

**The Victorian Ambulatory Care
Sensitive Conditions Study:**

***Opportunities for Targeted
Interventions in Cardiovascular
Diseases and Chronic
Obstructive Pulmonary Disease***

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Health Outcomes Section
Development and Resources Branch
Public Health Division

Executive Summary

Background

There is increasing pressure on the Victorian public acute and emergency hospital system to meet the demand for inpatient care. To address this problem, the Victorian Department of Human Services is conducting a major project “Meeting Emergency Demand”. The Victorian Ambulatory Care Sensitive Conditions (ACSCs) study previously analysed a set of priority conditions where hospital admissions can be reduced through improved prevention and primary care.

This report presents the results of further analyses of selected ACSCs. These conditions include angina, hypertension, congestive cardiac failure and chronic obstructive pulmonary disease.

Purpose

The aim of this report is to demonstrate opportunities for further targeted interventions to reduce demand on hospital services. Detailed analyses of the key conditions are provided, identifying trends in hospitalisations, urban/rural differentials, regional variations, and variations by the Primary Care Partnerships (PCPs).

Methods

The Victorian Admitted Episodes Dataset (VAED) was analysed from 1993-1994 to 2000-2001 (21st of May). Rates of admission were age and sex standardised to the Victorian population (1996) using the direct method. Co-morbidities were identified by the Charlson index using ICD-9-CM codes in any of the diagnosis fields. The comorbidity score is an index for measuring severity of illness using routine databases such as the VAED.

Key Findings

Angina

- There were 13,814 admissions for angina with an average of 2.78 bed days in 2000-2001. More than seventy percent (n=9908) of these admissions were through the emergency department.
- A twenty percent reduction in number of admissions for angina would lead to a reduction of 7680 bed days in Victoria.
- There has been a significant increase in the rates of admissions for angina over the eight year period.
- Admission rates for angina were higher in rural areas compared to the metropolitan. This pattern was consistent over the eight year period.

- The Loddon Mallee region has the highest rate of admission while the Eastern Metropolitan region has the lowest. Southern Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural Region with a rate ratio significantly lower than Victoria.
- There were seventeen PCPs with significantly higher admission rates than Victoria.
- These seventeen PCPs with admission rates significantly higher than Victoria, from highest to lowest, are Bendigo/Loddon, Campaspe, Swan Hill/Gannawarra/Buloke, Wellington, Wimmera, Central Grampians, South West, South Coast Health Services Consortium, Central West, Frankston and Peninsula, South East, Mildura, Central Highlands, Moira/Strathbogie/Greater Shepparton, East Gippsland, Mitchell/Murrindindi, Mt Alexander/Central Goldfields/Macedon Ranges.
- The three Metropolitan PCPs with the highest number of admissions for angina were Monash/Whitehorse/Manningham, Frankston and Peninsula, and South East.
- These three Metropolitan PCPs contribute about twenty three percent (n=3,119) of all admissions for angina in Victoria, which is twenty one percent of total bed days.
- The average comorbidity score (0.40) for these seventeen PCPs is similar to that of Victoria.
- These seventeen PCPs contribute about forty three percent (n=6015) of all admissions in Victoria, which is forty five percent of total bed days.
- A thirty percent reduction in the number of admissions for angina in these seventeen PCPs and an eleven percent reduction in the remaining PCPs would lead to a twenty percent reduction in the number of admissions for angina in Victoria, which equates to approximately \$4.7 million of hospital expenditure.

Hypertension

- There were 989 admissions for hypertension with an average of 3.76 bed days in 2000-2001 where hypertension was listed as the principal diagnosis. More than sixty percent (n=603) of these admissions were through the emergency department.
- A twenty percent reduction in number of admissions for hypertension would lead to a reduction of 743 bed days in Victoria.
- There has been a decline in the rates of hypertension admissions in rural areas but metropolitan areas show similar patterns over eight years.

- Admission rates for hypertension were higher in rural areas compared to metropolitan. This pattern was observed over the eight year period.
- The Grampians Region has the highest rate of admission while the Eastern Metropolitan region has the lowest. Compared to Victoria, all rural regions except Barwon South Western, have rate ratios significantly higher than Victoria. All Metropolitan Regions have rate ratios significantly lower than Victoria.
- There was more than twenty fold variation in admission rates for hypertension across PCPs.
- There were eleven PCPs with significantly higher admission rates than Victoria.
- These eleven PCPs with admission rates for hypertension significantly higher than Victoria, from highest to lowest, are Wimmera, Swan Hill/Gannawarra/Buloke, Mitchell/Murrindindi, Southern Grampians/Glenelg, Campaspe, Moira/Strathbogie/Greater Shepparton, South Coast Health Services Consortium, Mildura, Central Grampians, Wellington, Central Highlands.
- The three Metropolitan PCPs with the highest number of admissions for hypertension were Inner South, Outer East, and North Central Metropolitan.
- These three Metropolitan PCPs contribute about seventeen percent (n=166) of all admissions for hypertension in Victoria, which is fifteen percent of total bed days.
- The average comorbidity score (0.31) for these eleven PCPs is similar to that of Victoria.
- These eleven PCPs contribute about thirty eight percent (n=375) of all admissions for hypertension in Victoria, which is about forty six percent of total bed days.
- A twenty percent reduction in the number of admissions for hypertension across all PCPs in Victoria equates to approximately \$2.5 million of hospital expenditure.

