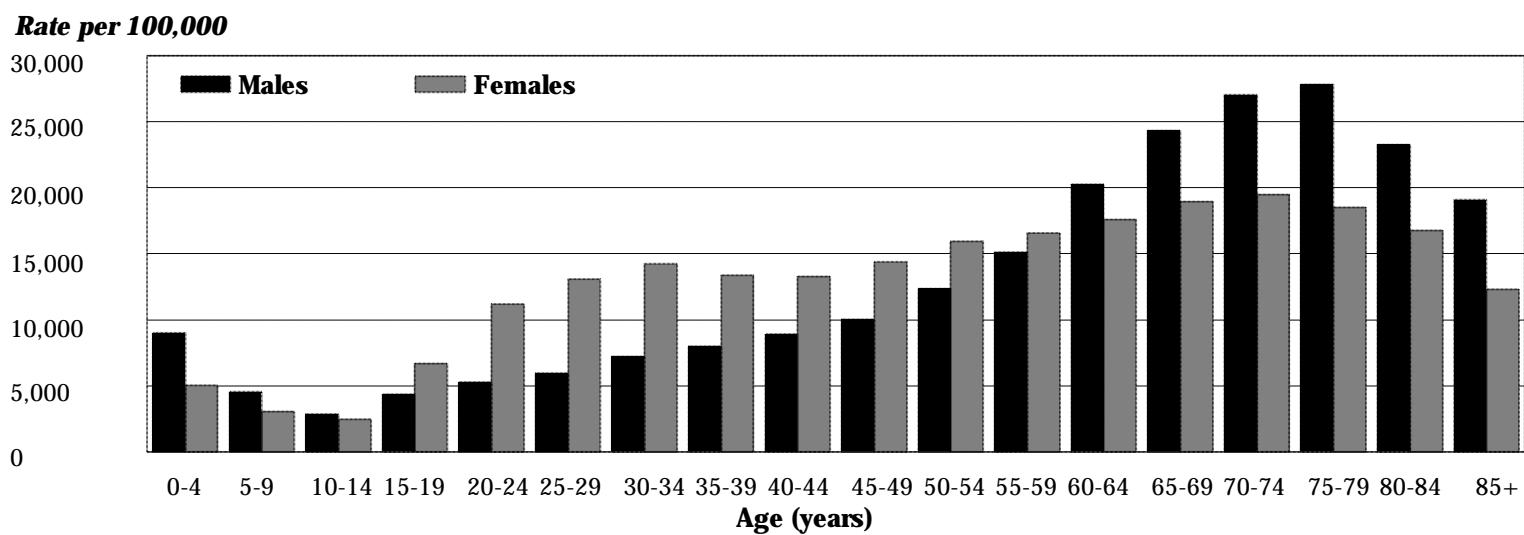
**Figure 6.4: Admissions to private hospitals, by age and sex, Victoria, 1995/96**



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 70 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, Victoria, 1995/96**

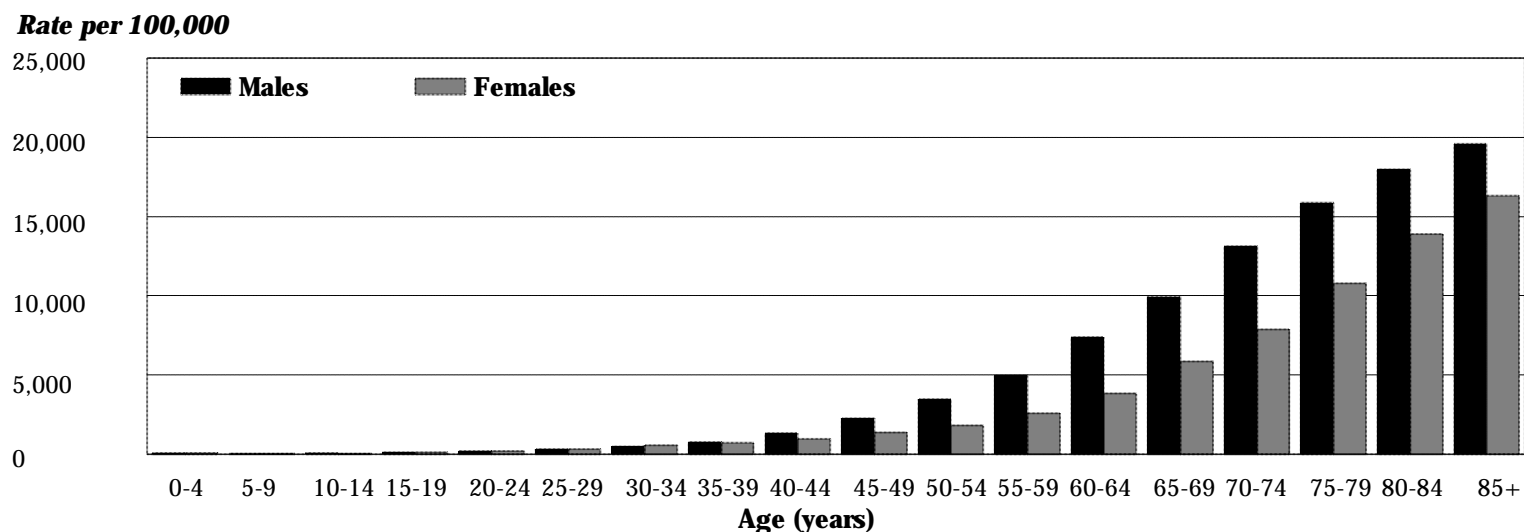


Source: See *Data sources, Appendix 1.3*

**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 all age groups. Admission rates for respiratory system

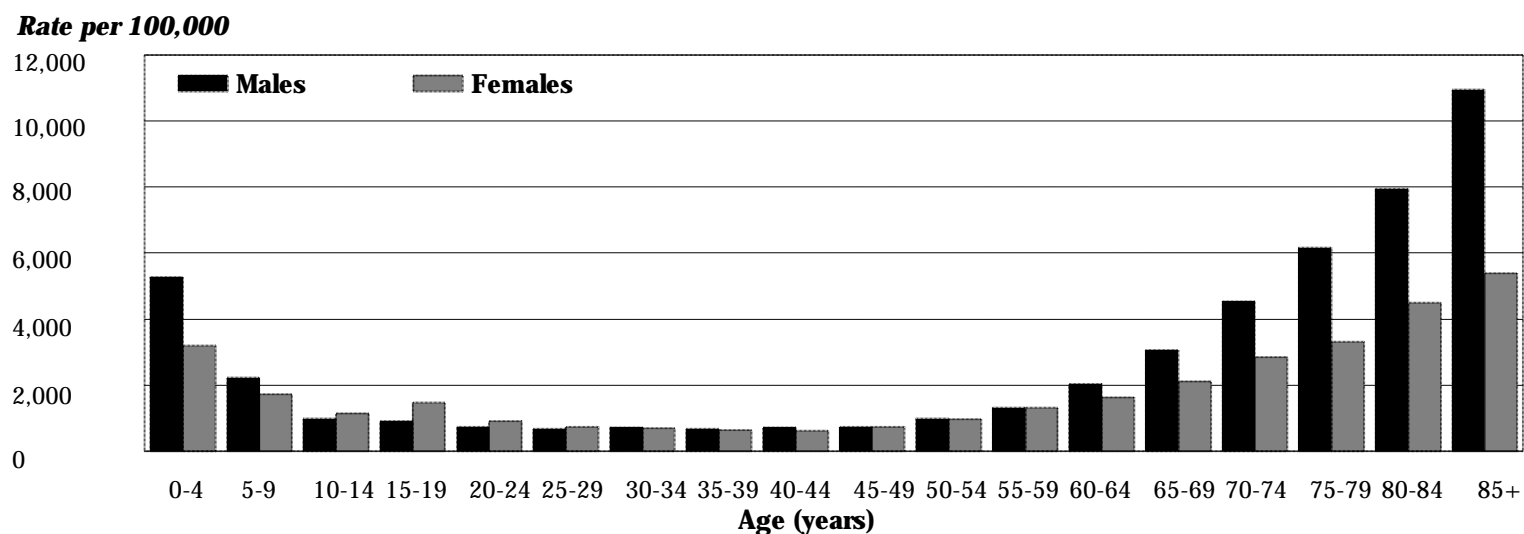
diseases were highest among children aged from 0 to 4 years and people aged 70 years and over, with little difference between the age groups from 20 to 54 years (**Figure 6.7**): males predominate in the majority of these groups.

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



Source: See Data sources, Appendix 1.3

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



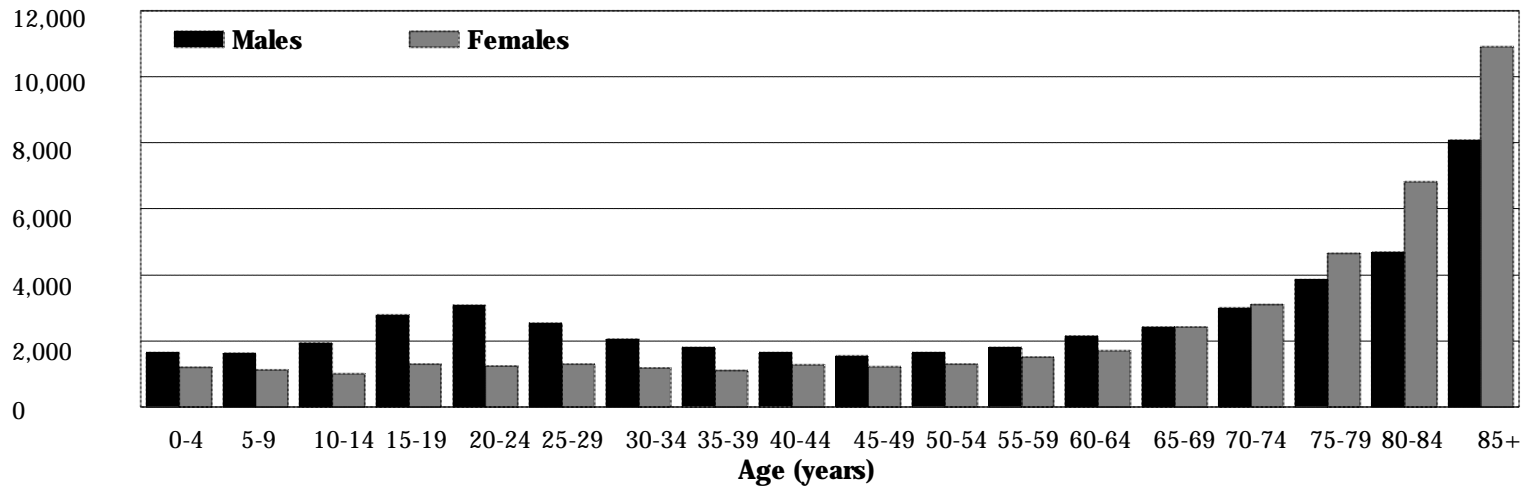
Source: See Data sources, Appendix 1.3

Male and female admission rates for accidents, poisonings and violence (**Figure 6.8**) are in direct contrast with the pattern for total admissions (**Figure 6.2**). Males predominate in all age groups up to and including the 65 to 69 year age group, with the largest differentials between the ages of 10 and 29 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, Victoria, 1995/96**

**Rate per 100,000**



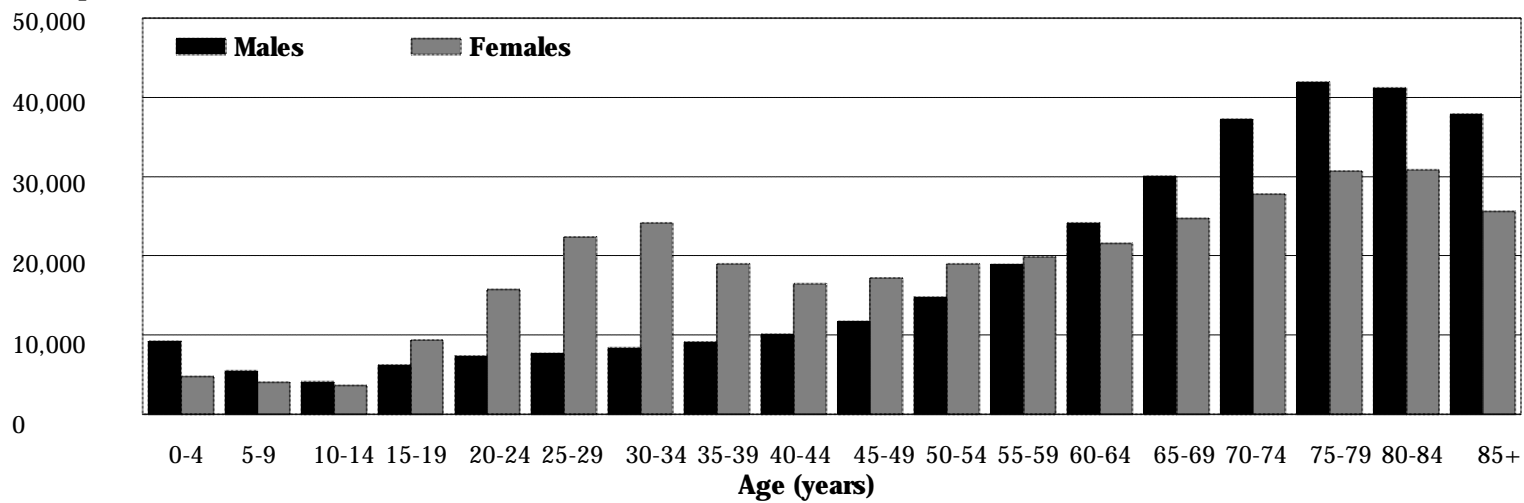
Source: See Data sources, Appendix 1.3

There is little variation in admission rates by either age or sex for admissions for a surgical procedure (Figure 6.9) and same day admissions for a surgical procedure (Figure 6.10), with the major difference occurring for females aged from 35 to 59 years.

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

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

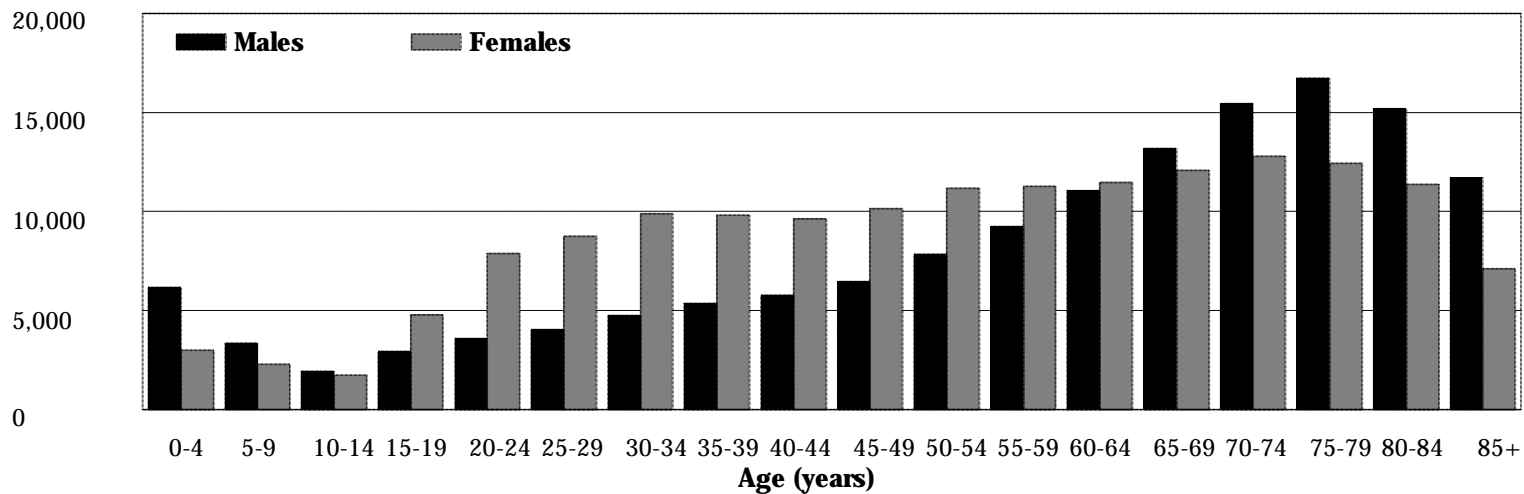
**Rate per 100,000**



Source: See Data sources, Appendix 1.3

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

**Rate per 100,000**



Source: See Data sources, Appendix 1.3



## Differences related to area of residence

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

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

### *Isolation and distance*

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

### *Higher risks faced*

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

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

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

### *Ready availability of beds*

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

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

In addition to the greater burden of ill health among Indigenous people noted above on page 183, 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.

### 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.

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

Further, an examination of the data suggests that some patients have changed address to live close to the location of renal dialysis facilities, thus distorting the patterns of use by address of usual residence. It should be noted that the acute episodes analysed also include repeat admissions, although not to the extent occurring among same day patients (in particular those requiring 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 92.7 per cent of the total acute admissions for 1995/96.

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

**Table 6.3: Public acute and private hospital admissions included in the analysis<sup>1</sup>, Victoria, 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>	4,253	0.9	11,960	1.7	16,213	1.4
<b>Cancer</b>						
lung cancer	730	0.1	3,278	0.5	4,008	0.3
cancer of the female breast	1,331	0.3	3,641	0.5	4,972	0.4
<b>Total cancer</b>	19,125	3.9	42,231	6.1	61,356	5.2
<b>Mental disorders</b>						
psychosis	4,924	1.0	13,011	1.9	17,935	1.5
neurotic, personality or other mental disorders	3,491	0.7	9,857	1.4	13,348	1.1
<b>Total mental disorders</b>	8,417	1.7	22,907	3.3	31,324	2.6
<b>Circulatory system diseases</b>						
ischaemic heart disease	4,288	0.9	33,567	4.8	37,855	3.2
<b>Total circulatory diseases/disorders</b>	16,327	3.3	87,493	12.6	103,819	8.7
<b>Respiratory system diseases</b>						
bronchitis, emphysema or asthma	1,989	0.4	13,714	2.0	15,703	1.3
<b>Total respiratory diseases/disorders</b>						
0 to 4 year olds	1,717	0.3	11,846	1.7	13,563	1.1
all ages	8,246	1.7	64,207	9.2	72,453	6.1
<b>Accidents, poisonings and violence</b>	24,110	4.9	63,905	9.2	88,015	7.4
<b>All causes (excl. renal dialysis)</b>						
Females	273,207	55.3	393,691	56.7	666,898	56.1
Males	220,909	44.7	300,580	43.3	521,489	43.9
<b>Public acute hospitals (excl. renal dialysis)</b>	291,550	59.0	485,799	70.0	777,349	65.4
<b>Private acute &amp; psychiatric hospitals (excl. renal dialysis)</b>	202,566	41.0	208,471	30.0	411,037	34.6
<b>Total admissions (excl. renal dialysis)</b>	494,115	100.0	694,271	100.0	1,188,386	100.0
<b>Total admissions</b>						
Admissions for renal dialysis	93,197	15.9	378	0.1	93,575	7.3
All other admissions	494,115	84.1	694,271	99.0	1,188,386	92.7
<b>Total admissions (incl. renal dialysis)</b>	587,312	100.0	694,649	100.0	1,281,961	100.0
<b>Principal procedure</b>						
Tonsillectomy	46	0.01	8,790	2.6	8,836	1.3
Myringotomy	7,224	2.2	537	0.2	7,761	1.2
Caesarean section	25	0.01	11,233	3.3	11,258	1.7
Hysterectomy	2	0.00	7,922	2.4	7,924	1.2
Hip replacement	1	0.00	4,007	1.2	4,008	0.6
Lens insertion	11,803	3.6	9,735	2.9	21,538	3.2
Endoscopy	92,651	28.4	11,805	3.5	104,456	15.8
<b>Total (incl. all other) procedures</b>	326,462	100.0	336,746	100.0	663,208	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 the inclusion of such admissions could distort the

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

Same day admissions have increased to comprise an even greater proportion of all admissions, and to cover a growing range of conditions and procedures, and this approach is no longer appropriate. Instead the data analysed for this second edition includes all same day procedures with the exception of admissions for renal dialysis, as it is for these admissions that it appears likely that people may have moved residence. The exclusion of admissions for renal dialysis resulted in the exclusion of 93,575 admissions in 1995/96, 7.3 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>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.

<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 1,188,386 admissions to hospital of residents of Victoria in 1995/96, of which 98.75 per cent were admissions to hospitals within the State, 0.78 per cent were to hospitals in New South Wales, 0.20 per cent were to South Australian hospitals and 0.19 were to hospitals in Queensland (**Table 6.5**).

Variations in the proportions of residents of Victoria admitted to hospitals outside of the State are largely related to the location of their residence. For example, residents of Wodonga (situated on the State's northern border) frequently go to a hospital in Albury.

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 Victoria by State/Territory of location of hospital, 1995/96**

	Location of hospital							Total	
	NSW	Vic	Qld	SA	WA	Tas	NT		ACT
Number	9,290	1,173,558	2,296	2,321	381	227	166	148	1,188,386
Per cent	0.78	98.75	0.19	0.20	0.03	0.02	0.01	0.01	100.00

Source: See *Data sources*, Appendix 1.3

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

## Capital city comparison (Australia as the Standard)

The admissions included in this analysis are described in detail on page 189. 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

## Melbourne (Victoria as the Standard)

There were 832,129 admissions to public acute and private hospitals of residents of **Melbourne**, two per cent fewer admissions than were expected from the State rates (an SAR of 98\*\*). Females accounted for over half (56.5 per cent) of the admissions.

The overall pattern of distribution of SARs is of higher ratios in the outer south-west and in a number of inner and bayside SLAs, and lower ratios in a number of eastern SLAs, as well as other SLAs of higher socioeconomic status (**Map 6.1**).

Ratios were elevated by ten per cent or more in South Melbourne (an SAR of 125\*\*), Werribee (120\*\*), Brighton (114\*\*), Melbourne (112\*\*), St Kilda (111\*\*) and Caulfield (110\*\*). With few exceptions, the highest ratios were in the inner and middle suburbs.

Slightly more than half (52.6 per cent) of the SLAs in **Melbourne** had ratios below the level expected from the State rates. The lowest ratios were in a band of SLAs extending from Eltham (with an SAR of 92\*\*) to Springvale (86\*\*), as well as in several SLAs closer to the city centre and in Upper Yarra [Part A] (89\*\*). Within this group of SLAs Altona (76\*\*), Waverley (84\*\*), Doncaster and Templestowe (88\*\*), Footscray (90\*\*), Box Hill (91\*\*), Hawthorn and Nunawading (both 92\*\*) had the lowest ratios.

The largest number of admissions was recorded for residents of Knox (29,844 admissions), with more than 25,000 admissions in Moorabbin (28,963 admissions), Broadmeadows (28,930), Keilor (27,747), Waverley (27,725), Camberwell (25,689) and Sunshine (25,400).

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

## Geelong

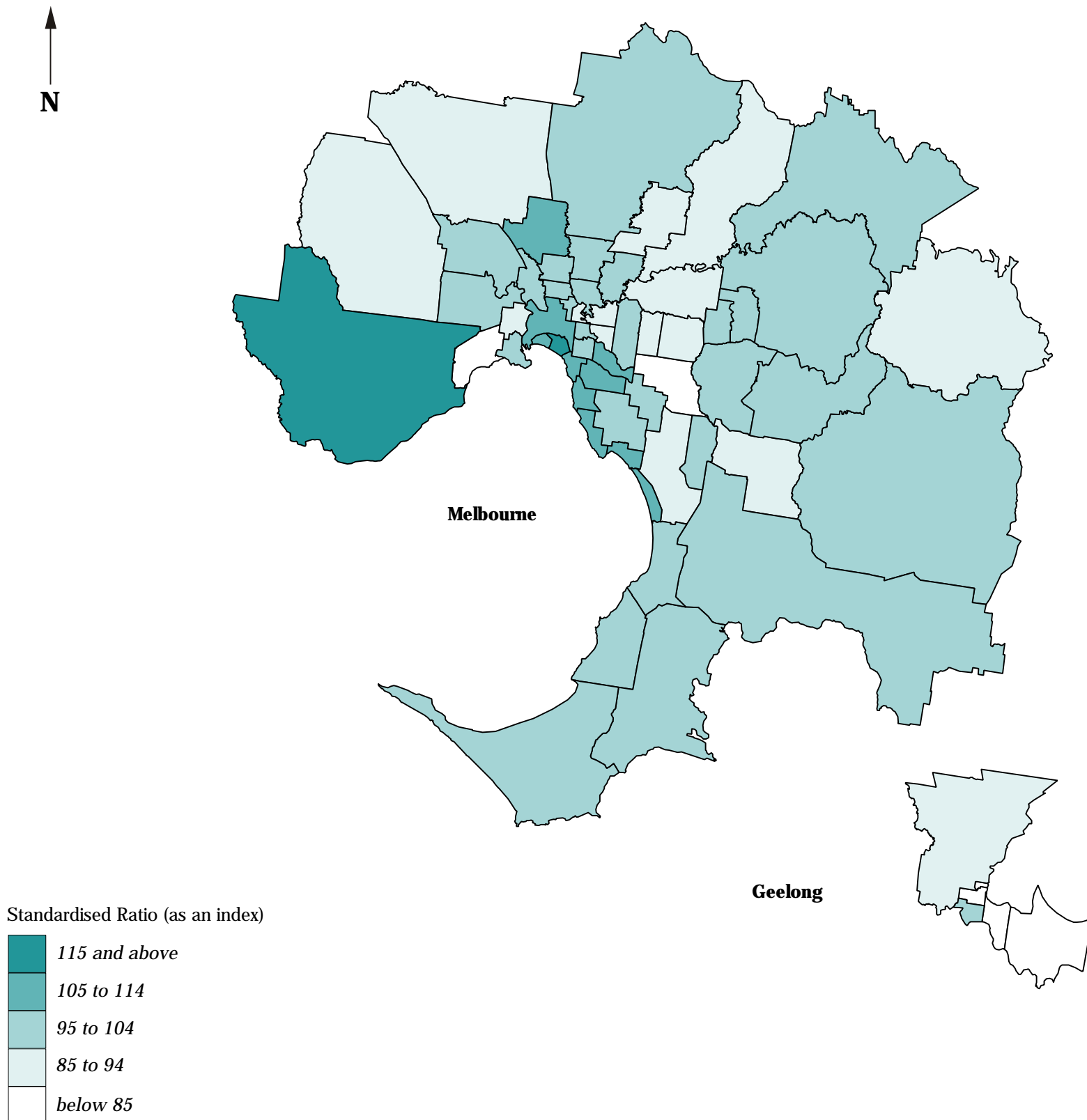
In **Geelong**, there were 25,173 admissions, 16 per cent fewer than expected from the State rates (an SAR of 84\*\*). The highest ratio was in Newtown (an SAR of 99), with the lowest in the City of Geelong (77\*\*), Bellarine-Inner and Geelong West (both 81\*\*). Females accounted for over half (57.0 per cent) of the admissions.

There were 12,228 admissions of residents of Corio-Inner, 4,079 from Bellarine and 3,252 from Geelong West.

### Map 6.1

## Admissions to public acute hospitals and private hospitals, Melbourne and Geelong, 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 VIC 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 189, 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**	- <sup>4</sup>	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 (Victoria as the Standard)

There were 331,085 admissions of residents of the non-metropolitan areas of Victoria to public acute and private hospitals in 1995/96, six per cent more than were expected from the State rates (an SAR of 106\*\*). The elevated ratio is in contrast to the below average rate of admissions for residents of **Melbourne** and **Geelong**. Females accounted for over half (55.1 per cent) of the admissions of residents of the non-metropolitan areas.

SLAs with ratios elevated by 30 per cent or more were scattered throughout the State with no apparent pattern (**Map 6.2**). More than half (59.5 per cent) of the State's SLAs recorded more admissions than were expected, with only 11 SLAs (6.7 per cent) recording ratios in the lowest range mapped. This is in contrast to the relatively low ratios in SLAs in **Melbourne** and **Geelong**.

The most highly elevated ratio was in Cobram (an SAR of 170\*\*, 70 per cent more admissions than expected from the State rates), with similarly elevated ratios in Myrtleford and Mansfield, both with an SAR of 161\*\*, Belfast (154\*\*) and Benalla and Portland (both 147\*\*).

The lowest ratios were recorded in the SLAs of Traralgon [Part B] (an SAR of 24\*\*, 76 per cent fewer admissions than expected from the State rates), Wimmera and Upper Yarra [Part B] (both 29\*\*) and Kara Kara (45\*\*).

The largest numbers of admissions were recorded for residents of Ballarat (20,436 admissions) and Bendigo (18,078), with 8,987 admissions in Warrnambool, 8,857 in South Barwon-Inner, 8,337 in Shepparton and 7,693 in Wodonga.

Of the towns mapped, the highest ratios were in Portland (an SAR of 147\*\*), Wangaratta and Warrnambool (both 129\*\*), with the lowest ratio in Greater Bendigo (97\*\*).

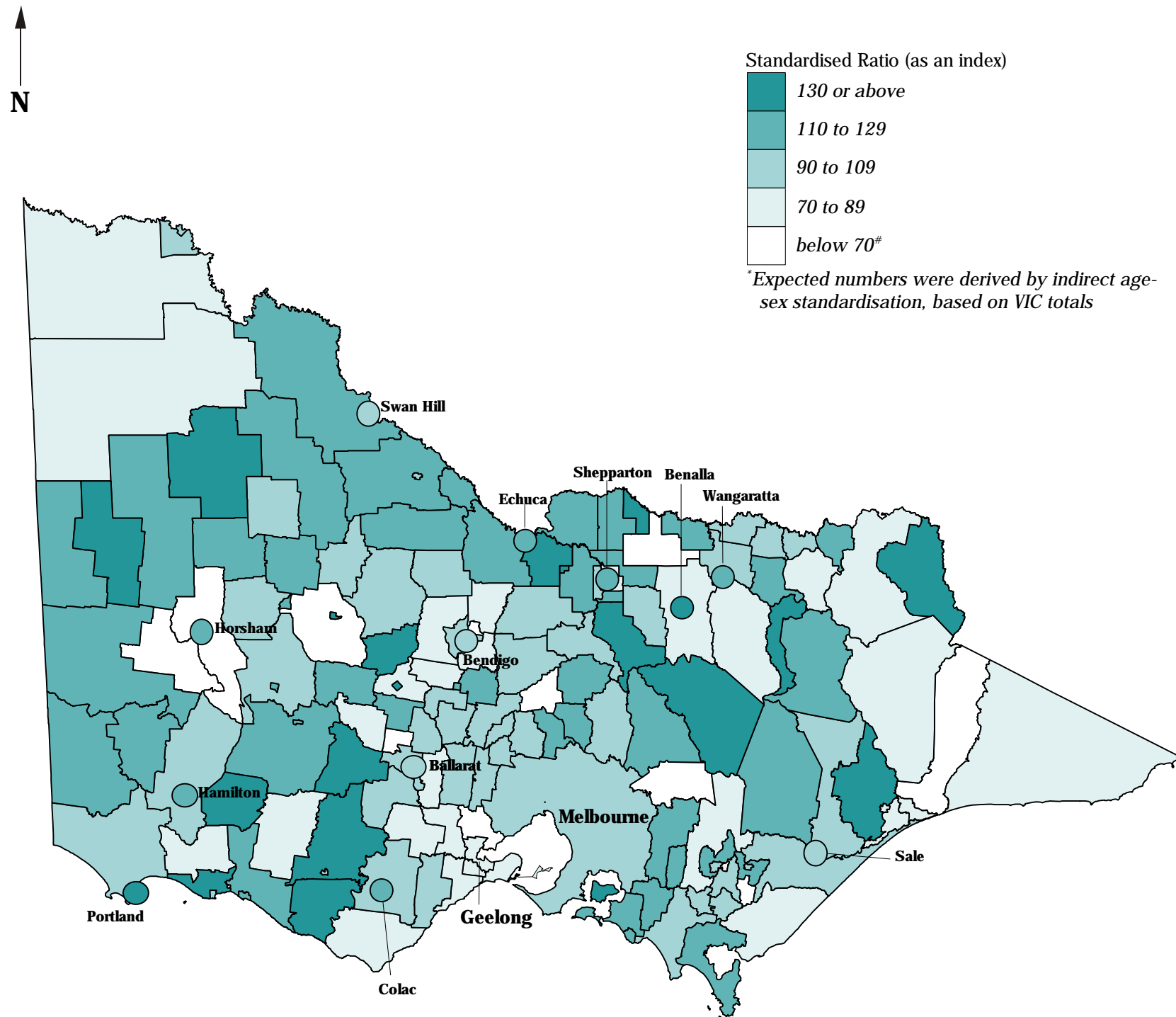
The results of the correlation analysis revealed a weak association at the SLA level with the indicators of socioeconomic disadvantage, the strongest being with the variables for dwellings without a motor vehicle (0.34) and housing authority rented dwellings (0.31). These results, together with the weak inverse correlation with the IRSD (-0.24), suggest the existence of an association at the SLA level between high rates of admission to hospital and socioeconomic disadvantage.



## Map 6.2

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

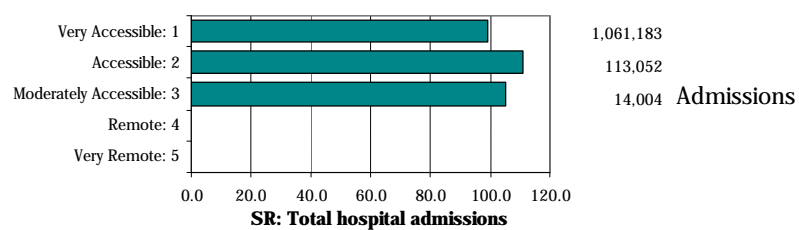
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



There are elevated standardised admission ratios (SARs) for admissions to public acute and private hospitals in the Accessible (an SAR of 111, 11 per cent more admissions than expected from the State rates) and Moderately Accessible (an SAR of 105) ARIA categories. The Very Accessible areas had an SAR of 100, with the number of admissions expected from the State rates (100).

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 189 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 65.4 per cent of the State's admissions in 1995/96. The remaining 34.6 per cent of admissions were to private (acute or psychiatric) hospitals. For metropolitan residents, the proportion was 59.9 per cent and for non-metropolitan residents, it was a substantially higher 78.4 per cent, reflecting both the higher rates of admission of country residents and the greater availability of public hospitals and the lack of private hospitals.

The age profile for female (56.5 per cent of inpatient admissions) and male admissions is graphed in **Figure 6.1**, page 184. 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.

## Melbourne (Victoria as the Standard)

There were 498,227 admissions of residents of **Melbourne** to public acute hospital in 1995/96, ten per cent fewer than expected from the State rates (90\*\*). This reflects a number of factors, including the availability in **Melbourne** of private hospitals, which reduces the demand for public hospital beds, as well as higher overall hospital use by residents of the non-metropolitan areas. Females living in **Melbourne** had more admissions to private hospitals than males, accounting for 55.5 per cent of all admissions to a public acute hospital.

SLAs in **Melbourne** were equally divided between those with elevated (49.1 per cent) and those with low ratios (50.9 per cent) SARs for admissions to public acute hospitals in 1995/96. The pattern of distribution at the SLA level is strongly associated with socioeconomic disadvantage, with the highest ratios in inner and western SLAs and the lowest across a broad area to the east and south-east of the city (**Map 6.3**).

Ratios were elevated by 15 per cent or more in the SLAs of Werribee (142\*\*), Sunshine (130\*\*), South Melbourne (123\*\*), Melbourne and Port Melbourne (both 122\*\*), Northcote (121\*\*), Brunswick (120\*\*) and Fitzroy, Preston and Broadmeadows (all 117\*\*).

There were 15 per cent or fewer admissions to public acute hospitals than expected from the State rates in 23 SLAs. The lowest ratios were in the high socioeconomic status SLAs of Waverley (with an SAR of 55\*\*), Camberwell and Hawthorn (both 62\*\*), Malvern (63\*\*), Mornington (64\*\*) and Doncaster and Templestowe (65\*\*).

The largest numbers of admissions were in Broadmeadows (21,262 admissions), Sunshine (20,786), Keilor (18,681), Preston (17,461) and Werribee (16,135).

There were correlations of meaningful significance with the variables for unemployment (0.69), low income families (0.65) and single parent families (0.62). These results, together with the inverse correlation of meaningful significance with the IRSD (-0.68), indicate the existence of an association at the SLA level between high rates of admission to public acute hospitals and socioeconomic disadvantage.

## Geelong

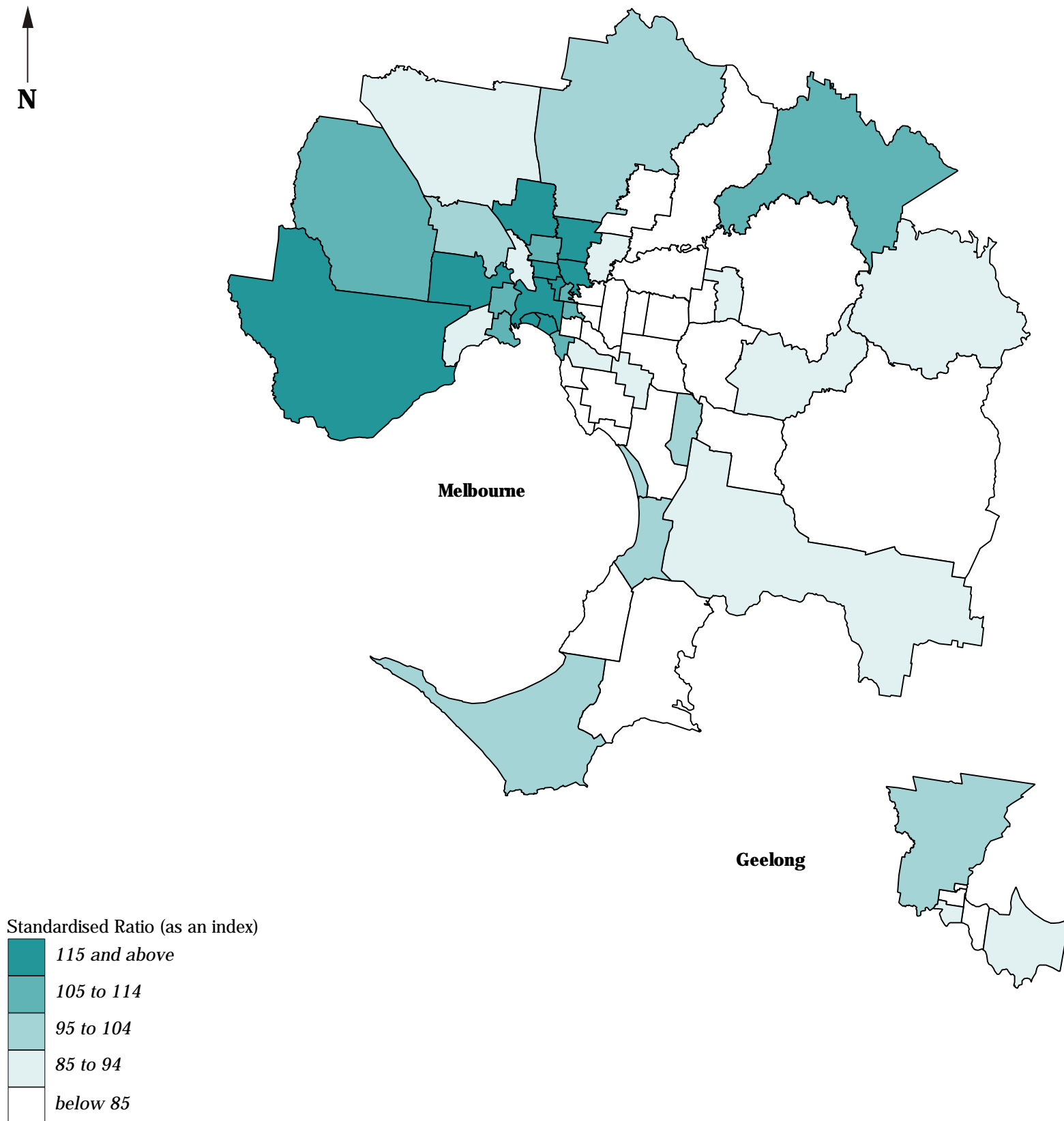
There were 18,153 admissions of residents of **Geelong** to public acute hospitals, seven per cent fewer than expected (an SAR of 93\*\*). Females accounted for over half (55.3 per cent) of all admissions to a public acute hospital.

Only Corio-Inner (101) reported more admissions than expected from the State rates. The lowest ratios were in the City of Geelong (76\*\*) and Geelong West (84\*\*). There were 9,469 admissions from Corio-Inner, considerably more than in next ranked Bellarine-Inner (2,996) and Geelong West (2,220).

### Map 6.3

## Admissions to public acute hospitals, Melbourne and Geelong, 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 Vic 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 204 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 (Victoria as the Standard)

The relative availability of public acute hospitals and lack of private hospitals in the non-metropolitan areas of Victoria (see Chapter 7) is evident from the high rate of use of public compared with private hospitals. People living outside of **Melbourne** and **Geelong** had 28 per cent more admissions to public acute hospitals than expected from the State rates (an SAR of 128\*\*), and 35 per cent fewer than expected admissions to private hospitals (65\*\*). Some reasons for the substantially higher rates, compared with those in **Melbourne**, are described on page 189. It should be noted that, although country residents use hospitals in **Melbourne** (and occasionally in another State or Territory), the admissions are mapped to the SLA of usual residence of the patient. Females accounted for over half (55.1 per cent) of all admissions of non-metropolitan residents to a public acute hospital.

As a result of the high overall standardised admission ratio for the non-metropolitan areas of Victoria, relatively few areas (40 SLAs, 24.5 per cent of all SLAs based on 1994 boundaries) had fewer admissions than expected from the State rates (**Map 6.4**). The lowest ratios were in Traralgon [Part B] (with an SAR of 27\*\*, 73 per cent fewer admissions than expected from the State rates), Upper Yarra [Part B] (34\*\*) and Wimmera (38\*\*). SARs of between 40 and 60 per cent lower than expected were recorded in Birchip (with an SAR of 44\*\*), Charlton (54\*\*), Huntly-Inner and Kara Kara (both 56\*\*) and Tallangatta [Part B] (57\*\*).

There were more than twice the number of admissions expected from the State rates recorded for residents of Myrtleford (with an SAR of 227\*\*), Mansfield (222\*\*), Cobram (217\*\*), Portland (212\*\*) and Benalla (208\*\*); with similarly highly elevated ratios in Mount Rouse (199\*\*), Deakin (192\*\*), Hampden (191\*\*), Upper Murray and Lowan (both 189\*\*).

In a further 43 SLAs (with more than five expected admissions) ratios were elevated by 50 per cent or more than expected from the State rates.

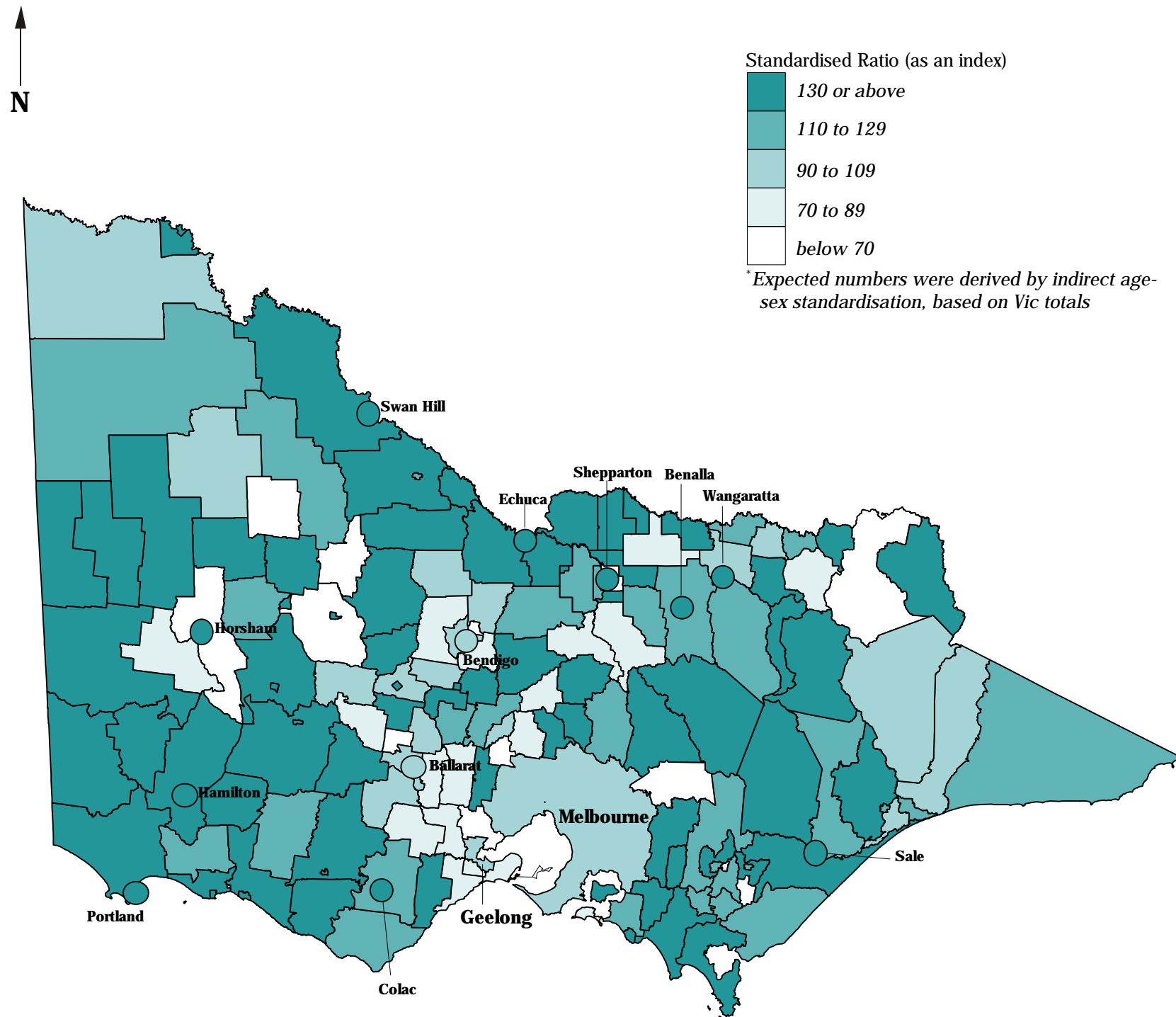
The largest numbers of admissions were recorded in Bendigo (12,693 admissions) and Ballarat (12,119), with other high numbers in Warrnambool (7,154 admissions), Wodonga (6,034), Shepparton (6,018) and Mildura (5,601).

There was generally only a weak correlation between high rates of admission to public acute hospitals and socioeconomic disadvantage at the SLA level in non-metropolitan Victoria. The strongest correlations were with the variables for dwellings without a motor vehicle (0.39) and housing authority rented dwellings (0.35). These results, together with the weak inverse correlation with the IRSD (-0.27), suggest the existence of an association at the SLA level between high rates of admission to public acute hospitals and socioeconomic disadvantage.

## Map 6.4

### Admissions to public acute hospitals, Victoria, 1995/96

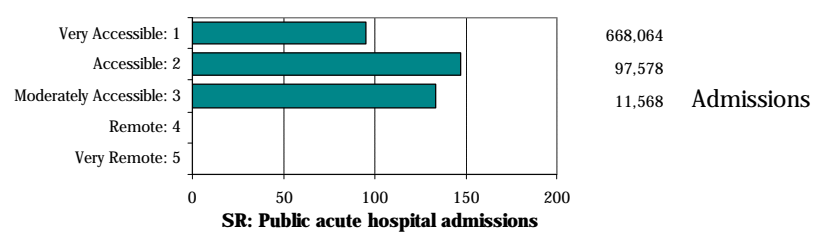
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions to public acute hospitals vary more markedly between the ARIA categories than do those for total admissions and cover a wider range. The lowest ratio is in the Very Accessible category (an SAR of 95), with SARs elevated by 33 per cent in the Moderately Accessible and 47 per cent in the Accessible categories, with SDRs of 133 and 147, respectively.

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 189 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 198, **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 34.6 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 65.4 per cent were admissions to public acute hospitals. For metropolitan residents, the proportion was higher, at 39.8 per cent, and for non-metropolitan residents, it was a substantially lower 21.2 per cent.

Females made greater use of private hospitals than males, with admissions to private hospitals representing 35.4 per cent of all female admissions studied (compared with 33.5 per cent for males) and accounting for 57.4 per cent of private hospital admissions (55.4 per cent in public acute hospitals).

The age profile for admissions of females and males is graphed in **Figure 6.4**, page 186. The most notable features are the higher admission rates for females from age 10 years through the child-bearing years to the late-fifties.

## Melbourne (Victoria as the Standard)

There were 333,902 admissions to private hospitals of residents of **Melbourne** in 1995/96, 14 per cent more than expected from the State rates (an SAR of 114\*\*). In contrast to admissions to public hospitals, where high standardised admission ratios were associated with socioeconomic disadvantage, rates of admission to private hospitals are generally higher in areas of higher socioeconomic status; that is, in areas where residents are more likely to have private health insurance. Females living in **Melbourne** had more admissions to private hospitals than males, accounting for 58.0 per cent of all admissions to a private hospital.

Standardised admission ratios were elevated by more than 50 per cent in Brighton (with an SAR of 195\*\*), Malvern (190\*\*), Sandringham (170\*\*), Camberwell (162\*\*), Mornington (157\*\*), Caulfield (156\*\*), Prahran (154\*\*) and Mordialloc (151\*\*) (**Map 6.5**). Ratios were also highly elevated in the SLAs of Hawthorn (with an SAR of 149\*\*), Kew (146\*\*), Knox (141\*\*) and Ringwood (140\*\*).

In contrast, the lowest ratios were recorded for residents of the lower socioeconomic status SLAs of Footscray (49\*\*, fewer than half the number of admissions expected from the State rates), Altona (50\*\*), Sunshine (55\*\*) and Fitzroy (60\*\*).

There were 15,977 admissions of residents of Waverley, 15,139 from Camberwell, 14,800 from Knox, 13,481 from Moorabbin and 12,907 from Doncaster and Templestowe.

Correlations of meaningful significance were recorded at the SLA level with the variables for female labour force participation (0.66) and high income families (0.62); and inverse correlations with unemployment (of substantial significance, -0.76), low income families (-0.68), early school leavers (-0.62) and people reporting poor proficiency in English (-0.61). These results, together with the correlation of substantial significance with the IRSD (0.80), indicate the existence of an association at the SLA level between high rates of private hospital admissions and high socioeconomic status.

