

Atlas of potentially avoidable hospitalisations in South Australia

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Public Health Information Development Unit



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Contents

List of tables.....	iv
List of figures	vi
List of maps	vii
Acknowledgements.....	ix
Glossary and symbols used.....	xi
Glossary	xi
Symbols used.....	xi
Executive summary	xiii
1 Introduction.....	1
1.1 The concept of ‘potentially avoidable hospitalisations’	1
1.2 Limitations of the concept.....	1
2 Methods	3
2.1 Potentially avoidable conditions and codes	3
2.2 Data sources	3
2.3 Data methods and analysis	3
3 Potentially avoidable hospitalisations: hospital admissions resulting from ambulatory care-sensitive conditions	5
3.1 Avoidable and unavoidable hospitalisations.....	5
3.2 Potentially avoidable hospitalisations: By hospital type.....	6
3.3 Potentially avoidable hospitalisations: time trend.....	7
3.4 Potentially avoidable hospitalisations by age and sex.....	8
3.5 Potentially avoidable hospitalisations by condition	9
3.6 Potentially avoidable hospitalisations by Health Region.....	15
3.7 Potentially avoidable hospitalisations by statistical local area.....	21
3.8 Correlation analysis	66
3.9 Potentially avoidable hospitalisations by socioeconomic status.....	68
3.10 Cost of potentially avoidable hospitalisations.....	73
Appendix 1.1: ICD codes.....	79
Appendix 1.2: Maps of Index of Relative Socio-economic Disadvantage.....	81
Appendix 1.3: Geographic areas mapped.....	83

Table 3.1: Potentially avoidable ¹ and unavoidable hospitalisations, by sex, South Australia, 2005/06 and 2006/07	5
Table 3.2: Potentially avoidable hospitalisations ¹ by hospital type, South Australia, 2005/06 and 2006/07	6
Table 3.3: Time trend of potentially avoidable hospitalisations ¹ , South Australia, 2001/02 to 2006/07	7
Table 3.4: Potentially avoidable hospitalisations ¹ by ag5e and sex, South Australia, 2005/06 and 2006/07	8
Table 3.5: Potentially avoidable hospitalisations ¹ by sub-category and condition, South Australia, 2005/06 and 2006/07	9
Table 3.6: Potentially avoidable hospitalisations ¹ by condition rank, South Australia, 2005/06 and 2006/07	10
Table 3.7: Potentially avoidable hospitalisations ¹ by selected condition and age, South Australia, 2005/06 and 2006/07	12
Table 3.8: Potentially avoidable hospitalisations ¹ by selected condition, age and sex, South Australia, 2005/06 and 2006/07	14
Table 3.9: Potentially avoidable hospitalisations ¹ by Health Region, South Australia, 2005/06 and 2006/07	15
Table 3.10: Potentially avoidable hospitalisations ¹ by sub-category/condition and Health Region, South Australia, 2005/06 and 2006/07	17
Table 3.11: Potentially avoidable hospitalisations ¹ by sub-category/condition and Health Region, South Australia, 2005/06 and 2006/07	18
Table 3.12: Potentially avoidable hospitalisations ¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2005/06 and 2006/07	19
Table 3.13: Potentially avoidable hospitalisations ¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2005/06 and 2006/07	20
Table 3.14: Total potentially avoidable hospitalisations ¹ by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	22
Table 3.15: Total potentially avoidable hospitalisations ¹ by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	24
Table 3.16: Potentially avoidable hospitalisations ¹ : diabetes complications by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	26
Table 3.17: Potentially avoidable hospitalisations ¹ : diabetes complications by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	28
Table 3.18: Potentially avoidable hospitalisations ¹ : chronic obstructive pulmonary disease by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	30
Table 3.19: Potentially avoidable hospitalisations ¹ : chronic obstructive pulmonary disease by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	32
Table 3.20: Potentially avoidable hospitalisations ¹ : dental conditions by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	34
Table 3.21: Potentially avoidable hospitalisations ¹ : dental conditions by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	36
Table 3.22: Potentially avoidable hospitalisations ¹ : dehydration and gastroenteritis by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	38

Table 3.23: Potentially avoidable hospitalisations ¹ : dehydration and gastroenteritis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	40
Table 3.24: Potentially avoidable hospitalisations ¹ : asthma, by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	42
Table 3.25: Potentially avoidable hospitalisations ¹ : asthma by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	44
Table 3.26: Potentially avoidable hospitalisations ¹ : congestive cardiac failure, by metropolitan Health Regions and sub-regions, South Australia, 2005/06 and 2006/07.....	46
Table 3.27: Potentially avoidable hospitalisations ¹ : congestive cardiac failure by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	48
Table 3.28: Potentially avoidable hospitalisations ¹ : ear, nose, and throat infections, by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07.....	50
Table 3.29: Potentially avoidable hospitalisations ¹ : ear, nose, and throat infections by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	52
Table 3.30: Potentially avoidable hospitalisations ¹ : pyelonephritis by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	54
Table 3.31: Potentially avoidable hospitalisations ¹ : pyelonephritis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	56
Table 3.32: Potentially avoidable hospitalisations ¹ : angina by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07	58
Table 3.33: Potentially avoidable hospitalisations ¹ : angina by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	60
Table 3.34: Potentially avoidable hospitalisations ¹ : cellulitis by metropolitan Health Regions and sub-regions, South Australia, 2005/06 and 2006/07	62
Table 3.35: Potentially avoidable hospitalisations ¹ : cellulitis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07	64
Table 3.36: Correlation ¹ between potentially avoidable hospitalisations and socioeconomic status ² , Metropolitan Adelaide and country South Australia, South Australia, 2006	67
Table 3.37: Average cost per admission of potentially avoidable hospitalisations ¹ by sub-category/condition and Health Region, South Australia, 2006/07	75
Table 3.38: Average cost per admission of potentially avoidable hospitalisations ¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2006/07.....	76
Table 3.39: Average cost per 100 population of potentially avoidable hospitalisations ¹ by sub-category/condition and metropolitan Health Region and metropolitan sub-region /District, South Australia, 2006/07	77
Table A1.1: ICD codes used in identifying potentially avoidable hospitalisations	79

Figure 3.1: Avoidable ¹ and unavoidable hospitalisations, by sex, South Australia, 2005/06 and 2006/07	5
Figure 3.2: Time trend of potentially avoidable hospitalisations ¹ , South Australia, 2001/02 to 2006/07.....	7
Figure 3.3: Time trend of potentially avoidable hospitalisations ¹ by quintile of socioeconomic status, South Australia, 2001/02 to 2006/07	7
Figure 3.4: Potentially avoidable hospitalisations ¹ by age and sex, South Australia, 2005/06 and 2006/07	8
Figure 3.5: Potentially avoidable hospitalisations ¹ by condition, South Australia, 2005/06 and 2006/07 ...	10
Figure 3.6: Potentially avoidable hospitalisations ¹ by Health Region, South Australia, 2005/06 and 2006/07	15
Figure 3.7: Potentially avoidable hospitalisations ¹ by socioeconomic status, South Australia, 2005/06 and 2006/07	68
Figure 3.8: Potentially avoidable hospitalisations ¹ : vaccine-preventable conditions by socioeconomic status, South Australia, 2005/06 and 2006/07	68
Figure 3.9: Potentially avoidable hospitalisations ¹ : chronic conditions by socioeconomic status, South Australia, 2005/06 and 2006/07	69
Figure 3.10: Potentially avoidable hospitalisations ¹ : acute conditions by socioeconomic status, South Australia, 2005/06 and 2006/07	71

Map 3.1: Avoidable hospitalisations: all conditions, metropolitan regions, South Australia, 2005/06 and 2006/07	23
Map 3.2: Potentially avoidable hospitalisations: all conditions, South Australia, 2005/06 and 2006/07	25
Map 3.3: Potentially avoidable hospitalisations: diabetes complications, metropolitan regions, South Australia, 2005/06 and 2006/07	27
Map 3.4: Potentially avoidable hospitalisations: diabetes complications, South Australia, 2005/06 and 2006/07	29
Map 3.5: Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, metropolitan regions, South Australia, 2005/06 and 2006/07	31
Map 3.6: Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, South Australia, 2005/06 and 2006/07	33
Map 3.7: Potentially avoidable hospitalisations: dental conditions, metropolitan regions, South Australia, 2005/06 and 2006/07	35
Map 3.8: Potentially avoidable hospitalisations: dental conditions, South Australia, 2005/06 and 2006/07	37
Map 3.9: Potentially avoidable hospitalisations: dehydration and gastroenteritis, metropolitan regions, South Australia, 2005/06 and 2006/07	39
Map 3.10: Potentially avoidable hospitalisations: dehydration and gastroenteritis, South Australia, 2005/06 and 2006/07	41
Map 3.11: Potentially avoidable hospitalisations: asthma, metropolitan regions, South Australia, 2005/06 and 2006/07	43
Map 3.12: Potentially avoidable hospitalisations: asthma, South Australia, 2005/06 and 2006/07	45
Map 3.13: Potentially avoidable hospitalisations: congestive cardiac failure, metropolitan regions, South Australia, 2005/06 and 2006/07	47
Map 3.14: Potentially avoidable hospitalisations: congestive cardiac failure, South Australia, 2005/06 and 2006/07	49
Map 3.15: Potentially avoidable hospitalisations: ear, nose, and throat infections, metropolitan regions, South Australia, 2005/06 and 2006/07	51
Map 3.16: Potentially avoidable hospitalisations: ear, nose, and throat infections, South Australia, 2005/06 and 2006/07	53
Map 3.17: Potentially avoidable hospitalisations: pyelonephritis, metropolitan regions, South Australia, 2005/06 and 2006/07	55
Map 3.18: Potentially avoidable hospitalisations: pyelonephritis, South Australia, 2005/06 and 2006/07	57
Map 3.19: Potentially avoidable hospitalisations: angina, metropolitan regions, South Australia, 2005/06 and 2006/07	59
Map 3.20: Potentially avoidable hospitalisations: angina, South Australia, 2005/06 and 2006/07	61
Map 3.21: Potentially avoidable hospitalisations: cellulitis, metropolitan regions, South Australia, 2005/06 and 2006/07	63
Map 3.22: Potentially avoidable hospitalisations: cellulitis, South Australia, 2005/06 and 2006/07	65
Map 3.23: Cost of potentially avoidable hospitalisations per admission, metropolitan region, South Australia, 2006/07	73
Map 3.24: Cost of potentially avoidable hospitalisations per head, metropolitan region, South Australia, 2006/07	73

List of maps ...continued	Page
Map A1.1: Index of Relative Socio-economic Disadvantage, metropolitan regions, 2006.....	81
Map A1.2: Index of Relative Socio-economic Disadvantage, South Australia, 2006	82
Map A1.3: Key to areas mapped by Statistical Local Area, metropolitan regions, South Australia, 2006	83
Map A1.4: Key to areas mapped by Statistical Local Area, South Australia, 2006	84
Map A1.5: Key to overlays for metropolitan sub-regions/Districts and Health Regions, South Australia, 2006	85

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Glossary and symbols used

Glossary

ACS conditions

Ambulatory care-sensitive conditions

Admissions

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

'Separation' is an episode of care for an admitted patient which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation). Separation also means the process by which an admitted patient completes an episode of care either by being discharged, dying, transferring to another hospital or changing the type of care. Separations of unqualified newborns, boarders or organ procurement patients are excluded.

In this atlas, the more commonly used term of 'admission' has been used. In an analysis such as this, which excludes most long stay patients, there is little difference between the number of admissions and the number of separations in a year. Also, 'admission' is a more familiar term to many people who will use this atlas.

Average number

The number of admissions over the years 2005/06 and 2006/07.

Expected numbers

See **Standardised Ratios**

Health Region

Health Regions are based on groupings of Statistical Local Areas: the two metropolitan Health Regions each have three sub-regions/Districts: see Maps A1.5 and A1.6 in Appendix 1.3.

Hospitalisations

Refer to 'Admissions' above

ICD-10-AM

International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification.

IRSD

Index of Relative Socio-economic Disadvantage – for further information, refer to Chapter 2, *Methods*.

RR

Rate ratio – for further information, refer to Chapter 2, *Methods*.

Separations

Refer to 'Admissions' above

Standardised Ratios

Presented as an index (per cent), based on expected numbers from the State average produced by indirect standardisation – for further information, see Chapter 2, *Methods*.

Symbols used

- * Statistically significant, at the 5% confidence level
- ** Statistically significant, at the 1% confidence level
- .. not applicable

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Executive summary

Introduction

To assess the adequacy, efficiency and quality of primary health care within the broader health system, one indicator that is currently of interest to decision-makers is that of 'Avoidable hospitalisations'. The term has been used to represent a range of conditions for which hospitalisation should be able to be avoided, because the disease or condition has been prevented from occurring, or because individuals have had access to timely and effective primary care, thus avoiding a hospital admission.

This report addresses the level and extent of regional variation in South Australia in a sub-set of avoidable hospitalisations, namely those arising from Ambulatory Care-Sensitive (ACS) conditions. ACS conditions are those conditions for which hospitalisation is considered potentially avoidable through preventive health care and early disease management, usually delivered in a primary care setting, for example by a general medical practitioner, or at by staff a community health centre. They can be used as an indicator to assess the adequacy, efficiency and quality of primary health care within the broader health system. Analyses at the area level may assist as a tool to monitor need; as a performance indicator of variations in access to, or the quality of, primary care; or in allocating limited resources among communities.

Admissions for these conditions can be avoided in three ways. Firstly, for conditions that are usually preventable through immunisation, disease can be prevented almost entirely. Secondly, diseases or conditions that can ultimately lead to rapid onset of problems, such as dehydration and gastroenteritis, can be treated early. Thirdly, chronic conditions, such as congestive heart failure, can be managed to prevent or reduce the severity of acute episodes and avoid hospitalisation.

This analysis has been undertaken for individual ambulatory care-sensitive conditions, and for groupings of conditions in three sub-categories: conditions that can be prevented through vaccination; acute conditions for which hospitalisations are avoidable with antibiotics or other medical interventions provided by primary care services; and selected chronic conditions that can be managed through the use of pharmaceutical agents, patient education, or behaviour change.

This report does not cover other types of avoidable hospitalisations, namely preventable hospitalisations, a sub-category of avoidable hospitalisations, comprising hospitalisations of people from diseases preventable through population-based health promotion strategies (e.g. alcohol-related conditions and most cases of lung cancer); or hospitalisations potentially avoidable through injury prevention strategies (e.g. road traffic accidents). Currently, there is no agreed approach to the categorisation of these aspects of avoidable hospitalisations in Australia, or internationally.

Key results

Current level and trends

In the years 2005/06 and 2006/07, admissions resulting from ACS conditions represented 10.2% of all hospital admissions in South Australia. This equates to an annual average of 53,754 admissions, all of which are potentially avoidable.

Over the years 2001/02 to 2006/07, potentially avoidable hospitalisations have increased by 12.4% (an average of 2.5% per annum), or 5,974 admissions. Taking into account population growth over this period, admissions for these avoidable conditions have still increased, but by a lower 8.2%, an average of 1.6% each year

By age and sex

Admissions for these conditions accounted for a notably higher proportion of all admissions of males (11.0% of total admissions of males) than was the case for females (9.5% of total admissions of females).

Almost one third (31.0%) of avoidable hospitalisations occurred in the 75 years and over age group, with more than one fifth (22.1%) in the 45 to 64 year age group. These two age groups alone contributed to an average of 29,770 avoidable hospitalisations, over half (53.1%) of all avoidable hospitalisations in this period.

The overall hospitalisation rate from ACS conditions for males was similar to that for females. However, there was marked variation between the age groups. Males in the 0 to 14 year age group had 27% more admissions than females of the same age; and there were 24% more admissions of males at ages 75 years and over, and 30% at ages 65 to 74 years. Rates for males were lower than for females in the 15 to 24 (36% lower) and 25 to 44 (22% lower) year age groups.

By sub-category and condition

Over half (55.8%) of hospital admissions for ACS conditions were attributable to chronic conditions, just over forty per cent (42.9%) to acute conditions and a small proportion (1.9%) to vaccine-preventable conditions.

The high proportion of potentially avoidable hospitalisations for chronic conditions in this period can be primarily attributed to hospitalisations for diabetes complications (accounting for 24.2% of all avoidable hospitalisations), with certain circulatory and respiratory conditions contributing to a further 29.1%: these were chronic obstructive pulmonary disease (10.3%) and asthma (7.2%), and congestive cardiac failure (7.1%), and angina (5.6%).

Dental conditions (8.7%); dehydration and gastroenteritis (8.7%); ear, nose and throat infections (6.7%); and pyelonephritis (includes urinary tract infections) (6.6%) made the greatest contribution to hospitalisations for acute conditions.

Influenza and pneumonia (1.5%) was the main admission cause for vaccine-preventable conditions.

By socioeconomic status

There is a strong, inverse, correlation at the SLA level across Metropolitan Adelaide between high rates of admission for conditions categorised as potentially avoidable, and socioeconomic disadvantage, as measured by the Index of Relative Socio-economic Disadvantage (IRSD). The correlations in country South Australia between potentially avoidable hospitalisations and socioeconomic disadvantage are generally weaker than those in Metropolitan Adelaide. The exceptions are the acute sub-category overall, and the specific acute conditions of dehydration and gastroenteritis and ear, nose and throat infections. These are notably different in country South Australia from Metropolitan Adelaide and are likely to reflect the higher prevalence of these conditions among the Aboriginal population.

Overall, admission rates for ambulatory care-sensitive conditions are higher in areas of greater socioeconomic disadvantage (lowest socioeconomic status) when compared with those of highest socioeconomic status. People living in the most disadvantaged areas of Metropolitan Adelaide had 48% more hospitalisations for a potentially avoidable (ambulatory care-sensitive) condition than those in the highest socioeconomic status areas. For people living in country South Australia, the gap was almost double, being 90% higher in the most disadvantaged areas.

By cost

Using actual cost data for episodes of avoidable hospitalisation in public acute hospitals in Metropolitan Adelaide (excluding Modbury), details of the average cost per admission were calculated by Health Region and sub-region/District. The results show a markedly (25.9%) higher cost per admission for residents of Southern Adelaide (\$3,850 per admission), than of Central Northern Adelaide (\$3,057). The highest costs per admission included, for Southern Adelaide, rheumatic heart disease, perforated/bleeding ulcers, influenza and pneumonia and appendicitis. Of the conditions with the largest numbers of admissions, costs were highest for diabetes complications, congestive cardiac failure, chronic obstructive pulmonary disease and pelvic inflammatory disease. In Central Northern Adelaide, the highest cost conditions were similar, although the cost per admission was much lower, being around one half to two thirds of the cost of the equivalent condition in the south. The costliest admissions were for gangrene, perforated/bleeding ulcers, appendicitis and influenza and pneumonia. Of conditions with the largest number of admissions, costs were (as in the south, although with a minor difference in rank order) highest for congestive cardiac failure, diabetes complications, chronic obstructive pulmonary disease and pelvic inflammatory disease.

A separate analysis calculated the average cost per 100 population. This provides a population health measure of the impact of potentially avoidable hospitalisations, highlighting the areas in which the greatest savings can, potentially, be made through access to timely and effective primary care. Of immediate interest is that the gap in average cost per 100 population between the Southern Adelaide and Central Northern Adelaide Health Regions is greater than it was per admission – 32.4% compared with 25.9%. And the variation at the sub-region level in Central Northern Adelaide is also greater, with Western sub-region having 6.8 times the avoidable hospitalisation rate as in Central East sub-region. Of note is the greater variation for the chronic sub-category (8.0 times higher rate in Western sub-region than in Central East sub-region) and, in particular, for diabetes complications (9.9). As well as having the highest overall average cost, Southern Adelaide had higher costs for the majority of the individual conditions. In addition, Outer Southern District has the highest overall average cost per 100 admissions of any District or sub-region, and the highest for the chronic sub-category and many individual conditions, including the higher prevalence diabetes complications, chronic obstructive pulmonary disease dehydration and gastroenteritis, asthma and congestive cardiac failure.

1 Introduction

1.1 The concept of ‘potentially avoidable hospitalisations’

The data presented in this report are referred to as ‘potentially avoidable hospitalisations’. In SA Health, the same category is referred to as ‘potentially preventable admissions’ (PPA), and by the Australian Institute of Health and Welfare (AIHW) as ‘potentially preventable hospitalisations’ (admissions from ambulatory-care sensitive conditions (ACS)).

ACS conditions are conditions for which hospitalisation is thought to be potentially avoidable if preventive care and early disease management are applied, usually in a primary care setting (for example, by a general medical practitioner or at a community health centre). This group of conditions is used as an indicator of the adequacy, efficiency and quality of primary health care within the broader health system. Analyses at the area level can be used as a tool to monitor need; as a performance indicator of variations in access to or the quality of primary care; or in allocating limited resources among communities.

Hospital admission for these conditions may be avoided in three ways. Firstly, for conditions that are usually preventable through immunisation, disease can be prevented almost entirely. Secondly, diseases or conditions that can lead to a rapid onset of problems, such as dehydration from gastroenteritis, can be treated early to avoid hospitalisation. Thirdly, chronic conditions, such as congestive heart failure, can be managed appropriately to prevent or reduce the severity of acute flare-ups and avoid hospitalisation.

This analysis has been undertaken for individual ASC conditions, and for ASC conditions grouped into three sub-categories:

- conditions that can be prevented through vaccination;
- acute conditions for which hospitalisations are commonly avoidable with antibiotics or other medical interventions available in primary care; and
- selected chronic conditions that can be managed by pharmaceutical agents, patient education, or behaviour change.

This report does not cover other aspects of avoidable hospitalisations, namely preventable hospitalisations, a sub-category of avoidable hospitalisations, which comprise hospitalisations for diseases preventable through population-based health promotion strategies (e.g., diseases such as alcohol-related conditions and most cases of lung

cancer); or hospitalisations potentially avoidable through injury prevention strategies (e.g., road traffic accidents). Currently, there is no agreed, uniform approach to the categorisation of avoidable hospitalisations in Australia, or internationally.

1.2 Limitations of the concept

The use of avoidable hospitalisations as a performance indicator of access to, or the quality of, primary care should be predicated by the recognition that many different factors contribute to hospitalisation rates. These include:

- the age, ethnicity and sex of patients;
- patient-related socioeconomic factors (ethnicity, income, level of education and insurance status);
- disease incidence, prevalence and severity;
- patient compliance with indicated treatment;
- perceived health need and care-seeking behaviour;
- access to care;
- availability of care including supply of primary care practitioners, hospital bed availability, a regular source of care or continuity of care;
- physician practice style; and
- whether care at home is feasible for reasons unrelated to health status or provision (Niti and Ng 2003)¹.

Furthermore, the use of the term ‘avoidable’ reflects agreement about what is considered achievable by primary health care at the time of any analysis undertaken. With advances in the scope and quality of health care, some conditions previously considered not being amenable may subsequently be able to be treated effectively. Alternatively, progress in health care and technology over time may make questionable the value of other conditions, previously considered as being relatively ‘robust’ indicators of the quality of health care (Nolte and McKee 2004)².

Finally, the concept of potentially avoidable hospitalisations is an artificial construct, as many hospital admissions are not fully preventable in reality; and its use as an indicator should therefore be qualified. A discussion of the concept and its history can be found in the *Atlas of Avoidable Hospitalisations in Australia* (Page et al. 2007:2-8) at <http://www.publichealth.gov.au>.

1 Niti M and Ng TP. (2003) Avoidable hospitalisation rates in Singapore, 1991-1998: assessing trends and inequities of quality in primary care. *Journal of Epidemiology and Community Health* 57(1): 17-22.

2 Nolte E and McKee M (2004). *Does health care save lives? Avoidable mortality revisited*. Nuffield Trust: London, UK.

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2 Methods

2.1 Potentially avoidable conditions and codes

The potentially avoidable conditions and codes used in this report are those used in the Australian Institute of Health and Welfare (2007) *Australian Hospital Statistics* report³ – the full code set is included in Appendix 1.1.

2.2 Data sources

The potentially avoidable hospitalisations' data file and the DRG cost weight data were provided by SA Health. The number of 'unavoidable' admissions was calculated by deducting the number of avoidable admissions from the total number of admissions, provided by SA Health for the same period.

Estimated resident population data were from the Australian Bureau of Statistics (ABS).

Measures of remoteness (using the ABS Australian Standard Geographical Classification (ASGC) of remoteness⁴) and disadvantage (using the ABS Index of Relative Socio-economic Disadvantage (IRSD)⁵) were added subsequently, by matching these measures at the Statistical Local Area (SLA) level to the address of the patient as recorded in patient records.

2.3 Data methods and analysis

The data used in the analysis in this report include all admissions to South Australian hospitals, regardless of where the person admitted usually lived. Data exclude residents of South Australia who were admitted to a hospital in another State or Territory, as data for these admissions are not held in South Australia. As a result, the figures will differ from those published by the AIHW, which use data based on the State/Territory of usual residence of the patient.

Another area of difference in figures published in Australia relates to variations in the code sets used. This is not a concern here, as the data provided by SA Health for this report have been based on the code set used by AIHW.

³ Reference: AIHW (2007) *Australian hospital statistics 2005-06*. Health services series no. 30. Cat no. HSE 50. Canberra: AIHW. At: <http://www.aihw.gov.au/publications/index.cfm/title/10455>; accessed 20 June 2007.

⁴ See 'ASGC remoteness classification' in Section 2.3.

⁵ Reference: ABS (2008) *An Introduction to Socio-Economic Indexes for Areas (SEIFA) 2006*. Information Paper. ABS Cat. No. 2039.0. Canberra: ABS. See: 'Socioeconomic status' in Section 2.3.

Other than in the time series, the numbers presented are the average of admissions over the two years, 2005/06 and 2006/07. Using two years' data increases the number of areas that can be mapped, although, for ease of interpretation, the numbers reported in the text and tables are the annual averages.

For the time series, single year data are shown, although the comparison by socioeconomic status uses two-year averages. The code set used to define potentially avoidable conditions for the years 2005/06 and 2006/07 was applied to each year of the time series.

Standardised rates/ ratios

Admission rates were age-standardised to the South Australian population by the indirect method. Indirect standardisation compares actual numbers to expected numbers, adjusting for age and sex. This produces a ratio which is commonly called a standardised ratio, or an SR. The expected number of admissions is taken from the number of admissions in the reference population, in this case the South Australian population. The SR of the reference population is always 100; an SR value of lower than 100 means that fewer than expected admissions occurred in the local population (i.e., the SLA or Health Region of interest) after adjusting for differences in age and sex; an SR of more than 100 means that there have been more admissions than expected.

The statistical significance of the standardised rates/ ratios was calculated using a Z score calculation, which gives a Z score for the observed number around the expected number for the local population. The Z score enables assessment of the statistical significance of the difference between the observed and expected numbers. Z scores are significant at the 95% level if their absolute value is greater than ± 1.96 (shown with a single asterisk, *), and at the 99% level if their absolute value is greater than ± 2.58 (shown with a double asterisk, **).

Rate ratios

'Rate ratios' (sometimes denoted as 'RR' in this report) show the differential between the standardised rates for two groups – for example, between males and females and between the areas with the lowest socioeconomic status (Quintile 5) and those with the highest socioeconomic status (Quintile 1). The statistical significance of rate ratios is shown with an asterisk(s). A single asterisk indicates that the ratio is statistically significant at the 5% confidence level, that is, that the likelihood of the observed ratio being due to change or random error is less than 5%. A double asterisk

indicates that the observed ratio is statistically significant at the 1% confidence level.

ASGC remoteness classification

The ASGC remoteness classification allocates areas (e.g., SLAs) to one of five classes, based on road distances to service centres (towns). The five remoteness classes to which SLAs can be allocated are: Major Cities of Australia, Inner Regional, Outer Regional, Remote, and Very Remote.

Socioeconomic status

Socioeconomic status was examined using the Index of Relative Socio-economic Disadvantage (IRSD)⁶. The IRSD is an area-based, summary measure of socioeconomic disadvantage and is calculated from variables including those relating to education, labour force status, occupation and Indigenous status, of individuals and families.

The IRSD is expressed as a number with a base for Australia of 1000: numbers above 1000 show relatively low disadvantage, and numbers below 1000 indicate relatively high disadvantage.

SLAs were ranked by their IRSD score and then allocated to one of five groups (quintiles), each representing approximately 20% of the population of South Australia. Admissions were then allocated to one of these five groups with similar socioeconomic status (referred to as quintiles of socioeconomic disadvantage of area). Rates were then calculated by quintile for each condition.

⁶ Australian Bureau of Statistics (ABS) (2008). *An Introduction to Socio-Economic Indexes for Areas (SEIFA) 2006*. Information Paper. ABS Cat. No. 2039.0. Canberra: ABS.

3 Potentially avoidable hospitalisations: hospital admissions resulting from ambulatory care-sensitive conditions

3.1 Avoidable and unavoidable hospitalisations

Over the two years 2005/06 and 2006/07, hospitalisations resulting from ambulatory care-sensitive (ACS) conditions accounted for ten per cent of all hospital admissions in South Australia (Table 3.1). This equates to almost 54,000 admissions annually, which are potentially avoidable.

Potentially avoidable hospitalisations accounted for a notably higher proportion of all admissions for males (11.0% of all admissions of males) than was the case for females (9.5%): however, the rate of avoidable admissions per 100,000 population was almost exactly the same for males and females.

The annual rate of potentially avoidable hospitalisations was 3,427.7 admissions per 100,000 population.

Although the rates of hospitalisations for ACS conditions were consistent for males and females, females had a higher rate of unavoidable (and total) hospitalisations. The rate ratio of 0.85** for unavoidable hospitalisations indicates that males had 15.0% fewer of these hospitalisations than did females.

Figure 3.1 illustrates these variations in rates of hospitalisation – for avoidable, unavoidable, and total admissions – for males and females.

Table 3.1: Potentially avoidable¹ and unavoidable hospitalisations, by sex, South Australia, 2005/06 and 2006/07

Hospitalisation category	Average number ²			%	Rate ³			Rate ratio
	Males	Females	Persons		(persons)	Males	Females		Persons
Avoidable ¹	26,494	27,260	53,754	10.2	3,421.3	3,433.9	3,427.7	1.00
Unavoidable	214,682	258,440	473,133	89.8	27,723.7	32,555.6	30,170.4	0.85**
Total	241,176	285,700	526,887	100.0	31,145.1	35,989.5	33,598.1	0.87**
Avoidable¹ (%)	11.0	9.5	10.2	..	..	..	..	..

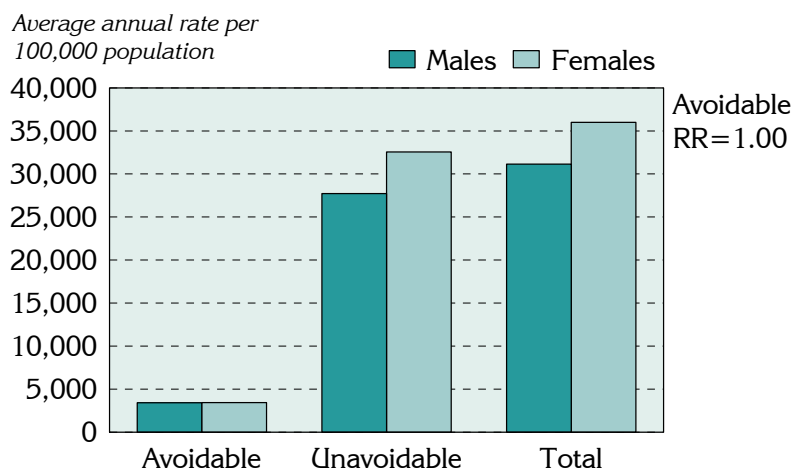
¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years, 2005/06 and 2006/07

³ Rate is the age-sex standardised rate per 100,000 population

⁴ Rate ratio (M:F) is the ratio of male to female rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01

Figure 3.1: Avoidable¹ and unavoidable hospitalisations, by sex, South Australia, 2005/06 and 2006/07



¹ Admissions resulting from ACS conditions

3.2 Potentially avoidable hospitalisations: By hospital type

Potentially avoidable hospitalisations: hospital type

Almost three quarters (73.8%) of potentially avoidable hospitalisations were in public acute hospitals, with the remainder (26.2%) in private hospitals (Table 3.2). Residents of country South Australia, who comprise just over one quarter of the State's population (27.0% at the 2006 Census), comprised almost one third of all admissions for these conditions (32.6% – 28.1% of admissions to a public acute hospital and 4.5% to a private hospital. With just over two thirds (67.4%) of these admissions, residents of Metropolitan Adelaide had around two thirds of their admissions in public acute (45.7%) and one third (21.7%) in private hospitals.

Table 3.2: Potentially avoidable hospitalisations¹ by hospital type, South Australia, 2005/06 and 2006/07

Sub-category and condition	Public acute hospitals			Private hospitals			Total ²
	Metro	Country	Total	Metro	Country	Total	
Vaccine-preventable	526	281	806	134	28	162	968
Influenza and pneumonia	408	228	636	107	23	130	765
Other vaccine preventable	118	54	172	29	6	34	206
Chronic	14,387	8,451	22,838	5,353	1,107	6,460	29,298
Iron deficiency anaemia	954	334	1,288	666	113	778	2,066
Diabetes complications	5,643	3,490	9,133	2,760	664	3,424	12,556
Nutritional deficiencies	5	1	6	3	1	4	10
Rheumatic heart disease	83	30	113	31	7	38	151
Hypertension	110	297	407	96	26	122	528
Congestive cardiac failure	1,762	1,139	2,901	785	109	894	3,794
Angina	1,667	958	2,625	274	81	354	2,979
Chronic obstructive pulmonary disease	2,946	1,612	4,558	860	94	954	5,512
Asthma	2,351	1,209	3,560	193	67	260	3,819
Acute	9,291	6,192	15,482	5,992	1,240	7,232	22,714
Dehydration and gastroenteritis	1,777	1,535	3,312	1,074	193	1,267	4,579
Convulsions and epilepsy	1,471	835	2,305	116	34	149	2,454
Ear, nose and throat infections	1,440	1,065	2,505	886	155	1,041	3,546
Dental conditions	663	796	1,459	2,536	651	3,186	4,645
Perforated/bleeding ulcer	253	101	354	91	14	105	459
Appendicitis (with generalised peritonitis)	137	61	198	44	9	53	250
Cellulitis	1,180	787	1,966	492	68	559	2,525
Pyelonephritis (includes urinary tract infections)	1,994	850	2,844	564	77	641	3,485
Pelvic inflammatory disease	135	79	214	133	32	165	378
Gangrene	253	88	341	60	10	70	410
Total avoidable hospitalisations	24,066	14,836	38,901	11,444	2,368	13,811	52,712
Per cent of Public acute/ Private	61.9	38.1	100.0	82.9	17.1	100.0	..
Per cent of Public acute and Private	45.7	28.1	73.8	21.7	4.5	26.2	100.0

¹ Admissions resulting from ACS conditions

² Total of public acute and private hospital figures

3.3 Potentially avoidable hospitalisations: time trend

Potentially avoidable hospitalisations: time trend

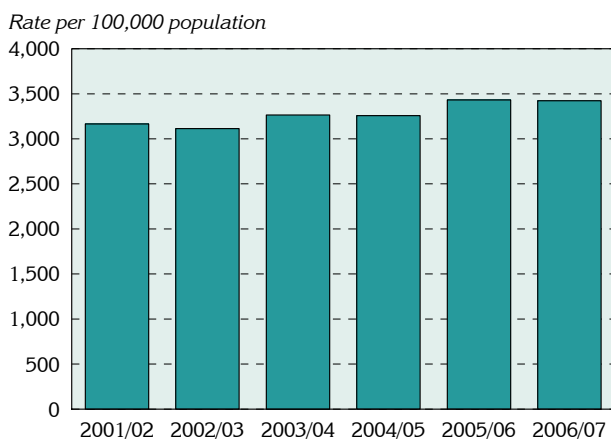
Over the five years from 2001/02, potentially avoidable hospitalisations have increased by 12.4% (an average of 2.5% per annum), or 5,974 admissions. Taking into account population growth over this period, admissions for these avoidable conditions have increased by a lower 8.2%, an average of 1.6% each year (Table 3.3). As can be seen in the table, and from Figure 3.2, the overall increase in rates has not been uniform over the years, alternating between decreases (albeit marginal in later years) and increases.

Table 3.3: Time trend of potentially avoidable hospitalisations¹, South Australia, 2001/02 to 2006/07

Period	Number	Rate per 100,000	Increase (%)
2001/02	47,992	3,164.8	..
2002/03	47,536	3,114.7	-1.6
2003/04	50,144	3,264.9	4.8
2004/05	50,378	3,257.6	-0.2
2005/06	53,541	3,431.3	5.3
2006/07	53,966	3,423.5	-0.2

¹ Admissions resulting from ACS conditions

Figure 3.2: Time trend of potentially avoidable hospitalisations¹, South Australia, 2001/02 to 2006/07



¹ Admissions resulting from ACS conditions

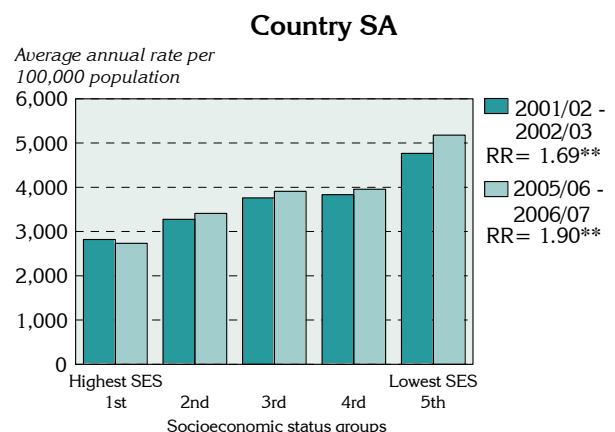
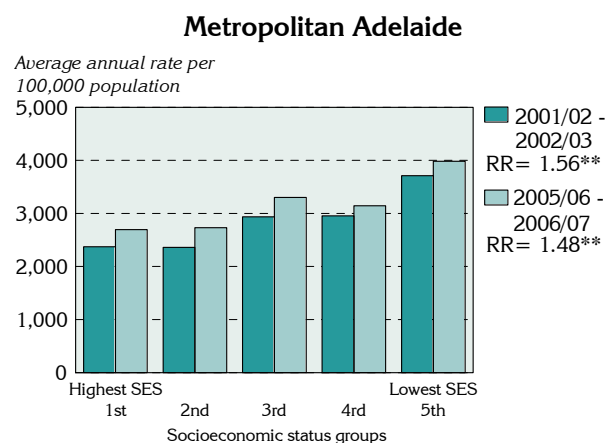
Potentially avoidable hospitalisations: time trend by socioeconomic status

Socioeconomic status (SES) is based on the Index of Relative Socio-economic Disadvantage (IRSD): the calculation of rates by groupings of areas (quintiles) and details of the IRSD are provided in Chapter 2, Methods.

For people living in Metropolitan Adelaide there is little change, between the two periods shown, in either the socioeconomic gradient (the pattern shown by the bars, with an increase in the admission rate for each increase in SES) or in the differential in rates between the lowest SES and highest SES areas, as shown by the rate ratio (RR) (Figure 3.3). The overall higher rate of avoidable admissions in the latest period is marginally more evident in the highest SES areas, resulting in a narrowing of the differential between the lowest and highest SES areas, from 56% to 48%.

