The Victorian Ambulatory Care Sensitive Conditions Study: Preliminary Analyses

Health Outcomes Section
Development and Resources Branch
Public Health Division

Published by Public Health Division
Victorian Government Department of Human Services
Melbourne Victoria

May 2001

Also Published on www.dhs.vic.gov.au/pdh/0104072

(0720401)

FOREWORD

Better access to primary healthcare increases the use of ambulatory care, prevents unnecessary hospitalisations and improves the health status of the population. The test of equity of access involves determining whether there are systematic differences in use of health services and health outcomes among groups and whether these differences result from barriers to primary care services.

The preliminary analyses from The Victorian Ambulatory Care Sensitive Conditions (ACSC's) study offers the potential for a new set of indicators describing differentials and inequalities in access to the primary healthcare system in Victoria. It also provides an evidence-based platform for policies directed at reducing demand on hospital services by offering opportunities for targeted interventions. The work on ACSC's has been based on internationally accepted standards in the analyses of preventable hospitalisation and is especially timely to the Department of Human Services given the contribution it can make to the recently announced Departmental flagship project 'Meeting Emergency Demand'.

Future work will include detailed analyses of the factors responsible for variations in ACSC rates, and Local Government profiles of ACSC's for community planning and evaluation. This will increase information on differentials in access to care and will inform strategies to reduce demand on the hospital system through public health and health system interventions.

Professor John Catford
Director Public Health and Chief Health Officer

Contents

List of Figures

List of Tables

1 Introduction

1.1 Access to Primary Health Care

The concept of access to primary health care can be viewed in a variety of ways, but broadly can be defined as: **the timely use of personal health services to achieve the best possible health outcomes.** This definition takes into account barriers to receiving care as well as the quality of the care provided. Using this definition we can ask whether the relatively poorer health outcomes of some specific population groups can be explained by problems related to access.

Several factors can impair access to primary care. They can be: **geographic** such as the distance, travel time and means of transportation; **financial** such as costs associated with health care and ability to pay; **cultural** such as language, religion and personal beliefs; and **organisational** such as availability of right kind of care on a continuing basis for those who need it.

The test of equity of access involves determining whether there are systematic differences in the use of health services and health outcomes among groups and whether these differences result from barriers to primary care services. Increasing access to primary care in communities is hypothesised to have a positive effect on reducing hospitalisations.

Measuring access to primary care is of great interest to policy makers who wish to evaluate the impact of changes in the way health care is delivered. However, monitoring access to care is not an easy task. There is no gold standard to measure access and new approaches are constantly being developed. In the past, researchers have relied primarily on population-based surveys. With these surveys, researchers can make inferences about who is at greatest risk for lacking access to care by comparing vulnerable populations, such as low-income persons, persons in poor health, and disadvantaged population to the rest of the population. Population-based surveys, however, are not the best instruments to examine relationships in health outcomes as they relate to access. As a result, primary care need is often assessed indirectly by using one or more social or health indicators. One such indicator is the rate of admissions to hospital for Ambulatory Care Sensitive Conditions (ACSCs).

1.2 Ambulatory Care Sensitive Conditions (ACSCs)

ACSCs are those for which hospitalisation is thought to be avoidable with the application of preventive care and early disease management, usually delivered in the ambulatory setting. In theory, timely and effective ambulatory care can help reduce the risks of hospitalisation by: preventing the onset of an illness or condition; controlling an acute episodic illness or condition; or managing a chronic disease or condition. This has led to the concept of **preventable or avoidable hospitalisation** as an indicator of health outcomes for evaluating quality of primary care. ACSC admission rates have also been proposed as a measure of access to health care.

Hospital admissions fall across a wide spectrum of preventability. Hospitalisations can be prevented through population-based health promotion, such as anti-smoking messages, vaccination programs, adequate management of chronic conditions, and timely care of an acute illness. Admissions for certain conditions may be considered more ‘preventable’ than others. We might consider that hospital admissions for vaccine preventable diseases such as measles and diphtheria are almost completely preventable while those for complications of chronic conditions are less so. ACSCs have been chosen in this project as those that are ‘sensitive’ to prophylactic or therapeutic interventions deliverable in a primary health care setting.

Because not all ACSC admissions are completely preventable, the variations in admission rates for these conditions are more informative than absolute rates.

1.3 ACSC Hospitalisations and Access to Primary Health Care

In the US, ACSC hospitalisations have been found to occur more often in people without health insurance, in rural and low-income communities (1-4). Such individuals are known to face significant barriers to care. The authors of many of these studies have concluded that admissions to hospital for conditions that might be considered preventable by good primary care are reflective of poor access to primary care services. This contention is supported by a study that showed that ACSC admissions were inversely associated with self-rated access to care, independent of physician practice style and socioeconomic factors (5). This study used additional information acquired through surveys of the population and individual physicians in the areas of interest.

Most of the work on ACSC admission rates has been done in the US where there are known variations in access to health care due to the lack of a universal health insurance scheme. Inequalities in health status are greater in the US than in most other developed nations. In this context, the association between ACSC admission rates and access to care might be more obvious than elsewhere. In fact, much smaller differences in ACSC admission rates were found in Ontario, Canada than across the US (1). Canada has a system of universal coverage similar to Australia.

In Australia, ACSC admissions have been examined in the Aboriginal population relative to the non-indigenous population (6). Significantly higher admission rates were found for those recorded as Aboriginal. Much of the data for this study came from states where a large proportion of the Aboriginal population live in remote areas with documented difficulties in accessing primary care services.

However, many authors urge caution in the use of ACSC admissions as indicators of sub-optimal primary care. They note that the ACSC indicator should be used to identify possible problems, which should then be investigated further.

1.4 Variations in ACSC Hospitalisations

Several factors other than access to primary care can influence variation in ACSC admission rates. They are:

- **Disease prevalence**

Systematic variations in disease prevalence can contribute to observed differentials in the rates of ACSCs. Prevalence of ACSCs can vary according to aetiology and progression characteristic of the disease, socioeconomic and environmental factors.

- **Propensity to seek primary health care**

People can decline to seek primary health care due to various factors, such as geographic location, transport barriers, education, cultural, financial, and beliefs about the effectiveness of interventions. Patients who seek medical care later in the course of their disease may have missed the opportunity for their illness to be managed in the primary care setting.

- **Socioeconomic barriers to care**

Access to care may be influenced by socioeconomic factors, such as race and poverty, which are important predictors of ACSC rates.

- **Hospital utilisation pattern**

Thresholds, criteria and capacity for clinical admission may vary between providers and across geographic areas.

1.5 Relevance to Departmental Initiatives

There are a number of major new initiatives being introduced in Victoria and nationwide aimed at improving quality, communication and coordination between health care service providers. Measuring and monitoring of ACSCs over time has the potential to reflect changes indicating the impact of these health reforms. Some of these initiatives are:

- **Coordinated Care Trials** are being undertaken to test whether multidisciplinary care planning and service coordination leads to improved health and wellbeing for people with chronic health conditions or complex care needs. Funds pooling between Commonwealth and State/Territory programs is being evaluated as a means of providing funding flexibility to support this coordinated approach to service delivery. For many people with chronic and complex care needs, care is provided by a number of quite separate service providers and funded by different levels of government. Often the result is that people receive the care they can get rather than the care they need. The trials seek to provide the right care at the right time.
- **Primary Care Partnerships (PCP)** is a strategy that Victoria has introduced to improve the experience and outcomes for people who use primary care services. PCPs aim to reduce the preventable use of hospital, medical and residential services through a greater emphasis on health promotion programs and by responding to the early signs of disease and/or people's need for support. PCPs will develop Community Health Plans for their communities. These plans will identify the priority health needs of the local area and describe how the providers in the PCP will work with each other and with other key stakeholders to respond to these needs. As part of the PCP strategy, several disease management projects will also be trialled to prevent hospital admissions for major illnesses like diabetes, heart disease, cancer and depression.
- Through its new **Enhanced Primary Care Package**, the Commonwealth Government has introduced new items into the Medical Benefits Schedule to encourage a more comprehensive, team approach on the part of GPs and to foster closer working relationships between GPs and other primary care and community support providers. The new items are for preparation of a multidisciplinary care plan, multidisciplinary case conferencing and voluntary health assessments of persons over 75 (or 55 for Koori patients).
- A key objective of the Department is to reduce inequalities in health and wellbeing. This report assists to demonstrate areas where service provision may not be adequate and where the targeting of resources needs to occur to reduce inequalities. By reducing these inequalities, the Departmental mission of enhancing and protecting 'the health and wellbeing of all Victorians emphasising vulnerable gaps and those most in need' can be advanced. This strongly complements the Government's draft social development framework. The potential of preventive and early intervention measures for reducing ill health and injury is well established. In an environment of increasing pressure on the tertiary sector, increased knowledge that adds to our understanding of how this pressure can be relieved is important.

1.6 Relevance to Public Health

- The public health strategic plan focuses on improving the health and well being of the population with a focus on **stopping disease** (reducing the impact and spread of disease amongst Victorians through immunisation, early intervention, screening and control); **closing the gaps** (decreasing disparities in health between social and cultural groups, geographical areas and indigenous and non-indigenous people in Victoria) and **building capacity** (turning information and research into knowledge, skills and action to strengthen the capacity of individuals, organisations and systems). Increasing emphasis on measuring, monitoring, and improving access to health care from public health perspectives has the potential to provide more comprehensive prenatal care leading to healthier babies; immunise more people against infectious diseases; reduce the risk of people developing diseases such as heart disease through health education and wellness programs (prevention); and enable people to control chronic conditions such as asthma and diabetes (control).
- The National Health Performance Committee proposed framework consists of three tiers reflecting that health status and health outcomes are influenced by the impacts of health determinants and health system performance. The Public Health Division, through the Health Outcomes Section, has taken major initiatives in measuring and monitoring population health status and health system performance. The study of ACSCs will complement the Victorian burden of disease (BOD) study and the Victorian Population Health Survey (VPHS) and, combined together, will provide a detailed picture of health care issues in Victoria. This is demonstrated in this report which identifies variations in rates of ACSC by Regions, small areas and socioeconomic status.
- The National Public Health Partnership (NPHP) strategic framework for preventing chronic disease has identified a number of areas for actions in improving chronic disease outcomes. A number of possible entry points for development of prevention strategies have been identified, including the population groups whose health may be at risk; the settings in which people 'live, work and play' and seek health care; and the lifestyle and risk factors that protect or damage health. This would also depend on the capacity of population health infrastructure (for example, constructing appropriate systems for monitoring and control of chronic diseases and their risk factors). Thus the prevention focus also encompasses health promotion and preventive opportunities of early detection, early intervention, rehabilitation, continuing care and self-management. While the notion of 'prevention is better than cure' is clearly true, it needs to be complemented in the context of chronic disease, with 'control is better than complication'. The measurement and surveillance of ACSCs and disease specific rates of ACSCs (for example, rates of complications of diabetes) has the potential to provide policy makers with the evidence for appropriately directing interventions and contributing to the development of a systematic approach to prevention and control of chronic diseases.
- The National Health Priority Areas (NHPA) initiative seeks to improve the health and wellbeing of the Australian population through reducing the burden of illness associated with the six endorsed priority areas. Analyses of ACSCs has direct public health relevance to the NHPAs, particularly asthma, diabetes and cardiovascular disease.
- The impact of improving access to primary health care in the community has direct implications for demand management. ACSCs can serve as a tool for containing cost. This tool promotes the efficient use of health care resources primarily because encouraging appropriate delivery of primary care reduces the need for costly inpatient care.

1.7 Purpose of the Study

This study presents the results of preliminary analysis of outcome indicators identifying some issues associated with access to primary health care in Victoria. This study has the following goals:

- To develop an initial set of indicators for ACSCs with a focus on chronic diseases, NHPAs, and vaccine preventable conditions.
- To use these indicators for assessing the current performance of the health system.
- To develop a surveillance system for continuous monitoring and analysis of these indicators.

The specific purpose of this report, based on preliminary analysis of the data, is to:

- Provide a discussion on the use and limitations of the concept of ACSCs.
- Develop a methodology for identifying and analysing ACSCs.
- Describe trends and variations in rates of ACSCs by Department of Human Services Regions, local government areas, and socioeconomic status.
- Demonstrate the value of ACSC indicators in monitoring trends over time.
- Discuss policy implications and options for future analysis of ACSCs.

2 Use of ACSC Concept

2.1 Potential Applications of ACSC

In Victoria, rates of ACSCs can be used as one of a range of indicators for monitoring the performance of the health system. They can:

- Serve as an information tool for planners and policy makers for continuous monitoring of health services in Victoria.
- Provide means for targeting strategies that can reduce the call on hospital system.
- Highlight barriers to accessing primary care in the community.
- Contribute to the evaluation of the performance of initiatives and interventions such as the PCP strategy.
- Evaluate the impact of other Department of Human Services policies (for example, rural health policy).
- Be reported to Government as one of the performance indicators of the health system in Victoria.

2.2 Limitations of ACSC

There are a number of limitations that should be considered when assessing the value that ACSC admissions rates can bring to monitoring primary care.

- The assessment of whether a condition or hospitalisation for a condition is sensitive to the provision of primary care and, therefore preventable, may often be subjective as well as evidence-based. As such, ACSC admission rates only suggest a degree of potential avoidability and point to possible areas of improvement.
- Factors other than access to primary care may influence hospitalisation rates and may be difficult to measure.
- There is a lack of information about variations in disease prevalence in small areas. This limits the ability to control for variability in ACSC rates that may be due to differential disease prevalence especially in the context of small area analysis.
- Although ACSCs have been used to evaluate the performance of the health system, their value in determining the impact of policy or interventions is not clear.

2.3 Classification of ACSCs

For this report a broad range of conditions classified as ACSCs in the literature was used. These were categorised according to the objectives of primary care as follows:

- **Vaccine-Preventable ACSCs** (reducing the incidence of preventable disease)

Good access to health care services can virtually prevent the occurrence of disease in this group. This includes hospitalisation for influenza, bacterial pneumonia, tetanus, measles, mumps, rubella, pertussis, and polio-conditions for which vaccination is available.

For these conditions, it is the actual condition that is deemed preventable rather than the hospitalisation.

- **Acute ACSCs** (reducing morbidity and pain through timely and appropriate treatment)

The personal health care system can provide symptomatic relief to patients for certain acute conditions that would be resolved independent of any medical intervention. In some situations, lack of attention to symptoms in a timely fashion can lead to acute medical problems requiring hospitalisation. Mild cases of this group of conditions should theoretically be managed in ambulatory care settings, preventing the disease from becoming more severe and necessitating hospitalisation. This category includes avoidable hospitalisation for acute disease, for example, dehydration/gastro, kidney infection, perforated ulcer, cellulitis, pelvic inflammatory disease, ear, nose and throat (ENT) infections, dental conditions.

These conditions may not be preventable in themselves but theoretically should not result in hospitalisation if adequate and timely primary care is received.

- **Chronic ACSCs** (reducing the effect of chronic disease and prolonging life)

Chronic conditions are usually not self-limiting and can lead to extensive use of medical services. Adverse consequences of disease can occur with or without medical care, but negative consequences are more common when regular care is absent. An advanced stage of a chronic disease requiring hospitalisation may indicate the existence of one or more access barriers to personal health care services. This category includes avoidable hospitalisation for selected chronic disease, for example, diabetes, asthma, angina, hypertension, congestive heart failure, chronic obstructive pulmonary disease (COPD).

In this case, although these conditions may be preventable through behaviour modification and lifestyle change, they can also be managed effectively through primary care in order to prevent deterioration and hospitalisation.

3 Data Sources and Methods

3.1 Hospital Admissions Data

Hospital separation data were obtained from the Victorian Admitted Episodes Database (VAED). The VAED is a minimum dataset containing data on all admitted patient activity submitted by all public and private acute hospitals, including acute facilities in rehabilitation and extended care institutions and day procedure centres.

For this preliminary analysis, definitions of ACSCs contained in published literature were used (see Appendix). The VAED records were selected based on diagnosis fields and some exclusions were made based on procedure fields. The ICD-9 codes used are also contained in the Appendix.

3.2 Trend Analysis

Data from 1993-94 through 1997-98 were used in this analysis. Prior to 1993, not all hospitals were contributing to the database and this also coincides with the introduction of casemix funding for hospitals.

3.3 ACSC Admission Rates

Population figures by gender and five-year age groups were obtained from the Australian Bureau of Statistics (ABS) 1996 census and these population figures have been used for the entire five-year period under analysis. Admission rates are age and sex standardised using the direct method to the Victorian population unless otherwise stated. Standardisation eliminates the effects of differences in the age structure of various populations. This allows comparisons between groups with different age compositions. Confidence intervals (CIs) define the range of values within which the rate is likely to lie. Ninety five per cent CIs for the standardised rates were based on poisson distribution.

3.4 Geographic Areas

The use of ACSC admissions to hospital requires calculation of admission rates for defined geographic areas. In Victoria, there have been significant changes over the last decade to the geographic areas that make up local government areas and that are used by the ABS. Currently there are 200 statistical local areas (SLAs), which make up 78 local government areas (LGAs). These boundaries were introduced in 1996 but did not apply for the whole of the 1996-97 financial year. For this reason, only the 1997-98 data can be used to apply admission rates to the current LGAs. Comparisons across the entire five years used in this analysis can therefore only be made at the Department of Human Services Regional level. Victoria is divided into nine health Regions, four of which encompass metropolitan Melbourne and five that cover the non-metropolitan areas in Victoria.

3.5 Socioeconomic Status

The ABS produces indices of socioeconomic status for SLAs based on census data. Using the 1996 SEIFA index of relative socioeconomic disadvantage, SLAs were grouped into SEIFA quintiles ensuring roughly equal population totals for each quintile. Quintiles 1 to 5 were therefore assigned to each admission based on SLA of residence.

4 ACSC Hospitalisation in Victoria

4.1 Overall ACSC Admissions

ACSC admissions account for 7 per cent of all admissions in Victoria. This equates to 7.4 per cent of all bed days in Victoria, which is about half a million bed days per year. Top four ACSCs in Victoria fall under the groupings of NHPAs(Table 1). Frequency of bed days is higher for congestive cardiac failure (CCF), diabetes complications and chronic obstructive pulmonary disease (COPD).

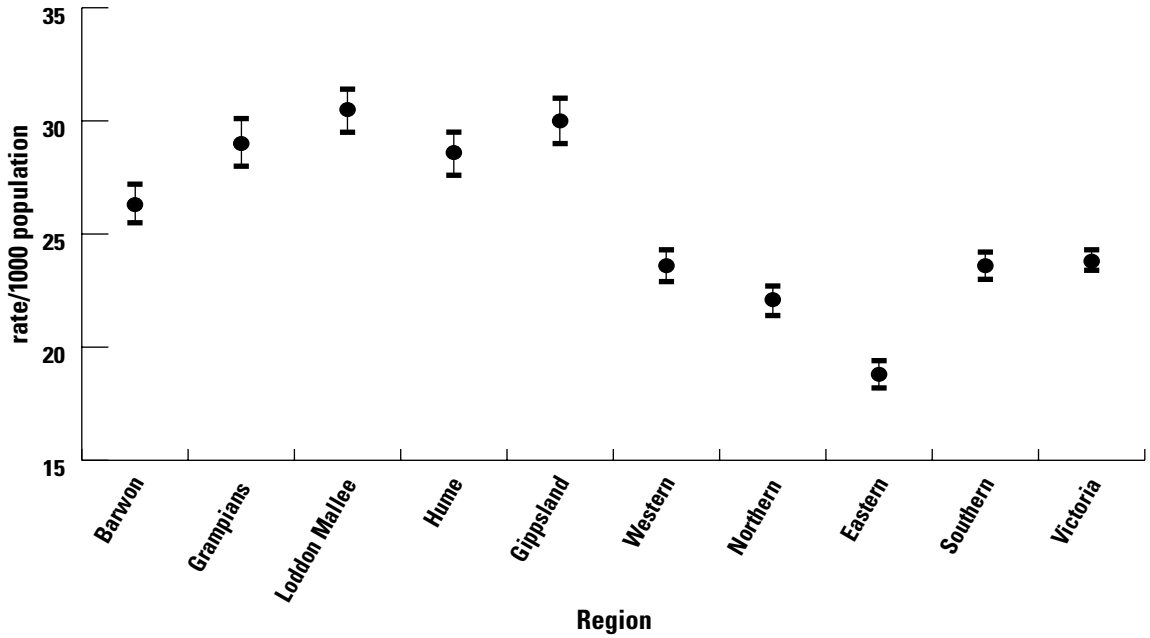
Table 1 Frequency of Admission and Bed Days for Top 10 ACSCs in Victoria

Rank	ACSC	Number Admitted	Bed Days
1	Angina	19,116	62,009
2	Asthma	12,936	45,178
3	Diabetes	11,935	86,834
4	CCF	11,539	89,231
5	Dental	8,840	10,436
6	COPD	7,968	62,585
7	Convulsions	6,846	21,165
8	Cellulitus	6,232	34,847
9	Dehydration/Gastro	6,029	17,566
10	ENT infections	5,631	10,478

Admission rates for the conditions listed as ACSCs in this analysis vary significantly across Victoria. This occurs despite supposed universal access to both primary health care and hospital care in Australia. In 1997-98, there were 23.8 ACSC admissions per 1,000 population in Victoria.

Across Department of Human Services Regions, rates ranged from 18.8/1000 in the Eastern Metropolitan Region to 30.5/1000 in the Loddon Mallee Region (Fig. 1). Overall, rural Regions have significantly higher ACSC admission rates than do metropolitan Regions, although there is still significant variation within metropolitan and rural areas.

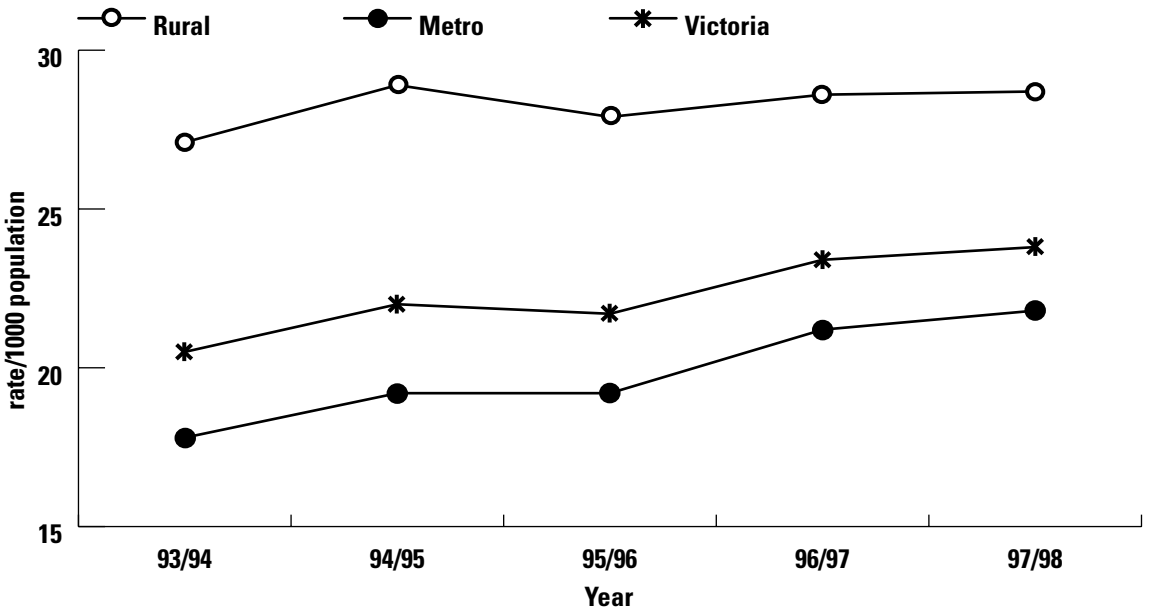
Figure 1 Total ACSC Admission Rates by Region, 1997-98 Data



4.2 Trends over Time

Data from other countries including New Zealand suggest that admission rates for ACSCs are increasing over time (7). A similar increase is seen in Victoria (Fig. 2), from 20.52/1000 (20.39-20.65) in 1993-94 to 23.82/1000 (23.68-23.96) in 1997-98. However, it seems that metropolitan Melbourne is primarily driving the increase, as there is little increase apparent in rural areas of Victoria. As a result, the ratio of ACSC admission rates between rural and metropolitan Victoria is decreasing, from 1.52 in 1993-94 to 1.32 in 1997-98.