## Geelong

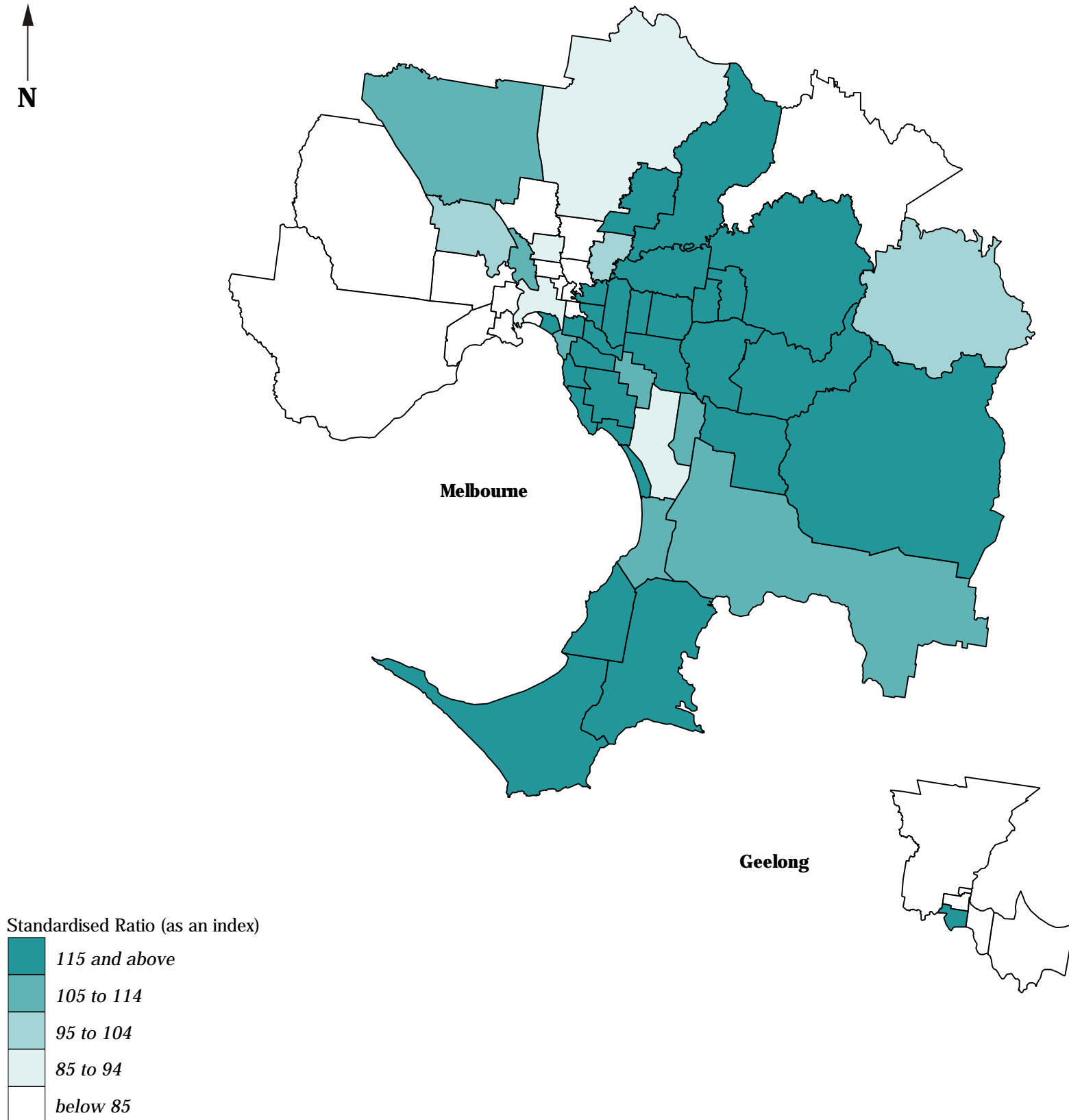
In **Geelong**, there were 7,020 admissions to private hospitals in 1995/96, 32 per cent fewer than expected from the State rates (an SAR of 68\*\*). Females accounted for close to two thirds (61.8 per cent) of all admissions to a private hospital.

Only in Newtown were there more admissions than expected (an SAR of 118\*\*). The lowest ratios were recorded in Corio-Inner (an SAR of 56\*\*) and Bellarine-Inner (63\*\*). Residents of Corio-Inner had 2,759 admissions, more than twice the 1,136 admissions from next ranked Newtown.

## Map 6.5

### Admissions to private hospitals, Melbourne and Geelong, 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 Vic 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 200, **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 (Victoria as the Standard)

The lack of private hospitals and the relatively ready availability of public acute hospitals throughout the non-metropolitan areas of Victoria is evident from the low rate of use of private compared with public acute hospitals. Residents of the areas outside of **Melbourne** and **Geelong** had 35 per cent fewer admissions from private hospitals than expected from the State rates (an SAR of 65\*\*); in contrast, they had 28 per cent more admissions to public acute hospitals than expected from the State (128\*\*). Females accounted for over half (54.5 per cent) of all admissions of non-metropolitan residents to a private hospital.

There were only 25 SLAs (15.3 per cent of all SLAs in non-metropolitan Victoria with elevated SARs for admissions to private hospitals in 1995/96 (**Map 6.6**). Ratios elevated by at least twice the level expected from the State rates were recorded for Euroa (with an SAR of 257\*\*), Birchip (220\*\*) and Phillip Island (200\*\*), with similarly high ratios in Karkaroc (an SAR of 197\*\*), Gisborne (175\*\*) and Charlton (174\*\*). Ratios elevated by more than 30 per cent were recorded for French Island (154), Avoca (142\*\*), Ballarat (137\*\*) and Goulburn (133\*\*).

Almost half (45.4 per cent) of the SLAs had fewer than half the number of admissions to private hospitals expected from the State rates. The lowest ratios were recorded for residents of the SLAs of Mildura [Part B] (with an SAR of 7\*\*, 93 per cent fewer admissions than expected); Glenelg and Wimmera (both 12\*\*); and Dundas, the City of Mildura, Mildura [Part A] and Tambo [Part B] (each with 15\*\*).

More than 2,000 admissions to private hospitals were recorded for residents from Ballarat (8,317 admissions), Bendigo (5,384), South Barwon-Inner (3,464), Shepparton (2,319) and Greater Geelong [Part B] (2,103).

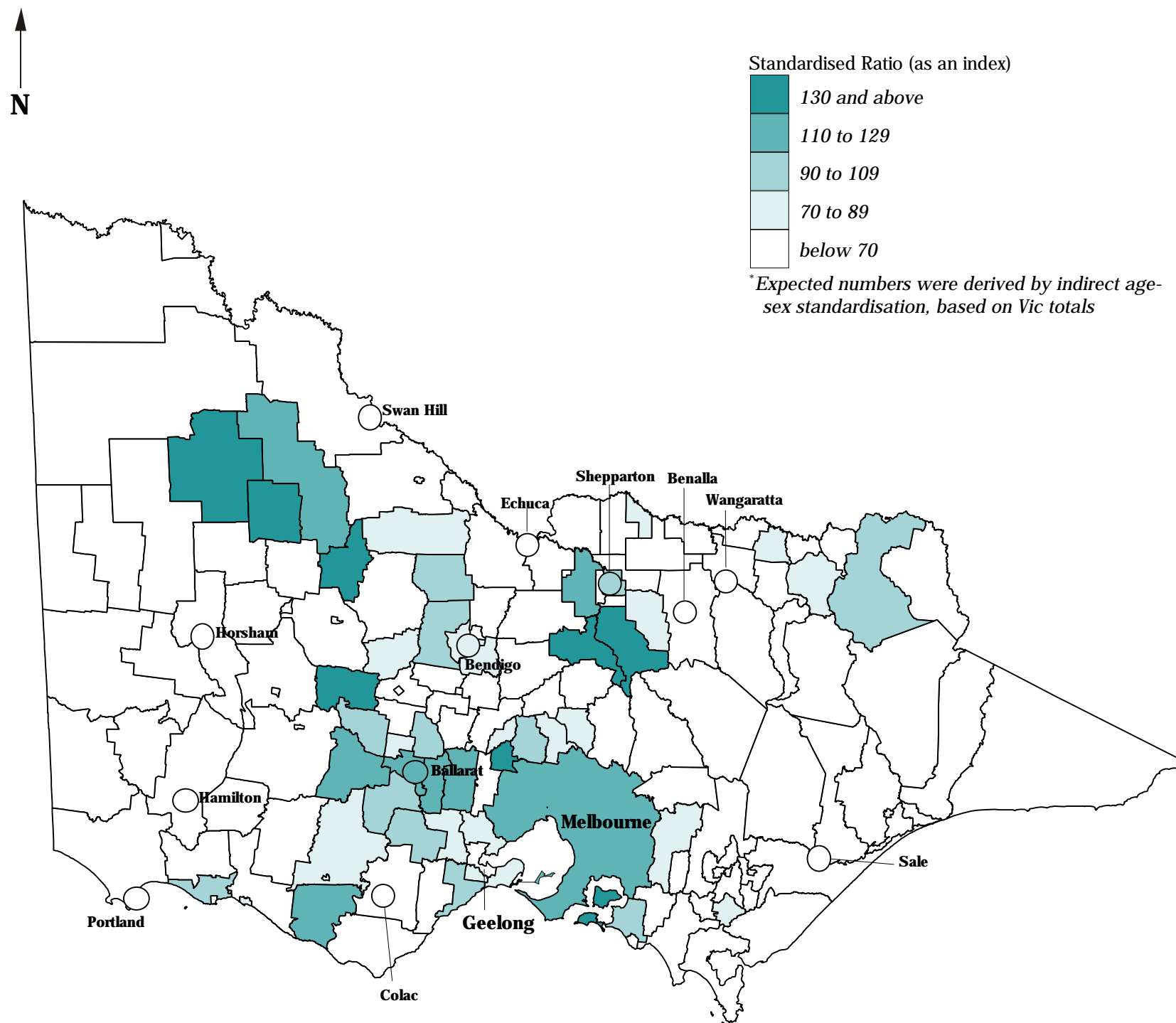
There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions to private hospitals and socioeconomic status.



## Map 6.6

### Admissions to private hospitals, Victoria, 1995/96

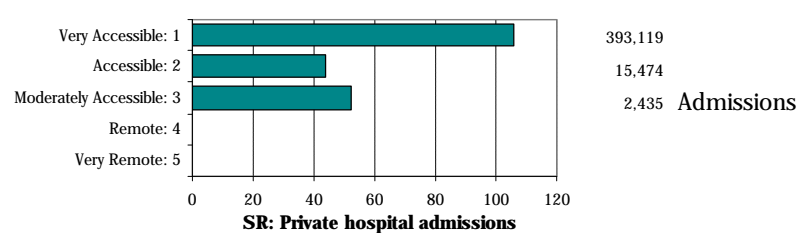
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Residents of the Very Accessible areas under the ARIA classification accounted for the majority (95.6 per cent) of admissions to private hospitals and had the only elevated standardised admission ratio (an SAR of 106), reflecting the greater availability of these facilities in Melbourne and Geelong. Ratios in the two other categories were lower, dropping to an SAR of 44 in the Accessible ARIA category and 52 in the Moderately Accessible category. Both of those ratios were less than half that in the Very Accessible areas.

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

## Admissions of males, 1995/96

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

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

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

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

**Table 6.12: Admissions of males, capital cities**

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

Males account for 43.9 per cent of all admissions of Victorian 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 residents of **Melbourne** the proportion was similar, at 43.5 per cent of admissions.

### Melbourne (Victoria as the Standard)

There were 362,105 admissions of males resident in **Melbourne** in 1995/1996, one per cent fewer than expected from the State rates (an SAR of 99\*\*).

The most highly elevated standardised admission ratios for males are in the city centre and a group of inner SLAs immediately to the east and south-east (**Map 6.7**).

Over one third of the SLAs (42.1 per cent) had elevated standardised admission ratios. Within this group, the highest ratios were in South Melbourne (with an SAR of 141\*\*, 41 per cent more admissions than expected from the State rates), St Kilda (130\*\*), Melbourne (126\*\*), Fitzroy (122\*\*) and Brighton (121\*\*). Other SLAs with relatively high ratios were Caulfield (an SAR of 118\*\*), Prahran (117\*\*), Malvern (116\*\*) and Richmond (115\*\*).

SLAs with the lowest ratios were Altona (an SAR of 75\*\*); Springvale and Waverley (both 85\*\*); Upper Yarra [Part A] (87\*\*); Bulla, Eltham and Melton (each 88\*\*); Doncaster and Templestowe and Footscray (both 89\*\*).

The largest number of admissions of males was reported for residents of Moorabbin, with 13,020 admissions, while there were 12,551 admissions of males from Waverley, 12,357 from Broadmeadows, 12,306 from Knox, 11,647 from Keilor and 11,261 from Sunshine.

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

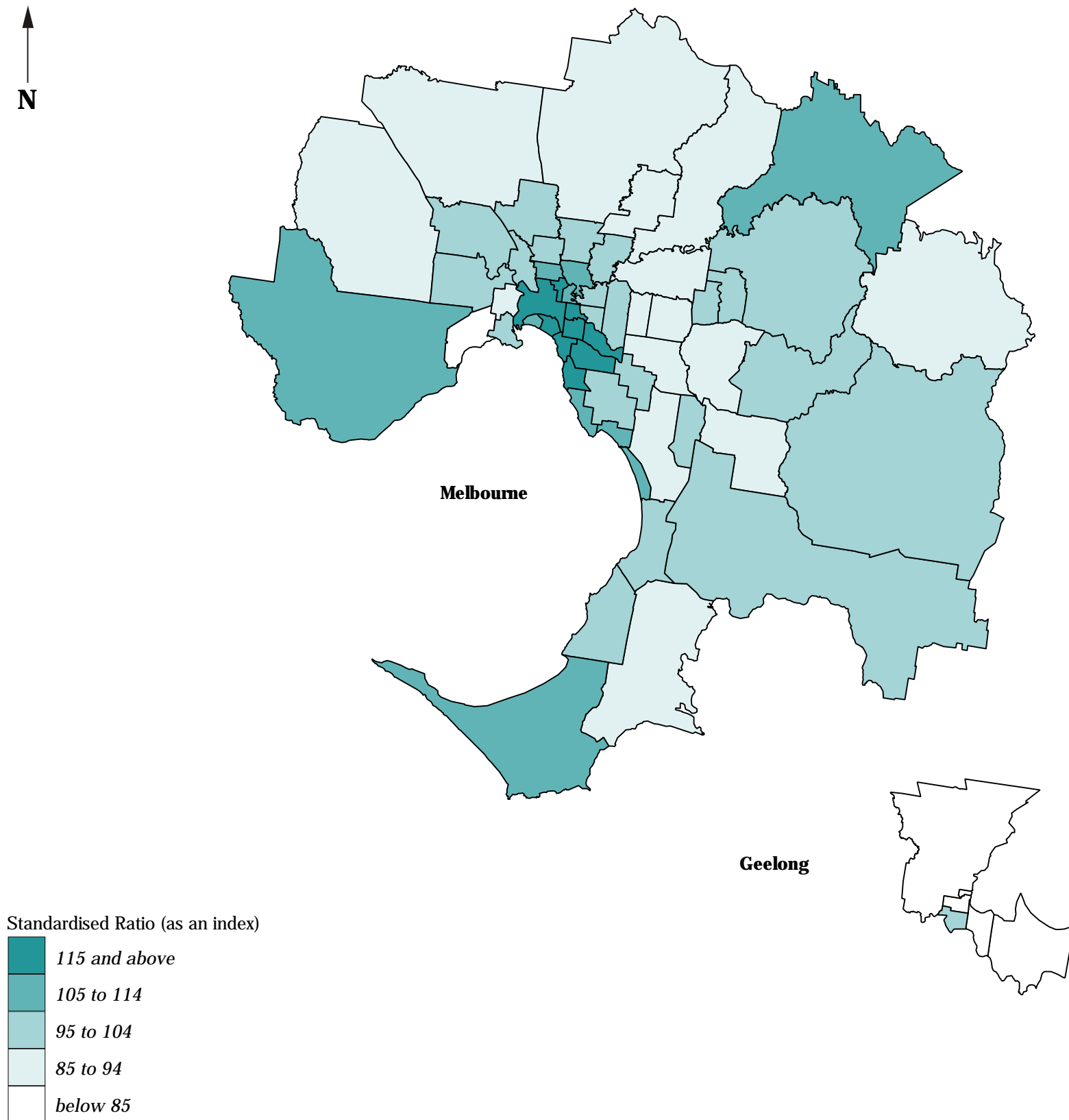
### Geelong

In **Geelong**, there were 10,835 admissions of males in 1995/1996, 17 per cent fewer admissions than expected from the State rates (an SAR of 83\*\*). Only in Newtown (102) were there more admissions than expected from the State rates. The lowest ratios were in Bellarine-Inner (an SAR of 76\*\*) and the City of Geelong (78\*\*). There were 5,337 admissions of males from Corio-Inner and 1,712 from Bellarine-Inner.

## Map 6.7

### Admissions of males, Melbourne and Geelong, 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 Vic totals

Source: See Data Sources, Appendix 1.3

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

## Admissions of males, 1995/96

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

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

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

In all of the States and Territories for which data 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 (Victoria as the Standard)

There were 148,549 admissions of males resident in the non-metropolitan areas of Victoria, 4 per cent more than were expected from the State rates (an SAR of 104\*\*). Admissions of males represented 44.9 per cent of all admissions in country Victoria.

Nineteen SLAs (11.7 per cent of all SLAs based on 1994 boundaries), had standardised admission ratios for males elevated by 30 per cent or more. The most highly elevated ratios were in Myrtleford (with an SAR of 171\*\*, with 71 per cent more admissions than expected from the State rates), Cobram (157\*\*), Benalla (156\*\*) and Belfast (152\*\*). Relatively high ratios were also recorded for residents of Mansfield (an SAR of 149\*\*), Kyabram (147\*\*) and Hampden and Mount Rouse (both with an SAR of 144\*\*) (**Map 6.8**).

The lowest ratios were in Traralgon [Part B] (with 76 per cent fewer admissions than expected from the State rates, an SAR of 24\*\* and 33 admissions), Upper Yarra [Part B] (25\*\* and 16 admissions), Wimmera (27\*\* and 101 admissions), Pyalong (45\*\* and 48 admissions) and Kara Kara (47\*\* and 72 admissions).

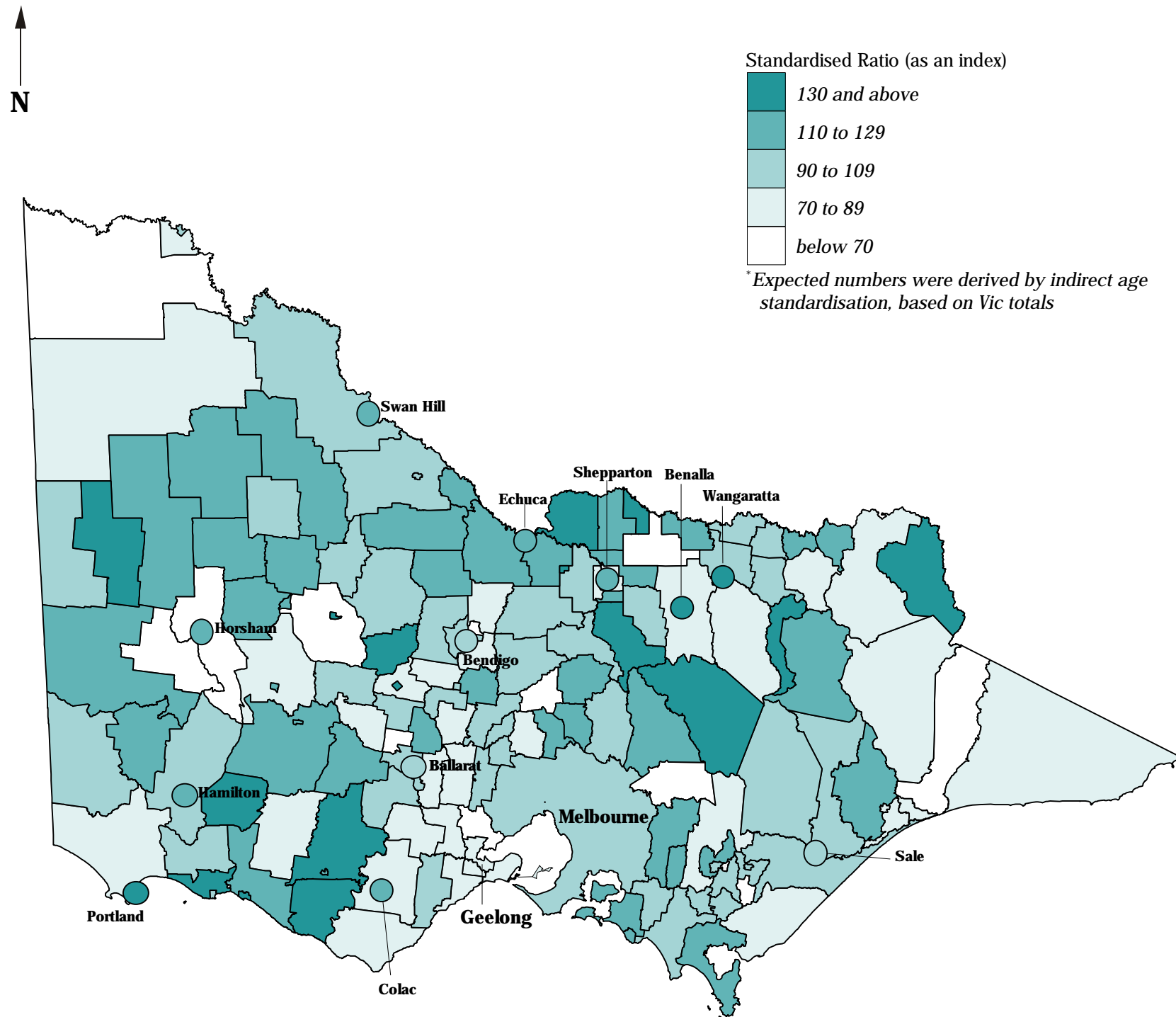
There were more than 3,000 admissions of male residents from Ballarat (8,987 admissions), Bendigo (7,730), Warrnambool (4,129), South Barwon-Inner (3,831), Shepparton (3,699) and Wodonga (3,428).

The strongest correlations were with the variables for dwellings without a motor vehicle (0.39) and housing authority rented dwellings (0.36). These results, together with the weak inverse correlation with the IRSD (-0.24) suggest the existence of an association at the SLA level between high rates of admissions of males and socioeconomic disadvantage.

## Map 6.8

### Admissions of males, Victoria, 1995/96

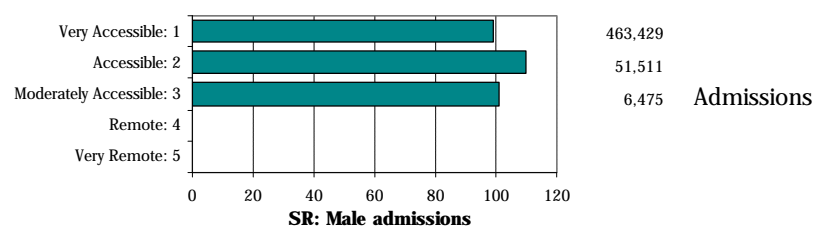
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for males were within one per cent of the level expected from the State rates in the Very Accessible (an SAR of 99) and Moderately Accessible (101) areas, with a more highly elevated ratio in the Accessible areas (an SAR of 110, ten per cent more admissions of males than expected from the State rates).

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 56.5 per cent of all admissions of residents of **Melbourne** and for 55.1 per cent of admissions of non-metropolitan residents. Overall, females had higher admission rates than males: 29,214 admissions per 100,000 population for females, compared with 23,314 admissions per 100,000 population for males.

### Melbourne (Victoria as the Standard)

There were 470,024 admissions of females resident in **Melbourne**, two per cent fewer than expected from the State rates (an SAR of 98\*\*).

The highest standardised admission ratio for females was in the outer western SLA of Werribee, with other SLAs with high ratios located in the middle suburbs to the north and west of the city, in some southern bayside SLAs and in several outlying south-eastern areas (**Map 6.9**). The lowest ratios were confined to a region stretching from Springvale to Brunswick and along the Yarra Valley to the outer SLAs of Eltham, Healesville and Upper Yarra [Part A].

Over one third (38.6 per cent) of SLAs in **Melbourne**, based on 1994 boundaries, had elevated ratios for admissions of females. However, only Werribee, with an SAR of 125\*\*, and South Melbourne, with an SAR of 114\*\* had ratios elevated by more than ten per cent above the level expected from the State rates. The next highest ratios were in the SLAs of Broadmeadows and Brighton, both with an SAR of 108\*\*, and Keilor and Sunshine, both with an SAR of 105\*\*.

The lowest ratios were in Altona (an SAR of 77\*\*, 23 per cent fewer admissions than expected from the State rates), Fitzroy and Collingwood (both 82\*\*), Waverley (83\*\*), Springvale (87\*\*), Doncaster and Templestowe (88\*\*) and Richmond (89\*\*).

There were more than 15,000 admissions of females living in Knox (17,539 admissions), Broadmeadows (16,573), Keilor (16,100), Moorabbin (15,943) and Waverley (15,175). In contrast there were fewer than 2,000 admissions of females from Port Melbourne (1,351), Healesville (1,553) and Upper Yarra [Part A] (1,822).

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

### Geelong

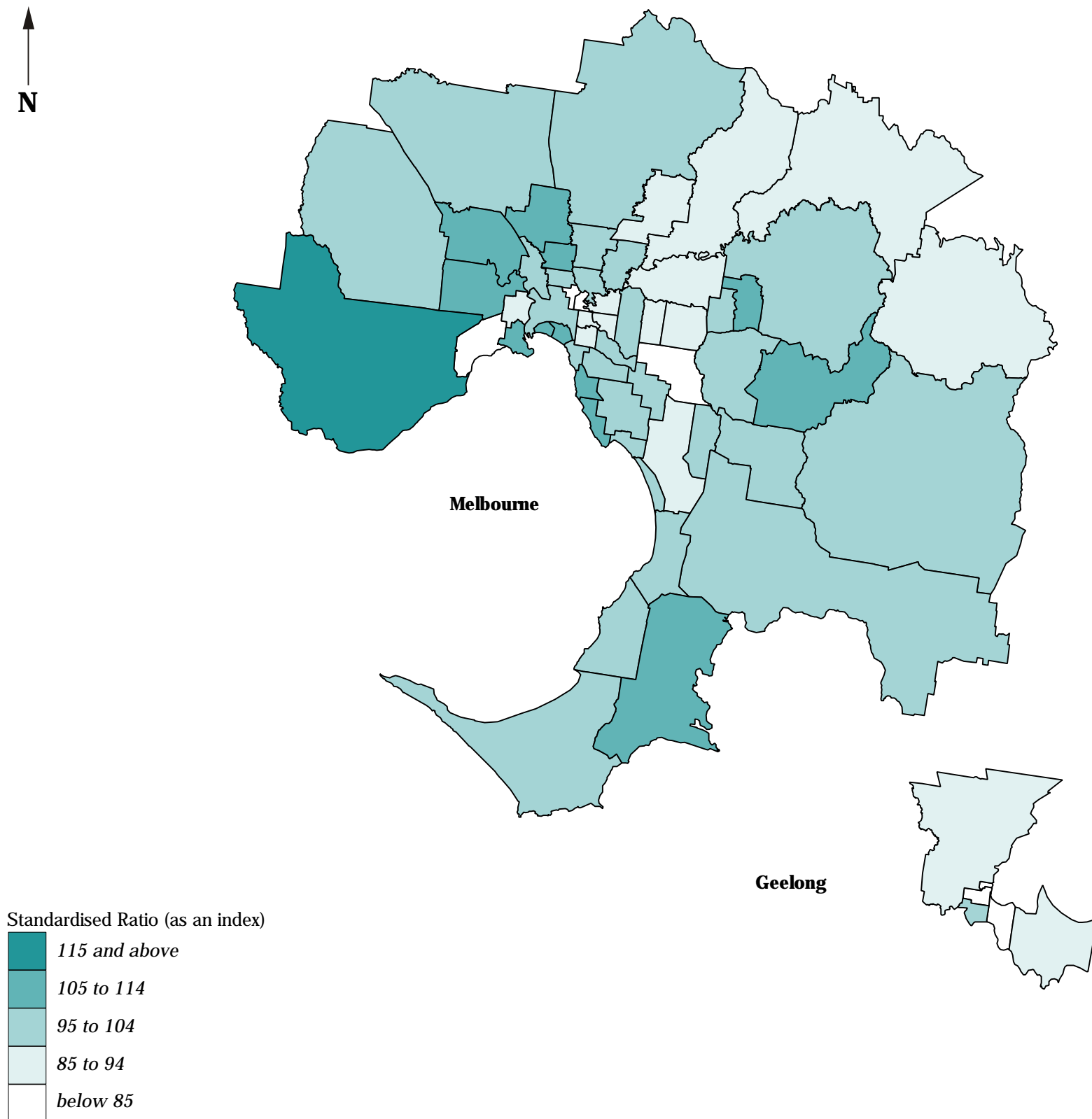
There were 14,338 admissions of females resident in **Geelong**, 15 per cent fewer admissions than expected from the State rates (an SAR of 85\*\*).

All of the SLAs had fewer admissions than expected, with the lowest ratios in the City of Geelong (an SAR of 76\*\*) and Geelong West (80\*\*). Corio-Inner had the largest number of admissions, with 6,891 admissions of females.

## Map 6.9

### Admissions of females, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 182,535 admissions of females resident in the non-metropolitan areas of Victoria, seven per cent more than expected from the State rates (an SAR of 107\*\*). Of the 163 SLAs in Victoria, 60.1 per cent had more admissions of females than expected from the State rates. Some comments on the possible reasons for the generally higher admission rates for residents of country areas are on page 189.

Generally, highly elevated ratios were recorded throughout the State, moreso in rural SLAs than in the towns (**Map 6.10**). The highest ratios were recorded in Cobram (with an SR of 182\*\*, 82 per cent more admissions of females than expected from the State rates), Mansfield (171\*\*), Bairnsdale [Part B] (164\*\*), Belfast (156\*\*), Ripon Hampden and Heytesbury (both 155\*\*), Deakin (154\*\*) and Portland and Myrtleford (both 152\*\*). Another 18 SLAs had ratios elevated by 30 to 50 per cent.

The lowest ratios were recorded for female residents of Traralgon [Part B] (an SAR of 24\*\*, 76 per cent fewer admissions than expected from the State rates), Wimmera (30\*\*), Upper Yarra [Part B] (32\*\*) and Kara Kara (43\*\*).

The largest numbers of admissions of females were of residents of Ballarat (11,448 admissions) and Bendigo (10,348), with a further 5,026 from South Barwon-Inner, 4,857 from Warrnambool, 4,638 from Shepparton and 4,266 from Wodonga.

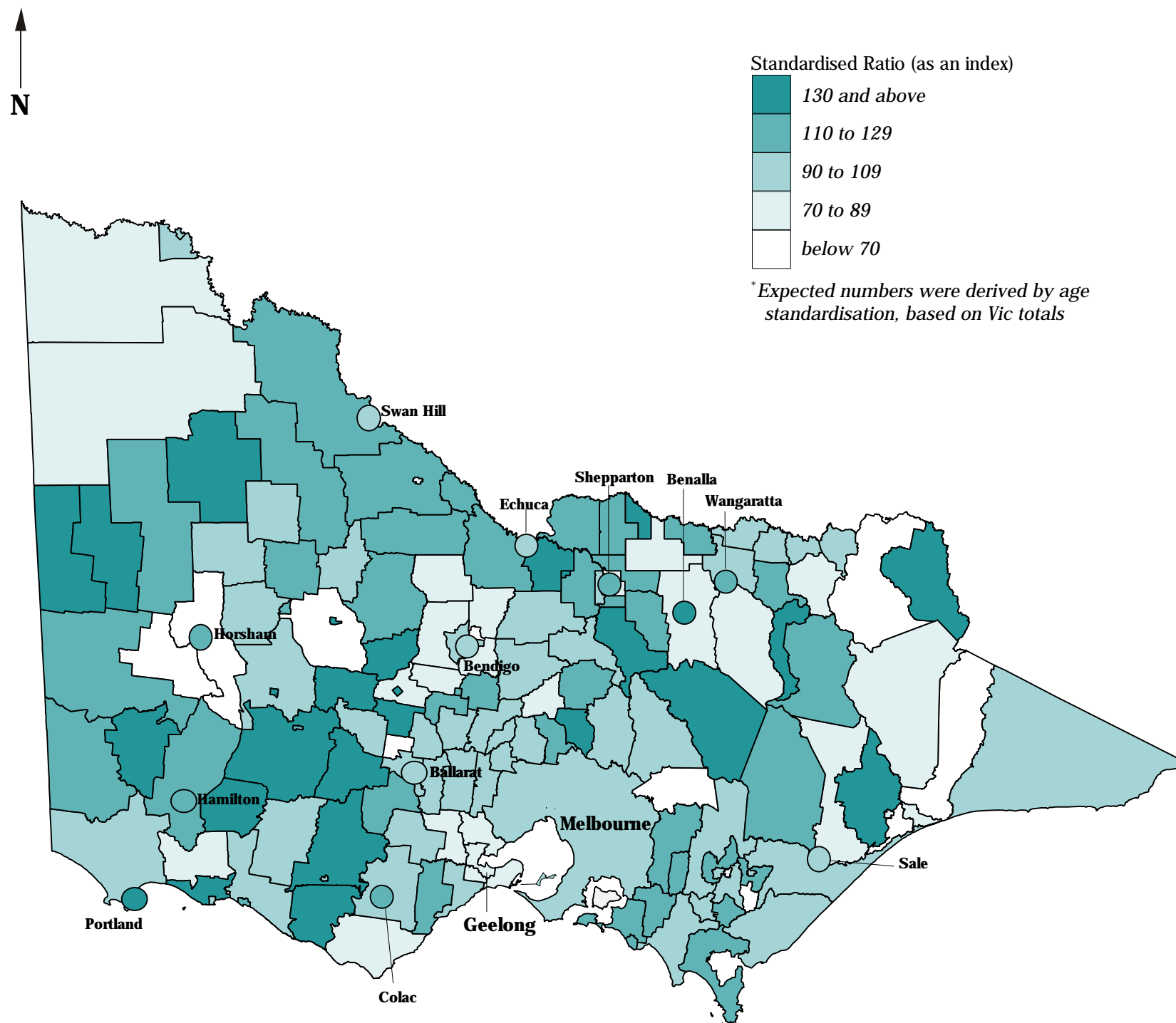
There were weak correlations with a number of the indicators of socioeconomic disadvantage, the strongest with the variables for dwellings without a motor vehicle (0.27) and housing authority rented dwellings (0.24). These results, together with the inverse correlation with the IRSD (-0.22), suggest the existence of a weak association at the SLA level between high rates of admissions of females and socioeconomic disadvantage.



## Map 6.10

### Admissions of females, Victoria, 1995/96

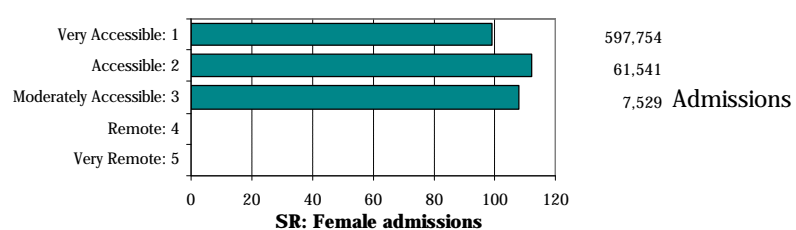
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for females have a distribution across the three ARIA categories in Victoria similar to that for males. Areas in the Very Accessible category had one per cent fewer admissions of females than were expected from the State rates, with 12 per cent more admissions than expected in the Accessible areas (an SAR of 112) and eight per cent more (108) in the Moderately Accessible areas.

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 189).

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 191).

**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 41.6 per cent of all admissions in 1995/96 of Victorian residents, with similar percentages recorded for males (42.4 per cent) and females (41.0 per cent). Same day admissions represented a higher proportion of all admissions in **Melbourne** (44.9 per cent) than in the rest of the State (34.0 per cent).

### Melbourne (Victoria as the Standard)

There were 373,503 same day admissions of residents of **Melbourne** in 1995/96, six per cent more than were expected from the State rates (an SAR of 106\*\*). This relatively high rate of admissions reflects, in part, the greater availability of (and easier access to) these services in **Melbourne** compared with the non-metropolitan areas of Victoria. Over half of the same day admissions were females (55.6 per cent, 207,758 admissions).

There were more same day admissions than expected from the State rates in two thirds of **Melbourne's** SLAs. SLAs with standardised admission ratios elevated by 15 per cent or more formed an almost continuous band around Port Phillip Bay (Map 6.11).

The highest ratios were recorded for residents of South Melbourne (with an SAR of 144\*\*), Brighton (138\*\*), Caulfield (133\*\*) and St Kilda (132\*\*). Relatively high ratios were also recorded in Sandringham (with an SAR of 126\*\*), Port Melbourne (121\*\*) and Werribee and Chelsea (both 120\*\*).

The lowest ratios were recorded for residents of Altona and Upper Yarra [Part A] (both with an SAR of 80\*\*), Melton (87\*\*) and Healesville and Springvale (both 91\*\*).

There were more than 10,000 same day admissions of residents of 12 SLAs, with the highest numbers of admissions in Waverley (13,754), Knox (13,750 admissions), Moorabbin (13,499), Keilor (12,916) and Broadmeadows (12,446).

There were correlations with the variables for managers and administrators, and professionals (0.46) and high income families (0.35), and inverse correlations with early school leavers (-0.47) and unskilled and semi-skilled workers (-0.46). These results, together with the weak correlation with the IRSD (0.26), suggest the existence of an association at the SLA level between high rates of same day admissions and high socioeconomic status.

### Geelong

There were 35 per cent fewer same day admissions in **Geelong** than were expected from the State rates (an SAR of 65\*\*). Of the 8,039 admissions, well over half (57.4 per cent) were females.

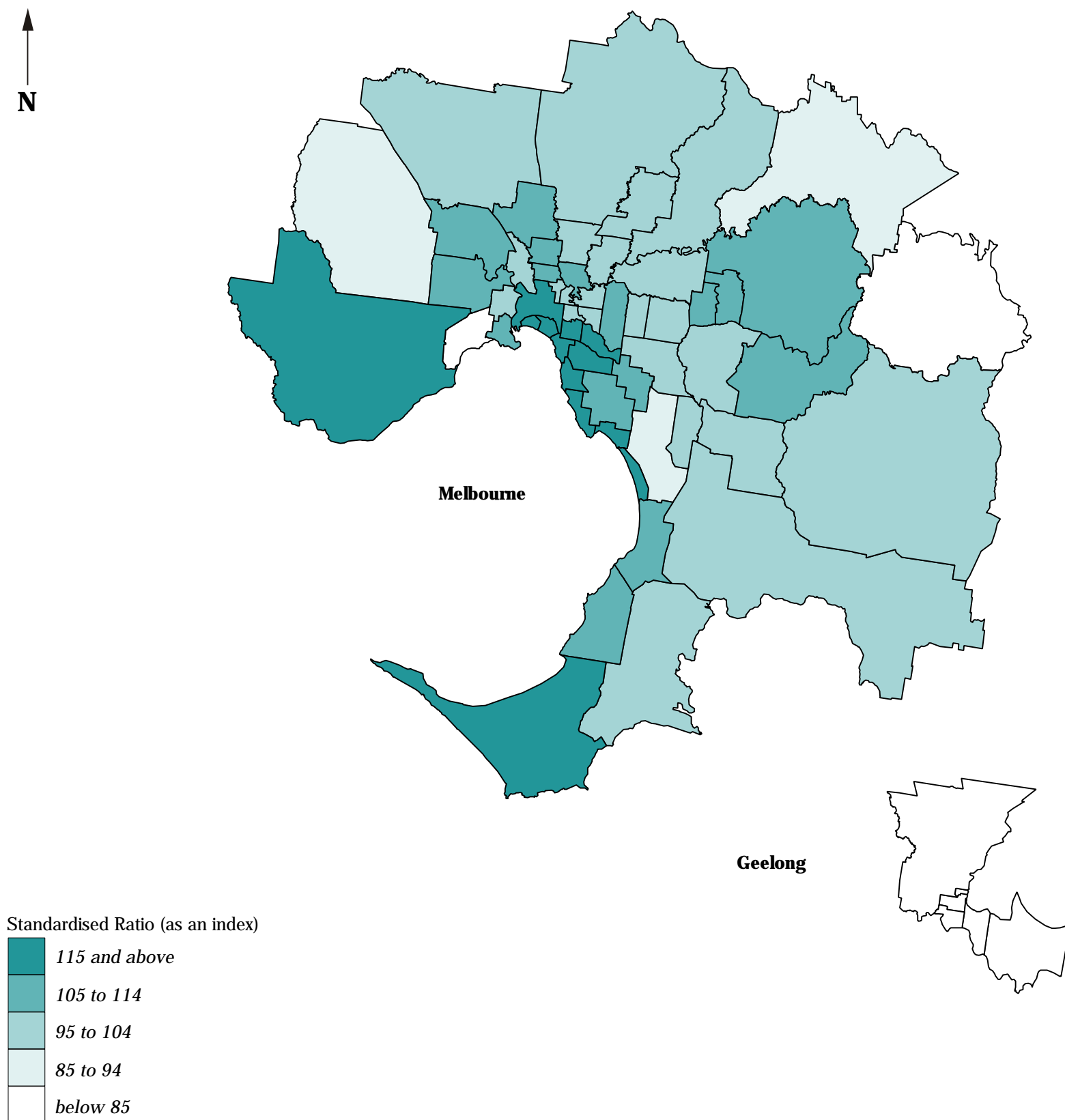
All of the five SLAs had a ratio of less than 100, with the lowest ratios in Bellarine-Inner (an SAR of 57\*\*) and Geelong West (61\*\*).

The largest number of admissions were of people from Corio-Inner (4,063 admissions), Bellarine-Inner (1,218) and Geelong West (942).

## Map 6.11

### Same day admissions, Melbourne and Geelong, 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 Vic 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 189 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 (Victoria as the Standard)

There were 112,573 same day admissions of residents of the non-metropolitan areas of Victoria, 13 per cent fewer than expected from the State rates (an SAR of 87\*\*). Females accounted for just over half (54.0 per cent) of the admissions.

Standardised admission ratios were generally low throughout Victoria, with patches of higher ratios in a number of dispersed areas, as well in many of the towns (**Map 6.12**).

Only Warragul (with an SAR of 139\*\*, 39 per cent more admissions than expected from the State rates), Mansfield and Benalla (both 131\*\*) had ratios elevated by more than 30 per cent. Other ratios elevated by 20 per cent or more were in Myrtleford and Narracan [Part A] (both with an SAR of 129\*\*), Buln Buln (125\*\*) and Wangaratta and Kyabram (both 121\*\*).

Very low ratios were recorded for residents of Tambo [Part B] (an SAR of 21\*\*), Traralgon [Part B] (21\*\*), Wimmera (24\*\*), Bairnsdale [Part A] (26\*\*), Upper Yarra [Part B] (27\*\*) and Bairnsdale (C) (29\*\*).

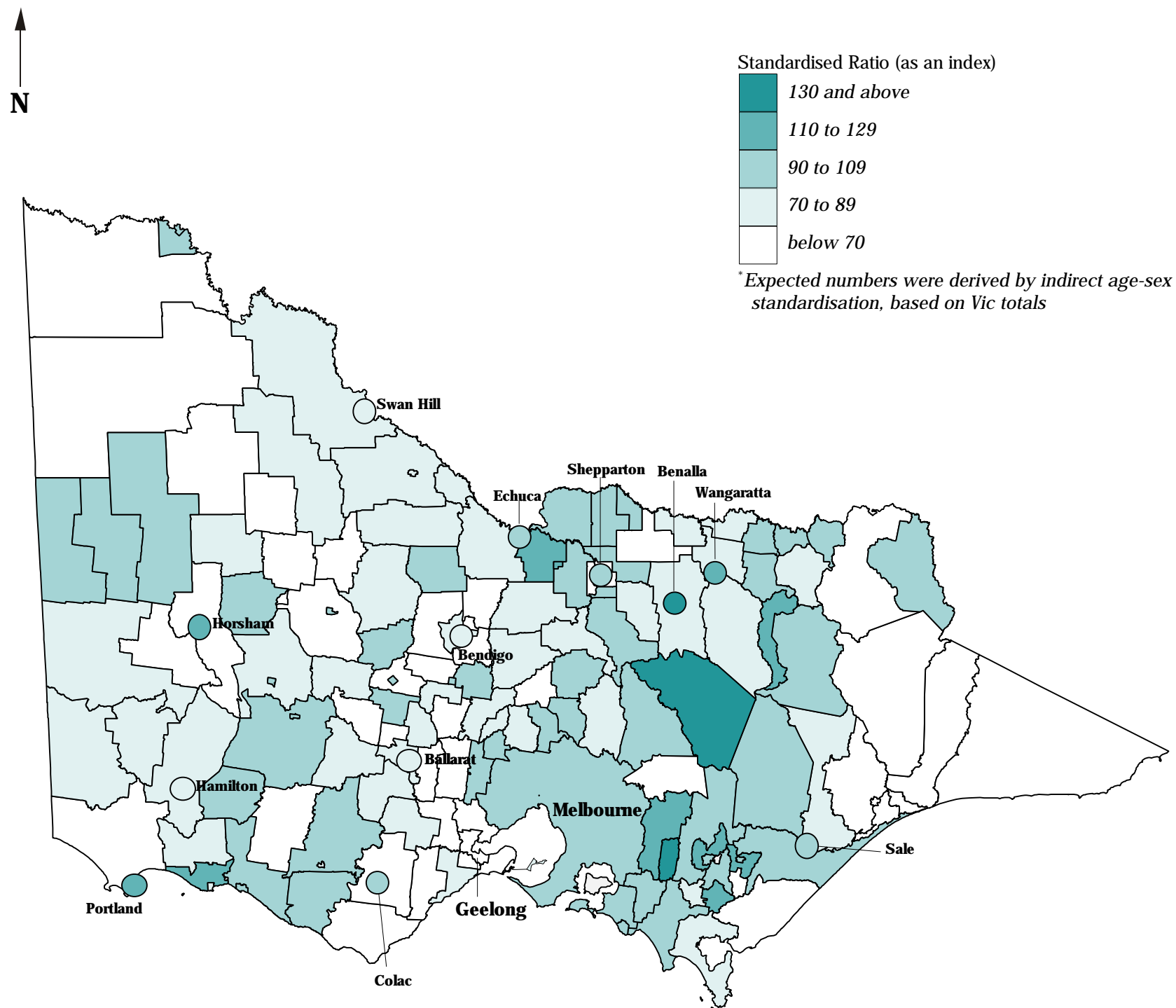
More than 3,000 same day admissions were recorded for residents of five SLAs in the non-metropolitan areas of Victoria: Ballarat (6,540 same day admissions), Bendigo (6,131), South Barwon-Inner (3,228), Wodonga (3,216) and Warrnambool (3,081).

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

## Map 6.12

### Same day admissions, Victoria, 1995/96

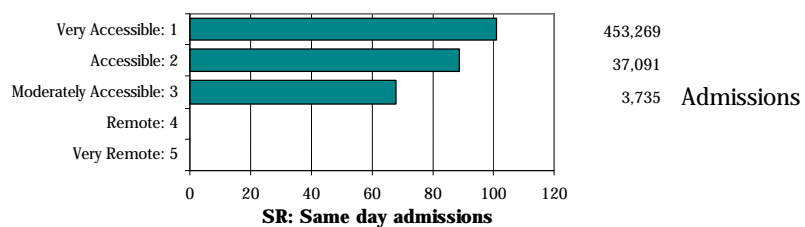
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for same day admissions are above the level expected from the State rates only in the Very Accessible areas (an SAR of 101), dropping off markedly to lower ratios of 89 in the Accessible and 68 in the Moderately Accessible areas, respectively. This pattern is likely to reflect the greater availability of, and ease of access to, these facilities in Melbourne and Geelong.

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 (35.2 admissions per thousand population for males and 32.9 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 1.4 per cent of all admissions of Victorian residents.

## Melbourne (Victoria as the Standard)

There were 10,577 admissions of residents of **Melbourne** for infectious and parasitic diseases, eight per fewer than were expected from the State rates (an SAR of 92\*\*). Males accounted for just over half (51.9 per cent) of these admissions.

Given the overall low ratio, it is not surprising that a majority of SLAs in **Melbourne** have low standardised admission ratios for infectious and parasitic diseases (**Map 6.13**). SLAs with the highest ratios are highly concentrated in the older, inner areas, while the lowest ratios dominate much of the remainder of **Melbourne**, particularly the Yarra Valley and outer areas.

Only six SLAs had standardised admission ratios elevated by 30 per cent or more. Of these, the City of Melbourne (with an SAR of 205\*\*, more than twice the number of admissions expected from the State rates) and South Melbourne (189\*\*) had the most highly elevated ratios, followed by Fitzroy (182\*\*), Northcote (157\*\*), Collingwood (141\*\*) and St Kilda (138\*\*).

The lowest ratios were recorded for residents of Altona (with an SAR of 56\*\*, almost half the number of admissions expected from the State rates), Doncaster and Templestowe and Waverley (both 69\*\*) and Healesville (69\*).

The largest numbers of admissions for infectious and parasitic diseases were of residents of the SLAs of Broadmeadows (404 admissions), Sunshine (371), Knox (365), Keilor (357), Berwick (328) and Cranbourne (328).

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

## Geelong

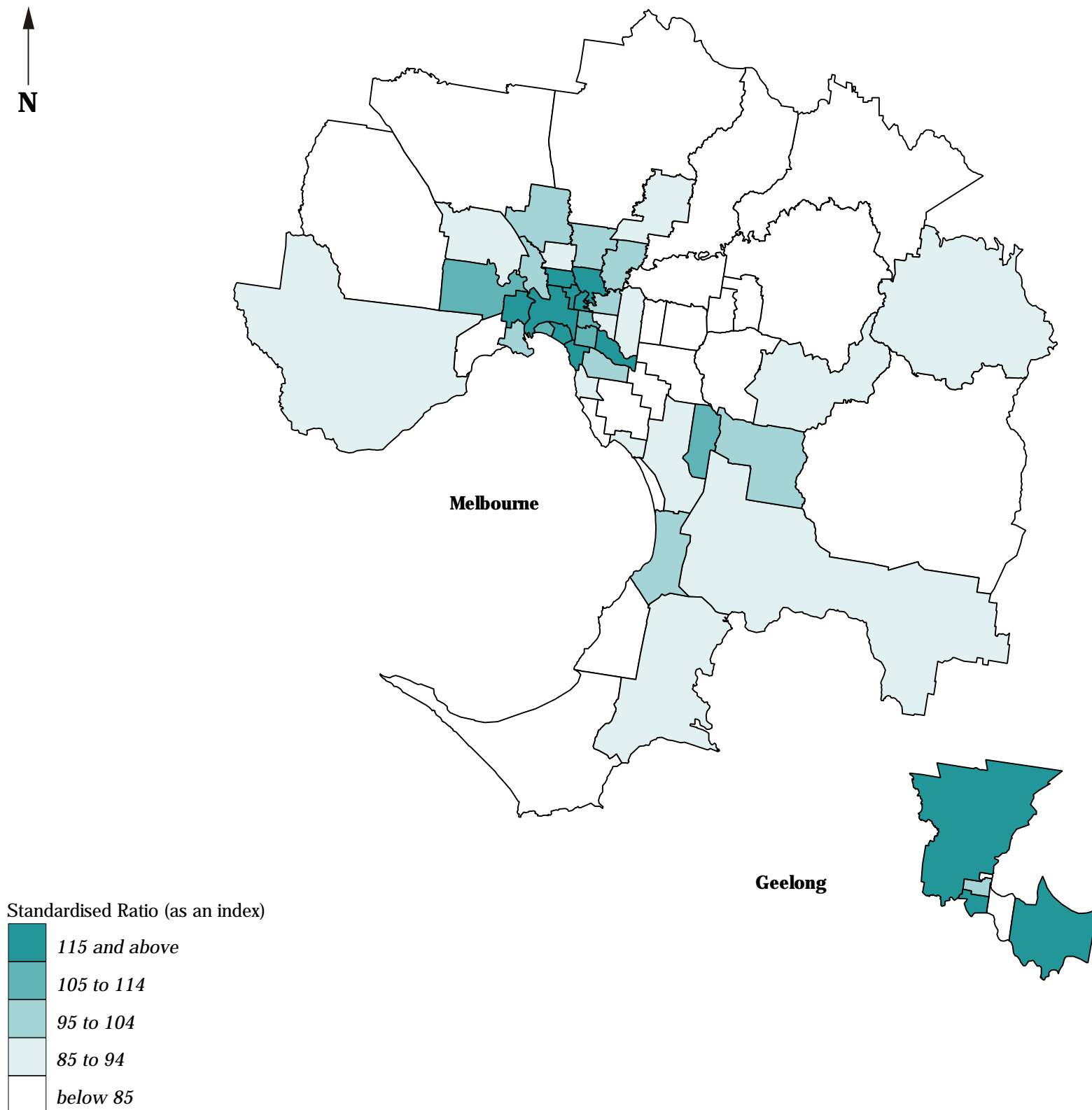
Residents of **Geelong** had 432 admissions for infectious and parasitic diseases during 1995/96, with males accounting for 51.2 per cent of these admissions. This was seven per cent more admissions than expected from the State rates (an SAR of 107). The highest ratios were recorded for residents of Bellarine-Inner (119), Newtown (117) and Corio-Inner (115\*). The lowest ratio was in the City of Geelong (50\*\*), with half the number of admissions expected from the State rates.