For people living in country South Australia, the differential in rates between the lowest SES and highest SES areas has increased, from 69% higher to 90% cent higher, or almost double (i.e., from a rate ratio of 1.69** to 1.90**).

Figure 3.3: Time trend of potentially avoidable hospitalisations¹ by quintile of socioeconomic status, South Australia, 2001/02 to 2006/07



¹ Admissions resulting from ACS conditions

3.4 Potentially avoidable hospitalisations by age and sex

Almost one third (31.0%) of admissions resulting from ambulatory care-sensitive (ACS) conditions occurred in the 75 years and over age group, with a further 22.1% occurring at ages 45 to 64 years (Table 3.4). These two age groups together accounted for an average of 28,527 avoidable hospitalisations, or over half (53.1%) of all avoidable hospitalisations. The 15 to 24 year age group had the lowest proportion (4.9%), with the next lowest proportion recorded for people aged 25 to 44 years (11.1%).

The 75 years and over age group also had the highest rate of avoidable hospitalisations, at 14,056.3 admissions per 100,000 population, almost twice that in the 65 to 74 year age group, with 7,166.9 admissions per 100,000 population. The highest annual rate among the remaining age groups was at ages 45 to 64 years.

Table 3.4: Potentially avoidable hospitalisations¹ by age and sex, South Australia, 2005/06 and 2006/07

Age (years)	Average number ²			% (persons)	Rate ³			Rate ratio M:F ⁴
	Males	Females	Persons		Males	Females	Persons	
0-14	4,657	3,507	8,164	15.2	3,170.1	2,496.2	2,840.6	1.27**
15-24	1,060	1,586	2,646	4.9	970.5	1,525.1	1,241.0	0.64**
25-44	2,643	3,349	5,992	11.1	1,232.1	1,581.3	1,405.6	0.78**
45-64	5,970	5,884	11,853	22.1	2,987.0	2,865.4	2,925.4	1.04*
65-74	4,594	3,834	8,427	15.7	8,158.0	6,256.2	7,166.9	1.30**
75+	7,571	9,102	16,673	31.0	15,910.8	12,813.9	14,056.3	1.24**
Total	26,494	27,260	53,754	100.0	3,421.3	3,433.9	3,427.7	1.00

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age-sex standardised rate per 100,000 population

⁴ Rate ratio (M:F) is the ratio of male to female hospitalisation rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01.

As noted, the overall hospitalisation rates for ACS conditions were similar for males and females, a rate ratio of 1.00. However, there were marked variations between the age groups (Table 3.4 and Figure 3.4). For males in the 0 to 14 year age group, the annual rate of admissions was 27.0% higher than for females of the same age (a rate ratio of 1.27**). Similarly, males in the 65 to 74 and 75 years and over age groups had, respectively, 30.0% and 24.0% more avoidable hospitalisations annually compared to females at these ages.

Avoidable hospitalisation rates for males were lower than for females in the 15 to 24 (36.0% lower, a rate ratio of 0.64**), and 25 to 44 (22.0% lower, a rate ratio of 0.78**) year age groups.

Figure 3.4: Potentially avoidable hospitalisations¹ by age and sex, South Australia, 2005/06 and 2006/07



¹ Admissions resulting from ACS conditions

3.5 Potentially avoidable hospitalisations by condition

Table 3.5 shows the number, rate, and proportion of avoidable hospitalisations by individual condition, within the three sub-categories of vaccine-preventable, chronic, and acute.

Over half (55.8%) of hospital admissions for ACS conditions were attributable to chronic conditions. The high proportion of admissions for chronic conditions in this period can be primarily attributed to the large number of hospitalisations for diabetes complications (accounting for 24.2% of all potentially avoidable hospitalisations). A number of respiratory and circulatory conditions contributed the next highest proportions in this (chronic) category: these were chronic obstructive pulmonary disease (10.3%) and asthma (7.2%), and congestive cardiac failure (7.1%) and angina (5.6%).

Dental conditions (8.7%); dehydration and gastroenteritis (8.7%); ear, nose and throat infections (6.7%); and pyelonephritis (includes urinary tract infections) (6.6%) made the greatest contribution to these admissions for conditions categorised as acute.

Influenza and pneumonia (1.5%) was the main cause for the small number of admissions for conditions categorised as vaccine-preventable.

Table 3.5: Potentially avoidable hospitalisations¹ by sub-category and condition, South Australia, 2005/06 and 2006/07

Sub-category and condition	Average number ²	Rate ³	% of total ⁴
Vaccine-preventable	1,005	64.1	1.9
Influenza and pneumonia	792	50.5	1.5
Other vaccine preventable	215	13.7	0.4
Chronic	29,968	1,911.0	55.8
Iron deficiency anaemia	2,076	132.3	3.9
Diabetes complications	13,016	830.0	24.2
Nutritional deficiencies	6	0.4	0.0
Rheumatic heart disease	202	12.9	0.4
Hypertension	535	34.1	1.0
Congestive cardiac failure	3,836	244.6	7.1
Angina	3,014	192.2	5.6
Chronic obstructive pulmonary disease	5,553	354.1	10.3
Asthma	3,865	246.5	7.2
Acute	23,059	1,470.4	42.9
Dehydration and gastroenteritis	4,666	297.5	8.7
Convulsions and epilepsy	2,497	159.2	4.6
Ear, nose and throat infections	3,591	229.0	6.7
Dental conditions	4,703	299.9	8.7
Perforated/bleeding ulcer	467	29.8	0.9
Appendicitis (with generalised peritonitis)	254	16.2	0.5
Cellulitis	2,571	163.9	4.8
Pyelonephritis (includes urinary tract infections)	3,527	224.9	6.6
Pelvic inflammatory disease	382	24.3	0.7
Gangrene	417	26.6	0.8
Total avoidable hospitalisations	53,754	3,427.7	100.0

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

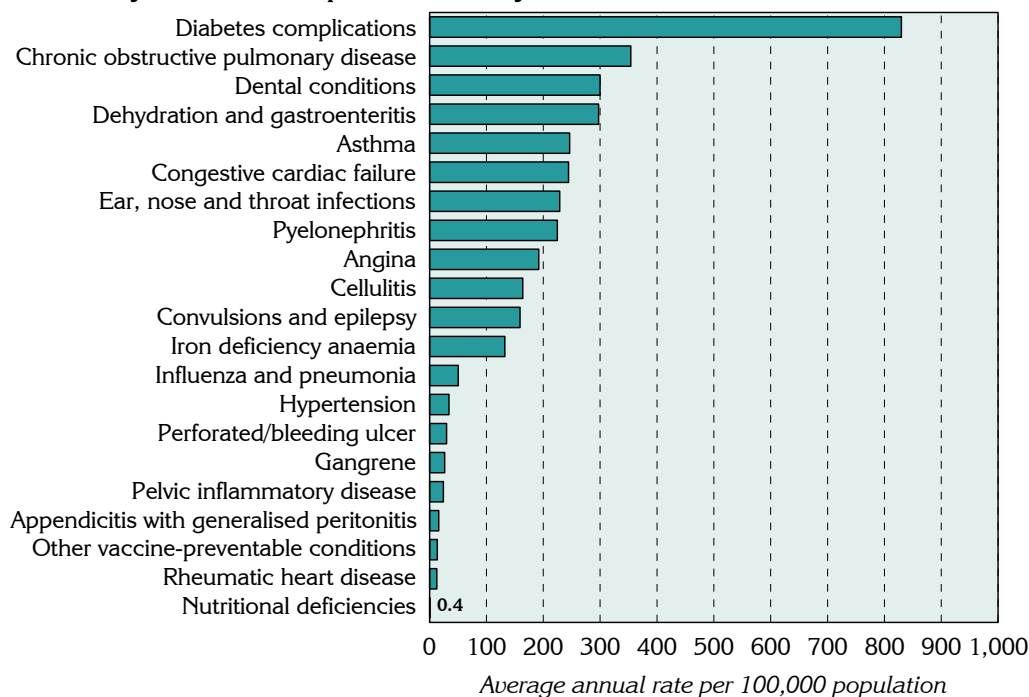
³ Rate is the age standardised rate per 100,000 population

⁴ Proportion of all avoidable hospitalisations

The conditions with the highest admission rates (Figure 3.5 and Table 3.6) were diabetes complications, chronic obstructive pulmonary disease, dental conditions, dehydration and gastroenteritis, asthma, and congestive heart failure.

Together, these six conditions comprised over two thirds (67.6%) of all avoidable hospital admissions over the years 2005/06 and 2006/07.

Figure 3.5: Potentially avoidable hospitalisations¹ by condition, South Australia, 2005/06 and 2006/07



¹ Admissions resulting from ACS conditions

Diabetes complications were the leading cause of avoidable hospitalisations, with a rate of 830.0 admissions per 100,000 population (Table 3.6). Chronic obstructive pulmonary disease, with a rate of 354.1, was ranked next, followed by dental conditions, with a rate of 299.9.

The rates for the other causes of avoidable hospitalisations ranged from 297.5 admissions per 100,000 population for dehydration and gastroenteritis (8.7% of total avoidable hospitalisations) to 0.4 admissions per 100,000 population for nutritional deficiencies.

Table 3.6: Potentially avoidable hospitalisations¹ by condition rank, South Australia, 2005/06 and 2006/07

Conditions	Average number ²	Rate ³	% of total ⁴
Diabetes complications	13,016	830.0	24.2
Chronic obstructive pulmonary disease	5,553	354.1	10.3
Dental conditions	4,703	299.9	8.7
Dehydration and gastroenteritis	4,666	297.5	8.7
Asthma	3,865	246.5	7.2
Congestive cardiac failure	3,836	244.6	7.1
Ear, nose and throat infections	3,591	229.0	6.7
Pyelonephritis (includes urinary tract infections)	3,527	224.9	6.6
Angina	3,014	192.2	5.6
Cellulitis	2,571	163.9	4.8
Convulsions and epilepsy	2,497	159.2	4.6
Iron deficiency anaemia	2,076	132.3	3.9
Influenza and pneumonia	792	50.5	1.5
Hypertension	535	34.1	1.0
Perforated/bleeding ulcer	467	29.8	0.9
Gangrene	417	26.6	0.8
Pelvic inflammatory disease	382	24.3	0.7
Appendicitis with generalised peritonitis	254	16.2	0.5
Other vaccine-preventable conditions	215	13.7	0.4
Rheumatic heart disease	202	12.9	0.4
Nutritional deficiencies	6	0.4	0.0

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ Proportion of all avoidable hospitalisations

Potentially avoidable hospitalisations by condition and age

Table 3.7 shows variations in admissions for ASC conditions by age group. Some notable features are admissions for diabetes complications, which ranked sixth in the 15 to 24 year age group, and increased in impact to be the largest contributor to these avoidable hospitalisations in the 45 to 64 year and older age groups. Admissions for dehydration and gastroenteritis were also important, for the 15 to 24 through to the 45 to 64 year age groups.

In the 0 to 14 year age group, infections of the ear, nose, and throat were the most common cause of avoidable hospitalisation, with a rate of 792.1 admissions per 100,000 population. The next highest causes of avoidable hospitalisation were asthma (783.8 admissions per 100,000 population), dental conditions (646.7 admissions per 100,000 population), and convulsions and epilepsy (247.8 admissions per 100,000 population).

Dehydration and gastroenteritis accounted for 16.0% of avoidable hospitalisations, a rate of 198.2 admissions per 100,000 population, in the 15 to 24 year age group. Ear, nose and throat infections, and convulsions and epilepsy, were the conditions with the next highest admission rates, with 187.4 and 141.4 admissions per 100,000 population, respectively.

In the 25 to 44 year age group, dehydration and gastroenteritis was the leading cause of avoidable hospitalisation, with a rate of 240.5 per 100,000 population. Over half (51.2%) of all avoidable hospitalisations in this age group were attributable to the top four causes: 17.1% of admissions were from dehydration and gastroenteritis, 12.2% from diabetes complications, 13.0% from dental conditions and 9.7%, from convulsions and epilepsy.

At ages 45 to 64 years, over one-quarter (28.2%) of avoidable hospitalisations were attributable to diabetes complications, a rate of 823.8 admissions per 100,000 population. With a much lower rate and percentage, dehydration and gastroenteritis ranked second, with 315.2 admissions per 100,000 population aged 45 to 64 years, and accounting for 10.8% of avoidable hospitalisations. Chronic obstructive pulmonary disease accounted for 10.6% of admissions for this age group (a rate of 309.5 per 100,000 population), while dental conditions contributed to 10.4% of admissions, or 303.6 admissions per 100,000 population aged 45 to 64 years.

Diabetes complications and chronic obstructive pulmonary disease were also important causes of avoidable hospital admissions in the 65 to 74 year age group. Diabetes complications accounted for over one third (38.9%) of avoidable hospitalisations (a rate of 2,876.1 admissions per 100,000 population), and chronic obstructive pulmonary disease for 16.7% (1,195.8 per 100,000 population).

The highest admission rates for these conditions in any of the age groups were at ages 75 years and over, ranging from 1,210.2 admissions per 100,000 for angina, to 4,334.2 admissions per 100,000 for diabetes complications. The top two causes accounted for almost half all avoidable hospitalisations for this age group; they were diabetes complications (30.8% of admissions), and congestive cardiac failure (16.3%).

Table 3.7: Potentially avoidable hospitalisations¹ by selected condition and age, South Australia, 2005/06 and 2006/07

Age (years)	Condition	Average number ²	Rate ³	Per cent ⁴
0-14	Ear, nose and throat infections	2,277	792.1	27.9
	Asthma	2,253	783.8	27.6
	Dental conditions	1,859	646.7	22.8
	Convulsions and epilepsy	712	247.8	8.7
	Other	1,073	373.2	13.1
	Total		8,164	2,840.6	100.0
15-24	Dehydration and gastroenteritis	423	198.2	16.0
	Ear, nose and throat infections	400	187.4	15.1
	Convulsions and epilepsy	302	141.4	11.4
	Asthma	290	136.0	11.0
	Pyelonephritis (includes urinary tract infections)	287	134.4	10.8
	Diabetes complications	281	131.8	10.6
	Other	670	314.1	25.3
Total		2,646	1,241.0	100.0
25-44	Dehydration and gastroenteritis	1,025	240.5	17.1
	Diabetes complications	731	171.4	12.2
	Dental conditions	779	182.7	13.0
	Convulsions and epilepsy	580	135.9	9.7
	Other	2,923	685.7	48.8
Total		5,992	1,405.6	100.0
45-64	Diabetes complications	3,338	823.8	28.2
	Dehydration and gastroenteritis	1,277	315.2	10.8
	Chronic obstructive pulmonary disease	1,254	309.5	10.6
	Dental conditions	1,230	303.6	10.4
	Other	5,273	1,301.4	44.5
Total		11,853	2,925.4	100.0
65-74	Diabetes complications	3,276	2,876.1	38.9
	Chronic obstructive pulmonary disease	1,406	1,195.8	16.7
	Congestive cardiac failure	645	548.1	7.6
	Angina	631	536.2	7.5
	Dehydration and gastroenteritis	627	533.2	7.4
	Other	2,406	2,045.8	28.5
Total		8,427	7,166.9	100.0
75+	Diabetes complications	5,141	4,334.2	30.8
	Congestive cardiac failure	2,719	2,291.8	16.3
	Chronic obstructive pulmonary disease	2,700	2,276.3	16.2
	Pyelonephritis (includes urinary tract infections)	1,485	1,251.9	8.9
	Angina	1,436	1,210.2	8.6
	Other	4,480	3,776.5	26.9
	Total		16,673	14,056.3

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ Per cent is the proportion of total ACS conditions within the relevant age group

Avoidable hospitalisations by condition, age and sex

In addition to the variations in condition by age, described above, there were also notable variations when further analysed by sex within these age groups (Table 3.8). This is evident in the rankings for avoidable hospitalisations for males and females, in all age groups apart from the 65 to 74 and (to a lesser extent) 75 years and over age groups.

In the 0 to 14 year age group, males had a 27% higher avoidable hospitalisation rate than females (a rate ratio of 1.27^{**}): this was the largest (positive) differential in rates for males in any of the age groups reported here. Asthma was the reported principal diagnosis for 31.7% of avoidable hospitalisations for males, compared with 22.1% for females: the male rate is 83.0% higher than that for females (a rate ratio of 1.83^{**}). Ear, nose, and throat infections were responsible for similar proportions of avoidable hospitalisations for males

and for females. Again, males had a higher admission rate for this condition (24% higher, a rate ratio of 1.24**).

Dental conditions accounted for 21.3% of admissions for males and 24.7% for females in this age group. The conditions of convulsions and epilepsy were the fourth ranked cause of avoidable hospitalisation for both males and females aged 0 to 14 years, with admission rates of 265.8 and 228.8, respectively.

In the 15 to 24 year age group, males had a 36% lower overall admission rate than females (a rate ratio of 0.64**), compared with the higher rate for males in the younger age group. Dehydration and gastroenteritis was responsible for most male avoidable hospitalisations (16.1%) and second highest for females (15.9%). The male rate for dehydration and gastroenteritis was also 36% lower than that for females. For males, the conditions with the next highest rates of avoidable hospital admissions were ear, nose and throat infections, convulsions and epilepsy, and diabetes complications, contributing 15.7%, 14.9% and 12.5% respectively, to total hospitalisations for males in this age group. For females, admissions for pyelonephritis ranked highest in this age group, at a rate of 257.8 admissions per 100,000 females: this rate was 15 times, or 93.0% higher than the male rate of admission for this condition, of 16.9 admissions per 100,000 males.

Males also had a lower rate of avoidable hospitalisations than females at ages 25 to 44 years (22% lower, a rate ratio of 0.78**). Diabetes complications accounted for 15.2% of male avoidable hospitalisations, a rate of 186.9 admissions per 100,000 males, with dehydration and gastroenteritis ranked second, accounting for 15.9% of male admissions. Admissions from dehydration and gastroenteritis ranked highest for females in this age group, and were responsible for 18.1% of avoidable hospitalisations for females, a rate of 286.2 admissions per 100,000 females. Dental conditions ranked second, contributing to 11.8% of female hospitalisations in this age group, followed by diabetes complications (9.9%), with a rate of 155.8 admissions per 100,000 females.

While there was relatively little difference in admission rates for males and females in the 45 to 64 year age group (with male rates four per cent above those for females), the same was not the case for individual conditions. For example, diabetes complications (ranked highest for both males and females) had a substantially higher rate for males than for females (a rate ratio of 1.87**); and angina, while having much lower rates, had a differential of 1.69**. Chronic obstructive pulmonary disease, dental conditions, dehydration and gastroenteritis and angina had similar rates of

admissions for males. Females in this age group had a higher rate of admissions for these conditions, with the exception of angina.

Rates of admission in the 65 to 74 year age group varied, with male rates higher overall by 30% (a rate ratio of 1.30**). The two top ACS conditions were the same for males and females: diabetes complications (42.5% of male admissions and 34.5% for females) and chronic obstructive pulmonary disease (16.9% and 16.4%). However, male rates were around one third higher than females rates for these conditions. The rates of avoidable hospitalisations for angina and congestive cardiac failure were also higher for males than for females, with rate ratios of 1.88** and 1.58**, respectively.

As for the previous age group, diabetes complications were the main contributor to avoidable hospitalisations at ages 75 years and over, with rates at 5,382.1 admissions per 100,000 males and 3,632.2 admissions per 100,000 females. Overall, males at these ages had 24% more avoidable hospitalisations than females in this age group (a rate ratio of 1.24**). Almost one fifth (19.6%) of male admissions in this age group were due to chronic obstructive pulmonary disease, with a further 16.7% of admissions attributable to congestive cardiac failure. The admission rate for males with chronic obstructive pulmonary disease was 83.0% higher than the female rate (a rate ratio of 1.83**), the largest rate differential in this age group.

Table 3.8: Potentially avoidable hospitalisations¹ by selected condition, age and sex, South Australia, 2005/06 and 2006/07

Age (years)	Selected condition	Males				Females				RR-M:F ⁶
		Average no. ²	Rate ³	% ⁴	Rank ⁵	Average no. ²	Rate ³	% ⁴	Rank ⁵	
0-14	Asthma	1,478	1,006.2	31.7	1	775	551.3	22.1	3	1.83**
	Ear, nose and throat infections	1,286	875.5	27.6	2	991	705.0	28.2	1	1.24**
	Dental conditions	993	675.7	21.3	3	866	616.4	24.7	2	1.10*
	Convulsions and epilepsy	391	265.8	8.4	4	322	228.8	9.2	4	1.16*
	Other	516	351.3	11.1	..	557	396.1	15.9	..	0.89*
	Total		4,657	3,170.1	100.0	..	3,507	2,496.2	100.0	..
15-24	Dehydration and gastroenteritis	171	156.1	16.1	1	252	242.4	15.9	2	0.64**
	Ear, nose and throat infections	167	152.4	15.7	2	233	224.1	14.7	3	0.68**
	Convulsions and epilepsy	158	144.2	14.9	3	144	138.5	9.1	6	1.04
	Diabetes complications	133	121.8	12.5	4	148	142.4	9.3	5	0.86
	Pyelonephritis ⁷	19	16.9	1.7	10	268	257.8	16.9	1	0.07**
	Other	434	397.4	40.9	..	544	523.3	34.3	..	0.76**
Total		1,060	970.5	100.0	..	1,586	1,525.1	100.0	..	0.64**
25-44	Diabetes complications	401	186.9	15.2	1	330	155.8	9.9	3	1.20**
	Dehydration and gastroenteritis	419	195.3	15.9	2	606	286.2	18.1	1	0.68**
	Dental conditions	383	178.3	14.5	3	397	187.2	11.8	2	0.95
	Convulsions and epilepsy	340	158.5	12.9	4	240	113.1	7.2	6	1.40**
	Pyelonephritis ⁷	85	39.4	3.2	9	332	156.8	9.9	5	0.25**
	Other	1,039	484.1	39.3	..	1,468	693.3	43.8	..	0.70**
Total		2,643	1,232.1	100.0	..	3,349	1,581.3	100.0	..	0.78**
45-64	Diabetes complications	2,154	1,077.8	36.1	1	1,184	576.6	20.1	1	1.87**
	Chronic obstructive pulmonary disease	533	266.5	8.9	2	722	351.4	12.3	3	0.76**
	Dental conditions	524	261.9	8.8	3	707	344.1	12.0	4	0.76**
	Dehydration and gastroenteritis	503	251.4	8.4	4	775	377.2	13.2	2	0.67**
	Angina	502	251.2	8.4	5	306	148.8	5.2	8	1.69**
	Other	2,076	1,038.5	34.8	..	2,390	1,164.0	40.6	..	0.89**
Total		5,970	2,987.0	100.0	..	5,884	2,865.4	100.0	..	1.04*
65-74	Diabetes complications	1,952	3,466.7	42.5	1	1,324	2,160.8	34.5	1	1.60**
	Chronic obstructive pulmonary disease	776	1,377.3	16.9	2	631	1,029.0	16.4	2	1.34**
	Angina	399	708.6	8.7	3	232	377.8	6.0	6	1.88**
	Congestive cardiac failure	382	677.5	8.3	4	263	429.2	6.9	4	1.58**
	Dehydration and gastroenteritis	275	488.4	6.0	5	352	574.5	9.2	3	0.85**
	Other	1,155	2,050.4	25.1	..	1,251	2,041.6	32.6	..	1.00
Total		4,594	8,158.0	100.0	..	3,834	6,256.2	100.0	..	1.30**
75+	Diabetes complications	2,561	5,382.1	33.8	1	2,580	3,632.2	28.3	1	1.48**
	Chronic obstructive pulmonary disease	1,486	3,122.9	19.6	2	1,214	1,709.1	13.3	3	1.83**
	Congestive cardiac failure	1,267	2,662.7	16.7	3	1,452	2,043.4	15.9	2	1.30**
	Angina	677	1,421.7	8.9	4	759	1,068.5	8.3	6	1.33**
	Pyelonephritis ⁷	476	1,000.3	6.3	5	1,009	1,420.5	11.1	4	0.70**
	Dehydration and gastroenteritis	471	989.8	6.2	6	779	1,096.0	8.6	5	0.90
Other	1,277	2,683.7	16.9	..	1,953	2,749.5	21.5	..	0.98	
Total		7,571	15,910.8	100.0	..	9,102	12,813.9	100.0	..	1.24**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age-sex standardised rate per 100,000 population

⁴ Per cent is the proportion of total ACS conditions within the relevant age-sex group

⁵ Rank is the rank order of the rates for the top four causes of avoidable hospitalisations for males and females: note that in some cases the rank order differs between males and females, resulting in the inclusion of more than four causes

⁶ RR-M:F is the ratio of male to female hospitalisation rates; rate ratios differing significantly from 1.0 are shown with

* p < 0.05; ** p < 0.01

⁷ Includes urinary tract infections

3.6 Potentially avoidable hospitalisations by Health Region

Rates of admission for ambulatory care-sensitive conditions (Table 3.9 and Figure 3.6), were highest in the Mid North (a rate of 5,400.7 per 100,000 population) and Northern & Far Western (5,454.0 admissions per 100,000 population) Regions.

The lowest regional rates of avoidable hospitalisations occurred in Central Northern Adelaide (3,103.3 per 100,000 population) and Hills Mallee Southern (3,198.2 admissions per 100,000 population). The remaining admission rates at the Health Region level ranged from 3,296.8 per 100,000 population in Southern Adelaide, to 4,018.8 per 100,000 population in Riverland.

The Mid North (14.0%), Northern & Far Western (13.3%), Eyre (11.9%) and Riverland (11.8%) Health Regions had the highest proportions of avoidable hospital admissions, compared to the State average of 10.6% (Table 3.9).

Apart from Central Northern Adelaide Health Region with 9.4% avoidable hospitalisations, the Health Regions all had proportions consistent with, or higher than, the State average proportion of 10.2%.

Table 3.9: Potentially avoidable hospitalisations¹ by Health Region, South Australia, 2005/06 and 2006/07

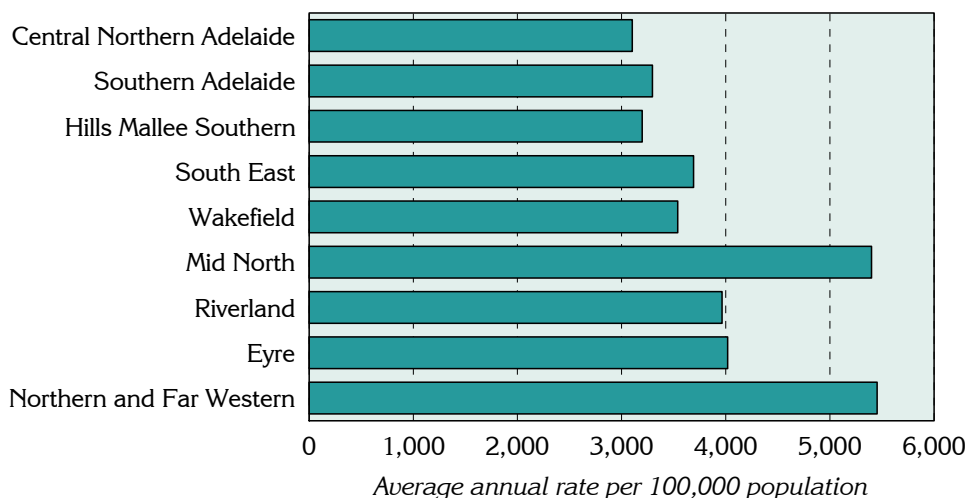
Health Region	Avoidable hospitalisations ¹		Total hospitalisations		% Avoidable (of Total)
	Average number ²	Rate ³	Average number ²	Rate ³	
Central Northern Adelaide	24,363	3,103.3	258,904	32,776.9	9.4
Southern Adelaide	11,146	3,296.8	118,326	35,106.2	9.4
Hills Mallee Southern	4,086	3,198.2	38,741	30,737.6	10.5
South East	2,292	3,690.9	21,040	33,831.2	10.9
Wakefield	3,838	3,539.4	35,620	33,369.6	10.8
Mid North	1,859	5,400.7	13,277	40,054.0	14.0
Riverland	1,350	3,964.3	11,416	34,060.0	11.8
Eyre	1,377	4,018.8	11,579	34,036.6	11.9
Northern and Far Western	2,401	5,454.0	17,986	39,438.5	13.3
Not SA resident	1,042	..	..	..	..
South Australia	53,754	3,427.7	526,887	33,598.1	10.2

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

Figure 3.6: Potentially avoidable hospitalisations¹ by Health Region, South Australia, 2005/06 and 2006/07



¹ Admissions resulting from ACS conditions

Potentially avoidable hospitalisations by Health Region and condition

Table 3.10 shows rates of avoidable hospitalisations by sub-category and individual condition for each of the South Australian Health Regions: Table 3.11 shows the differentials in these regional rates from the State rates. The Mid North and Northern & Far Western Health Regions had the largest differentials from the State rate for total avoidable hospitalisations, for chronic conditions overall, and for a number of the most prevalent chronic conditions (Table 3.11).

The highest rates of hospital admissions for these ACS conditions in the Health Regions were attributable to chronic conditions, with diabetes complications consistently having the highest rate among this group. The second highest rate across all Regions was for chronic obstructive pulmonary disease. In the Central Northern Adelaide, Southern Adelaide, Eyre, and Northern & Far Western Health Regions, it was the second highest rate of any cause of avoidable hospitalisations – vaccine preventable, chronic, or acute.

Although having the smallest numbers, vaccine preventable diseases show notable variation from the State rate in Eyre (total vaccine preventable diseases and influenza and pneumonia, elevated by 1.95** and 2.10**, respectively) (Table 3.11).

Admission rates for chronic conditions in the Mid North Health Region were 62% above the State rate (a rate ratio of 1.62**), with admissions for hypertension and asthma substantially higher, being respectively over five times (5.06**) and almost double (1.97**) the State rate. Rates for a number of other causes were elevated by 50% or more above the State rate. Northern & Far Western had a similarly high overall rate of avoidable hospitalisations for chronic conditions, with a rate ratio of 1.61**. Hypertension (over three times the State rate) and chronic obstructive pulmonary disease (over double) had the highest rates for individual chronic conditions in this Region. In Eyre Region, hypertension and congestive cardiac failure had the most highly elevated rates, being, respectively, over four times (4.43**) and over one and a half times (1.57**) the State rate. Residents of Riverland Health Region also had an admission rate for hypertension that was more than twice the State rate (a rate ratio of 2.33**). The Hills Mallee Southern, South East and Wakefield Health Regions all had elevated rates for hypertension.

In the metropolitan region, the highest rate (when compared with the State rate) was in Southern Adelaide, for admissions for iron deficiency anaemia, a rate ratio of 1.65**.

Overall rates for acute conditions were most highly elevated in the Northern & Far Western and Mid North Health Regions, above the State rate by 60% (a rate ratio of 1.60**) and 55% (a rate ratio of 1.55**), respectively. In Mid North, ear, nose and throat infections; dehydration and gastroenteritis; cellulitis and appendicitis were the conditions with the most highly elevated rates. While many of these conditions were also highly prevalent in Northern & Far Western, the greatest differential with the State rate was for pelvic inflammatory disease (2.08**), although there were few admissions. Of the other country regions, the most highly elevated rates were in South East, for convulsions and epilepsy (1.80**); and, in Riverland, for dental conditions (1.50**).

Dehydration and gastroenteritis was the leading cause of admission for acute conditions in Southern Adelaide, Hills Mallee Southern, South East, Wakefield, Mid North, and Eyre Health Region. In the Central Northern Adelaide, Riverland, and Northern & Far Western Health Regions, dental conditions was ranked highest.

Potentially avoidable hospitalisations by metropolitan sub-region/District and condition

The Northern sub-region had the highest rates for admissions for vaccine-preventable conditions and acute conditions overall; the Outer Southern District had the highest admission rate for chronic conditions and total avoidable conditions (rates in Table 3.12 and rate ratios in Table 3.13). The majority of rates 25% or more above the Metropolitan Adelaide rate were in these two areas.

The Outer Southern District also had the highest rates of admissions from the chronic conditions of iron deficiency anaemia, chronic obstructive pulmonary disease, congestive cardiac failure, diabetes and hypertension. Asthma admission rates were highest in the Outer Southern District and the Northern sub-region, and the Northern sub-region had the highest admission rate for angina. Rates for rheumatic heart disease in Western sub-region and iron deficiency anaemia in Urban Beaches District were also highly elevated.

For acute conditions, the Hills District had the highest admission rates from dental conditions (1.41** times the rate for Metropolitan Adelaide), gangrene and appendicitis. Dental conditions were also notably higher in Central East sub-region than in the metropolitan area as a whole (a rate ratio of 1.25**). The Outer Southern District had the highest rates for dehydration and gastroenteritis, cellulitis and pelvic inflammatory disease – and the lowest for dental conditions, 40% below the Metropolitan Adelaide rate).

Table 3.10: Potentially avoidable hospitalisations¹ by sub-category/condition and Health Region, South Australia, 2005/06 and 2006/07
Age standardised rate per 100,000 population

Sub-category/condition	Central Nthn Adelaide	Southern Adelaide	Hills Mallee Sthn	South East	Wakefield	Mid North	Riverland	Eyre	Northern & Far Western	South Australia
Vaccine-preventable	61.2	52.8	73.7	38.2	70.1	61.0	45.7	125.0	79.8	64.1
Influenza and pneumonia	46.9	43.3	57.4	33.6	61.5	33.8	36.7	106.2	65.5	50.5
Other vaccine-preventable diseases	14.5	9.7	16.7	4.7	8.9	28.1	9.0	18.8	14.5	13.7
Chronic	1,715.9	1,858.2	1,779.1	2,051.5	1,954.1	3,088.1	2,128.8	2,218.9	3,068.3	1,911.0
Iron deficiency anaemia	111.2	219.0	104.2	121.5	116.2	64.5	75.4	38.9	122.0	132.3
Diabetes complications	750.5	748.6	714.6	898.2	836.4	1,389.7	941.2	973.5	1,458.7	830.0
Nutritional deficiencies	#	#	#	#	#	#	#	#	#	0.4
Rheumatic heart disease	10.7	8.9	6.9	11.4	6.4	12.9	7.4	8.9	8.1	12.9
Hypertension	16.9	21.4	43.5	45.9	51.6	172.5	79.6	150.9	104.2	34.1
Congestive cardiac failure	216.9	238.1	241.7	302.0	273.1	359.6	277.5	383.0	370.4	244.6
Angina	185.2	144.5	210.9	260.2	238.6	287.6	225.6	210.4	226.5	192.2
Chronic obstructive pulmonary disease	332.0	354.2	304.2	337.6	318.0	543.3	381.5	384.8	757.1	354.1
Asthma	227.0	234.9	265.1	223.2	266.3	485.5	284.7	240.2	296.2	246.5
Acute	1,342.6	1,398.4	1,357.9	1,621.5	1,532.0	2,275.6	1,818.2	1,702.8	2,348.9	1,470.4
Dehydration and gastroenteritis	237.0	284.5	318.3	534.8	356.3	553.8	366.5	333.3	497.0	297.5
Convulsions and epilepsy	147.7	125.0	157.0	135.4	180.0	220.5	199.9	238.3	353.0	159.2
Ear, nose and throat infections	201.8	226.9	220.9	208.8	235.8	438.3	288.3	330.3	347.9	229.0
Dental conditions	292.3	278.5	253.6	254.2	291.0	361.4	449.2	286.8	497.8	299.9
Perforated/bleeding ulcer	32.2	26.7	22.3	26.2	32.4	29.4	26.6	18.1	23.1	29.8
Appendicitis	14.9	18.7	19.8	16.1	9.9	25.3	16.2	10.0	14.7	16.2
Cellulitis	142.0	163.0	145.0	209.2	191.8	294.5	196.4	199.1	231.3	163.9
Pyelonephritis (includes urinary tract infections)	227.9	218.5	187.1	193.5	202.0	311.0	216.1	225.7	271.6	224.9
Pelvic inflammatory disease	22.0	26.2	18.1	27.7	21.5	28.6	28.5	28.6	50.5	24.3
Gangrene	26.5	30.5	17.5	33.4	12.8	18.5	26.7	27.1	40.9	26.6
Total avoidable admissions	3,103.3	3,296.8	3,198.2	3,690.9	3,539.4	5,400.7	3,964.3	4,018.8	5,454.0	3,427.7

¹ Admissions resulting from ACS conditions

Rate not shown or not calculated, as there are fewer than five admissions over the period shown

Table 3.11: Potentially avoidable hospitalisations¹ by sub-category/condition and Health Region, South Australia, 2005/06 and 2006/07
Ratio of rates in each Health Region to State rate (based on data in Table 3.10)

Health Region rate above State rate by ■ 50% or more ■ 25 to <50% ■ 10 to <25%

Sub-category/condition	Central Nthn Adelaide	Southern Adelaide	Hills Mallee Sthn	South East	Wakefield	Mid North	Riverland	Eyre	Northern & Far Western
Vaccine-preventable	0.95	0.82*	1.15	0.60**	1.09	0.95	0.71	1.95**	1.24
Influenza and pneumonia	0.93	0.86	1.14	0.67	1.22	0.67	0.73	2.10**	1.30
Other vaccine-preventable diseases	1.05	0.71	1.22	0.34	0.65	2.05	0.65	1.37	1.06
Chronic	0.90**	0.97*	0.93**	1.07*	1.02	1.62**	1.11*	1.16**	1.61**
Iron deficiency anaemia	0.84**	1.65**	0.79*	0.92	0.88	0.49**	0.57**	0.29**	0.92
Diabetes complications	0.90**	0.90**	0.86**	1.08	1.01	1.67**	1.13*	1.17*	1.76**
Rheumatic heart disease	0.83	0.69	0.53	0.88	0.50	1.00	0.57	0.69	0.63
Hypertension	0.50**	0.63**	1.28	1.35	1.51*	5.06**	2.33**	4.43**	3.06**
Congestive cardiac failure	0.89**	0.97	0.99	1.23*	1.12	1.47**	1.13	1.57**	1.51**
Angina	0.96	0.75**	1.10	1.35**	1.24**	1.50**	1.17	1.09	1.18
Chronic obstructive pulmonary disease	0.94*	1.00	0.86**	0.95	0.90	1.53**	1.08	1.09	2.14**
Asthma	0.92**	0.95	1.08	0.91	1.08	1.97**	1.15	0.97	1.20
Acute	0.91**	0.95**	0.92**	1.10**	1.04	1.55**	1.24**	1.16**	1.60**
Dehydration and gastroenteritis	0.80**	0.96	1.07	1.80**	1.20**	1.86**	1.23*	1.12	1.67**
Convulsions and epilepsy	0.93*	0.79**	0.99	0.85	1.13	1.38*	1.26	1.50**	2.22**
Ear, nose and throat infections	0.88**	0.99	0.96	0.91	1.03	1.91	1.26	1.44	1.52
Dental conditions	0.97	0.93*	0.85**	0.85*	0.97	1.21	1.50**	0.96	1.66**
Perforated/bleeding ulcer	1.08	0.90	0.75	0.88	1.09	0.99	0.89	0.61	0.77
Appendicitis	0.92	1.15	1.22	0.99	0.61	1.56	1.00	0.62	0.91
Cellulitis	0.87**	0.99	0.88	1.28*	1.17*	1.80**	1.20	1.21	1.41**
Pyelonephritis (includes urinary tract infections)	1.01	0.97	0.83*	0.86	0.90	1.38**	0.96	1.00	1.21
Pelvic inflammatory disease	0.91	1.08	0.74	1.14	0.88	1.18	1.17	1.18	2.08**
Gangrene	1.00	1.15	0.66	1.26	0.48**	0.70	1.00	1.02	1.54
Total avoidable admissions	0.91**	0.96**	0.93**	1.08**	1.03**	1.58**	1.16**	1.17**	1.59**