Congestive Cardiac Failure (CCF)

- There were 8,359 admissions for CCF with an average of 7.37 bed days in 2000-2001. More than seventy four percent (n=6215) of these admissions were through the emergency department.

- A twenty percent reduction in the number of admissions for CCF would lead to a reduction of 12,321 bed days in Victoria.
- Although there has been a significant decline in the admission rates of CCF, it still accounts for about 10,000 admissions each year to Victorian hospitals.
- Admission rates for CCF were higher in rural areas compared to the metropolitan. This pattern was observed over the eight year period.
- The Hume Region has the highest rate of admission while the Eastern Metropolitan Region has the lowest.
- Western Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural region with a rate ratio significantly lower than Victoria.
- There were seventeen PCPs with significantly higher admission rates for CCF compared to Victoria.
- These seventeen PCPs with admission rates significantly higher than Victoria, from highest to lowest, are Wellington, Swan Hill/Gannawarra/Buloke, Mitchell/Murrindindi, Brimbank/Melton, Southern Grampians/Glenelg, Campaspe, Central Grampians, North Central Metropolitan, Mildura, Wimmera, South Coast Health Services Consortium, South West, Moira/Strathbogie/Greater Shepparton, Bendigo/Loddon, West Bay, Alpine/Delatite/Wangaratta, Central Highlands.
- The three Metropolitan PCPs with the highest number of admissions were Monash/Whitehorse/Manningham, Inner South, and North Central Metropolitan.
- These three Metropolitan PCPs contribute about twenty two percent (n=1,820) of all admissions for CCF in Victoria, which is twenty one percent of total bed days.
- The average comorbidity score (1.85) for these seventeen PCPs is similar to that of Victoria.
- These seventeen PCPs contribute about forty percent (n=3309) of all admissions in Victoria, which is about forty one percent of total bed days.
- A thirty percent reduction in number of admissions for CCF in these seventeen PCPs and thirteen percent reduction in the remaining PCPs would lead to a twenty percent reduction in the number of admissions for CCF in Victoria, which equates to approximately \$4.7 million of hospital expenditure.

Chronic Obstructive Pulmonary Disease (COPD)

- There were 10,137 admissions for COPD with an average of 7.33 bed days in 2000-2001. More than seventy six percent (n=7727) of these admissions were through the emergency department.
- A twenty percent reduction in number of admissions for COPD would lead to a reduction of 14,860 bed days in Victoria.
- There was a two fold increase in the number of admissions as well as admission rates over the eight year period.
- Rural areas show higher admission rates and rate ratios over the eight year period compared to metropolitan.
- The Hume region has the highest rate of admission while the Eastern Metropolitan region has the lowest.
- Western Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Gippsland is the only Rural region with a rate ratio significantly lower than Victoria.
- There were sixteen PCPs with significantly higher admission rates for COPD compared to Victoria.
- These sixteen PCPs with admission rates of COPD significantly higher than Victoria, from highest to lowest, are Central Grampians, Southern Grampians/Glenelg, Mitchell/Murrindindi, South West, Moira/Strathbogie/Greater Shepparton, Wimmera, Swan Hill/Gannawarra/Buloke, Alpine/Delatite/Wangaratta, Campaspe, Indigo/Towong/Wodonga, West Bay, Brimbank/Melton, Hume/Moreland, Frankston and Peninsula, North Central Metropolitan, Barwon.
- The three Metropolitan PCPs with the highest number of admissions were Frankston and Peninsula, North Central Metropolitan, and Monash/Whitehorse/Manningham.
- These three Metropolitan PCPs contribute about nineteen percent (n=1,973) of all admissions for COPD in Victoria, which is twenty one percent of total bed days.
- The average comorbidity score (1.47) for these sixteen PCPs is similar to that of Victoria.
- These sixteen PCPs contribute about fifty two percent (n=5,229) of all admissions in Victoria, which is about forty nine percent of total bed days.
- A thirty percent reduction in number of admissions for COPD in these sixteen PCPs and ten percent reduction in the remaining PCPs would lead to a twenty percent reduction in the number of admissions for COPD in Victoria, which equates to approximately \$6.1 million of hospital expenditure.

1 Introduction

1.1 Background

Ambulatory Care Sensitive Conditions (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.¹ 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.¹

The preliminary analyses from The Victorian ACSCs study offer a new set of indicators describing differentials and inequalities in access to the primary healthcare system in Victoria.² They also provide an evidence-based platform for policies directed at reducing demand on Victorian hospital services by offering opportunities for targeted community based interventions.

There is increasing pressure on the Victorian public acute and emergency hospital system to meet the demand for inpatient care.³ To address this problem, the Victorian Department of Human Services is conducting a major project “ Meeting Emergency Demand”. The Victorian ACSCs study previously analysed a set of priority conditions where hospital admissions can be reduced through improved prevention and primary care.³

This report presents the results of further analyses of selected ACSCs. These conditions include angina, hypertension, congestive cardiac failure and chronic obstructive pulmonary disease.