The largest numbers of admissions were of residents of Corio-Inner (229 admissions) and Bellarine-Inner (86 admissions).

### Map 6.13

## Admissions for infectious and parasitic diseases, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 5,204 admissions for infectious and parasitic diseases of residents of the non-metropolitan areas of Victoria, 21 per cent more than were expected from the State rates (an SAR of 121\*\*). This represents a substantially higher ratio than that recorded for residents of **Melbourne** (an SAR of 92\*\*) or **Geelong** (107). Males accounted for almost half (49.3 per cent) of these admissions.

SLAs with elevated standardised admission ratios were widespread throughout the State in both towns and rural areas. These high ratios were interspersed with SLAs with much lower ratios (**Map 6.14**).

In both Cobram (with an SAR of 325\*\*) and Kyabram (321\*\*), there were more than three times the expected number of admissions for infectious and parasitic diseases, while in Mount Rouse (284\*\*), Heytesbury (275\*\*), Myrtleford (266\*\*), Rochester (254\*\*) and Belfast (252\*\*), ratios were more than two and a half times higher than expected from the State rates. Other areas with ratios of more than twice the level expected from the State rates were Shepparton [Part B] (with an SAR of 238\*\*), Wannon (229\*\*), Upper Murray (228\*\*), Bass (211\*\*), Deakin (209\*\*) and Huntly Balance (200\*\*).

There were a further 30 SLAs with ratios elevated by between 50 per cent and 99 per cent.

The lowest ratios were recorded for residents of Romsey (64\*, less than two thirds the number of admissions expected from the State rates), Mildura Shire [Part A] (69\*\*), Horsham (71\*) and Gisborne (78).

The largest numbers of admissions were of residents of Ballarat (293 admissions), Bendigo (270 admissions), Warrnambool (180 admissions), Shepparton (158 admissions) and South Barwon-Inner (122 admissions).

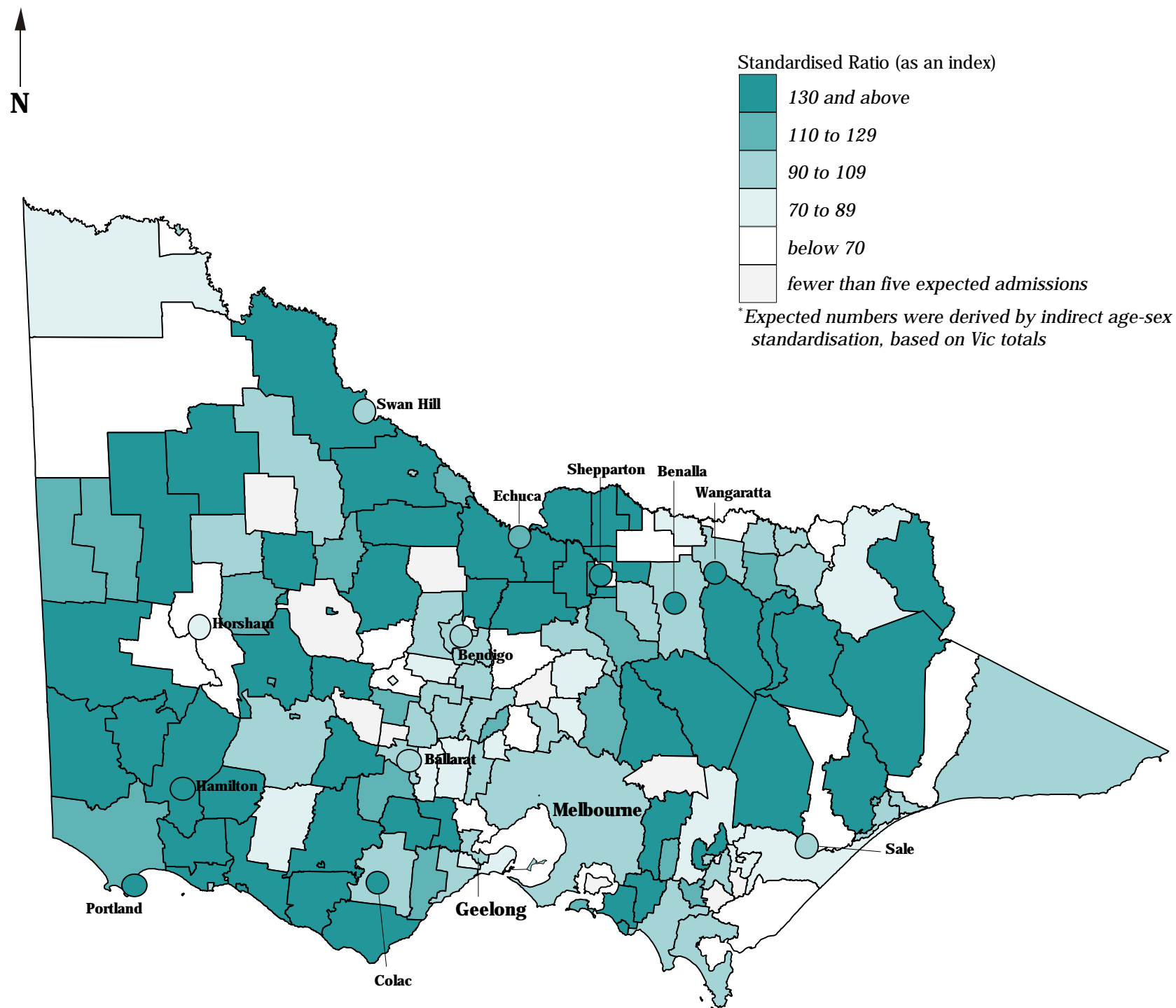
There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions for infectious diseases and socioeconomic status.



### Map 6.14

## Admissions for infectious and parasitic diseases, Victoria, 1995/96

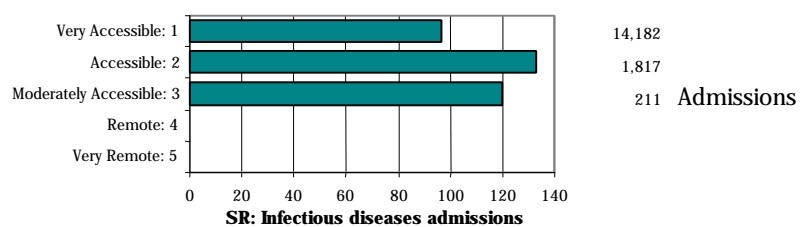
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for infectious diseases increase markedly across the ARIA categories. Areas in the Very Accessible category had three per cent fewer admissions for infectious diseases than were expected from the State rates, with 33 per cent more admissions than expected in the Accessible areas (an SAR of 133) and twenty per cent more (120) in the Moderately Accessible 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 5.2 per cent of all the admissions analysed for Victorian residents: 6.4 per cent of male admissions and 4.2 per cent of admissions of females.

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.

## Melbourne (Victoria as the Standard)

There were 43,492 admissions of residents of **Melbourne** for cancer, two per cent more than expected from the State rates (an SAR of 102\*\*). Males accounted for just over half (53.7 per cent) of these admissions.

SLAs with the highest standardised admission ratios are located in three areas: they are in and around the city centre, in the outer western suburbs and in southern Mornington Peninsula. SLAs with lower than expected SARs were generally located in the middle eastern and some eastern fringe areas (**Map 6.15**).

The most highly elevated ratios were in Flinders (an SAR of 151\*\*, 51 per cent more admissions than expected from the State rates), Brunswick and Werribee (both 135\*\*), South Melbourne (129\*\*), Mornington (127\*\*), the City of Melbourne (126\*\*) and Northcote (125\*\*).

Upper Yarra [Part A] (74\*\*) had the lowest ratio, with other ratios at least 20 per cent lower than expected in Springvale (77\*\*), Richmond (79\*\*) and Altona (80\*\*).

The largest numbers of admissions for cancer were recorded for residents living in the larger SLAs. There were 1,723 admissions from Moorabbin, and more than 1,500 from Camberwell (1,593 admissions), Waverley (1,586) and Doncaster and Templestowe (1,562). There were slightly lower numbers of admissions from Flinders (1,469 admissions) and Broadmeadows (1,429).

The correlation analysis showed there to be weak correlations with the variables for managers and administrators, and professionals (0.23) and people aged 65 years and over (0.23) and a weak inverse correlation with the variable for unskilled and semi-skilled workers (-0.28). These results, together with the weak correlation with the IRSD (0.11), suggest the existence of a weak association at the SLA level between high rates of admission for cancer and high socioeconomic status.

## Geelong

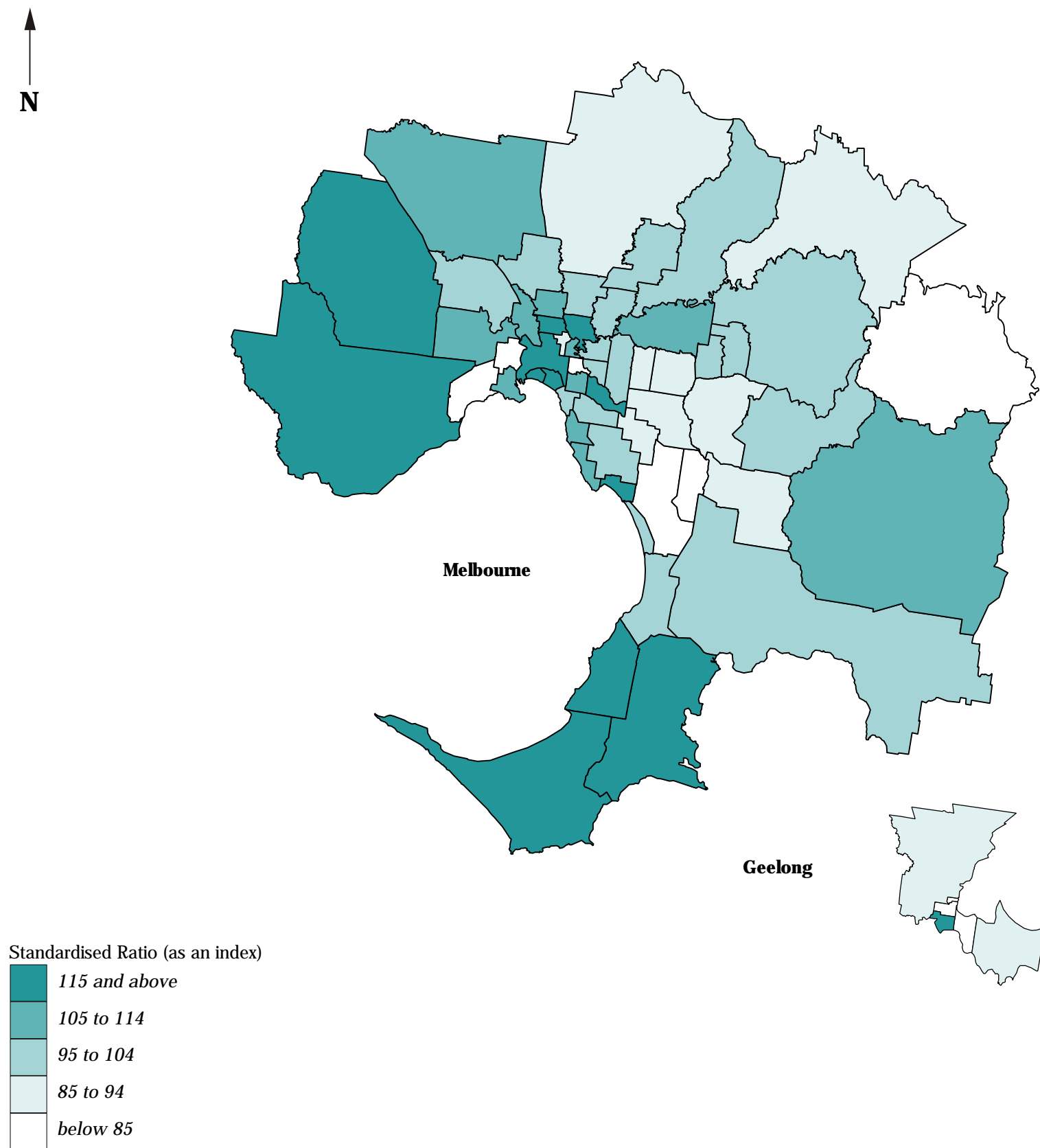
Residents of **Geelong** had 1,360 admissions for cancer, 14 per cent fewer than were expected from the State rates (an SAR of 86\*\*); just over half (53.2 per cent) of the admissions were males.

Only in Newtown (with an SAR of 115) were there more admissions than expected. The lowest ratios were recorded for residents of the City of Geelong (an SAR of 69\*\*, 31 per cent fewer admissions than expected from the State rates) and Geelong West (78\*\*). The largest number of admissions was recorded for residents of Corio-Inner (650 admissions).

## Map 6.15

### Admissions for cancer, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 16,504 admissions for cancer of residents of the non-metropolitan areas of Victoria, three per cent fewer than expected from the State rates (an SAR of 97\*\*). Males comprised just over half (55.2 per cent) of these admissions.

There is no clear pattern in the distribution across the State of standardised admission ratios for cancer, although SLAs with the lowest rates tend to be more clustered than are those with the highest ratios (**Map 6.16**).

The most highly elevated ratio (in SLAs with more than 20 admissions) was recorded for residents of Broadford, with more than twice the number of admissions expected from the State rates (an SAR of 210\*\*). Highly elevated ratios were also recorded for residents of Bet Bet (with an SAR of 181\*\*); Kilmore (167\*\*); Dunmunkle and Lowan (both 158\*\*); Myrtleford (156\*\*); Bright (154\*\*); and Lexton (153\*\*).

The lowest ratios were in Rodney [Part A] (with an SAR of 45\*\* with less than half the admissions expected from the State rates), Waranga and Benalla (both 57\*\*), Glenelg and Bairnsdale (both 60\*\*), and Heywood and Dundas (both 61\*\*).

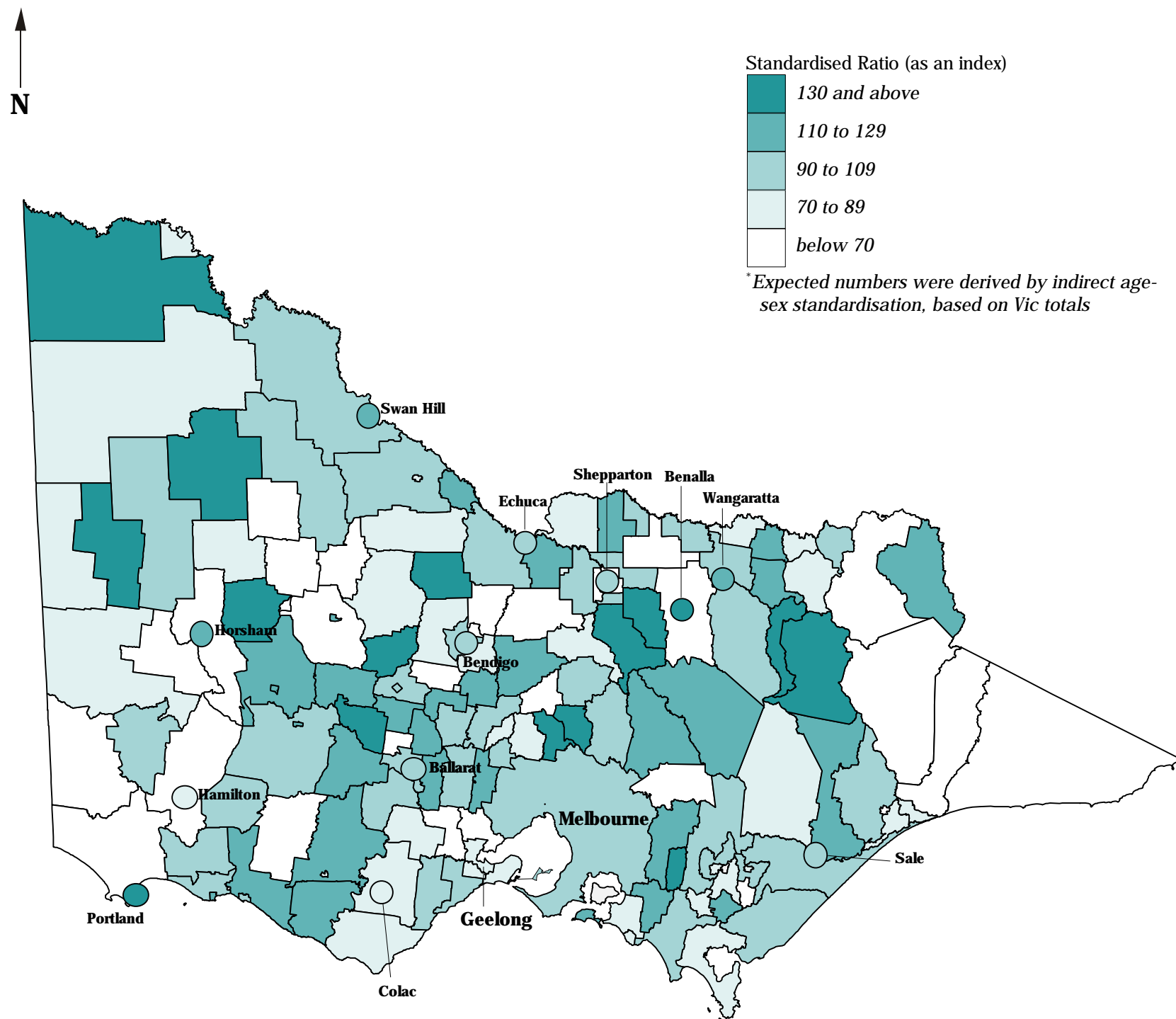
The largest numbers of admissions were recorded for residents of Ballarat, with 1,107, and Bendigo with 936. Other SLAs with relatively high numbers of admissions for cancer were South Barwon-Inner (544 admissions), Warrnambool (393), Greater Geelong [Part B] (374) and Shepparton (344).

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

## Map 6.16

### Admissions for cancer, Victoria, 1995/96

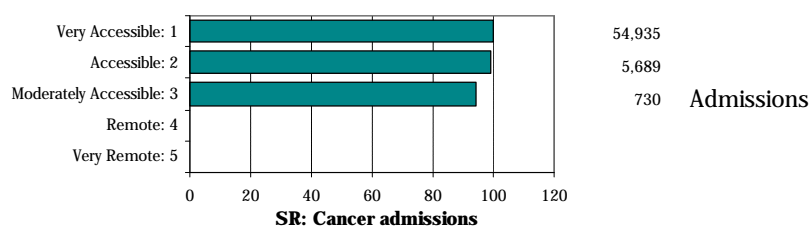
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for cancer varied only marginally across the three 'accessible' ARIA categories, from SARs of 100 in the Very Accessible areas and 99 in the Accessible areas, to an SAR of 94 in Moderately Accessible areas (six per cent fewer admissions for cancer than expected from the State rates).

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 6.5 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 Victorian residents.

As noted in the commentary to the map for all cancers (page 222), 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).

### Melbourne (Victoria as the Standard)

There were 2,709 admissions of residents of **Melbourne** for lung cancer, two per cent fewer than expected from the State rates (an SAR of 98). Males comprised just over two thirds (67.7 per cent) of these admissions.

SLAs with highly elevated standardised admission ratios were mainly confined to the middle and outer western suburbs and a cluster of inner SLAs, north of the city centre (**Map 6.17**). SLAs with low ratios were concentrated in the middle and outer eastern areas.

The highest ratio was recorded for residents of Brunswick, with more than twice the number of admissions for lung cancer than were expected from the State rates (an SAR of 220\*\*). Highly elevated ratios were also recorded in Werribee (211\*\*), South Melbourne (196\*\*), Morningside (152\*\*) and Sunshine (141\*\*), with other elevated ratios in Northcote (130), Keilor (129\*\*), Melton (128) and Fitzroy (126).

Excluding Healesville, Upper Yarra [Part A] and Richmond (all with fewer than 20 admissions for lung cancer) the lowest ratios were recorded for residents of Prahran (an SAR of 50\*\*), Caulfield (68\*\*), Box Hill (68\*\*), Altona (72) and Ringwood (73).

The largest numbers of admissions were recorded for residents of Sunshine (115 admissions for lung cancer), and Doncaster and Templestowe (108 admissions). Other SLAs with more than 100 admissions for lung cancer were Moorabbin (107) and Keilor and Broadmeadows (both 104).

There were weak correlations with the indicators of socioeconomic disadvantage (the strongest with the variable for unemployment (0.24)) and weak inverse correlations with the indicators of high socioeconomic status. These results, together with the weak inverse correlation with the IRSD (-0.18), suggest the existence of an association at the SLA level between high rates of admission for lung cancer and socioeconomic disadvantage. There were also weak correlations with the variables for people born in a predominantly non-English speaking country (0.22 with those reporting poor proficiency in English and 0.20 for those resident for more than five years), suggesting higher admission rates among these population groups.

### Geelong

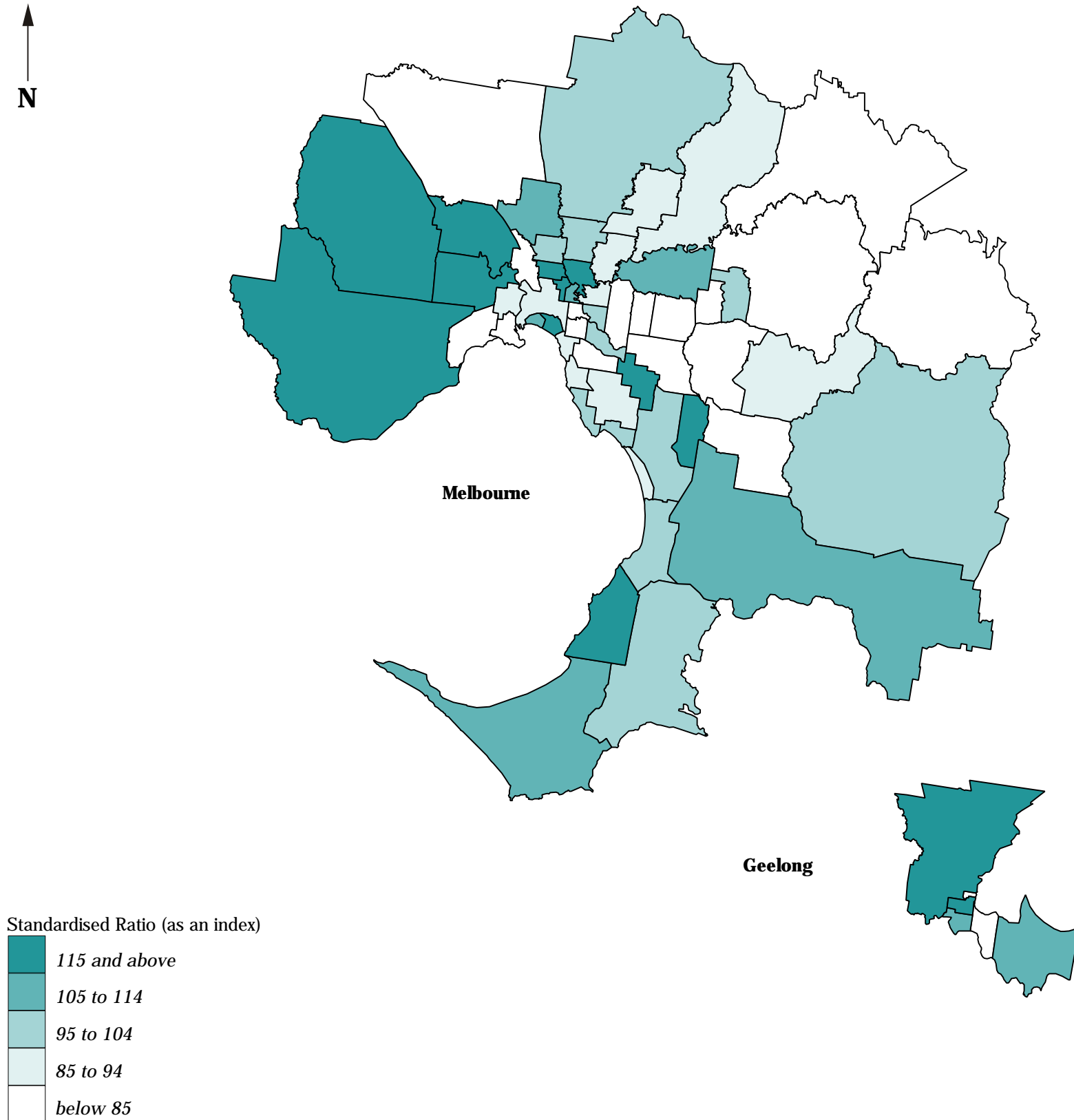
There were 120 admissions of residents of **Geelong** for lung cancer, 14 per cent more than expected from the State rates (an SAR of 114). Two thirds (66.7 per cent) were of males.

Only two SLAs had 20 or more admissions for lung cancer. In Geelong West there were 21 admissions (and an SAR of 143), while in Corio-Inner there were 63 admissions (an SAR of 126). Neither ratio was statistically significant.

### Map 6.17

## Admissions for lung cancer, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 1,179 admissions of non-metropolitan residents from lung cancer, four per cent more admissions than expected from the State rates (an SAR of 104). Males comprised almost three quarters (71.9 per cent) of these admissions.

Based on the State rates, fewer than five admissions for lung cancer were expected from many SLAs: however the map has been included as the areas with sufficient cases to produce reliable results are informative (**Map 6.18**).

The highest ratio (in SLAs with more than 20 admissions for lung cancer) was recorded for residents of Bet Bet (an SAR of 758\*\* and 21 admissions), with more than seven times the number of admissions expected from the State rates. Highly elevated ratios were also recorded in Benalla (an SAR of 278\*\* and 28 admissions), Portland (255\*\*; 23), the town of Swan Hill (C) (238\*\*; 23) and the Shire of Swan Hill (227\*\*; 27).

Of SLAs with standardised admission ratios lower than expected from the State rates, only South Barwon-Inner had a statistically significant ratio (with an SAR of 54\*\* and 22 admissions for lung cancer). Other SLAs with low ratios were Shepparton (83) and Warrnambool (85).

The largest numbers of admissions were recorded for residents of Ballarat (75 admissions), Bendigo (55 admissions), Benalla (28 admissions) and the Shire of Swan Hill (27 admissions).

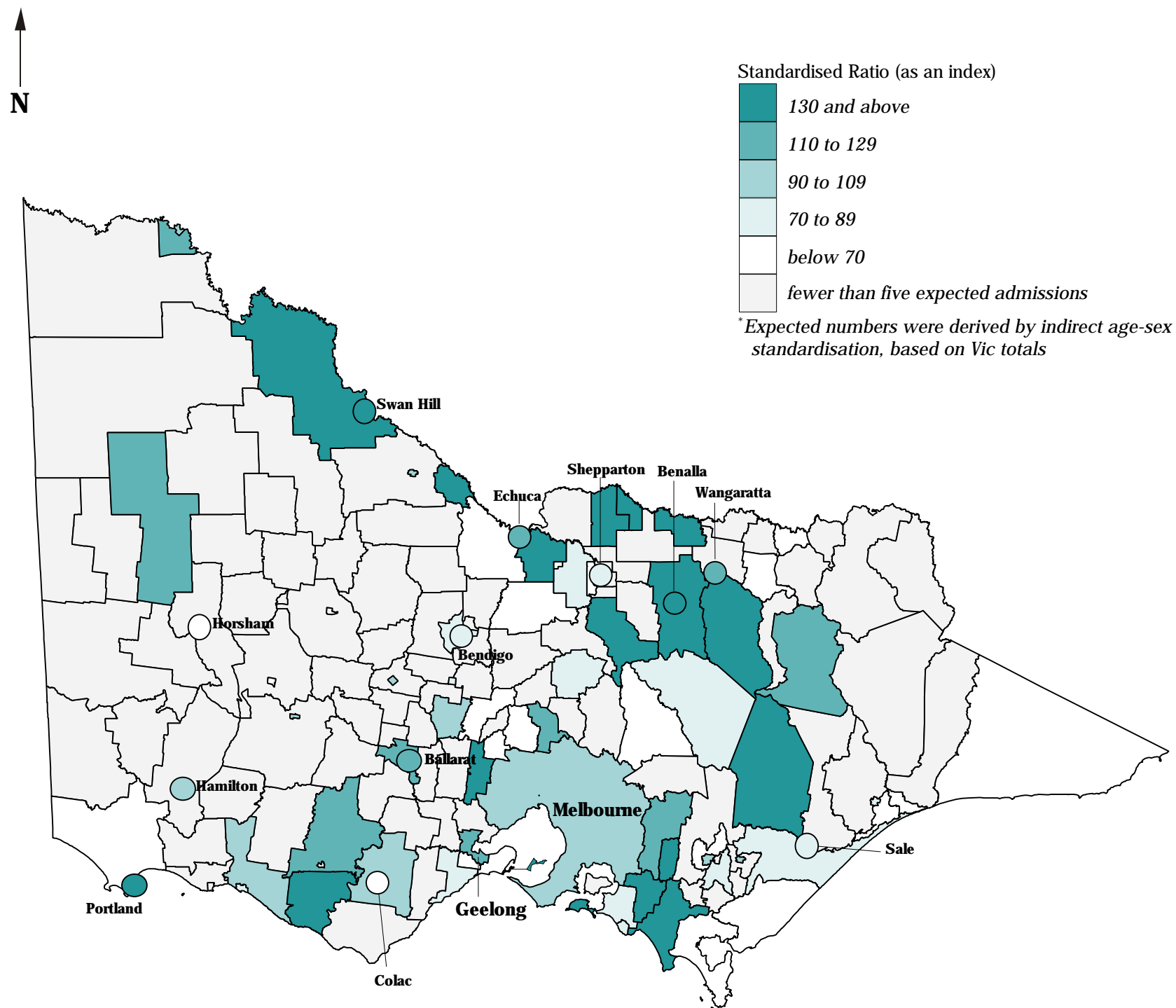
The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.



## Map 6.18

### Admissions for lung cancer, Victoria, 1995/96

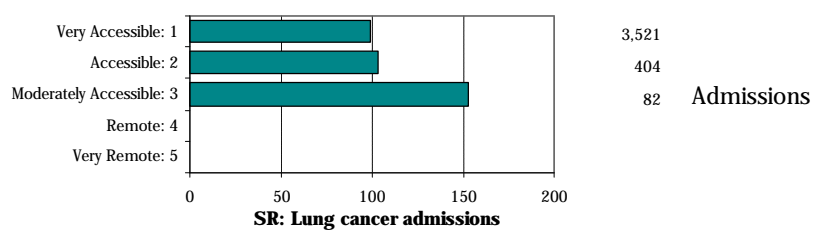
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for lung cancer present a different distribution from those for all cancers when examined by ARIA categories. The Very Accessible and Accessible areas have ratios close to the level expected from the State rates (SARs of 99 and 103, respectively). Areas in the Moderately Accessible category have a highly elevated ratio of 153 (53 per cent more admissions than expected from the State rates).

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 recorded for females in Victoria. Incidence rates for some cancers are higher among people from the affluent areas (Esterman et al. 1990).

In 1995/96, hospital admissions for breast cancer accounted for 0.4 per cent of all admissions analysed and 7.3 per cent of admissions for cancer of Victorian residents.

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

## Melbourne (Victoria as the Standard)

In 1995/96, there were 3,326 admissions of females aged 40 years or over for breast cancer who were residents of **Melbourne**, five per cent more admissions than were expected from the State rates (an SAR of 105\*\*).

SLAs with the highest standardised admission ratios for breast cancer are most heavily concentrated in and around the city centre and in some middle and outer south-eastern suburbs. Very low ratios were recorded in many SLAs located adjacent to those with the highest ratios, as well as in other areas (Map 6.19).

There were more than twice the number of admissions expected from the State rates for female residents of the City of Melbourne (with an SAR of 265\*\*), Northcote (222\*\*) and Brunswick (215\*\*), with other highly elevated ratios in Williamstown (192\*\*), Mornington (188\*\*), Cranbourne (174\*\*), Hastings and Sunshine (both with an SAR of 166\*\*) and Port Melbourne (157).

The lowest standardised admission ratio for these cancers was recorded for females resident in Oakleigh, with 59 per cent fewer admissions than expected from the State rates (an SAR of 41\*\*). Other low ratios were in Altona (with an SAR of 63\*), Footscray (71), Coburg (76) and Waverley (77\*\*). Low SARs were also recorded in Healesville (46), Collingwood (62) and Richmond (64), but each of these SLAs had fewer than 20 admissions, and the ratios were not statistically significant.

There were 153 admissions for breast cancer of female residents of Sunshine, and 138 from Camberwell, with just over 100 admissions from Cranbourne, Broadmeadows, Keilor, Moorabbin, Doncaster and Templestowe and Waverley.

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

## Geelong

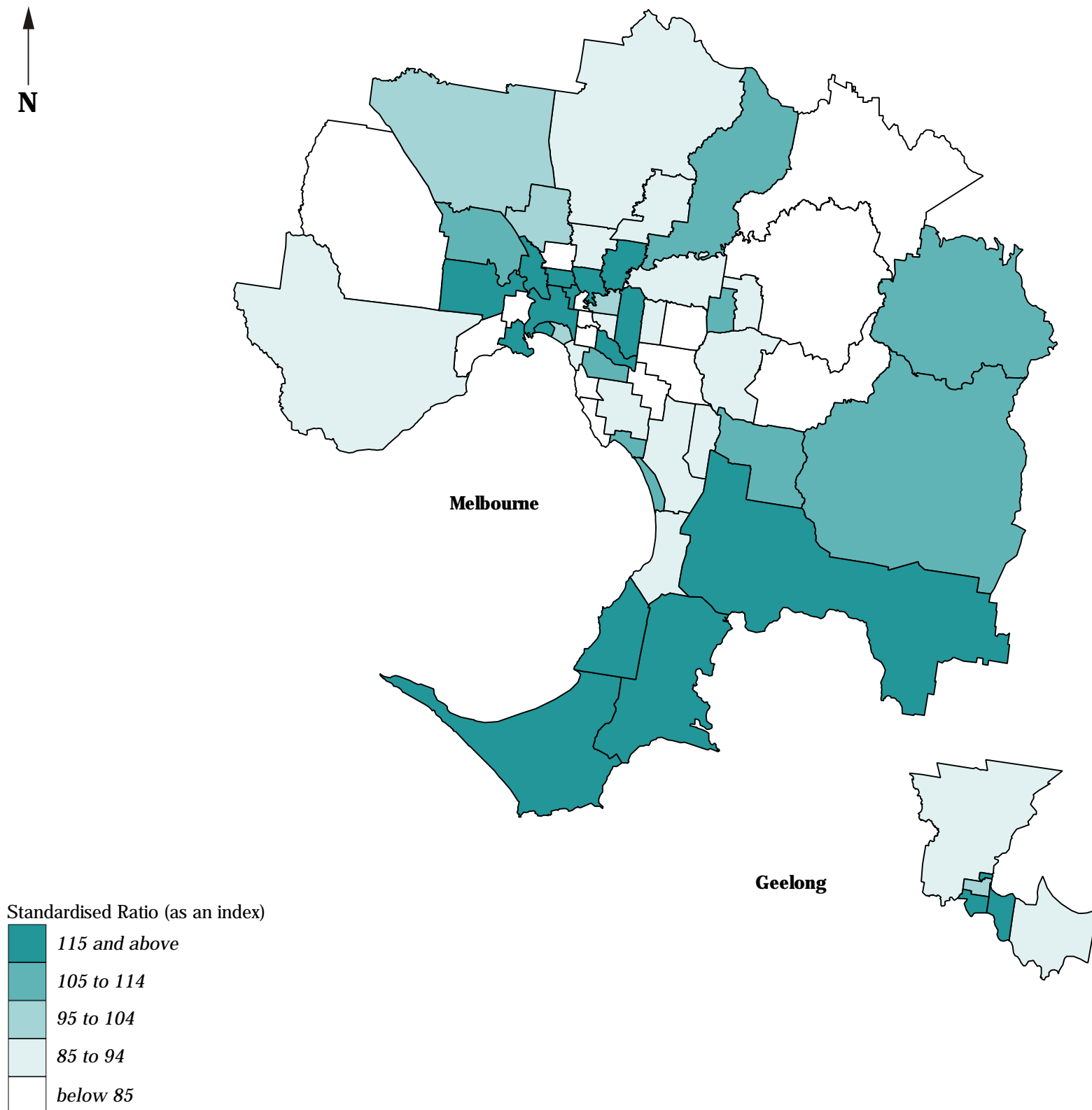
There were 113 admissions for breast cancer of female residents of **Geelong**, an SAR of 101. Neither the ratio for the **Geelong** major urban centre nor those for any of its SLAs was statistically significant.

The highest ratios were recorded for females resident in Newtown (an SAR of 156) and the City of Geelong (135), while the lowest was for Corio-Inner (86). The largest numbers of admissions were recorded for females in Corio-Inner (47 admissions) and the City of Geelong (18 admissions).

### Map 6.19

## Admissions of females aged 40 years and over for breast cancer, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

In 1995/96, there were 1,020 admissions for breast cancer of female residents of the non-metropolitan areas of Victoria aged 40 years or over, 14 per cent fewer admissions than expected from the State rates (an SAR of 86\*\*).

Based on the State rates, fewer than five admissions of females for breast cancer were expected from many SLAs: however the map has been included as the areas with sufficient cases to produce reliable results are informative (**Map 6.20**).

Of SLAs with 20 or more admissions, the highest ratio was recorded for female residents of Phillip Island, an SAR of 294\*\* and 23 admissions. Other SLAs with high ratios were Woorayl (137), Mildura (119) and South Barwon-Inner (113). High standardised admission ratios were also recorded for females in Lowan (376\*\*), Newstead (235\*), Ararat (201\*\*) and Metcalfe (201), however, these ratios were based on 17 or fewer admissions.

The lowest ratios were recorded for female residents of Greater Geelong [Part B] (with an SAR of 65\* and 21 admissions) and Bendigo (64\*\*).

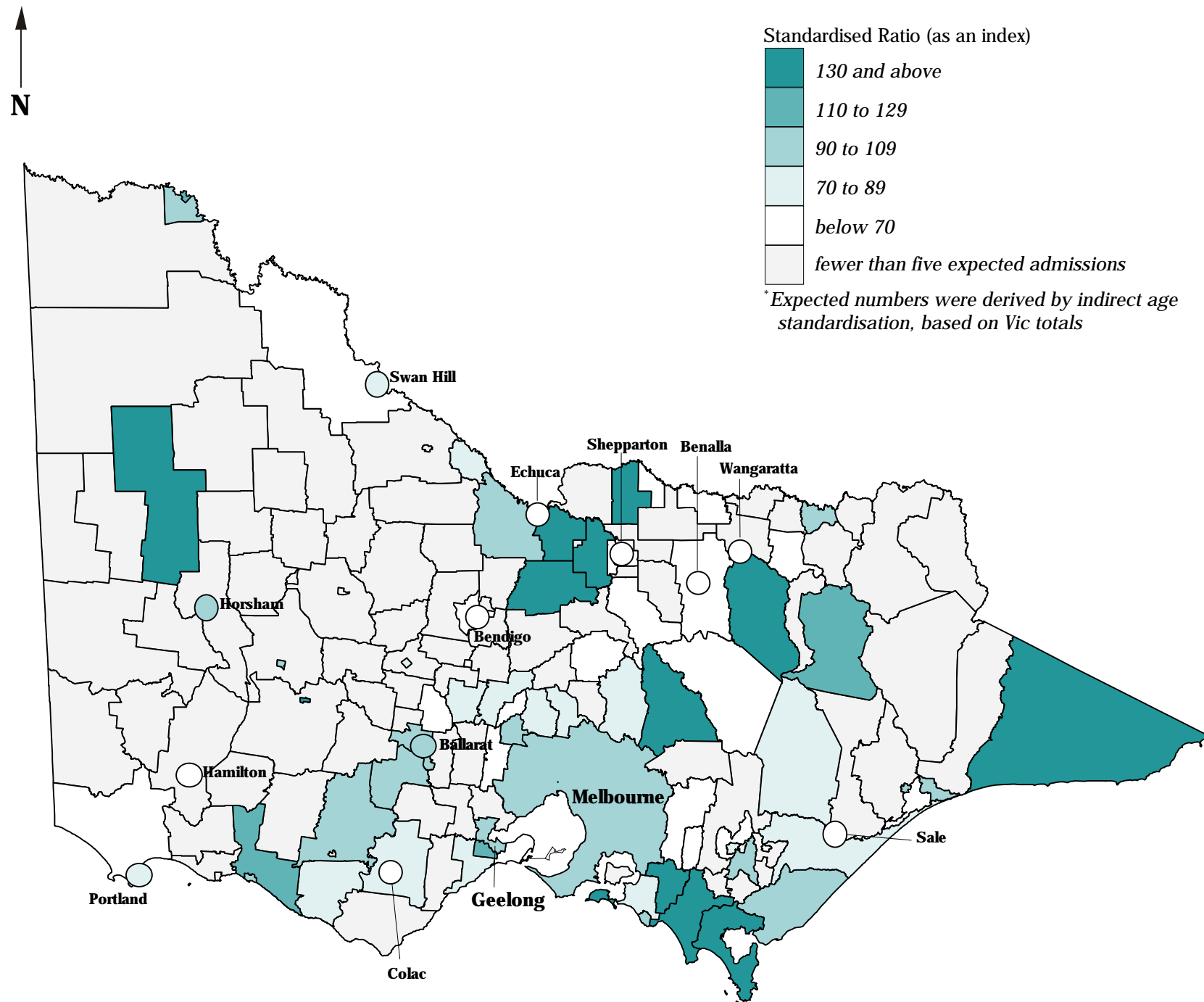
The largest numbers of admissions were of female residents from Ballarat (79 admissions), South Barwon-Inner (51), Bendigo (49), Mildura and Wodonga (26) and Warrnambool (24).

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, Victoria, 1995/96**

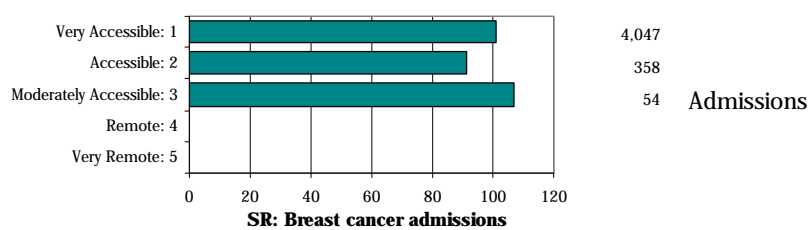
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios (SARs) for cancer of the female breast are highest in the Moderately Accessible areas (with an SAR of 107) and lowest in the Accessible areas (an SAR of 91). There were close to the expected numbers of admissions of female residents of the Very Accessible areas (an SAR of 101).

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 either psychosis; neurotic, personality or other mental disorders; or mental retardation. The variable mapped opposite is of patients 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 1.5 per cent of all admissions analysed for Victorian residents, with similar proportions recorded for country (1.2 per cent) and metropolitan (1.6 per cent) residents.

## Melbourne (Victoria as the Standard)

There were 13,343 admissions of residents of **Melbourne** in 1995/96 for psychosis, four per cent more admissions of residents of **Melbourne** than were expected from the State rates (an SAR of 104\*\*). Females accounted for over half (55.8 per cent) of these admissions.

The spatial distribution of patient addresses for this condition can be affected by the location of hostels, boarding houses and shelters providing accommodation for people with chronic psychiatric disabilities. 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 other homeless people, including those who live largely 'on the street'.

SLAs with high ratios were concentrated in a strip extending from the city centre, south-east to Springvale (Map 6.21). Areas with the lowest ratios were particularly concentrated in suburbs to the west, east and outer south-east of **Melbourne**.

The most highly elevated ratios were in Ringwood (with an SAR of 220\*\*) and St Kilda (219\*\*), with other highly elevated ratios in South Melbourne and Prahran, both with an SAR of 180\*\*; Brighton (172\*\*); Fitzroy (170\*\*); and the City of Melbourne and Caulfield (both with an SAR of 168\*\*).

Very low ratios were recorded in Melton (with an SAR of 30\*\*, 70 per cent fewer admissions for psychosis than expected from the State rates) and Werribee (32\*\*), with low ratios also in Altona (36\*\*), Bulla (45\*\*), Sunshine and Keilor (both 52\*\*), Cranbourne (59\*\*), Doncaster and Templestowe (64\*\*) and Footscray (68\*\*).

The largest numbers of admissions were recorded for residents of Caulfield and Knox, with 580 and 500 admissions respectively. There were more than 400 admissions in Moorabbin (486 admissions), Waverley (461), St Kilda (449), Springvale (446) and Nunawading (444).

There were correlations at the SLA level with the variables for managers and administrators, and professionals (of meaningful significance, 0.55), dwellings without a motor vehicle (0.44) and female labour force participation (0.40); and inverse correlations of meaningful significance with early school leavers (-0.58) and unskilled and semi-skilled workers (-0.50). These results, together with the weak correlation with the IRSD (0.26), suggest the existence of an association at the SLA level between high rates of admission for psychosis and high socioeconomic status.

## Geelong

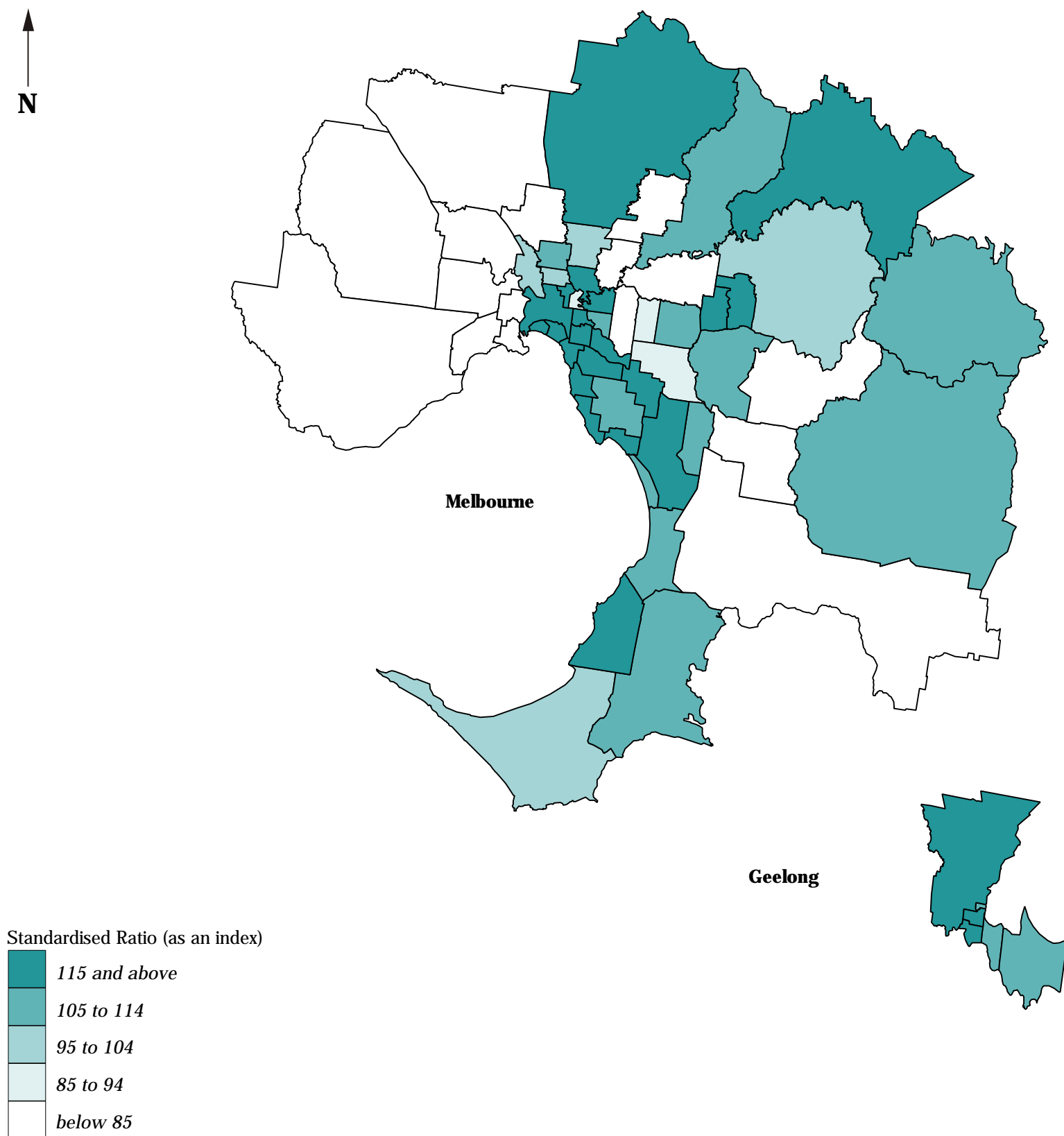
There were 575 admissions of residents of **Geelong** in 1995/96 for psychosis (an SAR of 127\*\*). Females accounted for almost two thirds (62.3 per cent) of these admissions.

All of the SLAs in **Geelong** had elevated ratios, with the most highly elevated being in Newtown (an SAR of 168\*\*), Geelong West (150\*\*) and Corio-Inner (123\*\*); the lowest was in the City of Geelong (106).

## Map 6.21

### Admissions for psychosis, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

In 1995/96, there were 4,017 admissions for psychosis of residents of the non-metropolitan areas of Victoria, 14 per cent fewer admissions than were expected from the State rates (an SAR of 86\*\*). Females represented over half (57.7 per cent) of all admissions for this condition.

Areas with elevated ratios were concentrated in the State's north-west and to the north of **Melbourne**, with an extensive band of SLAs with very low ratios stretching from Portland on the coast to Swan Hill and Echuca on the river (Map 6.22).

Of SLAs with at least 20 admissions, the highest ratios were recorded for residents from the north-west of the State, where Mildura [Part B] had 42 admissions from psychosis, more than six times the number expected from the State rates, an SAR of 674\*\*. In the adjacent City of Mildura, there were almost four times the number of admissions expected from the State rates (an SAR of 371\*\*), while in nearby Karkaroc (now known as Yarrambiack North), there were more than two and a half times more admissions for psychosis than expected (an SAR of 261\*\*). Elevated ratios were also recorded in the regional centres of Colac (with an SAR of 245\*\*), Lowan (233\*\*) and Warracknabeal (225\*\*). A further eight SLAs had standardised admission rates for psychosis elevated by 50 per cent or more above the levels expected. The standardised admission ratios recorded for these SLAs were all statistically significant.

The lowest ratios were in Ballarat and Bendigo (both with an SAR of 38\*\*, 62 per cent fewer admissions than expected from the State rates); Swan Hill (48\*\*); and Traralgon (51\*\*).

The largest numbers of admissions for psychosis were of residents of South Barwon-Inner, with 460 admissions and Mildura, with 330 admissions. More than 100 admissions were recorded for residents of Mildura Shire [Part A] (134 admissions), Shepparton (120), Ballarat (115), Bendigo (110) and Colac (108).