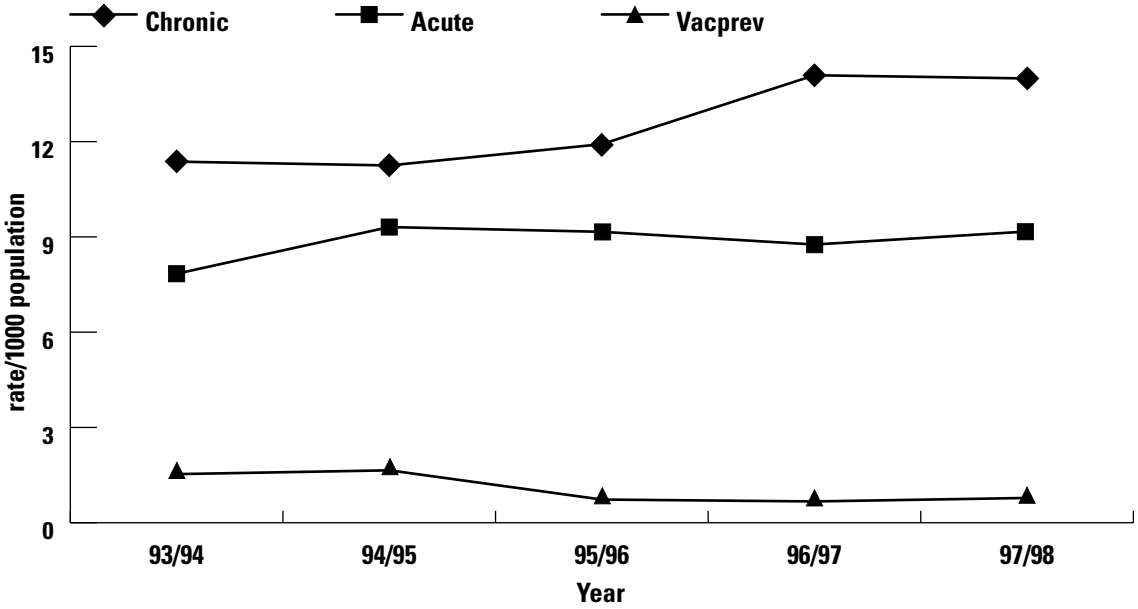
Figure 2 Total ACSC Admission Rates for Rural Regions, Metropolitan Regions and Victoria by Year



When divided into three categories vaccine-preventable (vacprev), chronic illness and acute conditions (Figure 3), it appears that ACSC admissions attributed to chronic disease are increasing over time while admissions for acute conditions are more stable.

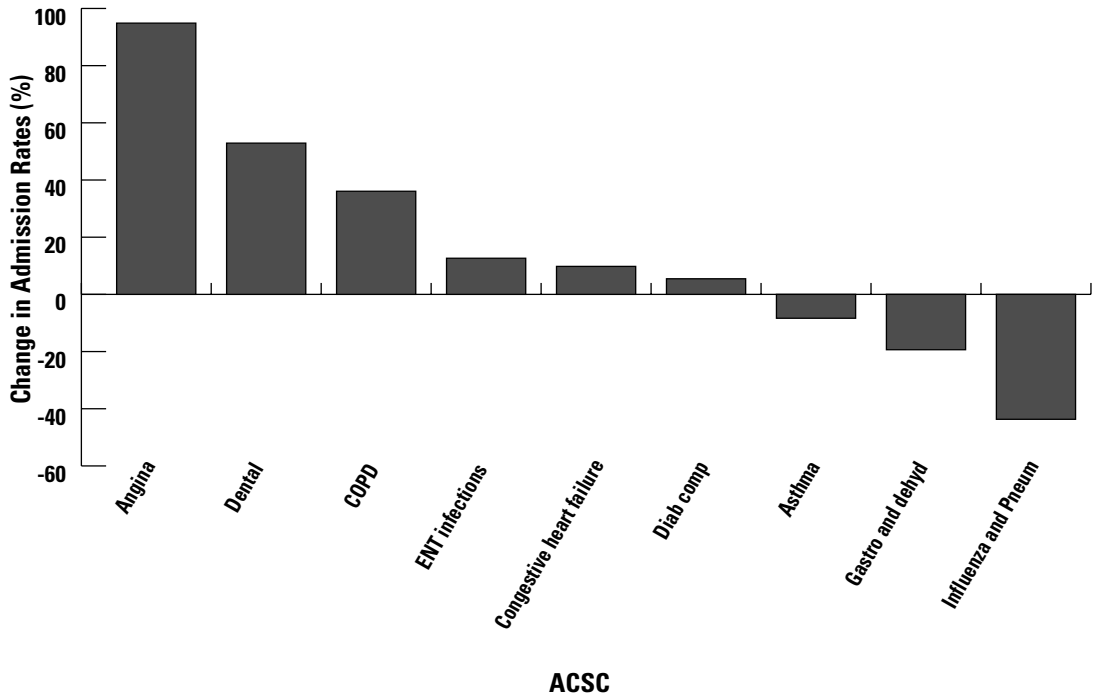
This may be due to the changing pattern of morbidity, where the prevalence of major chronic diseases is reported to be increasing. In contrast, admissions for vaccine-preventable conditions have declined since 1993-94.

Figure 3 Acute, Chronic and Vaccine-Preventable ACSC Admission Rates by Year



Looking at individual conditions, there are considerable variations over time (Figure 4). The rate of angina admissions has almost doubled between 1993-94 and 1997-98, whereas the rate of admissions for vaccine-preventable influenza and pneumonia has decreased.

Figure 4 Change in Admission Rates (%) between 1993-94 and 1997-98 for Individual Conditions



4.3 Vaccine-Preventable ACSC Admission Rates

The 'vacprev' category is made up of two major groups of conditions, influenza and pneumonia as one and, secondly, other vaccine-preventable conditions, which include whooping cough, tetanus, polio, diphtheria, Hib, measles, mumps and rubella.

When analysed separately, these two categories show differences. Admissions for influenza and pneumonia show a similar pattern to other ACSC admission rates with higher rates in rural areas. In contrast, admissions for other vaccine-preventable conditions are higher in metropolitan areas, primarily due to two metropolitan Regions, Western and Northern. The pattern over time is also quite different; influenza and pneumonia show a major decline between 1994-95 and 1995-96 (Figure 5). A similar pattern is seen for influenza and pneumonia admissions when just those aged over 65 are examined (Figure 6). In contrast, other vaccine-preventable admission rates declined in metropolitan areas from 1993-94 to 1995-96, while rural areas are relatively stable (Figure 7). The high rate of admissions for other vaccine-preventable conditions in metropolitan areas between 1993 and 1995 may be due to a pertussis outbreak occurring mainly in metropolitan areas at this time.

Figure 5 Influenza and Pneumonia ACSC Admission Rates for Rural and Metropolitan Regions by Year

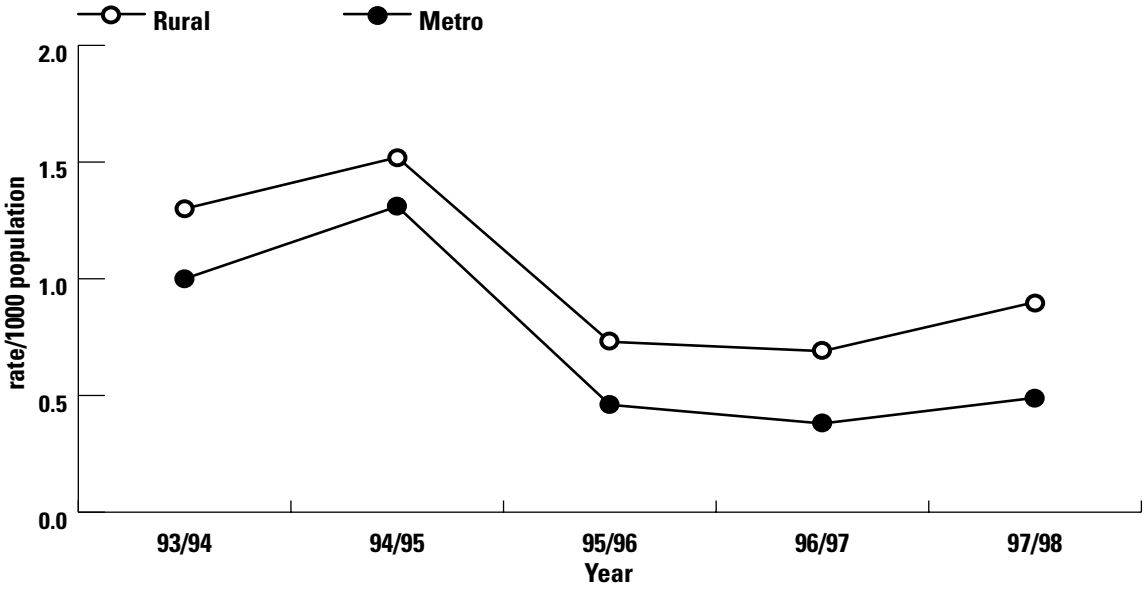


Figure 6 Influenza and Pneumonia ACSC Admission Rates for Rural and Metropolitan Regions by Year (over 65s only).

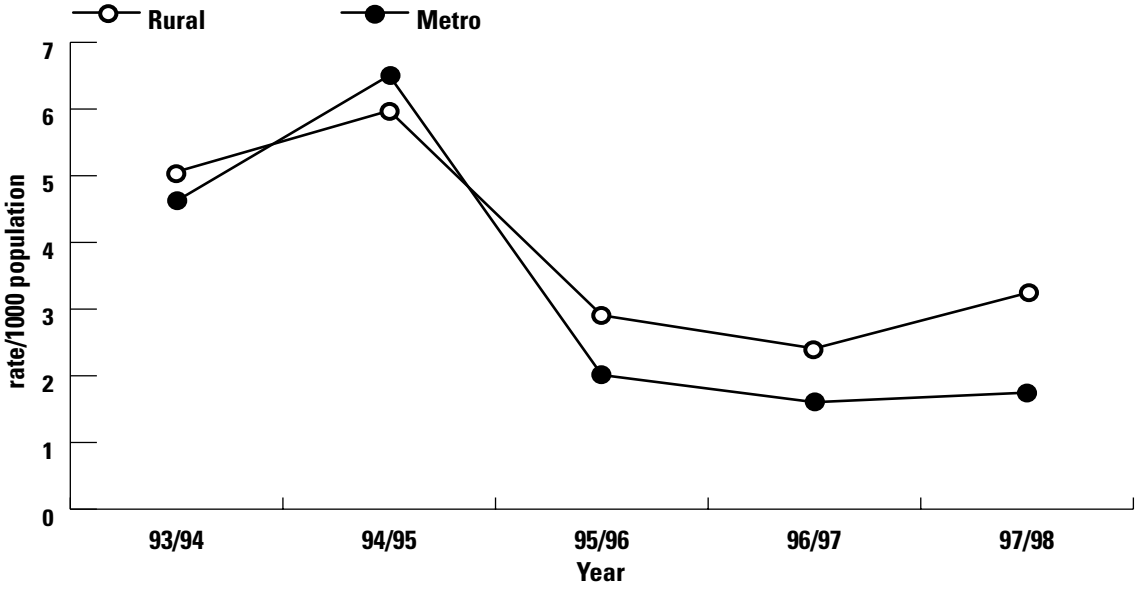
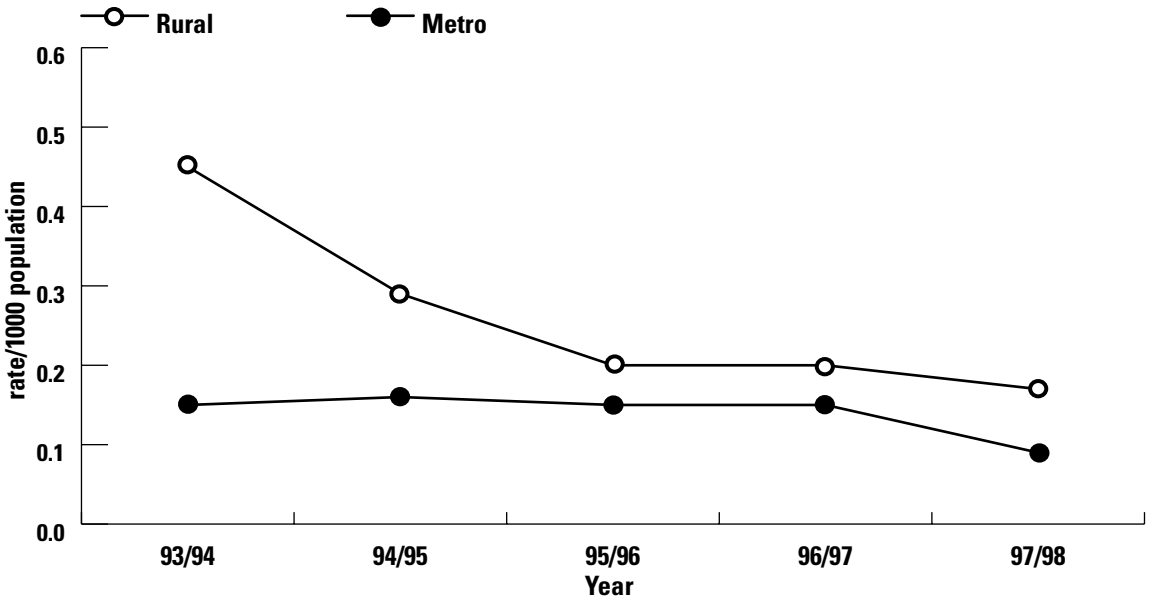


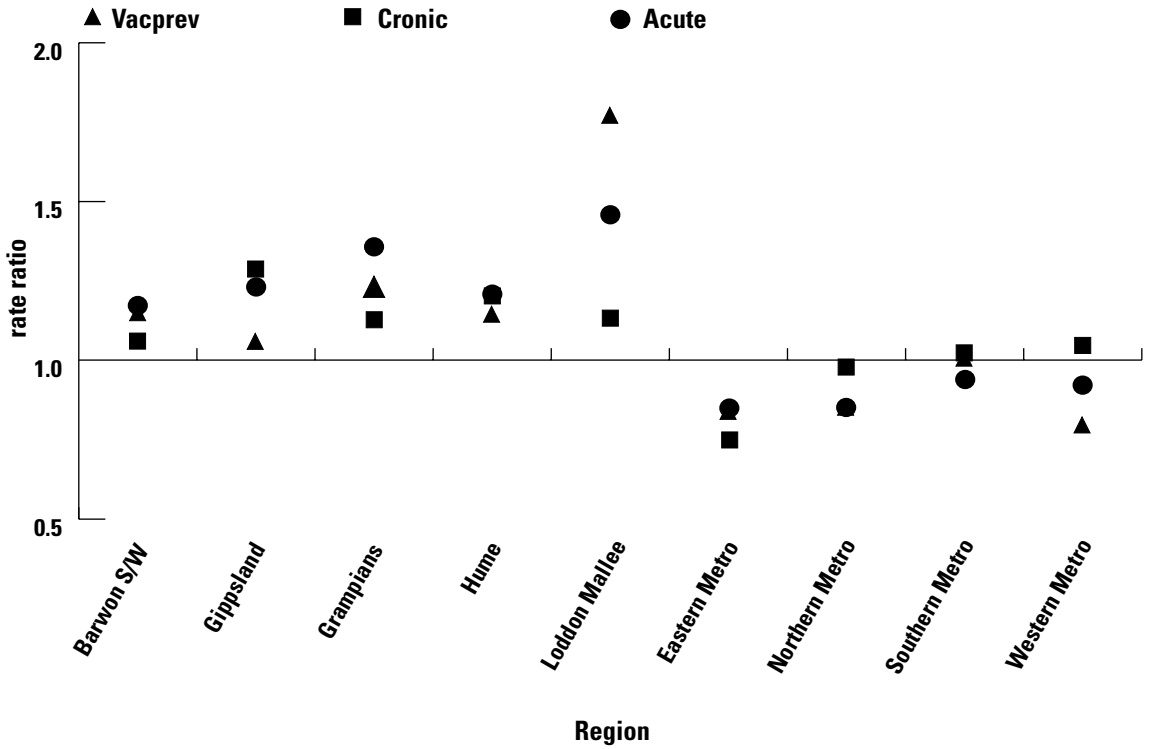
Figure 7 Other Vaccine-Preventable ACSC Admission Rates for Rural and Metropolitan Regions by Year



4.4 Variations across Department of Human Services Regions

When all the ACSC admissions for various conditions are added together, significant variations are seen across Regions (Figure 1). However, the same pattern is not necessarily seen for individual conditions. For example, in Gippsland the highest admission rate relative to Victoria is seen for chronic conditions, whereas in Loddon Mallee it is vaccine-preventable conditions (Figure 8).

Figure 8 ACSC Admission Rate Ratios by Regions (Regional Admission Rates Relative to Victoria, Victoria = 1), 1997-98 Data



Using this same method of comparing Regions to the State overall, rate ratios for individual conditions are shown for each Region in the following graphs. This information may be useful in directing resources into disease-specific strategies in Regions.

Figure 9 ACSC Admission Rate Ratios for Barwon South Western Region (Victoria = 1), 1997-98 Data

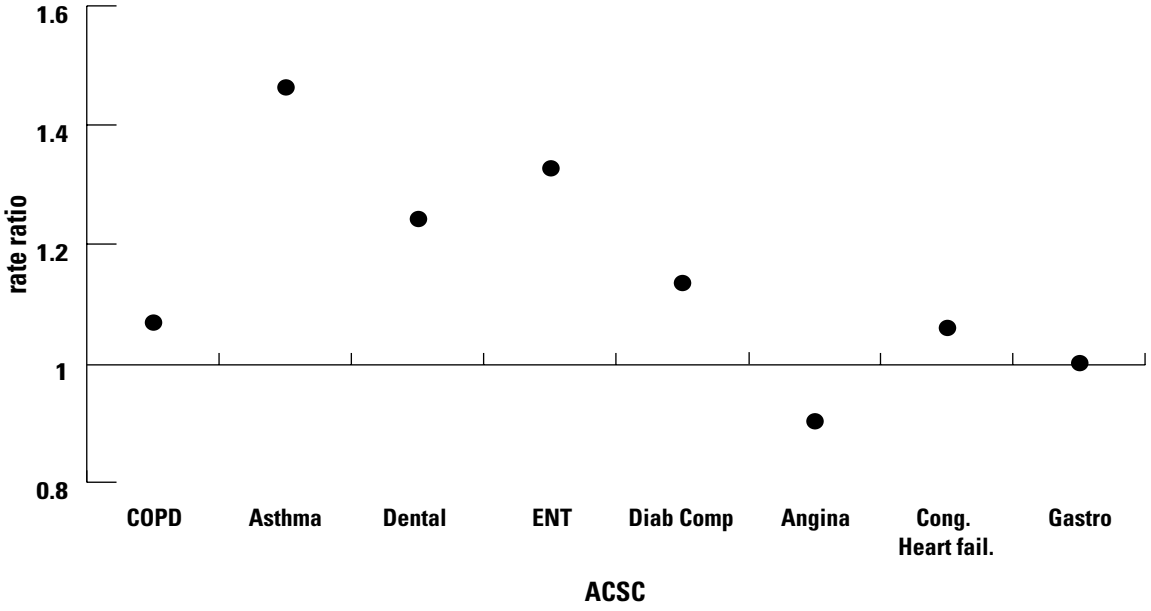


Figure 10 ACSC Admission Rate Ratios for Gippsland Region (Victoria = 1), 1997-98 Data

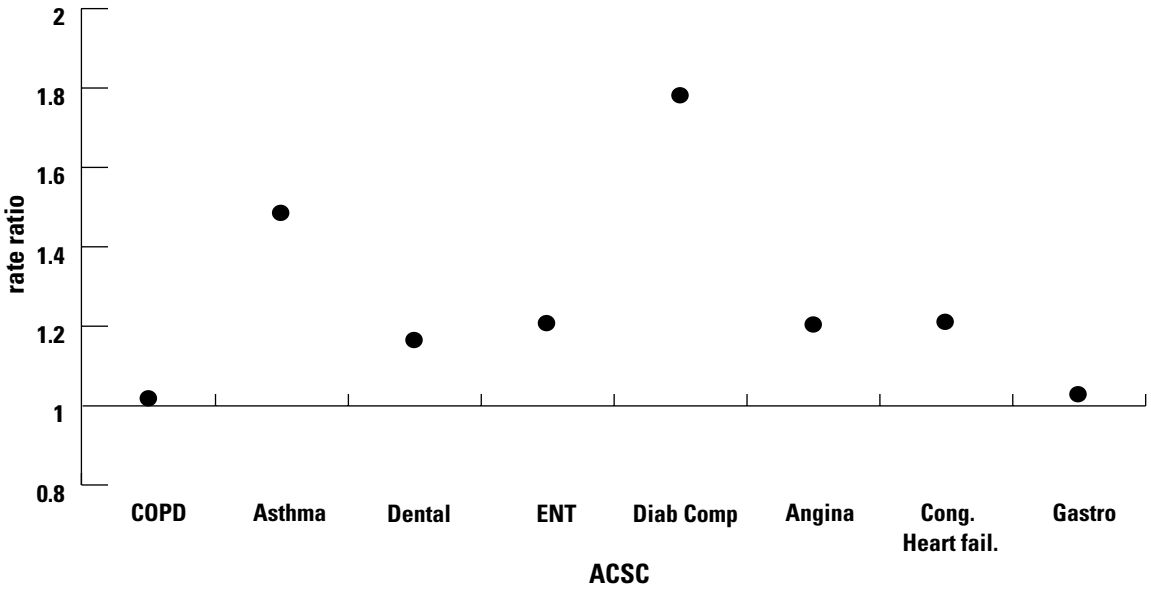


Figure 11 ACSC Admission Rate Ratios for Grampians Region (Victoria = 1), 1997-98 Data