¹ Admissions resulting from ACS conditions

Table 3.12: Potentially avoidable hospitalisations¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2005/06 and 2006/07
Age standardised rate per 100,000 population

Sub-category/condition	Central Nthn Adelaide				Southern Adelaide			Metropolitan Adelaide	
	Northern sub-region	Western sub-region	Central East sub-region	Total	Urban Beaches District	Hills District	Outer Southern District		Total
Vaccine-preventable	67.1	54.8	59.4	61.2	52.2	49.8	55.8	52.8	58.7
Influenza and pneumonia	54.5	38.5	44.8	46.9	40.0	42.3	48.6	43.3	45.8
Other vaccine-preventable diseases	12.7	16.6	15.0	14.5	12.3	8.2	7.4	9.7	13.0
Chronic	2,112.5	1,635.6	1,311.9	1,715.9	1,804.5	1,310.2	2,336.7	1,858.2	1,759.0
Iron deficiency anaemia	129.7	96.5	102.8	111.2	212.2	169.4	265.6	219.0	143.9
Diabetes complications	873.6	770.9	583.1	750.5	729.0	528.6	939.7	748.6	749.9
Nutritional deficiencies	#	#	#	#	#	#	#	#	0.4
Rheumatic heart disease	12.1	13.8	6.0	10.7	9.4	10.6	7.0	8.9	10.2
Hypertension	17.9	18.2	14.6	16.9	20.3	21.7	22.8	21.4	18.3
Congestive cardiac failure	235.7	215.9	199.6	216.9	226.5	199.1	291.3	238.1	223.4
Angina	264.9	172.0	105.9	185.2	158.5	93.4	159.6	144.5	172.8
Chronic obstructive pulmonary disease	463.6	277.8	236.6	332.0	337.3	184.0	508.6	354.2	339.0
Asthma	278.9	209.5	155.7	227.0	228.8	169.0	282.6	234.9	229.4
Acute	1,441.9	1,200.1	1,335.7	1,342.6	1,409.5	1,416.7	1,371.6	1,398.4	1,359.3
Dehydration and gastroenteritis	243.5	233.6	231.7	237.0	289.7	243.7	306.0	284.5	251.2
Convulsions and epilepsy	176.1	126.8	124.2	147.7	140.4	96.6	125.2	125.0	141.0
Ear, nose and throat infections	230.0	150.8	200.9	201.8	227.7	226.2	226.5	226.9	209.2
Dental conditions	267.7	260.3	360.8	292.3	297.7	406.5	172.7	278.5	288.2
Perforated/bleeding ulcer	32.2	33.1	31.2	32.2	30.7	22.6	23.2	26.7	30.5
Appendicitis	13.3	16.2	16.3	14.9	17.0	20.4	19.4	18.7	16.1
Cellulitis	163.3	112.9	141.8	142.0	150.2	131.9	203.6	163.0	148.3
Pyelonephritis (includes urinary tract infections)	255.1	217.4	205.4	227.9	211.5	188.4	251.0	218.5	225.1
Pelvic inflammatory disease	24.6	22.6	17.5	22.0	23.8	20.7	32.6	26.2	23.2
Gangrene	40.6	22.6	13.7	26.5	23.3	56.3	22.8	30.5	27.7
Total avoidable admissions	3,586.6	2,879.6	2,689.6	3,103.3	3,252.1	2,774.3	3,726.5	3,296.8	3,161.6

¹ Admissions resulting from ACS conditions

Rate not shown or not calculated, as there are fewer than five admissions over the period shown

Table 3.13: Potentially avoidable hospitalisations¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2005/06 and 2006/07
Ratio of rates in each Sub-region/District to the rate in Metropolitan Adelaide (based on data in Table 3.12)

Sub-region rate above State rate by ■ 50% or more ■ 25 to <50% ■ 10 to <25%

Sub-category/condition	Central Nthn Adelaide				Southern Adelaide			Metropolitan Adelaide	
	Northern sub-region	Western sub-region	Central East sub-region	Total	Urban Beaches District	Hills District	Outer Southern District		
Vaccine-preventable	1.14	0.93	1.01	1.04	0.89	0.85	0.95	0.90	1.00
Influenza and pneumonia	1.19	0.84	0.98	1.02	0.87	0.92	1.06	0.95	1.00
Other vaccine-preventable diseases	0.98	1.28	1.15	1.12	0.95	0.63	0.57	0.75	1.00
Chronic	1.20**	0.93**	0.75**	0.98*	1.03	0.74**	1.33**	1.06**	1.00
Iron deficiency anaemia	0.90	0.67**	0.71**	0.77**	1.47**	1.18	1.85**	1.52**	1.00
Diabetes complications	1.16**	1.03**	0.78**	1.00	0.97**	0.70**	1.25**	1.00	1.00
Rheumatic heart disease	1.19	1.35	0.59	1.05	0.92	1.04	0.69	0.87	1.00
Hypertension	0.98	0.99	0.80	0.92	1.11	1.19	1.25	1.17	1.00
Congestive cardiac failure	1.06	0.97	0.89*	0.97	1.01	0.89	1.30**	1.07	1.00
Angina	1.53**	1.00	0.61**	1.07	0.92	0.54**	0.92	0.84**	1.00
Chronic obstructive pulmonary disease	1.37**	0.82**	0.70**	0.98	0.99	0.54**	1.50**	1.04	1.00
Asthma	1.22**	0.91	0.68**	0.99	1.00	0.74**	1.23**	1.02	1.00
Acute	1.06**	0.88**	0.98	0.99	1.04	1.04	1.01	1.03	1.00
Dehydration and gastroenteritis	0.97	0.93	0.92	0.94	1.15**	0.97	1.22**	1.13**	1.00
Convulsions and epilepsy	1.25	0.90	0.88	1.05**	1.00	0.69**	0.89	0.89*	1.00
Ear, nose and throat infections	1.10**	0.72**	0.96	0.96	1.09	1.08	1.08	1.08**	1.00
Dental conditions	0.93	0.90	1.25**	1.01	1.03	1.41**	0.60**	0.97	1.00
Perforated/bleeding ulcer	1.06	1.09	1.02	1.06	1.01	0.74	0.76	0.88	1.00
Appendicitis	0.83	1.01	1.01	0.93	1.06	1.27	1.20	1.16	1.00
Cellulitis	1.10	0.76**	0.96	0.96	1.01	0.89	1.37**	1.10	1.00
Pyelonephritis (includes urinary tract infections)	1.13*	0.97	0.91	1.01	0.94	0.84*	1.12	0.97	1.00
Pelvic inflammatory disease	1.06	0.97	0.75	0.95	1.03	0.89	1.41	1.13	1.00
Gangrene	1.47**	0.82	0.49**	0.96	0.84	2.03**	0.82	1.10	1.00
Total avoidable admissions	1.13**	0.91**	0.85**	0.98*	1.03	0.88**	1.18**	1.04**	1.00

¹ Admissions resulting from ACS conditions

3.7 Potentially avoidable hospitalisations by statistical local area

The following pages include maps for Metropolitan Adelaide and country South Australia of total avoidable hospitalisations and the top ten ambulatory care-sensitive conditions by Statistical Local Area. Each map also has an overlay, using a thicker line, to show the Health Regions, sub-regions and Districts in Metropolitan Adelaide; and Health Regions, in country South Australia. The map for country South Australia shows the data for Metropolitan Adelaide as a whole, rather than by SLA. Also included are:

- for the metropolitan regions, a table showing age standardised admission rates and standardised ratios for the metropolitan Health Regions and sub-regions/Districts;
- for country South Australia, a table showing age standardised admission rates and standardised ratios for the country Health Regions, Towns and Balance;
- a discussion of the mapped standardised ratios by Statistical Local Area; and
- a figure showing the standardised ratios by the ASGC remoteness classification⁷.

Attention is also drawn to variations that are consistent with the pattern of distribution of the State's population when described by socioeconomic status. To assist in this regard, maps of the Index of Relative Socio-economic Disadvantage (IRSD) at the 2006 Census are shown in Appendix 1.2. The patterns in these can be compared with the patterns for hospitalisations for the various potentially avoidable conditions mapped.

The results of a correlation analysis are presented in Section 3.8; these data provide further evidence of any association between rates of potentially avoidable hospitalisations and socioeconomic status, as measured by the IRSD.

A key to the areas mapped is included in Appendix 1.3.

⁷ See Chapter 2, *Methods*.

Potentially avoidable hospitalisations, metropolitan regions, South Australia, 2005/06 and 2006/07

Over the two years 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations of people living in Metropolitan Adelaide was 35,509 (Table 3.14). The standardised ratio (SR) of 92** indicates that there were eight per cent fewer potentially avoidable hospitalisations in Metropolitan Adelaide than expected from the State rate; rates in country South Australia were markedly higher (see over).

Table 3.14: Total potentially avoidable hospitalisations¹ by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	24,363	3,103.3	91**
Northern sub-region	11,240	3,586.6	105**
Western sub-region	6,621	2,879.6	84**
Central East sub-region	6,502	2,689.6	78**
Southern Adelaide	11,146	3,296.8	96**
Urban Beaches District	5,032	3,252.1	95**
Hills District	2,094	2,774.3	81**
Outer Southern District	4,020	3,726.5	109**
Adelaide (excl. Gawler)	35,509	3,161.6	92**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.1)

The distribution of potentially avoidable hospitalisations shows relatively little variation at the SLA level across much of Metropolitan Adelaide. However, the highest rates are in the three most disadvantaged metropolitan SLAs, of Playford - Elizabeth, Playford - West Central and Onkaparinga - Hackham. As a result of these rates, and elevated rates in other disadvantaged SLAs together with low rates in many high SES areas, the correlation analysis suggests a strong association between high rates of avoidable hospitalisations and socioeconomic disadvantage (a correlation coefficient of -0.58, Table 3.36).

The Central East (with an SR of 78**) and Western (SR of 84**) sub-regions, and the Hills District (SR of 78**), all had around twenty per cent fewer of these hospitalisations than were expected (Table 3.14). By contrast, the Outer Southern District and the Northern Sub-region had nine per cent and five per cent, respectively, more avoidable hospitalisations than expected.

Central Northern Adelaide

There were nine per cent fewer potentially avoidable hospitalisations in 2005/06 and 2006/07 in the Central Northern Adelaide Health Region than expected from the State rate (an SR of 91**).

Playford - Elizabeth had the most highly elevated ratio for potentially avoidable hospitalisations in the Region, 47% above the State rate (an SR of 147** and 1,327 admissions).

The neighbouring SLAs of Playford - West Central, with 516 admissions and an SR of 136**, Salisbury - Balance (351, 127**), and Salisbury - Inner North (809, 126**) also had more admissions than expected. Other SLAs in the region with large numbers of admissions were Tea Tree Gully - South (1,214 admissions, an SR of 102), West Torrens - West (1,165 admissions, an SR of 98), Port Adelaide Enfield - East (1,121 admissions, an SR of 102) and Salisbury - South East (1,113 admissions, an SR of 98*).

The SLAs of Burnside - North-East (510 admissions, SR of 61**), Charles Sturt - Coastal (743, 61**) and Prospect (442, 68**) had the lowest rates in the Region.

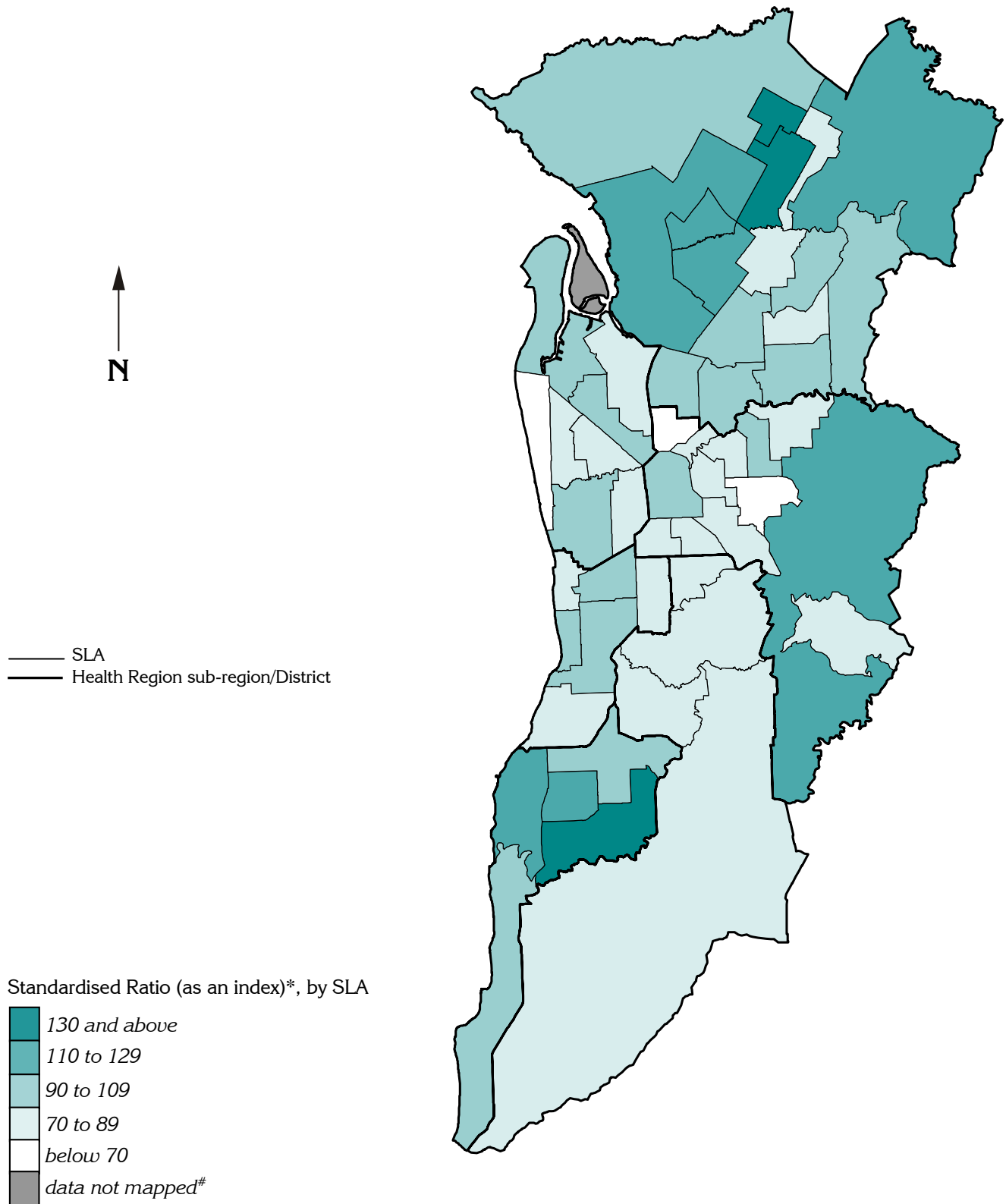
Southern Adelaide

There were four per cent fewer admissions than expected in the Southern Adelaide Health Region, an SR of 96**. Rates of admission for potentially avoidable hospitalisations varied between SLAs, with more SLAs with fewer of these admissions than expected than with more.

Onkaparinga - Hackham had almost one third more admissions than expected, with an SR of 132** and 547 admissions, with Onkaparinga - North Coast and - Morphett just below that level, with SRs of 125** and 119**, respectively.

The lowest ratios were recorded in Marion - South SLA, an SR of 73**, Onkaparinga - Hills and - Reservoir (79** and 82**) and Mitcham - North-East, - Hills and - West (80**, 81** and 84**).

Map 3.1:
 Avoidable hospitalisations: all conditions, metropolitan regions, South
 Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations, country South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations over the years 2005/06 and 2006/07 of people living in country areas of South Australia was 17,203, a rate of 3,865.4 admissions per 100,000 population (Table 3.15). This was thirteen per cent more admissions than expected from the State rate (an SR of 113**).

Table 3.15: Total potentially avoidable hospitalisations¹ by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	4,086	3,198.2	93**
Murray Bridge (RC)	677	3,630.3	106
Victor Harbor (C)	523	2,867.7	84**
Balance of Hills Mallee Southern	2,887	3,175.9	93**
South East	2,292	3,690.9	108**
Mount Gambier (C)	855	3,605.9	105
Balance of South East	1,438	3,743.3	109**
Wakefield	3,838	3,539.4	103*
Barossa (DC) - Tanunda	173	3,201.5	93
Balance of Wakefield	3,666	3,557.1	104*
Mid North	1,859	5,400.7	158**
Peterborough (DC)	140	6,188.5	181**
Port Pirie City Dists (M) - City	880	5,807.7	169**
Balance of Mid North	840	4,933.7	144**
Riverland	1,350	3,964.3	116**
Eyre	1,377	4,018.8	117**
Port Lincoln (C)	558	4,003.7	117**
Balance of Eyre	819	4,029.1	118**
Northern & Far Western	2,401	5,454.0	159**
Cooper Pedy (DC)	145	7,853.8	229**
Port Augusta (C)	909	7,086.0	207**
Roxby Downs (M)	85	3,284.3	96
Whyalla (C)	1,035	4,970.9	145**
Balance of Northern & Far Western	229	3,826.6	112
Country South Australia (incl. Gawler)	17,203	3,865.4	113**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.2)

Northern & Far Western and Mid North Health Regions had the most highly ratios for potentially avoidable hospitalisations, with over fifty per cent more admissions than expected from the State rate (SRs of 159**, and 158**, respectively) (Table 3.15). Hills Mallee Southern had the lowest ratio, with seven per cent fewer admissions than expected (an SR of 93**).

A number of SLAs in country South Australia had substantially elevated numbers of these admissions, including Unincorporated West Coast (an SR of 870**, 95 admissions), Unincorporated Riverland (367**, 13), Mount Remarkable (208**, 229); and the towns of Cooper Pedy (229**, 145), Port Augusta (207**, 909), and Ceduna (197**, 224),

with almost twice the expected number of admissions (910 admissions, and an SR of 199**; and 224 admissions, 190**, respectively).

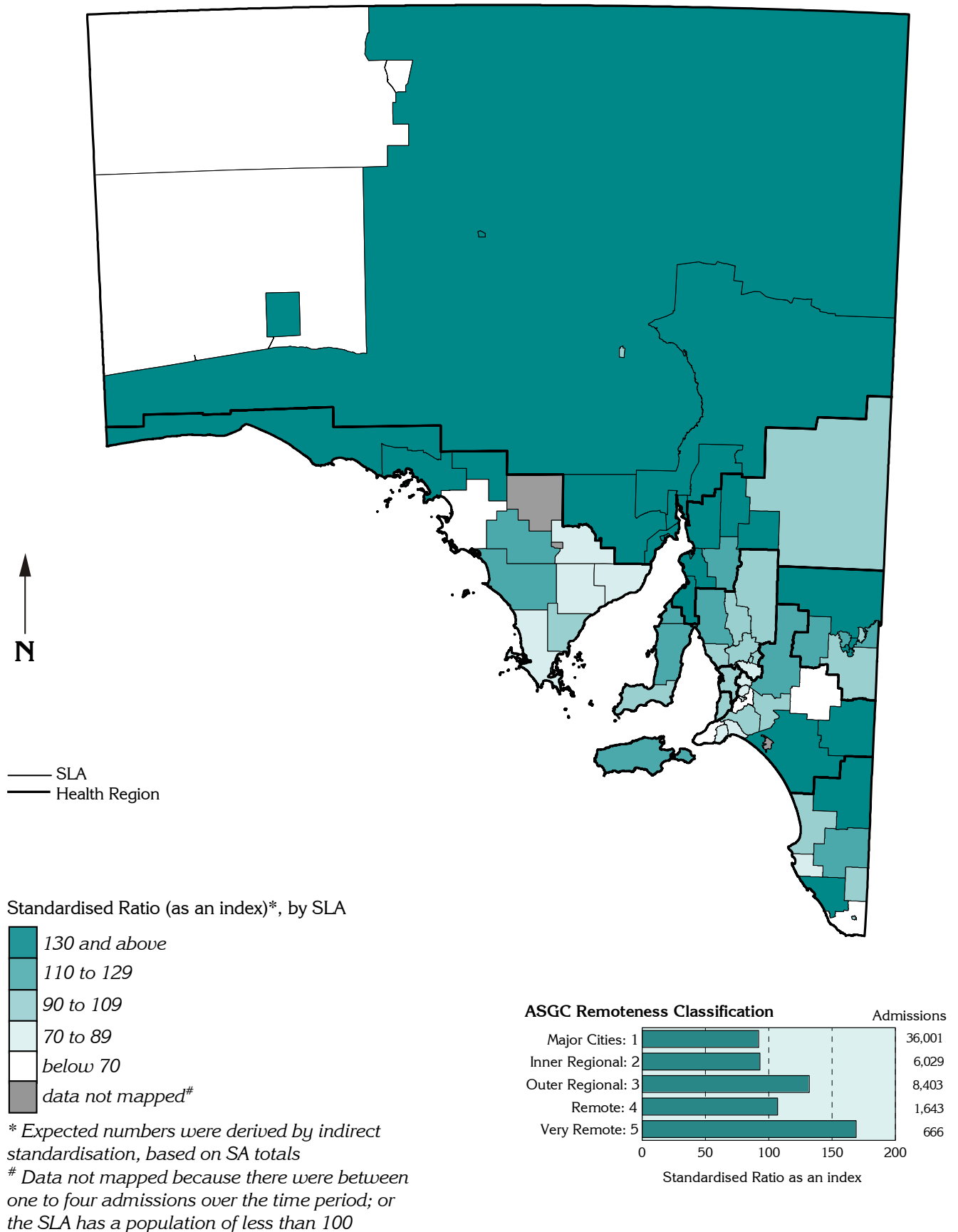
The lowest ratios were in Anangu Pitjantjatjara, with an SR of 21**, and eleven admissions; Karoonda East Murray (57**, 26); Mount Barker Balance (57**, 138); and Grant (61**, 149).

Remoteness classification

The graph of potentially avoidable hospitalisations by remoteness shows the highest rates to be in the Very Remote and Outer Regional areas, ratios of 169** (with 666 admissions) and 132** (8,403 admissions), respectively. The lowest ratios of avoidable hospitalisation were in the Major Cities and Inner Regional remoteness classes, with SRs of 92** and 93**.

Map 3.2:

Potentially avoidable hospitalisations: all conditions, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: diabetes complications, metropolitan regions, South Australia, 2005/06 and 2006/07

Over the years 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for diabetes complications of people living in Metropolitan Adelaide was 8,403, a rate of 749.9 admissions per 100,000 population (Table 3.16). While there were ten per cent fewer potentially avoidable hospitalisations for diabetes complications of residents of Metropolitan Adelaide than would be expected from the State rate (a standardised ratio (SR) of 90**), there were notably more admissions of people living in country South Australia (see over).

Table 3.16: Potentially avoidable hospitalisations¹: diabetes complications by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	5,862	750.5	90**
Northern sub-region	2,577	873.6	105**
Western sub-region	1,849	770.9	93**
Central East sub-region	1,436	583.1	70**
Southern Adelaide	2,541	748.6	90**
Urban Beaches District	1,182	729.0	88**
Hills District	395	528.6	64**
Outer Southern District	965	939.7	113**
Adelaide (excl. Gawler)	8,403	749.9	90**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.3)

The distribution at the SLA level across Metropolitan Adelaide of potentially avoidable hospitalisations for diabetes complications is consistent with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1) and shown in the correlation analysis (a correlation coefficient of -0.79, Table 3.34). Rates were consistent at the regional level, but varied between the sub-regions and Districts (Table 3.16). For example, the Outer Southern District had 13% more admissions than expected (an SR of 113**): by contrast, the neighbouring Hills District, had 46% fewer hospitalisations for diabetes complications than expected (an SR of 64**). The range in rates in Central Northern Adelaide was smaller, from an SR of 105** in Northern sub-region to 70** in Central East sub-region.

Central Northern Adelaide

The average number of potentially avoidable hospitalisations for diabetes complications in Central Northern Adelaide Health Region was 5,862, or 750.5 admissions per 100,000 population, ten per cent below the State rate.

Playford - West Central had 89% more admissions than expected from the State rate (an SR of 189**, 146 admissions). A cluster of neighbouring SLAs also had elevated ratios; these included Playford - Elizabeth (with an SR of 153**, 338 admissions) and Salisbury - Inner North (151**, 183), - Balance (130*, 63) and - Central (126**, 256).

Other SLAs in this Region with a large number of admissions for diabetes complications were West Torrens - West (312 admissions, an SR of 100), Salisbury - South East (275 admissions, an SR of 103), and Tea Tree Gully - South (269 admissions, an SR of 90).

The SLAs of Adelaide Hills - Central (an SR of 43**, 41 admissions), Burnside - North East (49**, 107), Burnside - South-West (52**, 114) and Unley - East (52**, 96) had the lowest ratios in the Region.

Southern Adelaide

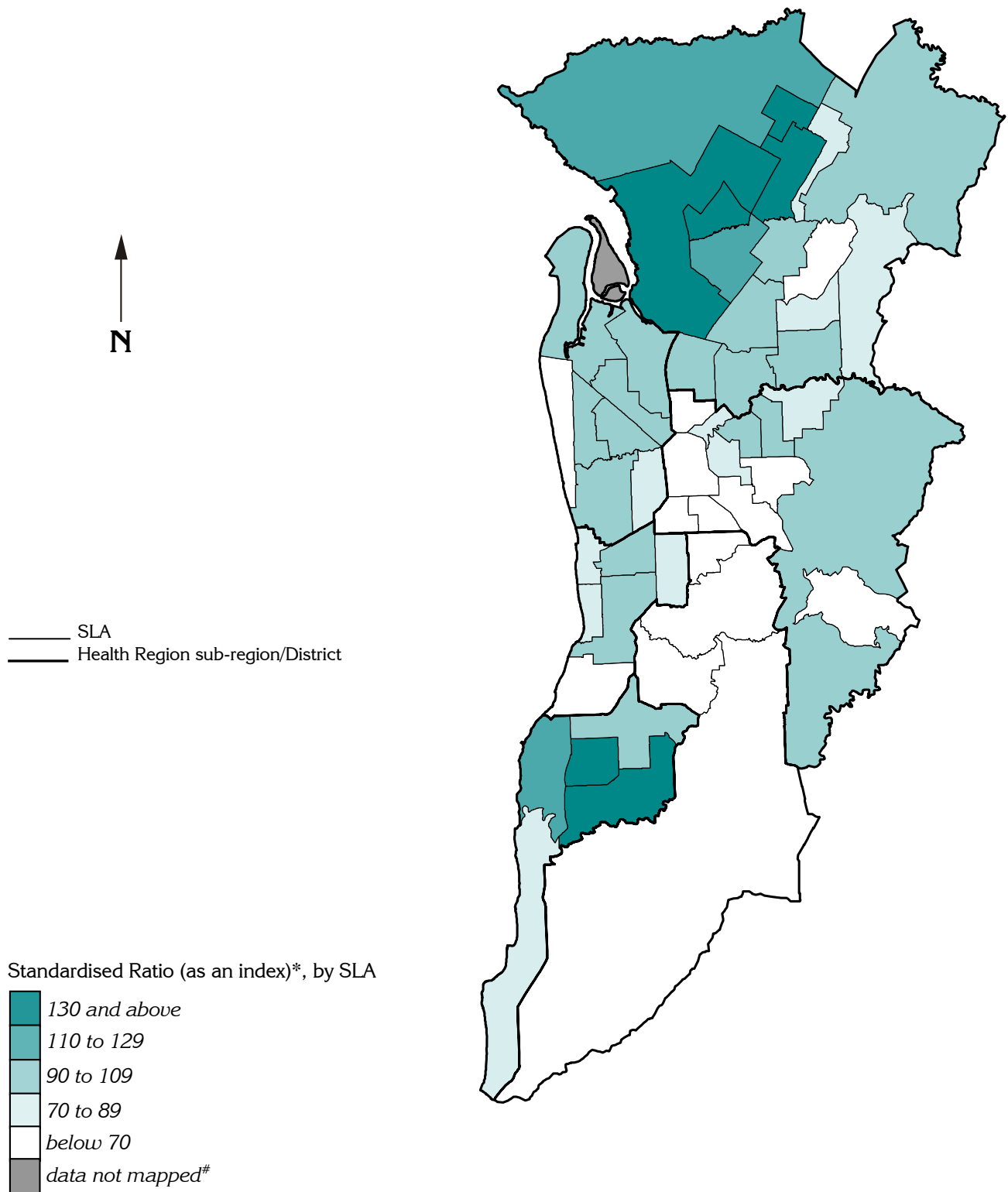
There were also ten per cent fewer admissions for diabetes complications than expected in the Southern Adelaide Health Region, an SR of 90**.

Higher than expected numbers of admissions for diabetes complications were found in the Onkaparinga SLAs of - Hackham (an SR of 157**, 142 admissions), - Morphett (135**, 239), and - North Coast (125**, 205)

By comparison, the Onkaparinga SLAs of Hills and Reservoir had the lowest ratios in the Region for diabetes complications, with standardised ratios of 56** and 62**, respectively, indicating approximately fifty per cent fewer admissions for these conditions of residents of these SLAs than expected from the State rate.

Map 3.3:

Potentially avoidable hospitalisations: diabetes complications, metropolitan regions, South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: diabetes complications, country South Australia, 2005/06 and 2006/07

Over the years 2005/06 and 2006/07, there was an average of 4,154 potentially avoidable hospitalisations for diabetes complications of people living in country South Australia, 12% more admissions than expected from the State rate, an SR of 112** (Table 3.17).

Table 3.17: Potentially avoidable hospitalisations¹: diabetes complications by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	947	714.6	86**
Murray Bridge	178	939.5	113
Victor Harbor	167	760.2	92
Balance of Hills Mallee Southern	603	657.3	79**
South East	538	898.2	108
Mount Gambier	249	1,098.1	132**
Balance of South East	289	776.7	94
Wakefield	931	836.4	101
Barossa - Tanunda	28	506.9	61**
Balance of Wakefield	903	853.6	103
Mid North	503	1,389.7	167**
Peterborough	40	1,606.4	194**
Port Pirie City Districts - City	229	1,460.3	176**
Balance of Mid North	235	1,299.3	157**
Riverland	322	941.2	113*
Eyre	326	973.5	117**
Port Lincoln	133	992.8	120*
Balance of Eyre	193	960.7	116*
Northern & Far Western	589	1,458.7	176**
Cooper Pedy	25	1,279.0	154*
Port Augusta	240	1,997.4	241**
Roxby Downs	11	907.5	109
Whyalla	269	1,351.5	163**
Balance of Northern & Far Western	45	837.0	101
Country South Australia (incl. Gawler)	4,154	927.6	112**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.4)

There were over two thirds more potentially avoidable hospitalisations for diabetes complications than expected of people living in the Northern & Far Western and Mid North Health Regions, with SRs of 176** and 167**, respectively (Table 3.17). The lowest ratio was in the Hills Mallee Southern Health Region, with 14% fewer admissions for these conditions than expected from the State rates (an SR of 86*).

Unincorporated West Coast had a standardised ratio of 1735**, indicating that the 30 recorded admissions were 17.35 times the number expected, for a population of the size and age distribution of this SLA, had the State rate of admission applied there. Other SLAs in country South Australia with highly elevated ratios (and at least 25 admissions)

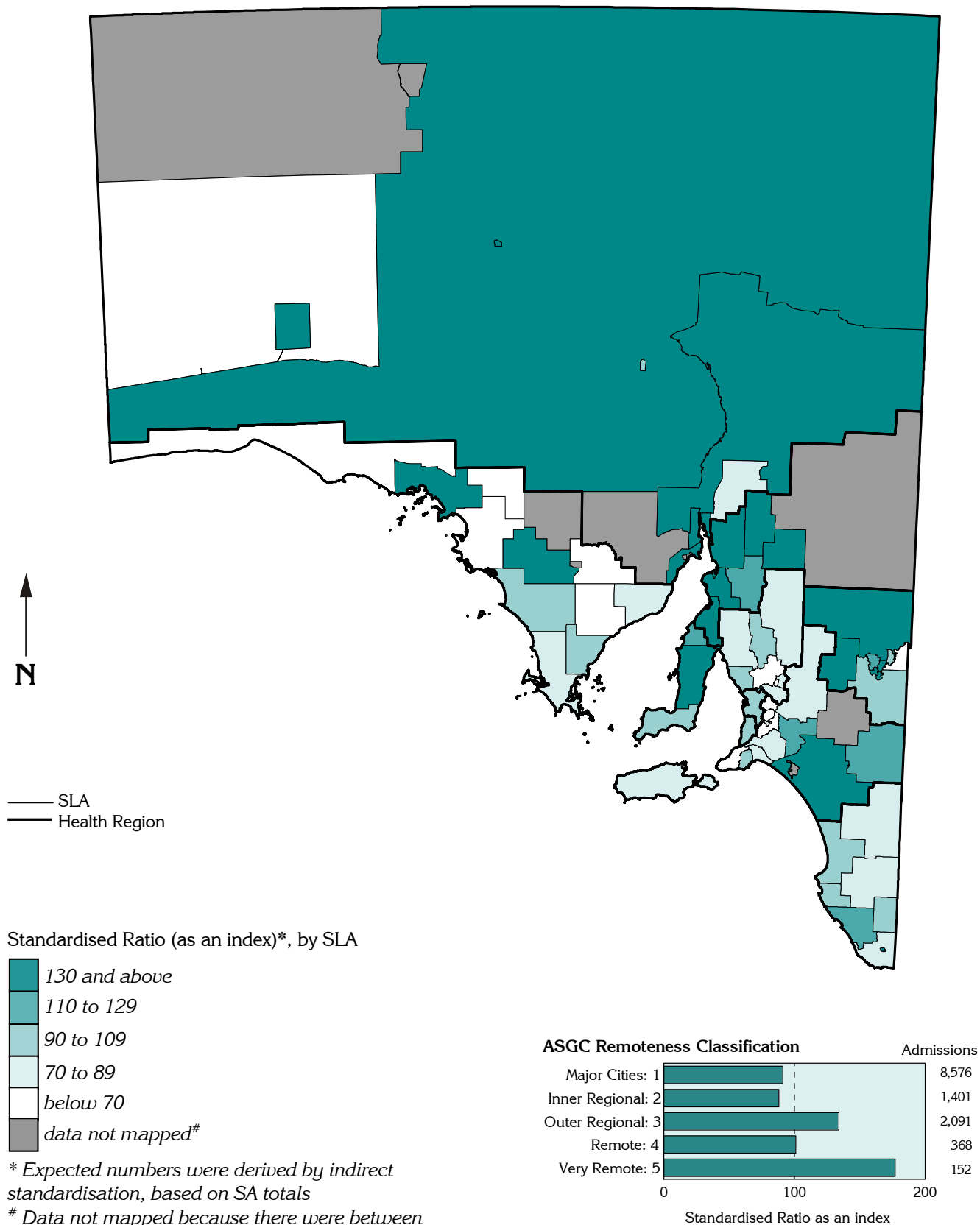
included Port Augusta (with an SR of 241**, 240 admissions); Ceduna (213**, 53); Port Pirie City & Districts - Balance (196**, 63); and the city itself (176**, 229); Peterborough (194**, 40); and Whyalla (163**, 269).

Areas with the lowest ratios, all with expected numbers approximately fifty per cent or less than the State average, were Adelaide Hills - North (an SR of 53*, 25 admissions), Yankalilla (54**, 26), Mount Barker Balance (59**, 31), Barossa - Tanunda (61**, 28), Adelaide Hills Balance (62**, 43) and Light (65**, 53).

Remoteness classification

The highest avoidable hospitalisations rates for diabetes complications occurred in the Very Remote and Outer Regional areas, with admission ratios of 177** and 177**, respectively; the lowest were in the Inner Regional and Major Cities areas, with ratios of 88** and 91**, respectively.

Map 3.4:
Potentially avoidable hospitalisations: diabetes complications,
South Australia, 2005/06 and 2006/07



* Expected numbers were derived by indirect standardisation, based on SA totals
[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, metropolitan regions, South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations for chronic obstructive pulmonary disease (COPD) over 2005/06 and 2006/07 of people living in Metropolitan Adelaide was 2,597, four per cent fewer admissions from these conditions than expected from the State rate, a standardised ratio (SR) of 96** (Table 3.18).

Table 3.18: Potentially avoidable hospitalisations¹: chronic obstructive pulmonary disease by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	2,597	332.4	94**
Northern sub-region	1,322	463.6	131**
Western sub-region	685	277.8	78**
Central East sub-region	591	236.6	67**
Southern Adelaide	1,209	354.3	100
Urban Beaches District	567	337.3	95
Hills District	136	184.0	52**
Outer Southern District	507	508.6	144**
Adelaide (excl. Gawler)	3,806	339.0	96**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.5)

The distribution at the SLA level across Metropolitan Adelaide of potentially avoidable hospitalisations for COPD shows a very strong association with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1) and shown in the correlation analysis (Table 3.34). Within Central Northern Adelaide, admission rates for COPD varied between sub-regions: from 31% more admissions than expected in Northern (an SR of 131**), to 33% fewer than expected (an SR of 67**) in Central East (Table 3.18). A similar pattern was evident in the Southern Adelaide Health Region, ranging from a markedly elevated admission rate in Outer Southern (an SR of 144**), to a substantially lower rate in the Hills District (an SR of 52**).

Central Northern Adelaide

There were 2,597 avoidable hospitalisations for COPD in the Central Northern Adelaide Health Region, six per cent fewer than expected from the State rate, an SR of 94**.

A cluster of SLAs in the Northern sub-region had elevated rates of avoidable hospitalisations for COPD. The highest of these was 893.1 admissions per 100,000 population in the Playford - Elizabeth SLA, two and a half times the expected rate, with an SR of 252** for the 240 admissions. The SLAs of Playford - West Central, 72 admissions, and Salisbury - Inner North, 91 admissions, also had twice as many hospitalisations for COPD than expected, with SRs of 235** and 200**, respectively.

Other SLAs with high average numbers of admissions for COPD were also in the Northern sub-region: Port Adelaide Enfield - East (169 admissions, an SR of 148**) and Tea Tree Gully - South (134 admissions, an SR of 104).

The SLAs of Walkerville (an SR of 41**, and only 14 admissions), Charles Sturt - Inner East (an SR of 44**, and 41 admissions), and Charles Sturt - Coastal (an SR of 47**, and 66 admissions) had the lowest rates of admission for COPD in this Region, all with fewer than half the expected number.

Southern Adelaide

The rate of admissions for COPD in the Southern Adelaide Health Region was consistent with the State rate, with 354.3 admissions per 100,000 population (an SR of 100).