1.2 Purpose

The aim of this report is to demonstrate opportunities for targeted interventions for reducing demand on hospital services. More specifically, this report identifies:

- i. trends in hospitalisations;
- ii. urban/rural differentials;
- iii. regional variations;
- iv. variations by PCP;

1.3 Data Sources and Methods

1.3.1 Hospital Admissions Data

Hospital separation data were obtained from the Victorian Admitted Episodes Dataset (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.⁴

Clinical data are stored as ICD-9-CM codes in twelve diagnosis and procedure fields in the VAED.⁵ The ACSCs identified using the ICD-9-CM codes in the diagnoses fields of the VAED were angina (ICD-9-CM 4111, 4118, 413) as principal diagnosis only (exclude cases with procedure codes of 01 to 8699); hypertension (4010, 4019, 40200, 40210, 40290) as principal diagnosis only (exclude cases with procedure codes of 35, 375, 376, 377, 378); congestive cardiac failure (428, 40201, 40211, 40291, 5184) as principal diagnosis only (exclude cases with procedure codes of 35, 36, 375, 376, 377, 378); and chronic obstructive pulmonary disease (491, 492, 494, 496, 4660) as principal diagnosis (4660 as principal diagnosis only with 2nd diagnosis of 491, 492, 494, 496).²

Co-morbidities were identified by the Charlson index using ICD-9-CM codes in any of the diagnosis fields.⁶⁻⁷ The comorbidity score is an index for measuring severity of illness using routine databases such as the VAED.

1.3.2 Trend Analysis

Data from 1993–1994 through 21st of May 2001 were used in this analysis. Prior to 1993, not all hospitals were contributing to the database and this year also coincides with the introduction of case-mix funding for hospitals. The number of admissions reported for the year 2000-2001 was the actual number recorded for the period July 2000-21st May 2001. The admission rates reported for this period were based on the actual admissions multiplied by the factor of 1.231 (the ratio of the number of days in the full year to the part year).

1.3.3 Geographic Areas

The use of individual 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 boundaries of the geographic areas that make up Local Government Areas under the Australian Standard Geographic Classification (ASGC). Currently there are 200 statistical local areas (SLAs), which make up 78 LGAs. These boundaries have been collapsed into thirty two Primary Care Partnership (PCP) catchment areas. Comparisons across the entire eight years used in this analysis were made at the Department of Human Services Region level. Victoria is divided into nine health Regions, four of which encompass metropolitan Melbourne and five that cover the non-metropolitan areas in Victoria.

1.3.4 Admission Rates

Population figures by gender and five-year age groups were obtained by using the Estimated Resident Population (ERP) figures produced by the Australian Bureau of Statistics (ABS) and were used for calculating admission rates and 95% confidence intervals (CI). Estimates at the local government area (LGA) level were used to calculate admission rates and 95% CI for the thirty two PCP areas in Victoria. Admission rates were age and sex standardised (direct method) using the Victorian population for 1996 as the reference. Ninety five per cent CIs for the standardised rates were based on the Poisson distribution.

1.3.5 Rural Metropolitan Differences

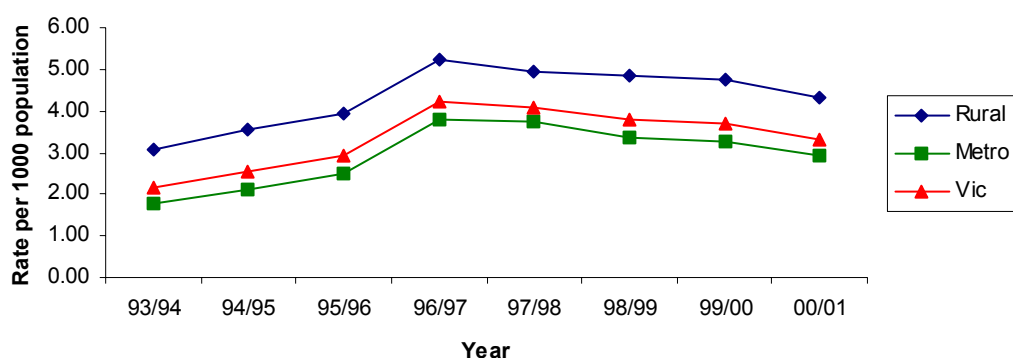
Throughout the document standardised admission rates are used providing important information on the relative impact of ACSCs in rural and metropolitan settings. It is however valuable to review the crude numbers of admissions with respect to PCP catchments in order to obtain additional information about opportunities for high yield targeted interventions. This is illustrated in tables 2, 4, 6, and 8 for angina, hypertension, congestive cardiac failure, and chronic obstructive pulmonary disease, respectively.