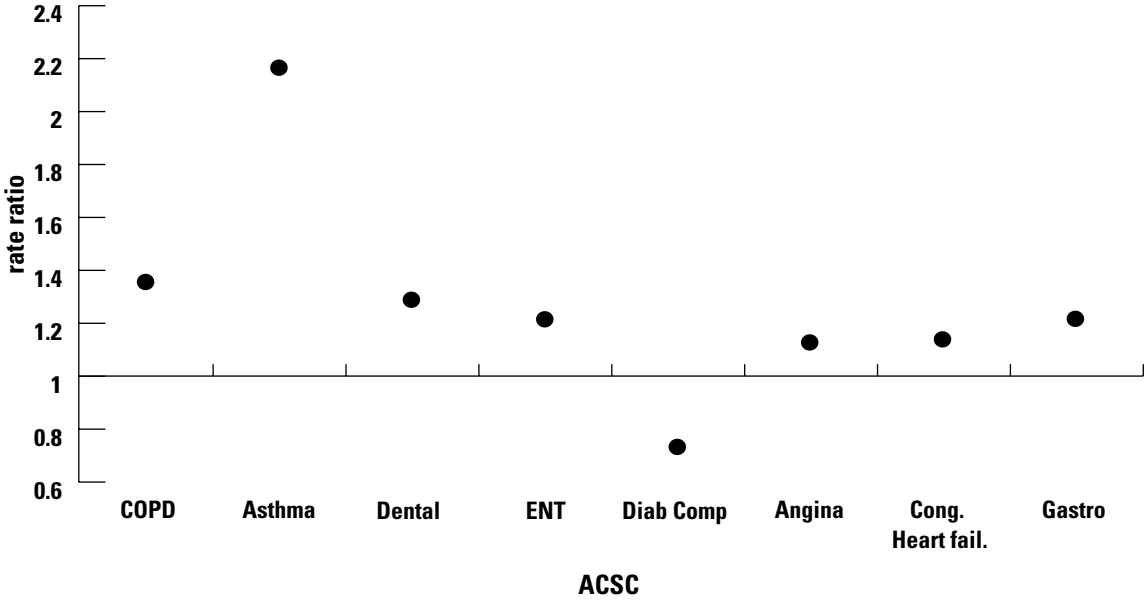


Figure 12 ACSC Admission Rate Ratios for Hume Region (Victoria = 1), 1997-98 Data

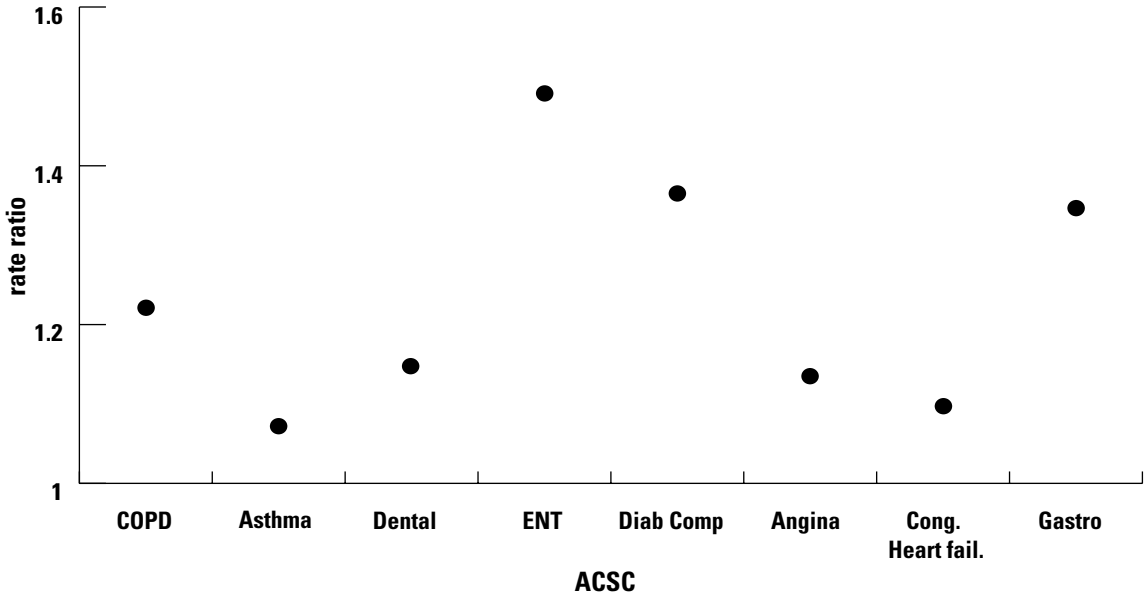


Figure 13 ACSC Admission Rate Ratios for Loddon Mallee Region (Victoria = 1), 1997-98 Data

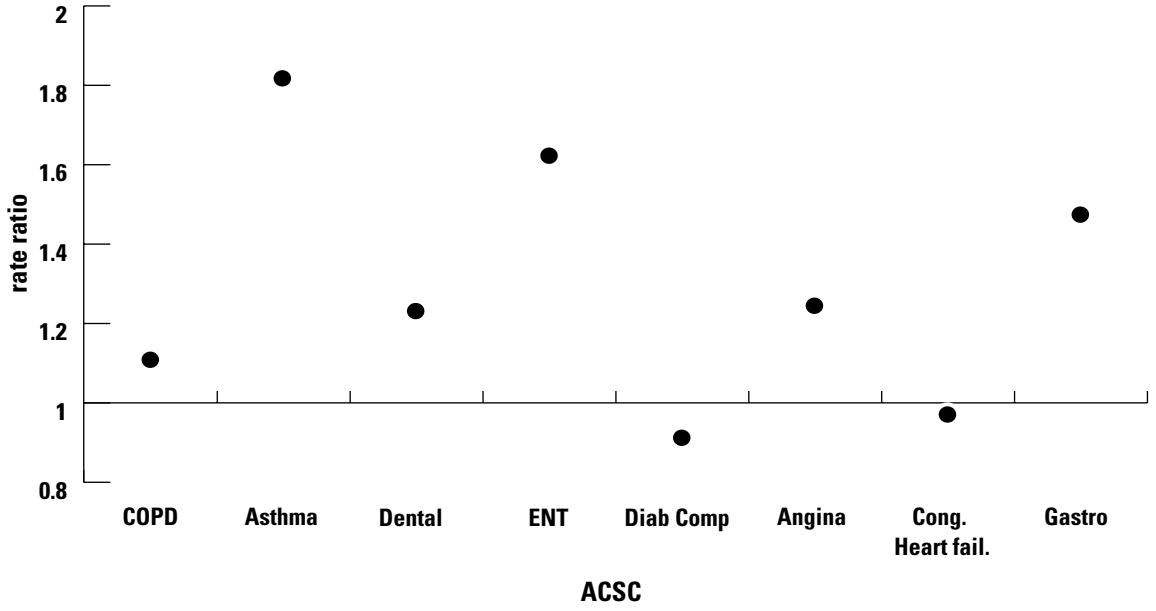


Figure 14 ACSC Admission Rate Ratios for Eastern Metropolitan Region (Victoria = 1), 1997-98 Data

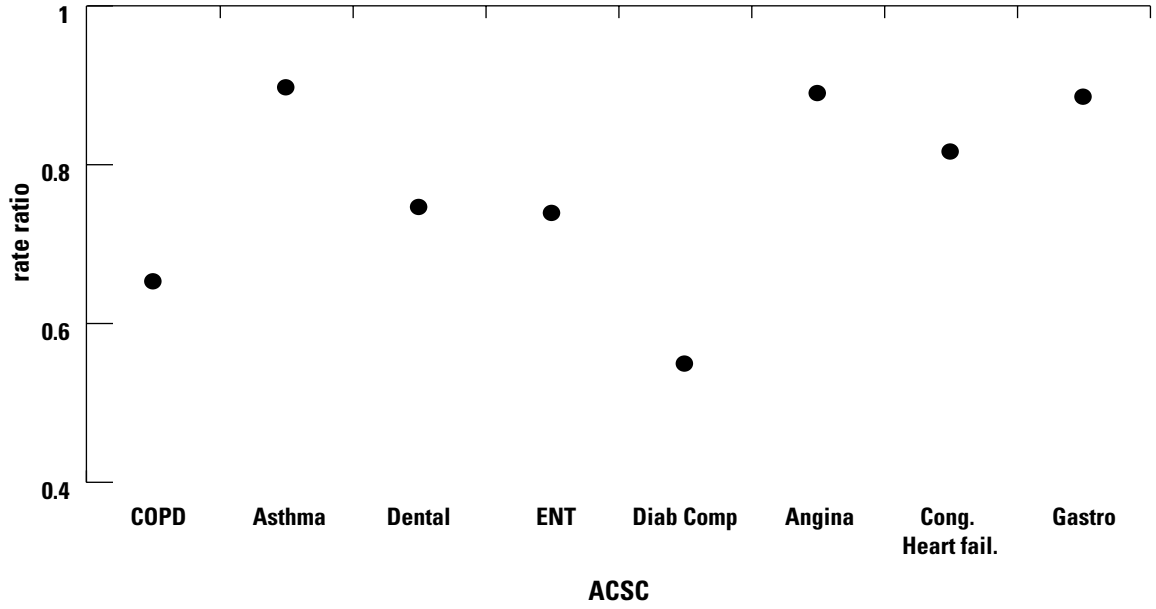


Figure 15 ACSC Admission Rate Ratios for Northern Metropolitan Region (Victoria = 1), 1997-98 Data

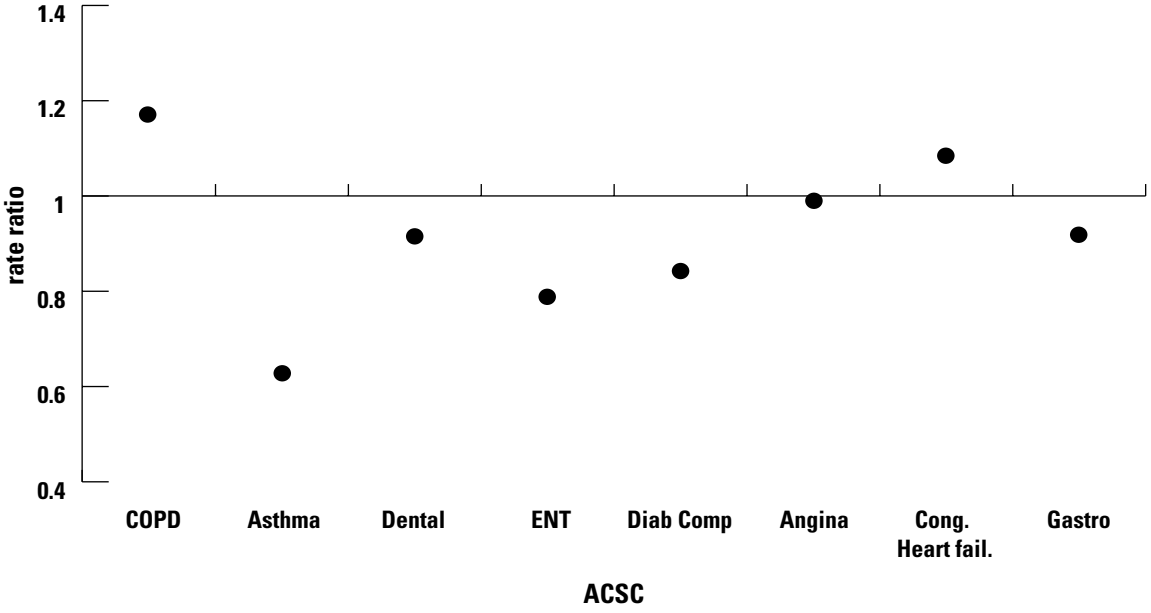


Figure 16 ACSC Admission Rate Ratios for Southern Metropolitan Region (Victoria = 1), 1997-98 Data

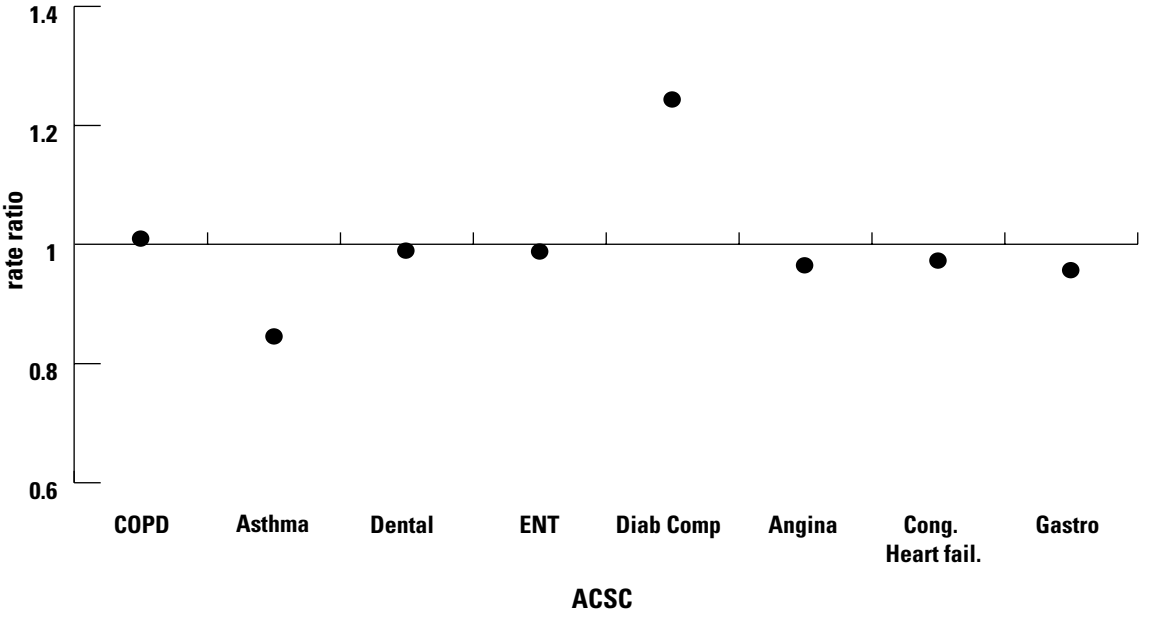
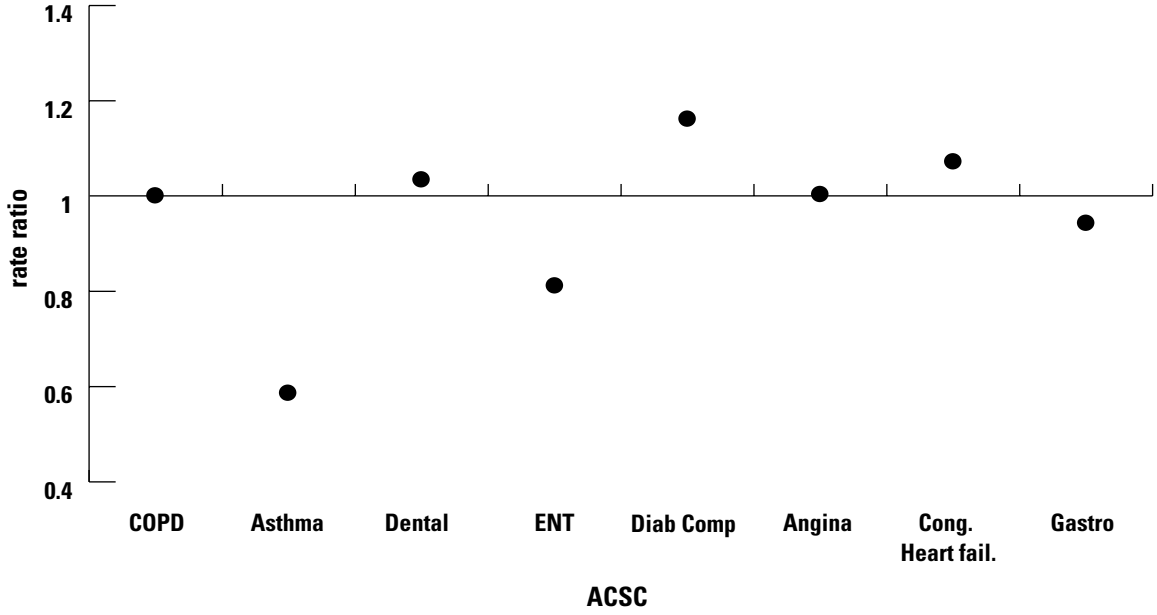


Figure 17 ACSC Admission Rate Ratios for Western Metropolitan Region (Victoria = 1), 1997-98 Data



Asthma and diabetes complications seem to appear the most often as both the highest and lowest rates compared to Victoria for Regions (Table 1). Admission rates for asthma, however, do not show as much variation across Regions than do most other conditions.

Table 2 ACSC with the Highest and Lowest Rates Relative to Victoria for Each Region

	Compared to Victoria	
Department of Human Services Region	**Highest rate**	**Lowest rate**
Barwon South Western	Asthma	Angina
Grampians	Asthma	Diabetes Complications
Loddon Mallee	Asthma	Diabetes Complications
Hume	Ear, nose throat infections	Asthma
Gippsland	Diabetes Complications	COPD
Western Metro	Diabetes Complications	Asthma
Northern Metro	COPD	Asthma
Eastern Metro	Rates for all conditions below Victoria	
Southern Metro	Diabetes Complications	Asthma

4.5 Variations by Socioeconomic Status

The ABS produces indices of socioeconomic status for SLAs based on census data. Using the 1996 SEIFA index of relative socioeconomic disadvantage, SLAs were grouped into SEIFA quintiles ensuring roughly equal population totals for each quintile. Quintiles 1 to 5 were therefore assigned to each admission based on domicile of residence.

Using 1997-98 data, ACSC admission rates were higher in the quintile 1 (lower socioeconomic group) and decreased with improving socioeconomic status (quintile 5, Figure 18). When individual conditions and categories are examined, differences emerge. There is a significant gradient for the chronic and

acute categories but not for vaccine-preventable (Figure 19). Significant gradients were seen for ENT infections, COPD, congestive heart failure (conghf), angina, asthma and diabetes complications (diab comp). No gradient was seen for dehydration and gastroenteritis (gastro) or dental conditions (Figure 20).

The rate ratio between the lowest and the highest socioeconomic status quintiles is largest for diabetes complications and asthma, and overall is larger for chronic conditions than for acute.

Figure 18 Total ACSC Admission Rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data

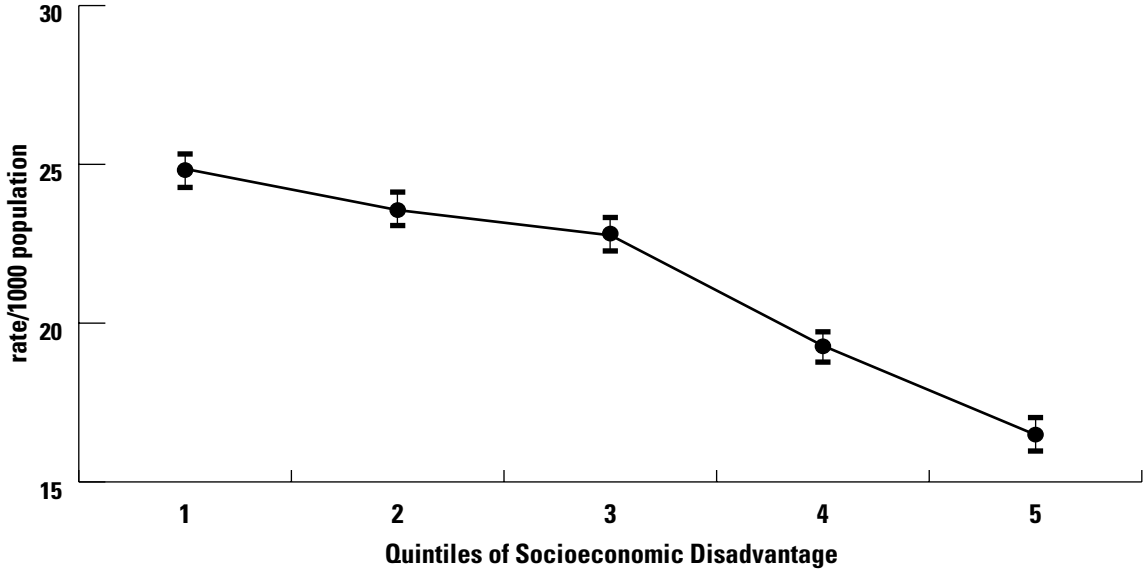


Figure 19 Acute, Chronic and Vaccine-Preventable ACSC Admission Rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data

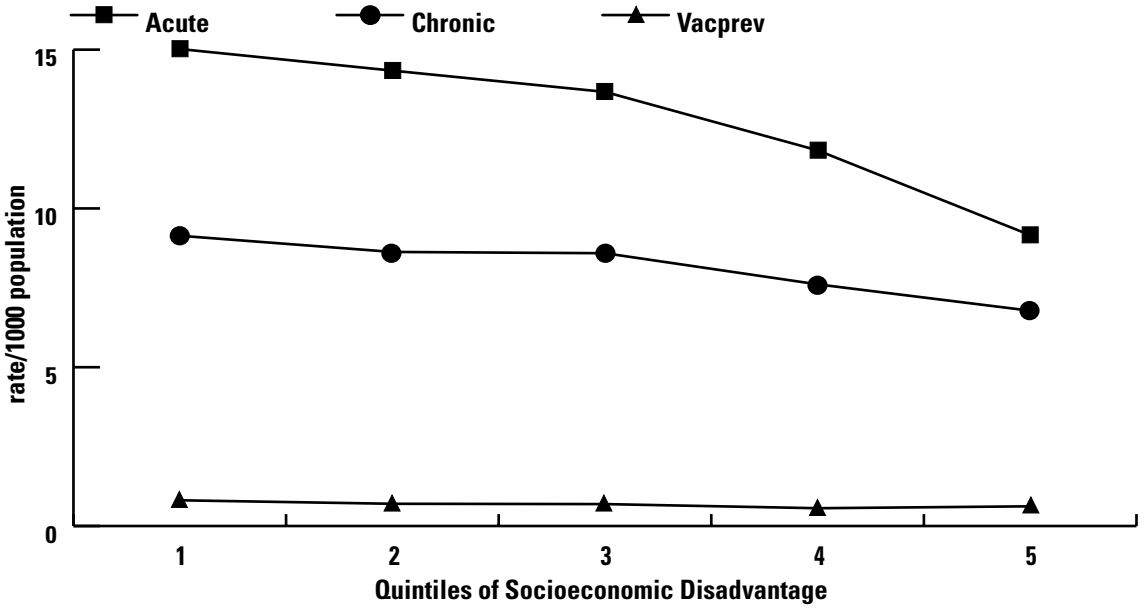
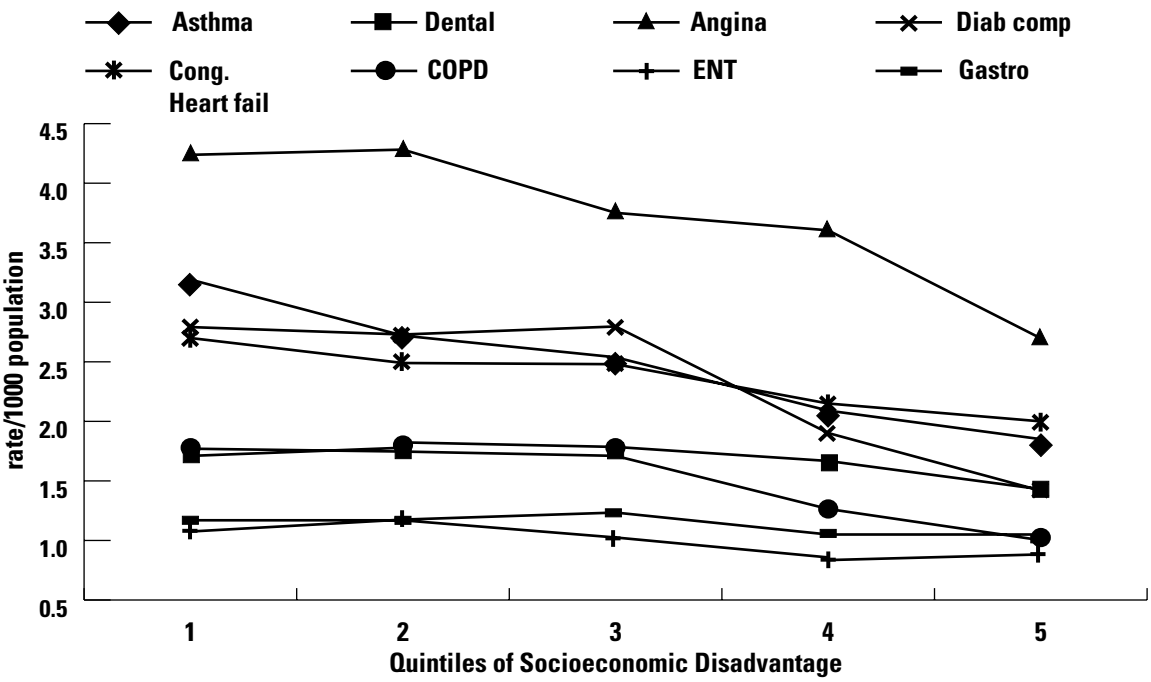


Figure 20 ACSC Admission Rates for Separate Conditions by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data



Key Findings:

- There is significant variation in ACSC admission rates across Victoria.
- Rural Regions have higher ACSC admission rates than do metropolitan Regions.
- Overall ACSC admission rates in Victoria have increased since 1993-94.
- ACSC admission rates in metropolitan Regions are increasing more than in rural Regions.
- Chronic ACSC admission rates are increasing more than acute ACSC admission rates.
- Vaccine-preventable ACSC admission rates have decreased.
- Overall, ACSC admission rates increase with increasing socioeconomic disadvantage.
- Some individual conditions are more sensitive to socioeconomic status than are others.