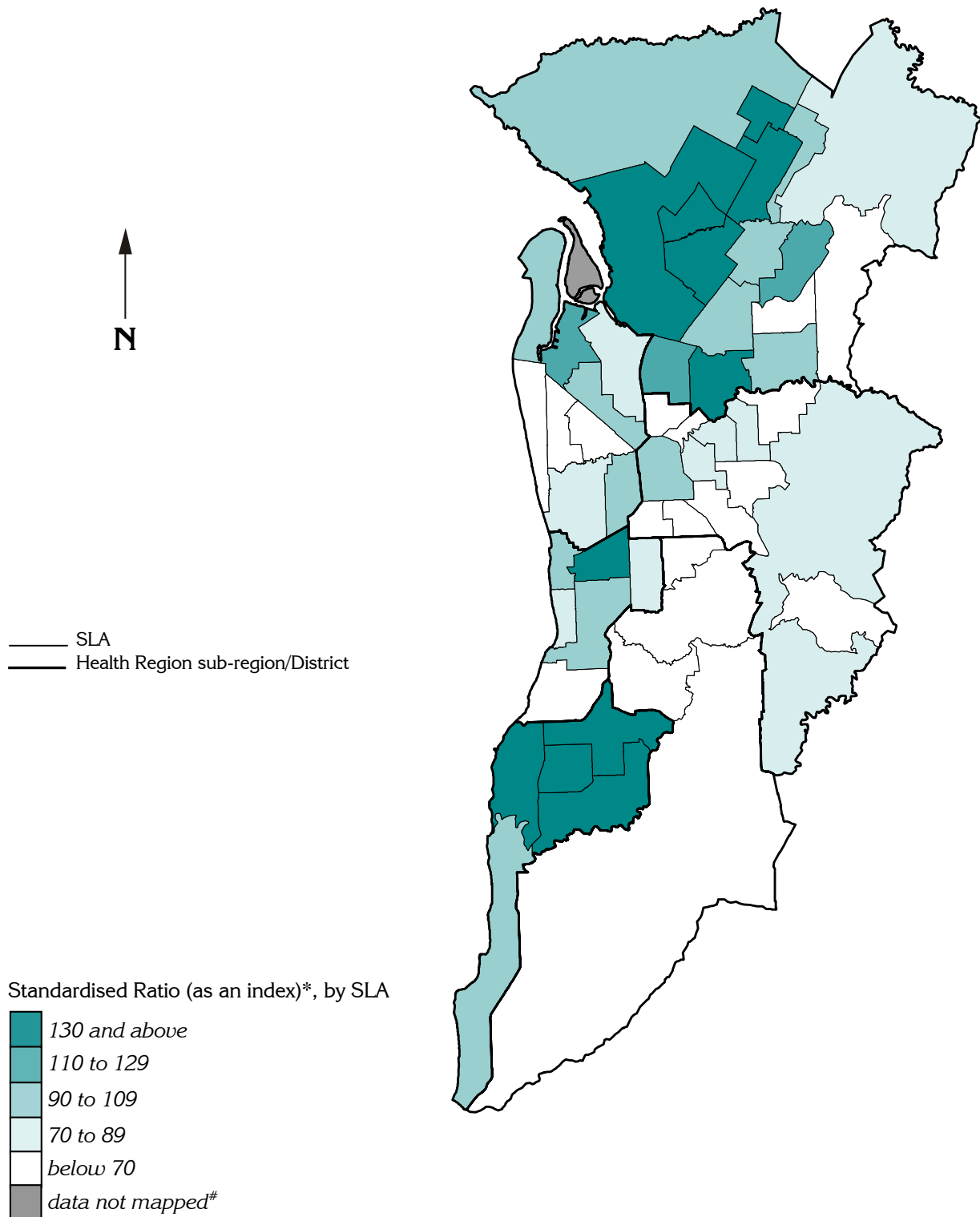
A cluster of three SLAs in the Outer Southern District had the highest rates in this Region: Onkaparinga - Hackham (65 admissions, an SR of 180**), Onkaparinga - North Coast (126 admissions, an SR of 176**), and Onkaparinga - Morphett (114 admissions, an SR of 155**).

Marion - North (with an SR of 131**) and Marion - Central (an SR of 97) SLAs in the Urban Beaches District had the largest number of admissions for COPD, at 160 and 149 respectively.

Mitcham - North East (32 admissions, an SR of 47**), Onkaparinga - Hills (20 admissions, an SR of 49**) and Mitcham - Hills (45 admissions, an SR of 50**) in the Hills District, all had approximately fifty per cent fewer admissions for COPD than expected, when compared to the State rate.

Map 3.5:

Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, metropolitan regions, South Australia, 2005/06 and 2006/07



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

Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, country South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations for chronic obstructive pulmonary diseases (COPD) of people living in country areas of South Australia over the years 2005/06 and 2006/07 was 1,706, a rate of 382.7 admissions per 100,000 population (Table 3.19). This was eight per cent more admissions than were expected from the State rate (an SR of 108**).

Table 3.19: Potentially avoidable hospitalisations¹: chronic obstructive pulmonary disease by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	404	304.2	86**
Murray Bridge	107	566.6	160**
Victor Harbor	41	174.6	49**
Balance of Hills Mallee Southern	256	283.1	80**
South East	199	337.6	95
Mount Gambier	78	348.4	98
Balance of South East	121	331.0	93
Wakefield	355	318.0	90*
Barossa - Tanunda	8	140.0	40**
Balance of Wakefield	347	327.7	93
Mid North	200	543.4	153**
Peterborough	11	438.6	124
Port Pirie City Districts - City	128	804.0	227**
Balance of Mid North	62	333.5	94
Riverland	131	381.5	108
Eyre	128	384.8	109
Port Lincoln	47	353.1	100
Balance of Eyre	81	406.1	115
Northern & Far Western	290	757.2	214**
Cooper Pedy	19	1,054.9	298**
Port Augusta	104	906.5	256**
Roxby Downs	0	0.0	0
Whyalla	144	743.7	210**
Balance of Northern & Far Western	24	469.7	133
Country South Australia (incl. Gawler)	1,706	382.7	108**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia (admissions) and Port Augusta (256**, 104 admissions).

Country South Australia and Health Regions (Map 3.6)

Northern & Far Western Health Region had over twice the expected numbers of potentially avoidable hospitalisations for COPD (an SR of 214**, and 290 admissions). Hospitalisations for these conditions of the Mid North population were 53% above the State rate (an SR of 153**, and 200 admissions) (Table 3.19). Hills Mallee Southern had the lowest ratio, 14% below the State rate (an SR of 86**, and 4,344 admissions).

The SLAs in country South Australia with the highest ratios for admissions from COPD included Unincorporated West Coast, with a substantially elevated ratio of 3317**, and 19 admissions); and the mid north towns of Cooper Pedy (298**, 19

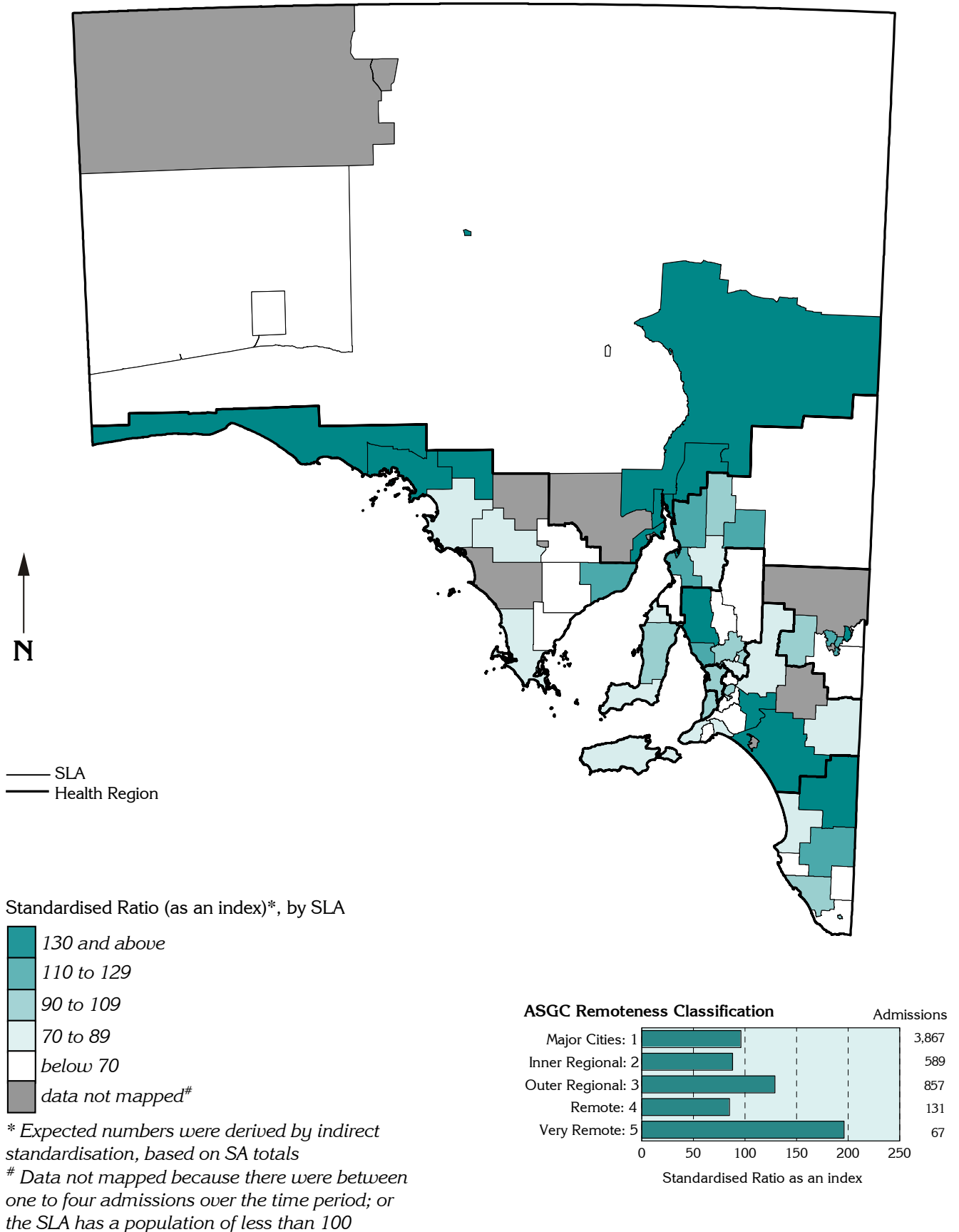
The SLAs of Port Pirie City Districts - City and the town of Whyalla also had more than twice the expected number of admissions (227**, 128 admissions; and 210**, 144 admissions, respectively). Grant, Victor Harbor and Goyder and Alexandrina - Strathalbyn had the lowest ratios.

Remoteness classification

The graph of avoidable hospitalisations by remoteness shows the highest admission rates for chronic obstructive pulmonary disease to have occurred in the Very Remote areas of the State, a standardised ratio of 196**, but with just 67 admissions. The lowest rates of admissions occurred in the Remote and Inner Regional areas of South Australia, with ratios of 85 and 88** respectively.

Map 3.6:

Potentially avoidable hospitalisations: chronic obstructive pulmonary disease, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: dental conditions, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for dental conditions of people living in Metropolitan Adelaide was 3,198, a rate of 288.2 admissions per 100,000 population (Table 3.20). This was four per cent fewer of these admissions than expected from the State rate (standardised ratio (SR) of 96*).

Table 3.20: Potentially avoidable hospitalisations¹: dental conditions by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	2,274	292.3	97**
Northern sub-region	938	267.7	89**
Western sub-region	535	260.3	87**
Central East sub-region	801	360.8	120**
Southern Adelaide	925	278.5	93*
Urban Beaches District	400	297.7	99**
Hills District	319	406.5	136**
Outer Southern District	206	172.7	58**
Adelaide (excl. Gawler)	3,198	288.2	96*

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.7)

The distribution of rates of potentially avoidable hospitalisations for dental conditions is, in many ways, the reverse of the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1): that is, it includes many areas of high socioeconomic status, as is supported by the correlation analysis (Table 3.34). While overall rates in both Central Northern Adelaide and Southern Adelaide Health Regions were slightly below the State rate, both of these Regions had one sub-region/District with elevated rates. These were Central East sub-region, with 20% more admissions than expected (an SR of 120**) and Hills District, with 36% more admissions than expected (an SR of 136**) (Table 3.20). Outer Southern District had a substantially (42%) lower than expected number of admissions, an SR of 58**.

Central Northern Adelaide

The majority of SLAs with elevated rates of avoidable hospitalisations for dental conditions were located in a cluster covering much of the Central East sub-region. The SLAs of Adelaide Hills - Ranges, with an SR of 231**, Adelaide (164**), Adelaide Hills Central (158**), Burnside - South-West (158**), Walkerville (153*) and Unley - West (141**) had the highest rates in this cluster. Further north, Playford - Hills had over three times the expected number (an SR of 359**), but there were only 39 admissions.

SLAs with the highest average number of admissions were in the Northern sub-region; Port Adelaide Enfield - East, 107 admissions; Tea Tree Gully - South, 102 admissions; and Burnside - South West SLA, 101 admissions.

Playford - East Central SLA in the Northern sub-region had the lowest hospitalisation rate for dental conditions, an SR of 37**, with only 24 admissions.

Southern Adelaide

In the Southern Adelaide Health Region, there were seven per cent fewer potentially avoidable hospitalisations for dental conditions than expected from the State rate, an SR of 93*.

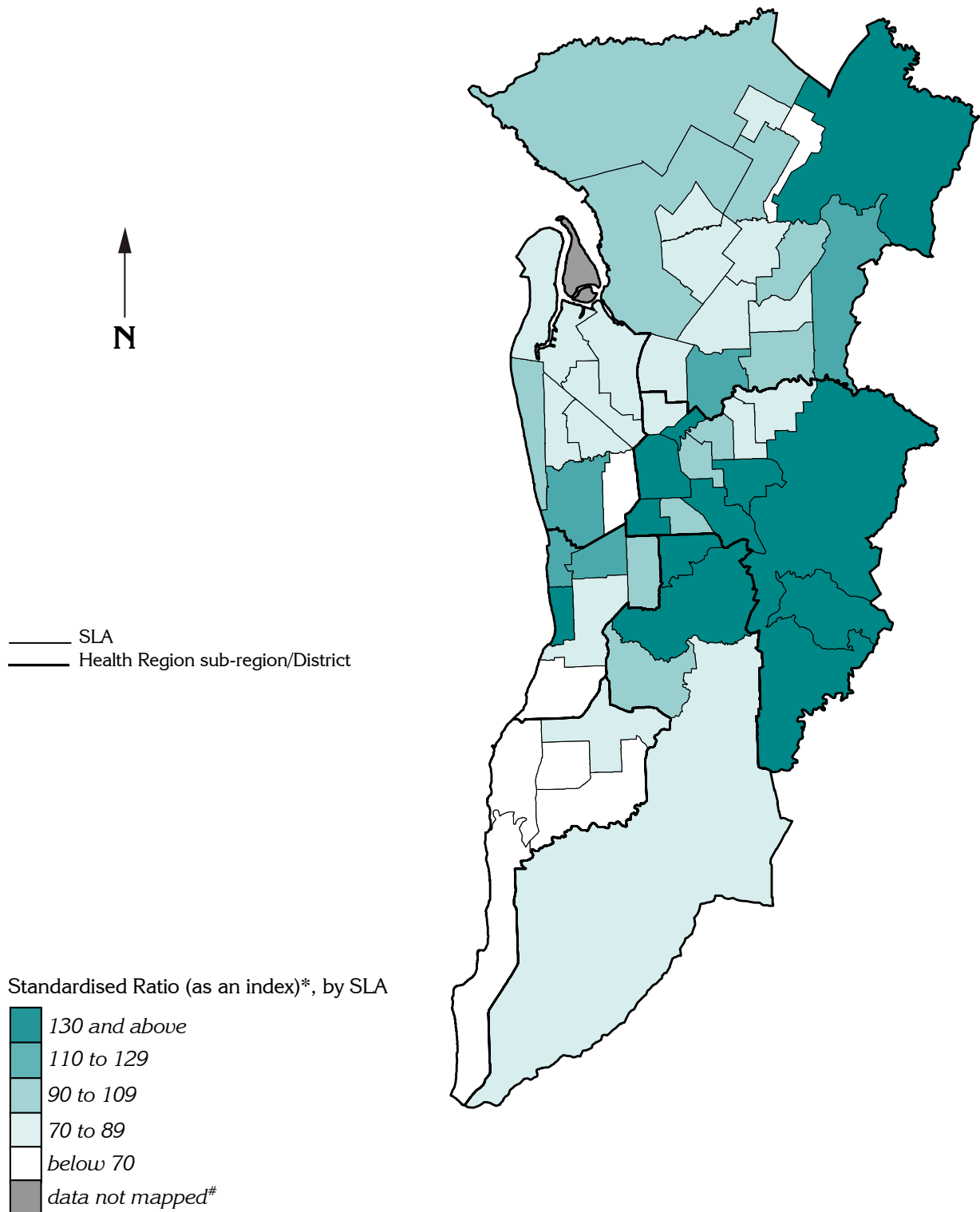
SLAs in this Region with the highest rates were Holdfast Bay - South, with an SR of 181** and 75 admissions, from the Urban Beaches District; and Mitcham - Hills, an SR of 176**, 131 admissions, and Mitcham - North-East, an SR of 171** and 80 admissions, both from the Hills District.

The 131 admissions of people living in Mitcham - Hills SLA was the highest average number for the Region. The SLAs of Onkaparinga - Reservoir and Marion - North had the next highest average number of admissions, with 81 in each SLA.

The Outer Southern District contains a cluster of SLAs with the lowest rates of admission for dental conditions in the Region, ranging from an SR of 47** in Onkaparinga - Morphett, to 56** in Onkaparinga - South Coast. Marion - South had 44% fewer admissions than expected for these conditions, an SR of 56**.

Map 3.7:

Potentially avoidable hospitalisations: dental conditions, metropolitan regions, South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: dental conditions, country South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for dental conditions of people living in country areas of South Australia was 1,447, a rate of 315.5 admissions per 100,000 population (Table 3.21). This was five per cent more admissions than were expected from the State rate (an SR of 105), although the higher rate was not statistically significant.

Table 3.21: Potentially avoidable hospitalisations¹: dental conditions by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	321	253.6	85**
Murray Bridge	64	338.3	113
Victor Harbor	30	242.8	81
Balance of Hills Mallee Southern	228	281.4	79**
South East	171	254.2	85*
Mount Gambier	52	206.0	69**
Balance of South East	119	334.2	94
Wakefield	315	291.0	97
Barossa – Tanunda	20	395.7	132
Balance of Wakefield	295	337.7	95
Mid North	119	361.4	120**
Peterborough	6	262.3	87
Port Pirie City Districts – City	50	333.5	111
Balance of Mid North	295	337.7	95*
Riverland	157	449.2	150**
Eyre	105	286.8	96
Port Lincoln	48	321.3	107
Balance of Eyre	58	311.1	88
Northern & Far Western	260	497.8	166**
Cooper Pedy	5	216.5	72
Port Augusta	79	535.3	178**
Roxby Downs	37	773.5	258**
Whyalla	105	452.2	151**
Balance of Northern & Far Western	35	553.8	156**
Country South Australia (incl. Gawler)	1,447	315.5	105

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.8)

There were 66% more potentially avoidable hospitalisations for dental conditions than expected in the Northern & Far Western Region, with an SR of 166**, and 260 admissions (Table 3.21). The lowest ratios were in the Hills Mallee Southern and South East Regions, with expected numbers 15% below the State level (SRs of 85** and 85*, respectively).

SLAs in country South Australia with the highest ratios included Unincorporated Far North (an SR of 420**, and an average of 20 admissions), Renmark Paringa - Paringa (267**, 16 admissions), Roxby Downs (258**, 37 admissions), Port Pirie City Districts Balance (216**, 25 admissions) and Berri & Barmera - Barmera (209**, 28 admissions).

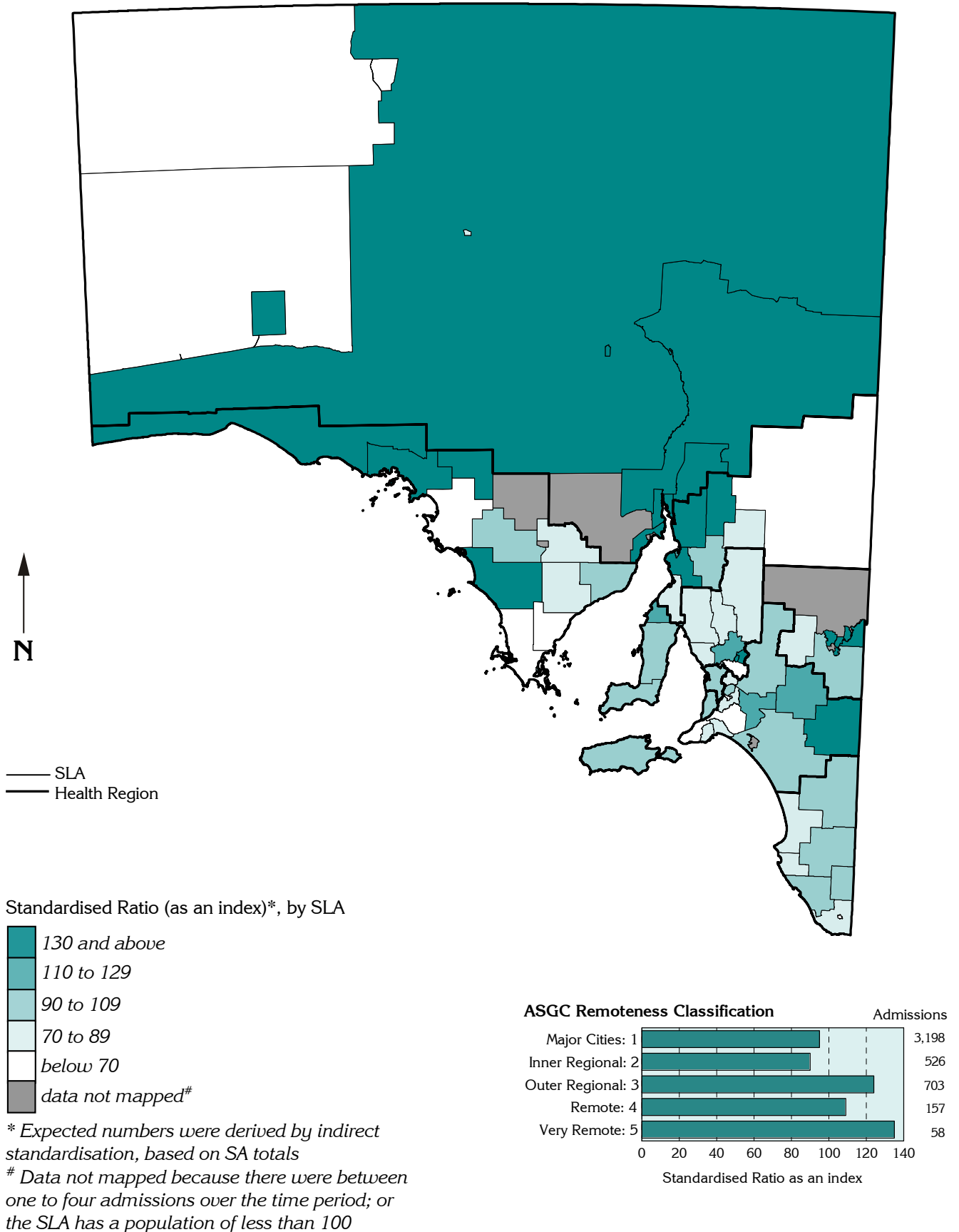
Areas with the lowest ratios – all with expected numbers around thirty to 45% below the State average – included Barossa - Barossa (an SR of 55*, an average of 15 admissions), Mount Barker - Central (55**, 33 admissions), Alexandrina - Strathalbyn (an SR of 67, and 20 admissions); Mount Gambier (69**, 52); and Goyder (an SR of 70, and ten admissions).

Remoteness classification

The graph of remoteness shows the highest rates of hospitalisation for dental conditions occurred in the Very Remote and Outer Regional areas of South Australia, with admission ratios of 135* and 124**, respectively. The lowest ratio was in the Inner Regional areas, with an SR of 90*.

Map 3.8:

Potentially avoidable hospitalisations: dental conditions, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: dehydration and gastroenteritis, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for dehydration and gastroenteritis of people living in Metropolitan Adelaide was 2,851, a rate of 251.2 admissions per 100,000 population (Table 3.22). This was 16% fewer admissions for this potentially avoidable condition than expected, from the State rate, a standardised ratio (SR) of 84^{**}: that is, rates in country South Australia for these conditions were substantially higher than those in Metropolitan Adelaide (see over).

Table 3.22: Potentially avoidable hospitalisations¹: dehydration and gastroenteritis by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,884	236.9	80^{**}
Northern sub-region	769	243.5	82 ^{**}
Western sub-region	540	233.6	79 ^{**}
Central East sub-region	576	231.7	78 ^{**}
Southern Adelaide	967	284.5	96
Urban Beaches District	449	289.7	97
Hills District	186	243.7	82 ^{**}
Outer Southern District	332	306.0	103
Adelaide (excl. Gawler)	2,851	251.2	84^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.9)

The distribution of admissions for dehydration and gastroenteritis has no association with the distribution of the population by socioeconomic status. In Central Northern Adelaide Health Region, avoidable hospitalisation rates were 20% below the level expected from the State rate (an SR of 80^{**}) (Table 3.22). Rates in the sub-regions were consistent with the regional rate.

In Southern Adelaide Health Region, the rate of avoidable hospitalisations for these conditions was somewhat higher than in the north, at four per cent lower than expected (an SR of 96). The Hills District had the lowest rate, 18% below the State average, with a slightly above-average rate in Outer Southern District.

Central Northern Adelaide

The two Adelaide Hills SLAs of Ranges and Central had the highest potentially avoidable hospitalisation rates for dehydration and gastroenteritis in the Region, although neither rate was statistically significant, elevated by 13% and eight per cent, respectively. The rate for Tea Tree Gully - South SLA in the Northern sub-region, was slightly higher than expected, an SR of 102.

As well as having an elevated rate of avoidable hospitalisation from these conditions, Tea Tree Gully - South SLA had the highest average number of admissions in the Region, with 106 admissions.

West Torrens - West SLA had the second largest number, with 98 admissions.

The Central East sub-region contains five of the seven SLAs with the lowest average annual admission rate for dehydration and gastroenteritis in the Region, of which Campbelltown - East (with an SR of 56^{**}) and Prospect (59^{**}) had the lowest rates in the sub-region. West Torrens - East SLA (63^{**}) had the lowest rate in the Western sub-region, while Salisbury - North-East had the lowest in the Northern sub-region (66^{**}).

Southern Adelaide

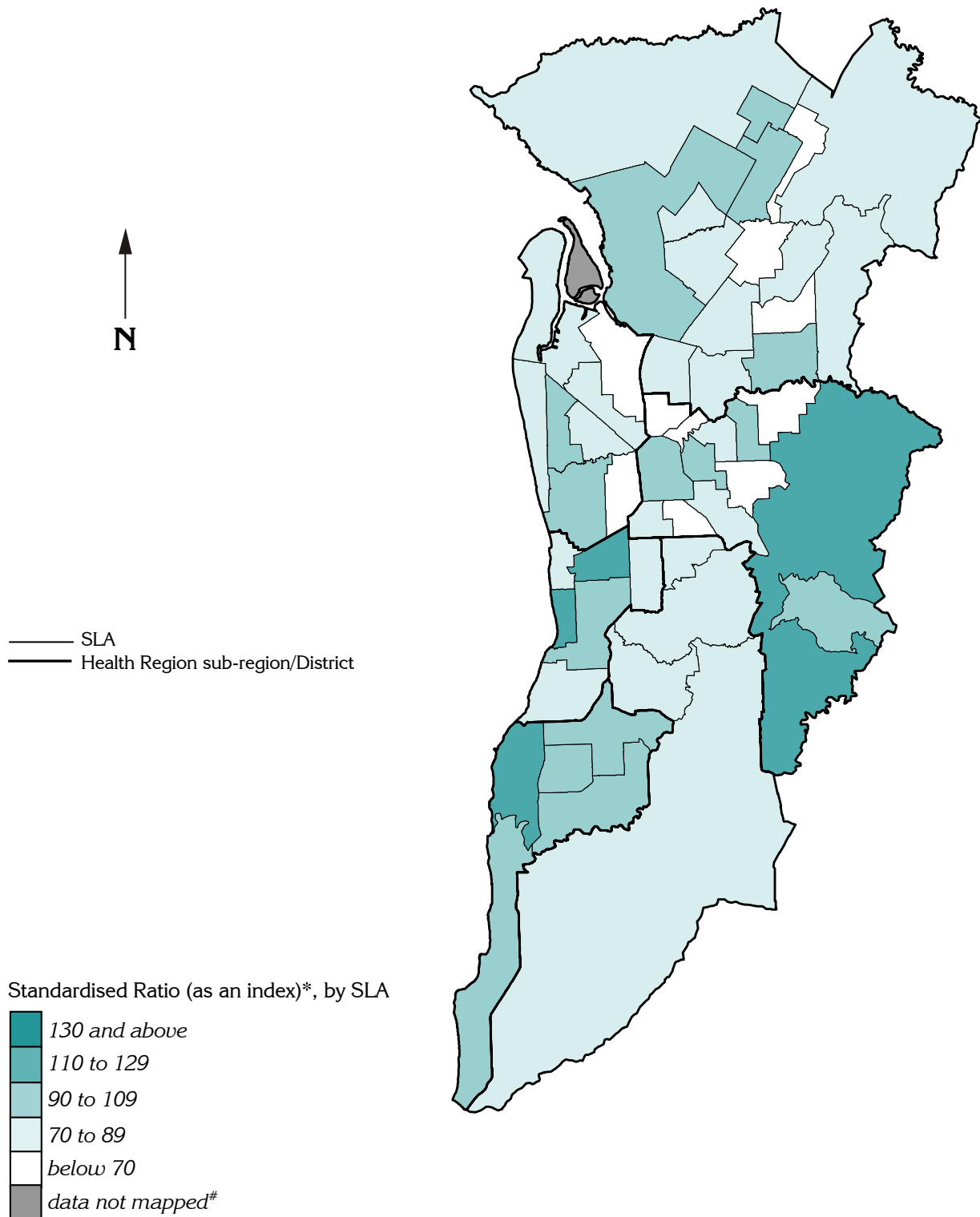
Onkaparinga - North Coast and Holdfast Bay - South SLAs had the highest rates of potentially avoidable hospitalisations for dehydration and gastroenteritis in Southern Adelaide Region, both 17% above the State rate (SRs of 117). The adjoining SLAs to both these areas also had high hospitalisation rates: Onkaparinga - Hackham (an SR of 108) in the Outer Southern District, and Marion - North (112) in the Urban Beaches District.

Marion - Central and - North SLAs had the highest average number of hospitalisations for dehydration and gastroenteritis in the Region, with 114 admissions and 102 admissions, respectively.

The lowest rates of potentially avoidable hospitalisation for dehydration and gastroenteritis in the Region were calculated for Mitcham - West and Mitcham - Hills, both with an SR of 80.

Map 3.9:

Potentially avoidable hospitalisations: dehydration and gastroenteritis, metropolitan regions, South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: dehydration and gastroenteritis, country South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations for dehydration and gastroenteritis of people living in country areas of South Australia was 1,728 over the years 2005/06 and 2006/07, a rate of 398.7 admissions per 100,000 population (Table 3.23). This was substantially (34%) more admissions than were expected from the State rate (an SR of 134**).

Table 3.23: Potentially avoidable hospitalisations¹: dehydration and gastroenteritis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	396	318.4	107
Murray Bridge	54	293.4	99
Victor Harbor	34	199.4	67*
Balance of Hills Mallee Southern	308	412.2	116**
South East	326	534.9	180**
Mount Gambier	86	368.2	124*
Balance of South East	240	759.0	214**
Wakefield	376	356.3	120**
Barossa - Tanunda	25	474.7	160*
Balance of Wakefield	351	416.6	118**
Mid North	182	553.8	186**
Peterborough	12	536.6	180*
Port Pirie City Districts - City	77	534.8	180**
Balance of Mid North	94	681.8	193**
Riverland	121	366.6	123*
Eyre	111	333.4	112
Port Lincoln	38	279.5	94
Balance of Eyre	73	441.0	125
Northern & Far Western	218	497.0	167**
Coober Pedy	14	748.2	251**
Port Augusta	83	646.7	217**
Roxby Downs	6	221.9	75
Whyalla	97	475.9	160**
Balance of Northern & Far Western	18	354.5	100
Country South Australia (incl. Gawler)	1,728	398.7	134**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.10)

The Mid North and South East Health Regions had approximately eighty per cent more admissions from dehydration and gastroenteritis (with SRs of 186**, and an average of 182 admissions; and 180**, 326 admissions, respectively) than expected from the State rates (Table 3.23). Hills Mallee Southern and Eyre Regions had the lowest ratios, of 107 (396 admissions) and 112 (111 admissions), respectively.

The SLAs in country South Australia with the most highly elevated ratios included Wattle Range - West and Mount Remarkable, both with over four and half times the expected number of admissions (SRs of 475**, and an average of 124 admissions; and 459**, and 43 admissions, respectively). Areas with 40

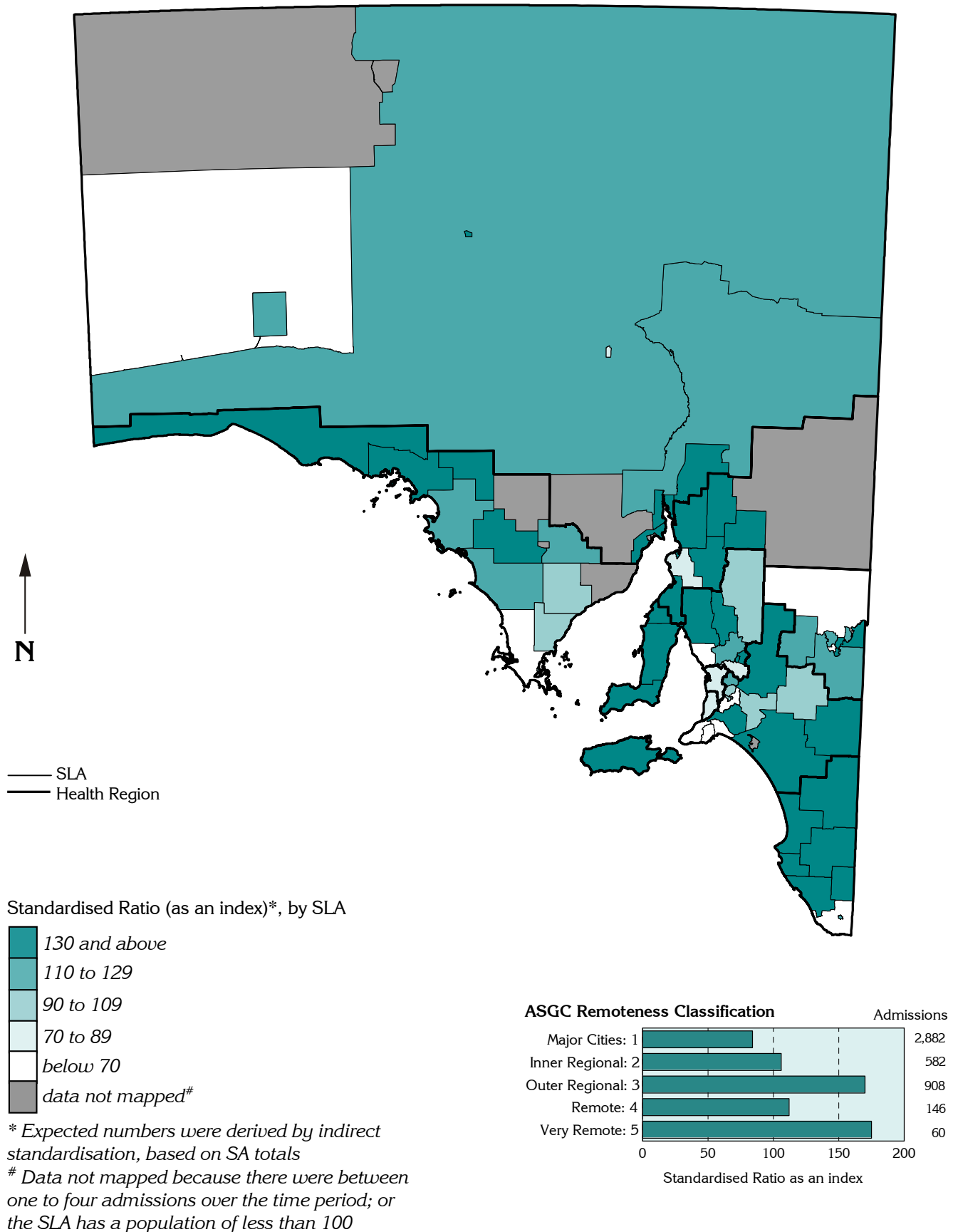
rates over twice the State average included Ceduna (269**, 26 admissions), Coober Pedy (251**, 14), The Coorong (224**, 38), Port Augusta and Tatiara (both with SRs of 217**, and 83 and 43 admissions, respectively), and Mid Murray (204**, 53).

A number of SLAs had rates more than thirty per cent below the State average. These included Mallala (an SR of 59, and twelve admissions), Alexandrina - Coastal (65*, 27), Yankalilla (66, ten admissions) and Victor Harbor (67*, 34).

Remoteness classification

The remoteness graph shows the highest rates of hospitalisation for dehydration and gastroenteritis occurred in the Very Remote, a ratio of 175**, and Outer Regional, a ratio of 170**, areas of South Australia. The lowest rates were in the Major Cities areas, with a ratio of 84**.

Map 3.10:
Potentially avoidable hospitalisations: dehydration and gastroenteritis,
South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: asthma, South Australia, metropolitan regions, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for asthma of people living in Metropolitan Adelaide was 2,544, a rate of 229.4 admissions per 100,000 population (Table 3.24). This was seven per cent fewer admissions from this potentially avoidable condition than expected from the State rate, a standardised ratio (SR) of 93**. Rates in country South Australia were notably higher (see over).

Table 3.24: Potentially avoidable hospitalisations¹: asthma, by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,772	227.0	92**
Northern sub-region	1,017	278.9	113**
Western sub-region	420	209.5	85**
Central East sub-region	336	155.7	63**
Southern Adelaide	772	234.9	95
Urban Beaches District	298	228.8	93
Hills District	129	169.0	69**
Outer Southern District	345	282.6	115*
Adelaide (excl. Gawler)	2,544	229.4	93**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.11)

Apart from elevated rates in some north-eastern SLAs, the distribution of admissions for asthma at the SLA level across Adelaide is relatively consistent with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1) and shown in the correlation analysis (Table 3.34).

Rates vary markedly between the sub-regions in Central Northern (with an overall SR of 92**), from 13% above the State rate in Northern (an SR of 113**), to 37% below (an SR of 63**) in Central East (Table 3.24).

In Southern Adelaide, with an SR of 95**, the variation at the District level was from 31% below average in Hills District (an SR of 69**) to 15% above average (115*) in Outer Southern District.

Central Northern Adelaide

The three Tea Tree Gully SLAs of - Hills (with an SR of 162**), - North (146**), and - South (134**) had substantially elevated rates of potentially avoidable hospitalisations for asthma. Playford - Elizabeth (with an SR of 132**) and Port Adelaide Enfield - East (122*) also had elevated rates.

As well as having elevated rates, Tea Tree Gully - North and - South SLAs, together with Salisbury - South-East (with an SR of 114) had the highest average numbers of admissions for asthma in the Region, with 108, 105 and 106 admissions, respectively.

Six of the seven SLAs with the lowest rates of potentially avoidable hospitalisations for asthma in the Region were located in the Central East sub-region. Campbelltown - East had the lowest, with just less than half the expected rate (an SR of 49**); others in this group with similarly low rates were Burnside - North-East (an SR of 50**) and - South-West (51**). West Torrens - East SLA had the lowest rate in the Western sub-region, with 41% fewer admissions than expected (an SR of 59**).