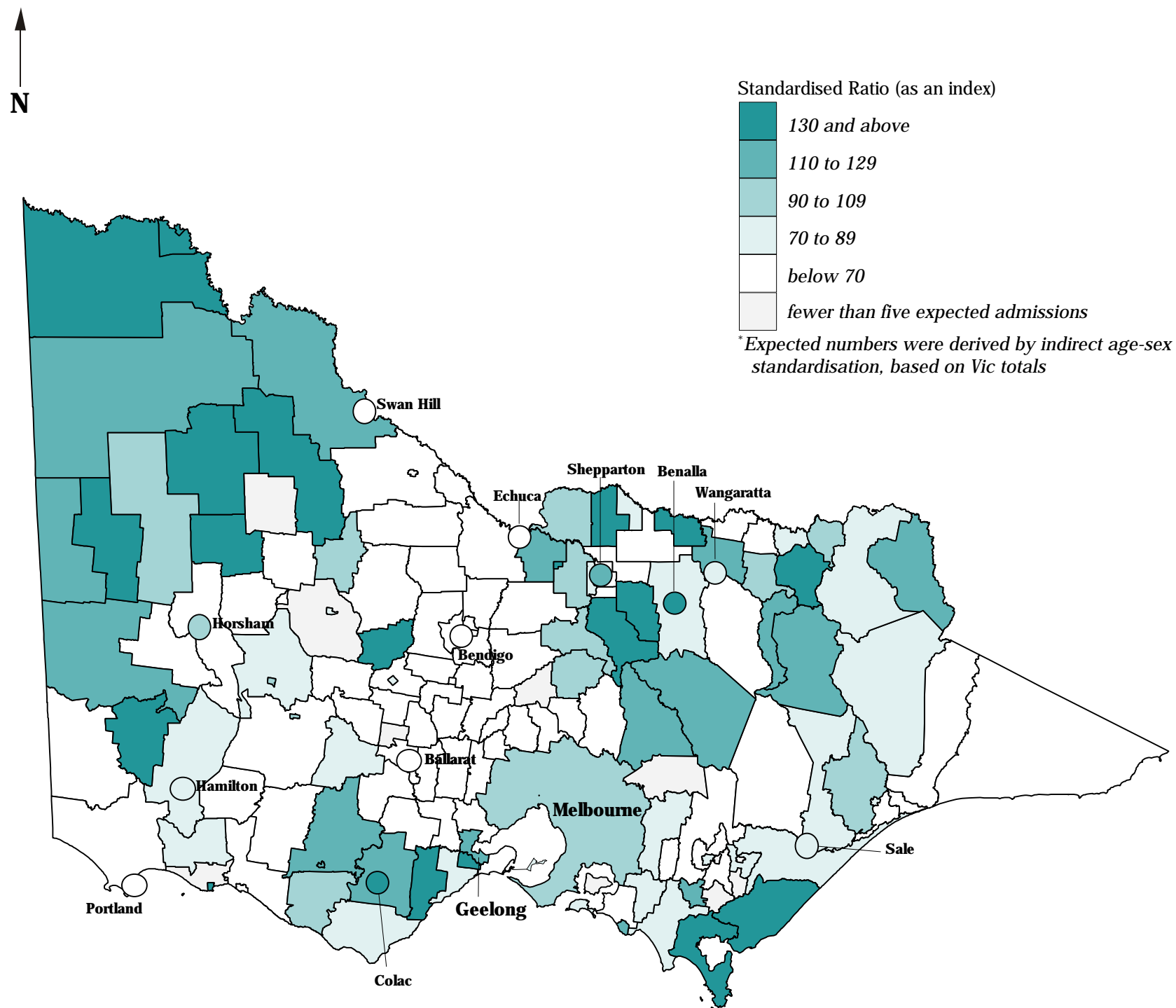
There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions for psychosis and socioeconomic status.



## Map 6.22

### Admissions for psychosis, Victoria, 1995/96

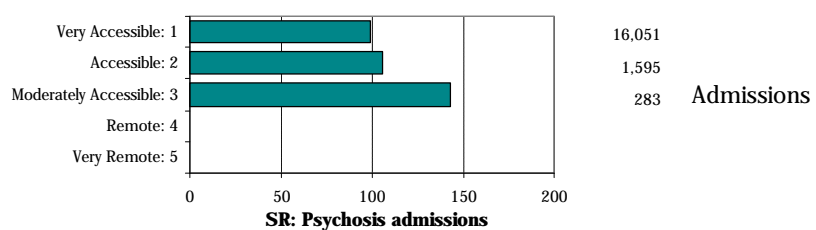
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for psychosis increase from close to the expected numbers of admissions in the Very Accessible areas (an SAR of 99) to six per cent more than expected in the Accessible areas (106), before increasing substantially to an SAR of 143 in the Very Accessible areas. The numbers of admissions outside of the Very Accessible areas are, however, quite low.

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

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

## Capital city comparison (Australia as the Standard)

As was the case for admissions for psychosis, standardised admission ratios (SARs) for admissions for neurotic, personality or other mental disorders (described below) varied widely between the capital cities (**Table 6.28**). 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 234) by the fact that a neurosis arises as a result of stresses and anxieties in the person's environment. The most common are anxiety states, reactive depression and obsessive compulsive disorders.

Females had a higher overall rate of admissions for neurotic personality or other mental disorders than did males (357.5 admissions per 100,000 population compared with 237.8) and higher rates at almost all ages, in particular from 15 through to 44 years of age. Admissions to hospital for neurotic, personality or other mental disorders accounted for 1.1 per cent of all the admissions analysed for Victorian residents.

## Melbourne (Victoria as the Standard)

There were 9,278 admissions for neurotic, personality or other mental disorders of residents of **Melbourne**, 3.0 per cent fewer than expected from the State rates (an SAR of 97\*\*). This indicates a lower rate of admissions from these causes than for residents of the non-metropolitan areas, with a ratio elevated by ten per cent (an SAR of 110\*\*). This is in contrast to the higher rate of admissions for psychosis among metropolitan residents (page 234). Females accounted for well over half (61.5 per cent) of these admissions.

SLAs with elevated standardised admission ratios are concentrated in and around the city centre and in a strip extending south-east to Moorabbin, together with isolated areas in the middle north-eastern, eastern and south-eastern suburbs (**Map 6.23**). Areas with low ratios were particularly concentrated to the west of the city and in the outlying eastern suburbs.

Highly elevated ratios were recorded for residents of the older inner areas of Richmond (an SAR of 182\*\*), the City of Melbourne (181\*\*), St Kilda (180\*\*), South Melbourne (179\*\*), Fitzroy (163\*\*) and Prahran (153\*\*). Relatively highly elevated ratios were also recorded for residents of Dandenong (140\*\*), Camberwell (136\*\*), Collingwood (127) and Caulfield (125\*\*).

SLAs in **Melbourne's** west, including Altona (with an SAR of 38\*\*), Melton (45\*\*) and Keilor (47\*\*), had the lowest ratios. Elsewhere in **Melbourne**, low ratios were recorded in Werribee (with an SAR of 54\*\*), Pakenham (58\*\*), Upper Yarra [Part A] (62\*\*) and Sunshine (67\*\*).

In 1995/96, there were 384 admissions of residents of Camberwell for neurotic, personality or other mental disorders, with 356 from Moorabbin, 353 from Knox, 305 from Waverley, 283 from Caulfield and 281 from Nunawading.

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

## Geelong

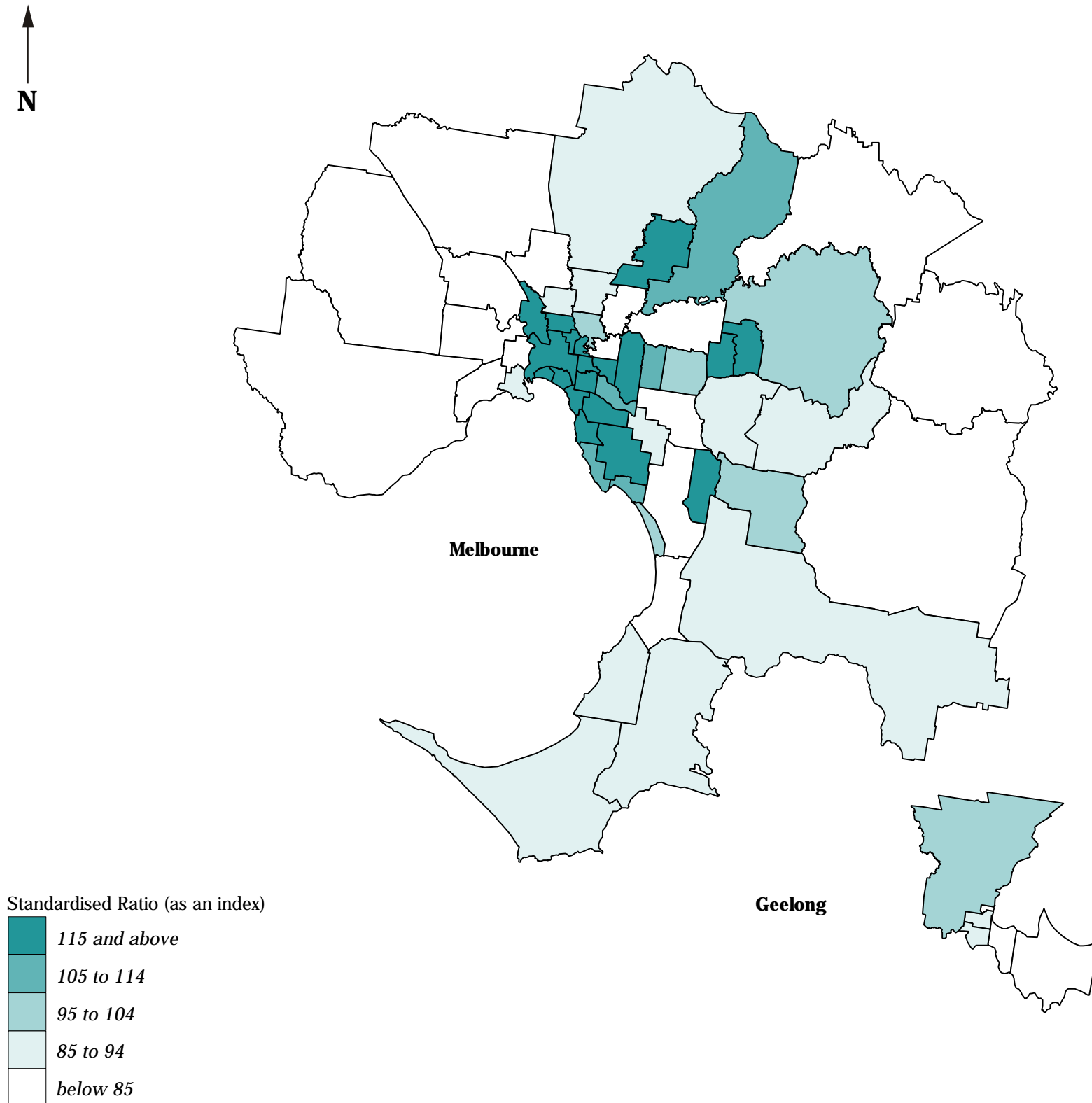
In **Geelong**, there were 308 admissions for neurotic, personality or other disorders, seven per cent fewer admissions than expected from the State rates (an SAR of 93). Females accounted for just over two thirds (67.2 per cent) of these admissions.

The highest ratio was in Geelong West (with an SAR of 154\*\*), and the lowest ratios were in Corio-Inner (with an SAR of 76\*\*) and the City of Geelong (76). Corio-Inner had the largest number of admissions (121 admissions), with 65 admissions of residents of Geelong West and 57 from Bellarine-Inner.

### Map 6.23

## Admissions for neurotic, personality or other mental disorders, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 3,762 admissions for neurotic, personality or other mental disorders of residents of the non-metropolitan areas of Victoria, ten per cent more than expected from the State rates (an SAR of 110\*\*). This is a higher rate of hospitalisation of residents of the non-metropolitan areas than for those from **Melbourne**, with an SAR of 97\*\*. Females accounted for over half (57.4 per cent) of admissions for these conditions.

Over half (53.4 per cent) of the SLAs in the non-metropolitan areas of Victoria had elevated ratios for neurotic, personality or other mental disorders: the highest ratios were in SLAs spread throughout the State, other than in the largest towns (**Map 6.24**).

The most highly elevated ratios (in SLAs with more than 20 admissions), were in Broadford (an SAR of 391\*\* and 49 admissions), Bet Bet (315\*\*, 20 admissions) and Kyabram (311\*\*, 56 admissions), all with more than three times the number of admissions for neurotic, personality or other mental disorders than were expected from the State rates. There were more than twice the expected number of admissions for these conditions in 12 other SLAs, the most highly elevated being in Maryborough (an SAR of 287\*\*), Phillip Island (271\*\*), Glenelg (265\*\*) and Wonthaggi (259\*\*).

A further 20 SLAs (with more than 20 expected admissions) had ratios elevated by 50 per cent or more.

The lowest ratios were recorded for residents of Surf Coast [Part A] (an SAR of 55\*\*, almost half the number of admissions expected from the State rates), Ballarat (57\*\*), Bendigo (60\*\*) and Greater Geelong [Part B] (63\*\*).

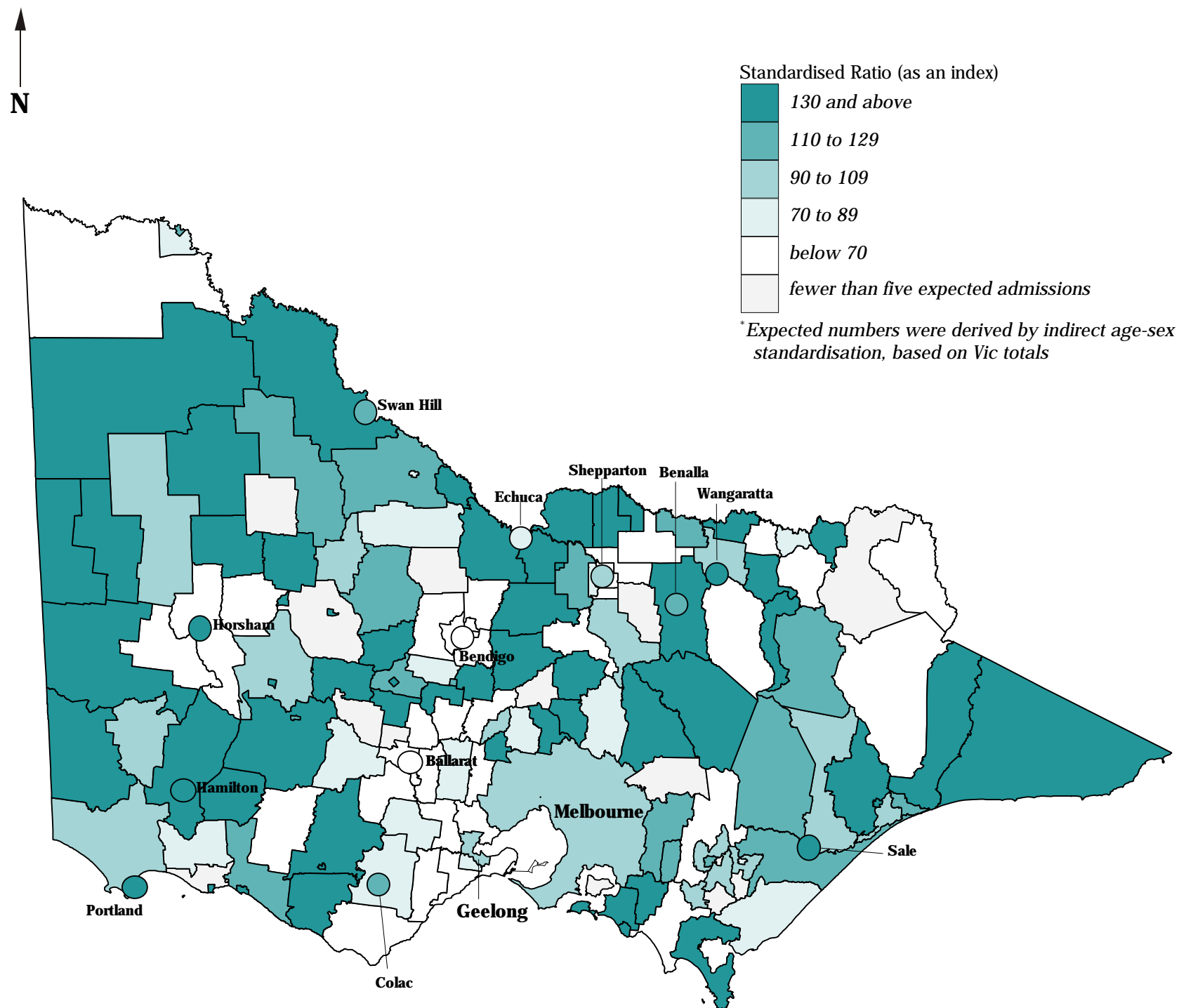
The largest numbers of admissions for neurotic, personality or other mental disorders in 1995/96 were of residents of Ballarat, with 127 admissions; Bendigo and Warrnambool, both with 123 admissions; South Barwon-Inner, with 91 admissions; and Seymour and Shepparton, both 73.

There was a correlation at the SLA level with the variable for low income families (0.34) and an inverse correlation with high income families (-0.31). These results, together with the weak inverse correlation with the IRSD (-0.27), suggest the existence of an association at the SLA level between high rates of admission for neurotic, personality or other mental disorders and socioeconomic disadvantage.

## Map 6.24

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

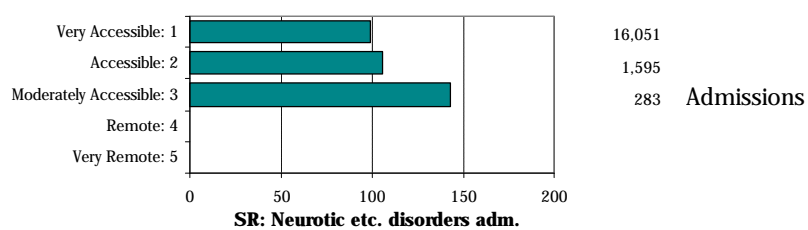
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for neurotic, personality or other mental disorders increase from close to the expected numbers of admissions in the Very Accessible areas (three per cent fewer admissions than expected from the State rates, an SAR of 97) to SARs of 131 in the Accessible areas and 152 in the Moderately Accessible areas (52 per cent more admissions than expected from the State rates). The numbers of admissions outside of the Very Accessible areas are, however, quite low.

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 Victoria accounted for 9.7 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).

## Melbourne (Victoria as the Standard)

There were 68,682 admissions for circulatory system diseases of residents of **Melbourne** in 1995/96, five per cent fewer admissions than were expected from the State rates (an SAR of 95\*\*). Males accounted for over half (55.8 per cent) of these admissions.

The spatial distribution of SARs shows the highest ratios are concentrated in areas to the west of the city, with slightly lower ratios in the north-western and northern suburbs, as well as in suburbs located in some outer north- and south-eastern parts of the metropolitan area. SLAs with low ratios tended to be located in areas of high socioeconomic status, covering large areas to the west and east of the city centre, extending through the Yarra Valley and to the south-east (Map 6.25).

The most highly elevated ratio was recorded for residents of Werribee, with 45 per cent more admissions from circulatory system diseases than expected from the State rates (an SAR of 145\*\*), with relatively high rates also prevailing in Sunshine (115\*\*), Healesville (112), Keilor (112\*\*), Broadmeadows (111\*\*) and Melton (111'). There were 13 other SLAs with elevated ratios.

Residents of Waverley (with an SAR of 76\*\*) had the lowest rate of admissions, marginally lower than in Eltham (78\*\*). There were also relatively low ratios in Mordialloc (80\*\*), Brighton and Moorabbin (both 81\*\*) and Hawthorn, Sandringham and Springvale (all 84\*\*).

The largest numbers of admissions were of residents of Broadmeadows (2,492 admissions), Moorabbin (2,408), Nunawading (2,349), Waverley (2,320) and Sunshine (2,313).

There were correlations at the SLA level with the variables for early school leavers (0.53), unskilled and semi-skilled workers (0.47) and children aged from 0 to 4 years (0.46); and inverse correlations with managers and administrators, and professionals (-0.49) and female labour force participation (-0.47). These results, together with the inverse correlation with the IRSD (-0.40), suggest the existence of an association at the SLA level between high rates of admission for circulatory system diseases and socioeconomic disadvantage.

## Geelong

There were nine per cent fewer admissions for circulatory system diseases of residents of **Geelong** than were expected from the State rates (an SAR of 91\*\*). Males accounted for over half (54.3 per cent) of the 2,457 admissions.

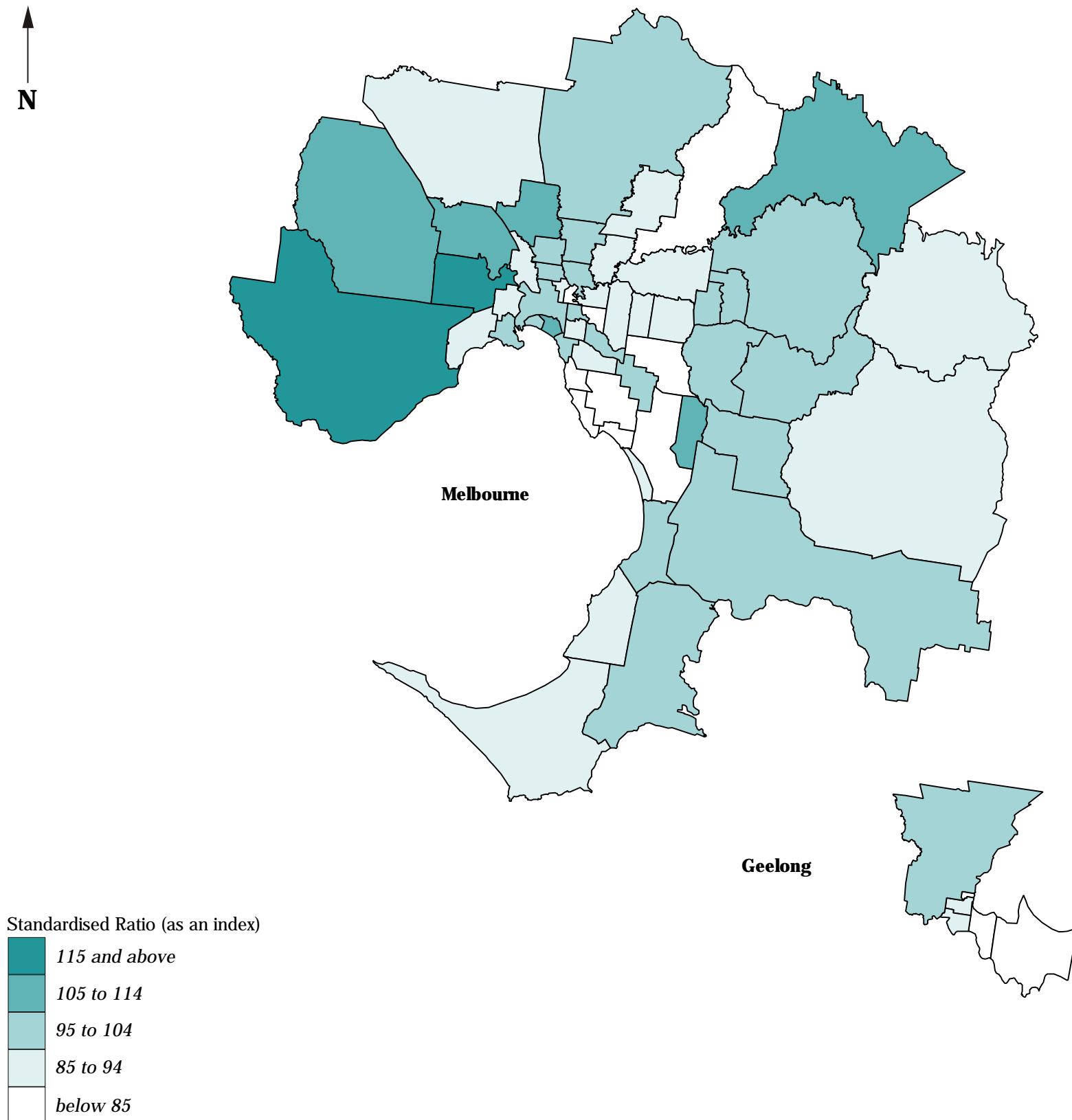
All of the SLAs in **Geelong** had SARs of less than 100, ranging from 98 in Corio-Inner, to 83\*\* in Bellarine-Inner and 78\*\* in the City of Geelong.

The largest number of admissions were of residents of Corio-Inner (1,216 admissions), Geelong West (358) and Bellarine-Inner (345).

## Map 6.25

### Admissions for circulatory system diseases, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 32,681 admissions of residents of the non-metropolitan areas of Victoria for circulatory system diseases in 1995/96, 14 per cent more than expected from the State rates, (an SAR of 114\*\*). Males accounted for over half (54.7 per cent) of these admissions.

Two thirds (66.3 per cent) of the SLAs in the non-metropolitan areas of Victoria had elevated ratios for admissions for circulatory system diseases. The highest ratios were in SLAs to the south-west and to the north of Melbourne, in particular in the Echuca/Shepparton/Benalla region (**Map 6.26**).

The highest ratios were recorded in Belfast, with more than twice as many admissions as expected from the State rates (an SAR of 213\*\*), and in Cobram, with twice the number expected (an SAR of 200\*\*). Other highly elevated ratios were recorded for residents of Upper Murray (187\*\*), Heytesbury (180\*\*), Myrtleford (178\*\*), Mount Rouse (176\*\*), Deakin (170\*\*), Hampden (168\*\*), St Arnaud and Portland (both with 165\*\*), Camperdown (163\*\*) and Ararat (160\*\*).

The lowest ratio (in SLAs with more than 20 admissions) was recorded in Wimmera (an SAR of 36\*\*), with 64 per cent fewer admissions for circulatory system diseases than expected from the State rates. Ratios more than 30 per cent lower than expected were also recorded for residents of Tallangatta [Part B] (with an SAR of 51\*\*), Huntly-Inner (59\*\*), Greater Geelong [Part C] (60\*\*), Southern Rural Central (66\*\*), and Yackandandah and Tungamah (both 68\*\*).

There were 2,254 admissions of residents of Ballarat, with a further 1,646 from Bendigo. Relatively high numbers of admissions were also recorded in Warrnambool (929), South Barwon-Inner (833), Shepparton (784), Greater Geelong [Part B] (694) and Wangaratta (637).

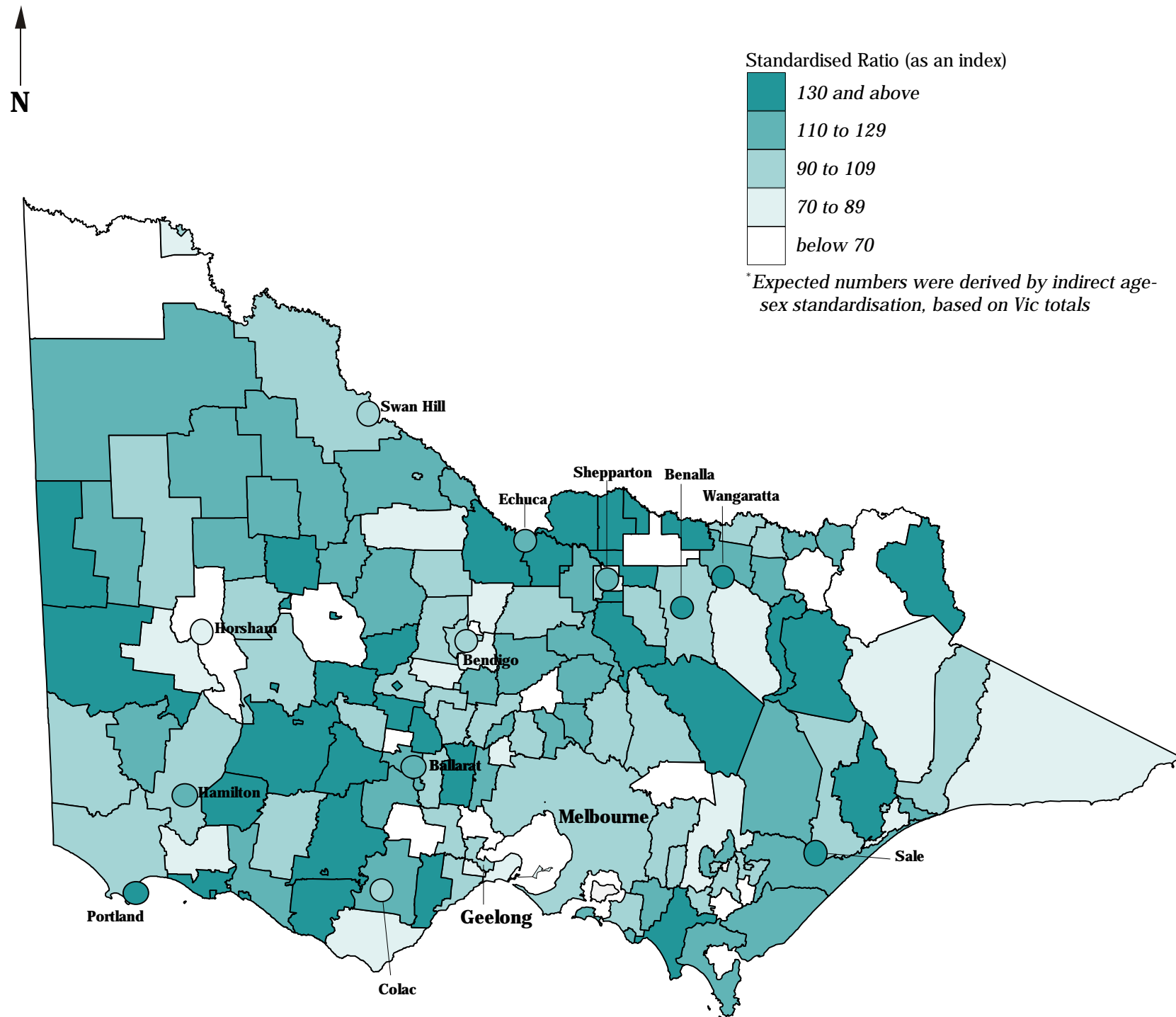
There was a weak association evident in the correlation analysis between high rates of admission for circulatory system diseases and the indicators of socioeconomic disadvantage. The weak inverse correlation with the IRSD (-0.21) supports the existence of an association at the SLA level between high rates of admission for circulatory system diseases and socioeconomic disadvantage.



## Map 6.26

### Admissions for circulatory system diseases, Victoria, 1995/96

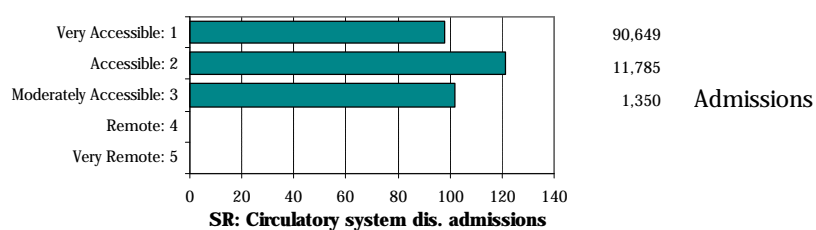
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



There are close to the expected numbers of admissions for circulatory system diseases of people living in the Very Accessible and Moderately Accessible areas (SARs of 98 and 102, respectively) and 21 per cent more than expected from the State rates in the Accessible ARIA category (with an SAR of 121).

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 3.2 per cent of all admissions of Victorian residents and 36.5 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.

## Melbourne (Victoria as the Standard)

There were 24,943 admissions for ischaemic heart disease of residents of **Melbourne** in 1995/96, five per cent fewer admissions than were expected from the State rates (an SAR of 95<sup>\*\*</sup>). Almost two thirds of the admissions (66.4 per cent) were males, a higher proportion than for admissions for all circulatory system diseases (55.8 per cent).

The spatial distribution of standardised admission ratios at the SLA level (Map 6.27) shows the lowest ratios to be concentrated in a contiguous area extending from Eltham and embracing most of the inner suburbs and the eastern middle suburbs, and continuing south along the entire Mornington Peninsula. To the west and east of this area are SLAs with considerably higher ratios. The highest ratios were located in outer northern and western suburbs, as well as in a number of outer eastern suburbs.

The most highly elevated ratio was recorded for residents of Werribee (an SAR of 145<sup>\*\*</sup>), with 45 per cent more admissions for ischaemic heart disease than expected from the State rates. Standardised admission ratios elevated by 15 per cent or more above the levels expected from the State rates were recorded in Croydon (with an SAR of 125<sup>\*\*</sup>), Melton and Cranbourne (both 122<sup>\*\*</sup>), Lillydale (120<sup>\*\*</sup>), Broadmeadows (119<sup>\*\*</sup>), Ringwood (116<sup>\*\*</sup>) and Sunshine (115<sup>\*\*</sup>).

Brighton (with an SAR of 63<sup>\*\*</sup>) and Collingwood (69<sup>\*\*</sup>) had the lowest ratios, while Prahran, Kew and Hawthorn all had SARs of 70<sup>\*\*</sup> (30 per cent fewer admissions than expected).

The largest number of admissions for ischaemic heart disease were recorded for residents of Broadmeadows (1,008 admissions), Nunawading (964), Waverley (891), Keilor (876) and Moorabbin (873). There were also more than 800 admissions from Knox, Sunshine, Preston and Frankston.

There were correlations of meaningful significance at the SLA level with the variables for early school leavers (0.64), children aged from 0 to 4 years (0.62) and unskilled and semi-skilled workers (0.57). Inverse correlations were recorded with the variables for managers and administrators, and professionals (-0.66) and high income families (-0.47). These results, together with the weak inverse correlation with the IRSD (-0.36), suggest the existence of an association at the SLA level between high rates of admission for ischaemic heart disease and socioeconomic disadvantage.

## Geelong

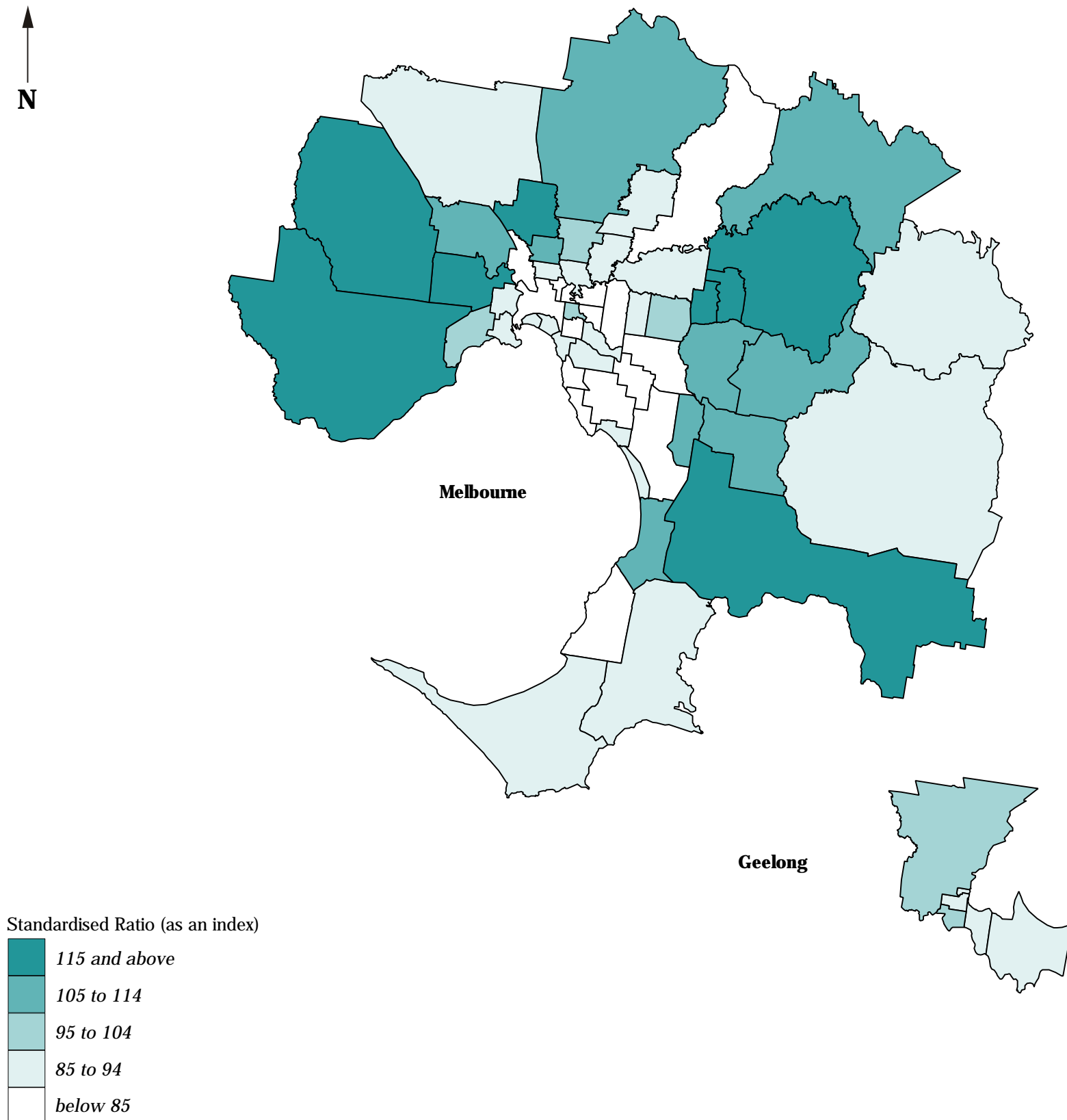
There were 951 admissions for ischaemic heart disease of residents of **Geelong**, three per cent fewer than expected from the State rates (an SAR of 97). Males accounted for well over half (61.3 per cent) of the admissions.

None of the SLAs in **Geelong** had ratios of statistical significance, and only Corio-Inner had an elevated SAR (an SAR of 103). The lowest ratios were recorded in the City of Geelong (88) and Geelong West (89). The largest number of admissions were of residents of Corio-Inner (476 admissions), Bellarine-Inner (141) and Geelong West (126).

### Map 6.27

## Admissions for ischaemic heart disease, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 11,961 admissions of residents of the non-metropolitan areas of Victoria for ischaemic heart disease in 1995/96, 13 per cent more than expected from the State rates (an SAR of 113<sup>\*\*</sup>). Males accounted for almost two thirds (63.3 per cent) of the admissions.

Elevated ratios were recorded in over half (59.3 per cent) of the SLAs in the non-metropolitan areas of Victoria, although they were scattered throughout the State with no significant concentrations (**Map 6.28**). There were, however, few SLAs with elevated ratios in the north-western or far eastern parts of the State.

The most highly elevated ratios were in Ararat Shire (with an SAR of 207<sup>\*\*</sup>) and Belfast (201<sup>\*\*</sup>), with just over twice the number of admissions for ischaemic heart disease than expected from the State rates. Similarly highly elevated ratios were also recorded for residents of Wangaratta (an SAR of 196<sup>\*\*</sup>), Mount Rouse and Camperdown (both 186<sup>\*\*</sup>), Upper Murray (182<sup>\*\*</sup>), Korong (177<sup>\*\*</sup>) and Cobram (176<sup>\*\*</sup>). Ratios were elevated by more than 50 per cent in a further 13 SLAs.

The lowest ratios (in SLAs with more than 20 admissions) were recorded in Otway (with an SAR of 52<sup>\*\*</sup> with just over half the number of admissions expected from the State rates), Yackandandah (63<sup>\*</sup>), Dimboola (65<sup>\*\*</sup>), Dunmunkle (68) and Walpeup (69).

The largest numbers of admissions for circulatory system diseases in the non-metropolitan areas of Victoria were recorded in Ballarat with 833 admissions, and Bendigo with 632 admissions.

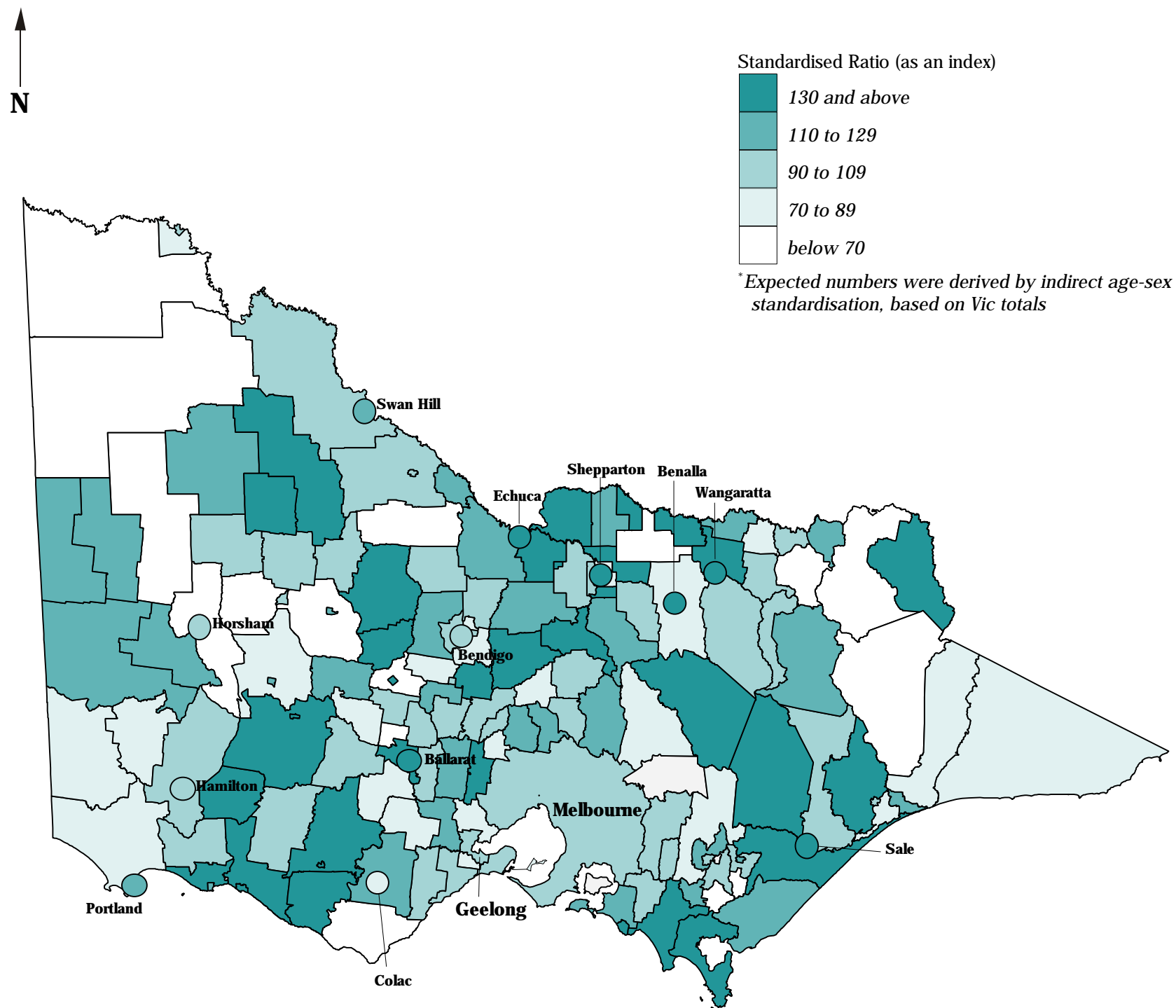
Relatively large numbers of admissions were also recorded in Shepparton (337 admissions), Warrnambool (335), Wangaratta (293), South Barwon-Inner (290) and Greater Geelong [Part B] (287).

There were weak correlations at the SLA level with the variables for housing authority rented dwellings (0.27), dwellings without a motor vehicle (0.24) and single parent families (0.21). These results, together with the weak inverse correlation with the IRSD (-0.24), suggest the existence of an association at the SLA level between high rates of admission for ischaemic heart disease and socioeconomic disadvantage.

## Map 6.28

### Admissions for ischaemic heart disease, Victoria, 1995/96

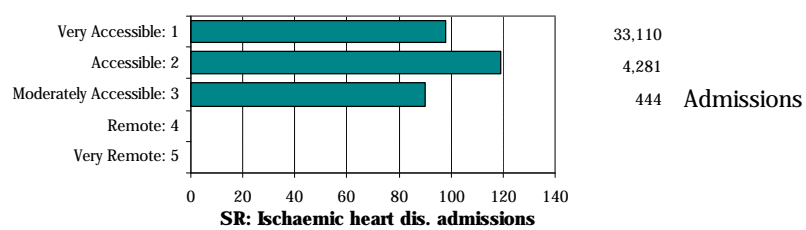
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



Standardised admission ratios for ischaemic heart disease vary a little more across the ARIA categories than do those for circulatory system diseases, from the lowest ratio in the Moderately Accessible areas (an SAR of 90, 10 per cent fewer admissions for these diseases than expected from the State rates), to an elevated ratio of 119 in the Very Accessible areas (19 per cent more admissions than expected). There were marginally fewer than the expected number of admissions of people living in the Accessible areas.

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 6.1 per cent of all admissions analysed for Victorian residents; 5.6 per cent of residents of **Melbourne** and 7.3 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).

## Melbourne (Victoria as the Standard)

There were 46,683 admissions of residents of **Melbourne** for respiratory system diseases, eight per cent fewer admissions than expected from the State rates (an SAR of 92\*\*). Males comprised over half (54.1 per cent) of these admissions.

The most highly elevated ratios were in SLAs in, and near, the city centre and to the west. SLAs with the lowest ratios were largely in the inner and eastern and south-eastern suburbs (Map 6.29).

The most highly elevated ratios were in the SLAs of Sunshine (with an SAR of 122\*\*), Werribee (121\*\*), the City of Melbourne (117\*\*), South Melbourne (115\*) and Preston (111\*\*). Elevated ratios were recorded in ten other SLAs.

At the other end of the scale, the lowest ratios were recorded for residents from Mornington (63\*\*, fewer than two thirds of the number of admissions for circulatory system diseases expected

from the State rates) and Waverley (67\*\*). Relatively low ratios were recorded in Camberwell (with an SAR of 73\*\*), Kew (75\*\*), Altona (76\*\*), Box Hill and Doncaster and Templestowe (both 77\*\*).

More than 1,500 admissions for circulatory system diseases were recorded for residents of Broadmeadows (1,836 admissions), Sunshine (1,801), Keilor (1,697), Knox (1,628) and Moorabbin (1,527).

There were correlations with the variables for unemployment (0.49), people reporting poor proficiency in English (0.46), dwellings without a motor vehicle (0.43), and people born in predominantly non-English speaking countries and resident for more than five years (0.39). An inverse correlation (-0.39) was recorded with female labour force participation. These results, together with the inverse correlation with the IRSD (-0.47), suggest the existence of an association at the SLA level between high rates of admission for respiratory system diseases and socioeconomic disadvantage.

## Geelong

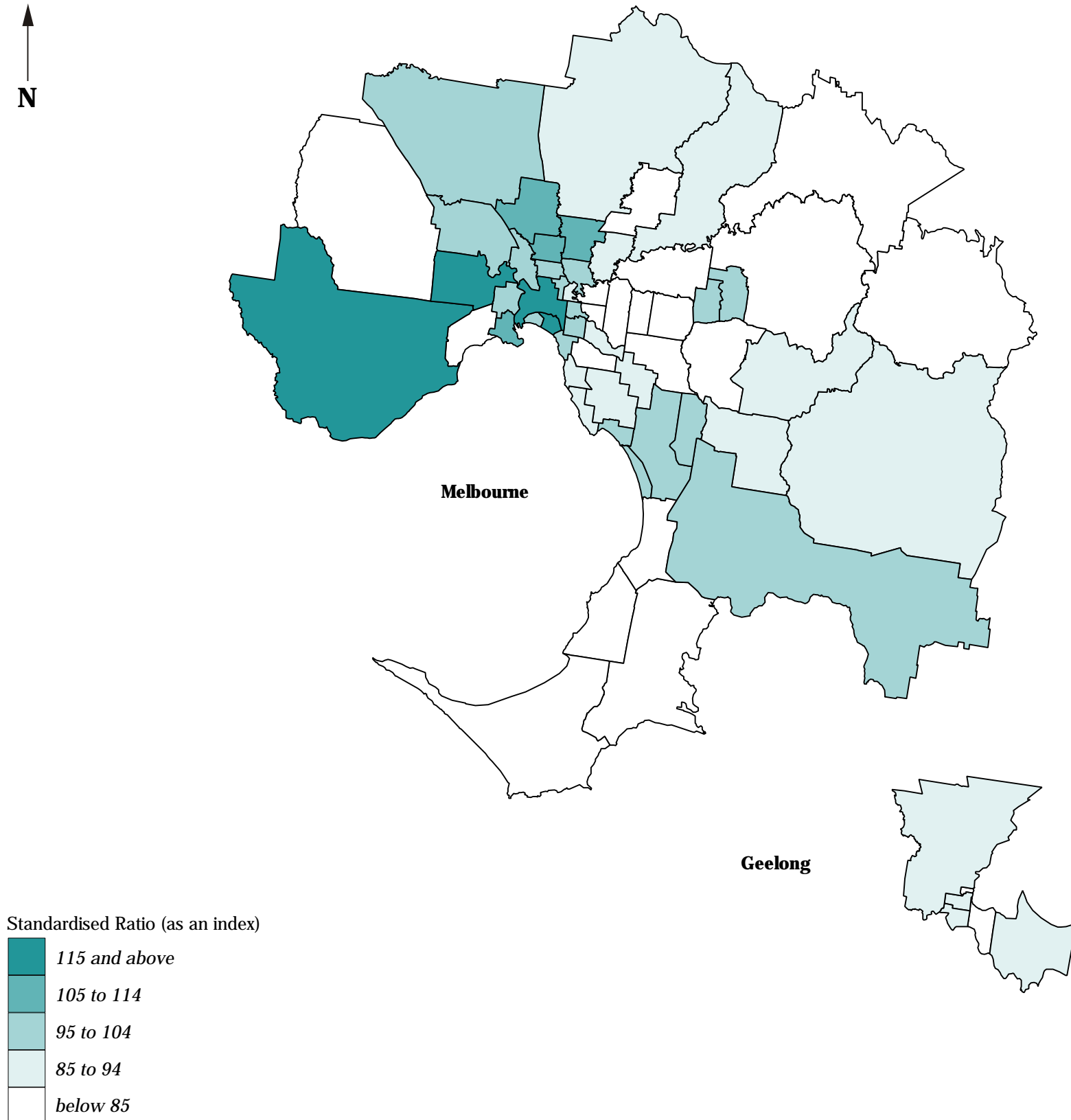
There were 1,628 admissions for respiratory system disease of residents of **Geelong** in 1995/96, 11 per cent fewer admissions than expected from the State rates (an SAR of 89\*\*). Males comprised over half (55.2 per cent) of these admissions.

All of the SLAs in **Geelong** had an SAR below 100, with Corio-Inner (with an SAR of 94) recording the highest ratio, and the City of Geelong (with an SAR of 67\*\*) the lowest. The largest numbers of admissions were of residents of Corio-Inner (839 admissions), Bellarine Inner (269 admissions) and Geelong West (218 admissions).

## Map 6.29

### Admissions for respiratory system diseases, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 24,142 admissions of residents of the non-metropolitan areas of Victoria for respiratory system diseases in 1995/96, 22 per cent more than expected from the State rates (an SAR of 122\*\*). Males accounted for over half (53.9 per cent) of these admissions.

SLAs with elevated ratios were concentrated in an area extending from the western border districts, through the Wimmera and Mallee area to Mildura, and then along the River Murray to the Echuca/Goulburn/Mansfield area (**Map 6.30**). SLAs with the lowest ratios were most predominant in the central western area of the State and immediately to the east of **Melbourne**.

Based on 1994 local government area boundaries, the most highly elevated standardised admissions ratios were recorded in Ripon (with an SAR of 279\*\*) and Cobram (267\*\*). Standardised admission ratios of more than twice the levels expected were recorded for residents of Benalla (an SAR of 222\*\*), Myrtleford (221\*\*), Karkaroc (216\*\*), Mansfield (215\*\*) and Nathalia (201\*\*).