5 Individual Conditions

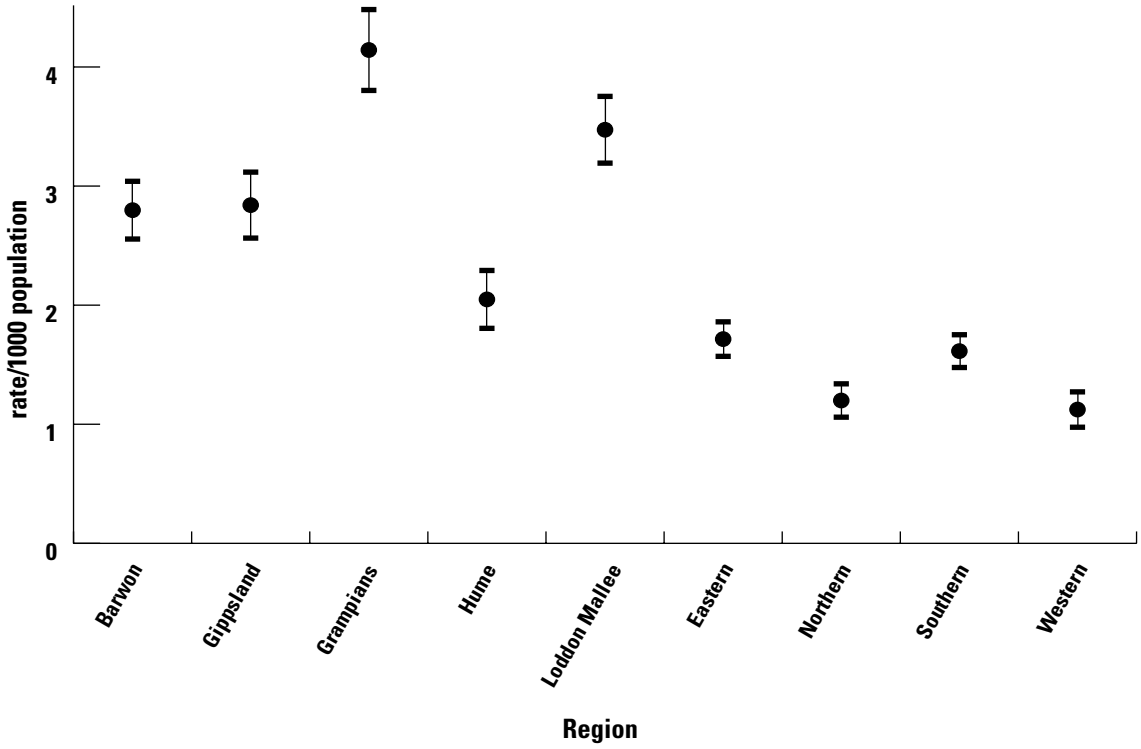
5.1 Dental Conditions

Some dental conditions have been classified as ambulatory care sensitive, that is, they are sensitive to treatment provided in the primary care sector. Hospital admissions for such ACSCs are considered largely preventable through adequate dental hygiene and preventive dental services. The rate of hospital admissions for these conditions can therefore be used as an indicator of access to dental primary care services.

In Victoria there are a large number of admissions to hospital for dental conditions (8,840 in 1997-98). The majority of these are for dental caries and the major procedures are forceps and surgical extraction of teeth. Extractions of wisdom teeth are not included in this category. Around 95 per cent of all patients are discharged on the same day and most are booked (not emergency) admissions. Around 50 per cent are admitted to public hospitals and 50 per cent to private.

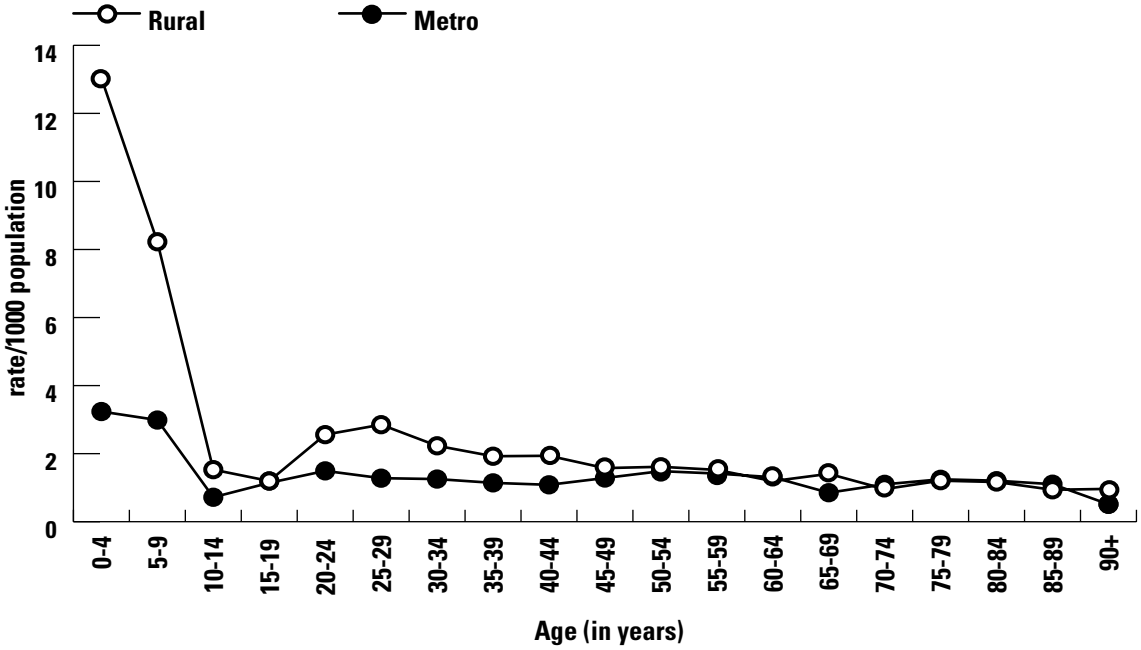
There are significant differences in dental admissions across the State, with higher rates in rural areas than in metropolitan, 2.65/1000 (2.56-2.74) compared to 1.34/1000 (1.30-1.38). There are also significant variations across Regions within metropolitan and rural areas, for example the Grampians Region has twice the rate seen in Hume.

Figure 21 ACSC Dental Admission Rates by Regions, 1997-98 Data



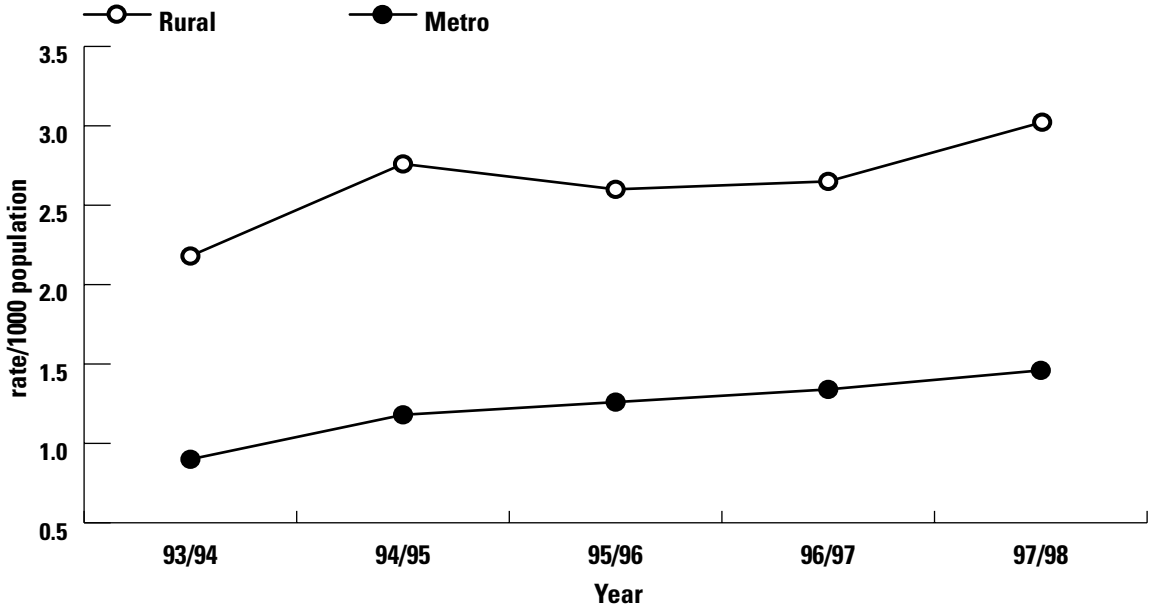
When age-specific rates are examined, the difference between rural and metropolitan areas lies primarily with young children aged 0-9 years and the predominant diagnosis in this age group is dental caries. In the 0-9 year age group, there is a more than threefold difference in admission rates between rural and metropolitan areas (Figure 22).

Figure 22 Age-Specific ACSC Dental Admission Rates by Rural and Metropolitan Regions, 1997-98 Data



When data from five years are analysed, there is a tendency for rates to increase in both rural and metropolitan areas. The difference between rural and metropolitan areas is however maintained (Figure 23).

Figure 23 Dental ACSC Admission Rates for Rural and Metropolitan Regions by Year



Most of this increase appears to be due to increased admissions among children aged 0-9 in both rural and metropolitan Regions. Admission rates for older age groups are remaining relatively static (Figures 24, 25).

Figure 24 Age-Specific Dental ACSC Admission Rates by Year, Rural Regions

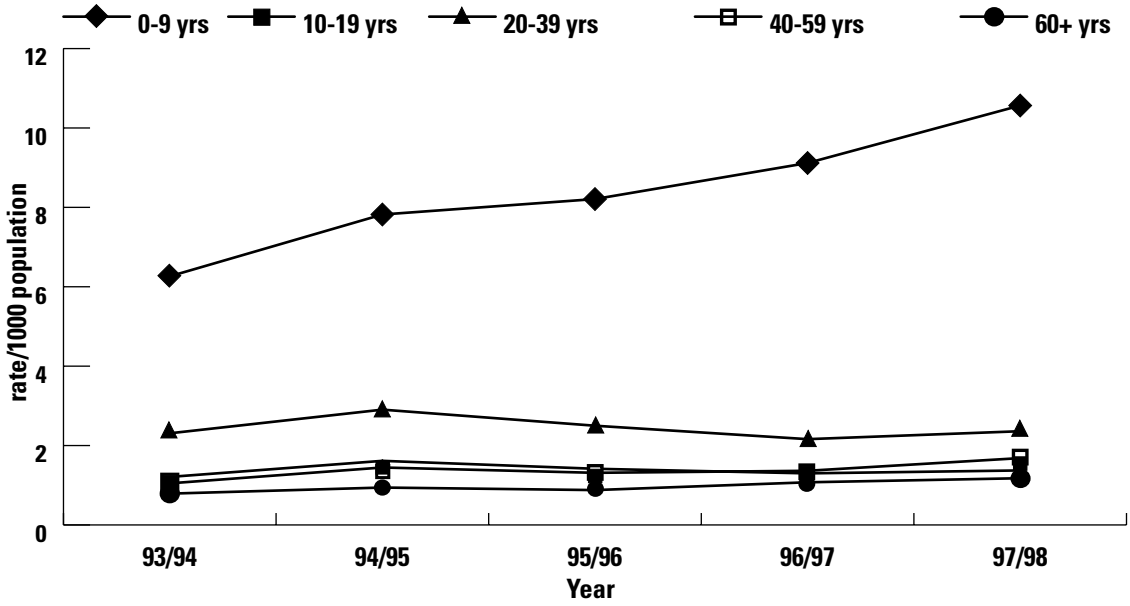
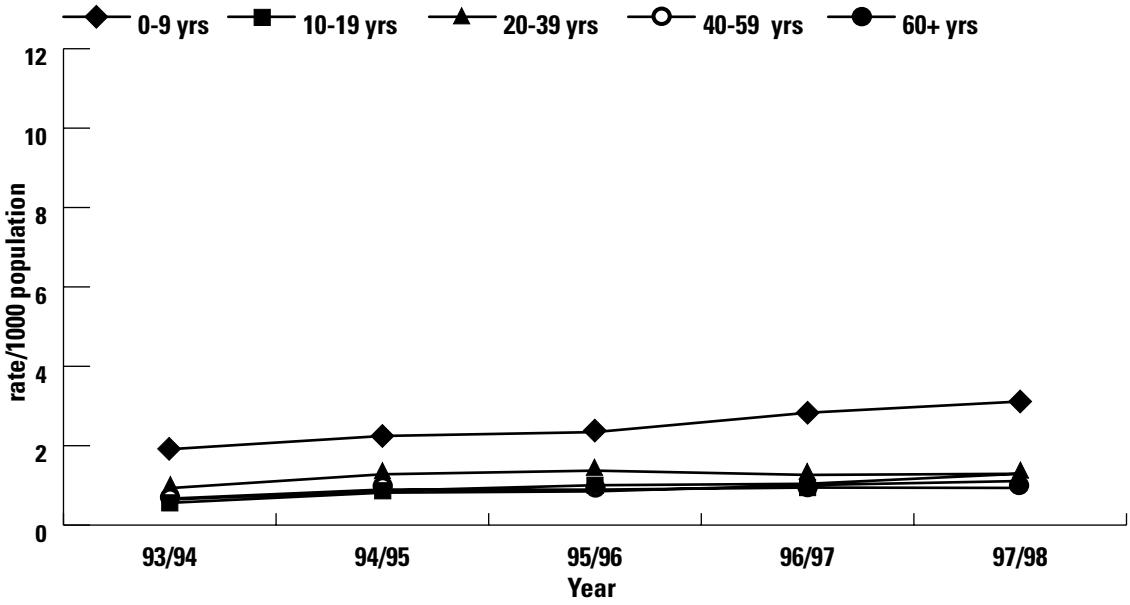


Figure 25 Age-Specific Dental ACSC Admission Rates by Year, Metropolitan Regions



There is little association between socioeconomic deprivation and dental admission rates (Figure 26). However, when age-specific rates are examined by socioeconomic status quintiles, a prominent relationship is observed for children aged 0-9 years only and not for other age groups (Figure 27). The lower rate of admissions in quintile 1 (most disadvantaged) compared to quintile 2 could represent difficulty accessing hospital-based dental services as well as primary dental services.

Figure 26 Dental ACSC Admission rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data

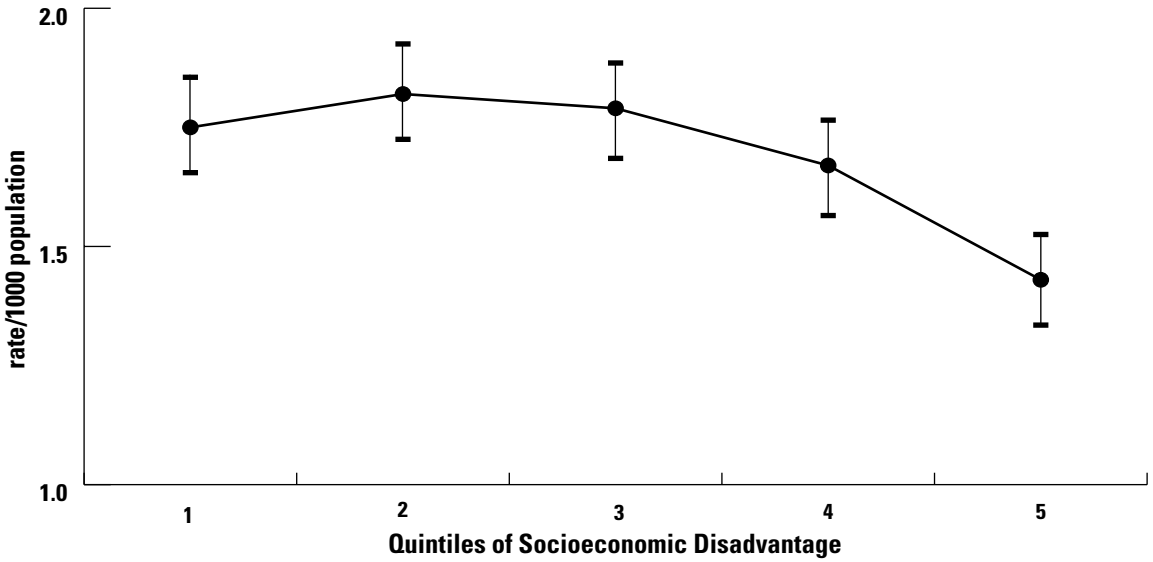
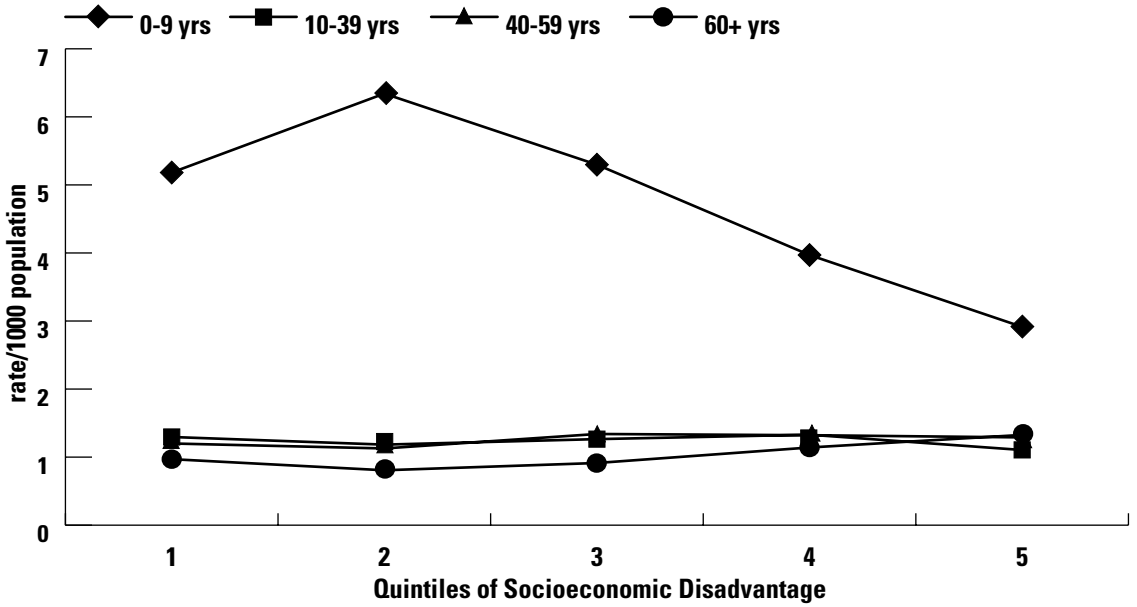


Figure 27 Age-Specific Dental ACSC Admission Rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data



Key Findings:

- Rural Regions have dental ACSC admission rates more than twice that in metropolitan Regions.
- The highest dental ACSC admission rate is seen in the Grampians Region.
- Dental ACSC admission rates are increasing with time in both rural and metropolitan Regions.
- The difference between rural and metropolitan Regions lies primarily with children aged 0-9 years.
- Overall, dental admission rates are not associated with socioeconomic disadvantage, except in children aged 0-9 years.

Issues for Further Investigation:

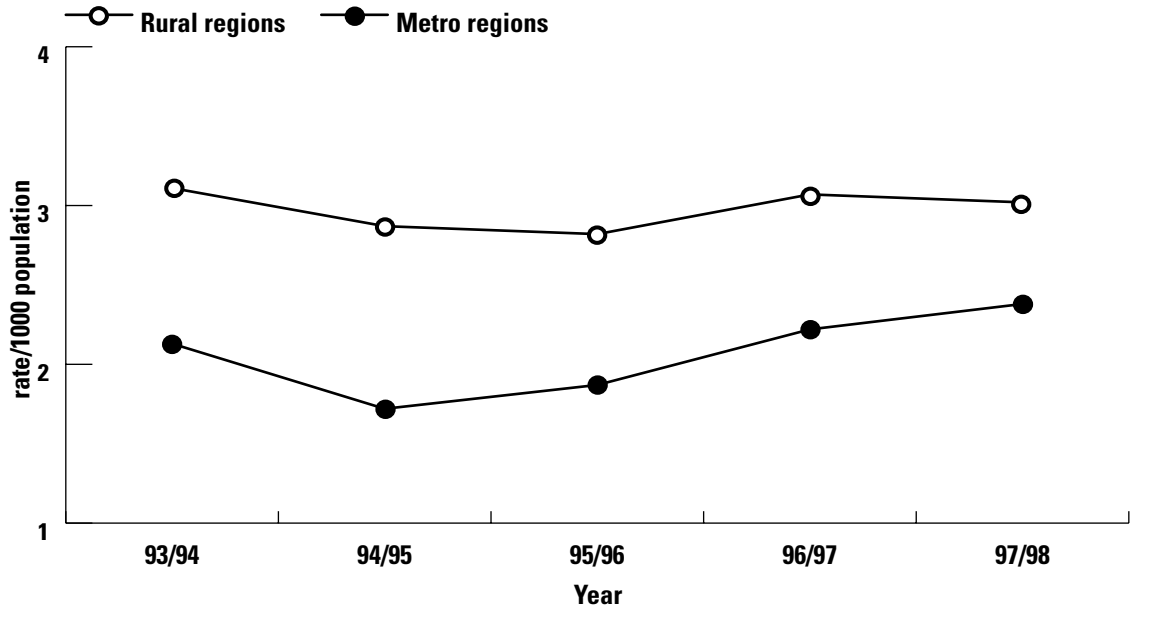
- The extent that the high rate of dental admissions in rural areas is reflective of poorer oral health or an artefact of public dental services in rural hospitals should be investigated.
- The differential impact of water fluoridation in rural communities requires further study as this may explain the relationship between socioeconomic status and dental admissions in young children.
- Children from areas of lower socioeconomic status may have greater difficulty accessing hospital dental services than less disadvantaged children of the same age.