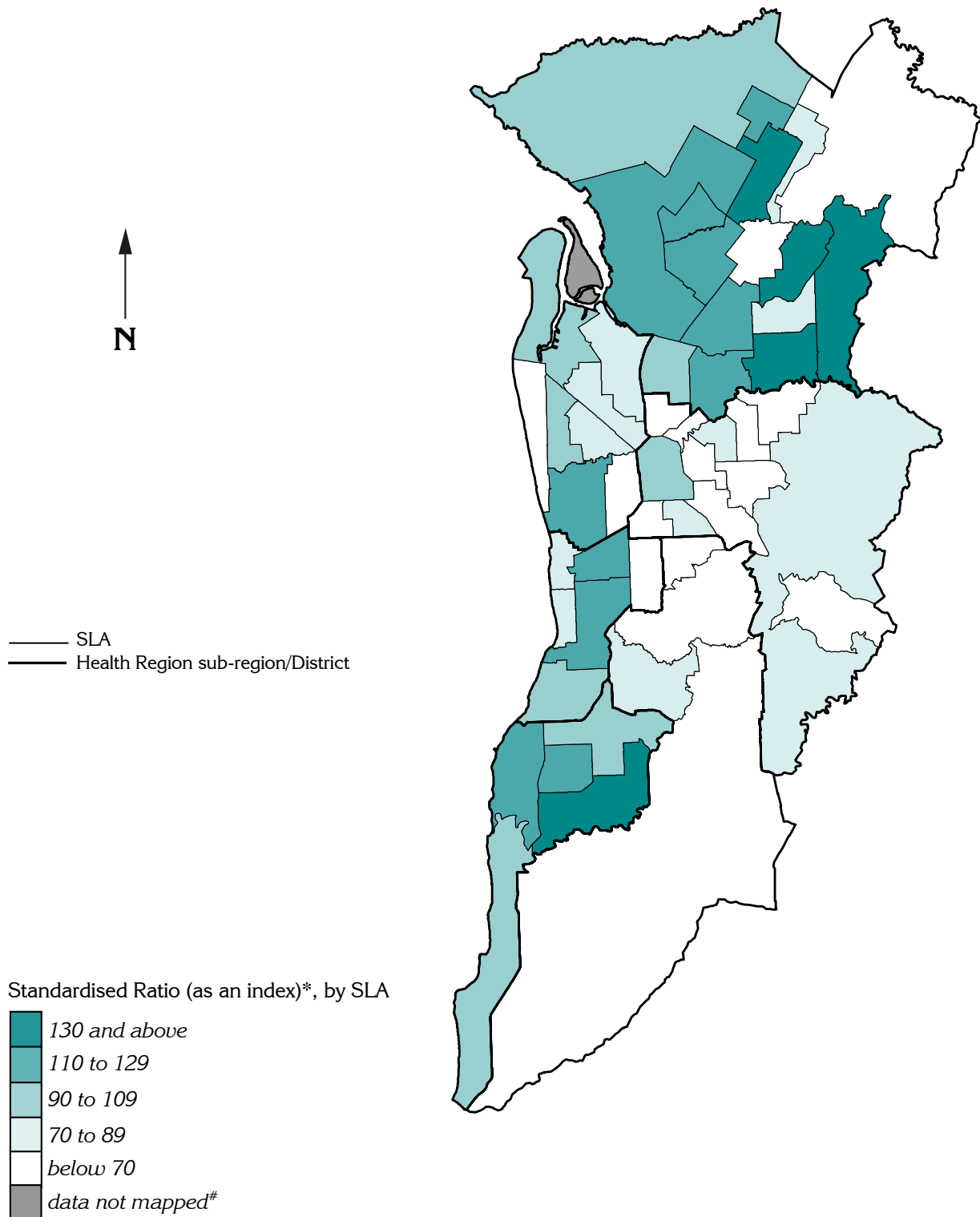
Southern Adelaide

Onkaparinga - Hackham SLA in Outer Southern District had a substantially elevated rate of potentially avoidable hospitalisations for asthma, 52% above the State rate (an SR of 152**), and the highest in the Southern Adelaide Region. The SLA of Onkaparinga - Morphett also had an elevated rate, with an SR of 129*.

Marion - Central SLA in the Urban Beaches District, had 90 admissions (and an SR of 119), the highest number for the Region. Onkaparinga - Woodcroft SLA in the Outer Southern District had the next largest number, with 88 admissions, an SR of 95.

The SLA with the lowest rate of potentially avoidable hospitalisations for asthma was Mitcham - West in the Urban Beaches District, with 45% fewer admissions than expected, an SR of 55**. The SLAs of Mitcham - North-East (an SR 58*) and - Hills (59**) and Onkaparinga - Hills (60*), also had substantially lower than expected rates.

Map 3.11:
Potentially avoidable hospitalisations: asthma, metropolitan regions,
South Australia, 2005/06 and 2006/07



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

Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: asthma, country South Australia, 2005/06 and 2006/07

The average number of admissions for asthma of people living in country areas of South Australia was 1,276 over the years 2005/06 and 2006/07, a rate of 277.7 admissions per 100,000 population (Table 3.25). This was notably (13%) more admissions than were expected from the State rate (an SR of 113**).

Table 3.25: Potentially avoidable hospitalisations¹: asthma by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	328	265.1	108
Murray Bridge	50	266.5	108
Victor Harbor	24	220.7	90
Balance of Hills Mallee Southern	308	412.2	116**
South East	155	223.2	91
Mount Gambier	51	191.0	78
Balance of South East	240	759.0	214**
Wakefield	284	266.3	108
Barossa - Tanunda	14	280.1	114
Balance of Wakefield	351	416.6	118**
Mid North	156	485.5	197**
Peterborough	5	247.9	101
Port Pirie City Districts - City	69	460.9	187**
Balance of Mid North	94	681.8	193**
Riverland	100	284.7	116
Eyre	90	240.2	97
Port Lincoln	45	290.3	118
Balance of Eyre	73	441.0	125
Northern & Far Western	163	296.2	120*
Cooper Pedy	12	602.9	245**
Port Augusta	68	440.3	179**
Roxby Downs	5	78.8	32**
Whyalla	63	257.9	105
Balance of Northern & Far Western	18	354.5	100
Country South Australia (incl. Gawler)	1,276	277.7	113**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.12)

There were 97% more admissions for asthma than expected in the Mid North Health Region (a substantially elevated SR, of 197**, and an average of 156 admissions) (Table 3.25). The lowest ratio was in the South East Region, with an SR of 91 (155 admissions).

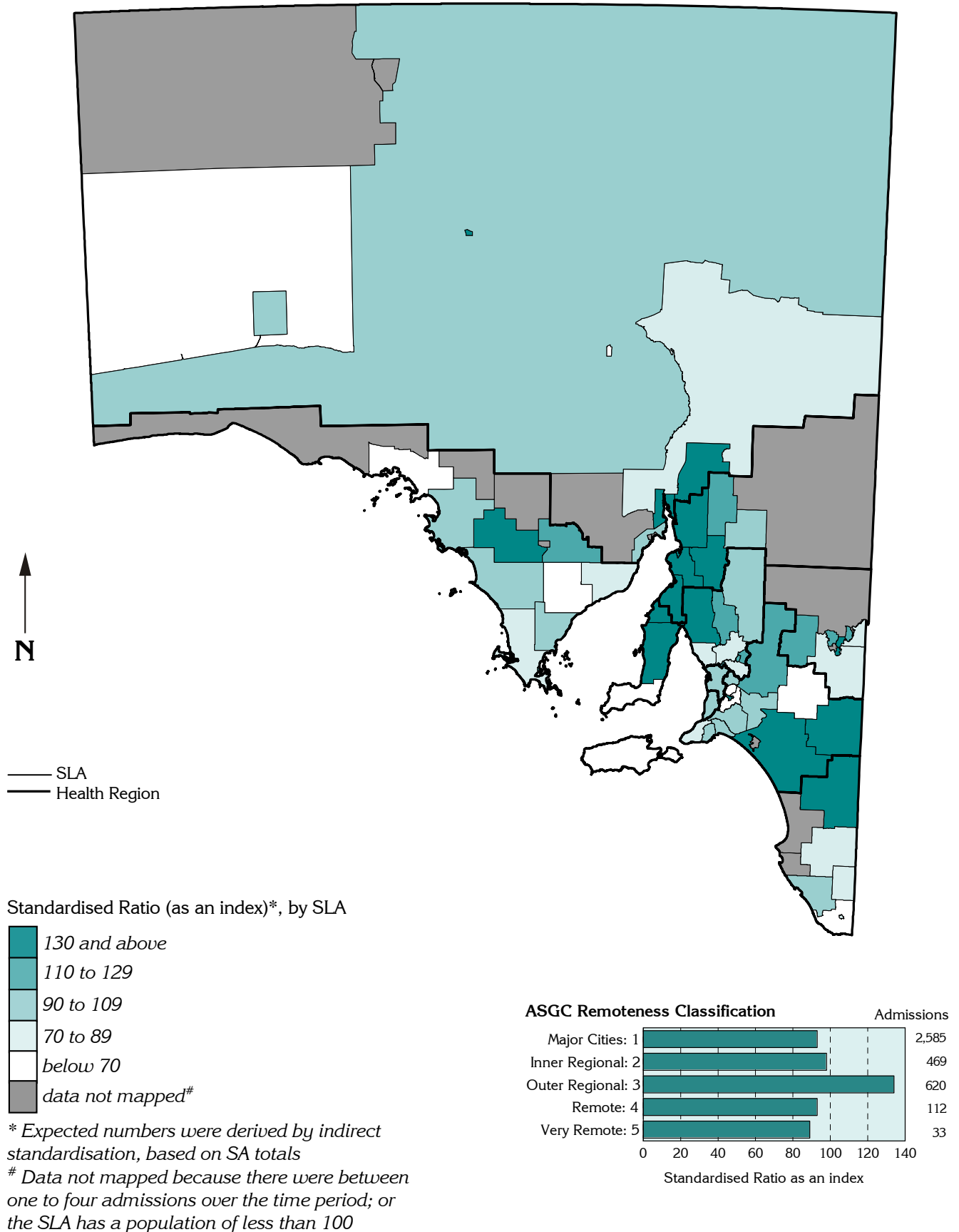
SLAs in country South Australia with the highest rates were mainly clustered around the mid north and lower eastern parts of the State. Areas with the highest ratios included Barunga West (an SR of 443**, and an average of 27 admissions), Mount Remarkable (309**, 21 admissions), Cooper Pedy (245**, twelve), Tatiara (228**, 43), The Coorong (200**, 31), Southern Mallee (197*, twelve), Port Pirie C Districts - City (187**, 69) and Port Augusta (179**, 68).

Areas with the lowest ratios included Grant (44**, an average of ten admissions), Mount Barker (an SR of 62, 14 admissions) and Adelaide Hills Balance (an SR of 67, 16 admissions).

Remoteness classification

The graph of remoteness shows the highest rates of potentially avoidable hospitalisations for asthma occurred in the Outer Regional areas of South Australia (a ratio of 134**). The ratios in the Remote (93) and Major Cities areas (93**) were both seven per cent below the State average, with the lowest ratio occurring in the Very Remote areas (an SR of 89).

Map 3.12:
Potentially avoidable hospitalisations: asthma, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: congestive cardiac failure, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for congestive cardiac failure of people living in Metropolitan Adelaide was 2,547 (Table 3.26). This was nine per cent fewer admissions than expected from the State rate, a standardised ratio (SR) of 91^{**}: rates in country South Australia were markedly higher (see over).

Table 3.26: Potentially avoidable hospitalisations¹: congestive cardiac failure, by metropolitan Health Regions and sub-regions, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,716	216.9	89^{**}
Northern sub-region	619	235.7	96
Western sub-region	561	215.9	88 ^{**}
Central East sub-region	537	199.6	82 ^{**}
Southern Adelaide	831	238.1	97
Urban Beaches District	414	226.5	93
Hills District	145	199.1	81 [*]
Outer Southern District	272	291.3	119 ^{**}
Adelaide (excl. Gawler)	2,547	223.4	91^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.13)

The distribution at the SLA level across Adelaide of potentially avoidable hospitalisations for congestive cardiac failure has similarities with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1). There were eleven per cent fewer hospitalisations in Central Northern Adelaide than expected from the State rate (an SR of 89^{**}) (Table 3.26). None of the sub-regions had an elevated rate, with the lowest rate in Central East (with an SR of 82^{**}).

In the Southern Adelaide Health Region, the rate was similar to the State rate (an SR of 97). The Outer Southern District had the highest rate, with an SR of 119^{**}, and the Hills District had the lowest, with an SR of 81^{*}.

Central Northern Adelaide

The Northern sub-region had three SLAs with highly elevated admission rates for congestive cardiac failure. Salisbury - Inner-North SLA had almost twice the expected rate of admissions, an SR of 197^{**}, and the SLAs of Playford - Elizabeth and Salisbury Balance both had over one-third more admissions than expected, with SRs of 137^{**} and 134, respectively. Adelaide Hills - Ranges, in Central East sub-region, also had a substantially elevated rate, an SR of 151^{*}.

West Torrens - West SLA, with 124 admissions, had the highest number of admissions for congestive cardiac failure in the Region. Tea Tree Gully - South (93 admissions), Playford - Elizabeth

(88) and Charles Sturt - North-East (86) also had high numbers.

The lowest rates in the Northern sub-region were in the SLAs of Playford - East Central (an SR of 43^{**}), Salisbury - North-East (54^{**}) and Playford - West (59^{**}), all with around half or fewer than the expected number of admissions. Charles Sturt - Coastal SLA (with an SR of 49^{**}) in the Western sub-region also had a lower than expected admission rate, whilst Unley - West, Burnside - North-East, and Walkerville SLAs had the lowest rates in the Central East sub-region, with SRs of 59^{*}, 60^{**} and 60^{*}, respectively.

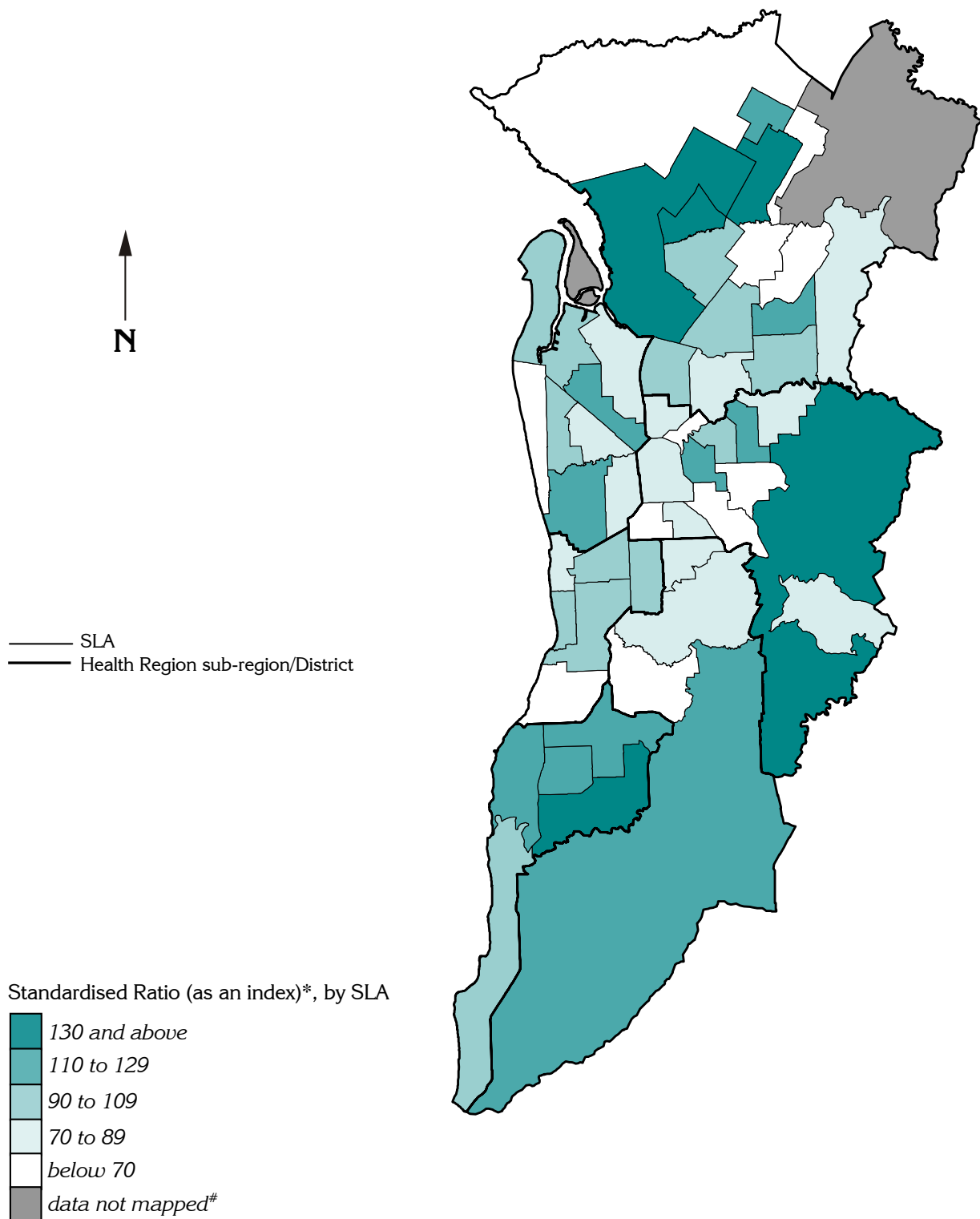
Southern Adelaide

In the Southern Adelaide Health Region, Onkaparinga - Hackham had a substantially elevated rate of potentially avoidable hospitalisations for congestive cardiac failure, and the highest in the Outer Southern District, with 75% more admissions than expected from the State rate (an SR of 175^{**}). The bordering SLA of Onkaparinga - Morphett also had an elevated rate, with an SR of 123.

Marion - Central and Marion - North SLAs in the Urban Beaches District had the highest number of admissions for congestive cardiac failure in the Region, 110 admissions and 94 admissions, respectively.

In Marion - South SLA, there were 52% fewer admissions for these conditions than expected from the State rate, an SR of 48^{*}, and the lowest in the Region. Onkaparinga - Reservoir SLA also had fewer admissions than expected, an SR of 60^{*}.

Map 3.13:
Potentially avoidable hospitalisations: congestive cardiac failure,
metropolitan regions, South Australia, 2005/06 and 2006/07



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

Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: congestive cardiac failure, country South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for congestive cardiac failure of people living in country areas of South Australia was 1,247, a rate of 291.2 admissions per 100,000 population (Table 3.27). This was markedly (19%) more admissions than were expected from the State rate (an SR of 119**).

Table 3.27: Potentially avoidable hospitalisations¹: congestive cardiac failure by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	308	241.7	99
Murray Bridge	58	314.3	128
Victor Harbor	46	184.7	75
Balance of Hills Mallee Southern	204	351.0	99
South East	172	302.1	123**
Mount Gambier	69	310.0	127*
Balance of South East	103	430.0	121*
Wakefield	297	273.1	112
Barossa - Tanunda	24	369.1	151**
Balance of Wakefield	273	386.7	109
Mid North	132	359.6	147**
Peterborough	9	377.1	154
Port Pirie City Districts - City	63	403.9	165**
Balance of Mid North	60	464.0	131*
Riverland	93	277.5	113
Eyre	123	383.1	157**
Port Lincoln	49	368.8	151**
Balance of Eyre	74	569.1	161**
Northern & Far Western	124	370.5	151**
Cooper Pedy	9	694.9	284**
Port Augusta	48	469.7	192**
Roxby Downs	0	0.0	0
Whyalla	54	305.6	125
Balance of Northern & Far Western	14	487.8	138
Country South Australia (incl. Gawler)	1,247	291.2	119**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.14)

The Eyre Region had the most highly elevated ratio, with 57% more admissions for congestive cardiac failure than expected (an SR of 157**, and an average of 123 admissions) (Table 3.27). Ratios in the Northern & Far Western and Mid North Regions were also approximately fifty per cent higher (SRs of 151** and 147**, with 124 and 132 admissions, respectively). Hills Mallee Southern had the lowest ratio (an SR of 99, 308 admissions).

The SLAs in country South Australia with the highest ratios included Ceduna, with a substantially elevated SR of 337**, 22 admissions), Orroroo/Carrieton (294**, and twelve admissions), Loxton Waikerie - West (207**, 27),

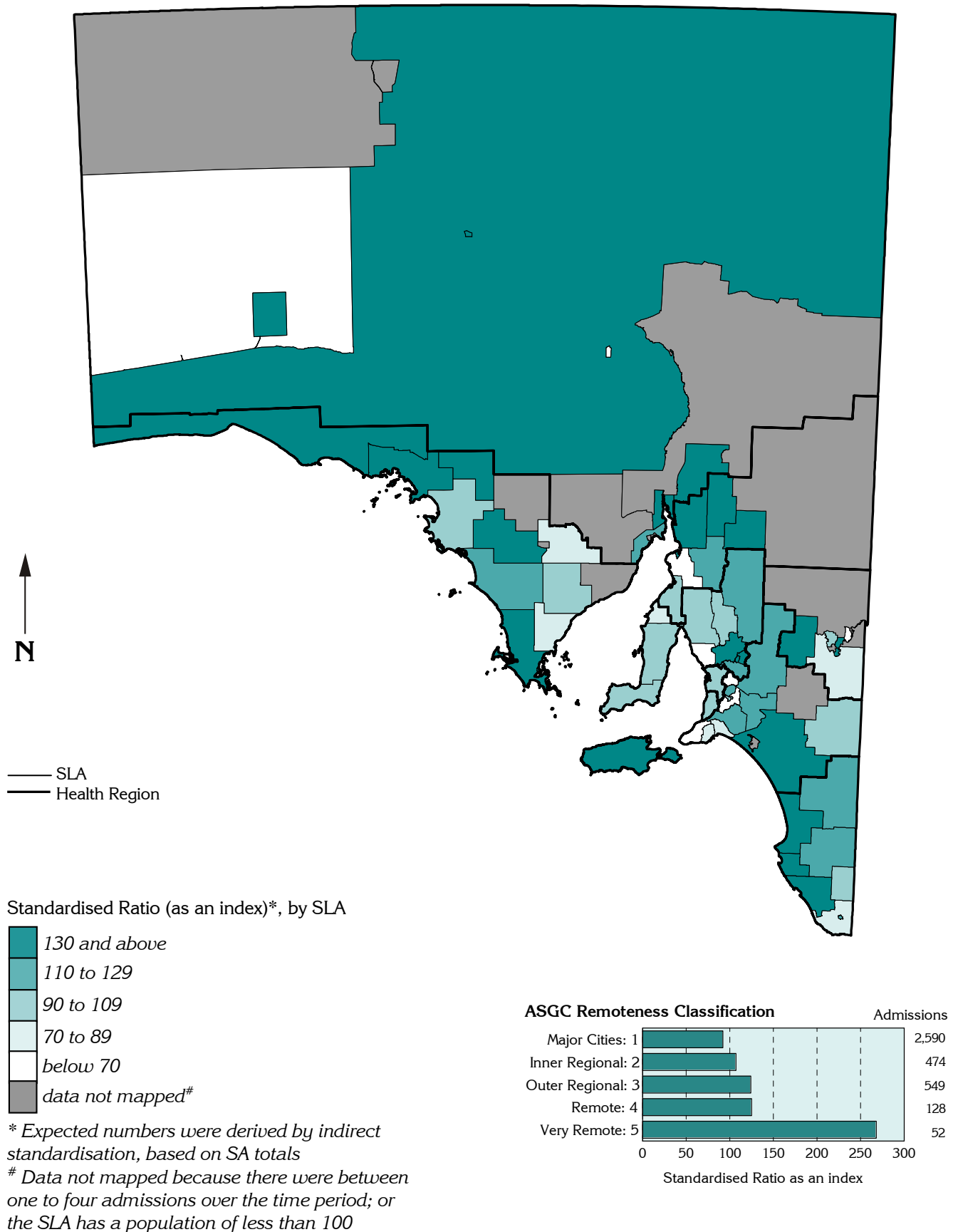
Port Augusta (192**, 48), Flinders Ranges (186, and ten admissions) and Light (175**, 35).

Renmark Paringa - Renmark had one of the lowest ratios in country South Australia (an SR of 68, and 13 admissions).

Remoteness classification

The graph of remoteness shows the admission rates of potentially avoidable hospitalisations for congestive cardiac failure increased slowly across the first four remoteness classes, then increased dramatically (more than doubled) in the Very Remote areas. The ratio in the Very Remote areas was 268**, compared with the other classes where the ratios were at much lower levels.

Map 3.14:
Potentially avoidable hospitalisations: congestive cardiac failure,
South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: ear, nose, and throat infections, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for ear, nose, and throat infections of people living in Metropolitan Adelaide was 2,326 (Table 3.28). This was nine per cent fewer admissions than expected from the State rate, a standardised ratio (SR) of 91^{**}: rates in country South Australia were markedly higher (see over).

Table 3.28: Potentially avoidable hospitalisations¹: ear, nose, and throat infections, by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,582	201.8	88^{**}
Northern sub-region	847	230.0	100
Western sub-region	301	150.8	66 ^{**}
Central East sub-region	434	200.9	88 ^{**}
Southern Adelaide	745	226.9	99
Urban Beaches District	297	227.7	99
Hills District	170	226.2	99
Outer Southern District	278	226.5	99
Adelaide (excl. Gawler)	2,326	209.2	91^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.15)

The distribution at the SLA level across Metropolitan Adelaide of rates of potentially avoidable hospitalisations for ear, nose, and throat infections has similarities with the distribution of the population of high socioeconomic status. The Central Northern Adelaide Health Region had 12% fewer admissions than expected from the State rate (an SR of 88^{**}) (Table 3.28). There was considerable variation across the sub-regions, with the lowest rate in Western, some 34% below the level expected from the State rate (an SR 66^{**}). The rates of admission in Southern Adelaide, and each of the sub-regions, were consistent with the State rate.

Central Northern Adelaide

The Northern sub-region contained the majority of SLAs with elevated rates of potentially avoidable hospitalisations for ear, nose, and throat infections. Tea Tree Gully - Hills (with an SR of 132), - South (123) and - North (118) all had high rates, although none were statistically significant. Unley - West (120) and Adelaide Hills - Ranges (151^{*}) SLAs had the highest rates in the Central East sub-region, with the Adelaide Hills - Ranges rate being the highest in the Region.

The three SLAs with the largest number of admissions for ear, nose, and throat infections, were all in the Northern sub-region: Tea Tree Gully - South, 89 admissions, an SR of 123; Salisbury - South-East, 85 and 98; and Tea Tree Gully - North, 81 and 118. None of these ratios were statistically significant.

The Western sub-region had the lowest ratios for potentially avoidable hospitalisations for these conditions in the Region. In Charles Sturt - North-East, there were 50% fewer admissions than expected from the State rate, an SR of 50^{**}; while the SLAs of Port Adelaide Enfield - Park, - Coast and West Torrens - East all had 47% fewer admissions than expected (an SR of 53^{**}). In the Central East sub-region, Prospect (with an SR of 56^{**}) and Burnside - North-East (69^{*}) SLAs had the lowest ratios.

Southern Adelaide

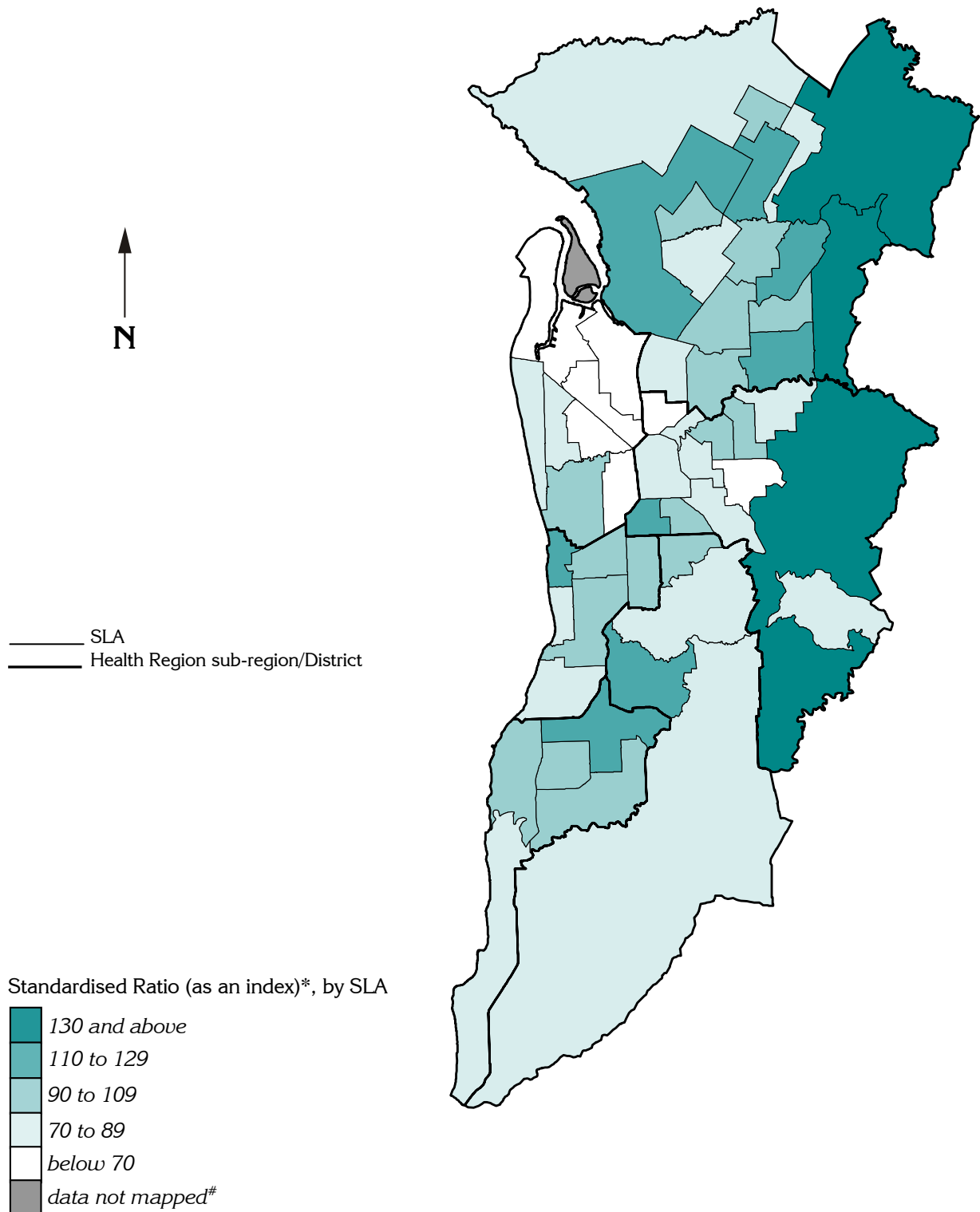
In the Hills District, Onkaparinga - Reservoir had 18% more potentially avoidable hospitalisations than expected from the State rate for ear, nose, and throat infections, an SR of 118. Onkaparinga - Woodcroft SLA in the Outer Southern District had a similar ratio (an SR of 115). Holdfast Bay - North SLA, had the highest ratio in the Urban Beaches District, an SR of 114.

The Onkaparinga SLAs of Woodcroft and Reservoir had the largest number of admissions for ear, nose, and throat infections, with 99 and 72 admissions, respectively. Marion - Central SLA had 74 admissions, five per cent more than expected.

Onkaparinga - South-Coast SLA in the Outer Southern District had the lowest ratio for hospitalisations for these conditions in the Region, an SR of 77. Mitcham - Hills SLA in the Hills District had a similarly low ratio, with an SR of 80.

Map 3.15:

Potentially avoidable hospitalisations: ear, nose, and throat infections, metropolitan regions, South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: ear, nose, and throat infections, country South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations for ear, nose and throat infections of people living in country areas of South Australia over the years 2005/06 and 2006/07 was 1,220, a rate of 267.2 admissions per 100,000 population (Table 3.29). This was markedly (17%) more admissions than were expected from the State rate (an SR of 117**).

Table 3.29: Potentially avoidable hospitalisations¹: ear, nose, and throat infections by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	269	220.9	96
Murray Bridge	35	187.8	82
Victor Harbor	19	180.6	79
Balance of Hills Mallee Southern	215	358.9	101
South East	145	208.8	91
Mount Gambier	37	135.7	59**
Balance of South East	108	396.1	112
Wakefield	249	235.8	103
Barossa - Tanunda	11	229.0	100
Balance of Wakefield	238	365.1	103
Mid North	139	438.3	191**
Peterborough	12	582.4	254**
Port Pirie City Districts - City	54	357.6	156**
Balance of Mid North	74	774.9	219**
Riverland	101	288.3	126*
Eyre	124	330.3	144**
Port Lincoln	47	298.6	130
Balance of Eyre	77	546.0	154**
Northern & Far Western	194	347.9	152**
Cooper Pedy	11	572.2	250**
Port Augusta	69	439.2	192**
Roxby Downs	11	183.6	80
Whyalla	85	347.9	152**
Balance of Northern & Far Western	18	362.7	102
Country South Australia (incl. Gawler)	1,220	267.2	117**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.16)

The rate of potentially avoidable hospitalisations for ear, nose and throat infections in the Mid North Region was almost twice the State rate (an SR of 191**, and an average of 139 admissions) (Table 3.29). The South East Region had the lowest ratio (an SR of 91, and 145 admissions).

There were around six to eight times the expected number of admissions for these potentially avoidable hospitalisations, when compared with the State average, in the Unincorporated West Coast (an SR of 823**, and eleven admissions) and Mount Remarkable (682**, and 41 admissions) SLAs. Areas with rates twice the State average included Peterborough (254**, twelve admissions), Cooper Pedy (250**, eleven admissions), The Coorong

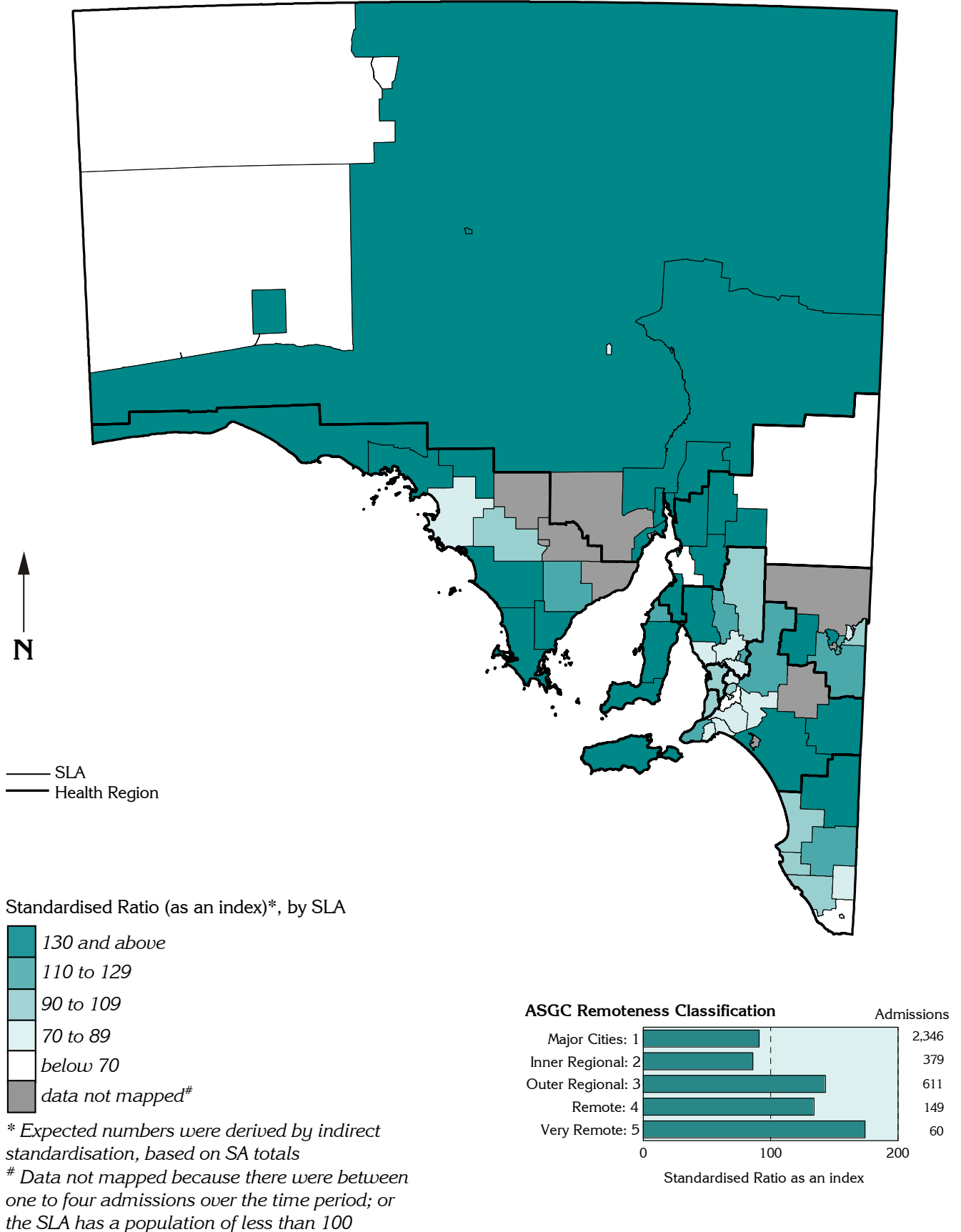
(249**, 36), Tatiara (224**, 39), Southern Mallee (220**, 13), Ceduna (219**, 22), Loxton Waikerie - West (203**, 22) and Yorke Peninsula - South (202**, 16).

Areas with low rates included Mount Barker Balance (an SR of 46**, and an average of ten admissions) and Mount Gambier (59**, 37).

Remoteness classification

The highest rate of potentially avoidable hospitalisations for ear, nose, and throat infections occurred in the Very Remote areas of South Australia, with a ratio of 174**. The Outer Regional areas and Remote areas of South Australia had the next highest ratios, of 143** and 134**, respectively. The lowest rate of admission occurred in the Inner Regional areas, a ratio of 86**.

Map 3.16:
Potentially avoidable hospitalisations: ear, nose, and throat infections,
South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: pyelonephritis, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for pyelonephritis of people living in Metropolitan Adelaide was 2,558 (Table 3.30). The standardised ratio (SR) of 100 indicates that this number was consistent with that expected from the State rate.

Note that the AIHW code set for this condition also includes admissions for urinary tract infections.

Table 3.30: Potentially avoidable hospitalisations¹: pyelonephritis by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,810	227.9	101
Northern sub-region	770	255.1	113**
Western sub-region	519	217.4	97
Central East sub-region	521	205.4	91*
Southern Adelaide	749	218.5	97
Urban Beaches District	346	211.5	94
Hills District	141	188.4	84*
Outer Southern District	262	251.0	112
Adelaide (excl. Gawler)	2,558	225.1	100

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.17)

The distribution at the SLA level across Adelaide of potentially avoidable hospitalisations for pyelonephritis has a strong association with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1) and shown in the correlation analysis (Table 3.34).