The lowest ratios (in SLAs with more than 20 admissions) were in Tungamah (with an SAR of 51\*\*), Narracan [Part B] and Greater Geelong [Part B] (both 69\*\*), Greater Geelong [Part C] and Huntly-Inner (both 71), and Queenscliffe (71\*).

The largest numbers of admissions for respiratory system diseases in the non-metropolitan areas of Victoria were recorded in Bendigo (1,471 admissions) and Ballarat (1,287 admissions). Relatively large numbers of admissions were also recorded in Shepparton (659 admissions), Warrnambool (573), South Barwon-Inner (506) and Wodonga (498).

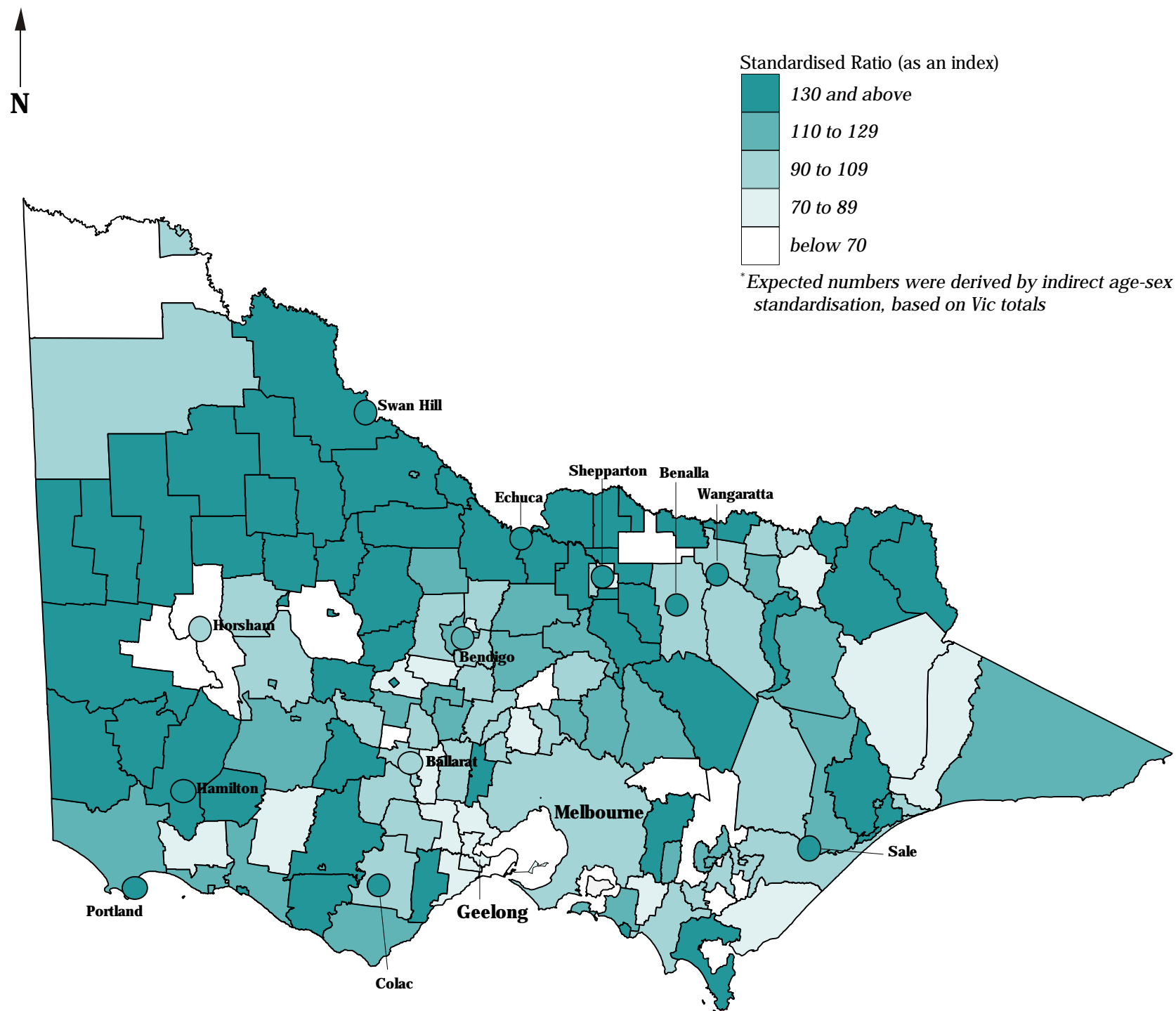
The strongest correlations at the SLA level were with the variables for people aged 65 years and over (0.43) and dwellings without a motor vehicle (0.31), and an inverse correlation with the variable for high income families (-0.32). These results, together with the weak inverse correlation with the IRSD (-0.25), suggest the existence at the SLA level of an association between high rates of admission for respiratory system diseases and socioeconomic disadvantage.



### Map 6.30

## Admissions for respiratory system diseases, Victoria, 1995/96

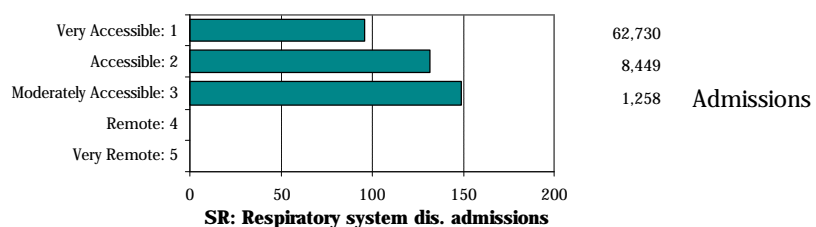
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for respiratory system diseases show a strong relationship with decreasing accessibility. The ratios increase by 55.2 per cent, from an SAR of 96 in the Very Accessible areas to an elevated SAR of 149 in the Moderately Accessible areas, where there 49 per cent more admissions than expected from the State rates. There was an elevated SAR of 132 in the Accessible areas.

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 (18.7 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.

## Melbourne (Victoria as the Standard)

There were 8,206 admissions for respiratory system diseases of children aged from 0 to 4 years and resident in **Melbourne**, 13 per cent fewer than were expected from the State rates (an SAR of 87\*\*). Males comprised almost two thirds (63.8 per cent) of these admissions.

The most highly elevated ratios for respiratory system diseases of children aged from 0 to 4 years were largely confined to the city centre and to some middle northern and middle and outer western suburbs (**Map 6.31**). The lowest ratios were recorded in SLAs in the higher socioeconomic suburbs of the Yarra Valley, the middle eastern SLAs, and on the lower Mornington Peninsula.

The most highly elevated ratios for respiratory system diseases were recorded for young children in Sunshine (with an SAR of 126\*\*) and Coburg (120\*). Other SLAs with ratios elevated by 10 per cent or more were Broadmeadows (with an SAR of 111\*), Dandenong and the City of Melbourne (both 111) and Hawthorn (110).

The lowest ratios were recorded for children aged from 0 to 4 years and resident in the two Mornington Peninsula SLAs of

Mornington (with an SAR of 47\*\*) and Flinders (49\*\*), with similarly low ratios in Caulfield, Hastings and Richmond (both 58\*\*) and Mordialloc and Collingwood (both 60\*\*).

The largest numbers of admissions for respiratory system diseases of children aged from 0 to 4 years were recorded in Cranbourne (with 475 admissions) and Broadmeadows (415).

There were more than 300 admissions from Keilor, Whittles, Sunshine, Werribee, Berwick and Knox.

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

## Geelong

In 1995/96, 392 children aged from 0 to 4 years from **Geelong** were admitted to hospital with respiratory system diseases, 18 per cent more than were expected from the State rates (an SAR of 118\*\*). This is in contrast to the lower than expected ratio in **Melbourne**. Just over two thirds (66.8 per cent) of the admissions (262 admissions) were for males.

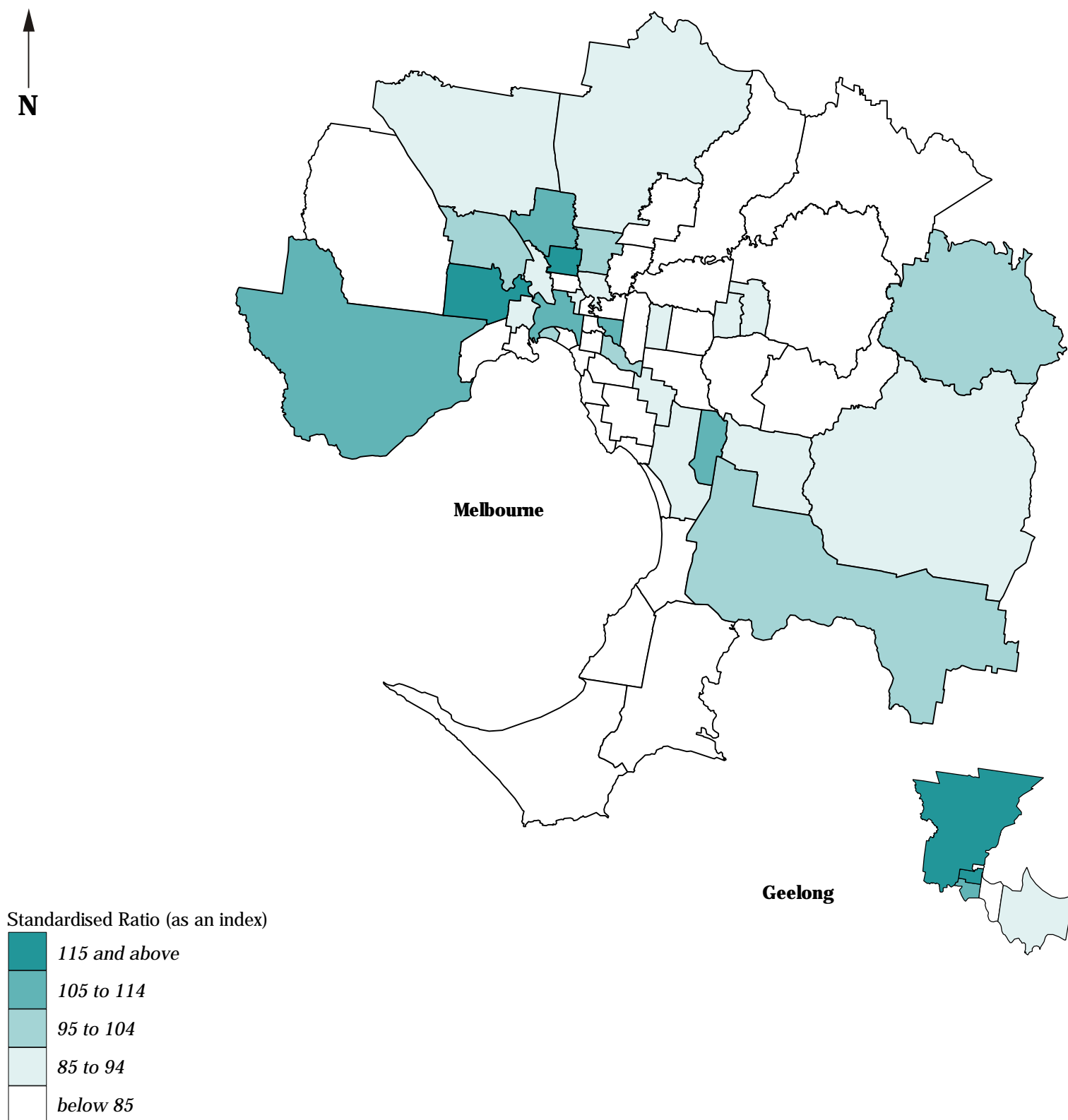
The highest ratio was recorded for residents of Corio-Inner (with an SAR of 136\*\*) and the lowest ratios were recorded for residents of the City of Geelong (79) and Bellarine-Inner (90).

Corio-Inner had the largest number of admissions with 229 admissions, nearly four times the number for residents of Bellarine-Inner (59 admissions).

### Map 6.31

## Admissions of children aged 0 to 4 years for respiratory system diseases, Melbourne and Geelong, 1995/95

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 Vic 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 (Victoria as the Standard)

Children aged from 0 to 4 years accounted for a fifth (20.6 per cent) of all admissions of residents of the non-metropolitan areas of Victoria for respiratory system diseases in 1995/96. There were 4,965 of these admissions, a substantial 32 per cent more than expected from the State rates (an SAR of 132\*\*). Males comprised almost two thirds (62.7 per cent) of these admissions.

The highest ratios were recorded in SLAs located in two extensive bands. The first stretched from Otway to the western border of the State, and the second extended from Mildura to the Echuca and Shepparton area, then south-east to the coast (**Map 6.32**). SLAs with relatively low ratios were largely confined to the central areas of the State.

There were more admissions of children aged from 0 to 4 years with respiratory system diseases than were expected from the State rates in almost two thirds (66.4 per cent) of the non-metropolitan SLAs. Ratios in three SLAs were elevated by more than three times the level expected from the State rates. They were Nathalia (with an SAR of 383\*\*), in the State's Upper Murray region, Ripon (364\*\*) and Cobram (305\*\*). Other SLAs with highly elevated ratios were Shepparton [Part B] (with an SAR of

285\*\*), Wangaratta (273\*\*), Myrtleford (248\*\*), Bairnsdale [Part A] (244\*\*) and Swan Hill (242\*\*), Bairnsdale [Part B] (239\*\*), Kyabram (236\*\*), Deakin and Hamilton (both with 234\*\*), Port Fairy (226\*\*), Numurkah (223\*\*) and Bairnsdale (220\*\*).

The lowest ratios (in SLAs with more than 20 admissions) were recorded for young children living in Seymour (with an SAR of 55\*\*), Kyneton (66), Horsham (C) (69) and Romsey (69).

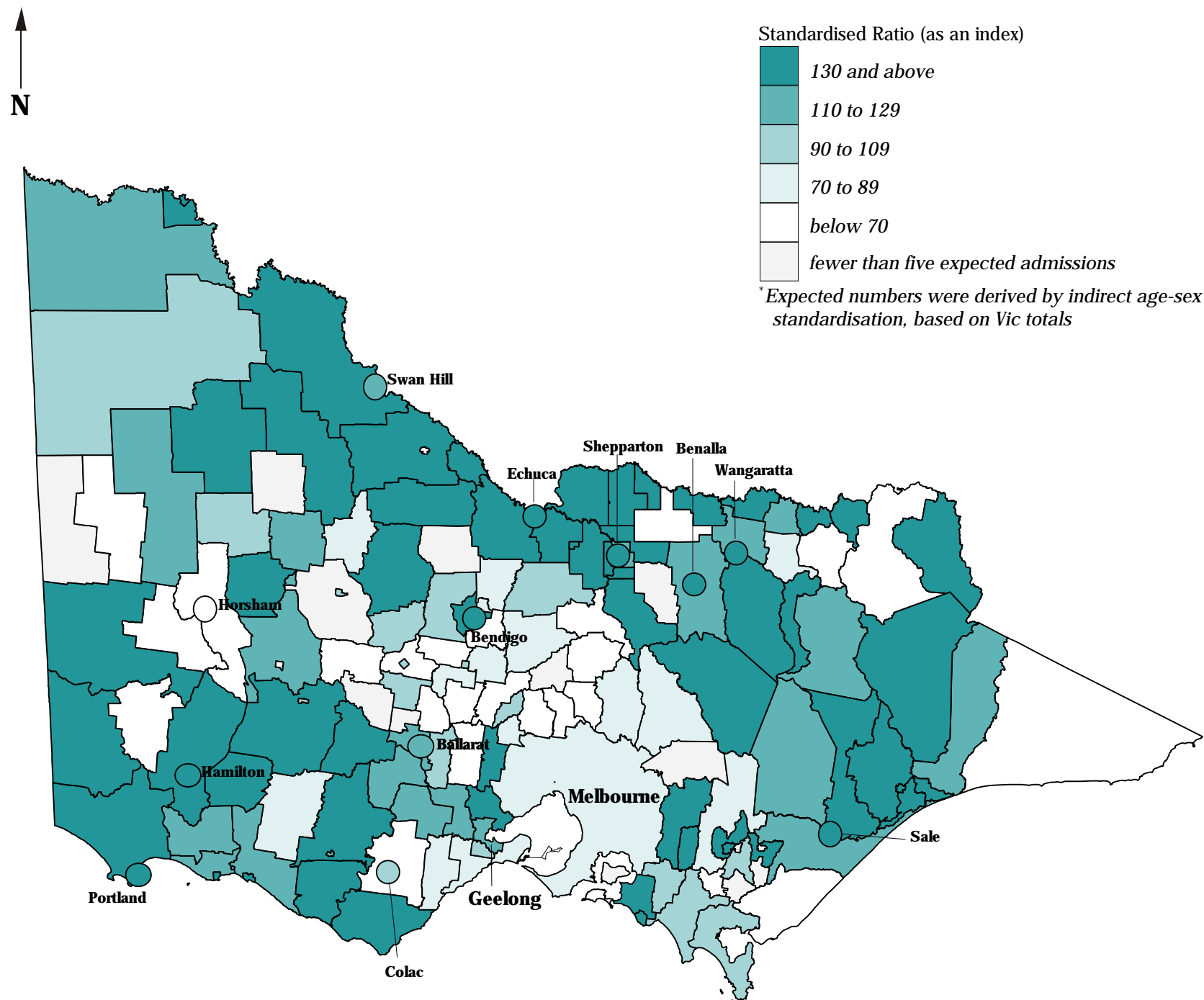
The largest numbers of admissions of children aged from 0 to 4 years for respiratory system diseases were recorded for children from Ballarat and Bendigo, with 271 and 270 admissions, respectively. Relatively high numbers of admissions were also recorded in Shepparton (194 admissions), Warrnambool (159), Wangaratta and Wodonga (both 140), Mildura (134) and South Barwon-Inner (100).

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions of children aged from 0 to 4 years for respiratory system diseases and socioeconomic status.

**Map 6.32**

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

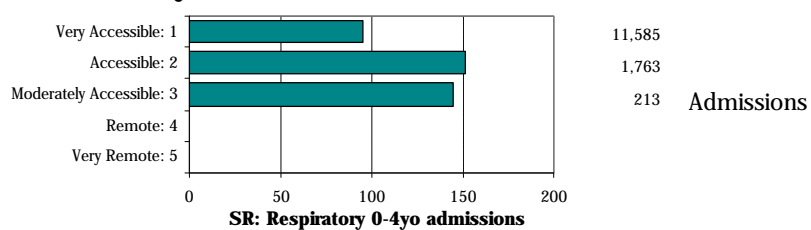
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for respiratory system diseases among young children (aged from 0 to 4 years) show a similar relationship with accessibility to that evident for admissions for these diseases at all ages. The ratios increase by more than fifty per cent, from an SAR of 95 in the Very Accessible areas (five per cent fewer admissions for these diseases than expected from the State rates) to SARs of 151 in the Accessible and 145 in the Moderately Accessible areas.

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, almost one fifth (17.1 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 25 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 21.7 per cent of admissions for all respiratory system diseases of Victorian residents; 19.9 per cent in **Melbourne** and 25.2 per cent in the non-metropolitan areas.

## Melbourne (Victoria as the Standard)

There were 9,269 admissions of residents of **Melbourne** for bronchitis, emphysema or asthma, 16 per cent fewer than expected from the State rates (an SAR of 84\*\*). Females comprised just over half (51.3 per cent) of the admissions.

Only nine SLAs (based on 1994 local government area boundaries) had elevated ratios (Map 6.33). The highest of these were Sunshine (with an SAR of 119\*\*), Dandenong (113), Cranbourne (112\*), Northcote and Werribee (both 110).

Lower than expected ratios were recorded in a number of higher socioeconomic SLAs, especially in the Yarra Valley, in the suburban bayside suburbs and in the southern Mornington Peninsula. The lowest ratios were recorded for residents of

Sandringham and Doncaster and Templestowe (both with an SAR of 54\*\*), Altona (61\*\*), Moorabbin (62\*\*), Mornington and Heidelberg (both 63\*\*), and Kew (64\*\*).

There were more than 300 admissions of residents from Sunshine (385 admissions), Cranbourne (383), Broadmeadows (362), Keilor (351), Knox (349) and Springvale (326).

There were correlations with the variables for unemployment (0.45), unskilled and semi-skilled workers (0.44) and female labour force participation (an inverse correlation of -0.47). These results, together with the inverse correlation with the IRSD (-0.48), suggest the existence of an association at the SLA level between high rates of admission for bronchitis, emphysema or asthma and socioeconomic disadvantage.

## Geelong

Residents of **Geelong** had 355 admissions for bronchitis, emphysema or asthma, ten per cent fewer than expected from the Victorian rates (an SAR of 90\*). Males comprised over half (54.9 per cent) of these admissions.

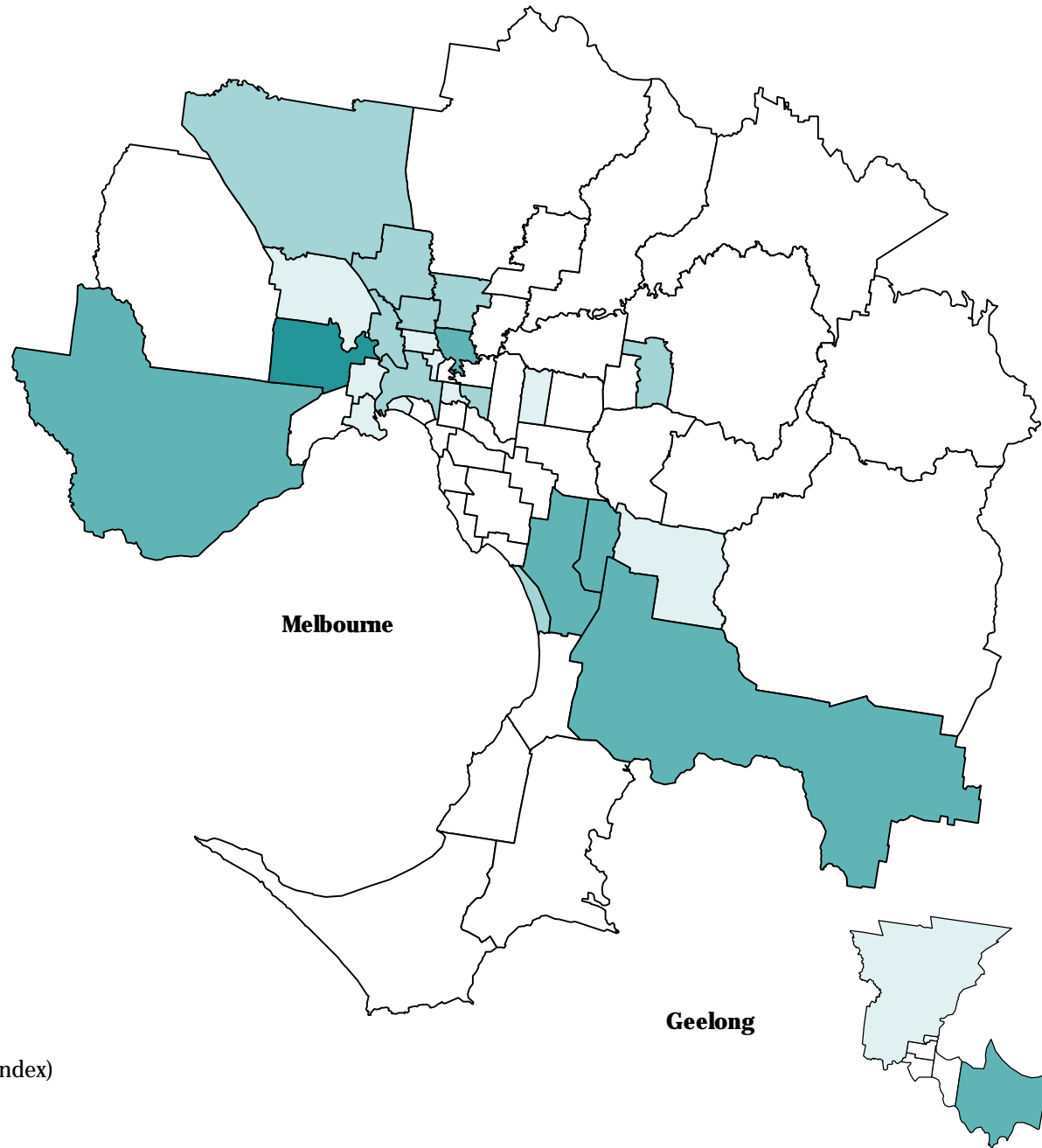
Bellarine-Inner had 11 per cent more admissions than expected from the State rates (an SAR of 111), and the City of Geelong had 30 per cent fewer (70\*).

The largest number of admissions were recorded for residents of Corio-Inner (179 admissions) and Bellarine-Inner (78).

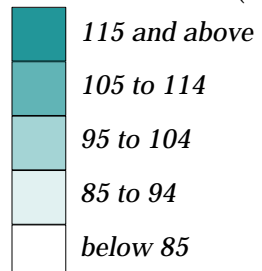
### Map 6.33

## Admissions for bronchitis, emphysema or asthma, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

The diseases of bronchitis, emphysema or asthma accounted for a quarter (25.2 per cent) of admissions for respiratory system diseases of residents of the non-metropolitan areas of Victoria in 1995/96. The elevated ratio (an SAR of 141\*\*) is consistent with (although more highly elevated than) that for admissions for all respiratory system diseases described earlier. Males accounted for over half (52.8 per cent) of the 6,079 admissions.

SLAs with highly elevated ratios were located throughout the State, often covering large, contiguous areas. The lowest ratios were confined to a smaller number of locations in the southern half of the State, largely near **Melbourne (Map 6.34)**.

The highest ratio was recorded for residents of Ripon, with more than five times the number of admissions expected from the State rates (an SAR of 537\*\* and 66 admissions). Other SLAs with highly elevated ratios were Cobram (412\*\* and 108 admissions), Karkaroc (387\*\*; 41 admissions), Benalla (362\*\*; 129), St Arnaud (347\*\*; 40), Donald (343\*\*; 32), Myrtleford (331\*\*; 53) and Upper Murray (316\*\*; 29).

The lowest ratios (in SLAs with more than 20 admissions) were in Kyneton (with an SAR of 68), Traralgon (69\*\*), Greater Geelong [Part B] (79), South Barwon-Inner (74\*\*) and Eaglehawk (74).

The largest numbers of admissions were recorded for residents of Ballarat (341 admissions), Bendigo (246), Shepparton (164) and Warrnambool (137). There were more than 100 admissions recorded in Benalla, Wangaratta, Mildura, South Barwon-Inner, Cobram, Wodonga, Moe, Mildura Shire [Part A] and Echuca.

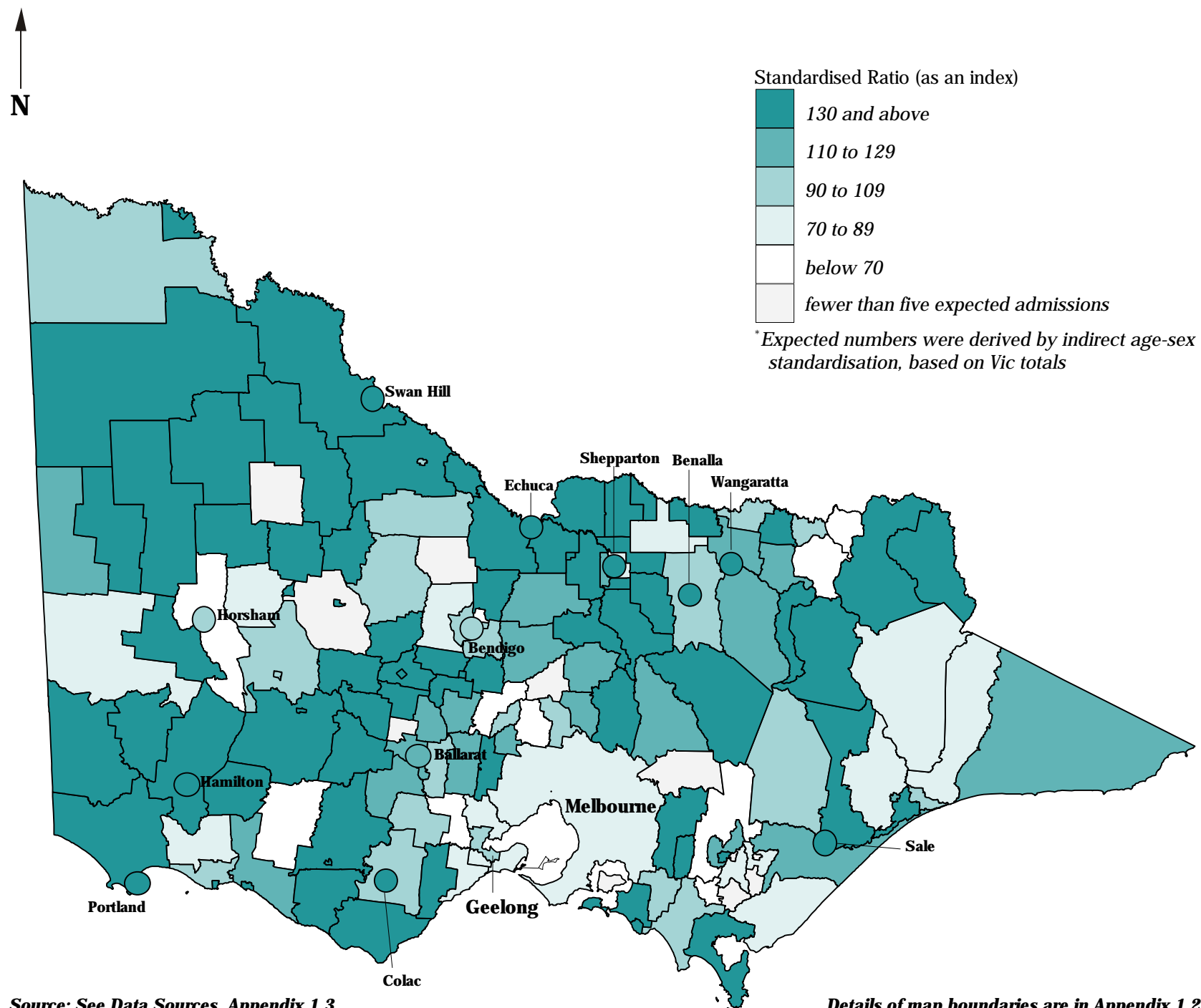
Although the results of the correlation analysis were not consistent, there was a correlation with the variable for low income families (0.28) and an inverse correlation with high income families (-0.35). These results, together with the weak inverse correlation with the IRSD (-0.25), suggest the existence of an association at the SLA level between high rates of admission for bronchitis, emphysema or asthma and socioeconomic disadvantage.



## Map 6 34

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

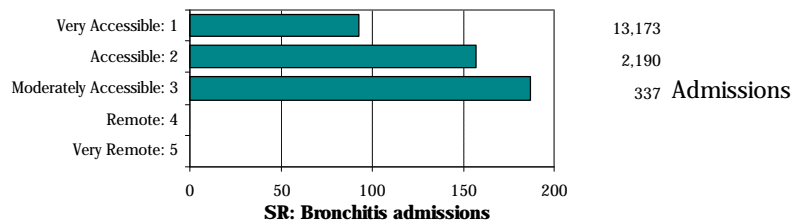
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for bronchitis, emphysema or asthma show an even strong relationship with decreasing accessibility than that evident for admissions for all respiratory system diseases. The ratios more than double from an SAR of 93 in the Very Accessible ARIA category (seven per cent fewer admissions for these diseases than expected from the State rates) to an SAR of 187 in the Moderately Accessible category (87 per cent more admissions than expected). There were also over fifty per cent more admissions for bronchitis, emphysema or asthma than expected from the State rates in the areas in the Accessible category (an SAR of 157).

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 7.4 per cent of all admissions analysed for Victorian residents; 9.4 per cent of male admissions and 5.9 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 90.5 per cent of admissions from these external causes, and were largely accidental falls (29.1 per cent of all admissions from these external causes) and motor vehicle traffic accidents (8.1 per cent). Admission rates for males were substantially higher for motor vehicle traffic accidents and injury purposely inflicted by other 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).

## Melbourne (Victoria as the Standard)

There were 58,747 admissions of residents of **Melbourne** from the combined causes of accidents, poisonings and violence, six per cent fewer than expected from the State rates (an SAR of 94\*\*). Males accounted for over half (54.7 per cent) of the admissions.

The most highly elevated standardised admission ratios for these external causes were largely in two locations: in the city and a number of adjacent SLAs and in the outer eastern suburbs (**Map 6.35**). An extensive band of SLAs also had very low ratios.

The highest ratios, based on 1994 local government boundaries, were recorded for residents of South Melbourne (with an SAR of 145\*\*), the City of Melbourne (137\*\*) and Pakenham (131\*\*). Relatively high ratios were also recorded in Port Melbourne (with an SAR of 129\*\*), Prahran and St Kilda (both 127\*\*), Sherbrooke (119\*\*) and Hastings and Mornington (both 113\*\*).

The lowest ratios were in Altona, with 29 per cent fewer admissions than expected from the State rates (an SAR of 71\*\*); Doncaster and Templestowe and Waverley (both 73\*\*) and Whittlesea (77\*\*).

The largest numbers of admissions from the combined causes of accidents, poisonings and violence were recorded for residents of Knox (2,052 admissions), Broadmeadows (1,940), Frankston (1,864), Moorabbin (1,783), Sunshine (1,758), Waverley (1,754) and Camberwell (1,716).

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions from the combined causes of accidents, poisonings and violence and socioeconomic status.

## Geelong

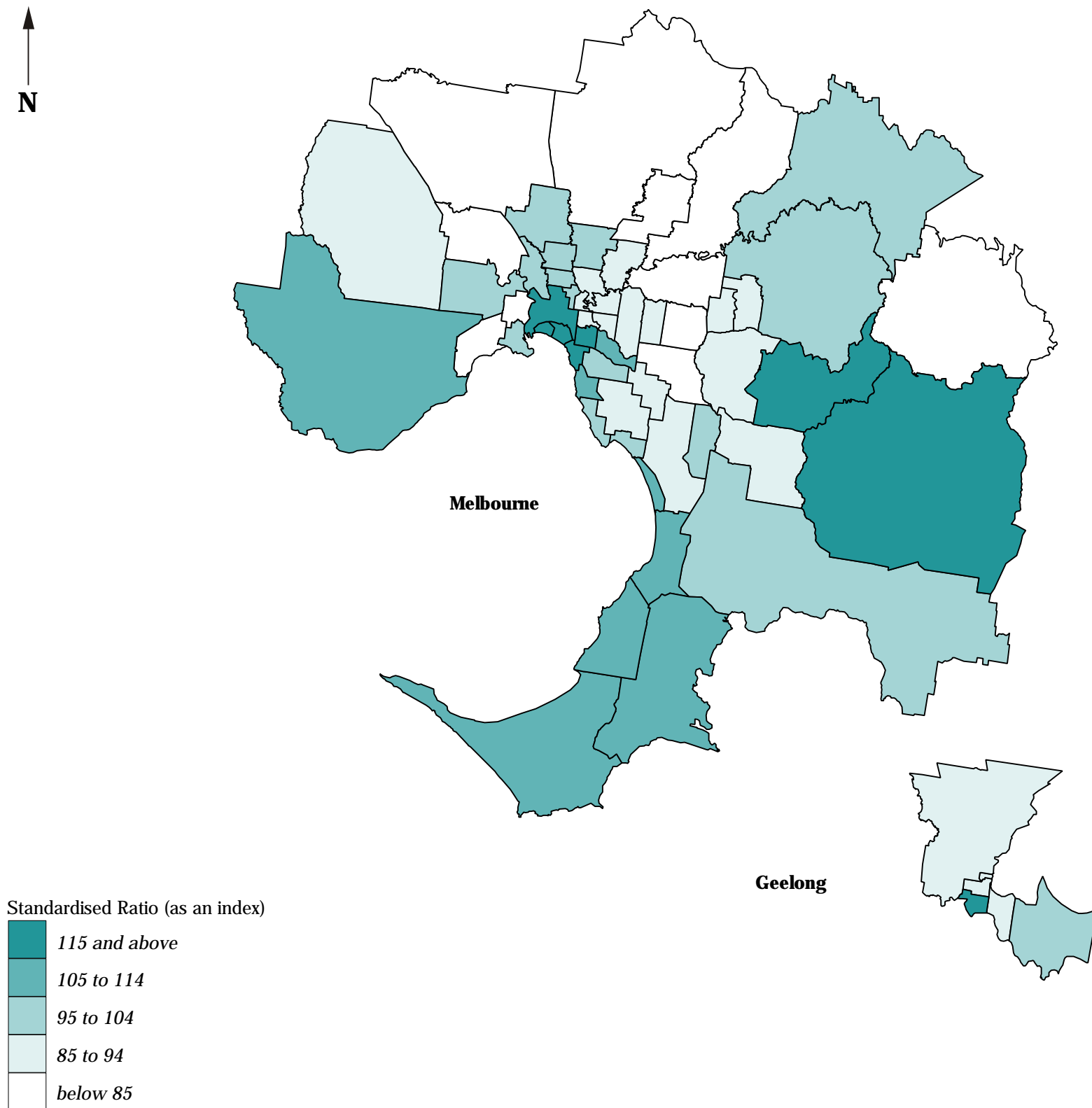
There were 2,139 admissions of residents of **Geelong** from the combined causes of accidents, poisonings and violence, four per cent fewer than expected from the State rates (an SAR of 96). Males accounted for well over half (57.0 per cent) of the admissions. At the SLA level, Newtown (with an SAR of 122\*\*) and Bellarine-Inner (104) had the highest ratios and Geelong West (87\*\*) had the lowest.

Residents of Corio-Inner had 987 admissions, with 391 from Bellarine-Inner.

### Map 6.35

## Admissions from accidents, poisonings and violence, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 27,128 admissions of residents of the non-metropolitan areas of Victoria from the combined causes of accidents, poisonings and violence, 17 cent more than expected from the State rates (an SAR of 117\*\*). Males accounted for well over half (57.6 per cent) of the admissions.

As many of the ratios 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 a 30 per cent variation from the standard, rather than 15 per cent as in the map of **Melbourne** for this variable.

Over two thirds (69.3 per cent) of SLAs had elevated ratios, with groups of contiguous SLAs with highly elevated ratios separated by a smaller number of SLAs with much lower ratios.

The highest rate of admissions from the combined causes of accidents, poisonings and violence was recorded for residents of Belfast (an SAR of 234\*\*), with more than twice the number of admissions expected from the State rates. Highly elevated ratios were also recorded for residents of Cohuna (with an SAR of 195\*\*), Cobram (183\*\*) and Kowree (180\*\*), Buln Buln (179\*\*), Heytesbury (178\*\*), Hampden (177\*\*), Birchip and Myrtleford (both with 176\*\*) and Mansfield (175\*\*).

The lowest ratios (in SLAs with more than 20 admissions) were in Wimmera (with an SAR of 47\*\*), Tungamah (52\*\*) and Shepparton (54\*\*), with around half the number of admissions expected from the State rates.

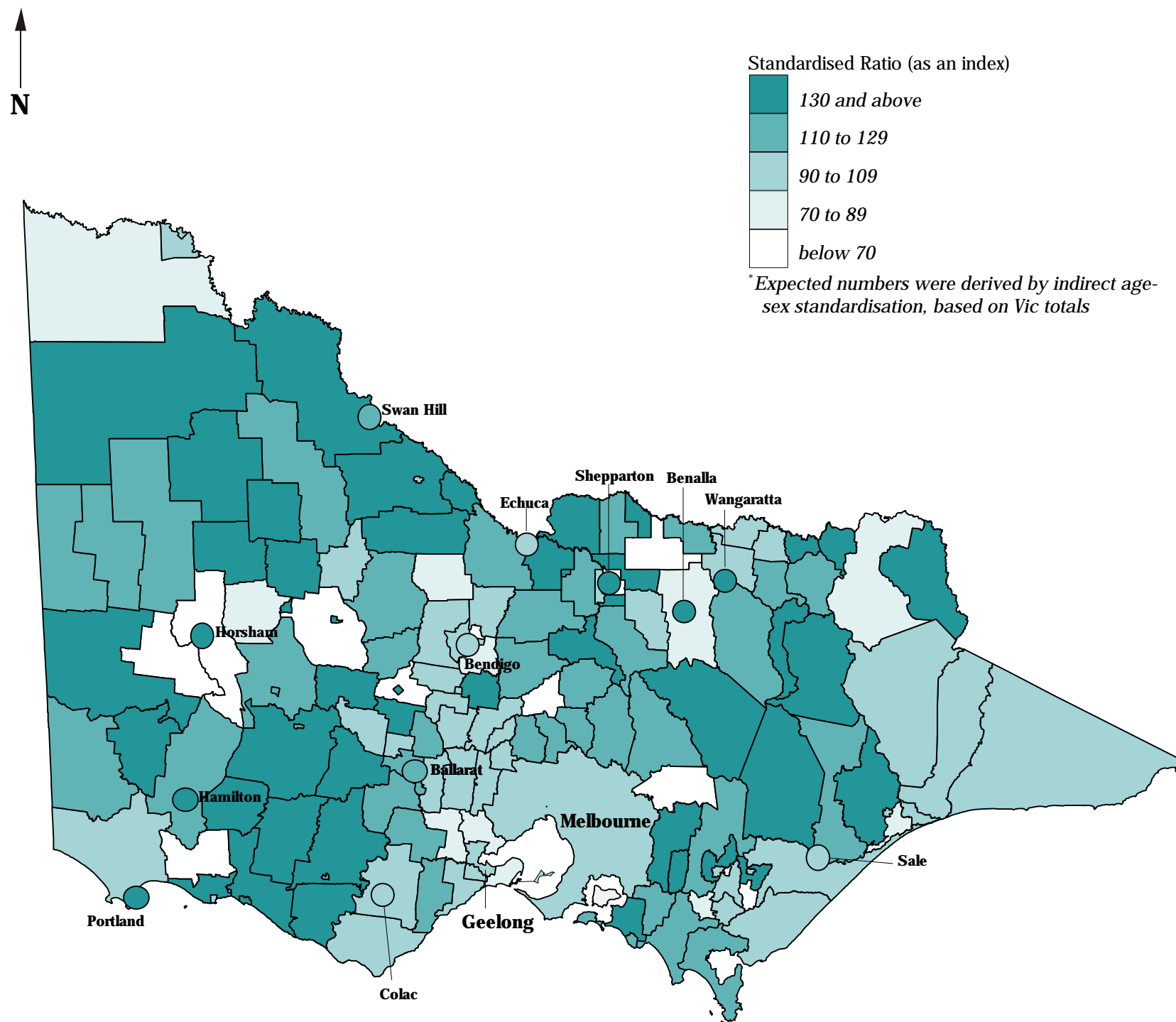
The largest numbers of admissions from these external causes of accidents, poisonings and violence were recorded for residents of Ballarat (1,739 admissions) and Bendigo (1,327). There were also more than 700 admissions of residents from Warrnambool (795 admissions), South Barwon-Inner (763) and Wodonga (747). Larger numbers of admissions were recorded in the towns of Shepparton (690 admissions), Wangaratta (450) and Mildura (439).

There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions from the combined causes of accidents, poisonings and violence and socioeconomic status.

### Map 6.36

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

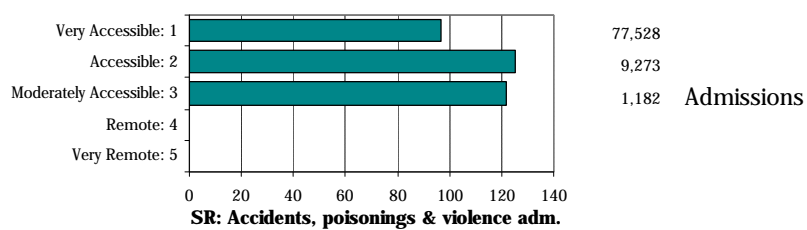
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



There are elevated standardised admission ratios for admissions from the external causes of accidents, poisonings and violence in the Accessible (an SAR of 125) and Moderately Accessible (122) ARIA categories. Residents of the Very Accessible areas had three per cent fewer admissions from these external causes than were expected from the State rates (an SAR of 97).

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 procedures for which data have been published over some years. All but three of these procedures (coronary artery bypass graft,

<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).

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.

Victoria has a higher standardised admission rate than the average of the other States for just over half of these procedures, with the most highly elevated being for myringotomy, angioplasty and tonsillectomy (**Table 6.42**). Rates for lens insertion, Caesarean section and hysterectomy were 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>		
	Victoria	Other States	Difference
Appendicectomy	1.53	1.39	9.9**
Coronary artery bypass graft	0.90	0.90	-0.1
Angioplasty	0.90	0.66	36.7**
Caesarean section	2.72	2.81	-3.4**
Cholecystectomy	2.19	2.18	0.6
Endoscopy	25.27	23.56	7.3**
Hip replacement	1.09	0.97	13.2**
Hysterectomy	1.82	1.85	-1.8
Lens insertion	4.91	5.10	-3.6**
Myringotomy	2.74	2.15	27.2**
Tonsillectomy	2.16	1.76	22.8**

<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 Victoria 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, Victoria**

Procedure	1986	1996/97
Appendicectomy		107.0
Caesarean section		97.5
Cholecystectomy		100.5
Hip replacement		109.0
Hysterectomy		98.9
Lens insertion		97.2
Tonsillectomy		116.1

<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).

### Victoria

In 1995/96, there were 556,711 admissions of residents of Victoria to public acute and private hospitals (including day surgery facilities), 22.4 per cent of all admissions in Australia, at which at least one surgical procedure was performed. These admissions involving a procedure represented almost half (46.9 per cent) of all admissions of residents of Victoria in this analysis (which includes all acute admissions, other than for renal dialysis).

Almost three quarters (71.0 per cent) of the admissions were residents of **Melbourne** (which comprises a similar 71.8 per cent of the State's population), 2.1 per cent were residents of **Geelong** (which comprises a higher 3.3 per cent of the population) and 26.9 per cent were of residents of the non-metropolitan areas of Victoria (which comprises a lower 24.9 per cent of the population). Females accounted for 58.9 per cent of the admissions, varying from 59.7 per cent of admissions of **Melbourne** residents, 58.0 per cent of admissions of **Geelong** residents to 56.8 of non-metropolitan residents.

Close to one half (44.9 per cent) of the procedures were performed on a same day basis, with males having slightly more principal procedures on a same day basis (45.6 per cent of all male principal procedures compared with 44.5 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

Over half (55.8 per cent) of the admissions to acute hospitals of residents of Victoria in 1995/96 involved a surgical procedure. Females accounted for 57.9 per cent of such admissions, and males for 42.1 per cent. For females, rates were highest in the 25 to 34 year age groups and again from age 60, while for males, rates were most common among those aged from their late fifties, increasing with each age group (**Figure 6.9**, page 188).

## Melbourne (Victoria as the Standard)

In 1995/96, there were 472,334 admissions of residents of **Melbourne** for a surgical procedure, equal to the level expected from the State rates (an SAR of 100<sup>\*</sup>). Females accounted for well over half (58.5 per cent) of these admissions.

The highest and lowest ratios for admissions for a surgical procedure were recorded in two adjacent western SLAs (**Map 6.37**).

Ratios were highest in Werribee (with an SAR of 131\*\*), Brighton (118\*\*), Mordialloc (115\*\*), South Melbourne and Sandringham (both 113\*\*), Malvern and Flinders (both 111\*\*) and Chelsea (110\*\*).

The lowest ratios were recorded for residents of Fitzroy (with an SAR of 80\*\*), and Altona and Collingwood (both 81\*\*). SLAs with relatively low ratios were located in **Melbourne's** inner northern and western suburbs, a number of south-eastern and eastern middle suburbs. Residents of Springvale had 14 per cent fewer admissions than expected from the State rates, an SAR of 86\*\*, while those from Richmond and Waverley both had an SAR of 88\*\*.

The largest numbers of admissions for surgical procedures were recorded for residents of Knox (18,023 admissions), Waverley (16,560), Keilor (16,471) and Moorabbin (16,299).

There were weak correlations with most of the indicators of socioeconomic disadvantage and weak inverse correlations with most of the indicators of high socioeconomic status. The weak correlation with the IRSD (0.32) supports the existence of an association at the SLA level between high rates of admission for surgery and high socioeconomic status.

## Geelong

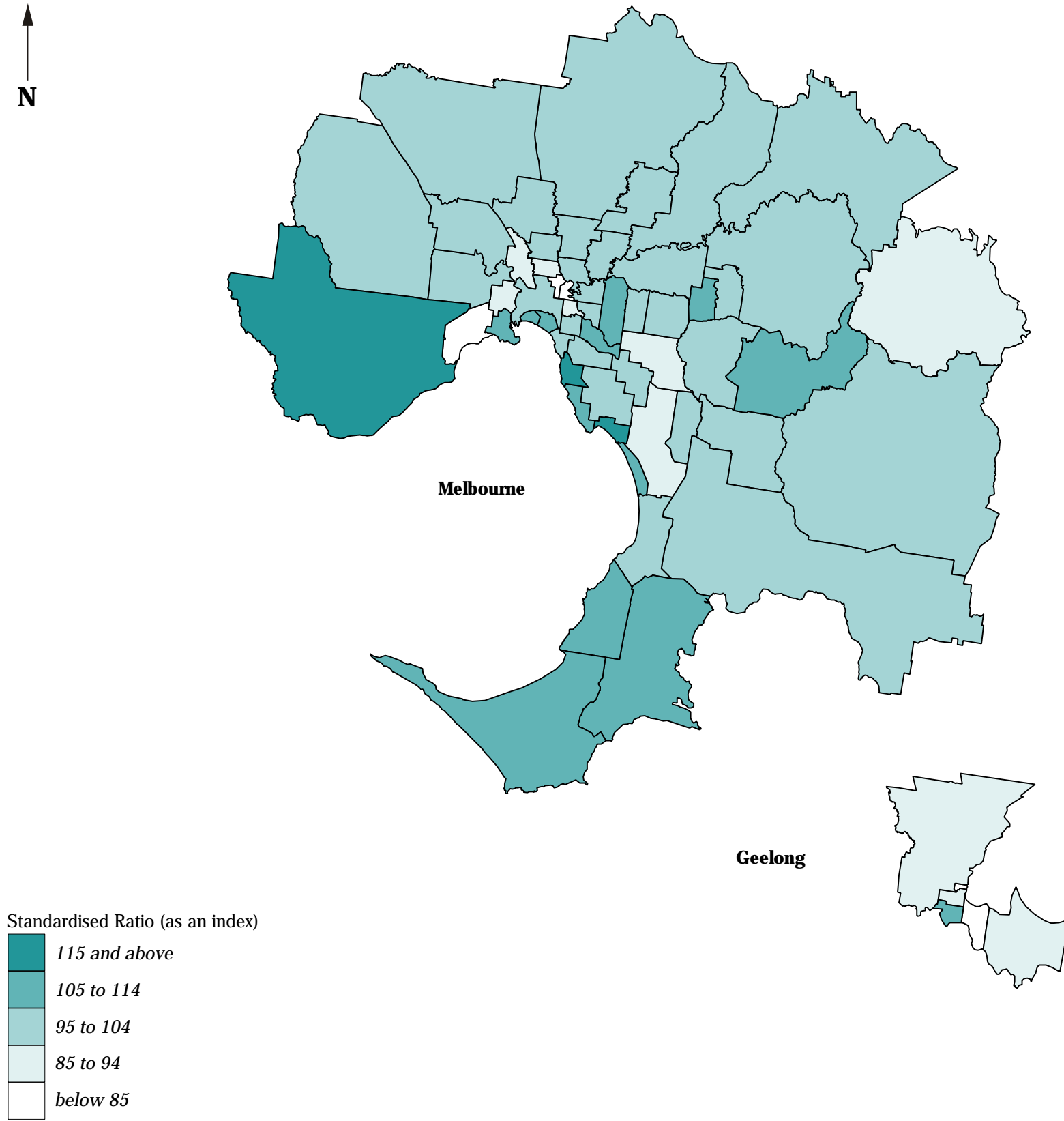
There were 14,725 admissions of residents of **Geelong** for a surgical procedure, 11 per cent fewer than expected from the State rates (an SAR of 89\*\*). Over half (57.6 per cent) were females. The highest ratios were recorded in Newtown (an SAR of 108\*\*) and Corio-Inner (89\*\*), with the lowest in the City of Geelong (82\*\*).