5.2 Diabetes Complications

Diabetes is one of the NHPAs for Australia. It is now estimated to contribute 3.3 per cent and 3.2 per cent for males and females respectively, to the burden of disease in Victoria (8). If the increased risk of ischaemic heart disease, stroke and peripheral vascular disease is included, the burden of diabetes increases to 5 per cent in males and 5.6 per cent in females (8). Diabetes complications include both short and long term conditions resulting from poor glucose control in both Type 1 and 2 diabetes and can include: ketoacidosis, retinopathy and circulatory disorders. These complications are preventable to some degree through good management of diabetes. It is therefore the condition that is preventable in this case, rather than the hospitalisation itself. In this analysis all admissions where a complication is mentioned in any diagnosis field have been selected. The complication is therefore not necessarily the cause of admission to hospital.

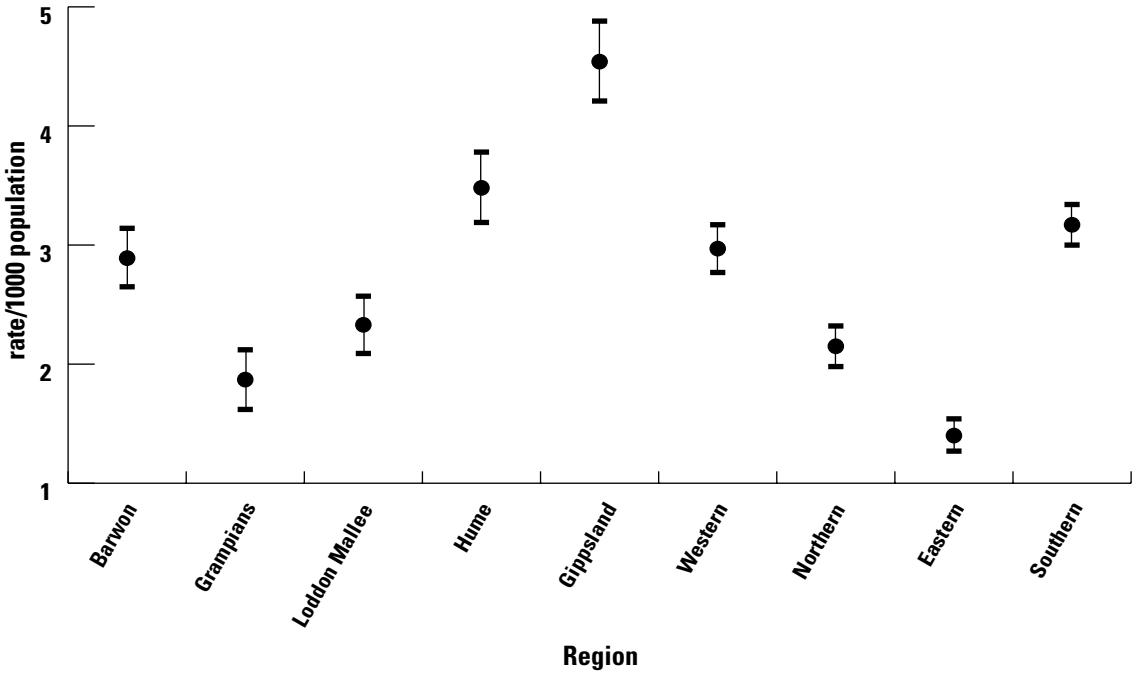
In 1997-98 there were approximately 12,000 admissions where a diabetic complication is mentioned. The rate of admissions has remained relatively constant since 1993-94 (Figure 28), however, there is a significantly higher admission rate in rural areas compared to metropolitan Melbourne, 3.02/1,000 population (2.93-3.12) and 2.38/1,000 (2.33-2.43) respectively.

Figure 28 Diabetes Complication ACSC Admission Rates for Rural and Metropolitan Regions by Year



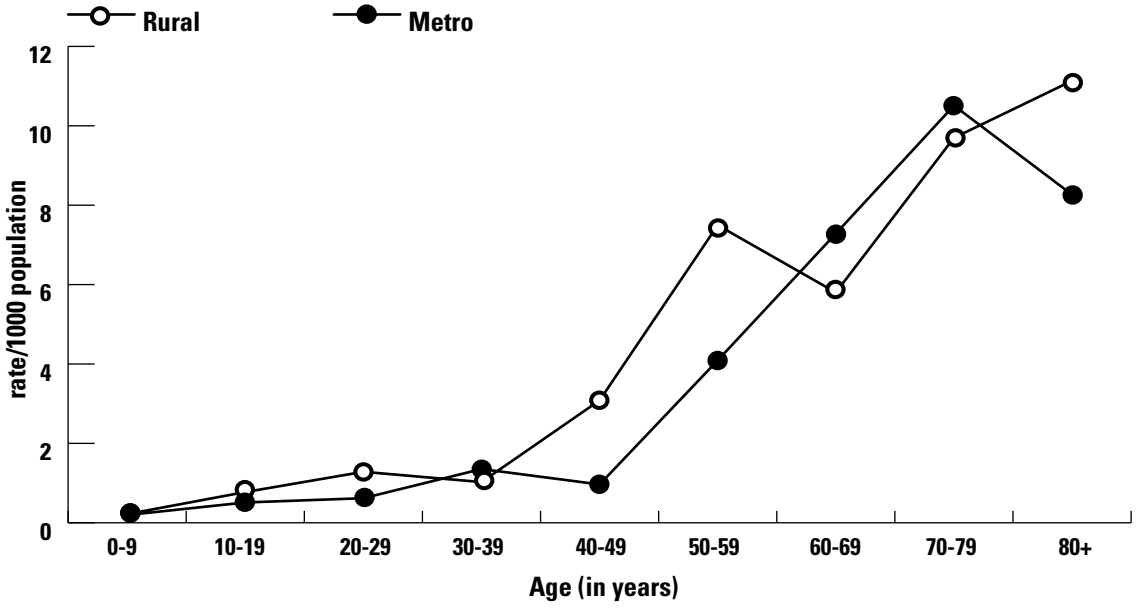
There are also significant variations across Department of Human Services Regions. Gippsland has the highest admission rate and Eastern Metropolitan the lowest. The Grampians Region has the lowest rate of admissions of all the rural Regions, a rate of admission similar to some of the metropolitan areas.

Figure 29 Diabetes Complication ACSC Admission Rates for Regions, 1997-98 Data



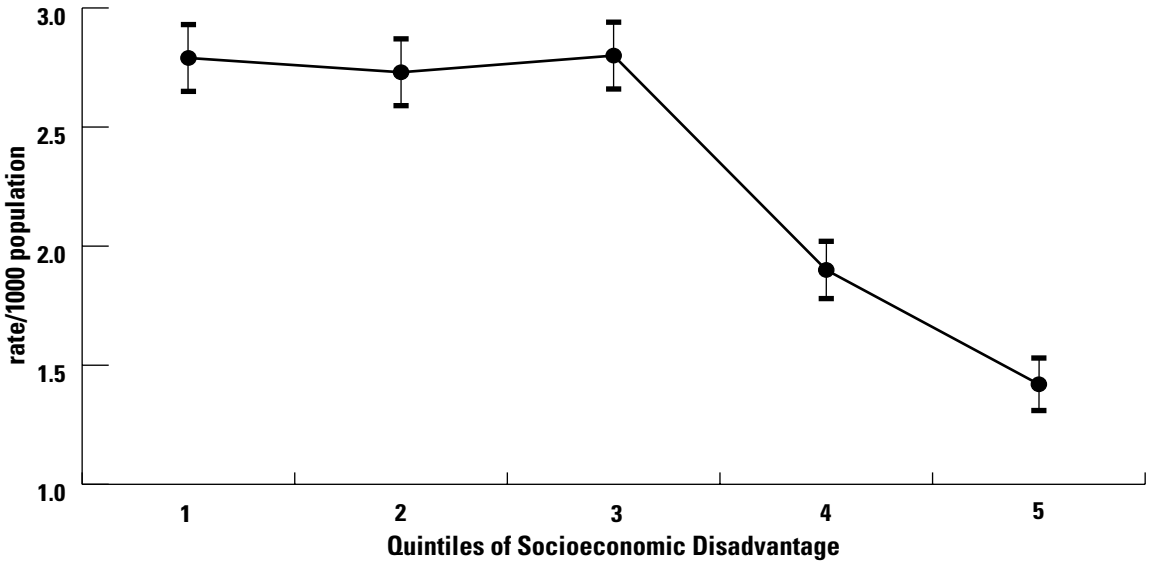
The difference in admission rates between rural and metropolitan areas seems to be predominantly in the 40-60 year age group (Figure 30).

Figure 30 Age-Specific Diabetes Complication ACSC Admission Rates for Rural and Metropolitan Regions, 1997-98 Data



When admission rates are calculated for quintiles of socioeconomic disadvantage, the highest quintiles (the least disadvantaged) have significantly lower admission rates for diabetic complications. This may explain some of the variation in admission rates across Regions, but doesn't necessarily explain the rate in Gippsland Region.

Figure 31 Diabetes Complication ACSC Admission Rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data



Key Findings:

- Diabetes complication admission rates are higher in rural Regions than in metropolitan Regions.
- The highest rate is seen in the Gippsland Region.
- The Grampians Region is similar to metropolitan Regions.
- Rural/metropolitan differences are more marked in the 40-60 year age group.
- Higher admission rates for diabetes complications are seen with increased socioeconomic disadvantage.

Issues for Further Investigation:

- The wide variation in diabetes complication admission rates in rural Regions should be investigated.

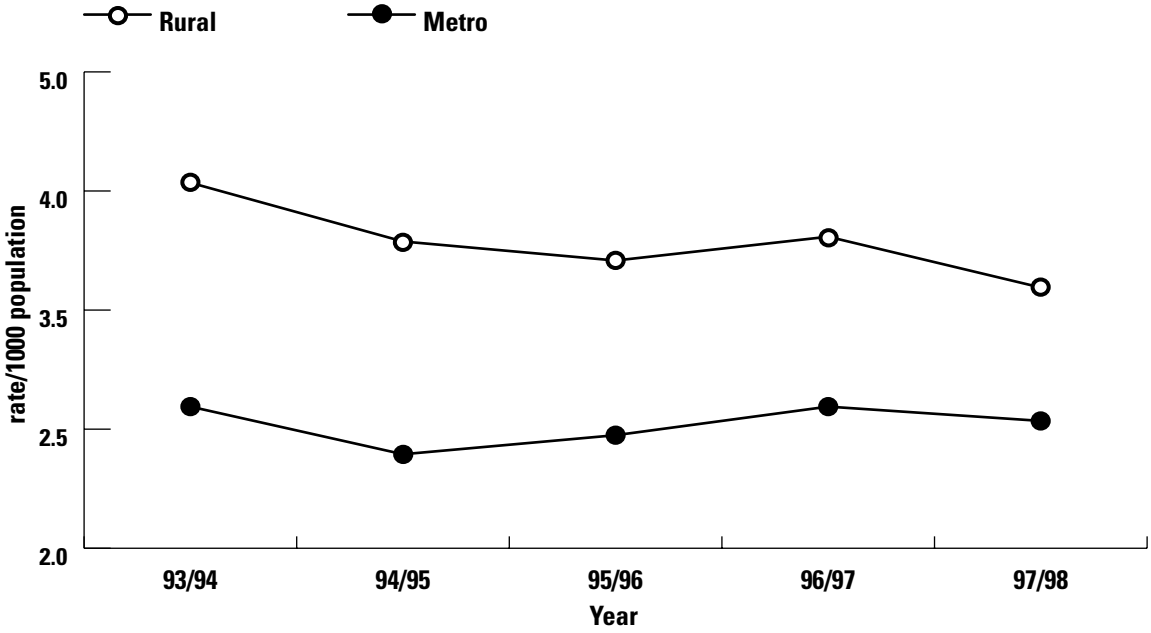
5.3 Asthma

Asthma is one of the NHPAs for Australia. Its incidence has been increasing and is now estimated to contribute 2.3 per cent and 2.9 per cent for males and females respectively to the burden of disease in Victoria (8).

There were approximately 13,000 admissions in Victoria in 1997-98 where asthma was listed as the principal cause of the admission. Asthma is a chronic condition that should ideally be managed in the community (9); hospitalisation is therefore technically avoidable. Again, there is a significant difference in admission rates between rural and metropolitan areas, 3.39/1,000 (3.29-3.49) compared to 2.55/1,000 (2.50-2.61) respectively.

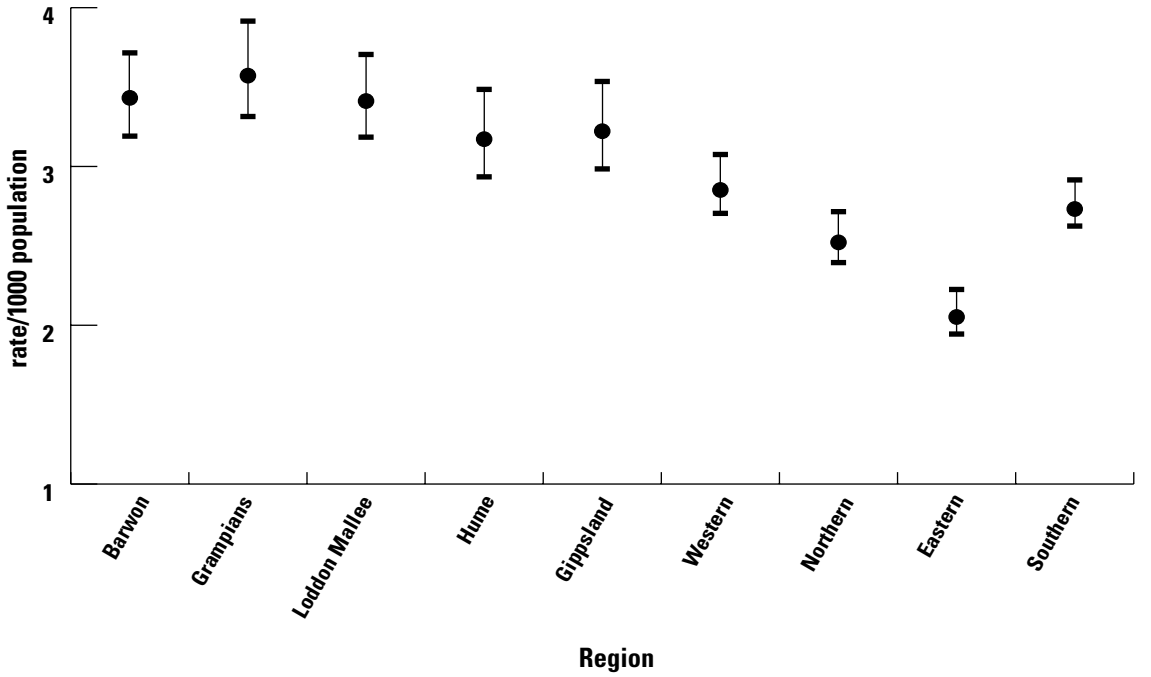
The difference between rural and metropolitan areas does, however, seem to be narrowing and is less pronounced in 1997-98 than in 1993-94 (Figure 32).

Figure 32 Asthma ACSC Admission Rates for Rural and Metropolitan Regions by Year



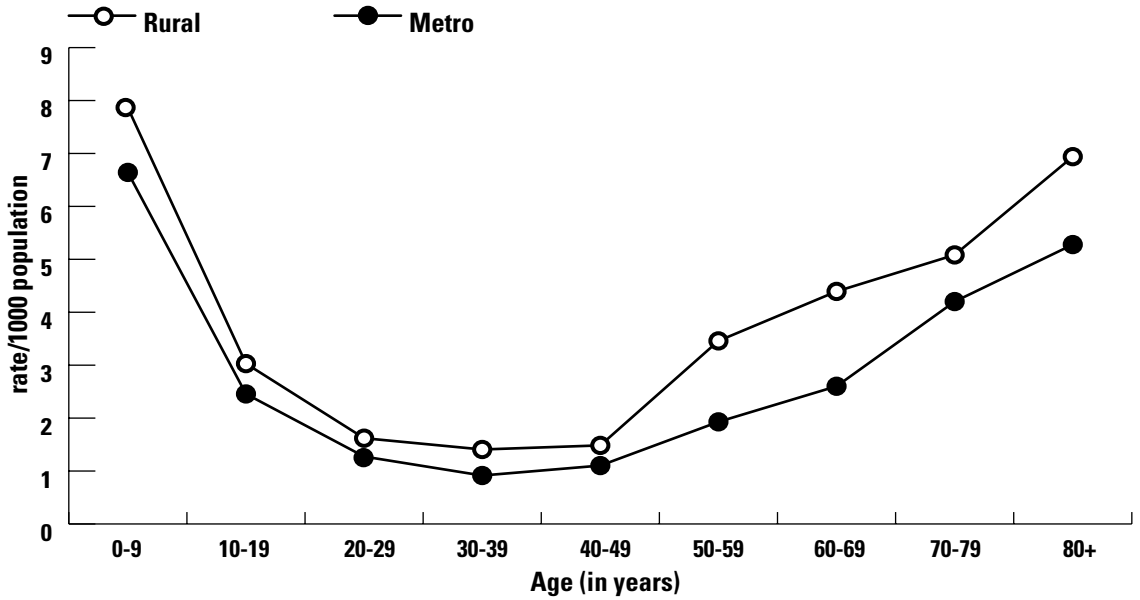
There is little difference in admission rates across rural Regions. However, in metropolitan areas, the Eastern Region has a lower admission rate than the other metropolitan Regions (Figure 33).

Figure 33 Asthma ACSC Admission Rates by Regions, 1997-98 Data



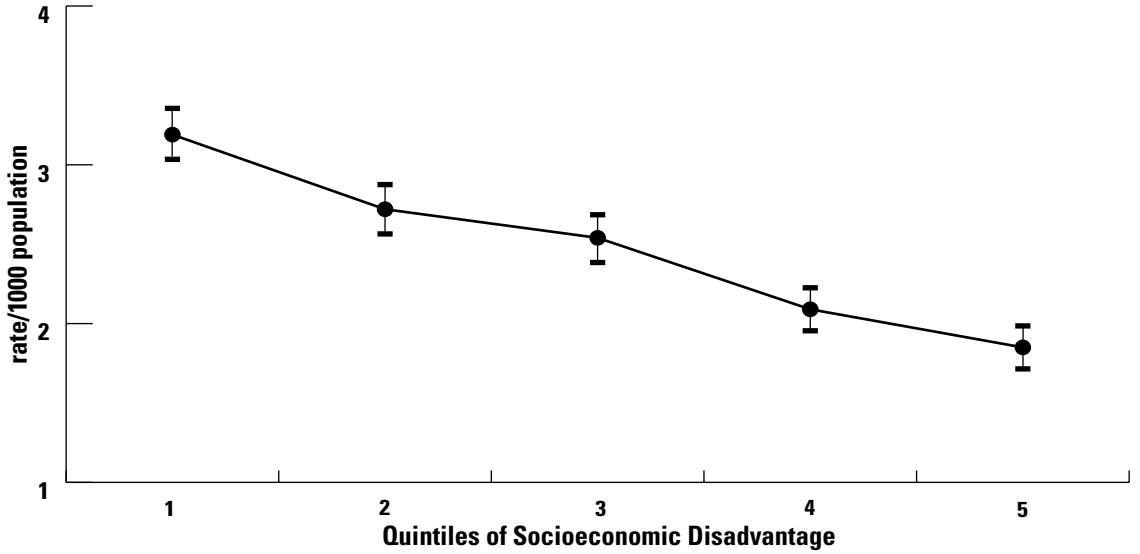
Admissions for asthma are highest in the younger age groups. However, the largest difference between rural and metropolitan areas is in the older age groups, those aged over 50 years (Figure 34). Many asthma management programs are targeted at younger people, however, these data show that directing programs and GPs towards better management of asthma in older people may reduce the burden of asthma in rural areas.

Figure 34 Age-Specific Asthma ACSC Admission Rates for Rural and Metropolitan Areas,1997-98 Data



There is a significant relationship between asthma admission rates and socioeconomic disadvantage (quintile 1 is the most disadvantaged) (Figure 35). This may well contribute to the variation in admission rates seen across Regions in Victoria.

Figure 35 Asthma ACSC Admission Rates by Quintiles of Socioeconomic Disadvantage (quintile 1 is the most disadvantaged), 1997-98 Data



Key Findings:

- Asthma ACSC admission rates are higher in rural Regions than in metropolitan Regions.
- There is little variation in asthma admission rates across rural Regions
- The difference between rural and metropolitan Regions is narrowing with time.
- The rural/metropolitan difference in ACSC admission rates for asthma is more marked in older age groups.
- Higher asthma admission rates are seen with increased socioeconomic disadvantage.

Issues for Further Investigation:

- The extent to which the prevalence and severity of asthma explain the rural metropolitan difference in asthma admission rates needs to be explored.
- The factors responsible for the more pronounced difference in ACSC admission rates for asthma between rural and metropolitan Regions in middle-aged people should be investigated further.

6 Primary Care Partnerships

6.1 ACSC Admission Rates in Primary Care Partnership Catchment Areas

The PCP Strategy aims to bring primary care providers such as GPs, community nurses and allied health workers together to better coordinate primary care services. One of the goals of the reform is to reduce the preventable use of hospital, medical and residential services. ACSC admission rates may, therefore, be useful as health indicators and to inform health planning within PCP catchment areas. PCP catchment areas are aggregates of LGAs and therefore standardised hospital admission rates can be calculated specific to these catchment areas.

ACSC admission rates in PCP catchment areas range from 15.4 admissions per 1000 population to 42.1/1000, a nearly threefold variation. PCP catchment areas have been ranked from the highest admission rate through to the lowest (Table 2). The highest rate of ACSC admissions was found in South West and the lowest in Boorondara.