In the Central Northern Adelaide Health Region, the rate of potentially avoidable hospitalisations for pyelonephritis was consistent with that expected from the State rate (an SR of 101) (Table 3.30). The Northern sub-region had 13% (an SR of 113**) more admissions than expected, while the Central East sub-region had nine per cent fewer than expected, an SR of 91*.

The rate of admission in the Southern Adelaide Health Region was marginally below the State rate, an SR of 97. The admission rates across the sub-regions varied from an SR of 84* in the Hills District to an SR of 112 in the Outer Southern District.

Central Northern Adelaide

Excluding Charles Sturt - North-East SLA in the Western sub-region (with a ratio of 125*), all the other SLAs with high hospitalisation rates for pyelonephritis were located in the Northern sub-region: Port Adelaide Enfield - Inner had the highest rate (an SR of 175**). Other elevated rates were in the Salisbury SLAs of - Balance (an SR of 144), - Central (144**) and - Inner North (128); and Playford - Hills and - West Central, with SRs of 132 and 126, respectively.

Port Adelaide Enfield - Inner, with 92 admissions, had the largest number of admissions in the Region as well as the highest rate. West Torrens - West was the SLA with the second largest number of admissions for pyelonephritis, 84 (and an SR of 100), similar to the number of admissions in the SLAs of Salisbury - South-East (81 admissions, an SR of 115), Port Adelaide Enfield - Coast (80, 120) and Charles Sturt - North-East (80, 125*).

Burnside - North-East and Charles Sturt - Coastal had the lowest hospitalisation rates for pyelonephritis (SRs of 65**, and 68**, respectively).

Southern Adelaide

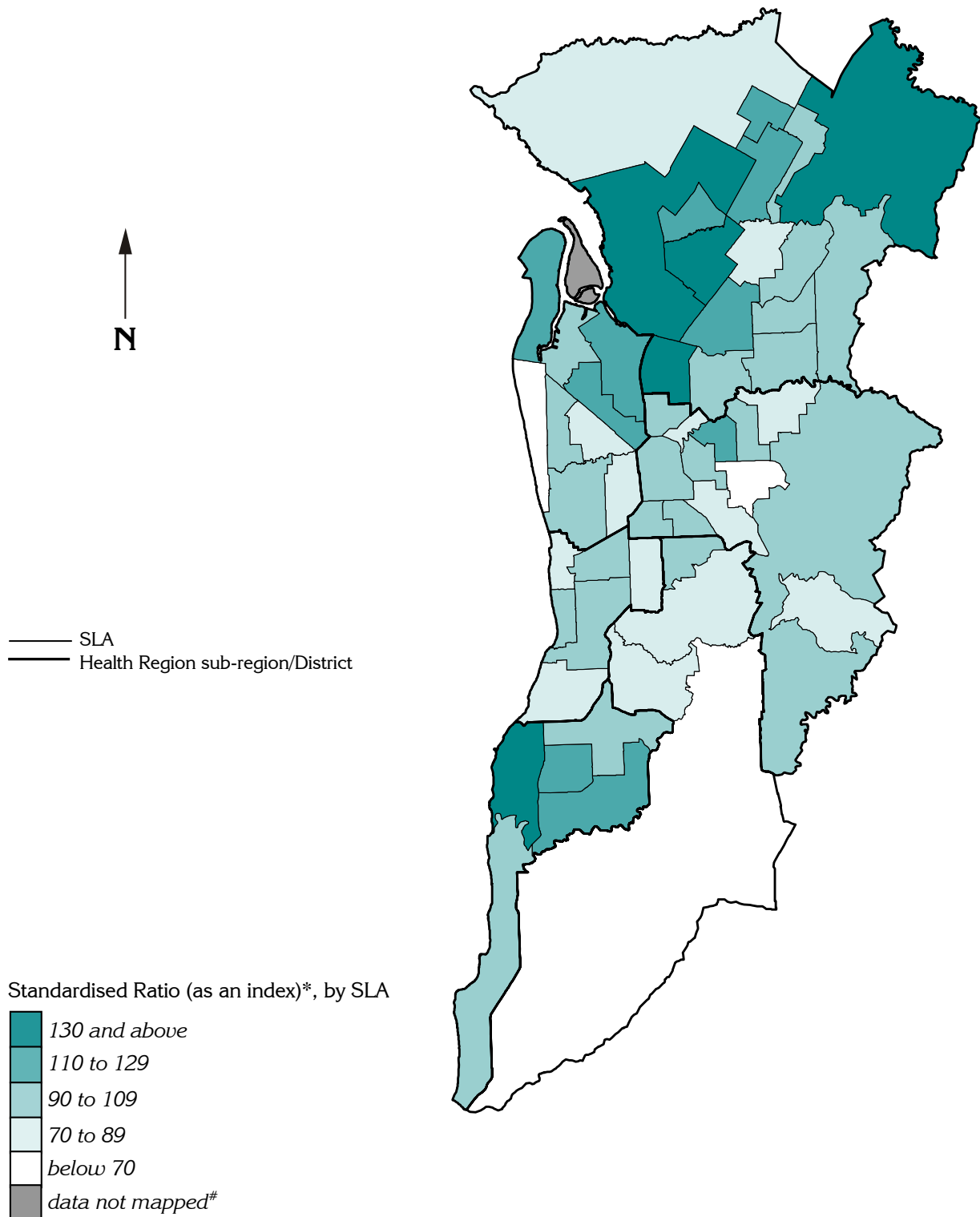
Onkaparinga - North Coast in the Outer Southern District had the highest potentially avoidable hospitalisation rate for pyelonephritis in the Region, with 40% more expected admissions from the State rate, an SR of 140**.

Two SLAs in the Urban Beaches District had the highest average number of **potentially avoidable hospitalisations** for pyelonephritis: Marion - Central, 92 admissions, an SR of 103, and Marion - North, 79 admissions, an SR of 105.

Onkaparinga - Hills SLA in the Hills District had the lowest potentially avoidable hospitalisation rate in the Region, 32% below the level expected from State rate (an SR of 68, and only 17 admissions). Mitcham - Hills SLA, also in the Hills District, had the second lowest rate, 23% below expected levels, an SR of 77.

Map 3.17:

Potentially avoidable hospitalisations: pyelonephritis, metropolitan regions, South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: pyelonephritis, country South Australia, 2005/06 and 2006/07

There were 927 potentially avoidable hospitalisations for pyelonephritis (includes urinary tract infections) of people living in country areas of South Australia over 2005/06 and 2006/07, a rate of 214.6 admissions per 100,000 population (Table 3.31). This was five per cent fewer admissions than expected (an SR of 95).

Table 3.31: Potentially avoidable hospitalisations¹: pyelonephritis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	232	187.1	83**
Murray Bridge	31	166.7	74
Victor Harbor	28	147.4	66**
Balance of Hills Mallee Southern	174	315.0	89
South East	117	193.5	86
Mount Gambier	36	151.9	68**
Balance of South East	81	346.2	98
Wakefield	214	202.0	90
Barossa - Tanunda	10	177.0	79
Balance of Wakefield	204	320.2	90
Mid North	106	311.0	138**
Peterborough	14	618.0	275**
Port Pirie City Districts - City	49	326.5	145**
Balance of Mid North	44	405.5	115
Riverland	72	216.1	96
Eyre	75	225.7	100
Port Lincoln	29	210.6	94
Balance of Eyre	46	372.1	105
Northern & Far Western	112	271.6	121*
Cooper Pedy	7	414.1	184
Port Augusta	38	315.4	140**
Roxby Downs	#	..	..
Whyalla	57	289.3	129
Balance of Northern & Far Western	9	243.3	69
Country South Australia (incl. Gawler)	927	214.6	95

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Rate not shown or not calculated, as there were between one to four admissions over the time period

Country South Australia and Health Regions (Map 3.16)

The distribution at the SLA level across country SA of potentially avoidable hospitalisations for pyelonephritis has a strong association with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.2) and shown in the correlation analysis (Table 3.34).

Mid North Health Region had the highest ratio (an SR of 138**, and an average of 106 admissions) (Table 3.31). The lowest ratios were in the Hills Mallee Southern and South East Regions (SRs of 83**, and 232 admissions; and 86**, and 117 admissions, respectively).

The SLAs with the highest rates were Peterborough (an SR of 275**, and an average of 14 admissions)

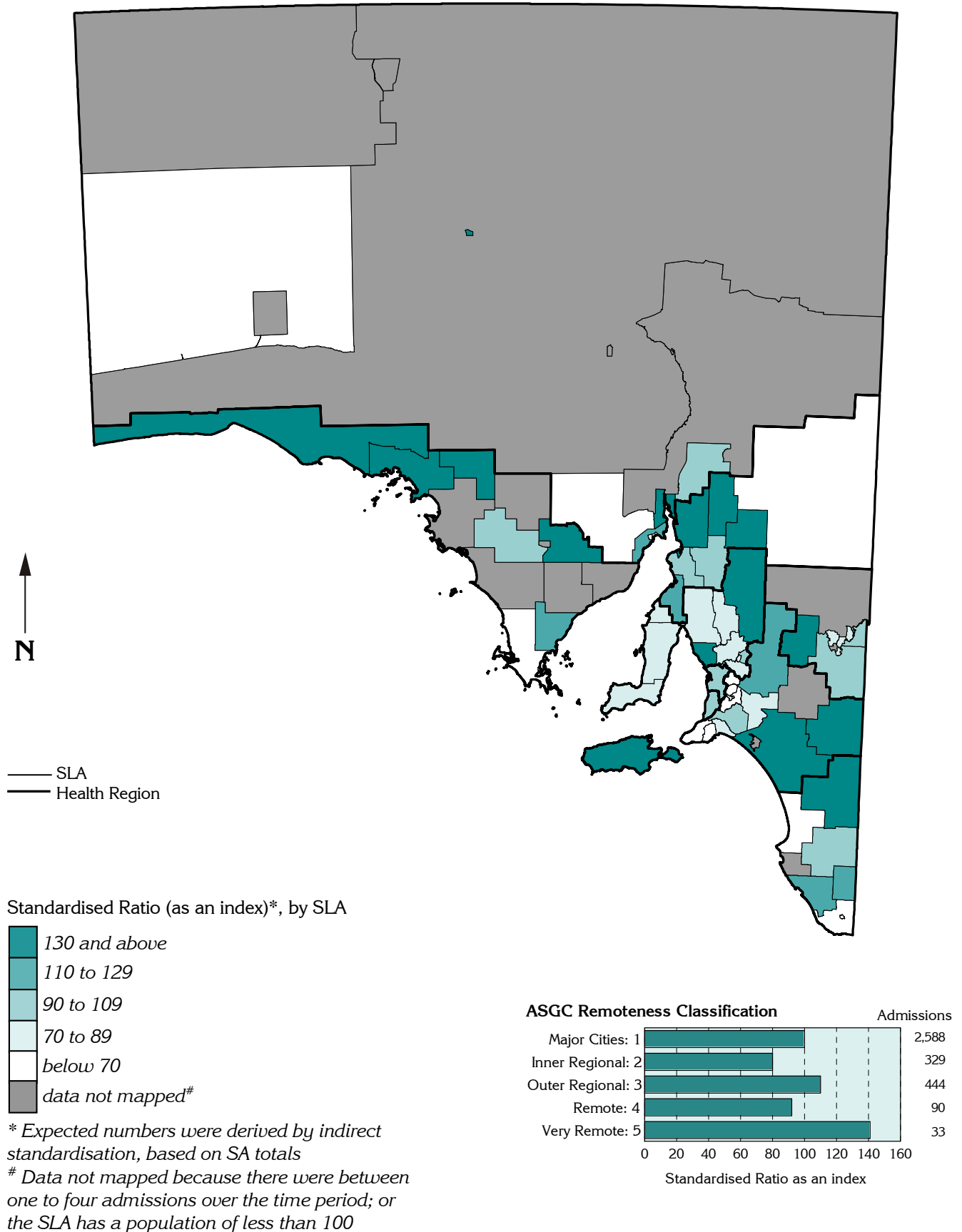
and Ceduna (236**, 17 admissions). In the south/south-east of the State, the rates were highest in the SLAs of Southern Mallee (185*, ten admissions) and The Coorong (159*, 20), and in the north in Mallala (155*, 22), Port Pirie City Districts - City (145**, 49) and Port Augusta (140*, 38).

Areas with rates approximately 30% lower than the State average included Victor Harbor, Mount Gambier and Adelaide Hills Balance.

Remoteness classification

The highest annual rate of hospitalisation for pyelonephritis was calculated for the Very Remote areas of South Australia, with a ratio of 141*. The Outer Regional areas and Major Cities of South Australia had the next highest ratios, 110*, and 100 (equalling the State rate), respectively. The Inner Regional areas had the lowest ratio, of 80**.

Map 3.18:
Potentially avoidable hospitalisations: pyelonephritis, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: angina, metropolitan regions, South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for angina of people living in Metropolitan Adelaide was 1,941 (Table 3.32). This is ten per cent fewer admissions than expected from the State rate, an SR of 90^{**}; rates in country South Australia were markedly higher (see over).

Table 3.32: Potentially avoidable hospitalisations¹: angina by metropolitan Health Regions and sub-regions/Districts, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,447	185.2	96^{**}
Northern sub-region	764	264.9	138 ^{**}
Western sub-region	418	172.0	90 [*]
Central East sub-region	265	105.9	55 ^{**}
Southern Adelaide	494	144.5	75^{**}
Urban Beaches District	263	158.5	82 ^{**}
Hills District	70	93.4	49 ^{**}
Outer Southern District	162	159.6	83 [*]
Adelaide (excl. Gawler)	1,941	172.8	90^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.19)

The distribution at the SLA level across Metropolitan Adelaide of potentially avoidable hospitalisations for angina has a very strong association with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1) and shown in the correlation analysis (Table 3.34).

The rate in the Central Northern Adelaide Health Region was marginally below the level expected from the State rate (an SR of 96^{**}), with 185.2 admissions per 100,000 population (Table 3.32). In the Northern sub-region, there were almost forty per cent more admissions than expected (an SR of 138^{**}), while numbers in Central East sub-region were 45% lower (an SR of 55^{**}).

The rate of potentially avoidable hospitalisations in Southern Adelaide Health Region for angina was 25% below the State rate, with 144.5 admissions per 100,000 population (an SR of 75^{**}). The Urban Beaches and Outer Southern sub-regions had similar admission rates, with SRs of 82^{**} and 83^{*}, respectively, while the rate in the Hills District was substantially lower (an SR of 49^{**}).

Central Northern Adelaide

The SLAs with the most elevated rates were clustered in the Northern sub-region. Playford - West Central had the highest hospitalisation rate, with over three times the expected numbers from the State, an SR of 330^{**}. Playford - Elizabeth (an SR of 264^{**}) and - West (141) SLAs also had higher than expected rates. The SLAs of Salisbury - Inner

North, - Central, and -Balance, also had elevated rates, with SRs of 230^{**}, 170^{**} and 147, respectively.

Playford - Elizabeth had the largest number of admissions (133 admissions). High numbers were also recorded for the SLAs of Tea Tree Gully - South (79 admissions, an SR of 114), Salisbury - Central (78, an SR of 170^{**}) and Salisbury - South East (76, an SR of 127^{*}) in the Northern sub-region.

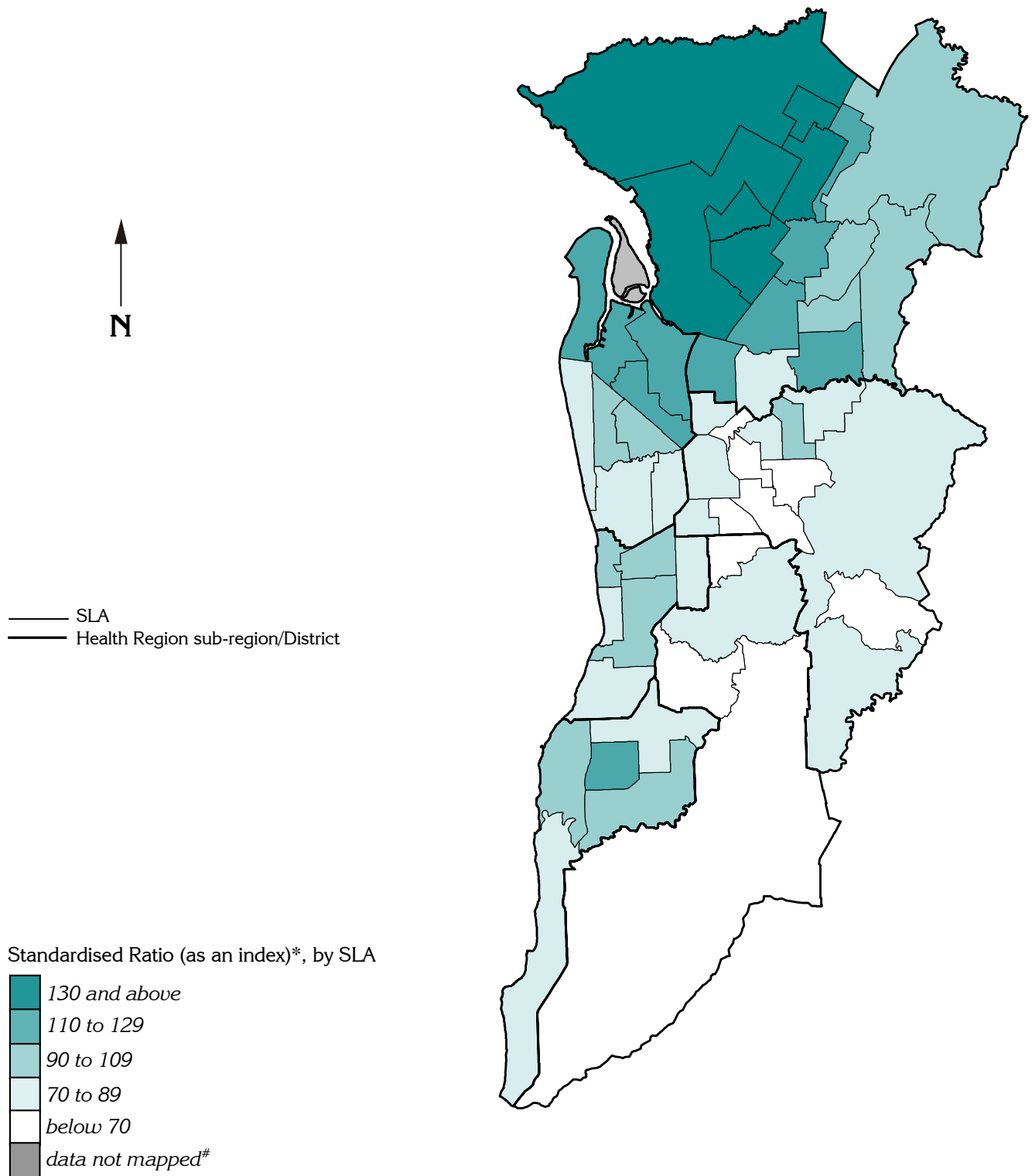
The Central East sub-region contained the SLAs with the lowest rates. Burnside - South-West and - North-East SLAs had the lowest rates, with SRs of 31^{**}, and 19^{**}, respectively, followed by Adelaide Hills - Central (an SR of 37^{**}). The admission rates for Walkerville (46^{*}), Unley - East (48^{**}) and Norwood Payneham St Peters - West (48^{**}) SLAs were at least fifty per cent below expected.

Southern Adelaide

Onkaparinga - Morphett SLA in the Outer Southern District had the highest hospitalisation rate in the Region, an SR of 121. Marion - Central was the other SLA to have a higher than expected hospitalisation rate, with a marginally elevated SR of 103, and the highest average number of admissions for (84), and Marion - North SLA the next largest, with 56 admissions.

The three lowest rates for angina were all fifty or more per cent below the State average: Onkaparinga - Reservoir had the lowest rate of potentially avoidable hospitalisations, an SR of 44^{**}, followed by Onkaparinga - Hills (an SR of 46) and Mitcham - North-East (48^{**}).

Map 3.19:
Potentially avoidable hospitalisations: angina, metropolitan regions,
South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: angina, country South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for angina of people living in country areas of South Australia was 1,038, a rate of 233.1 admissions per 100,000 population (Table 3.33). This was markedly (21%) more admissions than were expected from the State rate (an SR of 121**).

Table 3.33: Potentially avoidable hospitalisations¹: angina by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	279	210.9	110
Murray Bridge	33	176.1	92
Victor Harbor	59	264.3	138*
Balance of Hills Mallee Southern	187	377.6	107
South East	155	260.2	135**
Mount Gambier	75	334.6	174**
Balance of South East	80	396.4	112
Wakefield	265	238.6	124**
Barossa - Tanunda	7	123.2	64
Balance of Wakefield	258	451.2	127**
Mid North	105	287.6	150**
Peterborough	7	263.9	137
Port Pirie City Districts - City	56	359.8	187**
Balance of Mid North	42	422.8	119
Riverland	77	225.6	117
Eyre	70	210.4	109
Port Lincoln	35	259.6	135
Balance of Eyre	36	327.4	92
Northern & Far Western	89	226.5	118
Cooper Pedy	5	272.6	142
Port Augusta	42	355.7	185**
Roxby Downs	#	..	..
Whyalla	32	162.4	85
Balance of Northern & Far Western	10	355.5	100
Country South Australia (incl. Gawler)	1,038	233.1	121**

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Rate not shown or not calculated, as there were between one to four admissions over the time period

Country South Australia and Health Regions (Map 3.20)

All the Country Health Regions had elevated rates of potentially avoidable hospitalisations for angina when compared with the State average (Table 3.33). Mid North had the highest ratio, with 50% more admissions than expected (an SR of 150**, and 105 admissions). The regions with the lowest ratios were Hills Mallee Southern (110, 279 admissions) and Eyre (109, 70).

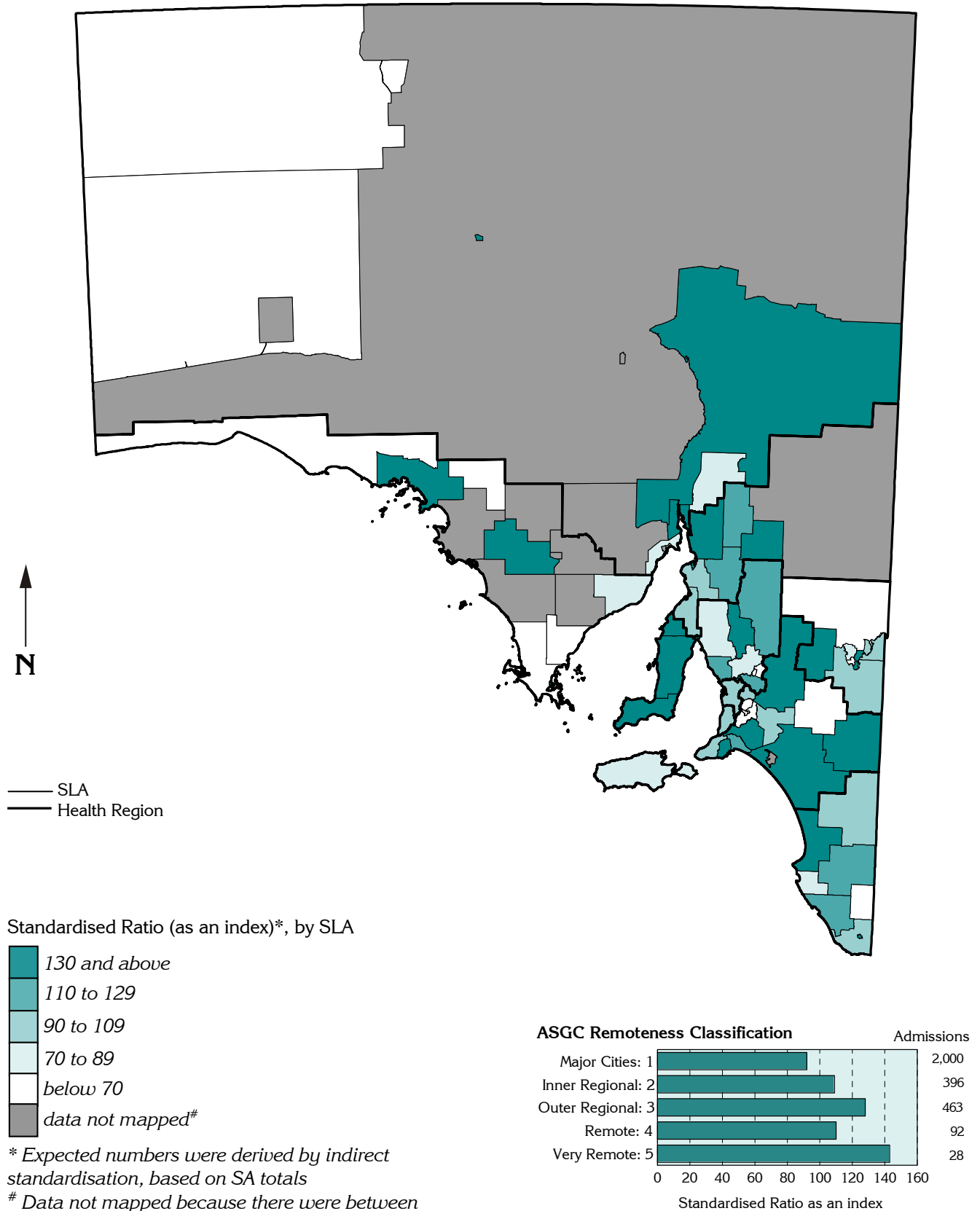
SLAs in the country areas of South Australia with highly elevated rates included Southern Mallee (an SR of 248**, and an average of twelve admissions), Ceduna (233**, 13 admissions), Port Pirie City Districts - City (187**, 56), Port Augusta (185**, 42), Mount Gambier (174**, 75) and Gawler (173**, 68).

SLAs with the lowest rates included the hills areas of Adelaide Hills Balance (an SR of 59, ten admissions) and Mount Barker - Central (62*, 19 admissions). Other areas with low rates included Barossa - Angaston (an SR of 54), Lower Eyre Peninsula (57), Mount Barker Balance (59), Barossa - Tanunda (64) and Tumby Bay (68). However, the average number of admissions in each of these areas was only between five and nine.

Remoteness classification

The highest annual rate of potentially avoidable hospitalisations for angina was calculated for the Very Remote areas of South Australia, with a ratio of 143. The Inner Regional and Remote areas had similar ratios, of 109 and 110 respectively. Major Cities had the lowest hospitalisation ratio, of 92**.

Map 3.20:
Potentially avoidable hospitalisations: angina, South Australia, 2005/06 and 2006/07



* Expected numbers were derived by indirect standardisation, based on SA totals
[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Potentially avoidable hospitalisations: cellulitis, metropolitan regions, South Australia, 2005/06 and 2006/07

The average number of potentially avoidable hospitalisations for cellulitis of people living in Metropolitan Adelaide over the years 2005/06 and 2006/07 was 1,671, a rate of 148.3 admissions per 100,000 population (Table 3.34). This was ten per cent fewer admissions than expected from the State rate, a standardised ratio (SR) of 90^{**}; rates in country South Australia were markedly higher (see over).

Table 3.34: Potentially avoidable hospitalisations¹: cellulitis by metropolitan Health Regions and sub-regions, South Australia, 2005/06 and 2006/07

Health Region and sub-region/District	Average number ²	Rate ³	SR ⁴
Central Northern Adelaide	1,118	141.9	87^{**}
Northern sub-region	511	163.3	100
Western sub-region	259	112.9	69 ^{**}
Central East sub-region	349	141.8	86 ^{**}
Southern Adelaide	553	163.0	99
Urban Beaches District	232	150.2	92
Hills District	102	131.9	80 [*]
Outer Southern District	220	203.6	124 ^{**}
Adelaide (excl. Gawler)	1,671	148.3	90^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Metropolitan regions (Map 3.21)

In the Central Northern Adelaide Health Region, potentially avoidable hospitalisation rates for cellulitis were markedly lower than expected from the State rates (an SR of 87^{**}), with 141.9 admissions per 100,000 population (Table 3.34). Compared with this regional rate, there were more admissions of people living in the Northern sub-region (an SR of 100^{**}), and fewer from the Western sub-region (an SR of 69^{**}).

Overall, rates in the Southern Adelaide Region were consistent with the State rate for potentially avoidable hospitalisations for cellulitis. Within the Region, the Outer Southern District had a markedly larger number of admissions than expected from the State rate (an SR of 124^{**}), while Urban Beaches and Hills District had markedly fewer than expected, with an SR of 80^{**}.

Central Northern Adelaide

The Northern sub-region contained a cluster of SLAs with higher, and some substantially higher, than expected numbers of admissions for cellulitis: Playford - Elizabeth and Salisbury - Balance had had SRs of 171^{**} and 159^{**} respectively. Playford - West Central (with an SR of 135), Salisbury - Inner North (135) and Playford - West (122) also had elevated ratios, although none were statistically significance. Adelaide Hills - Ranges (with an SR of 126) and Adelaide (123) had the highest rates in the Central East sub-region.

As well as having the highest admission rate in the Region, Playford - Elizabeth also had the largest number of admissions (70 admissions). West Torrens - West SLA had the next largest number of admissions, 55; while Port Adelaide Enfield - East had a similar number with 54 admissions.

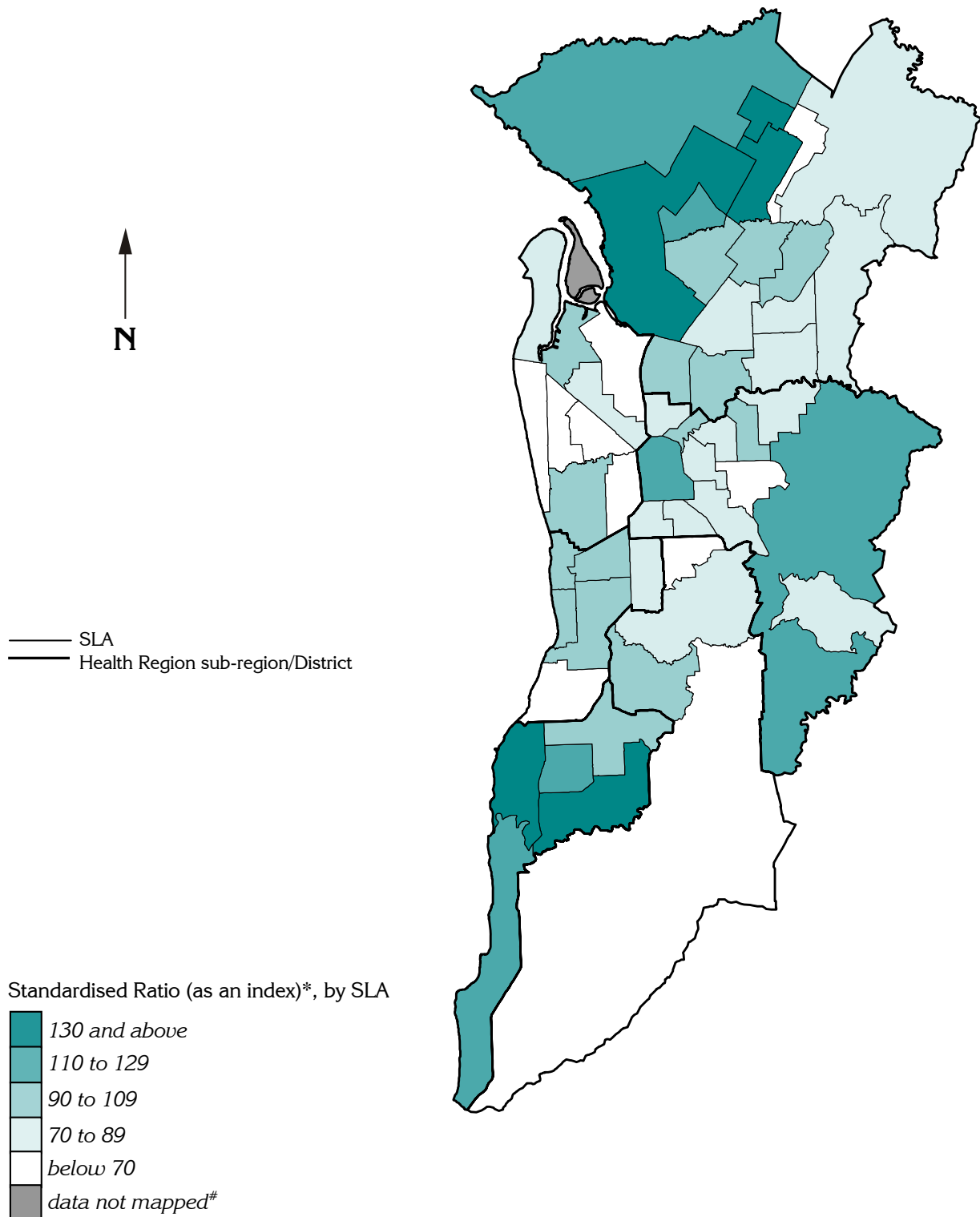
The majority of SLAs with low admission rates for cellulitis were in the Western sub-region. They included Port Adelaide Enfield - Park (with an SR of 42^{**}), Charles Sturt - Coastal (50^{**}), West Torrens - East (50^{**}), Charles Sturt - Inner West (55), and - Inner East (61^{*}). Playford - East Central SLA (with an SR of 60^{*}) had the lowest rate in the Northern sub-region, while Burnside - North-East SLA (56^{**}) had the lowest rate in Central East.

Southern Adelaide

The SLAs of Onkaparinga - North Coast and - Hackham in the Outer Southern District both had substantially more potentially avoidable hospitalisations for cellulitis than expected from the State rate, with SRs of 154^{**} and 153^{**}, respectively. The neighbouring SLAs of Onkaparinga - South Coast (with an SR of 129) and - Morphett (111) also had elevated numbers of admissions. Marion - Central and Onkaparinga - Woodcroft had the highest number of admissions for cellulitis, with 60 and 53 admissions, respectively.

The lowest ratio in the Region was recorded for Onkaparinga - Hills, an SR of 59. The SLAs of Mitcham - North-East, and Marion - South also had fewer than expected admissions for cellulitis, with SRs of 63^{*} and 64, respectively.

Map 3.21:
Potentially avoidable hospitalisations: cellulitis, metropolitan regions,
South Australia, 2005/06 and 2006/07



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

[#] Data not mapped because there were between one to four admissions over the time period; or the SLA has a population of less than 100

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Potentially avoidable hospitalisations: cellulitis, country South Australia, 2005/06 and 2006/07

Over 2005/06 and 2006/07, the average number of potentially avoidable hospitalisations for cellulitis of people living in country areas of South Australia was 854, a rate of 193.5 admissions per 100,000 population (Table 3.35). This was markedly (18%) more admissions than were expected from the State rate (an SR of 118^{**})

Table 3.35: Potentially avoidable hospitalisations¹: cellulitis by country Health Regions, Towns, and Balance, South Australia, 2005/06 and 2006/07

Health Region, Town, or Balance	Average number ²	Rate ³	SR ⁴
Hills Mallee Southern	184	145.0	88
Murray Bridge	22	116.6	71
Victor Harbor	19	108.7	66
Balance of Hills Mallee Southern	144	340.7	96
South East	129	209.3	128^{**}
Mount Gambier	40	169.6	103
Balance of South East	90	504.1	142 ^{**}
Wakefield	207	191.8	117^{**}
Barossa - Tanunda	11	205.3	125
Balance of Wakefield	196	412.8	117 [*]
Mid North	100	294.5	180^{**}
Peterborough	11	496.2	303 ^{**}
Port Pirie City Districts - City	54	367.8	224 ^{**}
Balance of Mid North	35	441.4	125
Riverland	66	196.5	120
Eyre	68	199.2	122
Port Lincoln	25	179.2	109
Balance of Eyre	43	459.4	130
Northern & Far Western	102	231.3	141^{**}
Cooper Pedy	10	498.3	304 ^{**}
Port Augusta	30	230.7	141
Roxby Downs	5	193.0	118
Whyalla	44	211.5	129
Balance of Northern & Far Western	14	501.8	142
Country South Australia (incl. Gawler)	854	193.5	118^{**}

¹ Admissions resulting from ACS conditions

² Average number of admissions over the two years 2005/06 and 2006/07

³ Rate is the age standardised rate per 100,000 population

⁴ SR=Standardised Ratio, percentage of variation in the region from the ratio of 100 in South Australia

Country South Australia and Health Regions (Map 3.22)

Mid North Health Region had the highest ratio for potentially avoidable hospitalisations from cellulitis, 80% more admissions than expected from the State average (an SR of 180^{**}, and 100 admissions) (Table 3.35). Rates in Northern & Far Western Region were 41% above the expected level (an SR of 141^{**}, 102 admissions). The lowest ratio was in the Hills Mallee Southern Region (an SR of 88, 184 admissions).

SLAs with the most highly elevated rates included Cooper Pedy (an SR of 304^{**}, and an average of ten admissions), Peterborough (303^{**}, eleven admissions), Naracoorte and Lucindale (296^{**}, 40),

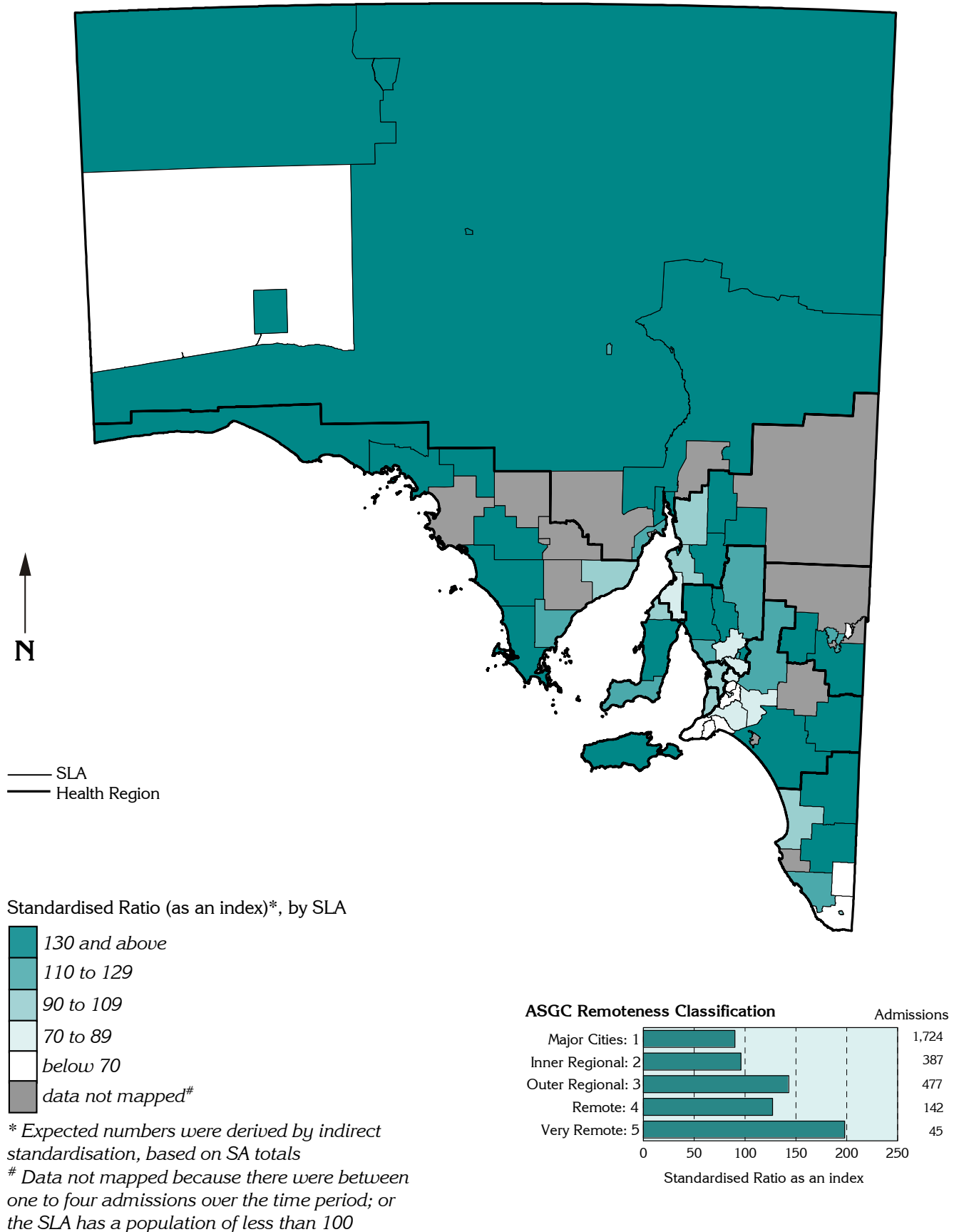
Port Pirie City Districts - City (224^{**}, 54) and The Coorong (217^{**}, 21).