The largest number of admissions were recorded for residents of Corio-Inner (7,185 admissions) and Bellarine-Inner (2,394 admissions).

### Map 6.37

## Admissions for surgical procedures, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 176,149 admissions of residents of the non-metropolitan areas of Victoria in 1995/96 for surgical procedures, two per cent more admissions than expected from the State rates (an SAR of 102\*\*). Females accounted for over half (56.2 per cent) of these admissions.

There is no clear pattern associated with the distribution of SLAs with the highest and lowest ratios, other than the generally low ratios in the north-west and south-east of the State (**Map 6.38**).

Portland (with an SAR of 160\*\*) and Belfast (146\*\*) had ratios elevated by more than 40 per cent. Relatively high ratios were also recorded for residents of Narracan [Part A] (with an SAR of 139\*\*), Benalla (132\*\*), Hampden (131\*\*) and Horsham and Cobram (both 130\*\*).

The lowest ratios (with at least 20 admissions) were in Traralgon [Part B] (with an SAR of 31\*\*, 69 per cent fewer admissions than expected from the State rates), Wimmera (32\*\*) and Upper Yarra [Part B] (37\*\*).

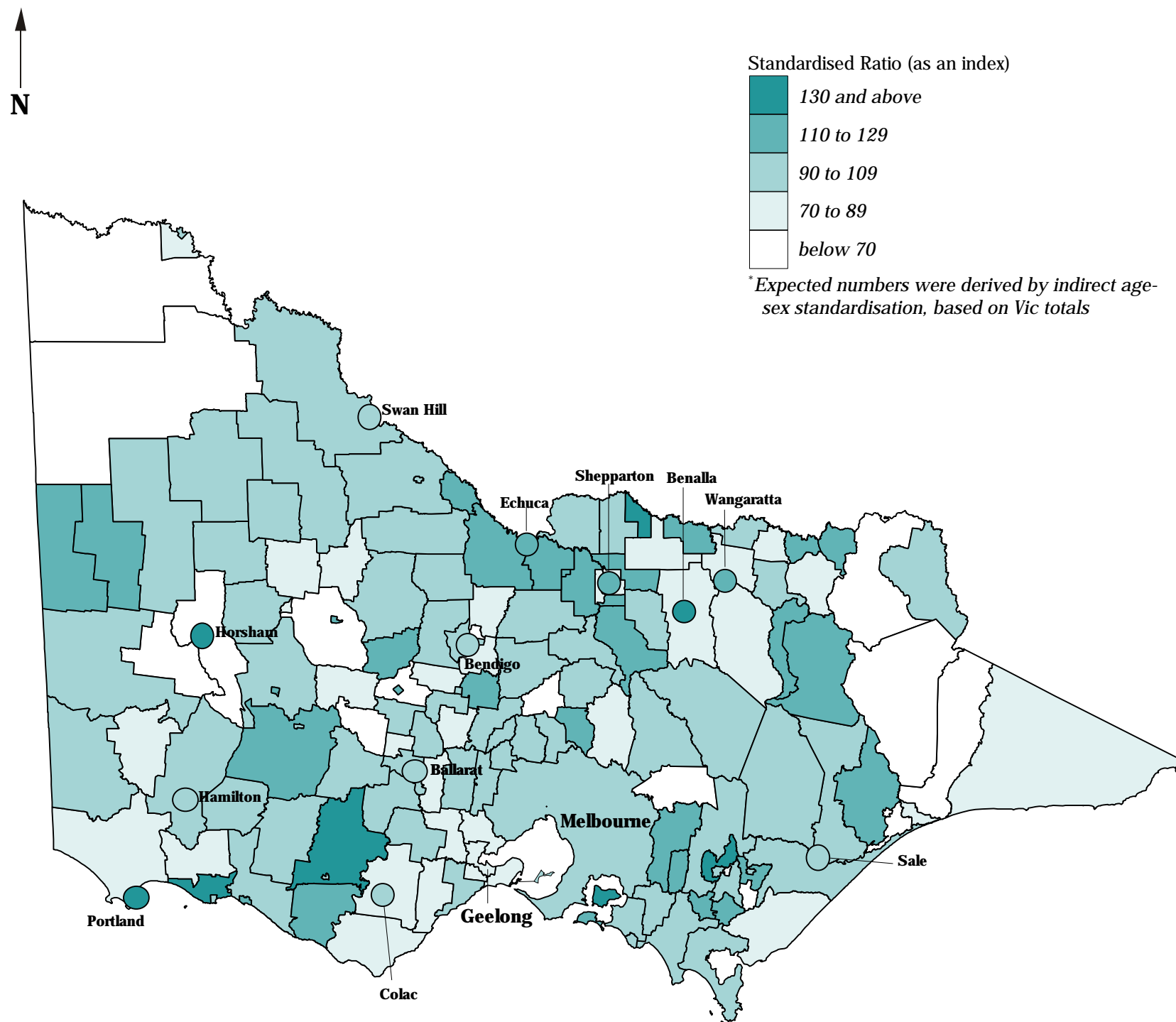
There were 10,841 admissions for a surgical procedure of residents of Ballarat and 10,650 from Bendigo. Relatively high numbers of admissions were also recorded from South Barwon-Inner (5,313 admissions), Warrnambool (4,902), Wodonga (4,859) and Shepparton (4,513).

There was no clear association evident in the correlation analysis at the SLA level between high rates of admission for surgery and the indicators of socioeconomic status.

### Map 6.38

## Admissions for surgical procedures, Victoria, 1995/96

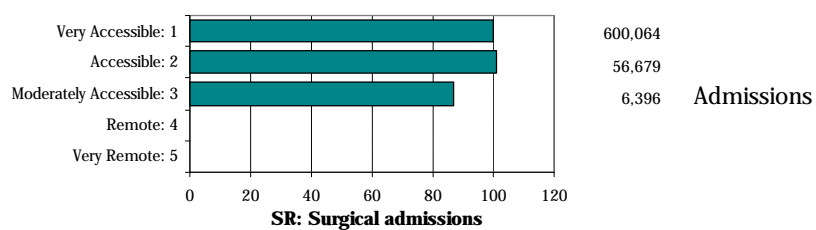
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving a surgical procedure were at or close to the level expected from the State rates in both the Very Accessible (an SAR of 100) and Accessible (101) ARIA categories, before dropping to 13 per cent fewer admissions for these procedures than were expected from the State rates in the Moderately Accessible ARIA category (an SAR of 87).

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

# Same day admissions for surgical procedures, 1995/96

## Capital city comparison (Australia as the Standard)

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

The standardised admission ratios (SARs) ranged from 64\*\* in **Canberra** and 72\*\* in **Darwin** to 111\*\* in **Melbourne** and 104\*\* in **Sydney**. When compared with ratios for all admissions for surgical procedures (**Table 6.44**), 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 (49.2 per cent) of all admissions of residents of Victoria in 1995/96 involving a surgical procedure were same day admissions. Females accounted for over half (57.5 per cent) of same day admissions. Admission rates were higher for females than for males in the age groups from 15 to 19 years through to 60 to 64 years (**Figure 6.10**, page 188). For males, the largest differentials over the rates for females were in the 0 to 14 year age groups and from age 65 years.

## Melbourne (Victoria as the Standard)

There were 237,965 same day admissions of residents of **Melbourne** for surgical procedures in 1995/96, two per cent more than were expected from the State rates. Of these same day admissions, 138,495 (58.2 per cent) were for females.

SLAs with the highest ratios were largely located on Port Phillip Bay (**Map 6.39**).

Brighton (with an SAR of 129\*\*) had the most highly elevated ratio, with 29 per cent more same day admissions for a surgical procedure than expected from the State rates. Similarly elevated ratios were recorded in Werribee (127\*\*), Flinders (125\*\*), Sandringham (124\*\*) and Mordialloc (122\*\*). SLAs with ratios elevated by ten per cent or more were South Melbourne (118\*\*), Camberwell (115\*\*), Malvern and Port Melbourne (both 114\*\*), Williamstown (114), Chelsea (113\*\*), Ringwood and Sherbrooke (112\*\*) and Caulfield (111\*\*).

The lowest ratios for same day admissions involving a surgical procedure were recorded in Fitzroy (with an SAR of 82\*\*), Altona (83\*\*) and Springvale and Collingwood (both 85\*\*).

The largest numbers of same day admissions involving a surgical procedure were recorded for residents of Knox (9,664 admissions), Waverley (9,019), Moorabbin (8,378), Keilor (8,317) and Doncaster and Templestowe (8,178).

There were correlations with the variables for female labour force participation (0.38) and high income families (0.35); and inverse correlations with people reporting poor proficiency in English (-0.53) and unemployed people (-0.46).

These results, together with the correlation with the IRSD (0.46), suggest the existence of an association at the SLA level between high rates of same day admissions for surgical procedures and high socioeconomic status.

## Geelong

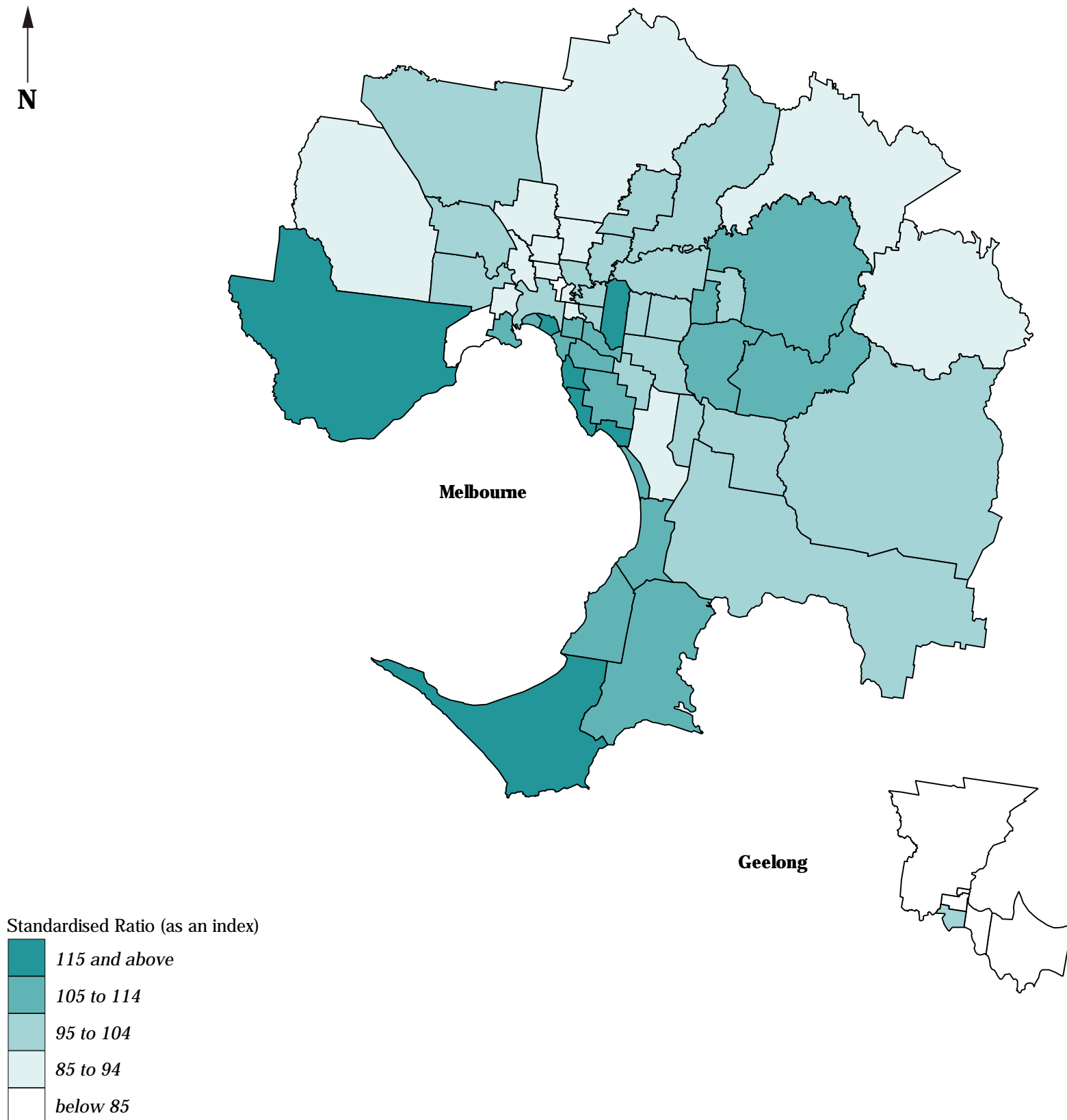
There were 5,957 same day admissions recorded for residents of **Geelong** in 1995/96, around three quarters of the number expected from the State rates (an SAR of 73\*\*). Over half (57 per cent) of the admissions were females.

All of the SLAs had fewer admissions than expected from the State rates. The highest ratios were recorded in Newtown (an SAR of 97) and Corio-Inner (74\*\*), and the lowest ratio in the City of Geelong (67\*\*). Almost one half of **Geelong's** same day admissions (2,928 admissions) were of people resident in Corio-Inner.

### Map 6.39

## Same day admissions for surgical procedures, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 82,540 same day admissions of residents of the non-metropolitan areas of Victoria for a surgical procedure in 1995/96, three per cent fewer than were expected from the State rates (an SAR of 97\*\*). Females accounted for over half (55.4 per cent) of these same day admissions.

The most highly elevated ratios were recorded in SLAs in isolated locations throughout the State. Areas with the lowest ratios were more numerous and more widely distributed than those in the highest range mapped, particularly in the central western and outer eastern regions of the State.

The most highly elevated ratios were recorded for residents of Narracan [Part A] (with an SAR of 158\*\*, 58 per cent more same day admissions for a surgical procedure than expected from the State rates); Portland (155\*\*); Warragul (150\*\*); Benalla (148\*\*); Morwell [Part B] and Buln Buln (both 141\*\*); Myrtleford (139\*\*); Traralgon [Part A] (136\*\*); Belfast and Bright (both 136\*\*).

The lowest ratios were recorded in Tambo [Part B] (with an SAR of 22\*\*), Wimmera (25\*\*), Bairnsdale (C) and Traralgon [Part B] (both 27\*\*) and Bairnsdale Shire [Part A] (28\*\*).

The largest numbers of admissions for same day surgery were of residents of Bendigo (4,658 admissions) and Ballarat (4,521). Elsewhere, there were more than 2,000 admissions of residents of Wodonga (2,606 admissions), Warrnambool (2,478), South Barwon-Inner (2,299) and Shepparton (2,127).

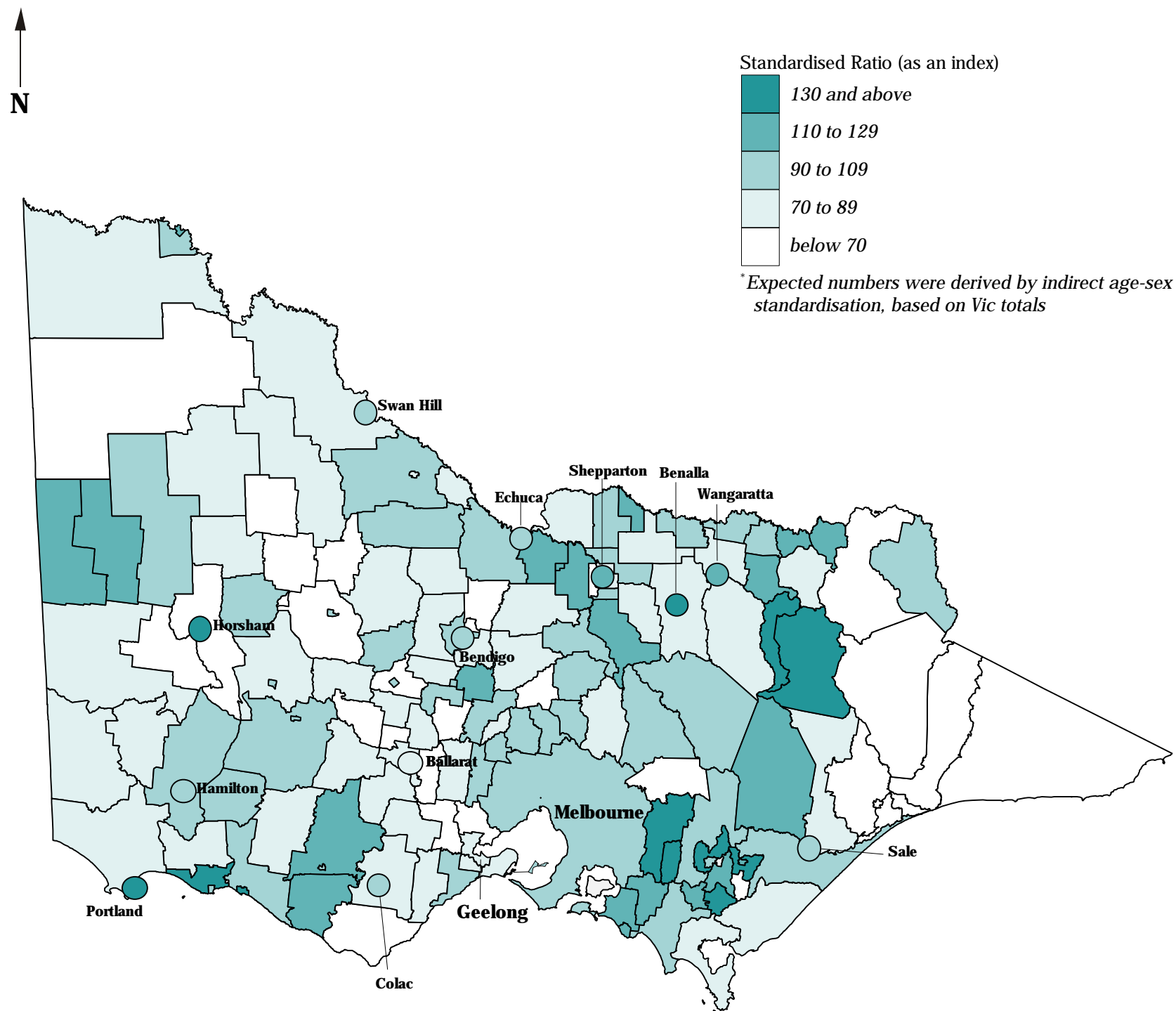
There was no consistent evidence in the correlation analysis of an association at the SLA level between high rates of admissions of females and socioeconomic status.



## Map 6.40

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

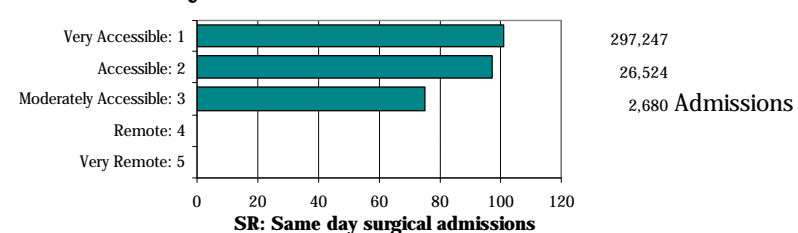
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for same day admissions involving a surgical procedure show a similar pattern to that evident for all surgical admissions, with lower ratios associated with decreasing accessibility. Ratios decline across the ARIA categories, from a high of 101 for people living in the Very Accessible areas, through a similarly near-expected ratio in the Accessible areas (an SAR of 97), to a low of 75 in the Moderately Accessible areas, where there were 25 per cent fewer same day admissions for these procedures than were expected from the State rates.

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 patient'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 Victoria 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 820.5 admissions per one hundred thousand females and 782.3 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 464.5 admissions per 100,000 females compared with 662.1 admissions per 100,000 males) and with substantially higher rates than for males in the age groups from 10 to 24 years. Overall, 56.2 per cent of admissions were females.

Data for Australia published by the AIHW (1998) showed the tonsillectomy and/or adenoidectomy rate in Victoria to be 22.8 per cent above that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

During 1995/96, there were 6,056 admissions for tonsillectomies and/or adenoidectomies of residents of **Melbourne** (an SAR of 98). Females accounted for over half (55.2 per cent) of these admissions.

The distribution of SLAs with the highest standardised admission ratios is widespread, covering many of the middle and outer western and northern SLAs, and much of the eastern and south-eastern part of **Melbourne**, away from the bayside SLAs (**Map 6.41**). SLAs with the lowest ratios are in clearly defined areas, in and around the city centre (and extending along the bay to the south-east), and in the outer eastern and south-eastern suburbs.

Standardised admission ratios for admissions for tonsillectomies and/or adenoidectomies were elevated by 40 per cent or more in Werribee (with an SAR of 141\*\*) and Ringwood (140\*\*); with elevations of 20 per cent or more in Williamstown (136\*), Cranbourne (125\*\*), Croydon (122\*), Brighton (121) and Sunshine (120\*\*).

The lowest ratios (in SLAs with more than 20 admissions) were in Mornington (with an SAR of 60\*\*), Flinders (63\*\*), Kew (64\*\*), Northcote (67\*\*) and Altona (68\*\*).

There were 292 admissions for tonsillectomies and/or adenoidectomies of residents of Cranbourne, 290 from Knox and 264 from Werribee. There were more than 200 admissions for these procedures of people from of Whittlesea, Broadmeadows, Sunshine, Keilor, Berwick and Doncaster and Templestowe.

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

## Geelong

In contrast with the lower than expected rate of admissions for these procedures in **Melbourne**, residents of **Geelong** had 31 per cent more admissions for tonsillectomies and/or adenoidectomies than expected from the State rates, an SAR of 131\*\*. There were 287 admissions for these procedures, of which just over half (52.3 per cent) were of females.

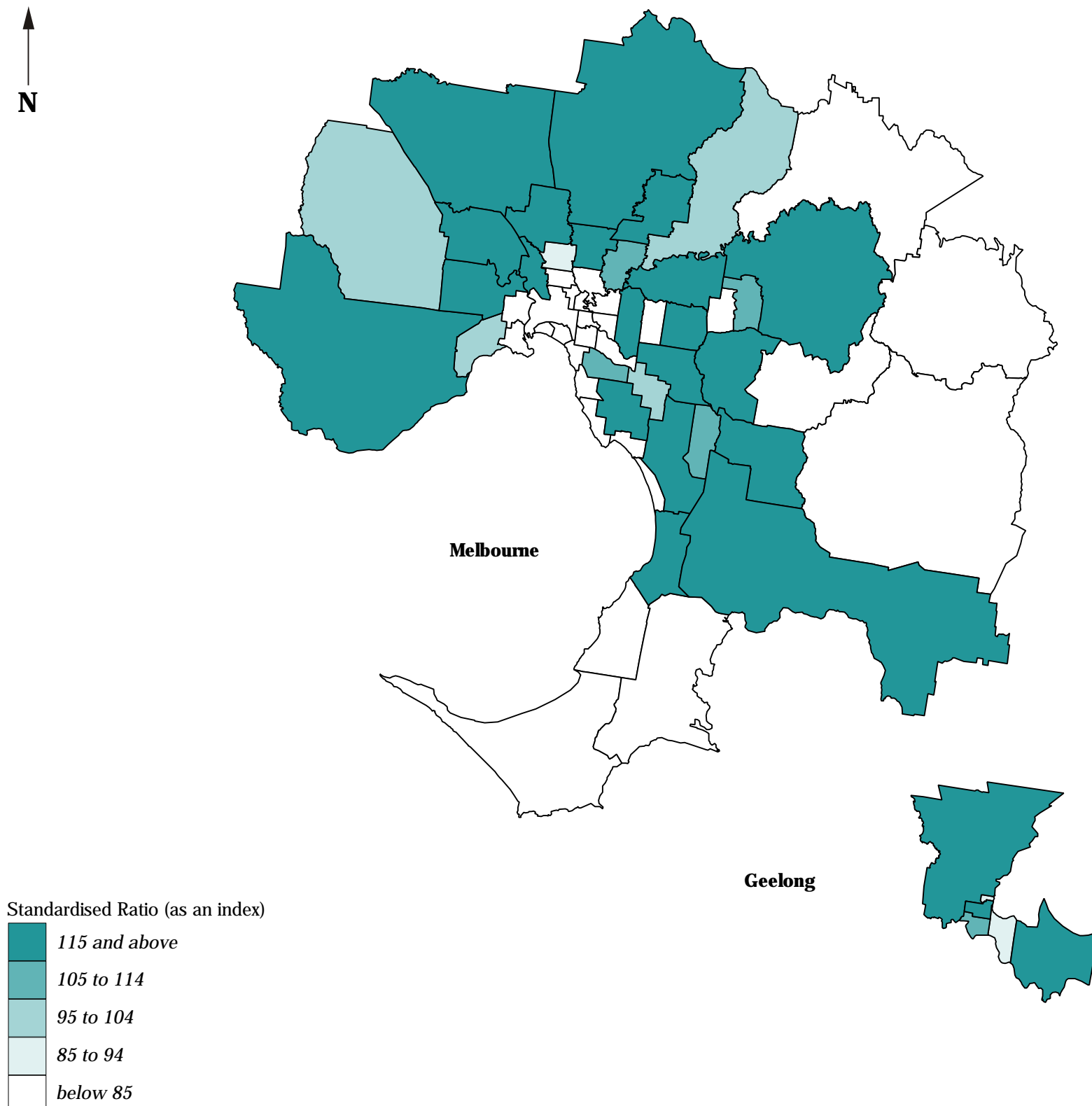
Only the SLA of Geelong (with an SAR of 88) had a ratio of less than 100, with a highly elevated ratio in Geelong West, with almost twice the expected number of admissions (an SAR of 197\*\* and 44 admissions). Elevated ratios were also recorded in Corio-Inner (133\*\*) and Bellarine Inner (121).

The largest number of over half (admissions was recorded for residents of Corio-Inner (151 admissions) some three times the number of admissions for a tonsillectomy and/or adenoidectomy of residents from Bellarine-Inner (51 admissions).

### Map 6.41

## Admissions for a tonsillectomy and/or adenoidectomy, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

During 1995/96, there were 2,493 admissions of residents of the non-metropolitan areas of Victoria for tonsillectomies and/or adenoidectomies, three per cent more admissions than expected from the State rates (an SAR of 103). Females accounted for 59.0 per cent of these procedures.

Thirty three SLAs were not mapped as fewer than five admissions were expected from the State rates. The spatial distribution of SLAs with the most highly elevated and lowest standardised admissions ratios is widespread, although in no noticeable pattern (**Map 6.42**).

SLAs with more than twice the number of admissions for tonsillectomies and/or adenoidectomies expected from the State rates (in SLAs with more than 20 admissions) were Stawell (with an SAR of 223\*\*), Horsham (216\*\*) and Maryborough (214\*\*). Relatively high SARs were also recorded in Deakin (185\*\*), Kyabram (180\*\*), Sale (173\*\*) and Echuca (144').

There were as many SLAs with extremely low ratios as there were with highly elevated ratios. The lowest ratios (in SLAs with more than 20 admissions) were recorded for residents from Mildura (with an SAR of 54\*\*), almost half the number of admissions expected from the State rates), Mildura Shire [Part A] (69'), Moe (85) and Greater Geelong [Part B] (86).

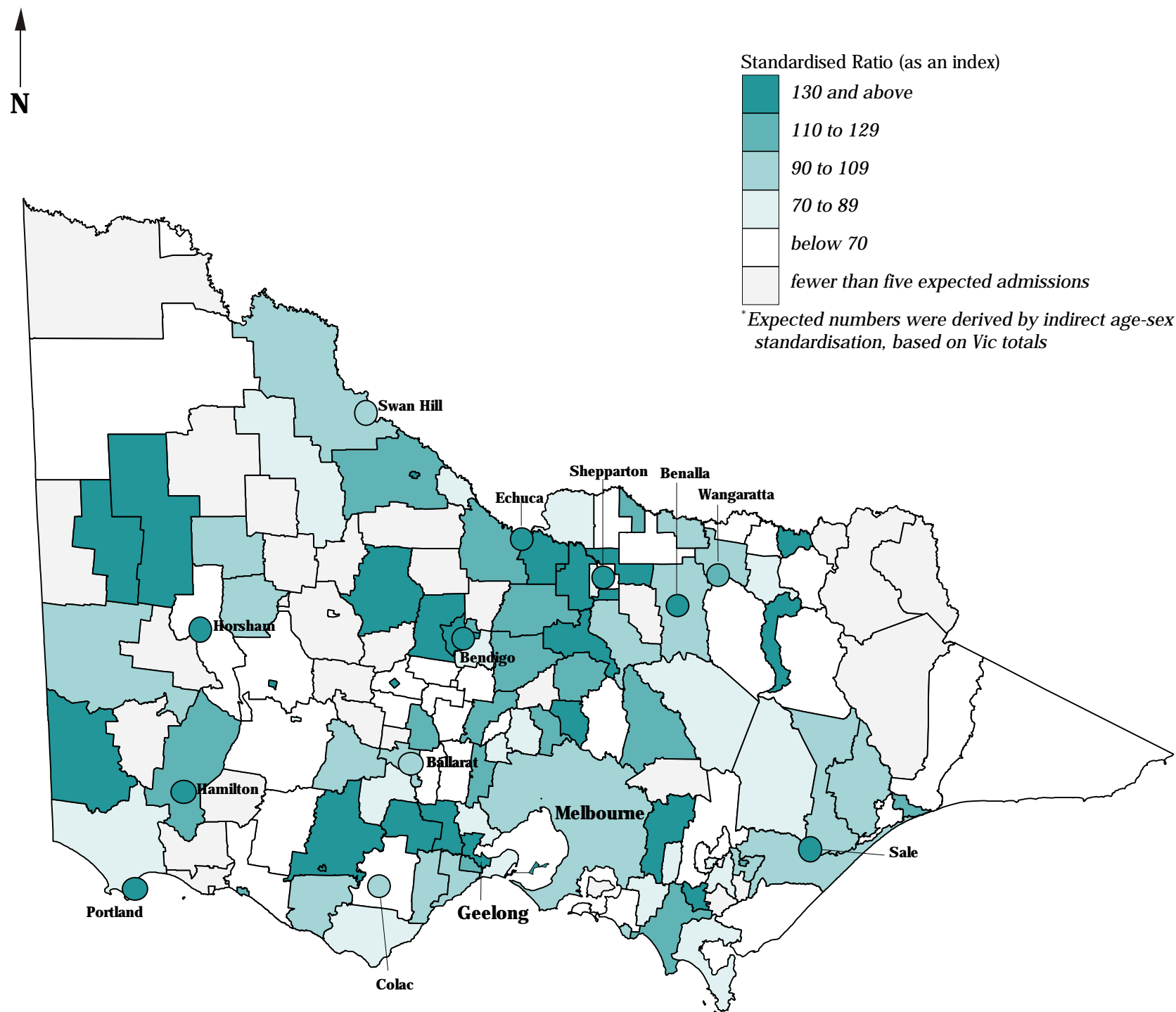
The largest numbers of admissions were of residents of Bendigo (189 admissions), Ballarat (140), South Barwon-Inner (96) and Wodonga (95). There were 56 admissions of people living in Horsham, 59 from Warrnambool and 74 from Shepparton.

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, Victoria, 1995/96**

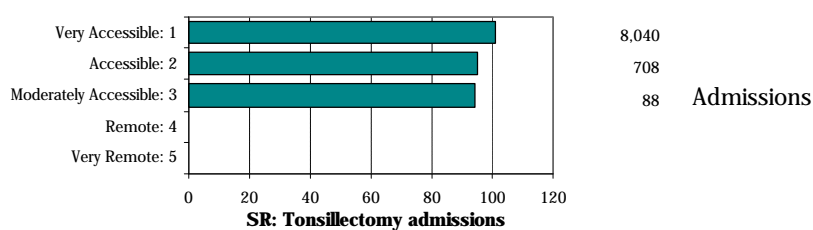
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for admissions involving a tonsillectomy and/or adenoidectomy are relatively close to the level expected from the State rates in all three ARIA categories in Victoria. The ratios vary from a marginally higher than expected ratio in the Very Accessible areas (one per cent more admissions than expected from the State rates, an SAR of 101) to lower than expected ratios in the Moderately Accessible (an SAR of 94, six per cent fewer admissions than expected) and Accessible (95) areas.

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 (85.3 per cent) of admissions of Victorian residents for this procedure were of people 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 over half (52.6 per cent) of the admissions for this procedure, with the most of the remainder (32.7 per cent) in the 5 to 9 year age group. Males accounted for over half (59.0 per cent) of all admissions for myringotomies and slightly more (62.9 per cent) in the 0 to 4 year age group.

Data for Australia published by the AIHW (1998) showed the myringotomy rate in Victoria to be 27.2 per cent above that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

In 1995/96, there were 5,468 admissions of children aged from 0 to 9 years living in **Melbourne** for a myringotomy (an SAR of 102). Almost two thirds (61.4 per cent) of these admissions were males. A majority (95.1 per cent) of the myringotomies in this analysis were performed on a same day basis.

SLAs with the most highly elevated standardised admission ratios for a myringotomy were distributed widely throughout **Melbourne** (**Map 6.43**), with the largest concentration in the eastern and bayside suburbs. The distribution of SLAs with low rates of admission is largely concentrated in a band extending from the City of Melbourne and Altona in the south, to the outer northern fringe of the Melbourne Statistical Division.

The highest ratio was recorded for children aged from 0 to 9 years in Mordialloc (an SAR of 231\*\*), with more than twice the expected number of admissions for a myringotomy, while highly elevated ratios were also recorded in Sandringham (198\*\*), Malvern (179\*\*), Brighton (165\*\*) and Ringwood (159\*\*). A further nine SLAs had ratios elevated by 30 per cent or more.

The lowest ratios (in SLAs with more than 20 admissions) were in Altona (with an SAR of 56\*\*), Coburg (63\*\*), Sunshine and Preston (64\*\*), Richmond (66), Footscray (66\*\*) and Broadmeadows (68\*\*). A further nine SLAs had ratios mapped in this lowest range, with ratios of 30 per cent or more lower than expected from the State rates.

The largest numbers of admissions for a myringotomy were of children aged from 0 to 9 years from the SLAs of Knox (374 admissions), Cranbourne (280), Berwick (236), Moorabbin (211), Lillydale (206) and Werribee (202).

There was a correlation with the variable for female labour force participation (0.58), and inverse correlations with unemployment (-0.64) and low income families (-0.52). The correlation of meaningful significance with the IRSD (0.63) supports the existence of an association at the SLA level between high rates of admission for a myringotomy and high socioeconomic status. There was also a correlation of substantial significance between high rates of these admissions and private hospital admissions (0.75).

## Geelong

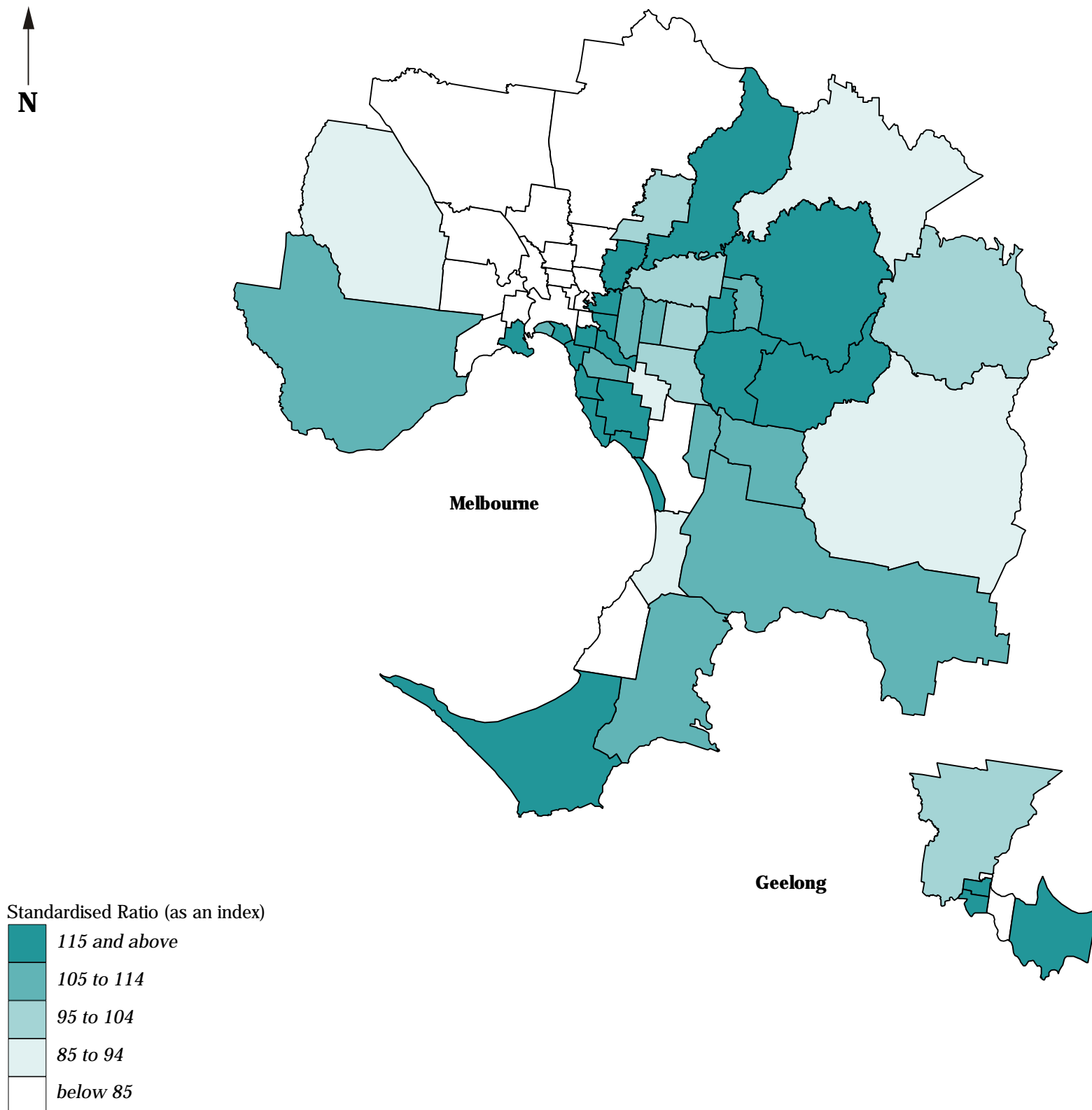
There were 205 admissions for a myringotomy of children aged from 0 to 9 years in **Geelong**, five per cent more than expected from the State rates (an SAR of 109). Over half (58 per cent) of the admissions were males: the majority (91.7 per cent) of these procedures were performed on a same day basis.

Elevated ratios were recorded for children living in Newtown (an SAR of 175\*\*), Geelong West (138) and Bellarine-Inner (123). In contrast, there were 47 per cent fewer admissions than expected for children aged from 0 to 9 years in the City of Geelong (53). The largest number of admissions was of children from Corio-Inner (94 admissions).

### Map 6.43

## Admissions of children aged 0 to 9 years for a myringotomy, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 2,088 admissions for a myringotomy of children aged from 0 to 9 years and resident in the non-metropolitan areas of Victoria, five per cent fewer than expected from the State rates (an SAR of 95<sup>1</sup>). Males accounted for 60.7 per cent of these admissions: 88.0 per cent of the myringotomies in this analysis were performed on a same day basis.

There is no discernible pattern in the distribution of the highest and lowest standardised admission ratios, other than generally higher ratios in the towns mapped (**Map 6.44**). The highest ratios (in SLAs with more than 20 admissions) were recorded for residents of Rodney [Part B] (with an SAR of 185\*\*), Hampden (173<sup>1</sup>), Horsham (171\*\*), Korumburra (161<sup>1</sup>), Rochester (159<sup>1</sup>), Hamilton (149<sup>1</sup>), Bendigo (147\*\*) and Benalla (137).

The lowest ratios were recorded for children aged from 0 to 9 years in Morwell [Part A] (with an SAR of 66<sup>1</sup>), Warragul (79) and Buln Buln (80).

Generally, the number of admissions for a myringotomy was low. Apart from Bendigo (174 admissions) and Ballarat (153), only South Barwon-Inner (80), Warrnambool (62), Wodonga (56) and Shepparton (55) had more than 50 admissions.

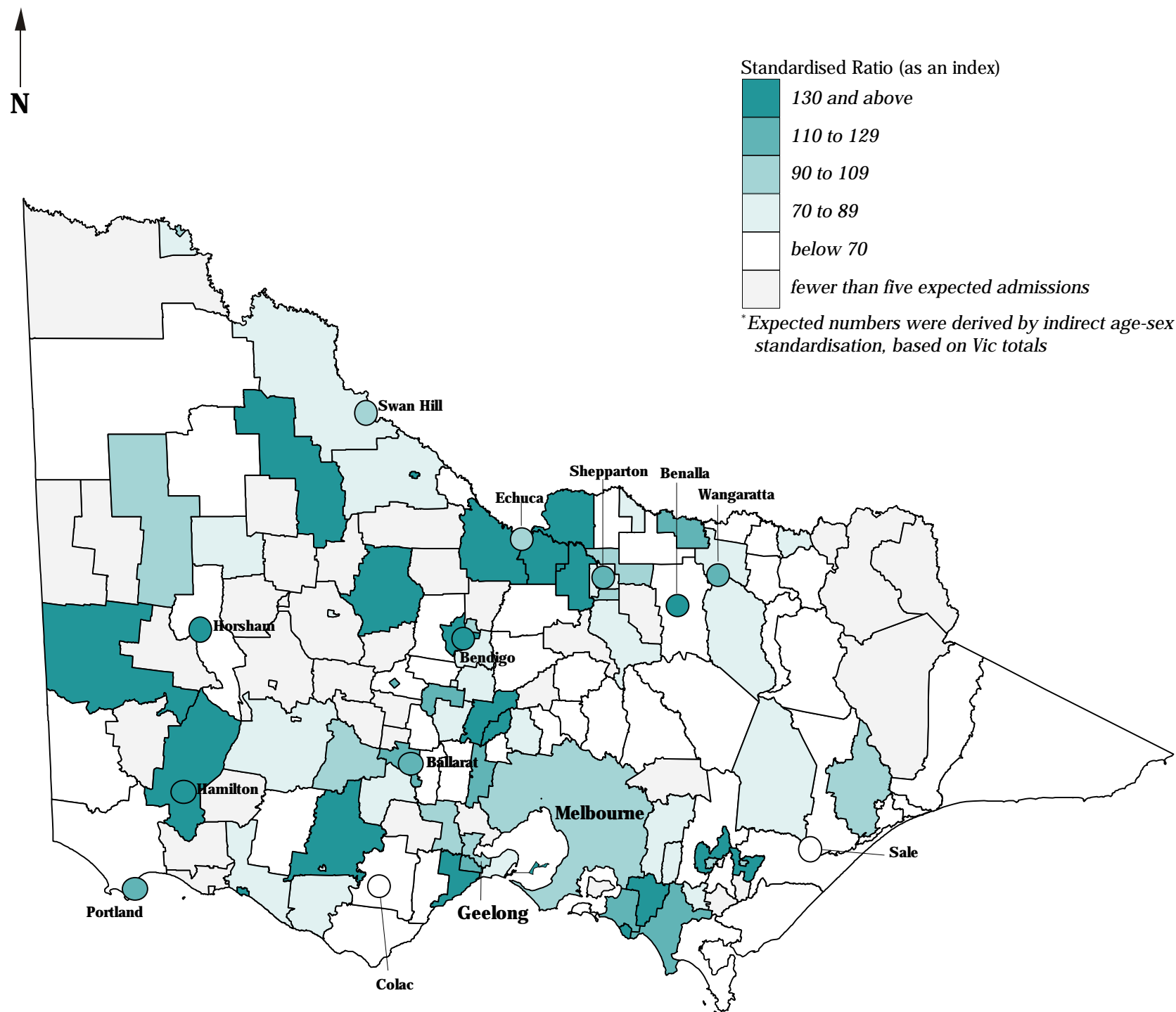
The correlation analysis was not undertaken because there were too many SLAs with small numbers of cases.



### Map 6.44

## Admissions of children aged 0 to 9 years for a myringotomy, Victoria, 1995/96

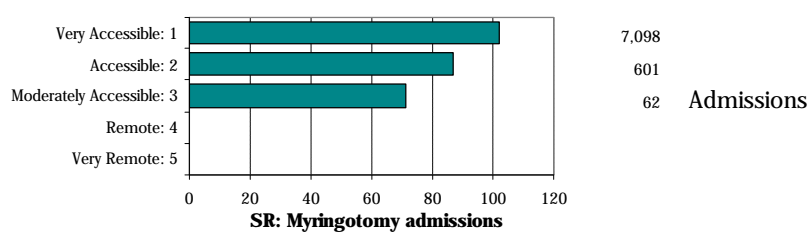
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios (SARs) for admissions involving a myringotomy show a strong relationship with decreasing accessibility. The ratios vary from a marginally higher than expected ratio for people in the Very Accessible areas (two per cent more admissions than expected from the State rates, an SAR of 102), dropping to SARs of 87 in the Accessible and 71 in the Moderately Accessible areas.

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 Victoria to be 3.4 per cent below that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

During 1995/96, there were 8,169 admissions of female residents of **Melbourne** aged from 15 to 44 years involving a Caesarean section, three per cent fewer than expected from the State rates (an SAR of 97\*\*).

Elevated ratios for this procedure were concentrated in the outer northern, north-western and western suburbs, as well as some inner western SLAs (**Map 6.45**); lower ratios were recorded in the inner suburbs and in the higher socioeconomic suburbs extending from the Upper Yarra area, through the eastern middle suburbs, and along the Mornington Peninsula.

The most highly elevated ratios for a Caesarean section were in Werribee (with an SAR of 173\*\*) and Williamstown (140\*\*), with other elevated ratios in Upper Yarra [Part A] (138\*), Whittlesea (118\*\*), Ringwood and Footscray (both 117), and Melton (115).

The lowest ratio was recorded for females aged from 15 to 44 years and living in Fitzroy (with an SAR of 42\*\*, 58 per cent fewer admissions for a Caesarean section than expected from the State rates), with slightly higher ratios in Prahran and Collingwood (52\*\*), St Kilda (62\*\*), Richmond (67\*\*), Waverley (68\*\*) and Port Melbourne (69).

The largest numbers of admissions for Caesarean sections were of residents of outer SLAs; there were 404 admissions of females aged from 15 to 44 years and living in Werribee, 364 from Whittlesea and 359 from Knox. Slightly fewer admissions were recorded for residents of Keilor (315 admissions), Cranbourne (314) and Broadmeadows (307).

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

## Geelong

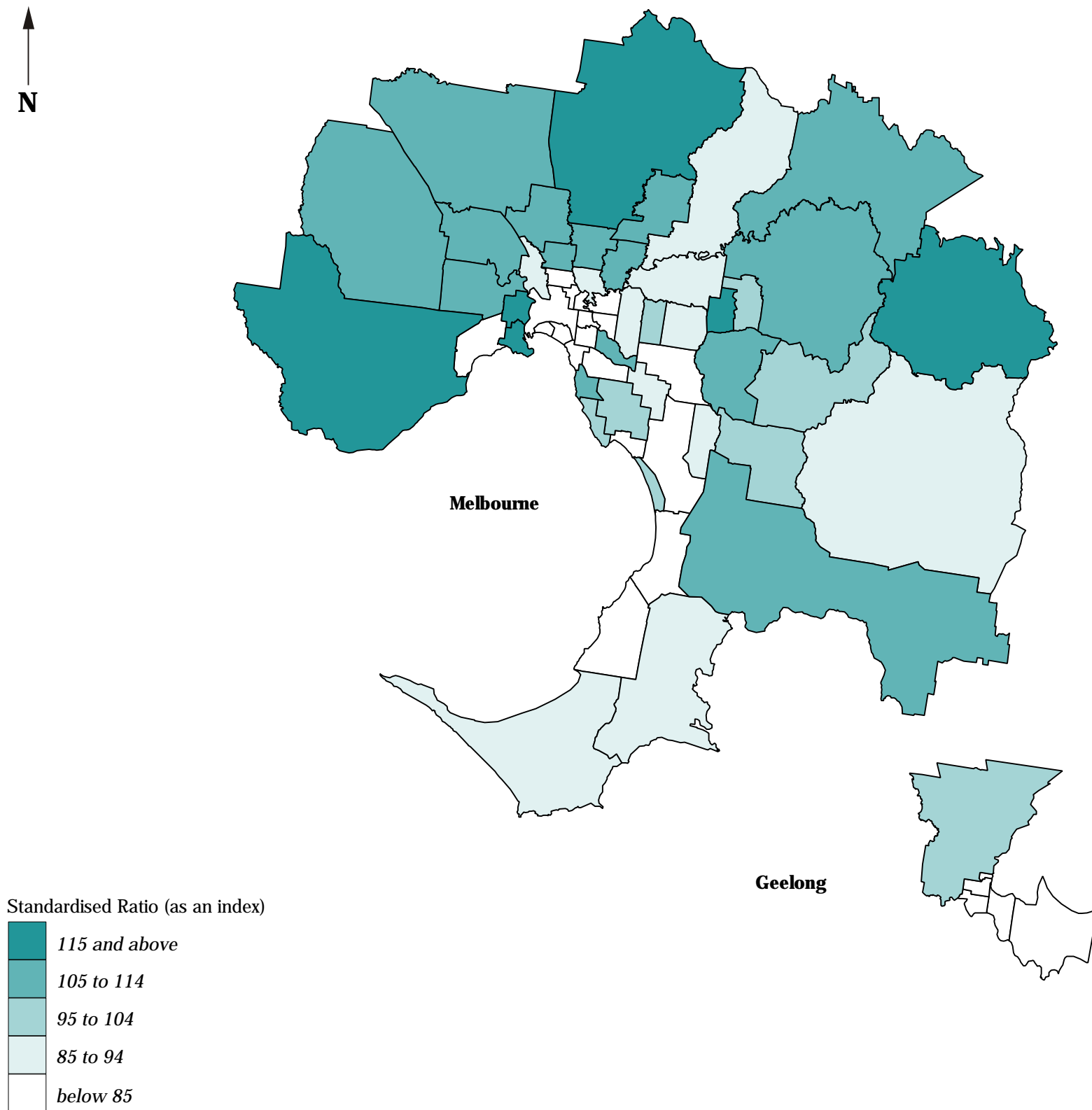
There were 225 admissions of female residents of **Geelong** aged from 15 to 44 years at which a Caesarean section was performed, 17 per cent fewer admissions than expected from the State rates (an SAR of 83\*\*). All SLAs had fewer admissions for a Caesarean section than expected, with ratios ranging from 59\* in the SLA of Geelong to 97 in Corio-Inner.

Female residents (aged from 15 to 44 years) of Corio-Inner had 127 admissions for a Caesarean section, nearly four times the 34 admissions recorded for those from Bellarine-Inner.

### Map 6.45

## Admissions of females aged 15 to 44 years for a Caesarean section, Melbourne and Geelong, 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 Vic totals

Source: See Data Sources, Appendix 1.3

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

## Admissions of females aged 15 to 44 years for a Caesarean section, 1995/96

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

There were 13,966 Caesarean sections (described on the previous text page) performed as a principal procedure on female residents of the non-metropolitan areas of Australia. There were elevated standardised admission ratios (SARs) for this variable in most of the non-metropolitan areas other than in Western Australia (with an SAR of 99), with the most highly elevated ratios in the Northern Territory (142\*\*) and South Australia (123\*\*).