Table 3 Total ACSC Admission Rates for Primary Care Partnership Catchment Areas in Victoria. Catchment Areas Are Also Ranked According to Acute and Chronic ACSC Admission Rates, 1997-98 Data

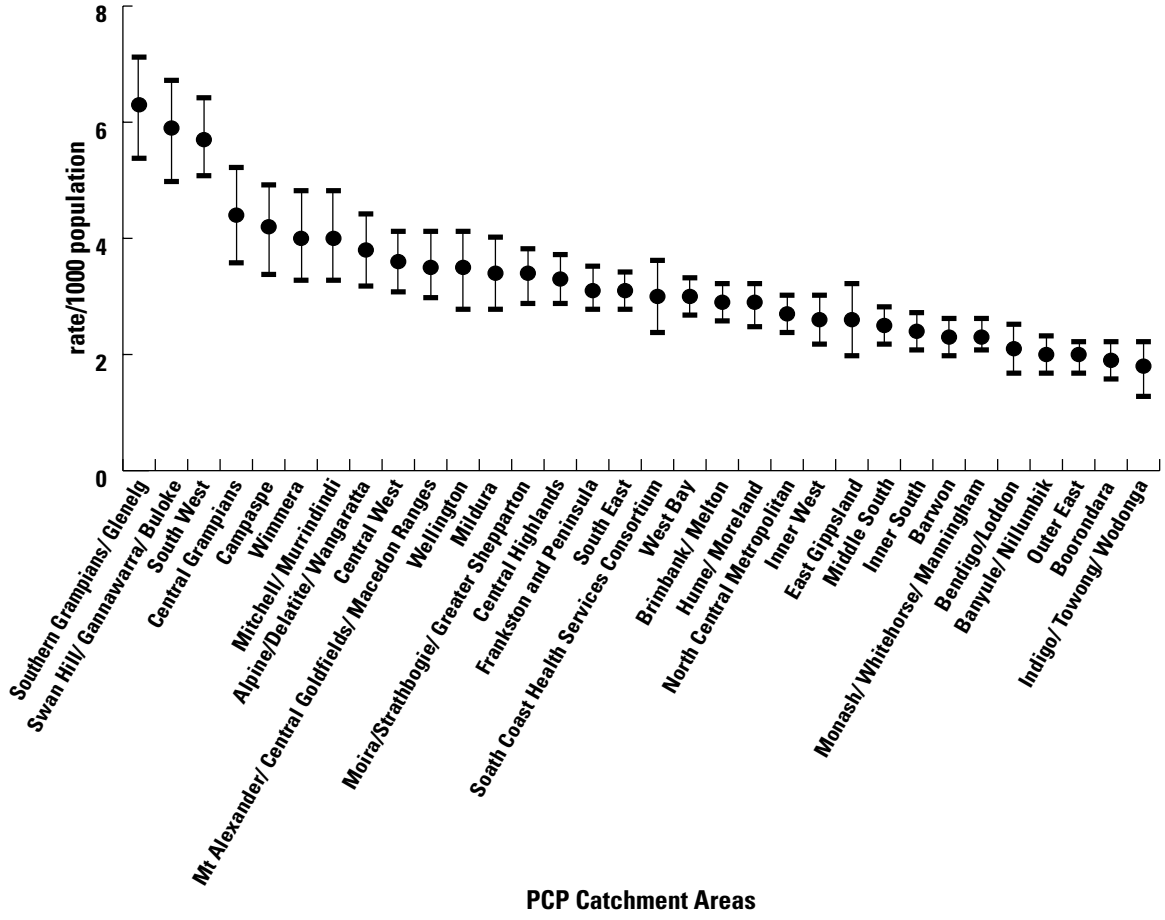
Region	Primary Care Partnership Catchment Area	ACSC Admission Rate (95% CI)	Rank Order (total)	Rank Order (acute)	Rank Order (chronic)
Barwon South Western	Southern Grampians/ Glenelg	35.6 (33.8-37.4)	4	5	5
	South West	41.6 (40.1-43.2)	1	3	1
	Barwon	20.6 (20.0-21.2)	28	20	29
Eastern	Boorondara	15.4 (14.8-16.0)	32	32	32
	Outer East	20.9 (20.4-21.4)	27	24	26
	Monash/ Whitehorse/ Manningham	18.9 (18.5-19.4)	31	30	31
Grampians	Wimmera	32.8 (31.1-34.5)	7	4	9
	Central Grampians	34.6 (32.6-36.5)	5	6	7
	Central Highlands	26.1 (25.3-27.0)	17	13	21
Loddon Mallee	Mildura	30.1 (28.6-31.6)	10	7	22
	Swan Hill/ Gannawarra/ Buloke	41.2 (39.2-43.2)	2	1	2
	Bendigo/Loddon	27.3 (26.2-28.3)	14	10	20
	Campaspe	38.0 (36.0-40.0)	3	2	3
	Mt Alexander/ Central Goldfields/ Macedon Ranges	24.6 (23.4-25.8)	20	14	23
Northern Metro	Hume/ Moreland	23.3 (22.7-23.9)	22	29	18
	Banyule/ Nillumbik	19.2 (18.5-19.9)	30	28	30
	North Central Metropolitan	22.8 (22.2-23.4)	23	27	19

Region	Primary Care Partnership Catchment Area	ACSC Admission Rate (95% CI)	Rank Order (total)	Rank Order (acute)	Rank Order (chronic)
Southern Metro	Inner South	21.1 (20.6-21.6)	25	22	27
	Middle South	21.0 (20.4-21.5)	26	26	25
	South East	25.5 (24.9-26.1)	18	19	14
	Frankston and Peninsula	27.5 (26.8-28.1)	12	17	8
Western Metro	Inner West	21.3 (20.6-22.1)	24	25	24
	West Bay	24.4 (23.7-25.1)	21	21	17
	Brimbank/ Melton	25.3 (24.5-26.2)	19	23	12
Gippsland	East Gippsland	26.5 (24.9-28.0)	16	18	10
	Wellington	27.4 (25.8-29.0)	13	16	11
	Central West	32.4 (31.3-33.5)	8	12	6
	South Coast health Services Consortium	30.0 (28.5-31.5)	9	8	13
Hume	Mitchell/ Murrindindi	26.9 (25.2-28.7)	15	15	16
	Moira/ Strathbogie/ Greater Shepparton	34.6 (33.4-35.8)	6	9	4
	Alpine/ Delatite/ Wangaratta	28.3 (27.0-29.6)	11	11	15
	Indigo/ Towong/ Wodonga	19.4 (18.2-20.7)	29	31	28

6.2 Asthma Admission Rates

Asthma was analysed as there are large numbers of admissions and asthma is of particular interest as a health priority for Victoria and for PCPs. Figure 36 shows asthma admission rates across all PCP areas; again there is a more than threefold difference between the highest and lowest rates, Southern Grampians/Glenelg and Indigo/Towong/Wodonga respectively.

Figure 36 Asthma ACSC Admission Rates for Primary Care Partnership Catchment Areas in Victoria, 1997-98 Data



7 Differences between Rural and Metropolitan Areas in Victoria

In 1997-98, admission rates for all ACSCs examined, except other vaccine-preventable conditions, were significantly higher in rural Regions than in metropolitan Regions. However, changes over time between rural and metropolitan areas are not consistent and may reflect changes in policy or the effects of particular disease specific programs.

7.1 Rate Ratio Differences between Rural and Metropolitan Regions

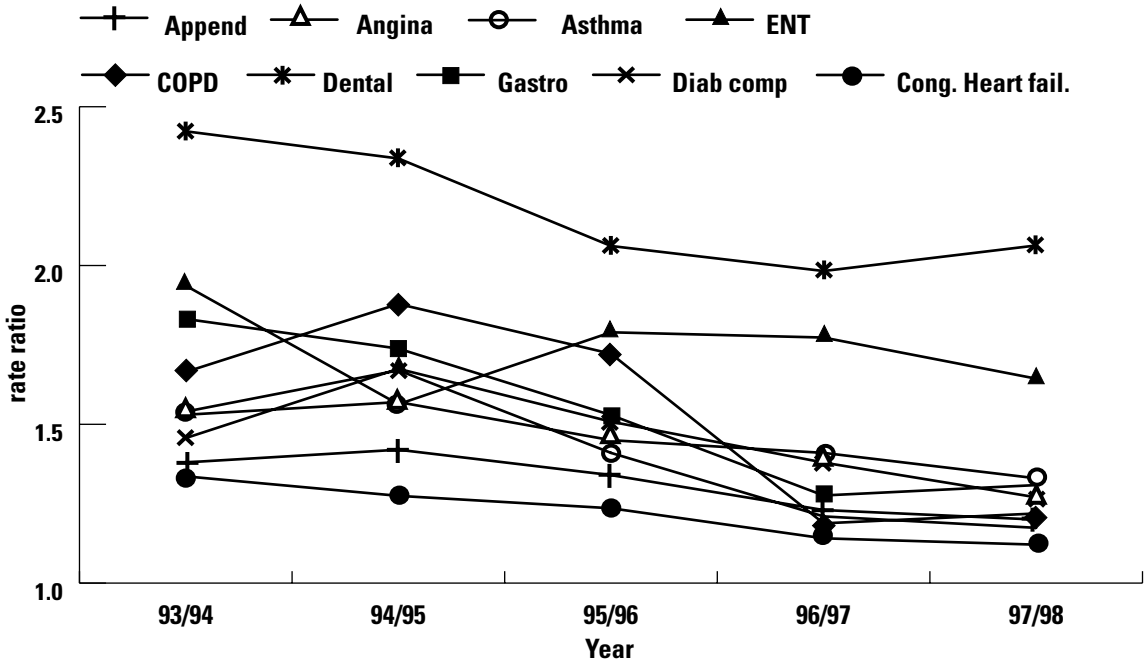
Although rural Regions show consistently higher ACSC admission rates, the rural metropolitan difference varies for different conditions. The largest ACSC admission rate ratio in 1997-98 between rural and metropolitan areas is seen for dental conditions and the lowest rate ratio for congestive heart failure (Table 3). The difference between rural and metropolitan areas in each of these conditions may well be due to different factors such as disease prevalence, financial and geographical barriers to care.

Table 4 Rural Metropolitan Rate Ratios for ACSCs, 1997-98 Data

ACSC	Rural/Metropolitan Admission Rate Ratio (95% CI)
Dental conditions	2.06 (2.01-2.12)
Ear, nose and throat infections	1.64 (1.60-1.68)
Vaccine preventable conditions	1.45 (1.42-1.48)
Asthma	1.33 (1.27-1.39)
Dehydration and gastroenteritis	1.31 (1.27-1.35)
Diabetes complications	1.27 (1.21-1.33)
COPD	1.22 (1.18-1.26)
Appendicitis	1.20 (1.17-1.24)
Angina	1.17 (1.10-1.23)
Congestive heart failure	1.12 (1.07-1.17)
Total	**1.31 (1.15-1.48)**

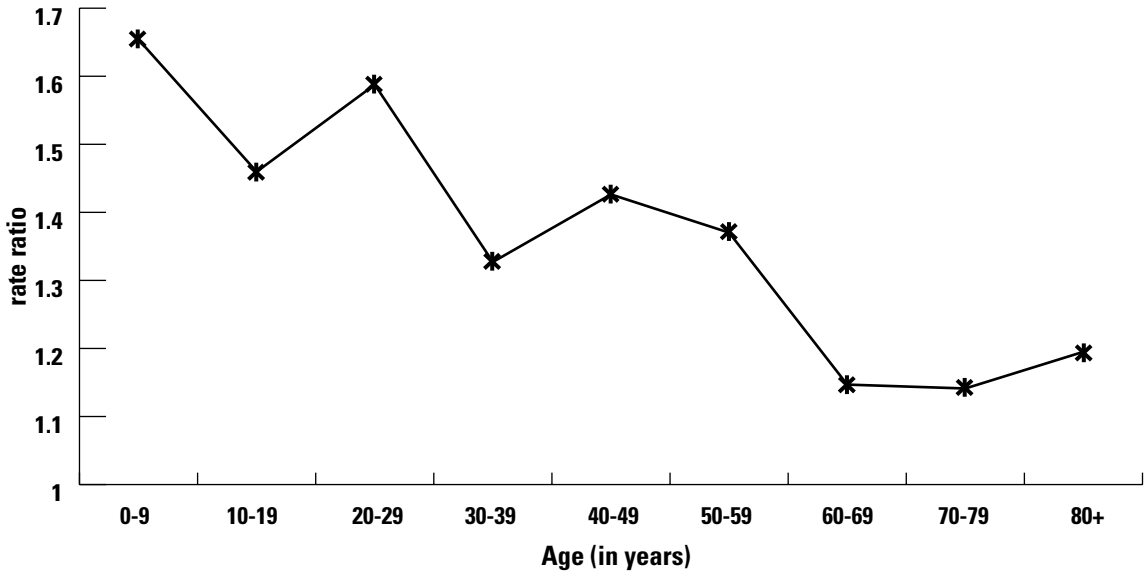
Figure 37 shows the rate ratio between rural and metropolitan areas across time for some conditions. The rate ratio appears to be decreasing over time, suggesting that the factors driving the difference between rural and metropolitan may be decreasing.

Figure 37 Rural Metropolitan ACSC Admission Rate Ratios by Year



When age-specific admission rates are examined, there is a higher admission rate for all age groups, however, the difference decreases with age (Figure 38). Younger people are therefore more subject to factors that may be driving the rural/metropolitan difference in ACSC admission rates.

Figure 38 Age-Specific Rural Metropolitan ACSC Admission Rate Ratios, 1997-98 Data



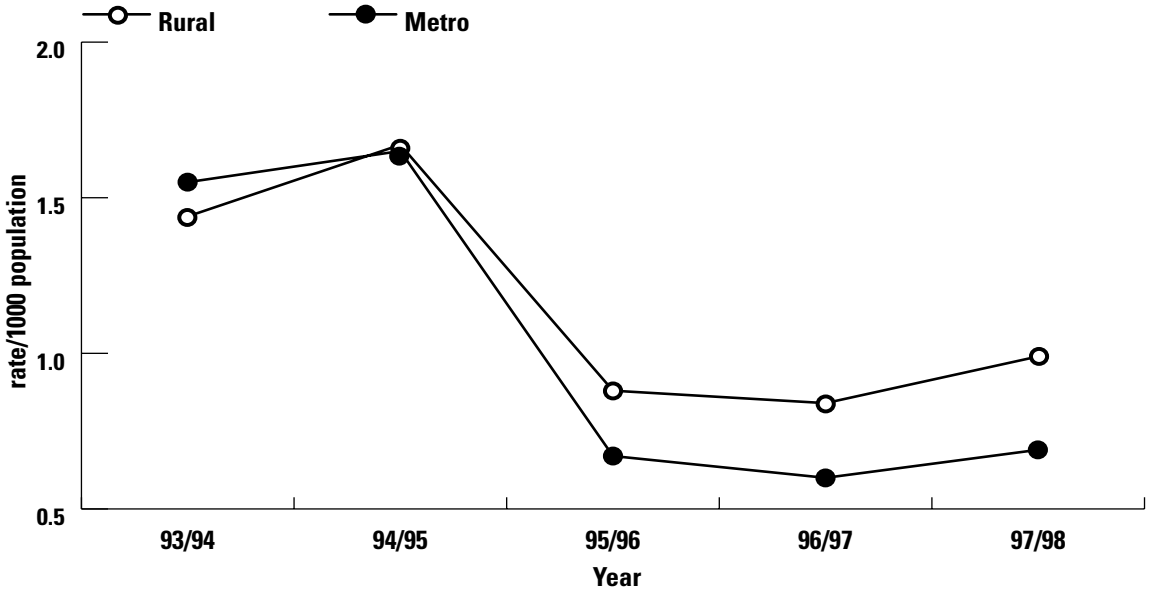
7.2 Rates and Rate Ratios between Rural and Metropolitan Regions for Individual Conditions

Detailed analyses of dental conditions, diabetes complications and asthma, including rural and metropolitan differences, are covered in chapter 5.

Vaccine-Preventable Conditions

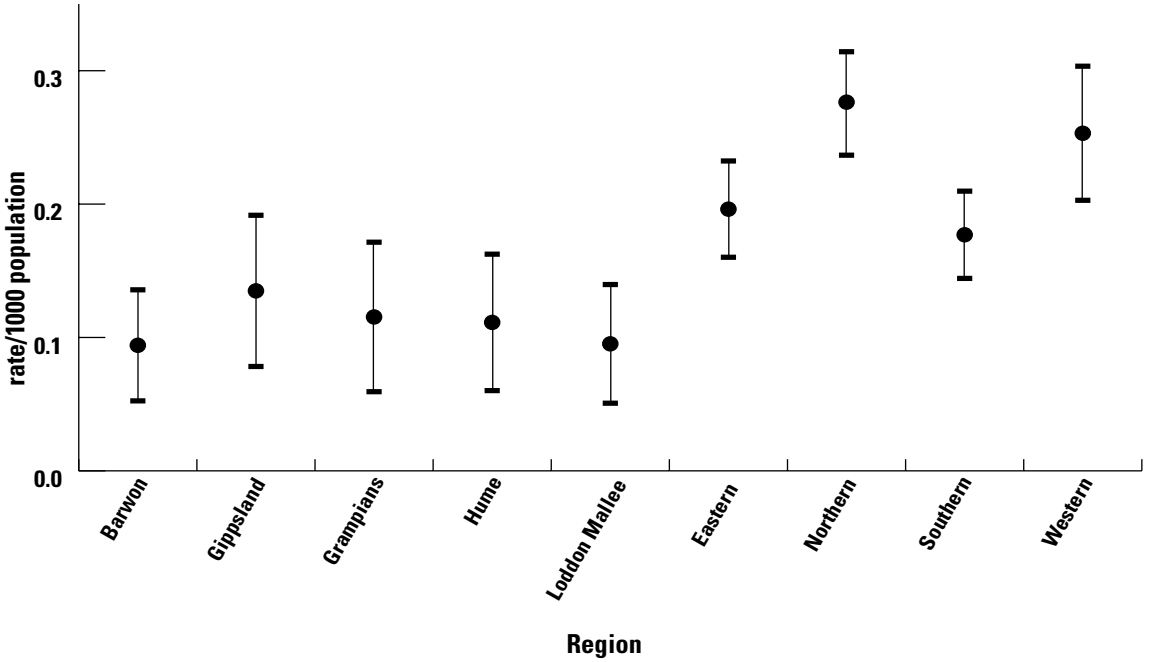
There was a considerable decline in admission rates for vaccine-preventable conditions between 1994-95 and 1995-96 (Figure 39). This decline is predominantly caused by a decline in pneumonia and influenza in the elderly (over 65s) and in other vaccine-preventable conditions in metropolitan Regions.

Figure 39 Vaccine-Preventable ACSC Admission Rates for Rural and Metropolitan Regions by Year



Metropolitan Regions show higher admission rates than do rural Regions for other vaccine-preventable conditions such as diphtheria, pertussis and tetanus (Figure 39). The Northern Metropolitan Region has the highest admission rate (Figure 40).

Figure 40 Other Vaccine-Preventable ACSC Admission Rates by Region, 1997-98 Data



In contrast, influenza and pneumonia admission rates are higher in rural Regions and particularly high in Loddon Mallee in 1997-98 (Figure 41).

Figure 41 Influenza and Pneumonia ACSC Admission Rates by Region, 1997-98 Data

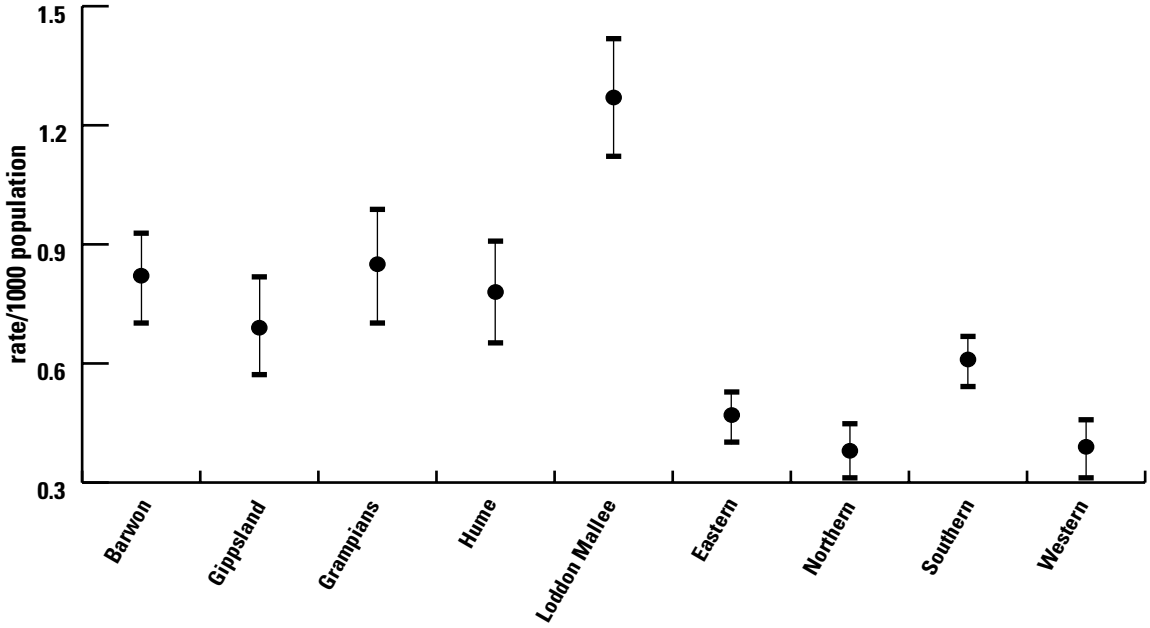
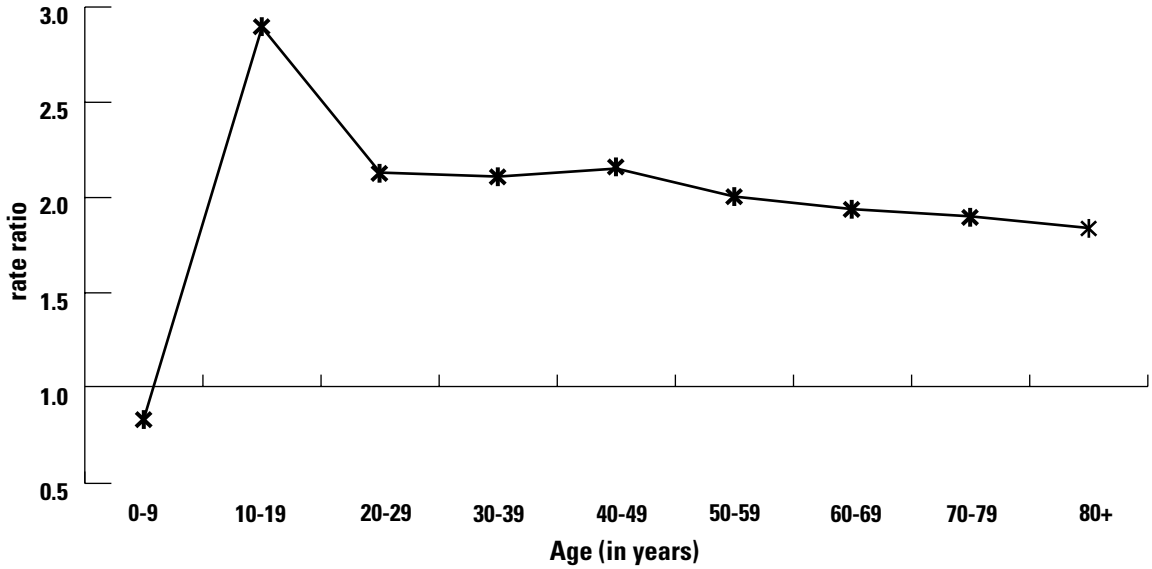


Figure 42 Age-Specific Rural Metropolitan Influenza and Pneumonia ACSC Admission Rate Ratios, 1997-98 Data

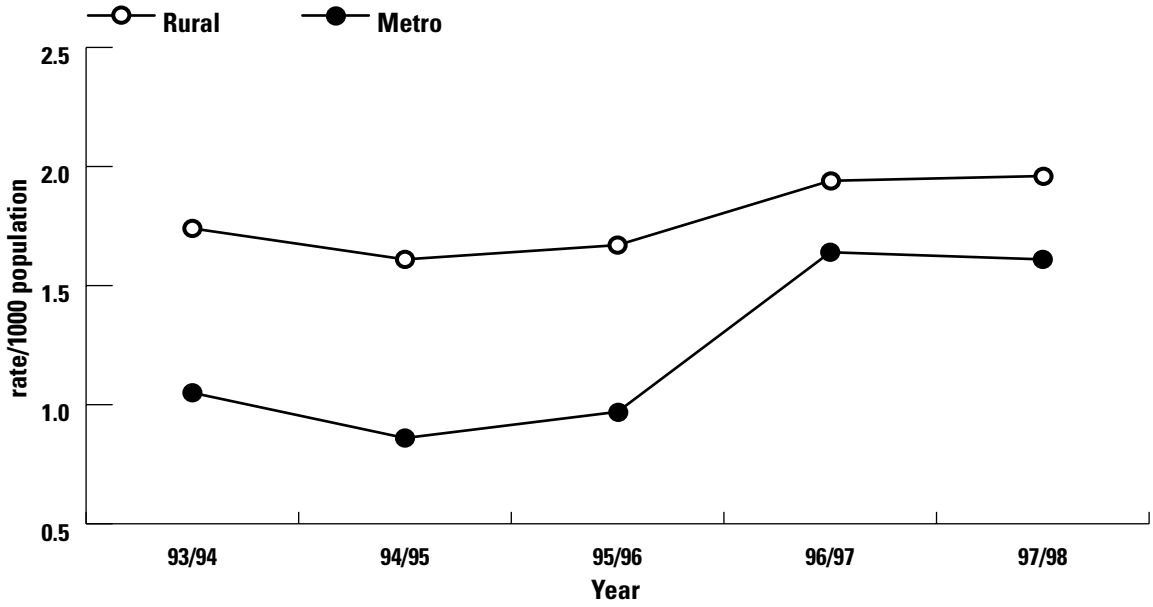


For influenza and pneumonia, the rate ratio between rural and metropolitan Regions is consistently high for adults aged 20 and over. Most of the preventable admissions for influenza and pneumonia are in those aged 65 and over, the age group eligible for free vaccination. The data support current policy to improve vaccination coverage in rural areas for persons 65 and over.