Areas with the lowest ratios included Alexandrina - Coastal (an SR of 65, and 15 admissions), Adelaide Hills Balance (an SR of 66, and ten admissions) and Victor Harbor (an SR of 80, and 19 admissions).

Remoteness classification

When examined by remoteness, the highest annual rate of hospitalisation for cellulitis was calculated for the Very Remote areas of South Australia, a ratio of 198^{**}. The Outer Regional areas had the next highest ratio (an SR of 143^{**}), with Major Cities having the lowest (an SR of 90^{**}).

Map 3.22:
Potentially avoidable hospitalisations: cellulitis, South Australia, 2005/06 and 2006/07



Details of map boundaries are in Appendix 1.3

3.8 Correlation analysis

A correlation analysis has been undertaken to illustrate the extent of association at the SLA level between socioeconomic status and potentially avoidable hospitalisations: see box below. Socioeconomic status is measured here using a summary measure, the Index of Relative Socio-economic Disadvantage (IRSD). The IRSD is one of four Socioeconomic Indexes for Areas developed by the Australian Bureau of Statistics (ABS 2008)⁸.

Correlation is the degree to which one variable is statistically associated with another. The correlation coefficient is a measure of the strength of this association. When high values for one variable are matched by high values for the other (or when low values are matched by low values), then they are positively correlated. Where the interdependence is inverse (i.e. high values for one are matched by low values for the other), the two variables are negatively correlated.

The Pearson product-moment correlation (r) has been used in this analysis to indicate the degree of correlation between pairs of variables. Pearson correlation coefficients range from +1 (complete positive correlation) through 0 (complete lack of correlation) to -1 (complete negative correlation). As a general rule, correlations of plus or minus 0.50 or above are considered to be of meaningful statistical significance (referred to in the text as 'strong'). Correlations of plus or minus 0.71 or above are of substantial statistical significance, because this higher value represents at least fifty per cent shared variation (r^2 greater than or equal to 0.5): these are referred to as being 'very strong' correlations. Correlations just below plus or minus 0.50 are referred to in the text as being 'moderate'; and those below plus or minus 0.30 are referred to as 'weak'.

Correlation coefficients were calculated by comparing the value (expressed as a percentage or as a standardised ratio) for each variable in each SLA with the value of each of the other variables. Correlation coefficients are generally referred to as being, for example, 'a correlation of low income families with the paired variable of hospital admissions of females'. However, to promote ease of reading where many correlation coefficients are quoted in the text, the word 'paired' has been omitted. For similar reasons, the symbol used to indicate a correlation coefficient (r) has been omitted.

The results of the correlation analysis, which was undertaken separately for Adelaide and country South Australia, are shown in the following table: coefficients from 0.3 to 0.49; from 0.5 to 0.7 and from 0.71 to 1 (both positive and negative) are highlighted in the table.

Metropolitan Adelaide

There is a strong, inverse correlation (-0.58) at the SLA level across Metropolitan Adelaide between high rates of admission for conditions categorised as potentially avoidable hospitalisations and socioeconomic disadvantage, as measured by the IRSD (Table 3.36). The correlation coefficient is negative (inverse) because low IRSD scores indicate high levels of relative disadvantage, and these low scores are being compared with high rates of avoidable hospitalisations.

At the sub-category level, the strongest correlation is with admissions for the total of chronic conditions (-0.75); and at the condition level, it is with diabetes complications (-0.79), angina (-0.76) and COPD (-0.73), these latter correlations being classed as 'very strong'. Correlations with the majority of the other chronic conditions are of moderate strength.

Of the acute conditions, admissions for pyelonephritis (includes urinary tract infections) are strongly correlated with socioeconomic disadvantage (-0.57). In contrast, there is a moderate correlation between admissions for dental conditions and high socioeconomic status (0.49); and a weak correlation between admissions for ear, nose and throat conditions and high socioeconomic status (0.29).

Country South Australia

The correlations in country South Australia between potentially avoidable hospitalisations and socioeconomic disadvantage, as measured by the IRSD, are generally weaker than those in Metropolitan Adelaide (Table 3.36). The exceptions are the acute sub-category overall (-0.25, compared with 0.03), and the specific acute conditions of dehydration and gastroenteritis (-0.34, compared with -0.08) and ear, nose and throat infections (-0.36, compared with 0.29). These are notably different in country South Australia from Metropolitan Adelaide and are likely to reflect the higher prevalence of these conditions among the Aboriginal population.

⁸ Reference: ABS (2008) *An Introduction to Socio-Economic Indexes for Areas (SEIFA) 2006*. Information Paper. ABS Cat. No. 2039.0. Canberra: ABS.

Table 3.36: Correlation¹ between potentially avoidable hospitalisations and socioeconomic status², Metropolitan Adelaide and country South Australia, South Australia, 2006

Weak  Moderate  Strong  Very strong 

Sub-category/condition	Metropolitan Adelaide	Country South Australia
Vaccine preventable	-0.55	-0.09
Chronic	-0.75	-0.28
Diabetes complications	-0.79	-0.32
Congestive cardiac failure	-0.40	-0.25
Angina	-0.76	-0.37
Chronic obstructive pulmonary disease	-0.73	-0.30
Asthma	-0.47	-0.31
Acute	0.03	-0.25
Dehydration and gastroenteritis	-0.08	-0.34
Dental conditions	0.49	-0.05
Ear, nose and throat infections	0.29	-0.36
Cellulitis	-0.35	-0.35
Pyelonephritis (includes urinary tract infections)	-0.57	-0.51
All avoidable admissions	-0.58	-0.28

¹ Weak: $< \pm 0.30$; Moderate: ± 0.30 to ± 0.49 ; Strong: ± 0.50 to ± 0.70 ; Very strong: $> \pm 0.70$

² Socioeconomic status is measured using the IRSD, 2006

3.9 Potentially avoidable hospitalisations by socioeconomic status

This section examines potentially avoidable hospitalisations for ambulatory care-sensitive conditions by socioeconomic status (SES), in order to show the extent of any inequality in rates of admissions for these conditions.

Socioeconomic status (SES) is based on the Index of Relative Socio-economic Disadvantage (IRSD): the calculation of rates by groupings of areas (quintiles), and the particular measure of socioeconomic disadvantage used (the IRSD), are described in Chapter 2, *Methods*. Separate calculations are made for Metropolitan Adelaide and country South Australia, other than for the conditions Other vaccine-preventable conditions and Rheumatic heart disease, both of which have insufficient numbers to present in this way.

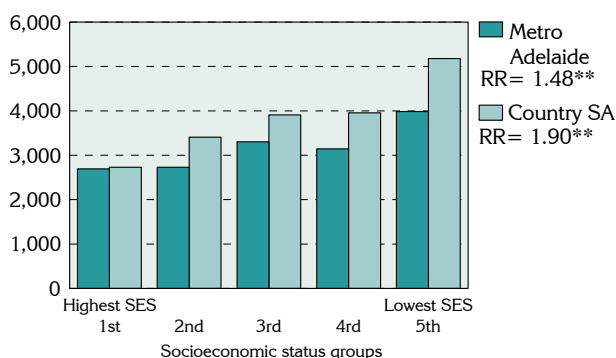
Overall, admission rates for ambulatory care-sensitive conditions are higher in areas of greater socioeconomic disadvantage (Quintiles 2 to 5) when compared with those of least socioeconomic disadvantage (Quintile 1). The extent of the differential in admission rates between the areas of lowest and highest SES (most and least disadvantaged) is shown by the ratio of the rates in these areas – referred to as the rate ratio.

Potentially avoidable hospitalisations by socioeconomic status

There is a distinct, step-wise socioeconomic gradient evident in total avoidable hospitalisation rates across both Metropolitan Adelaide and country South Australia, with each increase in disadvantage accompanied by an increase in admissions from these conditions, other than in the fourth quintile, for which rates are consistent with (country SA), or lower (Metropolitan Adelaide) than, those in the third quintile (Figure 3.7).

Figure 3.7: Potentially avoidable hospitalisations¹ by socioeconomic status, South Australia, 2005/06 and 2006/07

Average annual rate per 100,000 population



¹ Admissions resulting from ACS conditions

The rate ratio of 1.48** indicates that, over the years 2005/06 and 2006/07, people living in the lowest SES (most disadvantaged) areas of Metropolitan Adelaide had 48% more hospitalisations for a potentially avoidable (ambulatory care-sensitive) condition than those in the highest SES (least disadvantaged) areas. For people living in country South Australia, the gap was almost double, a rate ratio of 1.90**.

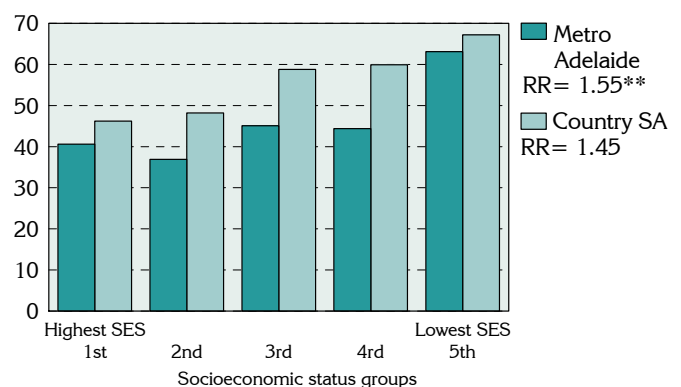
Potentially avoidable hospitalisations: vaccine-preventable conditions by socioeconomic status

Socioeconomic gradients are also evident for avoidable hospitalisations for vaccine-preventable conditions, with increasing admission rates associated with greater disadvantage (Figure 3.8). For influenza and pneumonia, avoidable hospitalisation rates in the lowest SES areas in Metropolitan Adelaide were 55% higher than those in the highest SES areas: the differential in country South Australia was 45%.

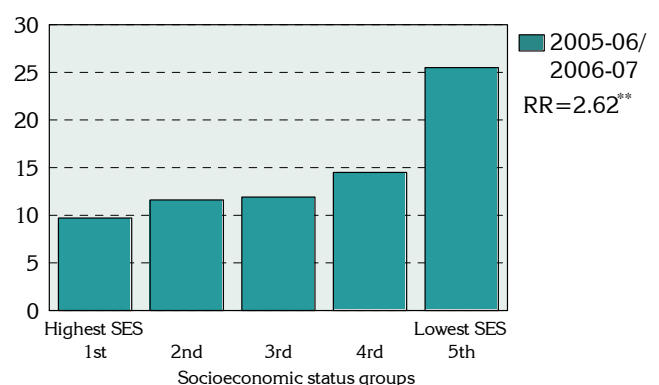
Figure 3.8: Potentially avoidable hospitalisations¹: vaccine-preventable conditions by socioeconomic status, South Australia, 2005/06 and 2006/07

Average annual rate per 100,000 population: note the different scales

Influenza and pneumonia



Other vaccine-preventable diseases



¹ Admissions resulting from ACS conditions

For other vaccine-preventable diseases the overall differential in rates is more than two and a half times (a rate ratio of 2.62**) and the gradient in rates is particularly steep, most notably from Quintile 4 to Quintile 5.

Potentially avoidable hospitalisations: chronic conditions by socioeconomic status

For the majority of the chronic conditions, there are a clear, and strong associations between rates of avoidable hospitalisations and socioeconomic disadvantage, both for people living in Metropolitan Adelaide and country South Australia (Figure 3.9). With the exception of the conditions iron deficiency anaemia and hypertension (for residents of Metropolitan Adelaide), there are also strong gradients.

Both angina and chronic obstructive pulmonary diseases have strong, continuous socioeconomic gradients in rates of potentially avoidable hospitalisations, such that in the lowest SES areas, admission rates for these conditions were substantially above those in highest SES areas (3.17** times for angina, and 2.76** times for

chronic obstructive pulmonary disease in Metropolitan Adelaide; and 1.85** and 2.60** , respectively, in country South Australia).

Rates of potentially avoidable hospitalisations for diabetes complications have strong and consistent differentials for residents of Metropolitan Adelaide (a differential of 2.07**) and country South Australia (2.30**).

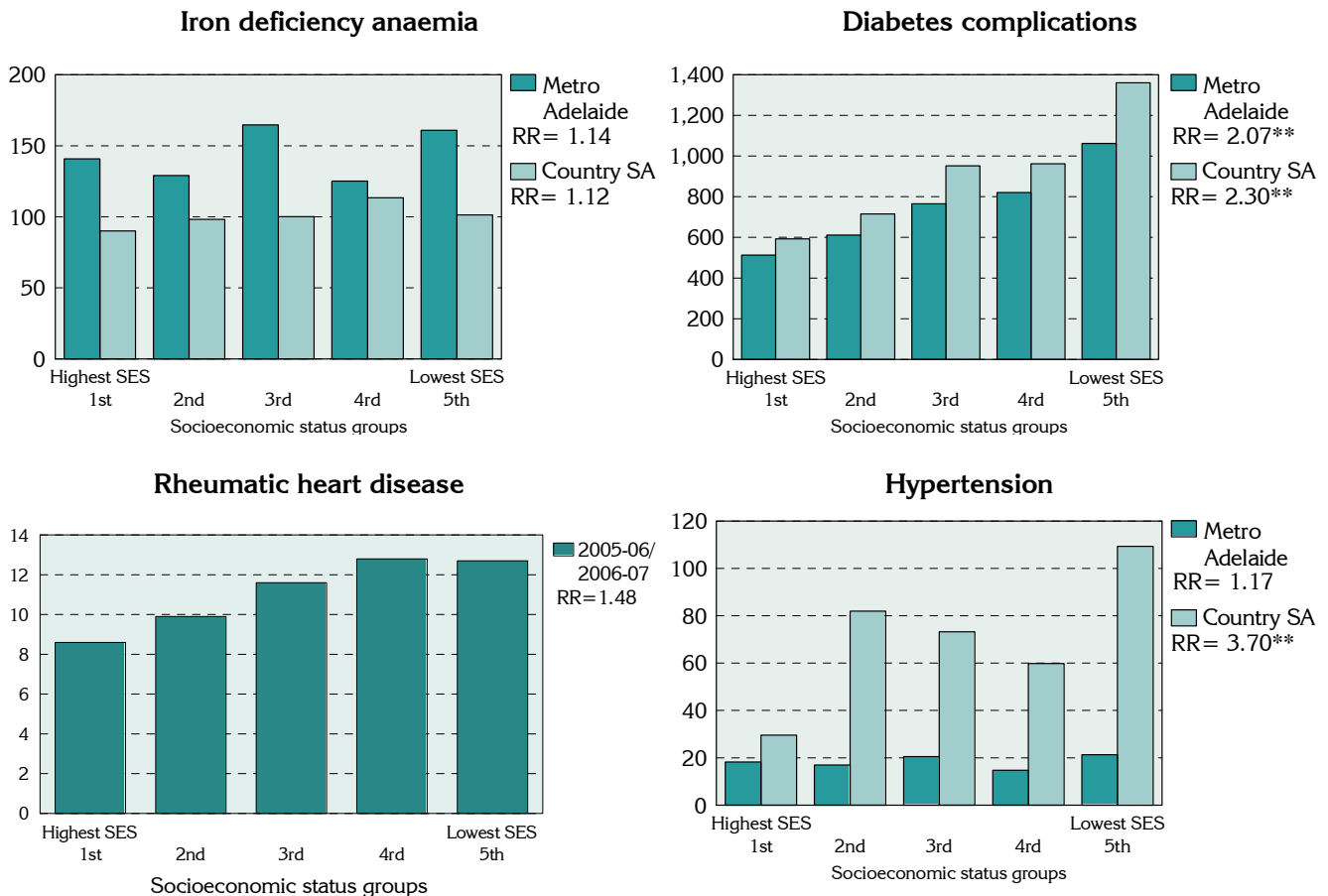
For hypertension, the differential in rates was far more marked in country South Australia (3.17**) than in Metropolitan Adelaide. (1.17).

Congestive cardiac failure and asthma also had strong differentials in rates when examined by socioeconomic status, of 1.65** for congestive cardiac failure, and 1.53** for asthma in Metropolitan Adelaide; and 1.36** and 1.55** , respectively, in country South Australia.

Due to the smaller number of admissions, the data for rheumatic heart disease are shown by socioeconomic status across the State as a whole. The overall differential, of 48%, is not statistically significant.

Figure 3.9: Potentially avoidable hospitalisations¹: chronic conditions by socioeconomic status, South Australia, 2005/06 and 2006/07

Average annual rate per 100,000 population: note the different scales

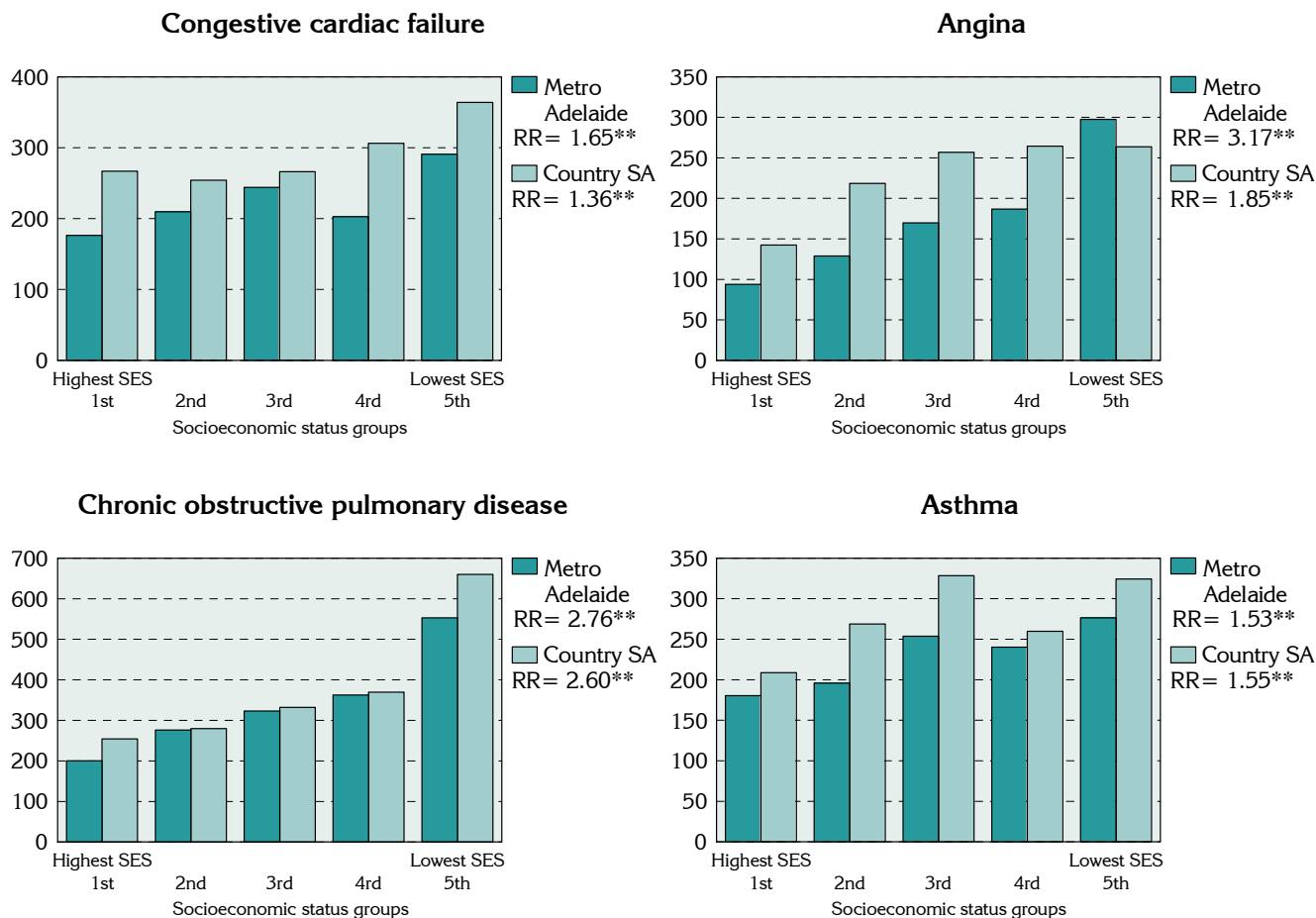


¹ Admissions resulting from ACS conditions

... continued

Figure 3.9: Potentially avoidable hospitalisations¹: chronic conditions by socioeconomic status, South Australia, 2005/06 and 2006/07 ... continued

Average annual rate per 100,000 population: note the different scales



¹ Admissions resulting from ACS conditions

There was no clear socioeconomic gradient across the areas of socioeconomic disadvantage for avoidable hospitalisation from iron deficiency anaemia.

Due to the very small numbers, the quintile graph for nutritional deficiencies is not shown.

Potentially avoidable hospitalisations: acute conditions by socioeconomic status

For the majority of the acute conditions there was a clear association between rates of avoidable hospitalisations and socioeconomic status, although there are marked differences in the patterns for Metropolitan Adelaide and country South Australia in a number of cases (Figure 3.10).

Avoidable hospitalisations for convulsions and epilepsy had a strong and distinct socioeconomic gradient, with an admission rate in the lowest SES areas almost twice that in the highest SES areas (1.94**) in Metropolitan Adelaide and over three times in country South Australia (3.38**).

Potentially avoidable hospitalisations from pyelonephritis, cellulitis, pelvic inflammatory disease and gangrene also had larger differentials

in admission rates of people living in country South Australia than in Metropolitan Adelaide, although there were generally no clear socioeconomic gradients in the rates. The largest of these differentials was for country residents admitted for pelvic inflammatory disease (a rate ratio of 3.38**); and for Metropolitan Adelaide it was for pyelonephritis (3.38**).

In contrast, for perforated/ bleeding ulcers, the socioeconomic gradient and the differential in rates between the lowest and highest SES areas were strongest for those living in Metropolitan Adelaide (a rate ratio of 1.42**). However, had the rate ratio for country South Australia been calculated between Quintiles 4 and 1, it would have shown there to be a markedly higher rate in these second-lowest SES areas, rather than the differential recorded of 0.71.

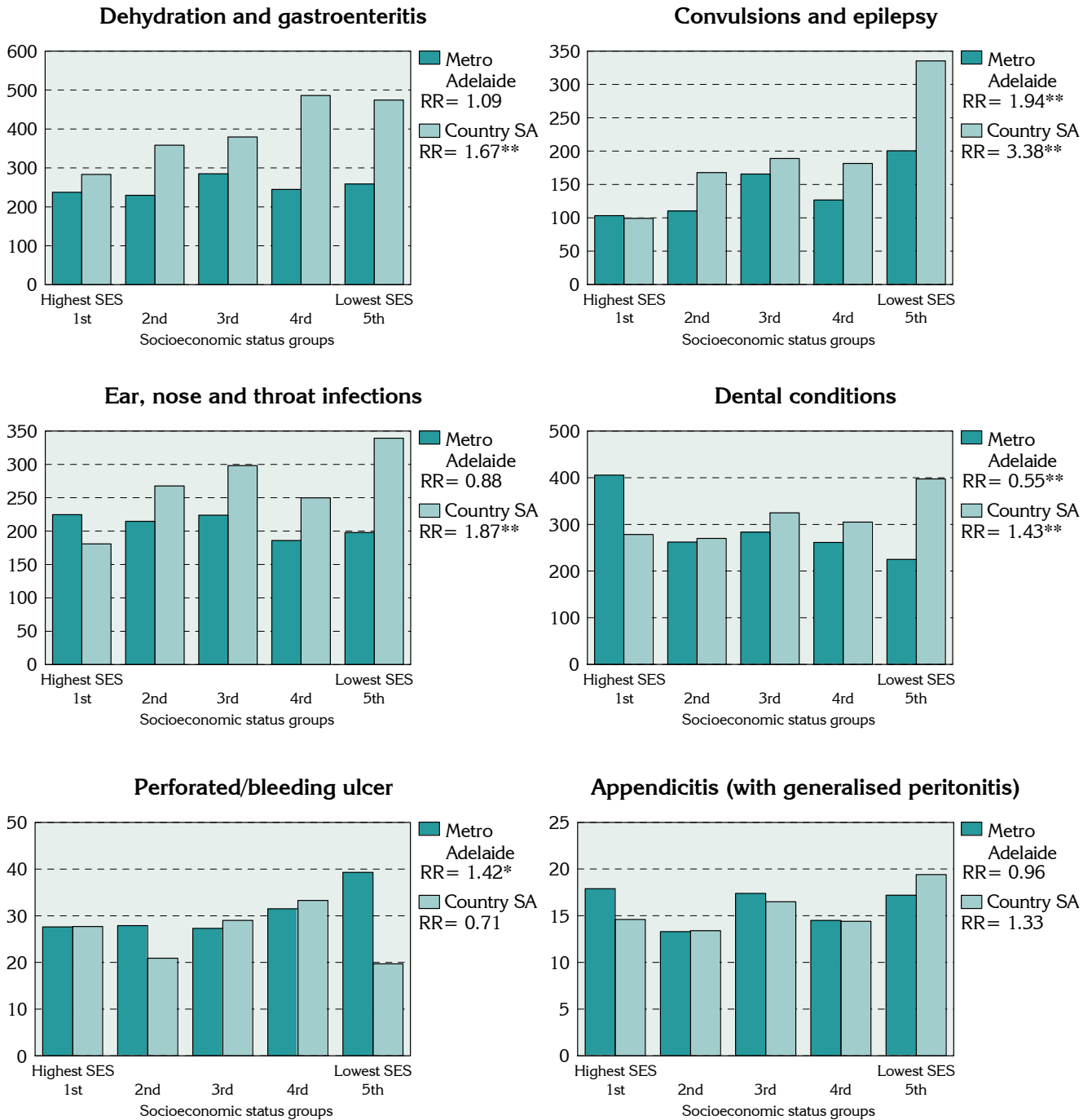
There was a moderate association for admissions from dehydration and gastroenteritis in Metropolitan Adelaide (although the rate ratio was not statistically significant); and a substantial difference in rates in country South Australia (a rate ratio of 1.67**). Admissions for appendicitis showed a similar pattern.

The most notable differences evident for these conditions are in the socioeconomic gradients for dental conditions and ear, nose and throat infections. For both of these conditions the gradient in Metropolitan Adelaide is the reverse of that generally seen for potentially avoidable hospitalisations.

For example, there were 45% fewer potentially avoidable hospitalisations for dental conditions in the lowest SES areas than in the highest SES areas (a rate ratio of 0.55**): for ear, nose and throat infections the gap is much smaller, with 12% fewer admissions for these potentially avoidable hospitalisations (0.88).

Figure 3.10: Potentially avoidable hospitalisations¹: acute conditions by socioeconomic status, South Australia, 2005/06 and 2006/07

Average annual rate per 100,000 population: note the different scales

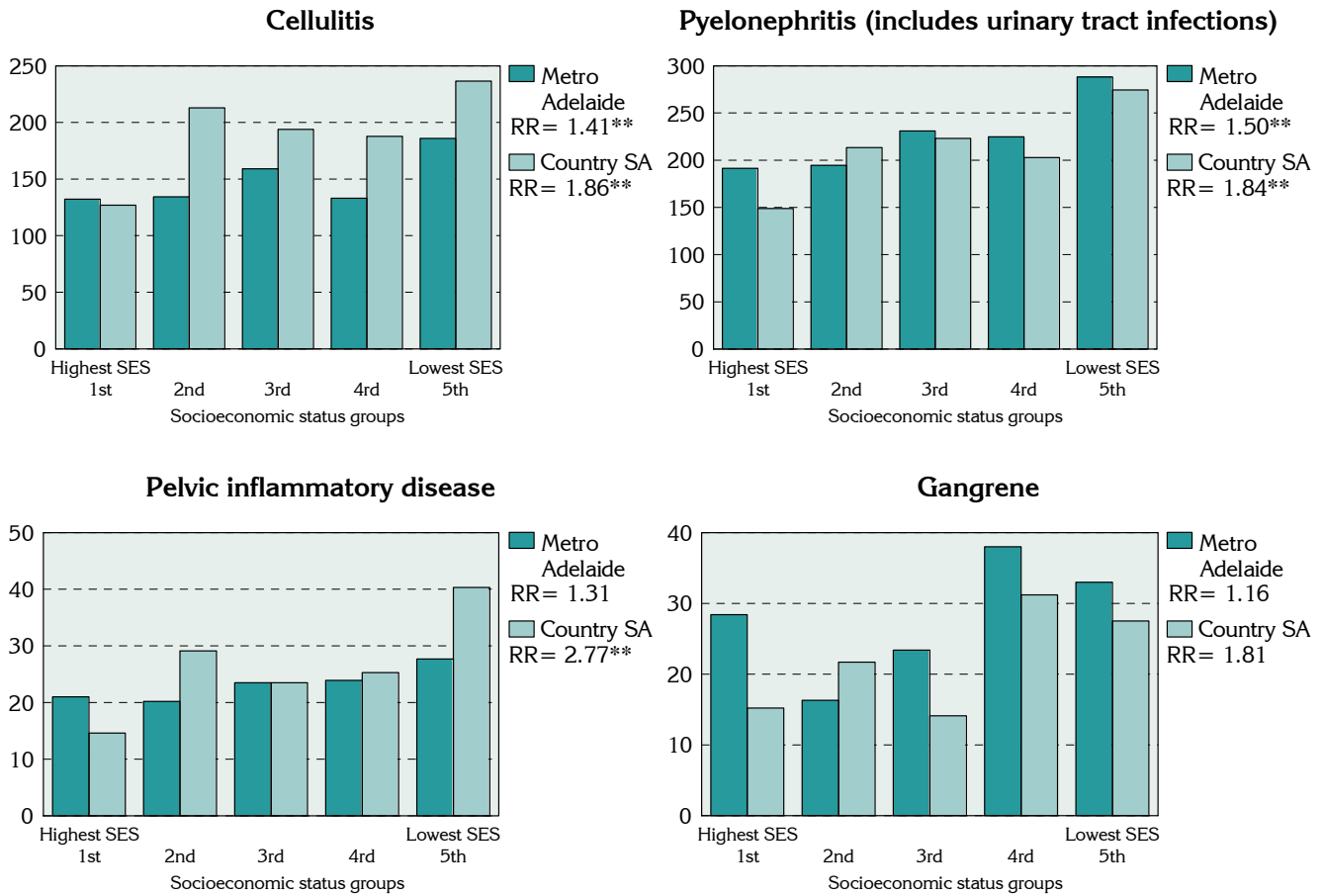


¹ Admissions resulting from ACS conditions

... continued

Figure 3.10: Potentially avoidable hospitalisations¹: acute conditions by socioeconomic status, South Australia, 2005/06 and 2006/07 ... continued

Average annual rate per 100,000 population: note the different scales



¹ Admissions resulting from ACS conditions

3.10 Cost of potentially avoidable hospitalisations

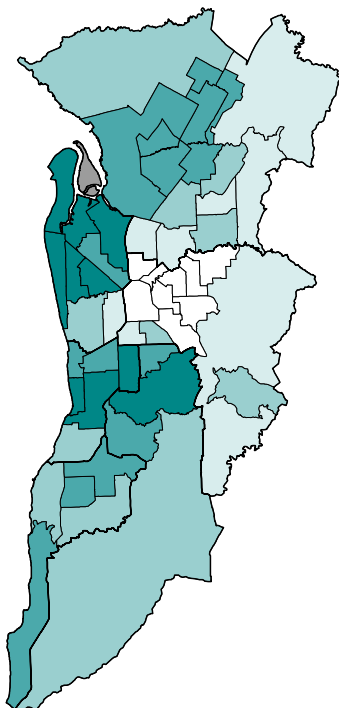
The data presented in this section refer only to admissions to metropolitan public acute hospitals (excluding Modbury Hospital): country residents admitted to these hospitals are included in the analysis of cost per admission, although have not by cost per population: nor have the data been mapped, because of the small number of cases involved. The costs are the actual cost of the admission for these potentially avoidable conditions, and not just the average cost per (avoidable and unavoidable) admission.

The distribution of the cost per admission for potentially avoidable hospitalisations at the SLA level across Metropolitan Adelaide (Map 3.23) has a number of similarities with the distribution of the population by socioeconomic status, as described by the IRSD (Map A1.1), with the highest cost per admission in a cluster of north-western SLAs. However, the high cost per admission in the group of SLAs running from south of the city centre to the

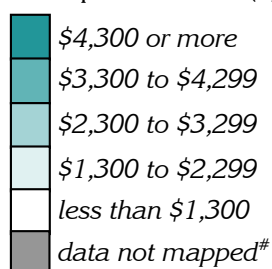
sea (Mitcham Hills, Mitcham West, Marion Central and Holdfast Bay South), does not fit this socioeconomic pattern.

When analysed as the cost per head of population (Map 3.24), rather than per admission, the pattern changes to one that is highly consistent with the distribution of the population by socioeconomic status, as described by the IRSD. While the north-western SLAs remain in the highest range, a number of outer northern and southern SLAs of high relative disadvantage move into this range. This is likely to reflect the greater number of admissions from these areas of greatest socioeconomic disadvantage: the rate ratio in the last line of Table 3.37 shows that the largest differentials in the cost per population and cost per admission figures occur in the sub-regions/Districts of greatest socioeconomic disadvantage – and that the smallest are in the sub-regions/Districts of least socioeconomic disadvantage. These points are amplified below.

Map 3.23: Cost of potentially avoidable hospitalisations per admission, metropolitan region, South Australia, 2006/07



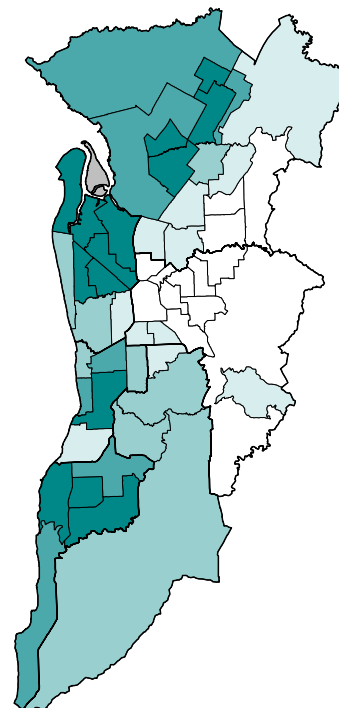
Cost* per admission (\$), by SLA



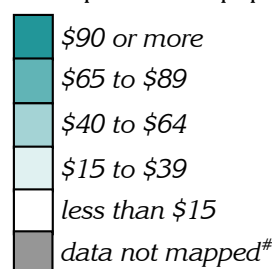
* Costs were indirectly age standardised, based on SA totals

[#] Data not mapped because the SLA has a population of less than 100

Map 3.24: Cost of potentially avoidable hospitalisations per head, metropolitan region, South Australia, 2006/07



Cost* per head of population (\$), by SLA



The average cost per admission is shown in Table 3.37 by Health Region. The following discussion refers to admissions of residents of Metropolitan Adelaide: a brief commentary on the admissions of residents of country South Australia, to the metropolitan hospitals in the analysis, is in the box, below: a number of caveats are included, to be borne in mind when using these non-metropolitan data.

The average cost per admission in Southern Adelaide was \$3,850 per admission, markedly (25.9%) higher than the \$3,057 per admission for residents of Central Northern Adelaide.

The highest costs per admission included, for Southern Adelaide, rheumatic heart disease, perforated/bleeding ulcers, influenza and pneumonia and appendicitis. Of the conditions with the largest numbers of admissions, costs were highest for diabetes complications, congestive cardiac failure, chronic obstructive pulmonary disease and pelvic inflammatory disease. In Central Northern Adelaide, the highest cost conditions were similar, although the cost per admission was much lower, being around one half to two thirds of the cost of the equivalent condition in the south. The costliest admissions were for gangrene, perforated/bleeding ulcers, appendicitis and influenza and pneumonia. Of conditions with the largest number of admissions, costs were (as in the south, although with a minor difference in rank order) highest for congestive cardiac failure, diabetes complications, chronic obstructive pulmonary disease and pelvic inflammatory disease.

Variations in cost per admission at the sub-region/District level are shown in Table 3.38. These data highlight again the importance of variations at the small area level in driving overall outcomes. For example, the variation in avoidable hospitalisation rates within Central Northern Adelaide is over four (4.4) times between the very high rate in Western sub-region and the very low rate Central East sub-region – a pattern repeated for each sub-category, and amplified for some conditions, in particular congestive cardiac failure (16.6 times), pyelonephritis (includes urinary tract infections) (6.0 times) and diabetes complications (5.4 times). There is much less variation at the District level in Southern Adelaide.

Table 3.39 shows the average cost per 100 population by Health Region and sub-region/District, providing a population health measure of the impact of potentially avoidable hospitalisations. Whereas the previous table provided details of the areas with the most costly potentially avoidable hospitalisations, this table provides a comparison of the cost per 100 people in each region, from which can be seen the areas in

which the greatest savings can, potentially, be made through access to timely and effective primary care. The data in Table 3.39 are shown as the cost per 100 population (not as a cost per head as in the map, above) because of the small costs involved for a number of the individual conditions.

Of immediate interest is that the gap in average cost per 100 population between the Southern Adelaide and Central Northern Adelaide Health Regions is greater than it was per admission – 32.4% compared with 25.9%. And the variation at the sub-region level in Central Northern Adelaide is also greater, with Western sub-region having 6.8 times the avoidable hospitalisation rate as in Central East sub-region. Of note is the greater variation for the chronic sub-category (8.0 times higher rate in Western sub-region than in Central East sub-region) and, in particular, for diabetes complications (9.9).

As well as having the highest overall average cost, Southern Adelaide had higher costs for the majority of the individual conditions. In addition, Outer Southern District has the highest overall average cost per 100 admissions of any District or sub-region, and the highest for the chronic sub-category and many individual conditions, including the higher prevalence diabetes complications, chronic obstructive pulmonary disease dehydration and gastroenteritis, asthma and congestive cardiac failure.

Country South Australia: caveats and commentary

The admissions to metropolitan public acute hospitals (excluding Modbury) of country South Australians for these avoidable conditions represent a particular group, including those from remote areas with no local hospital facilities; as well those with the most critical medical conditions, who need access to the higher level of specialised equipment and personnel available in these hospitals. As such, they are most likely to be the most expensive avoidable admissions of country South Australians, with the less critically ill being treated locally.