2 Angina

2.1 Trends in Victoria

There were 13,814 admissions for angina with an average of 2.78 bed days in 2000-2001. More than seventy percent (n=9908) of these admissions were through the emergency department. The rates of admissions for angina varied from 2.16/1000 (2.12-2.20) in 1993-94 to 3.31/1000 (3.25-3.36) in 2000-2001 (fig 1). The data for the year 2000/2001 is complete to the 21st of May. This is reflected in the lower number of admissions this financial year compared to 1999/2000 when 17,316 admissions were recorded for angina. This may also be reflected in lower admission rates in 2000/2001 as seasonality was not taken into account when adjusting the past year admission rates to estimate full annual rates. Although there was some decline in the number of admissions since 1996/97, angina still accounts for approximately 17,000 admissions each year in the Victorian hospitals.

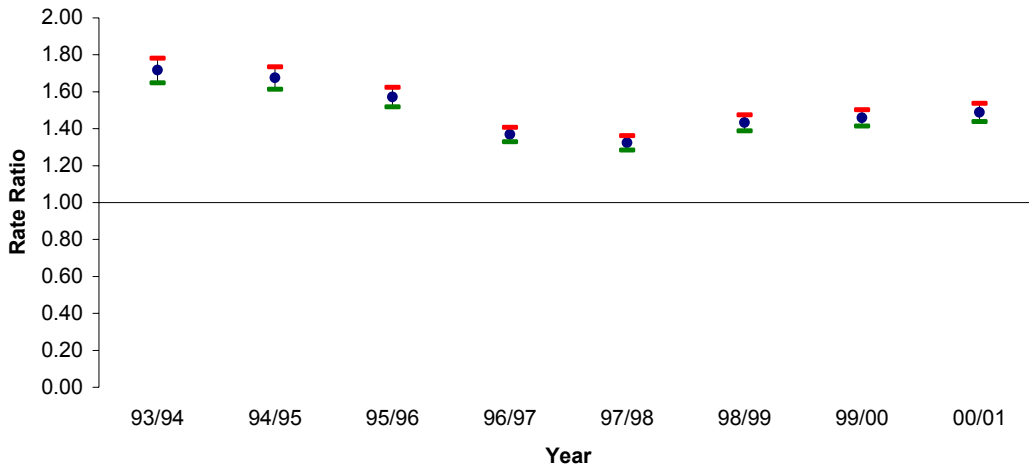
Figure 1 Angina ACSC Admission Rates for Rural and Metropolitan Regions, 93/94-00/01



2.2 Rural and Metropolitan Differences

There was a significantly higher admission rate for angina in rural areas compared to metropolitan, 4.33/1000 (4.21-4.45) and 2.91/1000 (2.85-2.97), respectively, in 2000-2001. Rural areas show higher admission rates and rate ratios compared to metropolitan areas over the eight year period (fig 1 & fig 2).

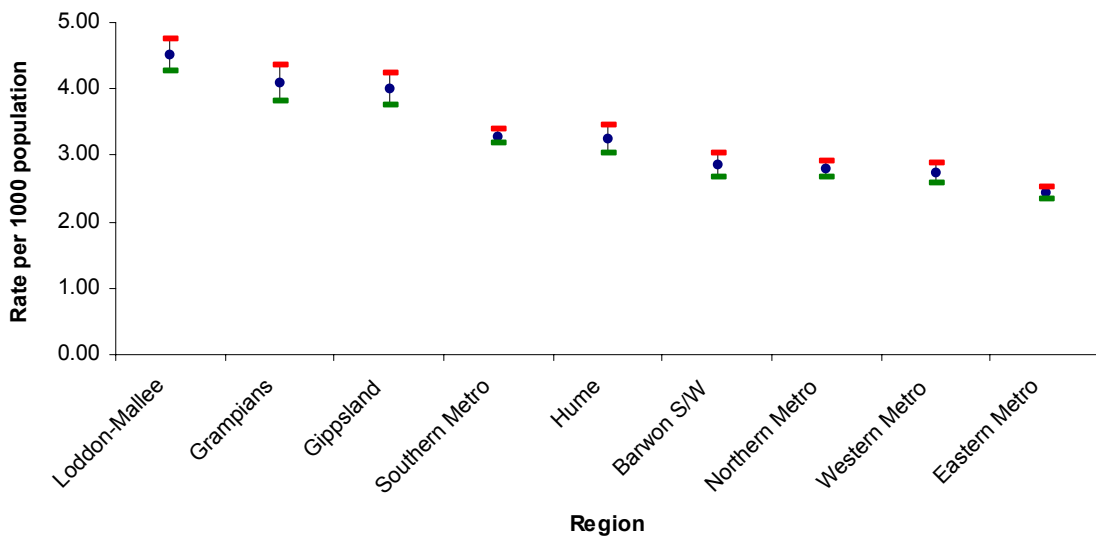
Figure 2 Angina ACSC Admission Rate Ratios for Rural Areas (Metropolitan=1), 93/94-00/01