**Table 6.53: 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 (Victoria as the Standard)

In 1995/96, there were 2,864 admissions of female residents (aged from 15 to 44 years) of the non-metropolitan areas of Victoria for a Caesarean section. This was 12 per cent more admissions than expected from the State rates, an SAR of 112\*\*.

Elevated ratios were recorded in SLAs scattered throughout the State, with noticeable concentrations in the Goulburn Valley and La Trobe Valley (**Map 6.46**).

The most highly elevated ratios (in SLAs with more than 20 admissions) for a Caesarean section were recorded for females aged from 15 to 44 years in Narracan [Part A] (with an SAR of 245\*\* and 33 admissions) and Newham and Woodend (243\*\*; 32). Other highly elevated ratios were recorded in Yarrawonga (with an SAR of 196\*\*), Horsham (190\*\*), Rodney [Part A] (178\*\*), South Gippsland (177\*\*), Colac (175\*\*), Rodney [Part B] (169\*\*), Heytesbury and Rochester (both 164\*), Swan Hill (162\*\*), Benalla (157\*) and Colac (152\*).

There were a further 20 SLAs (with more than 20 admissions) with ratios elevated by up to 50 per cent.

The lowest ratio was recorded for females aged from 15 to 44 years from Warragul (an SAR of 69 and 22 admissions). Low ratios were also recorded in South Barwon-Inner (with an SAR of 81), Wodonga (84), Bendigo and Warrnambool (both 85) and Swan Hill (86).

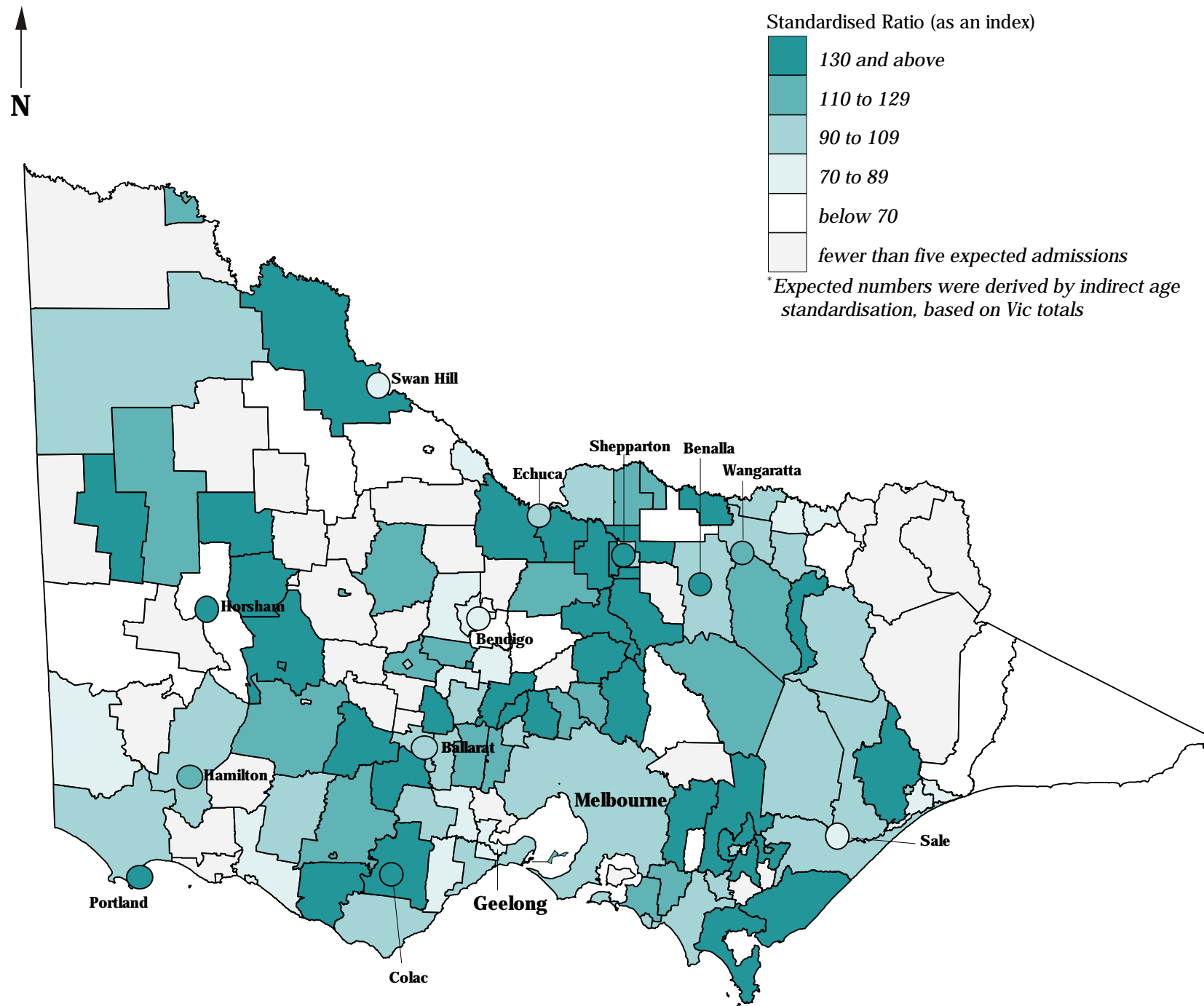
The largest numbers of admissions were recorded for females aged from 15 to 44 years in Ballarat (175 admissions) and Bendigo (138). Relatively large numbers of admissions were also recorded from Shepparton (95 admissions), Morwell (85), South Barwon-Inner (73), Wodonga (65), Mildura (64) and Traralgon (62).

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

**Map 6.46**

**Admissions of females aged 15 to 44 years for a Caesarean section, Victoria, 1995/96**

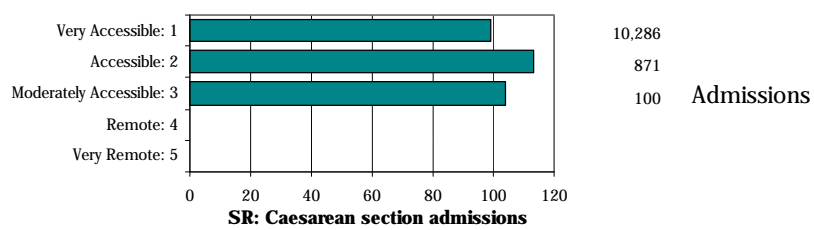
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for admissions of females aged from 15 to 44 years involving a Caesarean section were elevated by 13 per cent above the level expected from the State rates in the Accessible ARIA category (an SAR of 113), with lower ratios of 104 in the Moderately Accessible and 99 in the Very Accessible areas.

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: 1,665 admissions and a rate of 1002.2 per one hundred thousand females; 45 to 49 years: 1,818 admissions and a rate of 1155.9 per one hundred thousand females). As relatively few hysterectomies are performed on women younger than 30 years, the age range used in standardising this data are for women aged from 30 years.

Data for Australia published by the AIHW (1998) showed the hysterectomy rate in Victoria to be 1.8 per cent below that in the other States for which data were available (**Table 6.42**, page 267).

### Melbourne (Victoria as the Standard)

There were 5,413 admissions of female residents of **Melbourne** (aged 30 years and over) in 1995/96 at which an hysterectomy was performed. This was five per cent fewer admissions than expected from the State rates (an SAR of 95<sup>\*\*</sup>).

SLAs with elevated ratios were concentrated in the outer western and south-eastern areas (**Map 6.47**). Separating these two areas is a broad band of SLAs with very low ratios, embracing bayside areas from Port Melbourne to Chelsea, and extending north-eastwards to the outer margins of the metropolitan area.

SLAs with the most highly elevated standardised admission ratios for an hysterectomy were situated in **Melbourne's** west, in Werribee (with more than twice the number of hysterectomies expected for a female population of this size, an SAR of 215<sup>\*\*</sup>) and Melton (143<sup>\*\*</sup>). Relatively high ratios were also recorded in Dandenong (129<sup>\*\*</sup>), Cranbourne (127<sup>\*\*</sup>), Keilor (125<sup>\*\*</sup>) and Hastings (122).

Residents of Collingwood had by far the lowest ratio for admissions for hysterectomies (with an SAR of 27<sup>\*\*</sup>, around one quarter of the number of hysterectomies expected from the State rates), although low ratios for this procedure were generally recorded in the more socioeconomically advantaged areas of **Melbourne**, such as Kew and Brunswick (both with an SAR of 62<sup>\*\*</sup>), Hawthorn (64<sup>\*\*</sup>) and Caulfield (66<sup>\*\*</sup>).

The largest numbers of admissions of females aged 30 years and over for an hysterectomy were recorded for the outer SLAs of Keilor (251 admissions) and Werribee (250) recorded the largest numbers of admissions. There were more than 180 admissions from each of Knox (223 admissions), Broadmeadows (191), Waverley (189), Whittlesea (188) and Sunshine (185).

There was a correlation with of meaningful significance with the variable for early school leavers (0.58) and of lesser significance with unskilled and semi-skilled workers (0.49); and inverse correlations with the variables for managers and administrators, and professionals (-0.59), female labour force participation (-0.43) and high income families (-0.37). These results, together with the weak inverse correlation with the IRSD (-0.26), suggest the existence of an association at the SLA level between high rates of admission for an hysterectomy and socioeconomic disadvantage.

### Geelong

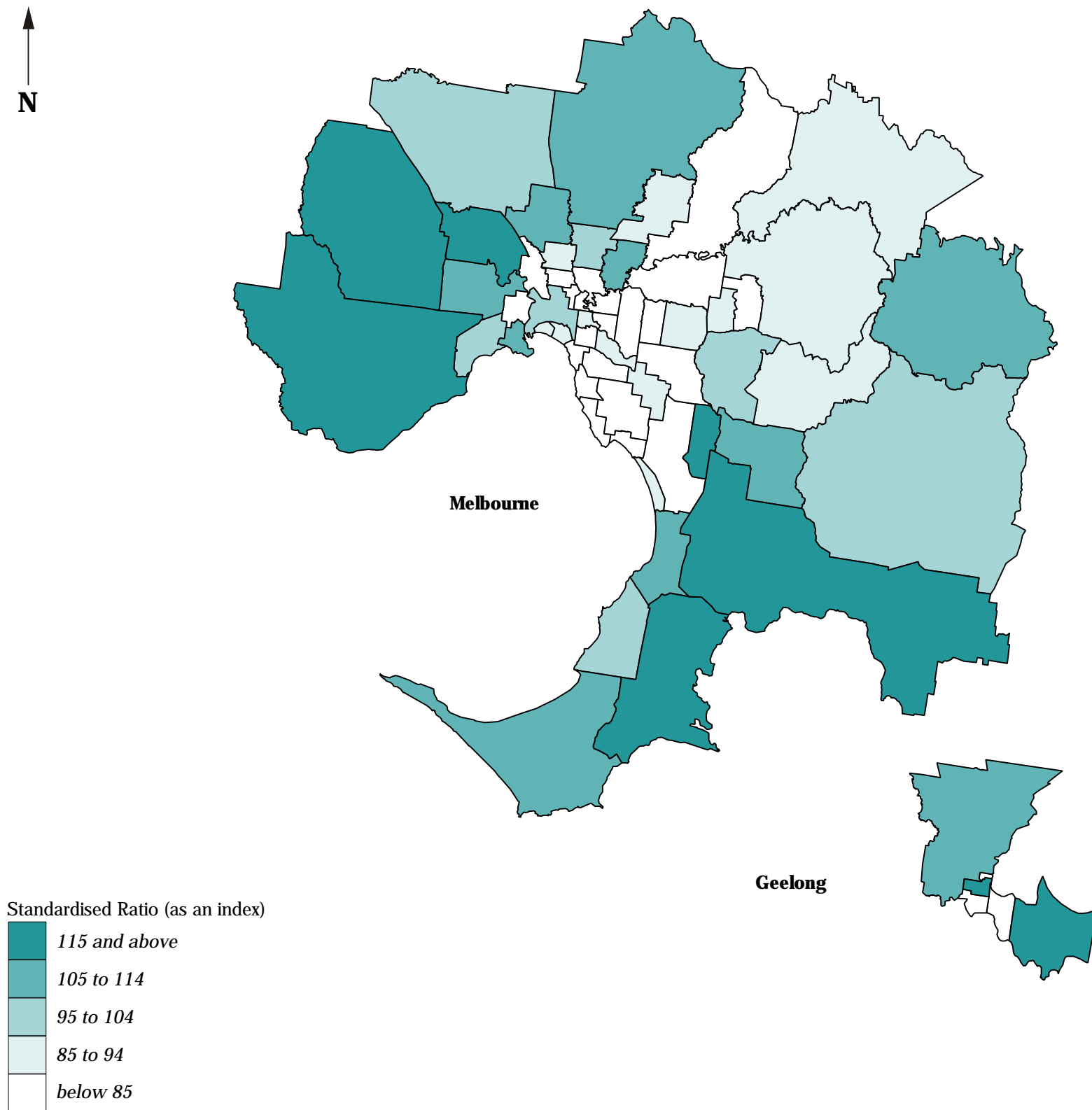
There were 204 admissions of females aged 30 years and over for an hysterectomy in **Geelong** in 1995/96, eight per cent more than expected from the State rates (an SAR of 108). Although elevated ratios were recorded in the SLAs of Geelong West (133), Bellarine-Inner (132) and Corio-Inner (107), none were statistically significant. The lowest ratio was in the City of Geelong (an SAR of 66).

There were 101 admissions of females aged 30 years and over from Corio-Inner and 44 from Bellarine-Inner.

**Map 6.47**

**Admissions of females aged 30 years and over for an hysterectomy, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 2,307 admissions of female residents of the non-metropolitan areas of Victoria (aged 30 years and over) for an hysterectomy procedure, 13 per cent more than expected from the State rates (an SAR of 113\*\*). This elevated ratio is in contrast to the lower levels in **Melbourne** and, to a lesser extent, in **Geelong**.

There were more SLAs in the non-metropolitan areas of Victoria with higher than expected ratios than there were with low ratios (**Map 6.48**). SLAs with high ratios were scattered widely throughout the State, with almost two thirds (64.7 per cent) of the towns mapped recording elevated ratios.

Of the SLAs with 20 or more admissions, the most highly elevated ratios were in Portland (with an SAR of 241\*\*), Deakin (217\*\*) and Rochester (200\*\*), with more than twice the expected number of admissions for an hysterectomy. Highly elevated ratios were also recorded in Horsham (an SAR of 187\*\*), Maffra (181\*\*), Rodney [Part B] (178\*\*), Benalla (173\*\*), Bacchus Marsh (168\*\*), Maryborough (159') and Numurkah (156'). A further 19 SLAs had ratios elevated by up to 50 per cent.

The lowest ratios were recorded for females aged 30 years and over from Greater Geelong [Part B] (29 per cent fewer admissions than expected from the State rates, an SAR of 71') and Wangaratta (82).

There were 141 admissions of females aged 30 years and over from Ballarat and 126 from Bendigo. Elsewhere, there were more than 50 admissions from South Barwon-Inner (76), Wodonga (63) and Shepparton (56), while each of Warrnambool, Morwell [Part A], Horsham, Portland and Traralgon had more than 40 admissions.

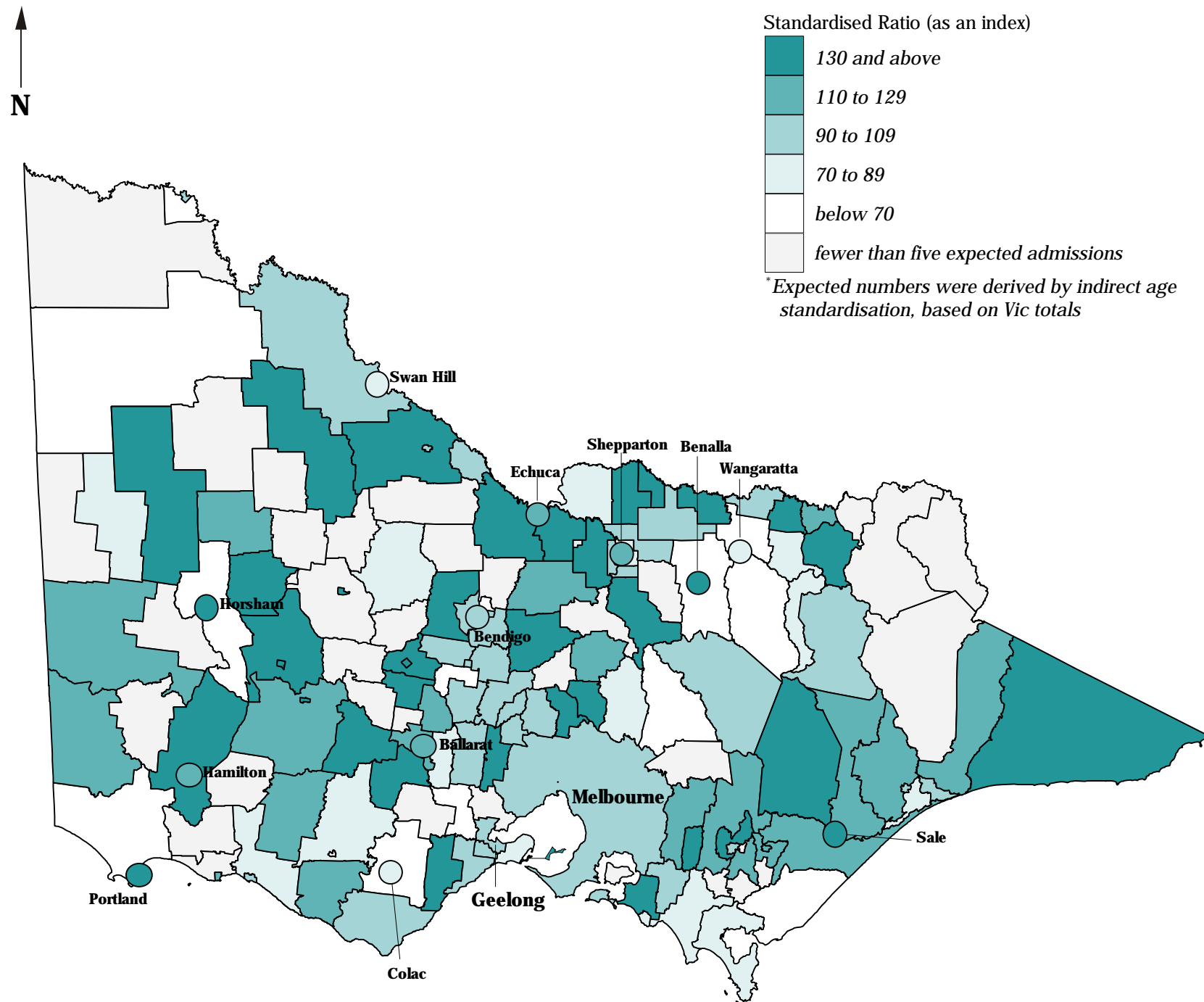
The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.



**Map 6.48**

**Admissions of females aged 30 years and over for an hysterectomy, Victoria, 1995/96**

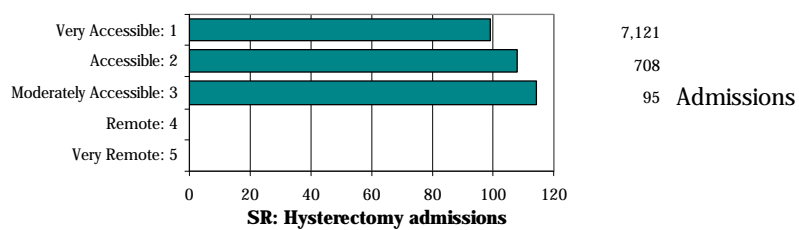
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



Standardised admission ratios for admissions of females aged 30 years and over involving an hysterectomy increase steadily across the three ARIA categories. The ratios range from one per cent lower than expected from the State rates in the Very Accessible areas (an SAR of 99), to eight per cent higher (an SAR of 108) in the Accessible areas and 14 per cent higher (an SAR of 114) in the Moderately Accessible areas.

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

# Admissions for an 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 (56.9 per cent) of admissions for a hip replacement in Victoria in 1995/96. Overall, the admission rate is marginally higher for females than males, however there is some variation between the age groups. Rates for 20 to 24 year olds, rates are 0.6 admissions per 100,000 population for females and 2.8 for males; for 55 to 59 year olds, they are 174.7 and 95.2 respectively; and for those aged 85 years and over, they are 324.7 and 363.6 respectively. For females, 70.8 per cent of admissions for a hip replacement were for those aged 65 years and over, and for males, there were 62.4 per cent (76.2 per cent for males 60 years and over).

Data for Australia published by the AIHW (1998) showed the hip replacement rate in Victoria to be 13.2 per cent above that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

In 1995/96, 2,587 admissions were recorded for residents of **Melbourne** for a hip replacement, seven per cent fewer admissions than expected from the State rates (an SAR of 93\*\*). Females accounted for well over half (59.2 per cent) of the admissions.

Highly elevated ratios for admissions for a hip replacement were most evident in the outer eastern SLAs, as well in a number of inner SLAs to the east of the city centre and south-eastern bayside SLAs (**Map 6.49**).

The highest ratios (in SLAs with more than 20 admissions) were recorded for residents of South Melbourne (with an SAR of 162\*, 62 per cent more admissions for a hip replacement than expected from the State rates), Ringwood (161\*\*), Sherbrooke (154\*), Sandringham (150\*\*), Mordialloc (145\*\*), Hawthorn (143\*) and Croydon (130).

St Kilda (with an SAR of 54\*\*), Whittlesea (58\*\*) and Springvale and Keilor (both 61\*\*) had the lowest ratios.

There were 131 admissions of residents of Camberwell for a hip replacement, 115 from Moorabbin and 108 from Nunawading. In Waverley, and Doncaster and Templestowe, there were 90 and 91 admissions respectively.

There was a correlation with the variable for female labour force participation (0.45) and inverse correlations with the variables for people born in predominantly non-English speaking countries and resident for more than five years (-0.49), unemployment (-0.48) and unskilled and semi-skilled workers (-0.43). These results, together with the correlation with the IRSD (0.41), suggest the existence of an association at the SLA level between high rates of admission for a hip replacement and high socioeconomic status.

## Geelong

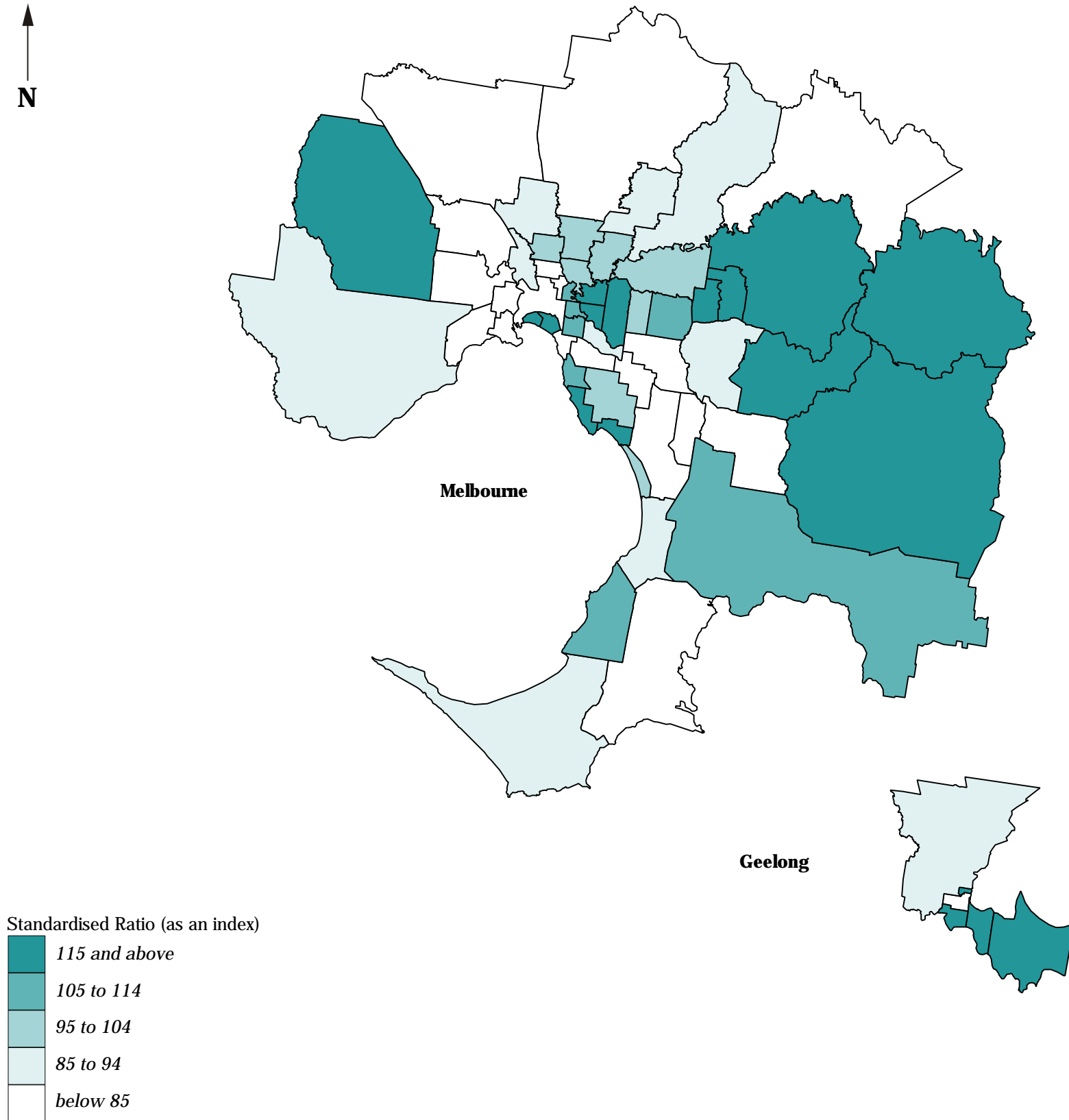
Residents of **Geelong** had 113 admissions for a hip replacement, six per cent more than were expected from the State rates (an SAR of 106). Females accounted for well over half (58.4 per cent) of the admissions.

Only Bellarine-Inner, with 21 admissions and an SAR of 131, and Corio-Inner, with 44 admissions and an SAR of 90, had more than 20 admissions.

### Map 6.49

## Admissions for an hip replacement, Melbourne and Geelong, 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 Vic 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 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 (Victoria as the Standard)

There were 1,308 admissions for a hip replacement recorded for residents of the non-metropolitan areas of Victoria, 17 per cent more than were expected from the State rates (an SAR of 117\*\*). Females accounted for 52.4 per cent of the admissions.

More than half of the non-metropolitan SLAs in Victoria had fewer than five admissions for hip replacement procedures. The distribution of standardised admission ratios reveals no clear pattern, although SLAs with the highest ratios are more predominant to the east of **Melbourne (Map 6.50)**.

Highly elevated ratios (in SLAs with more than 20 admissions) were recorded in Buln Buln (with an SAR of 189\*\*), Warragul (174\*\*), Woorayl (172\*\*), Morwell [Part A] (157\*) and Shepparton (149\*).

Low, but not statistically significant, ratios were recorded for residents of South Barwon-Inner (an SAR of 83), Greater Geelong [Part B] (90) and Warrnambool (91).

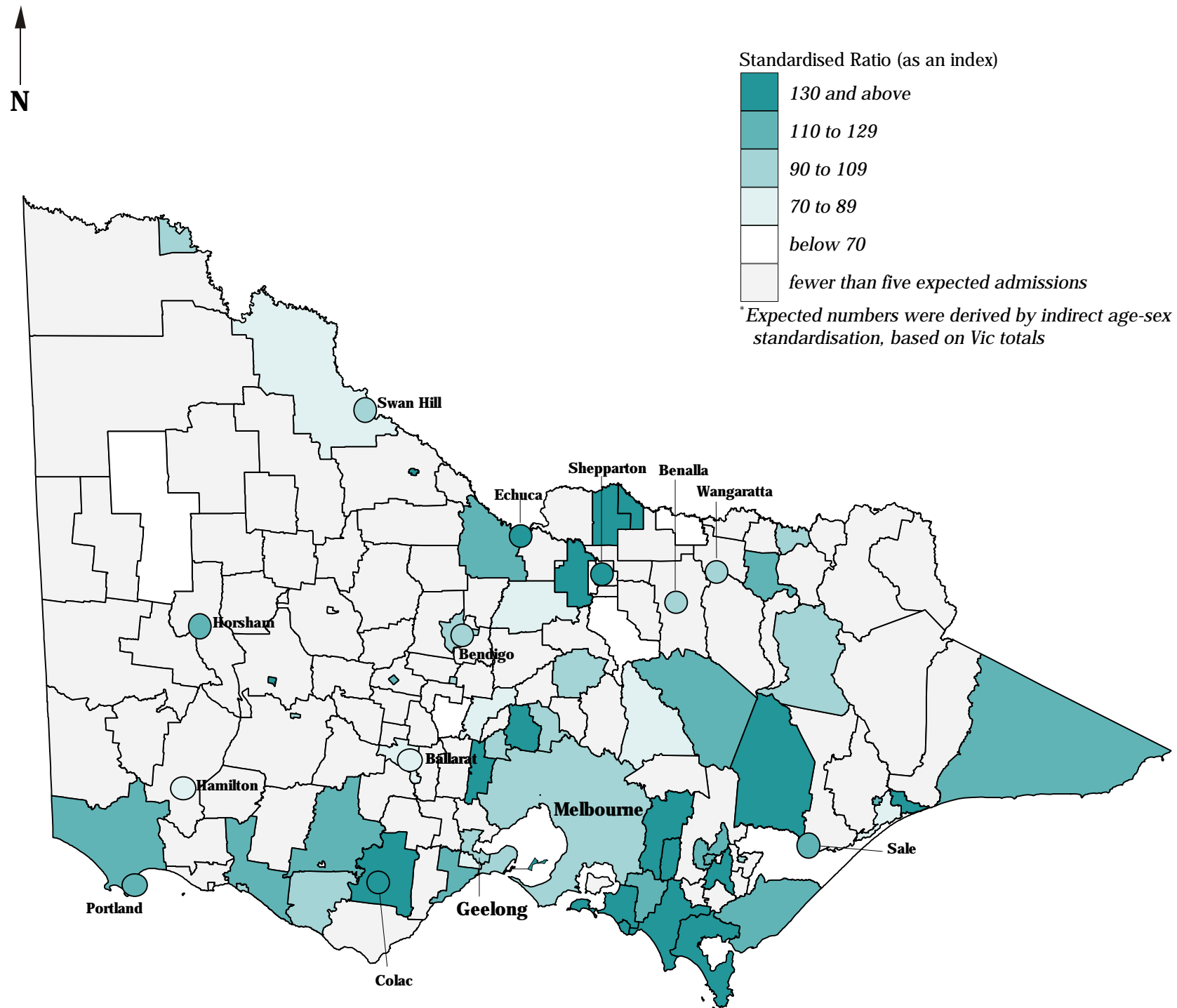
There were 30 or more admissions for hip replacement procedures of residents of Bendigo (68 admissions), Ballarat (56), Shepparton (37), South Barwon-Inner (34) and Greater Geelong [Part B] (30). Twenty or more admissions were recorded for residents of Morwell [Part B], Woorayl, Warrnambool, Buln Buln, Warragul, Moe and Wodonga.

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

## Map 6.50

### Admissions for an hip replacement, Victoria, 1995/96

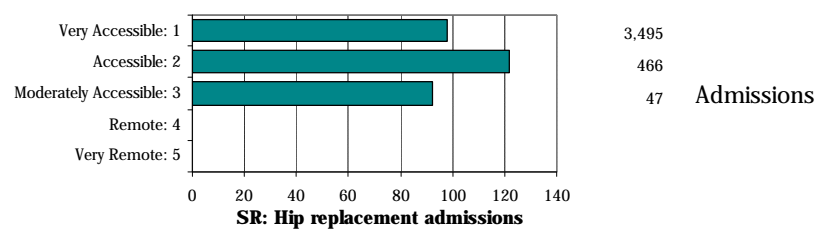
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions for a hip replacement increase from an SAR of 98 in the Very Accessible areas (accounting for 87.2 per cent of the admissions) to a high of 122 in the Accessible ARIA category (22 per cent more admissions than expected from the State rates), before dropping to the lowest ratio (an SAR of 92, eight per cent fewer admissions than expected) in the Moderately Accessible areas.

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 Victoria to be 3.6 per cent below that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

In 1995/96, there were 15,882 admissions of residents of **Melbourne** involving a lens insertion, six per cent more than expected from the State rates (an SAR of 106<sup>\*\*</sup>). Females comprised almost two thirds (62.9 per cent) of these admissions.

SLAs with high ratios were concentrated in two areas (**Map 6.51**), one covering middle suburbs to the east of the city centre and the other covering SLAs located in the outer south-east of the metropolitan area. The largest groups of SLAs with relatively low ratios are comprised of middle and outer SLAs which straddle the Yarra River and SLAs to the immediate north of the city centre.

The highest ratios were recorded for residents of Camberwell (with an SAR of 141<sup>\*\*</sup>), South Melbourne (140<sup>\*\*</sup>), Hastings (137<sup>\*\*</sup>), Hawthorn (133<sup>\*\*</sup>), Knox (129<sup>\*\*</sup>), Mornington (127<sup>\*\*</sup>) and Box Hill (125<sup>\*\*</sup>).

Bulla (with an SAR of 63<sup>\*\*</sup>) and Upper Yarra [Part A] (65<sup>\*</sup>) had the lowest SARs, followed by Coburg (75<sup>\*\*</sup>), Port Melbourne (77), Altona and Brunswick (both 77<sup>\*\*</sup>), and Eltham (80<sup>\*</sup>).

The largest number of admissions was of residents of Camberwell, with 940 admissions. However, there were more than 600 admissions of residents of Moorabbin (735 admissions), Waverley (627), Caulfield (626) and Nunawading (612).

There was an inverse correlation with the variable for high income families (0.39), and inverse correlations with the variables for early school leavers (-0.43), unemployment (-0.36) and Indigenous people (-0.36). These results, together with the correlation with the IRSD (0.40), suggest the existence of an association at the SLA level between high rates of admission for a lens insertion and high socioeconomic status.

## Geelong

There were 21 per fewer admissions for a lens insertion of residents of **Geelong** than were expected from the State rates (an SAR of 79<sup>\*\*</sup>). Females comprised over half (56.1 per cent) of the 465 admissions.

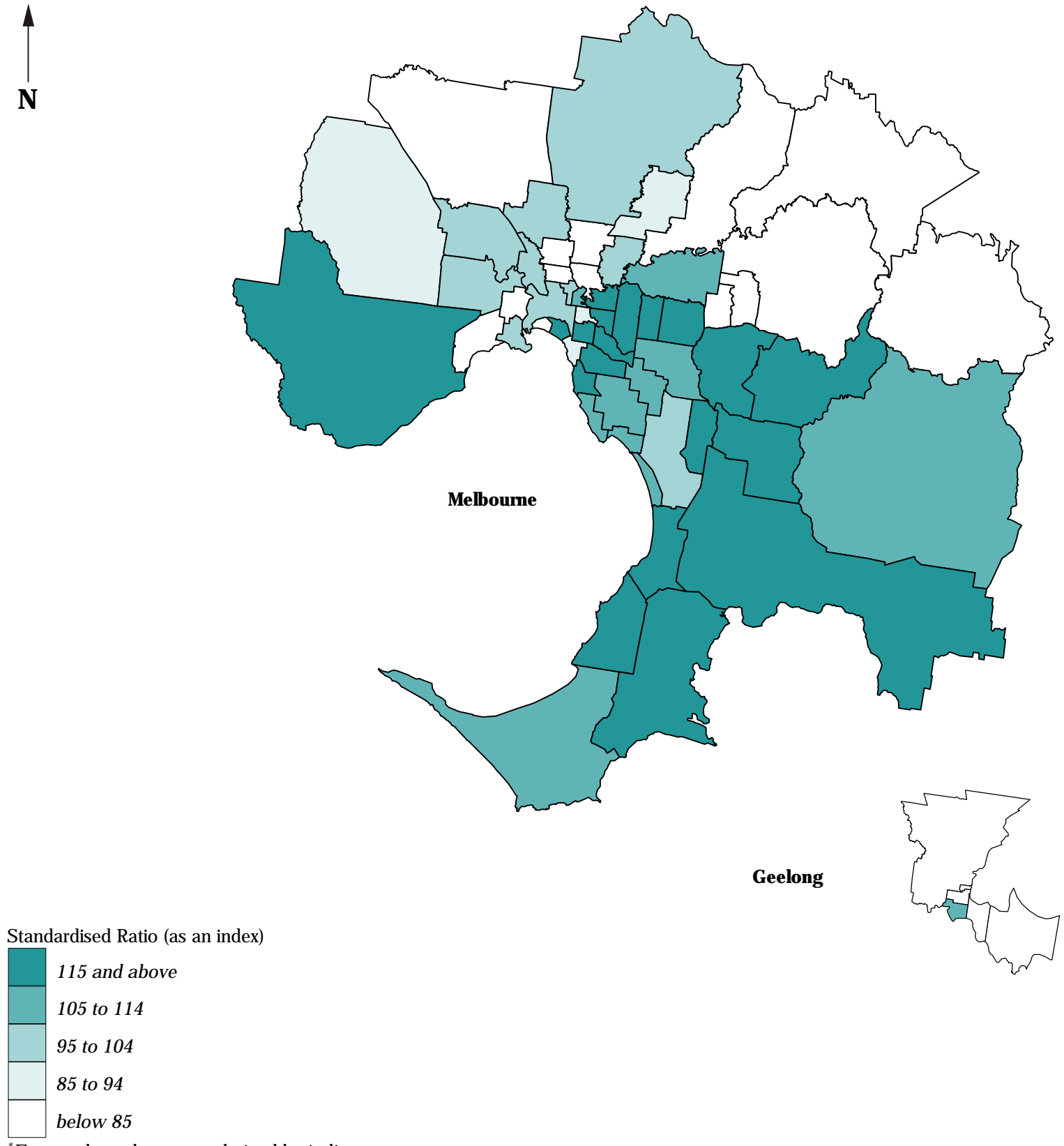
Standardised admission ratios ranged from 110 in Newtown to 69<sup>\*\*</sup> in Geelong West.

The largest number of admissions for a lens insertion was of residents from Corio-Inner, with 192 admissions, considerably higher than the 73 from Geelong West and 71 from Newtown.

### Map 6.51

## Admissions for a lens insertion, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

In the non-metropolitan areas of Victoria, there were 5,191 admissions for a lens insertion of which 61.2 per cent were females. This was 14 per cent fewer admissions than expected from the State rates, an SAR of 86\*\*.

SLAs with low standardised admission ratios for lens insertion procedures outnumber those with high ratios, and form a more or less contiguous band extending from around **Melbourne** to the north-west (**Map 6.52**).

Of SLAs with 20 or more admissions, the highest ratio was recorded for residents of Bairnsdale [Part B], where there were nearly four times the expected number of admissions (an SAR of 382\*\*). Other highly elevated ratios were recorded for residents of Kaniva (an SAR of 176\*), Tambo [Part A] (162\*\*), Bairnsdale [Part A] (147\*\*), Warrnambool (146\*\*) and Maffra (139\*\*).

With around half of the expected number of admissions, Seymour (with an SAR of 47\*\*) and Echuca (50\*\*) had the lowest ratios. Other SLAs with low admission ratios were Alexandra (56\*\*), Kyneton (64\*) and Maryborough and Wangaratta (both 64\*\*).

The largest numbers of admissions were of residents of Ballarat (328 admissions) and Bendigo (269). There were 201 admissions of residents from Warrnambool, and more than 100 admissions of people from South Barwon-Inner (167 admissions), Greater Geelong [Part B] (133), Shepparton (127) and Mildura (122).

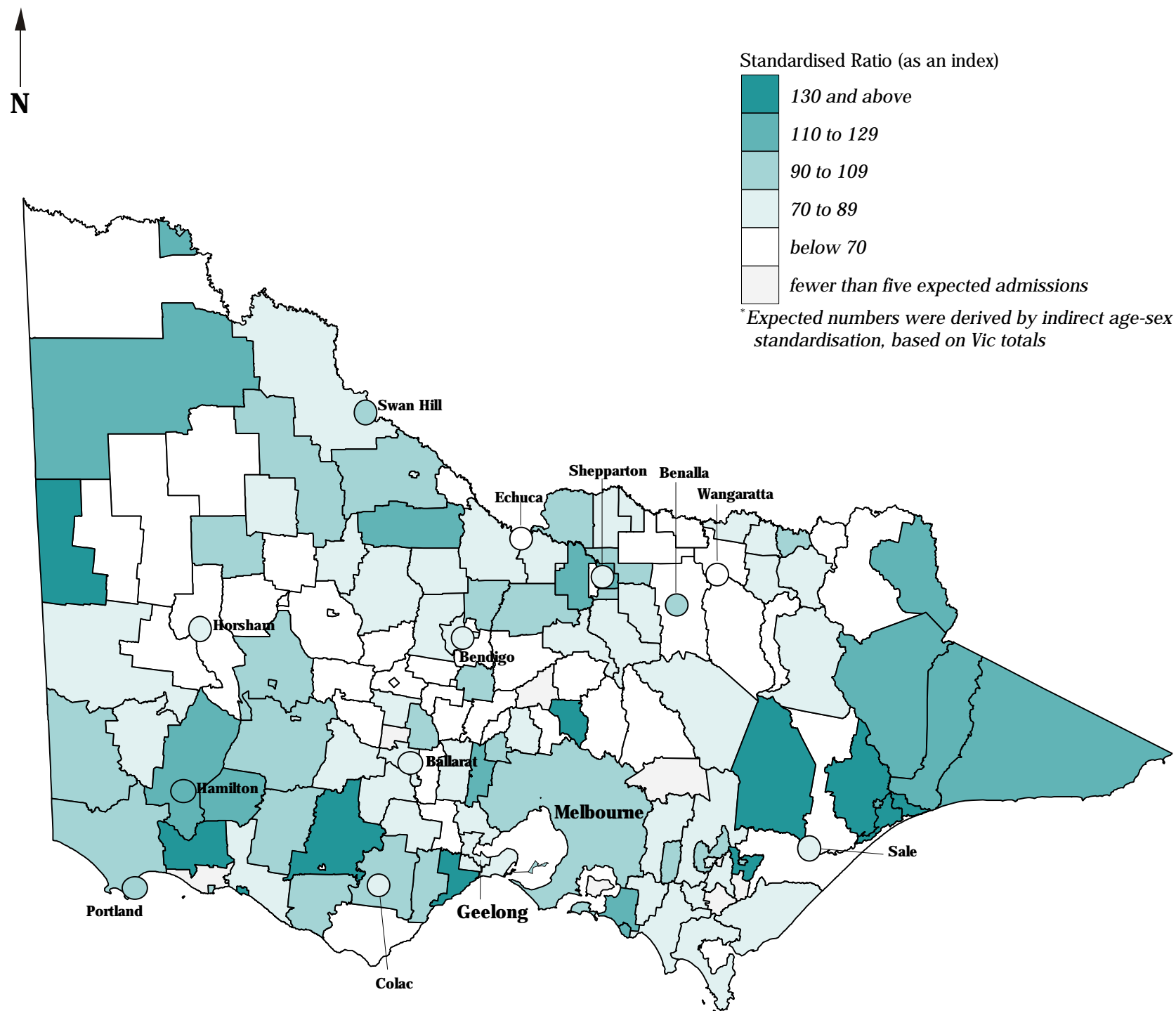
There was no clear association evident in the correlation analysis at the SLA level between high rates of admission for a lens insertion and socioeconomic status.



### Map 6.52

## Admissions for a lens insertion, Victoria, 1995/96

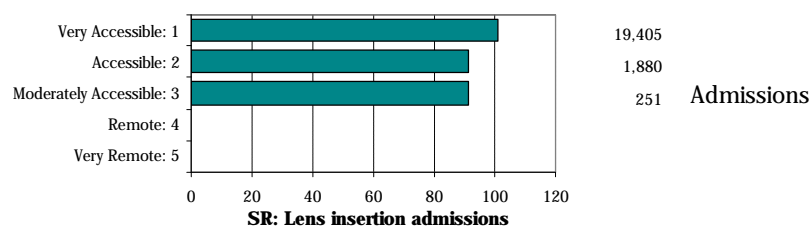
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions for a lens insertion are marginally higher than expected in the Very Accessible areas (one per cent more admissions than expected from the State rates, an SAR of 101), with nine per cent fewer admissions than expected from the State rates in both the Accessible and Moderately Accessible areas (with SARs of 91).

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 Victoria to be 7.3 per cent above that in the other States for which data were available (**Table 6.42**, page 267).

## Melbourne (Victoria as the Standard)

There were 76,073 admissions for endoscopies of residents of **Melbourne** in 1995/96, three per cent more than were expected from the State rates (an SAR of 103\*\*). Females accounted for over half (55.2 per cent) of these admissions. Almost all endoscopies (68,254 admissions, or 89.7 per cent) in this analysis were performed on a same day basis.

The highest standardised admission ratios for admissions for an endoscopy were in a number of inner and outer eastern SLAs, and several bayside SLAs. The few areas with the lowest ratios were located to the north and west of the city (**Map 6.53**).

Residents of Brighton (with an SAR of 130\*\*) and Pakenham (125\*\*) recorded the highest SARs, with similarly elevated ratios recorded for residents of Sandringham, Flinders and Sherbrooke (each with an SAR of 121\*\*) and Caulfield and Port Melbourne (both 120\*\*). A further 11 SLAs had ratios elevated by between 10 per cent and 20 per cent above the level expected from the State rates.

The lowest ratio was recorded in Melton (with an SAR of 66\*\*), with two thirds the number of admissions for endoscopies than were expected from the State rates. Relatively low ratios were also recorded in Altona (with an SAR of 76\*\*), Brunswick and Broadmeadows (both 82\*\*), and Whittlesea and Fitzroy (both 85\*\*).

The largest numbers of admissions were of residents of Waverley (3,286 admissions), Knox (3,118), Doncaster and Templestowe (2,781), Moorabbin (2,759), Camberwell (2,758) and Keilor (2,554).

There were correlations with the variables for female labour force participation (0.44) and high income families (0.37), and inverse correlations with the variables for people reporting poor proficiency in English (-0.48), unemployment (-0.46), people born in predominantly non-English speaking countries and resident for more than five years (-0.42) and unskilled and semi-skilled workers (-0.41). These results, together with the correlation with the IRSD (0.48), suggest the existence of an association at the SLA level between high rates of admission for an endoscopy and high socioeconomic status.

## Geelong

There were 1,701 admissions of residents of **Geelong** for an endoscopy in 1995/96, 35 per cent fewer than expected from the State rates (an SAR of 65\*\*), with a slightly lower proportion than in **Melbourne** performed on a same day basis (81.4 per cent). Females accounted for over half (57.6 per cent) of these admissions.

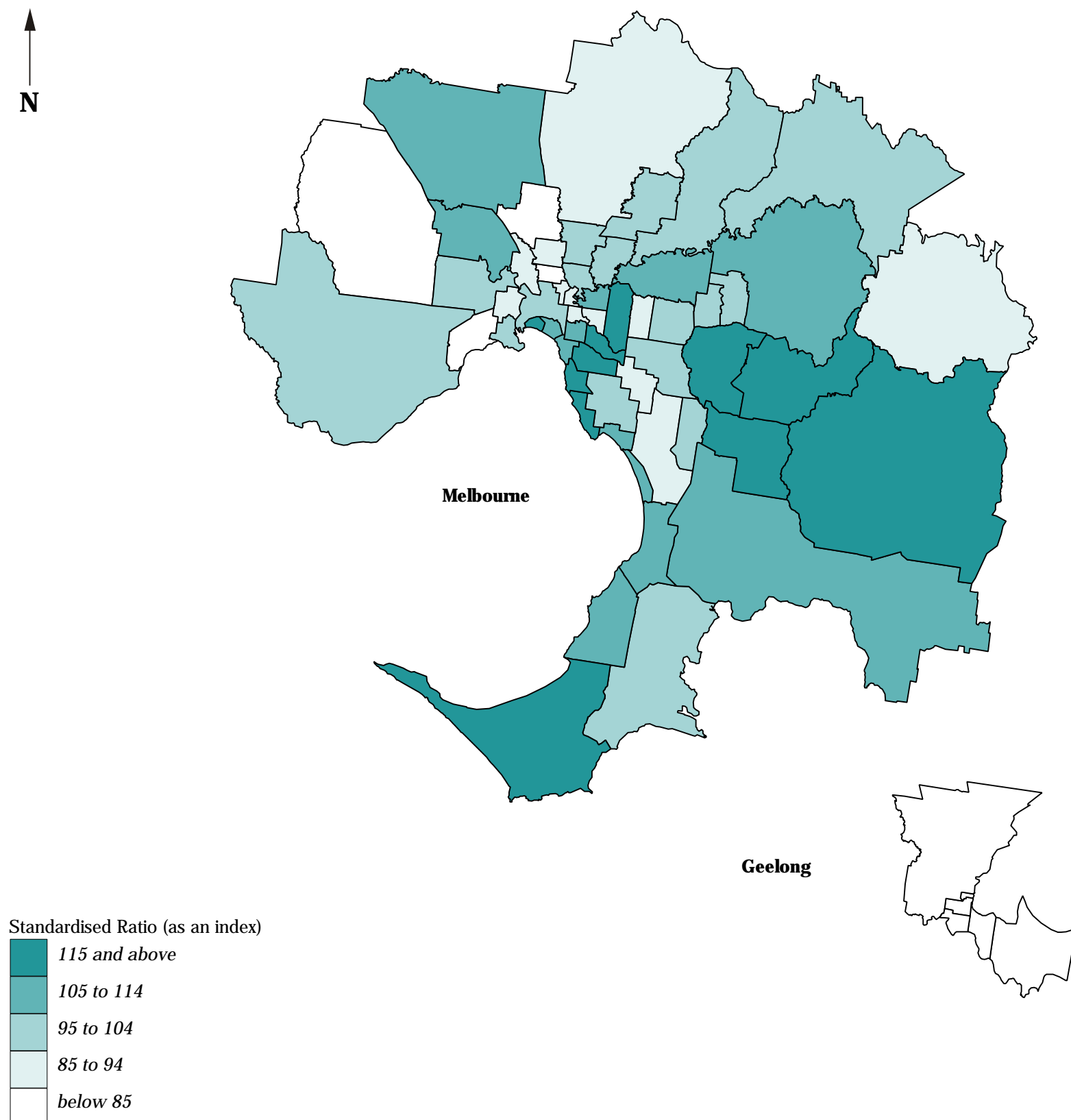
Ratios at the SLA level were all lower than expected, ranging from a high SAR of 82\*\* in Newtown to a low SAR of 53\*\* in Bellarine-Inner.

There were 865 admissions of residents from Corio-Inner for an endoscopy, almost four times the number of admissions from each of the four other SLAs in **Geelong**.

### Map 6.53

## Admissions for an endoscopy, Melbourne and Geelong, 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 Vic 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 (Victoria as the Standard)

There were 26,682 admissions of residents of the non-metropolitan areas of Victoria for an endoscopy in 1995/96, four per cent fewer than expected from the State rates (an SAR of 96\*\*). Females accounted for over half (54.1 per cent) of these admissions. A majority (86.2 per cent) of these admissions were same day admissions.

SLAs with the highest ratios were generally located in the south-east and south-west of the State, while those with low ratios were particularly concentrated in the State's east, and across a broad area from central Victoria to the north-west (**Map 6.54**).

The highest ratios (in SLAs with more than 20 admissions) were recorded in Portland (with almost twice the number of admissions expected, an SAR of 196\*\*), Warragul (184\*\*), Belfast (180\*\*), Kaniva (178\*\*), Myrtleford (173\*\*), Narracan [Part A] (170\*\*) and Buln Buln (162\*\*).