This is shown to be the case by the average cost per admission figures in Table 3.37. For all health regions, including those in Metropolitan Adelaide, vaccine-preventable conditions, the cost per admission was highest in the Eyre Region; for chronic conditions, the cost was highest in the South East Region; and, for acute conditions it was highest in the Riverland.

Table 3.37: Average cost per admission of potentially avoidable hospitalisations¹ by sub-category/condition and Health Region, South Australia, 2006/07

Age standardised cost per admission (\$)

Sub-category/condition	Central Nthn Adelaide	Southern Adelaide	Hills Mallee Sthn	South East	Wakefield	Mid North	Riverland	Eyre	Northern & Far Western	South Australia
Vaccine-preventable	6,992	7,686	9,142	9,761	6,073	4,144	#	31,611	2,780	7,953
Influenza and pneumonia	6,445	11,386	9,446	22,496	5,501	#	#	43,727	3,833	8,604
Other vaccine-preventable diseases	4,276	4,933	12,211	#	#	#	#	#	#	5,987
Chronic	3,378	4,437	3,557	6,130	3,383	3,315	4,229	5,258	5,483	3,813
Iron deficiency anaemia	1,235	1,147	1,109	#	915	#	#	#	#	1,162
Diabetes complications	4,216	6,845	4,777	6,181	3,736	3,672	5,503	6,431	6,134	4,925
Nutritional deficiencies	#	#	#	#	#	#	#	#	#	26,595
Rheumatic heart disease	4,866	12,647	5,545	27,588	#	#	#	#	#	8,605
Hypertension	2,568	2,552	#	#	#	#	#	#	#	2,520
Congestive cardiac failure	4,219	5,744	3,813	3,273	4,131	2,137	6,630	9,461	17,999	4,669
Angina	1,966	2,331	1,282	#	2,550	#	1,927	#	4,773	2,042
Chronic obstructive pulmonary disease	3,641	4,311	2,111	5,456	4,863	2,921	424	3,537	414	3,766
Asthma	2,038	2,376	2,611	2,517	2,481	1,197	2,207	2,406	1,225	2,183
Acute	2,410	2,972	2,753	1,640	2,143	2,244	4,911	2,911	2,371	2,663
Dehydration and gastroenteritis	1,711	2,174	751	653	1,756	768	#	986	323	1,803
Convulsions and epilepsy	2,421	3,329	2,358	4,326	2,266	1,990	9,348	3,468	3,599	2,691
Ear, nose and throat infections	1,672	1,612	1,686	1,793	1,449	1,027	2,804	#	1,813	1,645
Dental conditions	1,458	1,960	1,567	1,605	1,799	1,218	1,429	1,393	1,410	1,534
Perforated/bleeding ulcer	7,113	11,711	1,145	#	1,414	5,846	#	#	#	7,210
Appendicitis	6,371	9,911	4,898	#	4,835	#	#	#	#	7,410
Cellulitis	1,866	2,010	1,513	181	2,583	#	#	#	#	1,862
Pyelonephritis (includes urinary tract infections)	2,813	3,841	3,456	#	2,797	#	#	3,992	2,835	3,147
Pelvic inflammatory disease	3,301	3,305	2,589	#	1,060	3,385	0	#	14,462	3,243
Gangrene	8,130	6,736	31,455	#	2,333	#	#	#	#	11,560
Total avoidable admissions	3,057	3,850	3,570	4,881	3,008	3,144	4,246	6,135	4,453	3,445

¹ Admissions resulting from ACS conditions

Rate not shown or not calculated, as there are fewer than five admissions over the period shown

Table 3.38: Average cost per admission of potentially avoidable hospitalisations¹ by sub-category/condition and metropolitan sub-region/District, South Australia, 2006/07

Age standardised cost per admission (\$)

Sub-category/condition	Central Nthn Adelaide				Southern Adelaide			Metropolitan Adelaide	
	Northern sub-region	Western sub-region	Central East sub-region	Total	Urban Beaches District	Hills District	Outer Southern District		Total
Vaccine-preventable	7,302	11,621	2,191	6,992	8,686	1,620	10,561	7,686	7,197
Influenza and pneumonia	6,477	11,745	1,372	6,445	13,380	2,734	14,093	11,386	7,667
Other vaccine-preventable diseases	1,725	7,369	4,638	4,276	3,692	#	6,234	4,933	4,330
Chronic	3,500	4,630	999	3,378	4,850	5,096	3,935	4,437	3,702
Iron deficiency anaemia	1,461	1,690	298	1,235	1,142	1,592	1,040	1,147	1,180
Diabetes complications	4,151	6,025	1,127	4,216	7,370	7,021	6,345	6,845	4,930
Nutritional deficiencies	#	#	#	#	#	#	#	#	#
Rheumatic heart disease	4,057	6,887	447	4,866	10,313	44,412	15,679	12,647	6,576
Hypertension	2,619	3,279	802	2,568	2,733	3,878	2,011	2,552	2,594
Congestive cardiac failure	3,941	6,837	413	4,219	7,011	5,170	4,732	5,744	4,642
Angina	2,150	2,513	176	1,966	1,991	1,267	2,911	2,331	2,049
Chronic obstructive pulmonary disease	4,326	4,085	1,157	3,641	5,313	8,317	3,238	4,311	3,877
Asthma	2,058	2,368	1,462	2,038	2,446	2,332	2,330	2,376	2,167
Acute	2,357	3,691	886	2,410	3,512	3,103	2,451	2,972	2,586
Dehydration and gastroenteritis	1,769	2,457	570	1,711	2,289	4,125	1,431	2,174	1,877
Convulsions and epilepsy	2,872	3,197	844	2,421	3,670	3,016	3,016	3,329	2,674
Ear, nose and throat infections	1,677	1,939	1,355	1,672	1,794	1,551	1,496	1,612	1,642
Dental conditions	1,438	1,466	1,531	1,458	3,175	2,578	1,191	1,960	1,531
Perforated/bleeding ulcer	3,934	13,496	2,834	7,113	14,299	4,420	12,514	11,711	8,247
Appendicitis	7,243	7,717	2,908	6,371	9,575	7,166	11,454	9,911	7,857
Cellulitis	1,710	3,366	535	1,866	2,800	2,285	1,245	2,010	1,914
Pyelonephritis (includes urinary tract infections)	2,495	4,696	784	2,813	4,503	5,006	2,990	3,841	3,113
Pelvic inflammatory disease	4,022	3,001	701	3,301	3,120	7,378	2,280	3,305	3,295
Gangrene	7,074	10,880	4,343	8,130	8,756	1,655	10,665	6,736	7,456
Total avoidable admissions	3,122	4,365	986	3,057	4,340	4,106	3,360	3,850	3,305

¹ Admissions resulting from ACS conditions

Rate not shown or not calculated, as there are fewer than five admissions over the period shown

Table 3.39: Average cost per 100 population of potentially avoidable hospitalisations¹ by sub-category/condition and metropolitan Health Region and metropolitan sub-region /District, South Australia, 2006/07

Age standardised cost per 100 population (\$)

Sub-category/condition	Central Nthn Adelaide				Southern Adelaide			Metropolitan Adelaide	
	Northern sub-region	Western sub-region	Central East sub-region	Total	Urban Beaches District	Hills District	Outer Southern District		
Vaccine-preventable	257	408	77	246	305	57	371	270	253
Influenza and pneumonia	233	298	35	192	295	57	348	258	212
Other vaccine-preventable diseases	23	111	42	54	11	#	24	13	41
Chronic	4,387	5,208	654	3,474	4,253	2,931	6,448	4,639	3,826
Iron deficiency anaemia	67	78	10	52	154	125	240	173	89
Diabetes complications	2,260	3,113	316	1,913	2,444	1,636	3,753	2,667	2,141
Nutritional deficiencies	#	#	#	#	#	#	#	#	#
Rheumatic heart disease	20	56	1	24	52	9	50	41	29
Hypertension	17	30	3	16	23	27	32	27	19
Congestive cardiac failure	509	1,116	41	550	650	317	879	643	579
Angina	369	356	11	251	126	47	322	167	225
Chronic obstructive pulmonary disease	1,243	699	142	724	630	528	1,150	762	735
Asthma	340	452	164	321	506	351	537	482	369
Acute	1,676	2,608	466	1,575	2,240	1,697	2,480	2,196	1,762
Dehydration and gastroenteritis	201	343	53	196	297	411	325	330	237
Convulsions and epilepsy	311	358	83	258	422	238	299	337	281
Ear, nose and throat infections	185	147	85	148	206	162	228	204	165
Dental conditions	103	102	43	87	68	23	44	48	75
Perforated/bleeding ulcer	86	307	41	140	196	61	238	180	152
Appendicitis	73	91	23	63	99	119	265	162	93
Cellulitis	175	262	36	157	270	180	207	230	179
Pyelonephritis (includes urinary tract infections)	382	799	96	417	530	398	700	552	458
Pelvic inflammatory disease	51	31	3	32	22	68	51	43	35
Gangrene	94	130	13	80	112	40	146	107	88
Total avoidable admissions									
Average cost per 100 population	6,248	8,156	1,195	5,254	6,663	4,684	8,998	6,958	5,768
Average cost per admission	3,122	4,365	986	3,057	4,340	4,106	3,360	3,850	3,305
Rate ratio²	2.00	1.87	1.21	1.72	1.54	1.14	2.68	1.81	1.75

¹ Admissions resulting from ACS conditions

² Ratio of cost per population and cost per admission

Rate not shown or not calculated, as there are fewer than five admissions over the period shown

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Appendix 1.1: ICD codes

Table A1.1: ICD codes used in identifying potentially avoidable hospitalisations

Category	ICD-10-AM codes
Vaccine-preventable	
Influenza and pneumonia	J10, J11, J13, J14, J15.3, J15.4, J15.7, J15.9, J16.8, J18.1, J18.8 in any diagnosis field, excludes cases with additional diagnosis of D57 (sickle-cell disorders) and people under 2 months
Other vaccine-preventable conditions	A35, A36, A37, A80, B05, B06, B16.1, B16.9, B18.0, B18.1, B26, G00.0, M01.4 in any diagnosis field
Chronic	
Iron deficiency anaemia	D50.1, D50.8, D50.9 as principal diagnosis only
Diabetes complications	E10–E14.9 as principal diagnoses and E10–E14.9 as additional diagnoses where the principal diagnosis was: hyperosmolarity (E87.0) acidosis (E87.2) transient ischaemic attack (G45) nerve disorders and neuropathies (G50–G64) cataracts and lens disorders (H25–H28) retinal disorders (H30–H36) glaucoma (H40–H42) myocardial infarction (I21–I22) other coronary heart diseases (I20, I23–I25) heart failure (I50) stroke and sequelae (I60–I64, I69.0–I69.4) peripheral vascular disease (I70–I74) gingivitis and periodontal disease (K05) kidney diseases (N00–N29) [including end-stage renal disease (N17–N19)] renal dialysis (Z49)
Nutritional deficiencies	E40, E41, E42, E43, E55.0, E64.3 as principal diagnosis only
Rheumatic heart disease	I00 to I09 as principal diagnosis only. (Note: includes acute rheumatic fever)
Hypertension	I10, I11.9 as principal diagnosis only, exclude cases with procedure codes according to the list of procedures excluded from the Congestive cardiac failure category above
Congestive cardiac failure	I11.0, I50, J81 as principal diagnosis only, exclude cases with the following procedure codes: 33172-00, 35304-00, 35305-00, 35310-02, 35310-00, 38281-11, 38281-07, 38278-01, 38278-00, 38281-02, 38281-01, 38281-00, 38256-00, 38278-03, 38284-00, 38284-02, 38521-09, 38270-01, 38456-19, 38456-15, 38456-12, 38456-11, 38456-10, 38456-07, 38456-01, 38470-00, 38475-00, 38480-02, 38480-01, 38480-00, 38488-06, 38488-04, 38489-04, 38488-02, 38489-03, 38487-00, 38489-02, 38488-00, 38489-00, 38490-00, 38493-00, 38497-04, 38497-03, 38497-02, 38497-01, 38497-00, 38500-00, 38503-00, 38505-00, 38521-04, 38606-00, 38612-00, 38615-00, 38653-00, 38700-02, 38700-00, 38739-00, 38742-02, 38742-00, 38745-00, 38751-02, 38751-00, 38757-02, 38757-01, 38757-00, 90204-00, 90205-00, 90219-00, 90224-00, 90214-00, 90214-02
Angina	I20, I24.0, I24.8, I24.9 as principal diagnosis only, exclude cases with procedure codes not in blocks [1820] to [2016]
Chronic obstructive pulmonary disease	J20, J41, J42, J43, J44, J47 as principal diagnosis only, J20 only with additional diagnoses of J41, J42, J43, J44, J47
Asthma	J45, J46 as principal diagnosis only

Note: The conditions and codes are those used in the Australian Institute of Health and Welfare (2007) *Australian hospital statistics* report. Reference: AIHW (2007) *Australian hospital statistics 2005-06*. Health services series no. 30. Cat no. HSE 50. Canberra: AIHW. At: <http://www.aihw.gov.au/publications/index.cfm/title/10455>; accessed 20 June 2007.

... continued

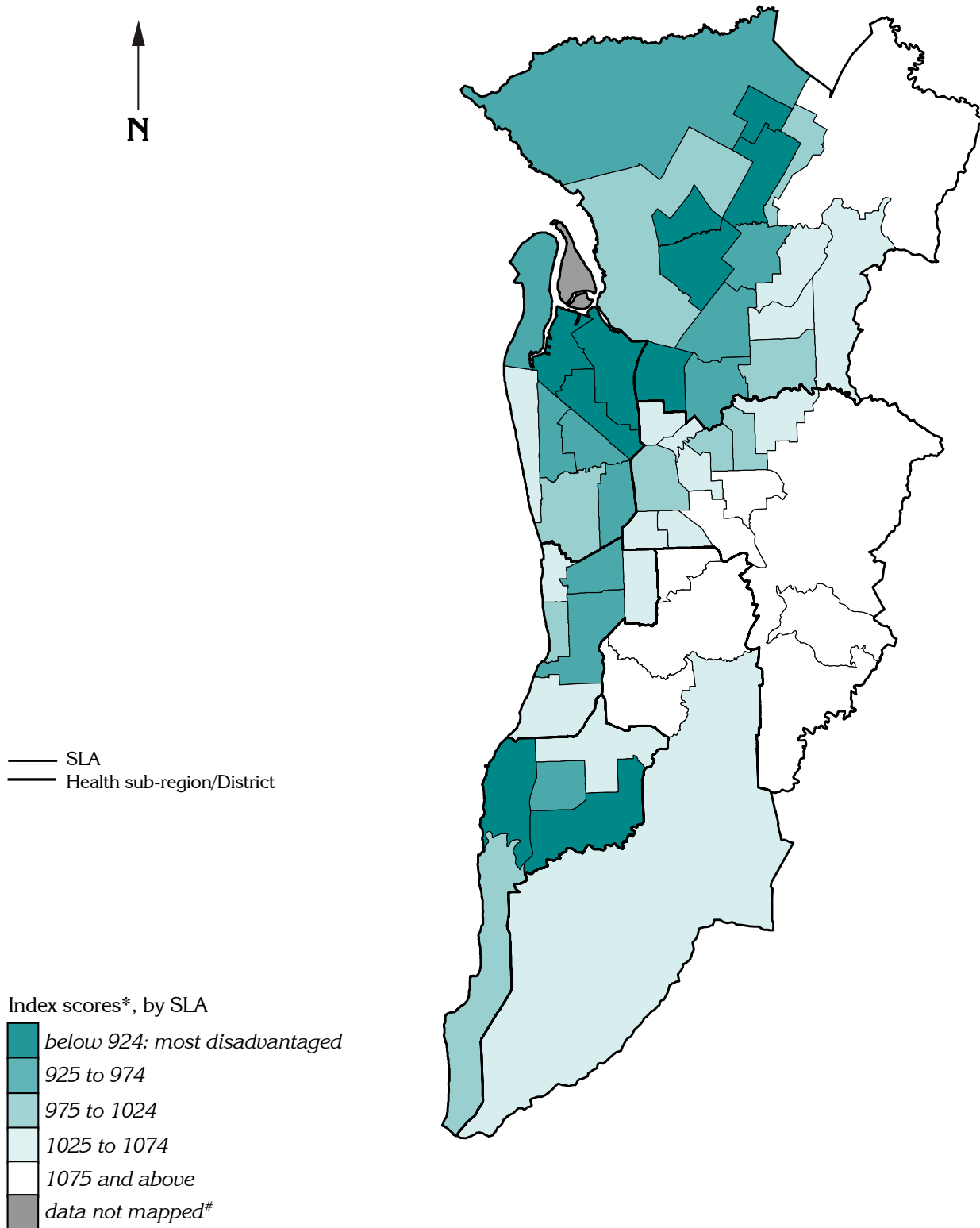
Table A1.1: ICD codes used in identifying potentially avoidable hospitalisations ... continued

Category	ICD-10-AM codes
Acute	
Dehydration and gastroenteritis	E86, K52.2, K52.8, K52.9 as principal diagnosis only
Convulsions and epilepsy	G40, G41, O15, R56 as principal diagnosis only
Ear, nose and throat infections	H66, H67, J02, J03, J06, J31.2 as principal diagnosis only
Dental conditions	K02, K03, K04, K05, K06, K08, K09.8, K09.9, K12, K13 as principal diagnosis only
Perforated/bleeding ulcer	K25.0, K25.1, K25.2, K25.4, K25.5, K25.6, K26.0, K26.1, K26.2, K26.4, K26.5, K26.6, K27.0, K27.1, K27.2, K27.4, K27.5, K27.6, K28.0, K28.1, K28.2, K28.4, K28.5, K28.6 as principal diagnosis only
Appendicitis with generalised peritonitis	K35.0 in any diagnosis field
Cellulitis	L03, L04, L08, L88, L98.0, L98.3 as principal diagnosis only, exclude cases with any procedure except those in blocks 1820 to 2016 or if procedure is 30216-02, 30676-00, 30223-02, 30064-00, 34527-01, 34527-00, 90661-00 and this is the only listed procedure
Pyelonephritis (includes urinary tract infections)	N10, N11, N12, N13.6, N39.0 as principal diagnosis only
Pelvic inflammatory disease	N70, N73, N74 as principal diagnosis only
Gangrene	R02 in any diagnosis field

Note: The conditions and codes are those used in the Australian Institute of Health and Welfare (2007) *Australian hospital statistics* report. Reference: AIHW (2007) *Australian hospital statistics 2005-06*. Health services series no. 30. Cat no. HSE 50. Canberra: AIHW. At: <http://www.aihw.gov.au/publications/index.cfm/title/10455>; accessed 20 June 2007.

Appendix 1.2: Maps of Index of Relative Socio-economic Disadvantage

Map A1.1: Index of Relative Socio-economic Disadvantage, metropolitan regions, 2006



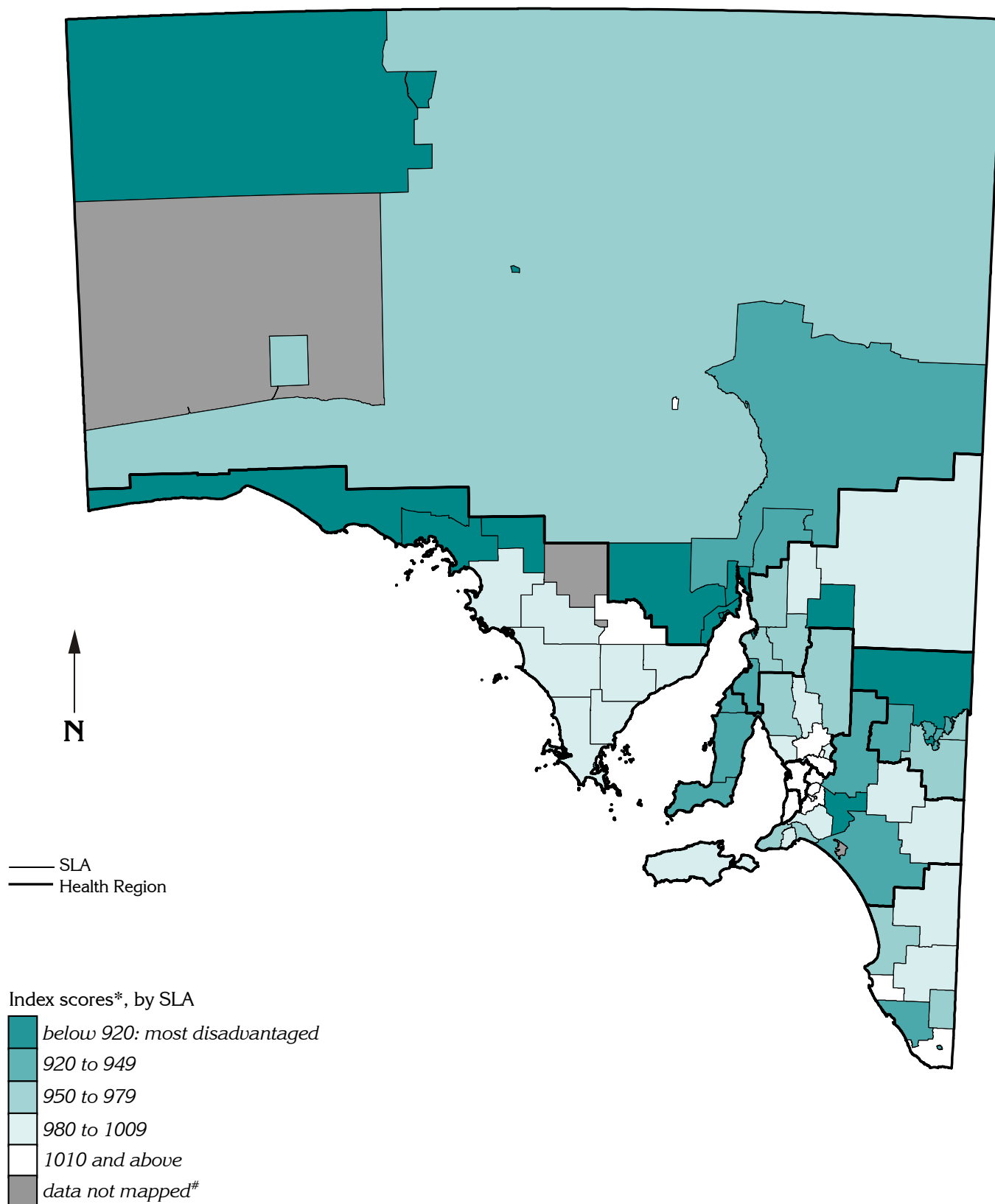
* Note: based on the Australian average score of 1000; the South Australian score is 979

Data not mapped: IRSD scores not available for areas with small populations or high levels of non-response in the Census

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Map A1.2: Index of Relative Socio-economic Disadvantage, South Australia, 2006



* Note: based on the Australian average score of 1000; the South Australian score is 979

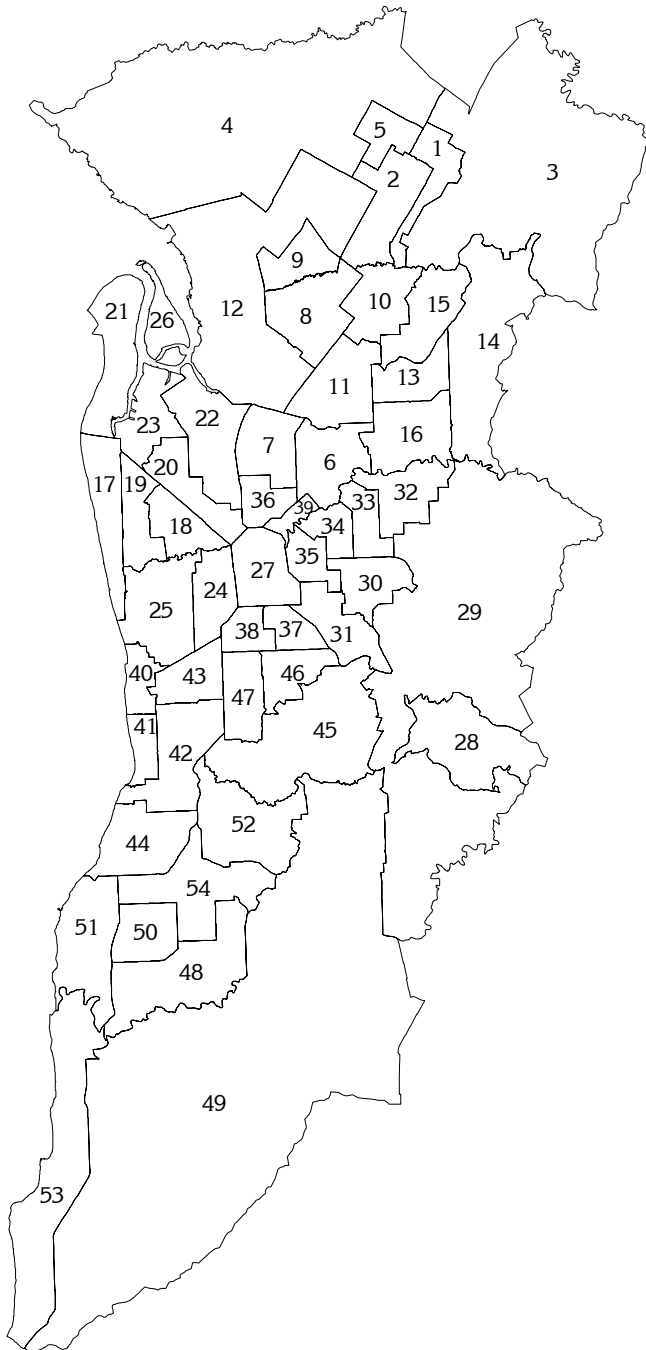
[#] Data not mapped: IRSD scores not available for areas with small populations or high levels of non-response in the Census

Details of map boundaries are in Appendix 1.3

Atlas of potentially avoidable hospitalisations in South Australia

Appendix 1.3: Geographic areas mapped

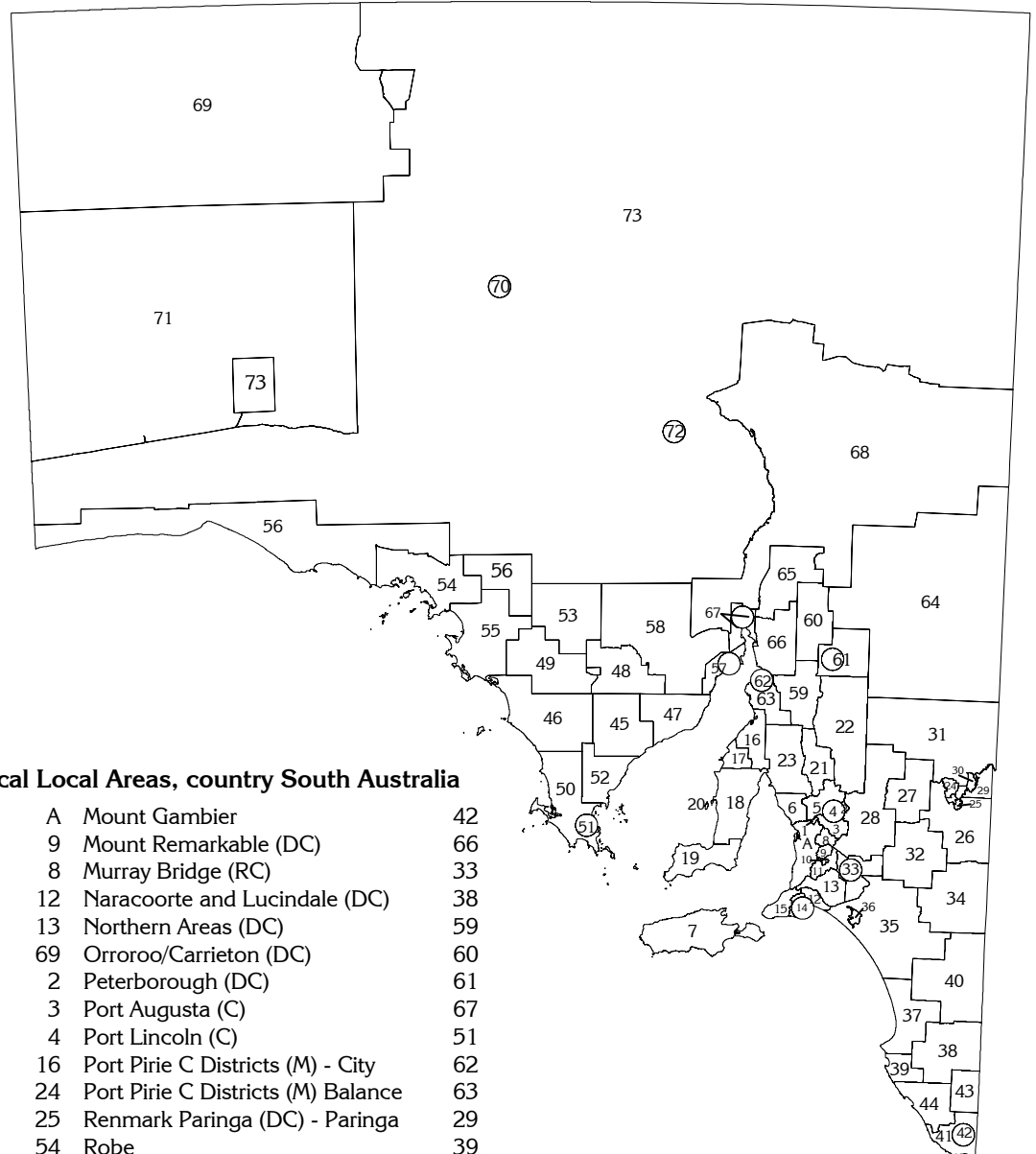
Map A1.3: Key to areas mapped by Statistical Local Area, metropolitan regions, South Australia, 2006



Alphabetical key to Statistical Local Areas, metropolitan regions, South Australia

Adelaide (C)	27
Adelaide Hills (DC) - Central	28
Adelaide Hills (DC) - Ranges	29
Burnside (C) - North-East	30
Burnside (C) - South-West	31
Campbelltown (C) - East	32
Campbelltown (C) - West	33
Charles Sturt (C) - Coastal	17
Charles Sturt (C) - Inner East	18
Charles Sturt (C) - Inner West	19
Charles Sturt (C) - North-East	20
Holdfast Bay (C) - North	40
Holdfast Bay (C) - South	41
Marion (C) - Central	42
Marion (C) - North	43
Marion (C) - South	44
Mitcham (C) - Hills	45
Mitcham (C) - North-East	46
Mitcham (C) - West	47
Norwood Payneham St Peters (C) - East	34
Norwood Payneham St Peters (C) - West	35
Onkaparinga (C) - Hackham	48
Onkaparinga (C) - Hills	49
Onkaparinga (C) - Morphet	50
Onkaparinga (C) - North Coast	51
Onkaparinga (C) - Reservoir	52
Onkaparinga (C) - South Coast	53
Onkaparinga (C) - Woodcroft	54
Playford (C) - East Central	1
Playford (C) - Elizabeth	2
Playford (C) - Hills	3
Playford (C) - West	4
Playford (C) - West Central	5
Port Adelaide Enfield (C) - Coast	21
Port Adelaide Enfield (C) - East	6
Port Adelaide Enfield (C) - Inner	7
Port Adelaide Enfield (C) - Park	22
Port Adelaide Enfield (C) - Port	23
Prospect (C)	36
Salisbury (C) - Central	8
Salisbury (C) - Inner North	9
Salisbury (C) - North-East	10
Salisbury (C) - South-East	11
Salisbury (C) Balance	12
Tea Tree Gully (C) - Central	13
Tea Tree Gully (C) - Hills	14
Tea Tree Gully (C) - North	15
Tea Tree Gully (C) - South	16
Unincorporated Western	26
Unley (C) - East	37
Unley (C) - West	38
Walkerville (M)	39
West Torrens (C) - East	24
West Torrens (C) - West	25

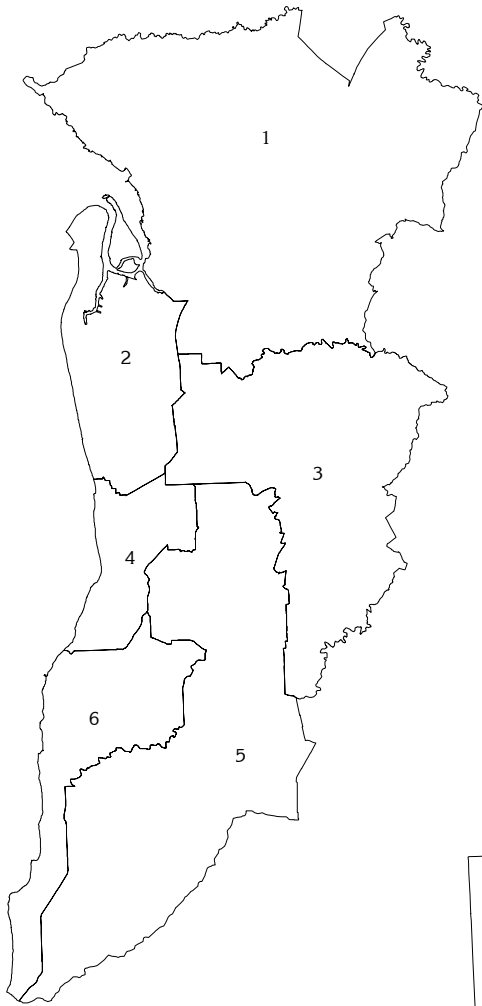
Map A1.4: Key to areas mapped by Statistical Local Area, country South Australia, 2006



Alphabetical key to Statistical Local Areas, country South Australia

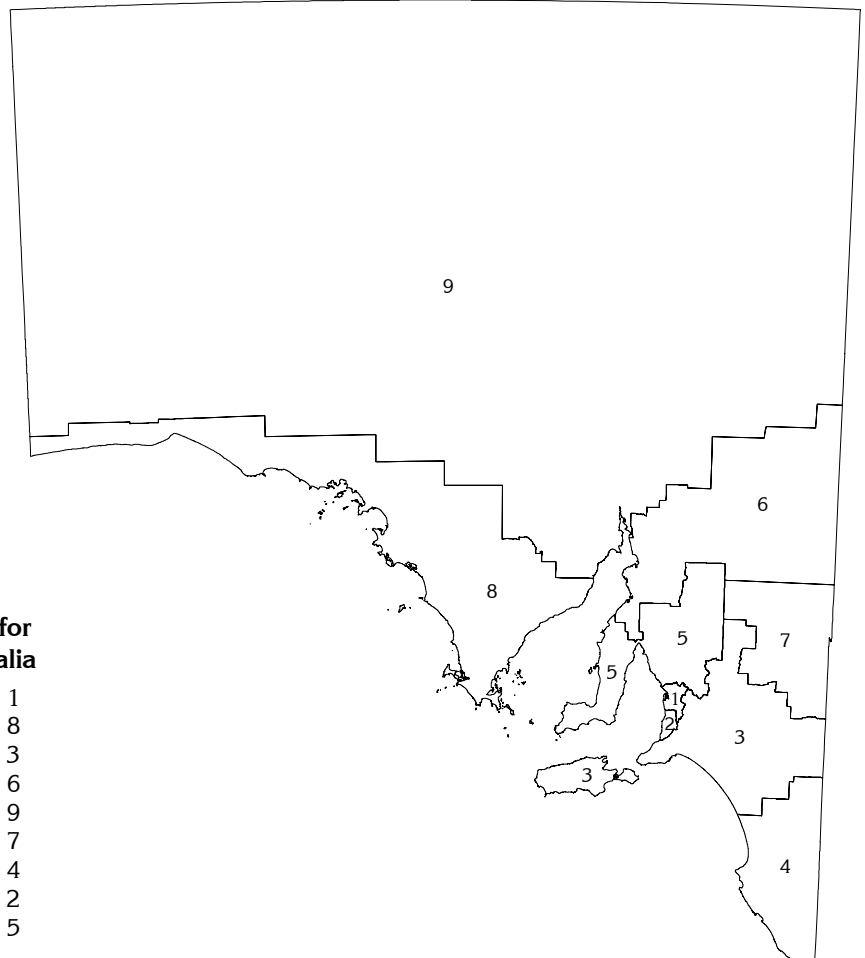
Metropolitan Adelaide	A	Mount Gambier	42
Adelaide Hills (DC) Balance	9	Mount Remarkable (DC)	66
Adelaide Hills (DC) - North	8	Murray Bridge (RC)	33
Alexandrina (DC) - Coastal	12	Naracoorte and Lucindale (DC)	38
Alexandrina (DC) - Strathalbyn	13	Northern Areas (DC)	59
Anangu Pitjantjatjara (AC)	69	Orroroo/Carrieton (DC)	60
Barossa (DC) - Angaston	2	Peterborough (DC)	61
Barossa (DC) - Barossa	3	Port Augusta (C)	67
Barossa (DC) - Tanunda	4	Port Lincoln (C)	51
Barunga West (DC)	16	Port Pirie C Districts (M) - City	62
Berri & Barmera (DC) - Barmera	24	Port Pirie C Districts (M) Balance	63
Berri & Barmera (DC) - Berri	25	Renmark Paringa (DC) - Paringa	29
Ceduna (DC)	54	Robe	39
Clare and Gilbert Valleys (DC)	21	Roxby Downs (M)	72
Cleve (DC)	45	Southern Mallee (DC)	34
Cooper Pedy (DC)	70	Streaky Bay (DC)	55
Copper Coast (DC)	17	Tatiara (DC)	40
Elliston (DC)	46	The Coorong (DC)	35
Flinders Ranges (DC)	65	Tumby Bay (DC)	52
Franklin Harbour (DC)	47	Unincorporated Far North	73
Gawler	1	Unincorporated Flinders Ranges	68
Goyder (DC)	22	Unincorporated Lincoln	53
Grant (DC)	41	Unincorporated Murray Mallee	36
Kangaroo Island (DC)	7	Unincorporated Pirie	64
Karoonda East Murray (DC)	32	Unincorporated Riverland	31
Kimba (DC)	48	Unincorporated West Coast	56
Kingston (DC)	37	Unincorporated Whyalla	58
Le Hunte (DC)	49	Unincorporated Yorke	20
Light (Reg C)	5	Victor Harbor (C)	14
Lower Eyre Peninsula (DC)	50	Wakefield (DC)	23
Loxton Waikerie (DC) - East	26	Wattle Range (DC) - East	43
Loxton Waikerie (DC) - West	27	Wattle Range (DC) - West	44
Mallala (DC)	6	Whyalla (C)	57
Maralinga Tjarutja (AC)	71	Yankalilla (DC)	15
Mid Murray (DC)	28	Yorke Peninsula (DC) - North	18
Mount Barker (DC) - Central	10	Yorke Peninsula (DC) - South	19
Mount Barker (DC) Balance	11		

Map A1.5: Key to overlays for metropolitan sub-regions/Districts and Health Regions, South Australia, 2006



Alphabetical key to overlays for metropolitan sub-regions/Districts

Central Northern Adelaide Area Health Service: Central East sub-region	3
Central Northern Adelaide Area Health Service: Northern sub-region	1
Central Northern Adelaide Area Health Service: Western sub-region	2
Southern Adelaide Health Service: Hills District	5
Southern Adelaide Health Service: Outer Southern District	6
Southern Adelaide Health Service: Urban Beaches District	4



Alphabetical key to overlays for Health Regions, South Australia

Central Northern Adelaide	1
Eyre	8
Hills Mallee Southern	3
Mid North	6
Northern & Far Western	9
Riverland	7
South East	4
Southern Adelaide	2
Wakefield	5

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