2.3 Variations across DHS Regions

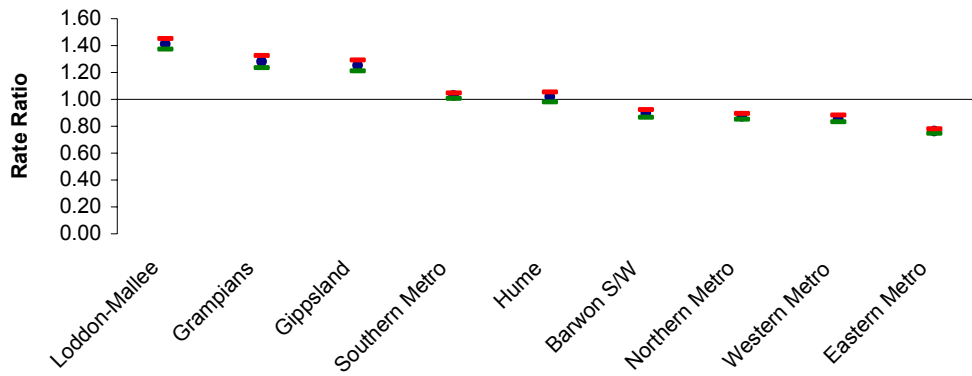
There were significant variations across DHS regions in Victoria. The admission rates in 2000-2001 varied from a high of 4.52/1000 (4.29-4.75) in Loddon Mallee to a low of 2.45/1000 (2.35-2.54) in the Eastern Metropolitan Region (fig 3). Southern Metropolitan Region has the highest admission rate of 3.29/1000 (3.18-3.39) compared to all other Metropolitan Regions.

Figure 3 Angina ACSC Admission Rates by Region, 00/01



Compared to Victoria, Loddon Mallee has the highest rate ratio while the Eastern Metropolitan Region has the lowest (fig 4). Southern Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural region with a rate ratio significantly lower than Victoria.

Figure 4 Angina ACSC Admission Rate Ratios for Regions (Victoria=1), 00/01



2.4 Variations across PCPs

The rate of admissions for angina, average bed days and co-morbidity scores in various PCPs for the year 2000-2001 are summarised in table 1.

Table 1: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for angina 00/01

Region	Primary Care Partnership	Number of admissions	Rate per 1000 persons		Average Bed-days	Average Comorbidity
			lower 95% CI	upper 95% CI		
Loddon-Mallee	Bendigo/Loddon	503	5.19	4.76	2.69	0.46
Loddon-Mallee	Campaspe	205	5.18	4.50	2.14	0.23
Loddon-Mallee	Swan Hill/Gannawarra/Buloke	226	4.95	4.33	2.21	0.33
Gippsland	Wellington	193	4.68	4.06	3.09	0.38
Grampians	Wimmera	222	4.53	3.96	3.26	0.36
Grampians	Central Grampians	162	4.29	3.66	3.20	0.40
Barwon S/W	South West	263	4.06	3.60	3.32	0.48
Gippsland	South Coast Health Services Consortium	251	3.98	3.51	2.76	0.48
Gippsland	Central West	397	3.95	3.59	2.70	0.57
Southern Metro	Frankston and Peninsula	1056	3.93	3.70	2.47	0.33
Southern Metro	South East	972	3.93	3.69	2.67	0.41
Loddon-Mallee	Mildura	183	3.86	3.33	2.76	0.28
Grampians	Central Highlands	481	3.86	3.53	3.77	0.48
Hume	Moira/Strathbogrie/Greater Shepparton	367	3.80	3.43	3.57	0.39
Gippsland	East Gippsland	184	3.63	3.13	2.81	0.54
Hume	Mitchell/Murrindindi	124	3.58	2.98	2.90	0.33
Loddon-Mallee	Mt Alexander/Central Goldfields/Macedon Ranges	226	3.46	3.03	2.65	0.31
Barwon S/W	Southern Grampians/Glenelg	145	3.26	2.75	3.57	0.43
Northern Metro	Hume/Moreland	679	3.06	2.84	3.04	0.46
Western Metro	West Bay	561	3.05	2.82	2.62	0.56
Western Metro	Brimbank/Melton	409	2.94	2.65	2.92	0.47
Eastern Metro	Outer East	826	2.84	2.66	2.26	0.29
Hume	Alpine/Delatite/Wangaratta	185	2.76	2.39	2.50	0.37
Northern Metro	North Central Metropolitan	700	2.73	2.54	3.17	0.51
Southern Metro	Middle South	694	2.68	2.49	2.54	0.40
Hume	Indigo/Towong/Wodonga	121	2.64	2.20	2.62	0.51
Southern Metro	Inner South	789	2.63	2.45	2.66	0.51
Northern Metro	Banyule/Nilumbik	388	2.56	2.31	2.24	0.33
Barwon S/W	Barwon	612	2.47	2.28	2.97	0.57
Eastern Metro	Monash/Whitehorse/Manningham	1091	2.46	2.32	2.56	0.32
Western Metro	Inner West	313	2.19	1.96	3.22	0.52
Eastern Metro	Boroondara	286	1.64	1.45	3.12	0.35

The rates in 2000-2001 varied from 1.64/1000 (1.45-1.83) in Boroondara to 5.19/1000 (4.76-5.62) in Bendigo/Loddon. The average bed days during the same time period varied from 2.14 in Campaspe to 3.77 in Central Highlands, while the comorbidity scores ranged from a low of 0.23 in Campaspe to 0.57 in Central West and Barwon.