Bairnsdale [Part A] (with an SAR of 23\*\*) and the adjacent City of Bairnsdale (25\*\*) had the lowest ratios, with other very low ratios occurring in Tambo [Part B] (31\*\*), Walpeup (34\*\*) and Tambo [Part A] (39\*\*).

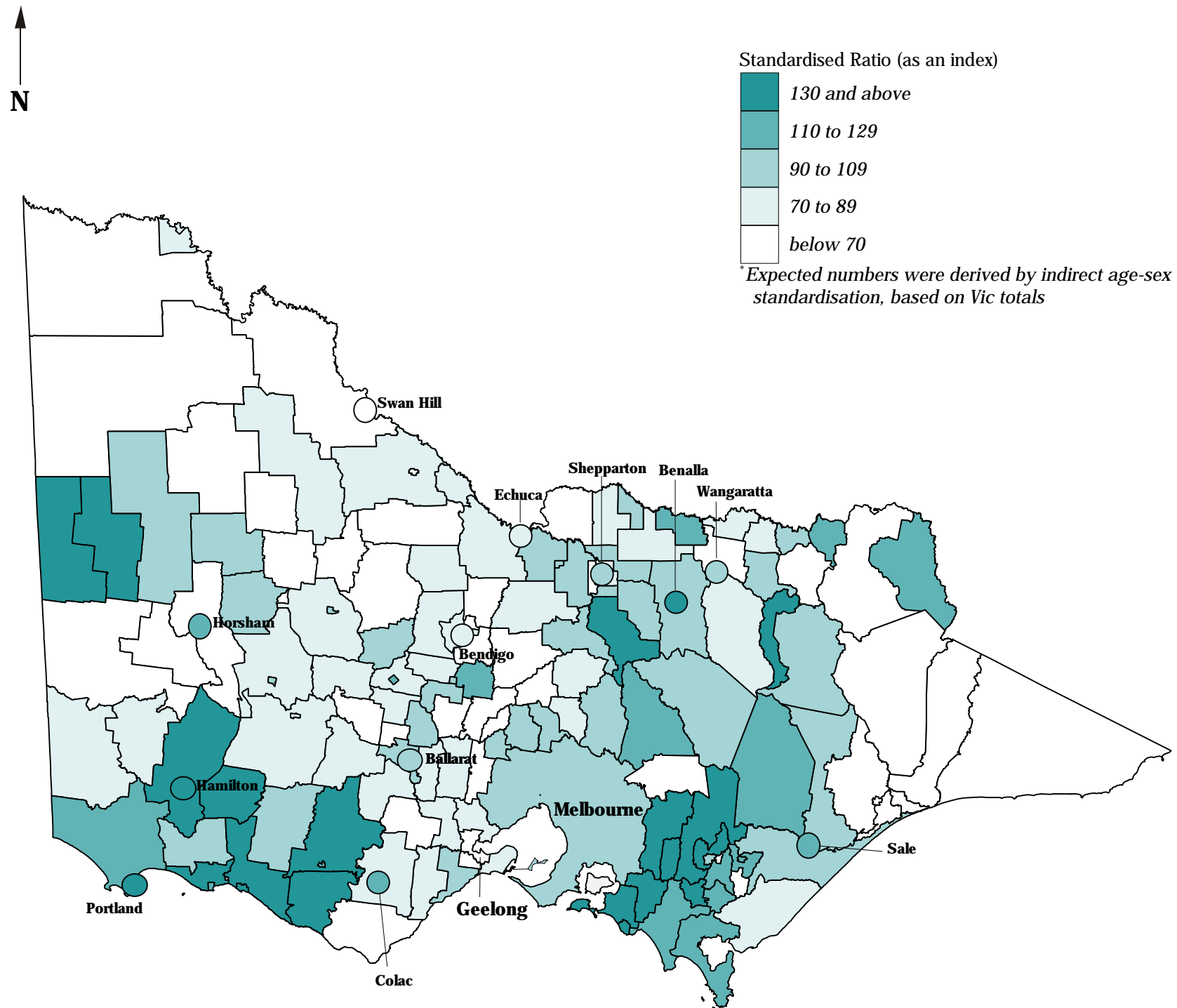
Only Ballarat (1,535 admissions) and Bendigo (1,293) recorded more than 1,000 admissions for endoscopies. Relatively high numbers of admissions were also recorded for residents of Warrnambool (951 admissions), South Barwon-Inner (694), Morwell [Part A] (668) and Shepparton (582).

There was no clear association evident in the correlation analysis at the SLA level between high rates of admission for an endoscopy and the indicators of socioeconomic status.

## Map 6.54

### Admissions for an endoscopy, Victoria, 1995/96

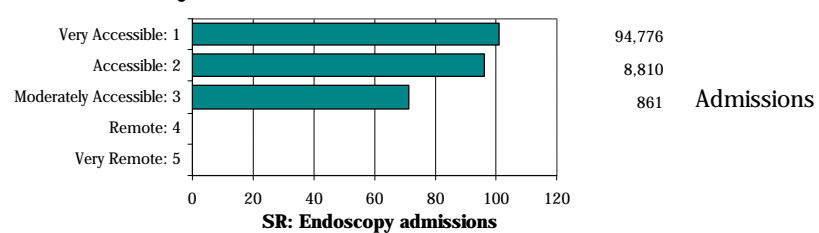
Standardised Ratio: number of admissions in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Standardised admission ratios for admissions involving an endoscopy decrease across the three ARIA categories, from an SAR of 101 in the Very Accessible areas to a slightly lower SAR of 96 in the Accessible areas and an SAR of 71 in the Moderately Accessible areas.

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 26 million unreferral attendances (called services in this atlas)<sup>6</sup> by GPs in Victoria, an average of 5.6 services for each person enrolled with Medicare. Total Medicare payments to GPs for these services were \$595 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).

<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.

National data are not available for the number of attendances at accident and emergency departments of public hospitals that are for primary health care services: that is, services that could have been provided by a GP. A study in South Australia in 1993/94 found that up to one third of such attendances were of this kind. This represents the equivalent of approximately 1.3 per cent of GP attendances recorded in the Medicare statistics collection for that year. These attendances are again likely to be predominantly of people of lower socioeconomic status.

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	Immunisations	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>

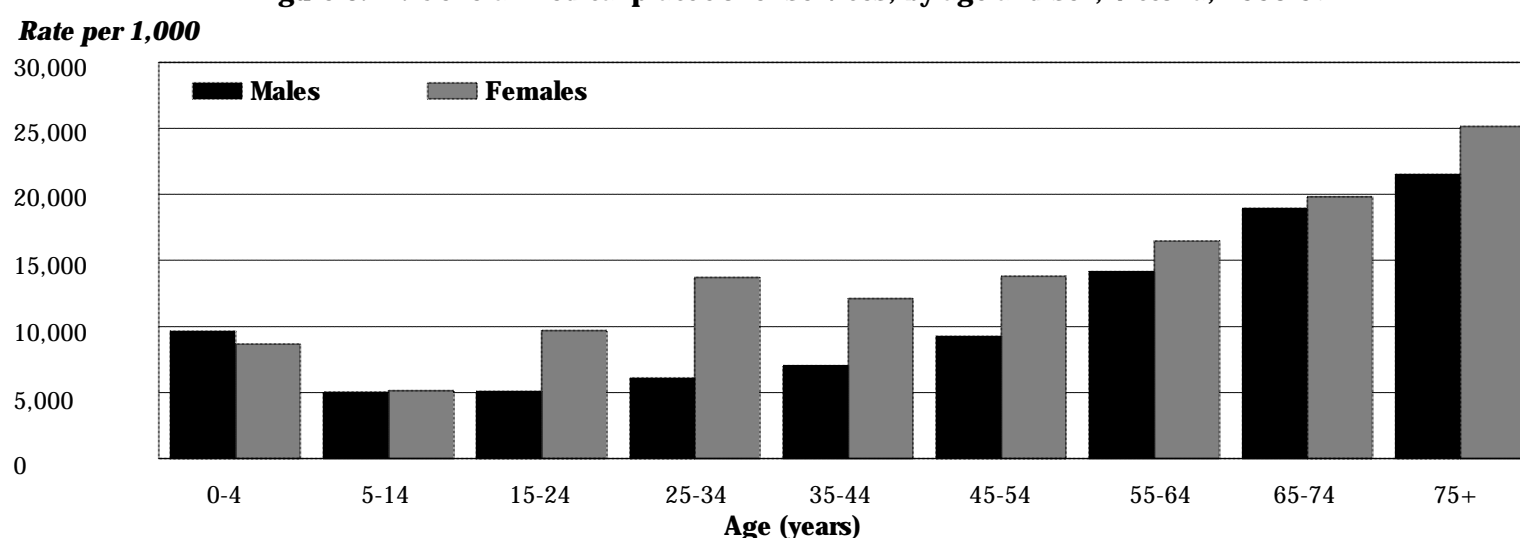
Source: Annual Report 1996, Royal Flying Doctor Service of Australia

**GP services by age and sex of patient**

Females used GP services more than males, accounting for 58.8 per cent of services in Victoria 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, Victoria, 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>	125**	113**	106**	107**	101**	90**	80**	87**	113**
<b>1989</b>	124**	99**	111**	106**	91**	101**	84**	86**	108**

<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

## Melbourne (Victoria as the Standard)

Male residents of **Melbourne** received 8,339,817 services from GPs in 1996, ten per cent more GP services than expected from the State rates (an SR of 110\*\*). The age distribution of these males is shown in **Figure 6.11**, on page 308.

The use of GP services by males was particularly high in **Melbourne's** older northern and western suburbs and in the Dandenong region, south-east of the city centre. Low levels of use are evident in a small cluster of higher socioeconomic areas to the immediate east of the city centre (**Map 6.55**).

The most highly elevated ratios for GP services were recorded in Melton East (an SR of 152\*\*), Broadmeadows (141\*\*), Brunswick (134\*\*), Dandenong Balance and Dandenong (both 133\*\*), Moreland North and Sunshine (both 132\*\*) and Coburg, Maribyrnong, and Preston (all 131\*\*).

Almost half (49.3 per cent) of the SLAs had ratios within ten per cent of the level expected from the State rates. Within this group, the highest ratios were in Knox North (109\*\*) and Casey South and Waverley East (both 108\*\*).

Generally, SLAs with the lowest ratios were located in the eastern inner areas, the Yarra Valley and outlying south-eastern areas. The lowest standardised ratios were recorded for males from Hawthorn (with an SAR of 81\*\*), Camberwell North (82\*\*), Cardinia South and Manningham East (both 84\*\*).

There were more than 200,000 GP services to males in 1996 in ten SLAs, with the largest numbers for males living in Whittlesea (278,692 admissions), Knox North (266,287), Preston (257,217), and Sunshine (242,454).

There were correlations of substantial significance with the variables for people born in predominantly non-English speaking countries and resident for more than five years (0.75) and people with poor English language skills (0.71), as well as a correlation of meaningful significance with unemployment (0.67). There were also inverse correlations with the variables for managers and administrators, and professionals (-0.50) and high income families (-0.45).

These results, together with the inverse correlation of meaningful significance with the IRSD (-0.64), indicate the existence of an association at the SLA level between high rates of use of GP services by males and socioeconomic disadvantage.

## Geelong

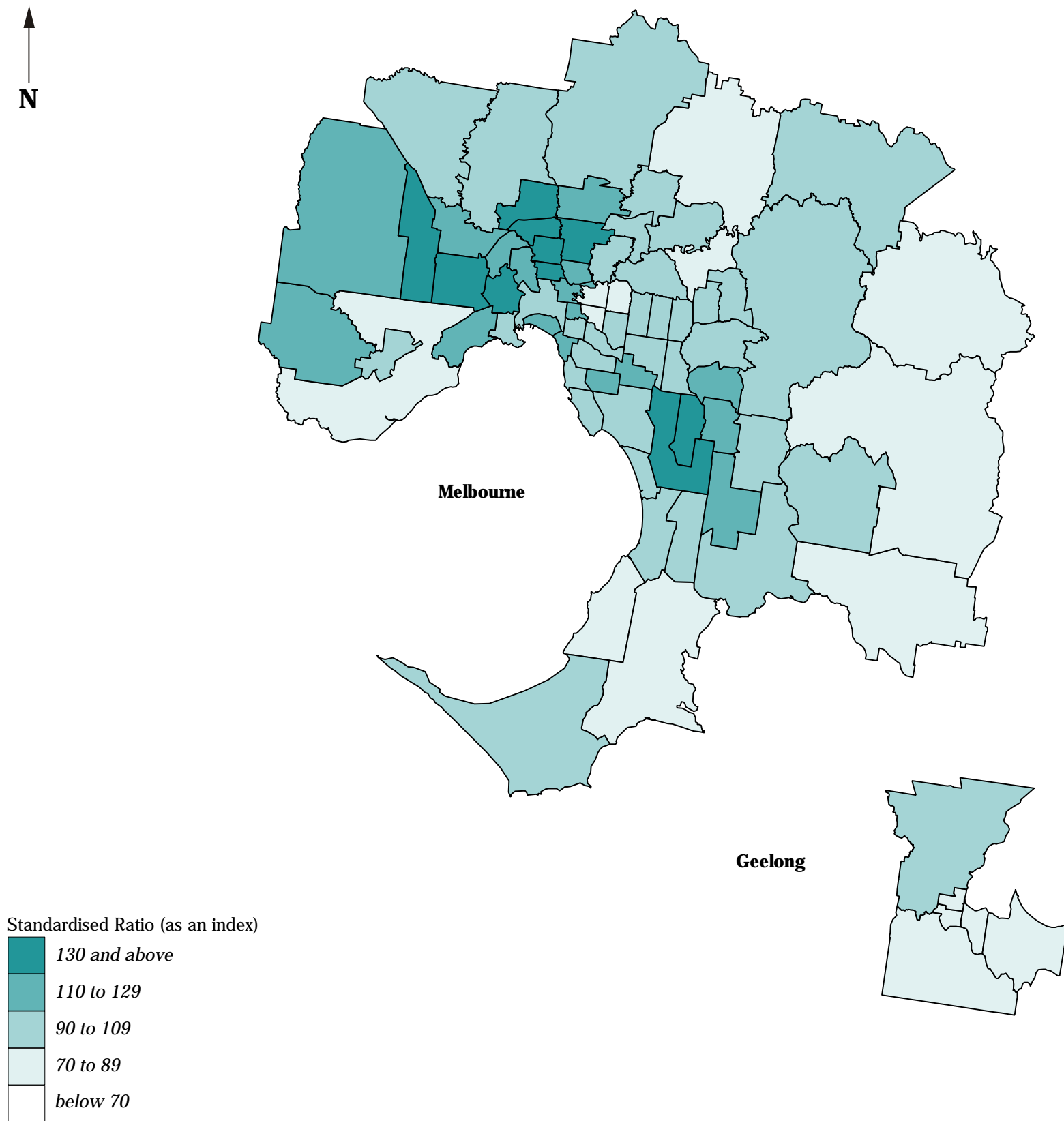
In **Geelong** in 1996, males recorded 313,089 GP services, 12 per cent fewer than expected from the State rates (an SR of 88\*\*).

There were fewer GP services than expected in each of the SLAs; the highest ratios were recorded for males in Corio-Inner (with an SAR of 95\*\*) and Geelong West (87\*\*), with the lowest in Newtown and South Barwon-Inner (both 81\*\*). The largest numbers of services were recorded for males in Corio-Inner (121,851 services) and South Barwon-Inner (77,334).

### Map 6.55

## General medical practitioner services to males, Melbourne and Geelong, 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 Vic 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 307, 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 (Victoria as the Standard)

Males living in the non-metropolitan areas of Victoria received 2,016,610 services from GPs in 1996. This was significantly fewer services than expected from the State rates, an SAR of 74\*\*; these low rates of use are in line with the lower levels of GPs in the non-metropolitan areas (see Chapter 7 for details of the distribution of GPs).

The use of GP services by males in the non-metropolitan areas of Victoria was relatively low throughout the State (**Map 6.56**).

Only in Wangaratta North (with an SR of 121\*\*), Yarriambiack South (112\*\*) and Benalla (101) did males use more GP services than expected from the State rates. In Morwell, the number of GP services was at the level expected from the State rates (an SR of 100).

Of the other SLAs, the highest ratios were in Hepburn West (97\*\*), Central Goldfields Balance (95\*\*), Colac and Bacchus Marsh (both 93\*\*).

Standardised ratios indicating use of GP services at rates of less than half those expected from the State rates were recorded for males in Horsham Balance (with an SR of 14\*\*, 86 per cent fewer GP services than expected from the State rates), Delatite North (22\*\*), Alpine East (39\*\*), Colac-Otway North (40\*\*), Wellington-Avon (44\*\*), Indigo [Part A] and Shepparton [Part B] East (both 45\*\*), Wangaratta South (47\*\*), and Delatite South (48\*\*).

More than 50,000 GP services were used by males in Ballarat (157,238 services), Bendigo (109,526), Mildura Shire [Part A] (67,279), Shepparton [Part A] (65,052), Morwell (55,263), Wodonga (55,110) and Greater Geelong [Part B] (51,987).

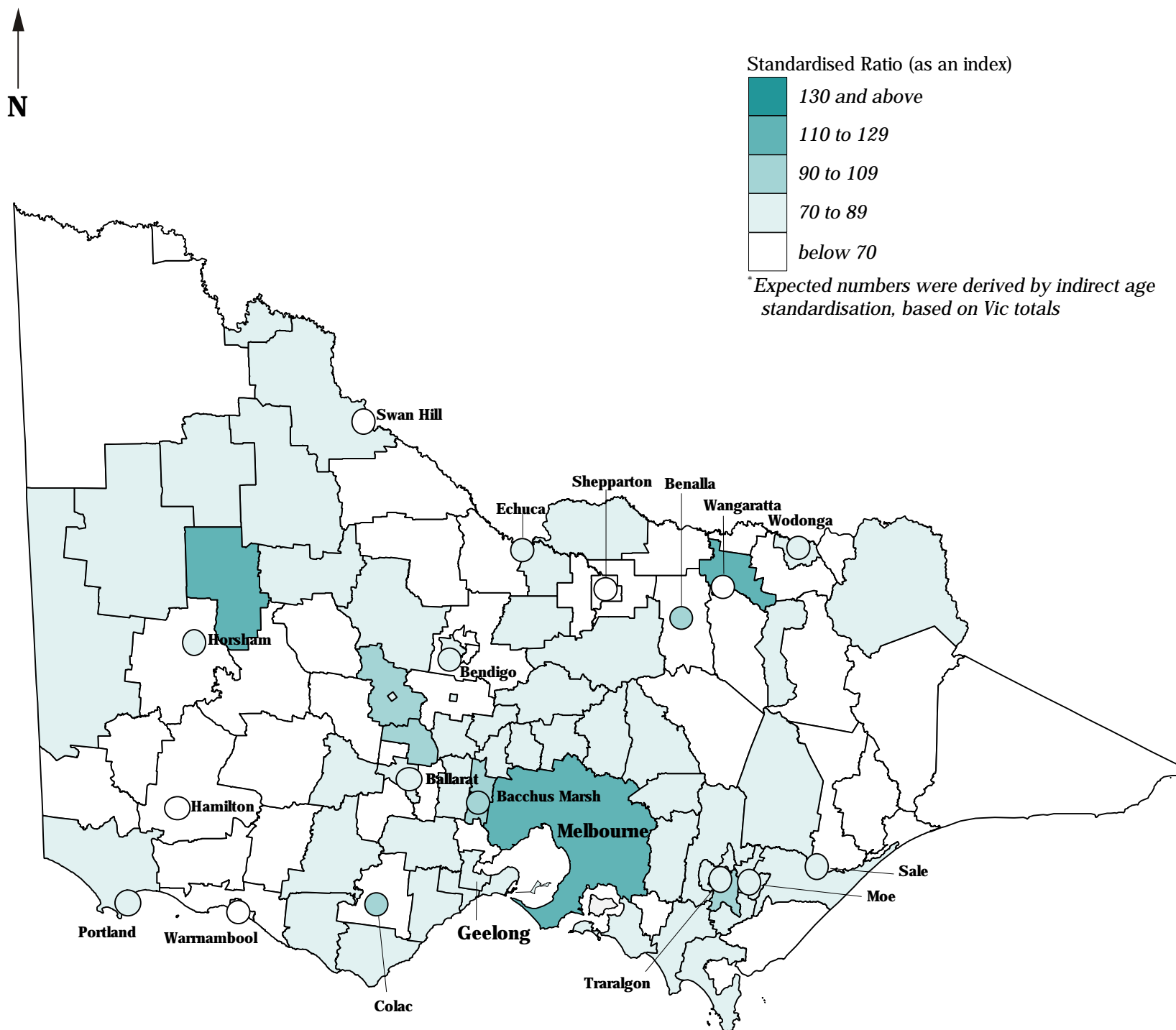
Of the towns mapped, only Benalla (101) had more GP services than expected. Both Colac and Bacchus Marsh had a ratio of 93\*\*, with the lowest ratios in Swan Hill (51\*\*) and Hamilton (63).

The association between use of GP services by males and the indicators of socioeconomic disadvantage was weaker in the non-metropolitan areas of Victoria than in **Melbourne**. There were weak positive correlations with the variables for single parent families (0.36) and dwellings with no motor vehicle (0.32), and weak inverse correlations with the variables for managers and administrators, and professionals (-0.32) and female labour force participation (-0.30). These results, together with the weak inverse correlation with the IRSD (-0.33), suggest the existence of an association at the SLA level between high rates of use of GP services by males and socioeconomic disadvantage.

### Map 6.56

## General medical practitioner services to males, Victoria, 1996

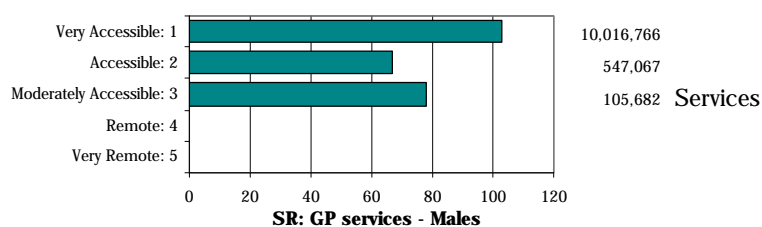
Standardised Ratio: number of services in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

### Accessibility/Remoteness Index of Australia



Males in areas in the Accessible category had the highest rate of use of general medical practitioner (GP) services, using three per cent more GP services than expected from the State rates (a standardised ratio (SR) of 103). The lowest SR of 67 in the Accessible category, is around one third (35.0 per cent) lower than the ratio in the Very Accessible areas. There were 22 per cent fewer GP services used by males in the Moderately Accessible areas than expected from the State rates. Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

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

# General medical practitioner services to females, 1996

## Capital city comparison (Australia as the Standard)

As was the case for GP services to males, the level of GP services received by females resident in the capital cities closely mirrored population size. There was, however, a lower differential (of 44.4 per cent) between the highest ratio, of 117\*\* in **Sydney**, and the lowest, of 81\*\* in **Darwin**, than was evident for males (56.2 per cent).

Between 1989 and 1996 SRs declined (relative to the Australian rates) in five of the capital cities, with the largest declines being in **Darwin** and **Hobart**.

**Table 6.65: General medical practitioner services to females, capital cities**  
*Standardised admission ratios*

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra <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, 6.9 services per female and 5.0 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 308.

## Melbourne (Victoria as the Standard)

Female residents in **Melbourne** received 11,770,039 services from GPs in 1996, seven per cent more than expected from the State rates (an SAR of 107\*\*). Females used 41.1 per cent more GP services than males.

Areas with high rates of use by females of GP services were concentrated in SLAs located in **Melbourne's** inner north, west and south-east (**Map 6.57**). The majority of SLAs had standardised ratios within ten per cent of the level expected from the State rates. The lowest rates of use of GP services were recorded in the city centre and in high socioeconomic status SLAs located immediately to the east.

The highest standardised ratio for GP services was recorded in Melton East, with 53 per cent more GP services than expected from the State rates (an SR of 153\*\*). Other relatively highly elevated ratios were recorded for females resident in Broadmeadows (an SR of 134\*\*), Dandenong and Dandenong Balance (both 126\*\*), Preston (125\*\*), Coburg and Moreland North (both 124\*\*), Hallam and Maribyrnong (both 123\*\*), Cranbourne, Keilor and Sunshine (all 121\*\*), and Melton Balance (120\*\*).

As noted above, most SLAs had ratios within ten per cent of the level expected from the State rates; the highest ratios in this group were for females in Knox North, Altona and St Kilda (all with SRs of 109\*\*) and Frankston West and Essendon (both 108\*\*).

The lowest rates of use of GP services were by females in Kew (with an SR of 81\*\*), Hawthorn and Camberwell North (both 83\*\*) and the City of Melbourne (85\*\*).

The largest number of GP services used by females were recorded in Knox North (384,732 services), Preston (359,631), Whittlesea South (349,884), Yarra Ranges South-West (341,028) and Manningham West (319,654). More than 250,000 services were recorded in nine other SLAs.

There were correlations of meaningful significance with the variables for unskilled and semi-skilled workers (0.64), early school leavers (0.57), people born in predominantly non-English speaking countries and resident for more than five years (0.57) and unemployment (0.52). There was also an inverse correlation with the variable for managers and administrators, and professionals (-0.62). These results, together with the inverse correlation with the IRSD (-0.61), indicate an association at the SLA level between high rates of use of GP services by females and socioeconomic disadvantage.

## Geelong

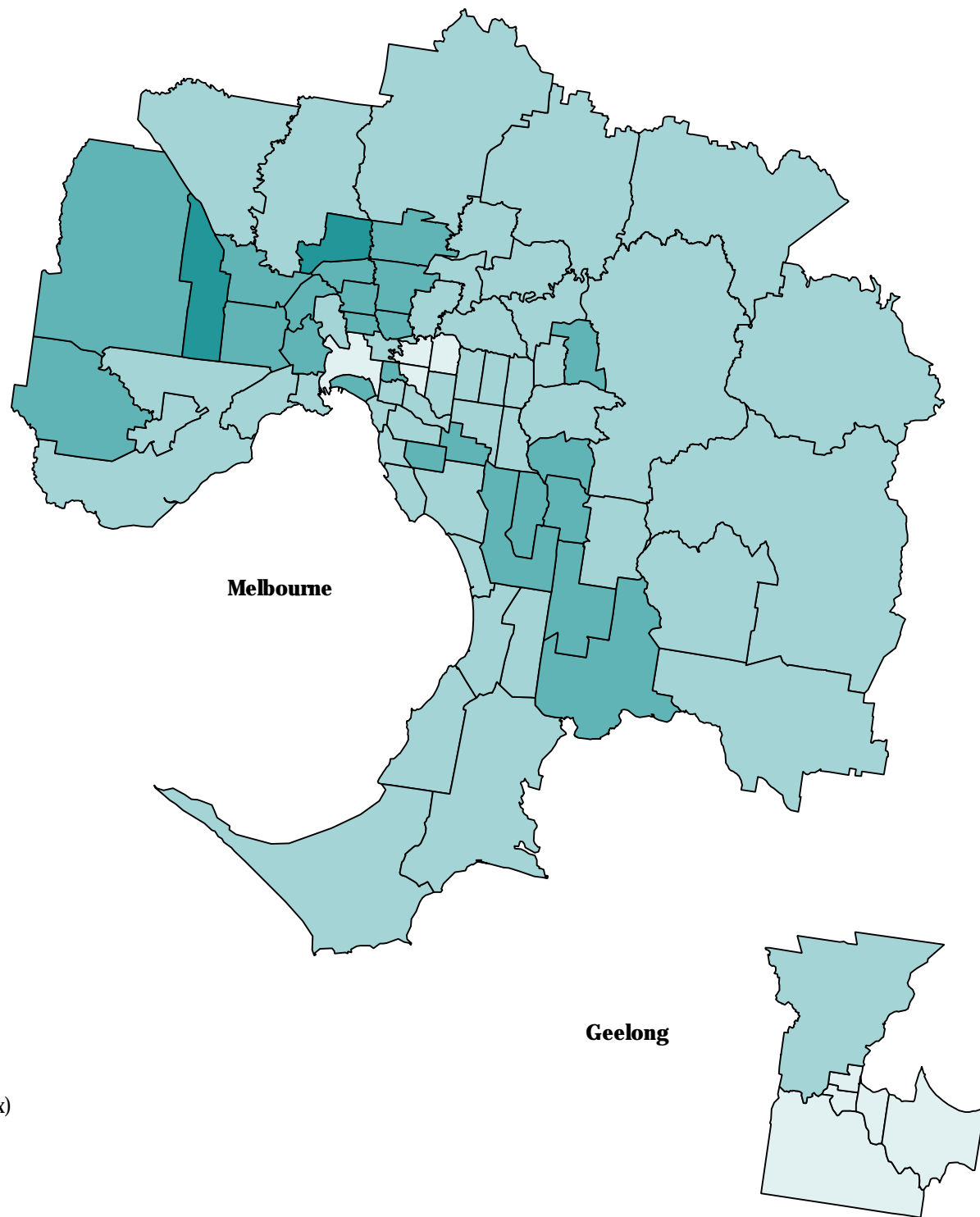
In **Geelong** (with an SR of 89\*\*), females used 465,747 GP services, 11 per cent fewer services than expected from the State rates.

The use of GP services by females was lower than expected in each SLA, with the highest ratios in Corio-Inner (an SR of 96\*\*) and Bellarine Inner (88\*\*). The lowest ratios were recorded for females from Newtown and South Barwon-Inner, both with an SR of 84\*\*.

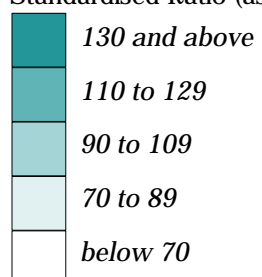
**Map 6.57**

**General medical practitioner services to females, Melbourne and Geelong, 1996**

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



Standardised Ratio (as an index)



\*Expected numbers were derived by indirect age standardisation, based on Vic 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 307). 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 (Victoria as the Standard)

As for male residents living in the non-metropolitan areas of Victoria, females used significantly fewer GP services in 1996 than expected. Overall, there were 2,975,988 GP services, 21 per cent fewer than expected from the State rates (an SAR of 79\*\*); these low rates of use are in line with the lower levels of GPs in the non-metropolitan areas (see Chapter 7 for details of the distribution of GPs).

Only in Wangaratta North (with 30 per cent more GP services to females than expected, an SR of 130\*\*), Yarriambiack (119\*\*) and Morwell (103\*\*), did females use GP services at rates above those expected from the State rates (**Map 6.58**). GP service use was at the level expected in Benalla, Hepburn West, Central Goldfields Balance and Yarra Ranges [Part B] (all with an SAR of 100).

In 44 SLAs (39.4 per cent of all SLAs), the use of GP services by females was at rates of 25 per cent or more lower than expected from the State rates. Within this group, the lowest standardised ratios were recorded in Horsham Balance (an SR of 18\*\*), Delatite North (25\*\*), Colac-Otway North (45\*\*), Shepparton [Part B] East and Alpine East (both 48\*\*), and Indigo [Part A] (50\*\*).

Females in Ballarat received 246,190 GP services in 1996, with 172,658 in next ranked Bendigo. High numbers of GP services were also recorded for females in Shepparton [Part A] (99,439 services), Mildura Shire [Part A] (96,030), Wodonga (83,749) and Morwell (78,007).

Of the towns mapped, the lowest standardised ratios were in Swan Hill (an SR of 54\*\*, almost half the expected number of GP services used by females) and Hamilton (68\*\*), with a ratio of 100 in Benalla, where the number of GP services provided was at the level expected from the State rates.

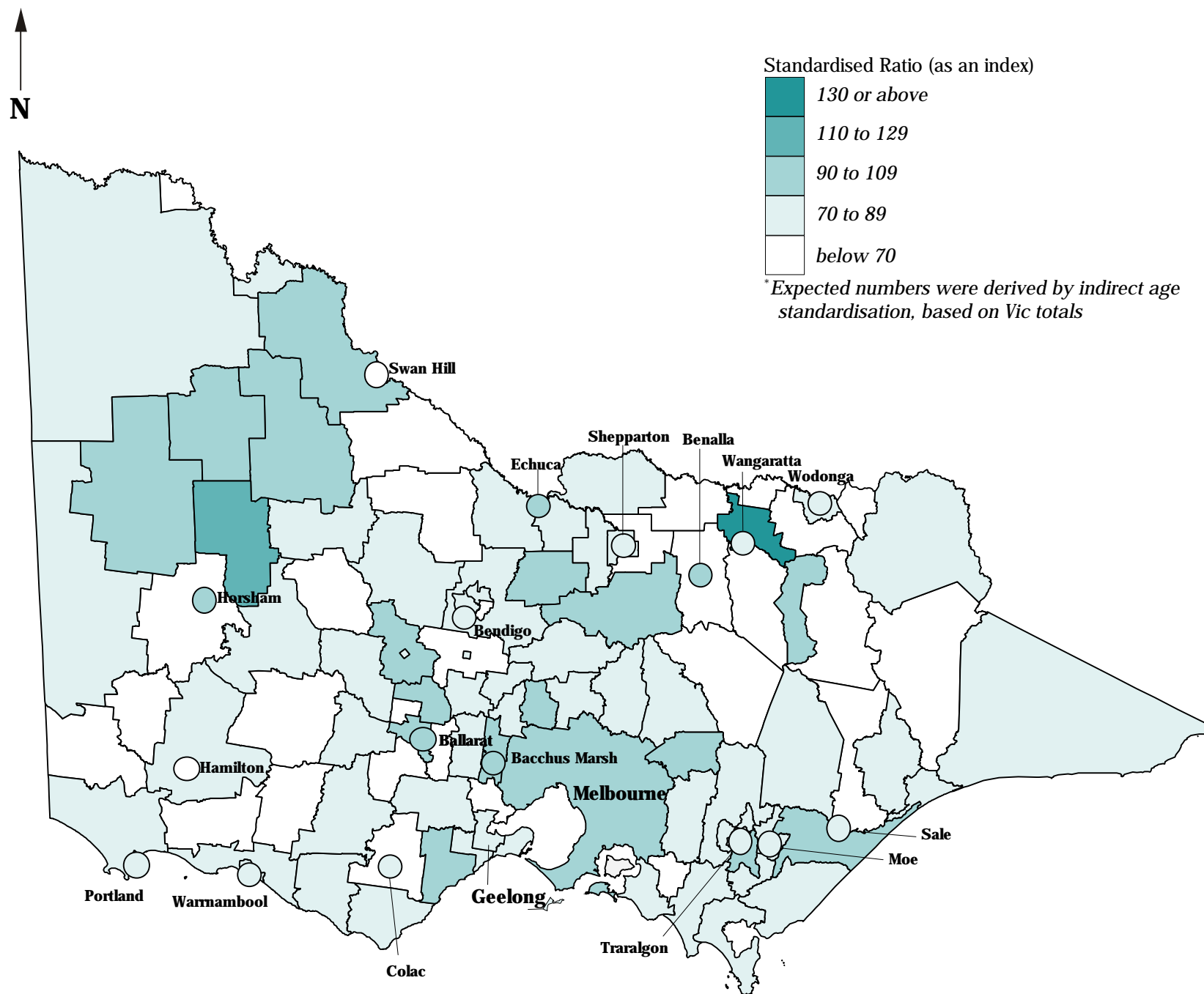
There were weak correlations with the variables for single parent families (0.27) and dwellings with no motor vehicle (0.22), and weak inverse correlations with female labour force participation (-0.29) and managers and administrators, and professionals (-0.24). These results, together with the weak inverse correlation with the IRSD (-0.26), suggest the existence of an association at the SLA level between high rates of use of GP services by females and socioeconomic disadvantage.



## Map 6.58

### General medical practitioner services to females, Victoria, 1996

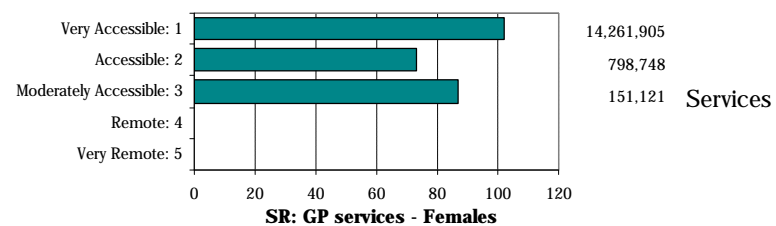
Standardised Ratio: number of services in each Statistical Local Area compared with the number expected\*



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

#### Accessibility/Remoteness Index of Australia



The distribution of standardised ratios (SRs) for the use of general medical practitioner (GP) services by females is different to that shown for males. The highest ratio is in the Very Accessible category, with 11 per cent more GP services than expected from the State rates. There is also an elevated ratio in the Moderately Accessible areas (an SR of 105, five per cent more GP services to females than expected), with one per cent fewer than the expected number of services to females in the Very Accessible areas. Details of the distribution of GPs (Chapter 7) are of relevance in interpreting these data.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

# Immunisation status of children at 12 months of age, 1998

## Capital city comparison

Immunisation data are collected by the Health Insurance Commission which maintains the Australian Childhood Immunisation Register (ACIR). The ACIR, a project funded by the Commonwealth Government through the Commonwealth Department of Health and Aged Care, provides comprehensive information on the immunisation status of children under seven years of age in Australia. These data are used to provide a measure of coverage at a National, State/Territory and local level and to provide an effective management tool for monitoring immunisation coverage and service delivery. The register was commenced in 1996 and by mid 1998 had sufficient coverage of the immunisation status of children at twelve months of age to be used for this analysis. Hull et al. (1999) reported that 80.1 per cent of vaccinations recorded in the ACIR for New South Wales were provided by GPs, 8.4 per cent by municipal councils and 11.5 per cent by other providers (eg. Government operated community health centres, Aboriginal health services and Royal Flying Doctor services).

The data shown here are the proportion of children born between 1 October 1996 and 30 September 1997 who were registered with Medicare and who were shown on the ACIR at 31 December 1998 as being fully immunised. Children who were fully immunised at 12 months of age were those who had been immunised for three doses of DTP (diphtheria, tetanus and pertussis), three doses of OPV (oral polio vaccine) and three doses of Hib (*Haemophilus influenzae* type b). The calculations shown in the tables and maps were made by the National Centre for Immunisation Research and Surveillance (NCIRS).

Immunisation rates for the capital cities were all close to the *All capitals* average of 82.5 per cent, ranging from 79.7 per cent in **Sydney** to 86.9 per cent in **Canberra**.

**Table 6.67: Proportion of children who were fully immunised at 12 months of age, capital cities, 1998**

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

## Melbourne

In 1998, 84.0 per cent of **Melbourne's** children were fully immunised at 12 months of age, a total of 44,387 children.

As **Map 6.59** shows, immunisation rates were highest in four discrete regions: in the outer western suburbs; in an area extending from north of the city cent to Whittlesea; in the band of suburbs between Hawthorn and Malvern and stretching to Croydon and Knox North; and in the extensive newer areas on the south-eastern periphery of **Melbourne**.

More than 90 per cent of children were fully immunised in Pakenham (91.3 per cent) and Knox South (90.6 per cent), with similarly high rates recorded in Cranbourne (89.4 per cent), Craigieburn (89.2 per cent), Sunbury (89.1 per cent), Frankston East (89.0 per cent), Berwick (88.7 per cent) and Nillumbik South-West (88.5 per cent).

There were 12 SLAs in which fewer than 80 per cent of children were fully immunised at age 12 months. Within this group, the lowest rates were recorded in Yarra Ranges Central (69.0 per cent), Sunshine (71.5 per cent), Port Phillip West (73.0 per cent) and Yarra Ranges North (73.3 per cent).

The largest numbers of fully immunised children lived in Yarra Ranges South-West (1,655 children), Whittlesea South (1,567), Knox North (1,445), Wyndham Werribee (1,237) and Hume Broadmeadows (1,162).

As would be expected, the correlation analysis showed a positive association at the SLA level between high rates of immunisation and high proportions of 0 to 4 year old children (0.38). Generally, there was a weak association between low immunisation levels and the indicators of socioeconomic disadvantage. The strongest correlations were with unemployment rates, low income families and dwellings without

a motor vehicle. The weak correlation with the IRSD (0.23) supports the existence of an association at the SLA level between low rates of immunisation and socioeconomic disadvantage. There were also weak inverse correlations with the variables for people born in predominantly non-English speaking countries (and resident for less than five years, -0.33; more than five years, -0.19; and with poor proficiency in English, -0.25), suggesting that these groups have lower infant immunisation rates.

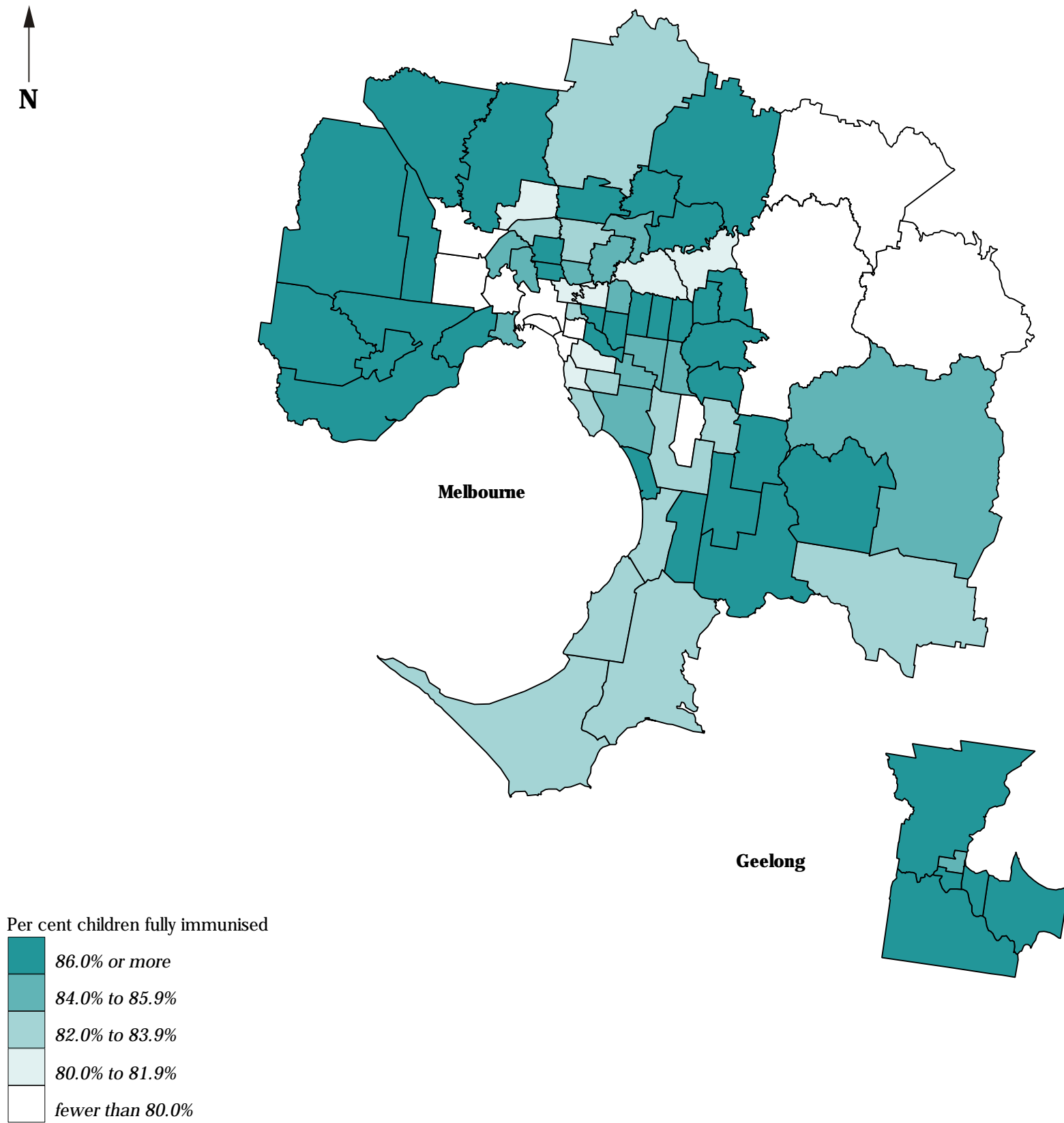
## Geelong

In **Geelong**, 86.9 per cent of children aged 12 months were fully immunised (2,088 children). Only Geelong West (85.1 per cent) had a lower proportion. Of the other SLAs, the highest immunisation rates were in South Barwon-Inner (88.6 per cent) and Newtown (88.4). In Corio-Inner, 794 children had been fully immunised by the age of 12 months, with 494 in South Barwon-Inner and 331 in Bellarine Inner.

**Map 6.59**

**Immunisation status of children at 12 months of age, Melbourne and Geelong, 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, capital cities, 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, 15,273 children in the non-metropolitan areas of Victoria were fully immunised at the age of 12 months, 86.0 per cent of children of this age.

The highest immunisation rates were largely in SLAs located in the western half of the State, especially in the Western Districts, the Mallee and the Riverland. The lowest rates were recorded in SLAs scattered throughout the State (**Map 6.60**).

The immunisation rate was above 90 per cent in almost one quarter (23.3 per cent) of SLAs, with the highest rates in Stawell (96.1 per cent of 12 month old children fully immunised), Ballan (95.5 per cent), Greater Geelong [Part C] (95.2), Buloke North (94.4), West Wimmera (94.2), Corangamite North (93.9), Ararat (93.8), Horsham Central (93.7), East Gippsland Balance (93.2) and Yarriambiack South (93.1).

There were 12 SLAs (10.7 per cent of all SLAs) in which immunisation rates of less than 80 per cent were recorded. In this group, the highest rates were recorded in Towong [Part B] (79.9 per cent), Campaspe South (78.8) and Alpine West (78.6).

The lowest rates in the State were in Mount Alexander Balance (65.1 per cent), Alpine East (67.5), Colac-Otway South and Yarra Ranges [Part B] (both 69.0 per cent).

The largest number of children in the non-metropolitan areas of Victoria who were fully immunised at 12 months of age was in Ballarat (1,099 children). Other relatively large numbers of fully immunised children were living in Bendigo (835 children), Mildura Shire [Part A] (709), Shepparton [Part A] (675), Wodonga (546) and Warrnambool (416).

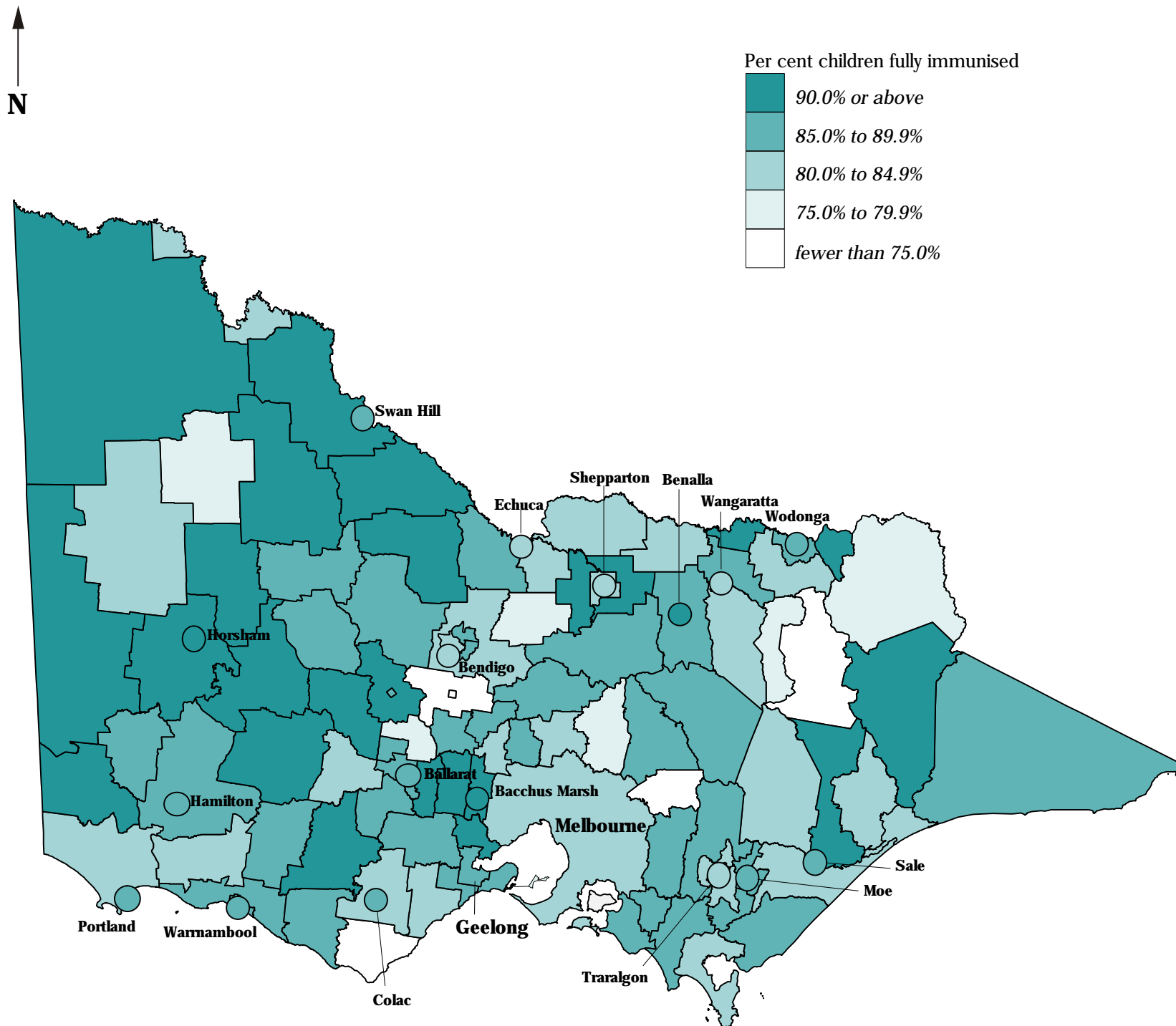
Of the towns mapped, immunisation rates were above 90 per cent in Horsham (93.7 per cent), Benalla (91.9 per cent) and Bacchus Marsh (90.2 per cent), compared with the lowest rates of 82.8 per cent and 83.1 per cent in Moe and Shepparton, respectively.

There was a weak inverse association evident in the correlation analysis at the SLA level with a number of the indicators of socioeconomic disadvantage. These results, and the very weak positive correlation with the IRSD (0.12), support the existence of a weak association at the SLA level between low rates of immunisation and socioeconomic disadvantage. There were also weak inverse correlations with the variables for people born in predominantly non-English speaking countries (and resident for less than five years, -0.24; more than five years, -0.23; and with poor proficiency in English, -0.16), suggesting that these groups have lower infant immunisation rates.

**Map 6.60**

**Immunisation status of children at 12 months of age, Victoria, 1998**

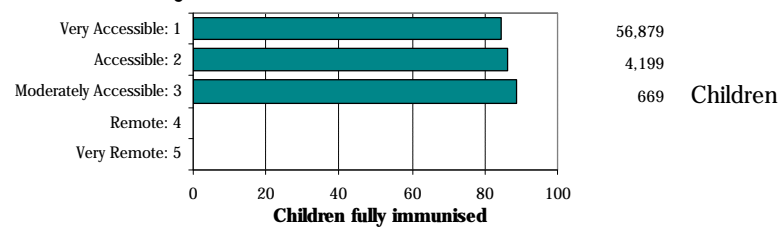
as a percentage of all children at 12 months of age in each Statistical Local Area



Source: See Data Sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

**Accessibility/Remoteness Index of Australia**



There is little variation in recorded immunisation rates across the ARIA categories in Victoria, with a small increase from 84.5 per cent (in the Very Accessible areas) to 88.5 per cent (in the Moderately Accessible areas) of 12 month old children being fully immunised.

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

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