Chronic Obstructive Pulmonary Disease

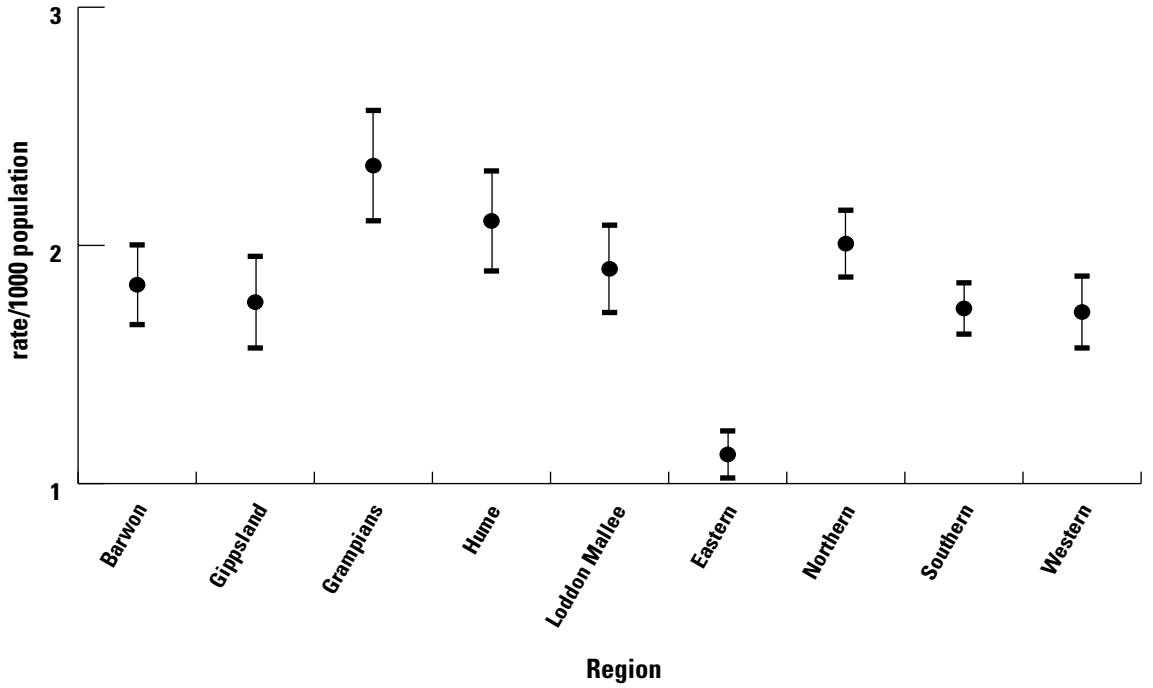
There has been a large increase in admissions for COPD in metropolitan Regions since 1995-96, with no similar rise seen in rural Regions (Figure 43). There has not been any major shift in the management of COPD over this period that could explain this rise, however, it is possible that there is more recognition of this condition now.

Figure 43 Chronic Obstructive Pulmonary Disease ACSC Admission Rates for Rural and Metropolitan Regions by Year



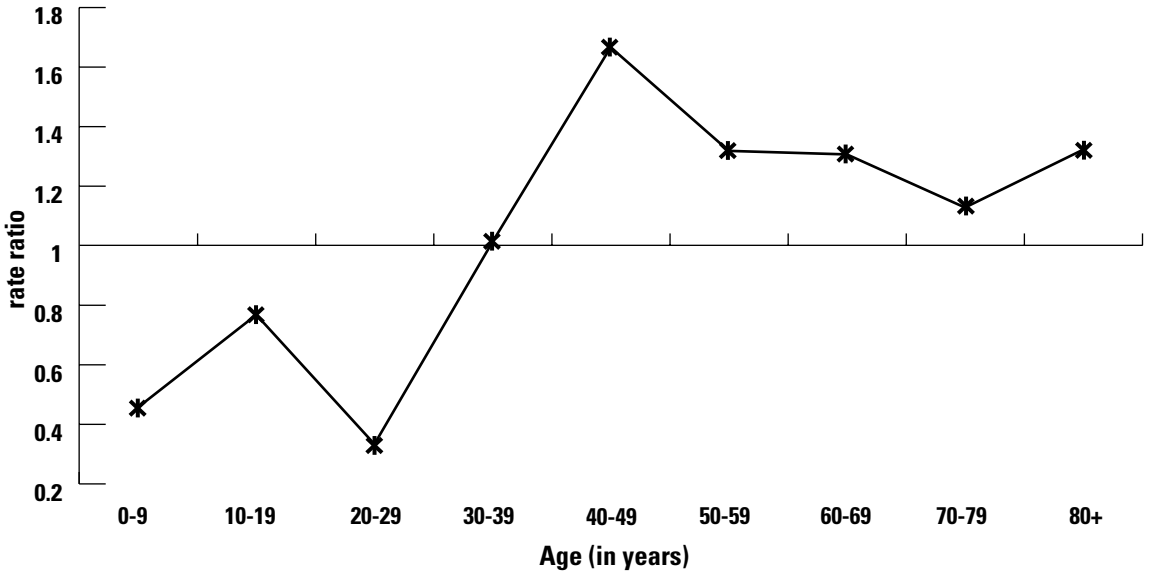
In 1997-98 there is little difference between rural and metropolitan Regions; Grampians Region has the highest rate and Eastern Metropolitan the lowest.

Figure 44 Chronic Obstructive Pulmonary Disease ACSC Admission Rates by Region, 1997-98 Data



In 1997-98 the largest rural metropolitan rate ratio is seen in those aged in their 40s (Figure 45).

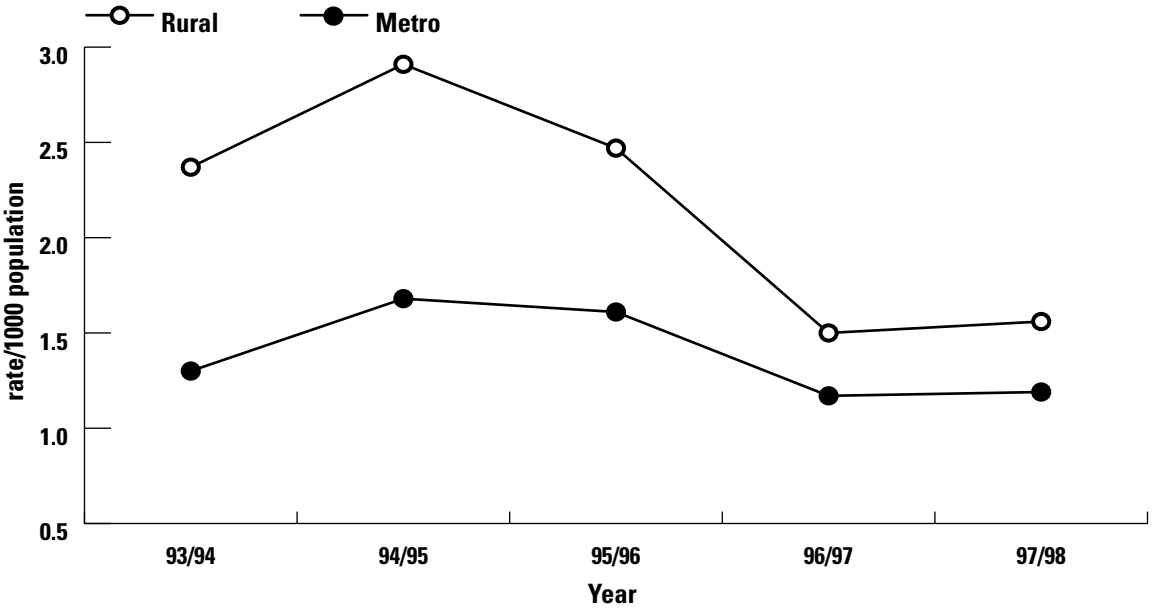
Figure 45 Age-Specific Rural Metropolitan Chronic Obstructive Pulmonary Disease ACSC Admission Rate Ratios, 1997-98 Data



Dehydration and Gastroenteritis

The rates of admission for dehydration and gastroenteritis have fallen since 1994-95, particularly in rural areas. This may reflect better management of these conditions and a lower rate of food-borne outbreaks.

Figure 46 Dehydration and Gastroenteritis ACSC Admission Rates for Rural and Metropolitan Regions by Year



There is very little difference across metropolitan Regions in admissions for gastroenteritis and dehydration and Loddon Mallee has the highest admission rate of the rural Regions (Figure 47).

Figure 47 Dehydration and Gastroenteritis ACSC Admission Rates by Region, 1997-98 Data

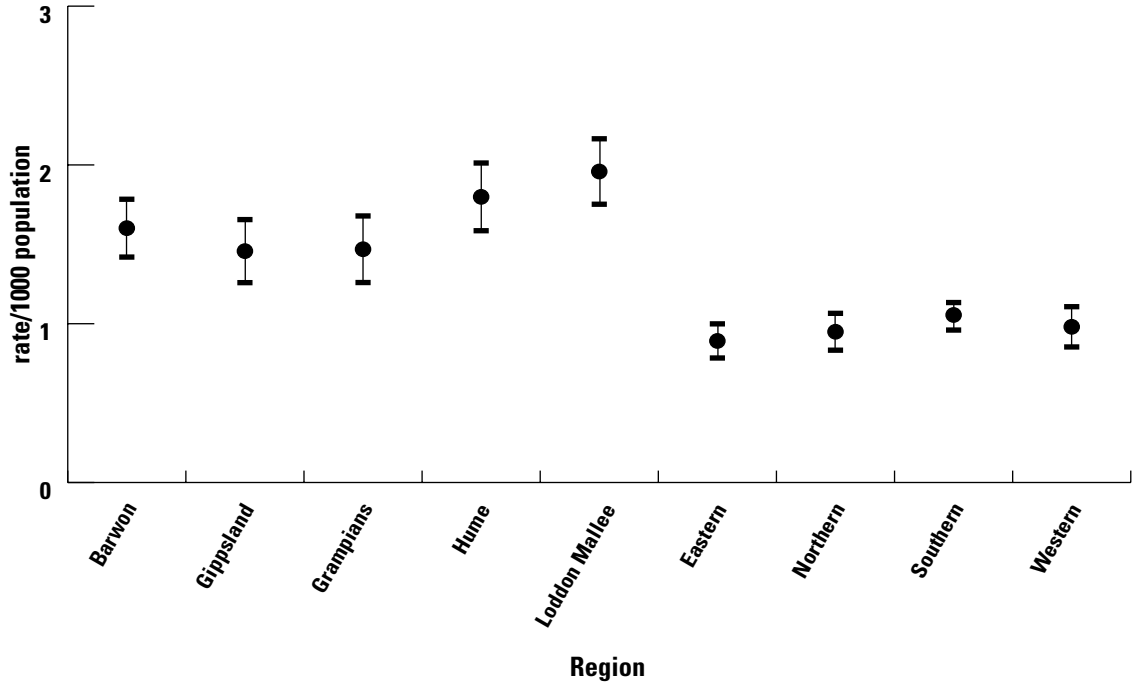
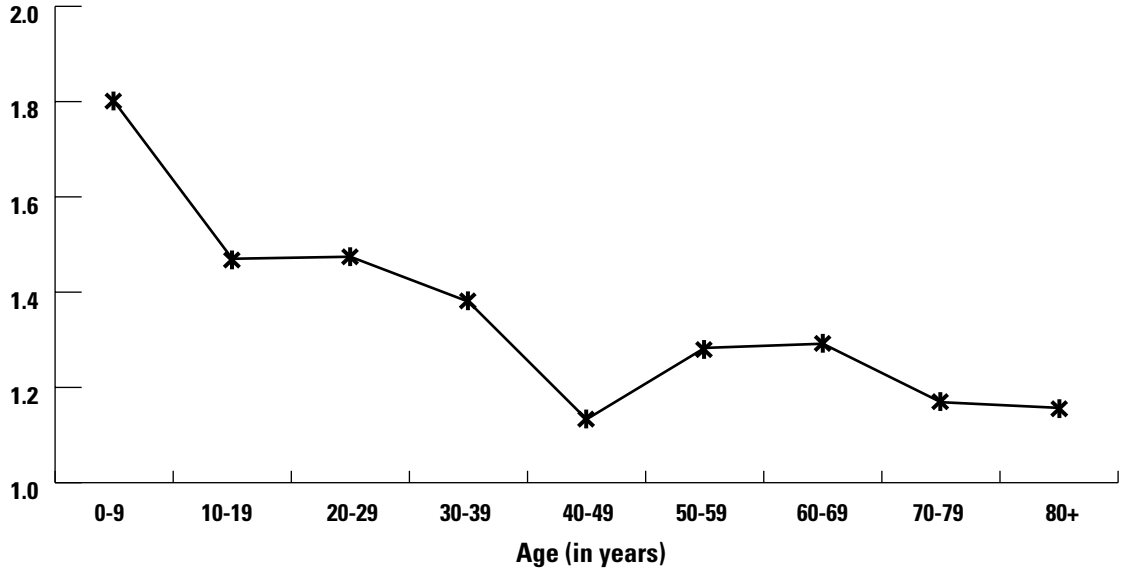


Figure 48 Age-Specific Rural Metropolitan Dehydration and Gastroenteritis ACSC Admission Rate Ratios, 1997-98 Data

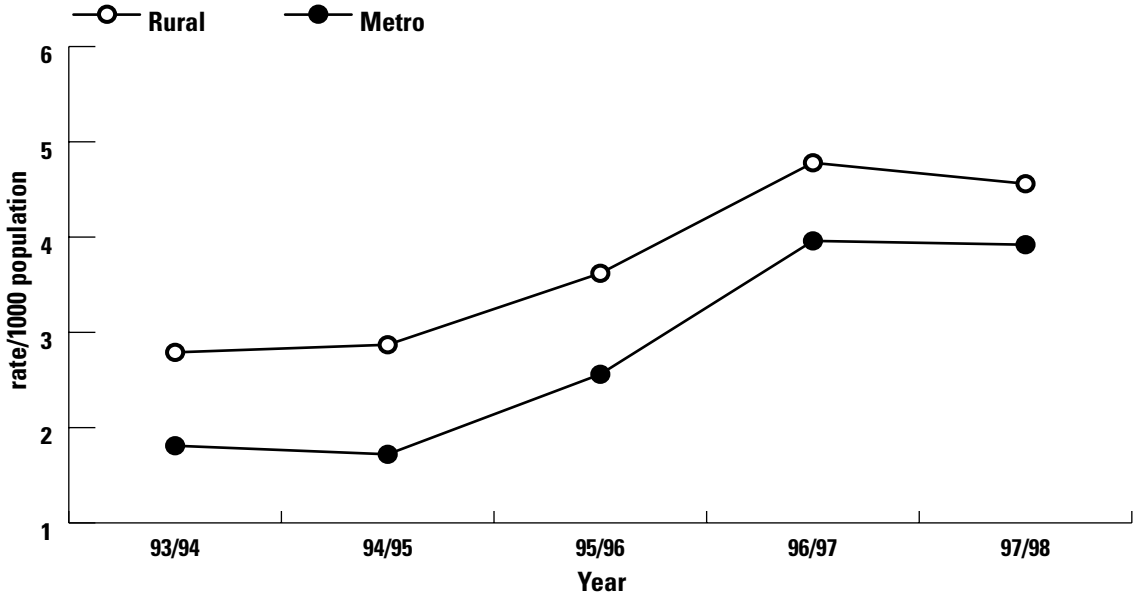


For dehydration and gastroenteritis, there is a relatively consistent decline in the rate ratio from a peak in persons aged 0-9 years (Figure 48). It is, therefore, in young children that efforts aimed at reducing the incidence of food-borne illness should be directed in rural areas.

Angina

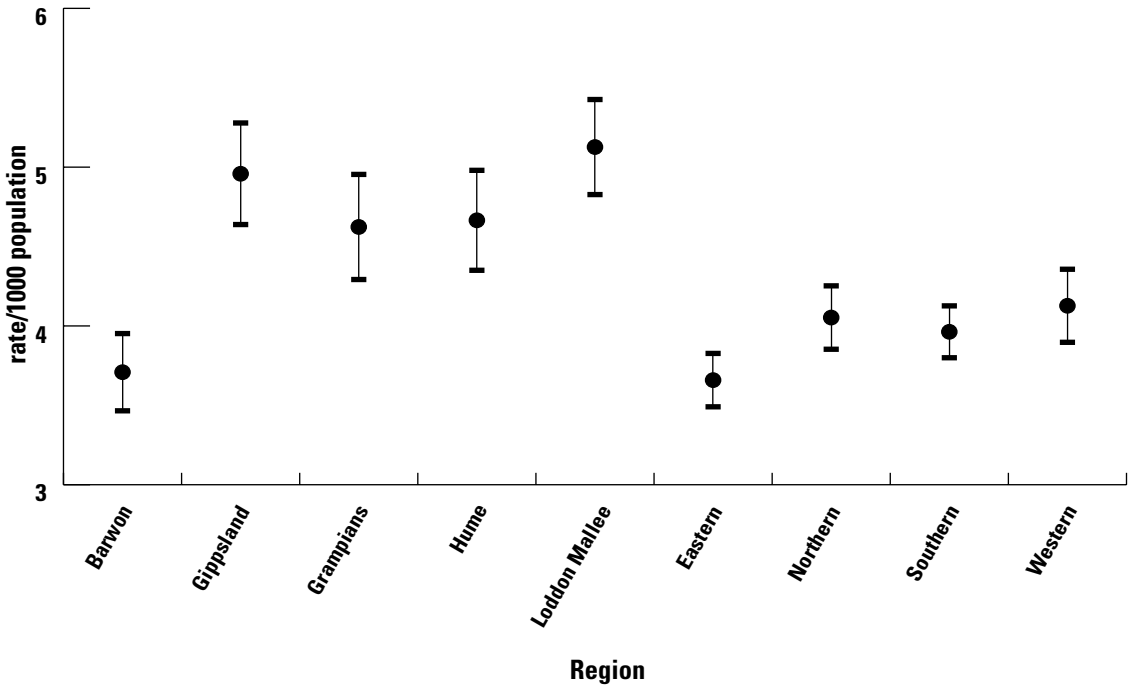
The admission rate for angina has increased substantially in both rural and metropolitan areas since 1994-95. The higher admission rates for angina in rural areas might reflect the difficulty in managing patients at home in these areas. Treatment of angina is now leaning towards more aggressive management (including surgery), which may lead to differing practice patterns between physicians.

Figure 49 Angina ACSC Admission Rates for Rural and Metropolitan Regions by Year



All the rural Regions with the exception of Barwon South Western have admission rates for angina higher than metropolitan Regions (Figure 50). Further analysis to identify why Barwon has a lower rate is needed.

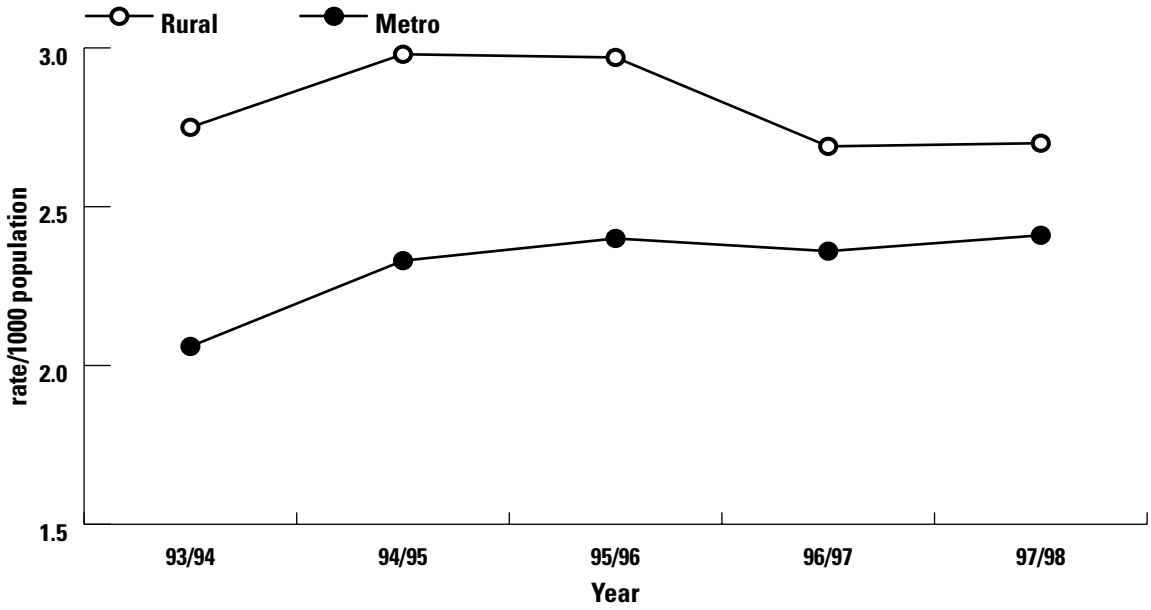
Figure 50 Angina ACSC Admission Rates by Region, 1997-98 Data



Congestive Heart Failure

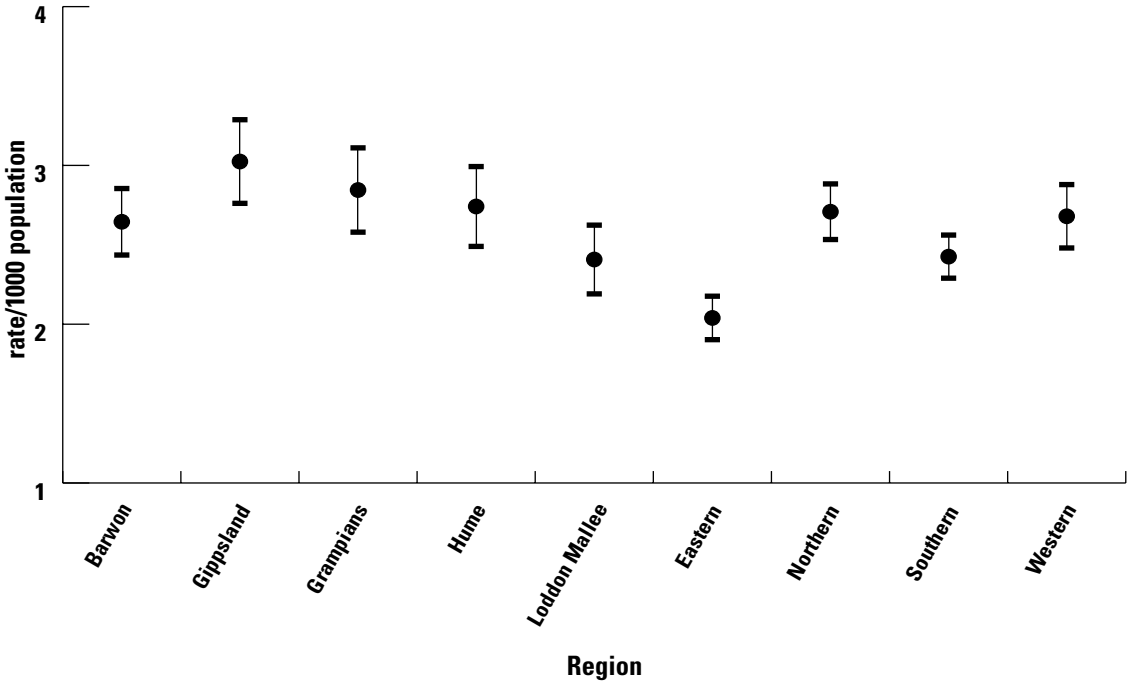
The difference between rural and metropolitan areas in admission rates is less apparent for congestive heart failure than other ACSCs examined here. This difference also appears to be narrowing over time (Figure 51).