The number and rates of admissions for angina in Metropolitan PCPs are summarised in table 2.

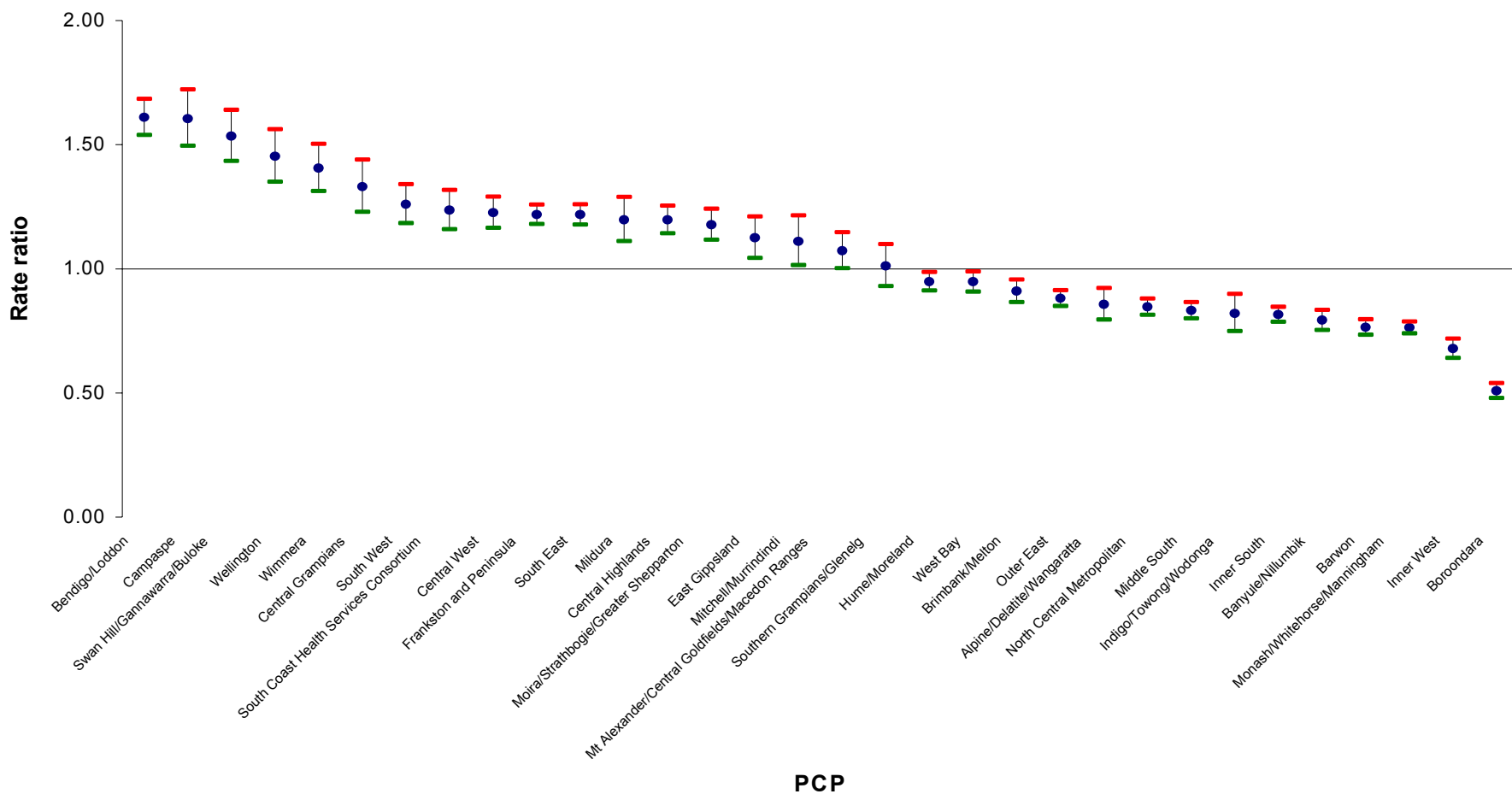
Table 2: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for angina in Metropolitan PCPs 00/01

<i>Region</i>	<i>Primary Care Partnership</i>	<i>Number of admissions</i>	<i>Rate per 1000 persons</i>	<i>lower 95% CI</i>	<i>upper 95% CI</i>	<i>Average Bed-days</i>	<i>Average Comorbidity</i>
Southern Metro	Frankston and Peninsula	1056	3.93	3.70	4.15	2.47	0.33
Southern Metro	South East	972	3.93	3.69	4.17	2.67	0.41
Northern Metro	Hume/Moreland	679	3.06	2.84	3.28	3.04	0.46
Western Metro	West Bay	561	3.05	2.82	3.29	2.62	0.56
Western Metro	Brimbank/Melton	409	2.94	2.65	3.22	2.92	0.47
Eastern Metro	Outer East	826	2.84	2.66	3.03	2.26	0.29
Northern Metro	North Central Metropolitan	700	2.73	2.54	2.92	3.17	0.51
Southern Metro	Middle South	694	2.68	2.49	2.87	2.54	0.40
Southern Metro	Inner South	789	2.63	2.45	2.81	2.66	0.51
Northern Metro	Banyule/Nilumbik	388	2.56	2.31	2.80	2.24	0.33
Eastern Metro	Monash/Whitehorse/Manningham	1091	2.46	2.32	2.60	2.56	0.32
Western Metro	Inner West	313	2.19	1.96	2.42	3.22	0.52
Eastern Metro	Boroondara	286	1.64	1.45	1.83	3.12	0.35

The three Metropolitan PCPs with the highest number of admissions for angina were Monash/Whitehorse/Manningham, Frankston and Peninsula, and South East. These three Metropolitan PCPs contribute about twenty three percent (n=3,119) of all admissions for angina in Victoria, which is twenty one percent of total bed days. Frankston and Peninsula, and South East were the only Metropolitan PCPs with rate ratios significantly higher than Victoria (fig 5).

There were seventeen PCPs with rate ratios significantly higher than Victoria (fig 5). Bendigo/Loddon had the highest rate ratio of 1.61 (1.54-1.69), while Boroondara had the lowest 0.51 (0.48-0.54).

Figure 5 Angina ACSC Admission Rate Ratios for PCP's (Victoria=1), 2000/2001



2.5 Key Findings

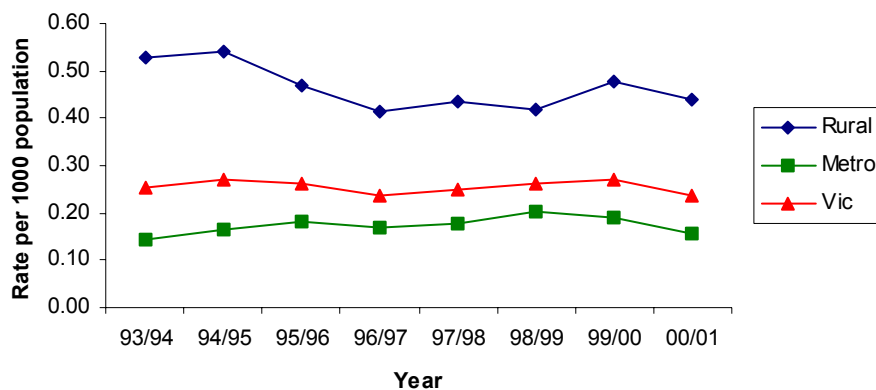
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- A twenty percent reduction in number of admissions for angina would lead to a reduction of 7680 bed days in Victoria.
- There has been a significant increase in the rates of admissions for angina over the eight year period.
- Admission rates for angina were higher in rural areas compared to the metropolitan. This pattern was consistent over the eight year period.
- The Loddon Mallee region has the highest rate of admission while the Eastern Metropolitan region has the lowest. Southern Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural Region with a rate ratio significantly lower than Victoria.
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- There were seventeen PCPs with significantly higher admission rates than Victoria.
- These seventeen PCPs with admission rates significantly higher than Victoria, from highest to lowest, are Bendigo/Loddon, Campaspe, Swan Hill/Gannawarra/Buloke, Wellington, Wimmera, Central Grampians, South West, South Coast Health Services Consortium, Central West, Frankston and Peninsula, South East, Mildura, Central Highlands, Moira/Strathbogie/Greater Shepparton, East Gippsland, Mitchell/Murrindindi, Mt Alexander/Central Goldfields/Macedon Ranges.
- The average comorbidity score (0.40) for these seventeen PCPs is similar to that of Victoria.
- These seventeen PCPs contribute about forty three percent (n=6015) of all admissions in Victoria, which is forty five percent of total bed days.
- A thirty percent reduction in the number of admissions for angina in these seventeen PCPs and an eleven percent reduction in the remaining PCPs would lead to a twenty percent reduction in the number of admissions for angina in Victoria, which equates to approximately \$4.7 million of hospital expenditure.

3 Hypertension

3.1 Trends in Victoria

There were 989 admissions for hypertension with an average of 3.76 bed days in 2000-2001 where hypertension was listed as the principal diagnosis. More than sixty percent (n=603) of these admissions were through the emergency department. The rates of admissions for hypertension have not significantly varied over eight years (fig 6). In 2000/2001, admission rates for hypertension were 0.23/1000 (0.22-0.25).