Figure 51 Congestive Heart Failure ACSC Admission Rates for Rural and Metropolitan Regions by Year



Despite the smaller difference between rural and metropolitan Regions, there is still considerable variation across Regions; Gippsland has the highest admission rate for congestive heart failure (Figure 52).

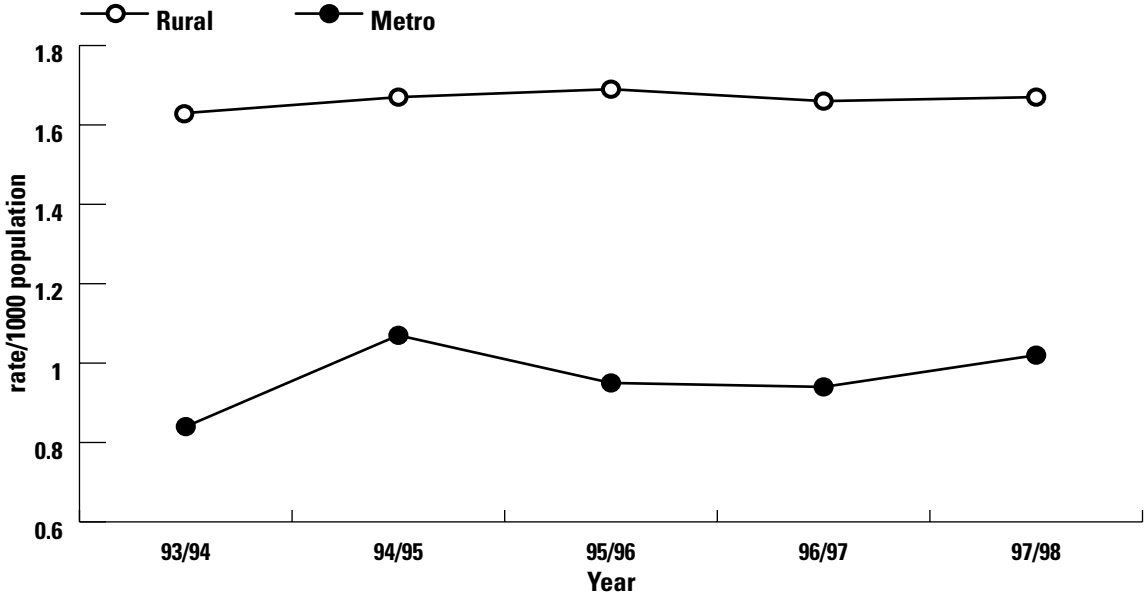
Figure 52 Congestive Heart Failure ACSC Admission Rates by Region, 1997-98 Data



Ear, Nose and Throat Infections

There is a large and consistent difference in admission rates for ear, nose and throat infections between rural and metropolitan areas, with little change over time (Figure 53).

Figure 53 Ear, Nose and Throat Infection ACSC Admission Rates for Rural and Metropolitan Regions by Year



The difference between rural and metropolitan Regions is consistent, with little variation across metropolitan Regions.

Figure 54 Ear, Nose and Throat Infection ACSC Admission Rates by Region, 1997-98 Data

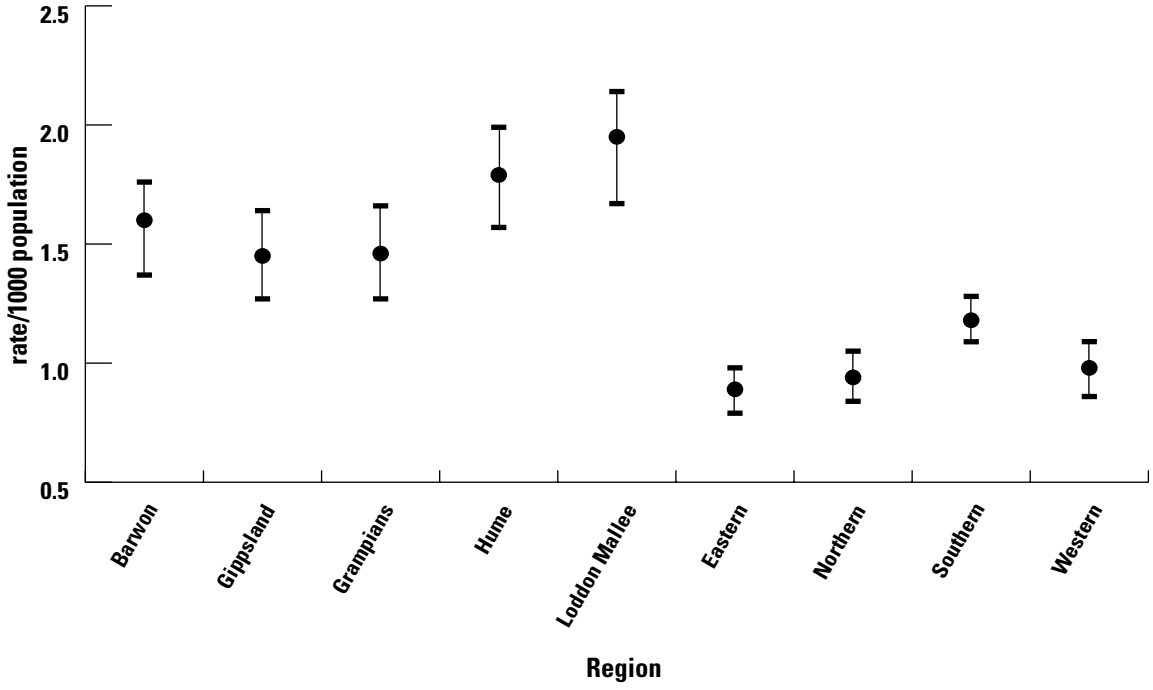
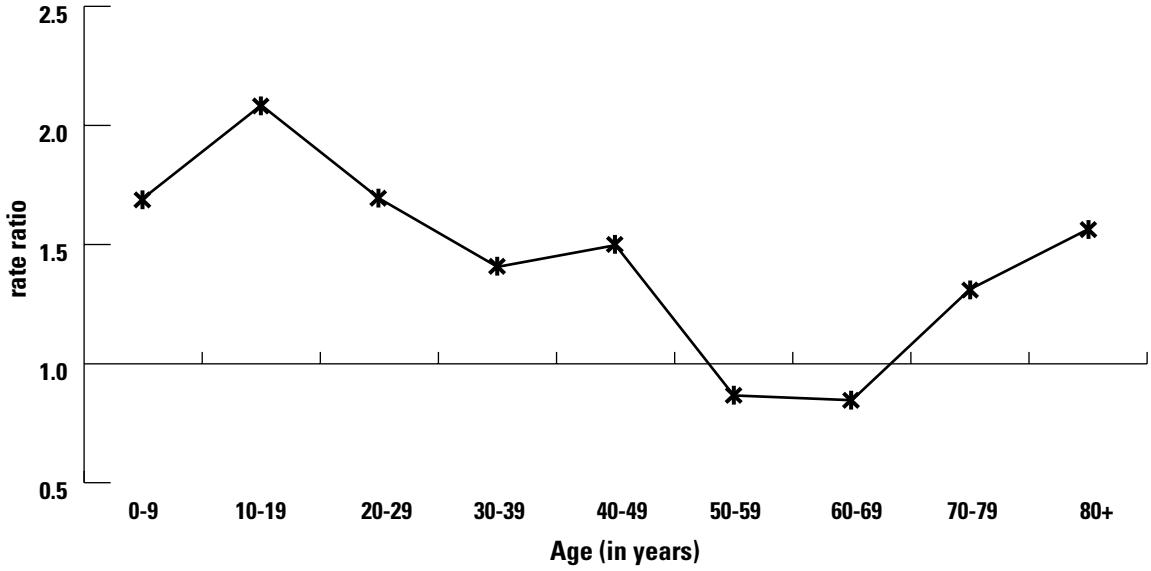


Figure 55 Age-Specific Rural Metropolitan Ear, Nose and Throat Infection ACSC Admission Rate Ratios, 1997-98 Data

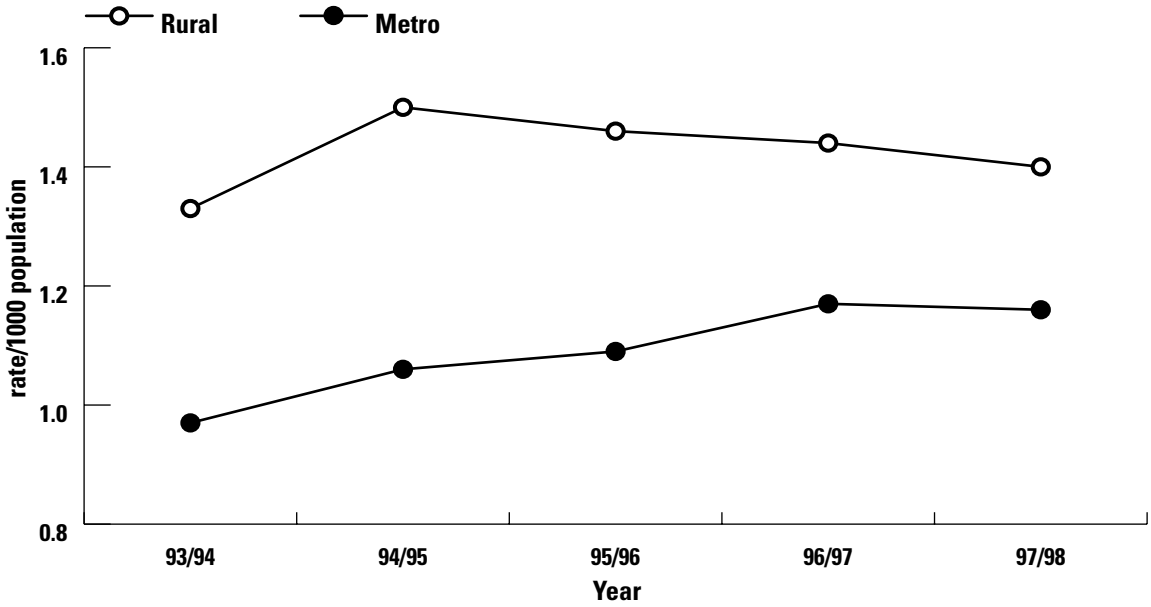


The rate ratio for ear, nose and throat infections is highest for those in their teens and declines towards middle age (Figure 55). Such infections should ideally be treated through primary care services and this differential may well represent a delay in accessing primary care services.

7.3 Appendicitis

Appendicitis was chosen as a marker condition, as it is a condition that requires admission to hospital for effective treatment and admission would not be expected to vary with differing access to primary care.

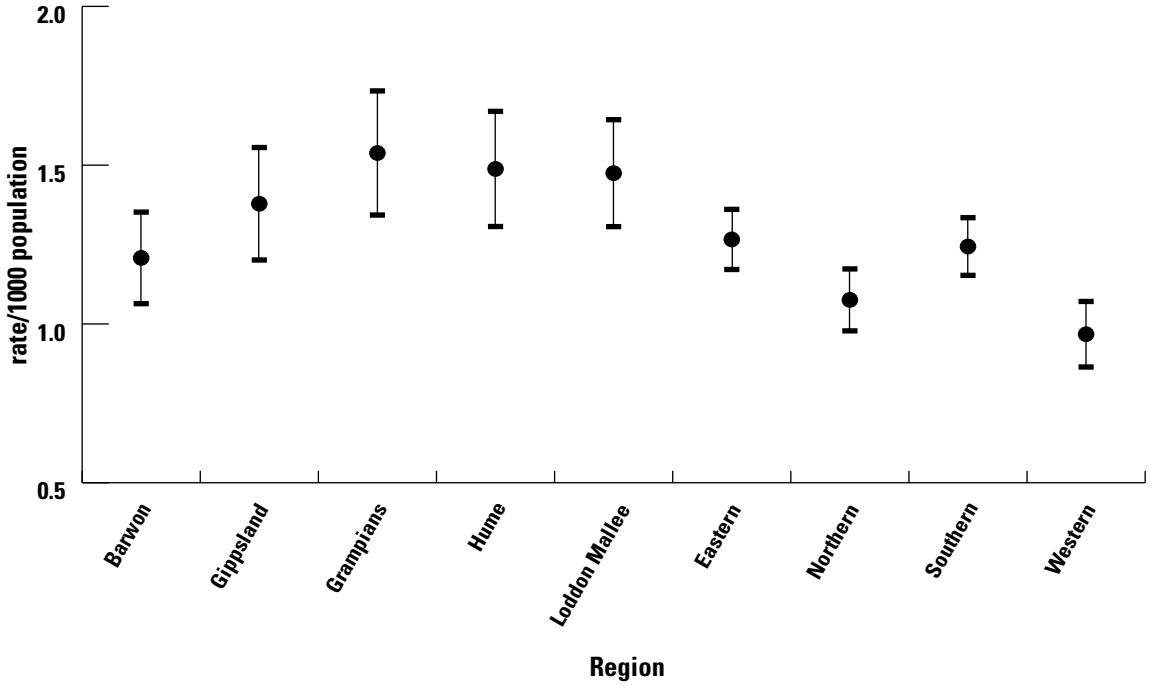
Figure 56 Appendicitis Admission Rates for Rural and Metropolitan Regions by Year



However, there remains a significant difference between rural and metropolitan areas in admission rates for appendicitis. In 1997-98, the rate in rural areas was 1.40/1000 (1.34-1.47) compared to 1.16/1000 (1.13-1.20).

There are also significant differences between Regions; the lowest rate is seen in the Western Metropolitan Region and the highest in the Grampians (Figure 57). Similar rates and differences are seen when only admissions where an appendectomy was performed were used.

Figure 57 Appendicitis Admission Rates by Region, 1997-98 Data



Key Findings:

- Rural Regions have consistently higher ACSC admission rates compared with metropolitan Regions.
- The rate ratio between rural and metropolitan Regions varies with different ACSC.
- The largest rate ratio is seen for dental conditions and the smallest for congestive heart failure.
- Overall, the rural/metropolitan ACSC admission rate ratio has been decreasing over time.
- The rural/metropolitan rate ratio also decreases with age.
- Individual ACSC admission rate ratios show different patterns with age.
- Significant variations occur in admission rates for appendicitis (a condition not sensitive to primary care). Rates are higher in rural Regions compared to metropolitan.

Issues for Further Investigation:

- The factors that influence variations in admission practice for conditions such as appendicitis, which are theoretically unlikely to be ambulatory care sensitive, should be explored.
- These differences suggest that at least some of the variation seen in ACSC admission rates across Victoria is due to factors other than access to primary care. Such factors might include: varying propensity to admit and/or operate on patients, financial incentives to admit patients or treat them as inpatients and availability of hospital beds.

8 Discussion and Recommendations

8.1 Discussion

This preliminary analysis has demonstrated that significant variations do exist across Victoria in admission rates for conditions classified as ambulatory care sensitive. Rurality and socioeconomic status appear to be significant factors contributing to this variation. There are, however, different patterns of variation with different ACSC.

The question then is: does this tell us anything about access to primary care in Victoria? Levels of socioeconomic disadvantage and rurality may well be proxies for poor access to primary care services. Barriers such as cost of services and pharmaceuticals and lack of access to transport options might be expected to be related to lower socioeconomic status and rurality. However, there is much evidence linking lower socioeconomic status with higher disease prevalence, particularly chronic and 'lifestyle' diseases. Rural Regions in Victoria tend to rank lower in socioeconomic status than do metropolitan Regions, confounding the association. The only way to separate these issues will be to analyse ACSC admission rates using multivariate models that include factors potentially contributing to variation such as: disease prevalence or incidence, severity of illness, geographic access to health care, financial barriers to care and propensity to seek care.

This analysis suggests that there is a potential for significant scope for health gain by improving appropriate health care delivered through the primary care system and through targeted prevention strategies. This is likely to decrease the pressure on the costly inpatient care via reduction in preventable admissions to hospital.

8.2 Potential Policy Implications

- Analysis of ACSC admission rates in LGAs has identified significant variations between PCP areas. These variations need to be monitored over time to identify specific catchment areas consistently above the expected rates. To the extent that these differences in rates are attributable to access barriers, small area analysis may prove to be a valuable planning and evaluation tool. Policy makers interested in assessing the impact of local access barriers often look for a yardstick to evaluate where the community stands compared with others in meeting the needs of particular groups in the community. ACSCs may prove to be a useful tool for monitoring service accessibility and need and providing valuable information for local health planning. This will also complement small area analysis using BOD methodology.
- Small area analysis of ACSCs may also have some role in evaluating the impact of policies and interventions. Analysis of ACSC may provide means to assess the impact of major initiatives such as PCP and integrated chronic disease management programs in improving access to care.
- This analysis has identified significant differentials in ACSC rates. What is driving higher rates of ACSC in rural Victoria? This analysis cannot separate out the economic, structural and geographic barriers that are traditionally lumped together as 'access barriers'. Further detailed analysis and investigation through the VPHS should assist in assessing the relative contribution of various factors that are driving the excess rates of ACSC in rural Victoria.
- A wide gradient in rates of ACSC by socioeconomic status was observed in this analysis. This indicates the usefulness of ACSCs as one of the indicators for monitoring disparities in access across social groups. This information can assist policy makers in developing programs that are directed to specific subgroups in the community. The differential associated with socioeconomic status can then be monitored longitudinally over time to identify the impact of various programs and interventions.

- Significant variations have also been observed for individual conditions such as diabetes, asthma and cardiovascular diseases. These variations were observed over time, within specific age groups, in relation to urban/rural differentials and socioeconomic status. For example, higher rates of asthma in rural areas, in the age group over 50 years, and in relation to socioeconomic status reflect the need for promotion of better care in the middle aged particularly in rural areas, and development of strategies to reduce admissions including effective self-management of asthma in this group.

8.3 Recommendations for Further Analyses

In summary, recommendations for further analysis for the next three years revolve around discerning factors that may explain the variations in ACSC admission rates outlined in this report. In particular, determining the extent to which access to primary care explains these variations. Specifically the recommendations are:

- Conduct a detailed multivariate analysis of urban rural differentials related to groups of ACSCs as well as individual conditions within each category.
- Examine the relationship between ACSC admission rates and use of primary care clinicians as the source of first contact and continuity of care.
- Examine the relationship between socioeconomic factors and ACSCs especially with respect to urban rural differentials.
- Conduct analysis of ACSCs at small area levels (for example, local government levels).
- Assess associations between the rates of ACSCs and the degree of remoteness as measured through ARIA (Accessibility Remoteness Index of Australia) and population density.
- Identify health seeking behaviours and clinician practice patterns through the VPHS and other data sources and analyse them in relation to ACSCs to gain an improved understanding of accessibility to health care in Victoria.

Appendix: Ambulatory Care Sensitive Conditions and ICD-9 Codes Used in this Analyses

The following conditions and codes were drawn from Weissman et al 1992 (2) and the Institute of Medicine 1993 (10).

Category	ICD9 codes	Notes
Influenza and pneumonia	481 4870 4871 4878	In any diagnosis field
Other vaccine preventable	032 0330 0339 037 045 055 056 0703 072 32000	In any diagnosis field
Asthma	493	Principal diagnosis only
Congestive heart failure	428 40201 40211 40291 5184	Principal diagnosis only, exclude cases with procedure codes of 35 36 375 376 377 378
Diabetes complications	2501 2502 2503 2504 2505 2506 2507 2508 2509	In any diagnosis field
Chronic obstructive pulmonary disease	491 492 494 496 4660	Principal diagnosis only, 4660 only with diag2 of 491 492 494 496
Angina	4111 4118 413	Principal diagnosis only, exclude cases with procedure codes 01 to 8699
Iron deficiency anaemia	2801 2808 2809	Principal diagnosis only
Hypertension	4010 4019 40200 40210 40290	Principal diagnosis only, exclude cases with procedure codes of 35 36 375 376 377 378
Nutritional deficiencies	260 261 262 2680 2681	Principal diagnosis only
Dehydration and gastroenteritis	2765 5589	Principal diagnosis only
Pyelonephritis	5900 5901 5908	Principal diagnosis only
Perforated/bleeding ulcer	5310 5311 5312 5314 5315 5316 5320 5321 5322 5324 5325 5326 5330 5331 5332 5334 5335 5336 5340 5341 5342 5344 5345 5346	Principal diagnosis only
Cellulitis	681 682 683 686	Principal diagnosis only, exclude cases with procedure codes 01 to 8699, except 860 where it is the only listed procedure
Pelvic inflammatory disease	614	Principal diagnosis only
Ear nose and throat infections	382 462 463 465 4721	Principal diagnosis only
Dental conditions	521 522 523 525 528	Principal diagnosis only
Appendicitis	540 541 542	In any diagnosis field
Convulsions and epilepsy	345 7803 6426	Principal diagnosis only
Gangrene	7853	In any diagnosis field

References

1. Billings J, Anderson GM, Newman LS. Recent findings on preventable hospitalisations. *Health Affairs*, 15(3); 239-249, 1996
2. Weissman JS, Gatsonis C, Epstein AM. Rates of avoidable hospitalisation by insurance status in Massachusetts and Maryland. *Journal of the American Medical Association*, 268(17); 2388-2394, 1992
3. Pappas G, Hadden WC, Kozak LJ, Fisher GF. Potentially avoidable hospitalisations: inequalities in rates between US socioeconomic groups. *American Journal of Public Health*, 87(5); 811-846, 1997
4. Silver MP, Babitz ME, Magill MK. Ambulatory care sensitive hospitalisation rates in the aged medicare population in Utah, 1990 to 1994: a rural-urban comparison. *The Journal of Rural Health*, 13(4); 285-294, 1997
5. Bindman AB, Grumbach K, Osmond D, Komaromy M, Vranizan K, Lurie N, Billings J, Stewart A. Preventable hospitalisations and access to health care. *Journal of the American Medical Association*, 274(4); 305-311, 1995
6. Stamp KM, Duckett SJ, Fisher DA. Hospital use for potentially preventable conditions in Aboriginal and Torres Strait islander and other Australian populations. *Australian and New Zealand Journal of Public Health*, 22(6); 673-678, 1998
7. *Our health, our future - Hauora Pakari, Koiora Roa. The health of New Zealanders 1999*. Ministry of Health, NZ http://www.moh.govt.nz/moh
8. Department of Human Services (1999). *Victorian Burden of Disease: Morbidity*. Melbourne: Public Health and Development Division, Victorian Government, Department of Human Services.
9. Department of Health and Aged Care, National Asthma Strategy Implementation Plan. National Asthma Campaign, , Australia, 1999
10. Michael Millman, editor, *Access to Health Care in America*. Report of a study by a committee of the Institute of Medicine, Division of Health Care Services.. National Academy Press, February 1993.