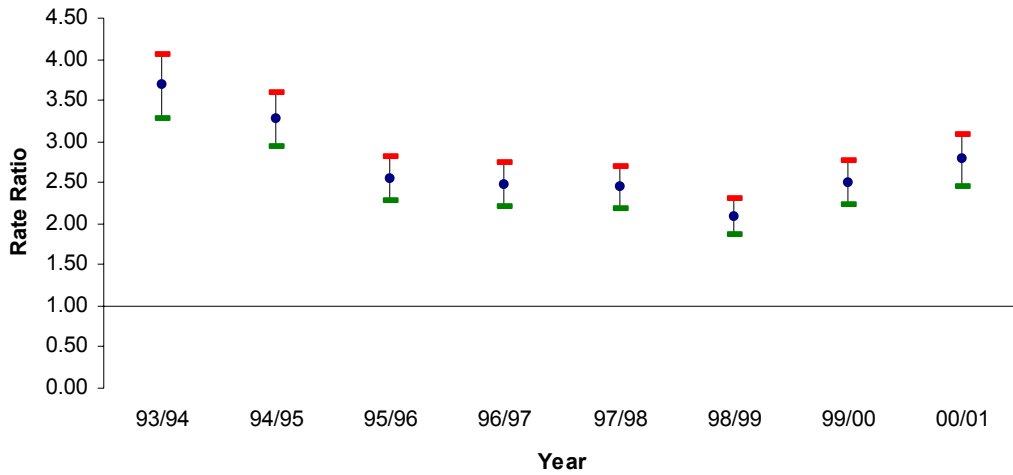
Figure 6 Hypertension ACSC Admission Rates for Rural and Metropolitan Regions, 93/94-00/01



3.2 Rural and Metropolitan Differences

There has been a decline in the rates of hypertension admissions in rural areas but metropolitan areas show similar patterns over eight years (fig 6). There was a significantly higher admission rate for hypertension in rural areas compared to metropolitan, 0.44/1000 (0.40-0.48) and 0.16/1000 (0.14-0.17), respectively, in 2000-2001. Rural areas show higher admission rates and rate ratios compared to metropolitan areas over the eight year period (fig 6 & fig 7).

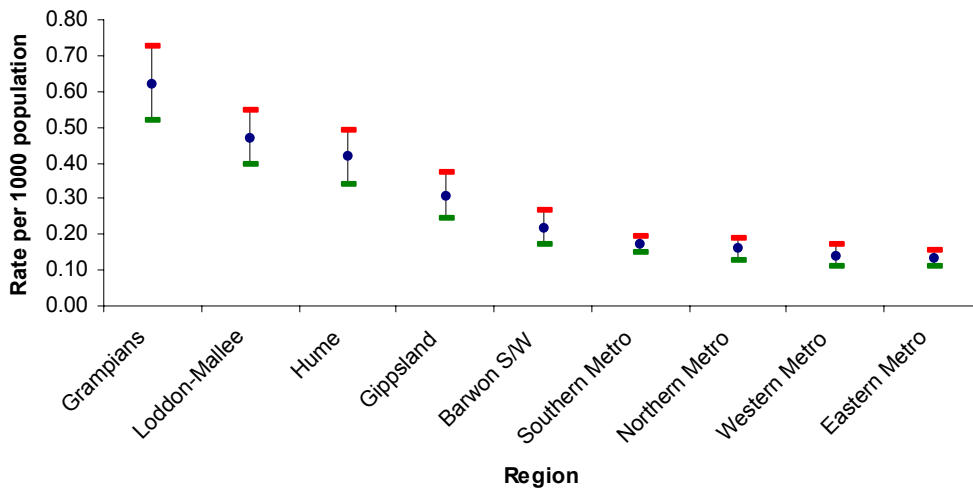
Figure 7 Hypertension ACSC Admission Rate Ratios for Rural Areas (Metropolitan=1), 93/94-00/01



3.3 Variations across DHS Regions

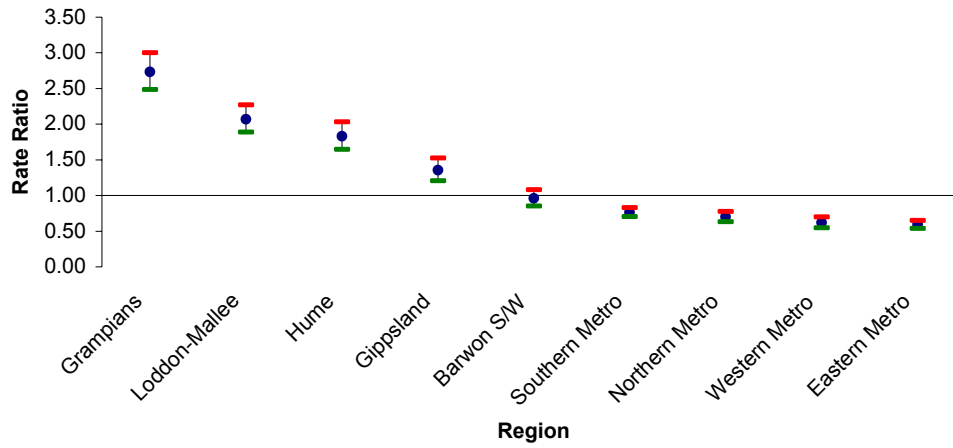
The admission rates in 2000-2001 varied from a high of 0.62/1000 (0.52-0.73) in Grampians to a low of 0.13/1000 (0.11-0.16) in the Eastern Metropolitan Region (fig 8).

Figure 8 Hypertension ACSC Admission Rates by Region, 00/01



Compared to Victoria, all rural regions except Barwon South Western, has rate ratios significantly higher than Victoria (fig 9). All Metropolitan Regions have rate ratios significantly lower than Victoria.

Figure 9 Hypertension ACSC Admission Rate Ratios for Regions (Victoria=1), 00/01



3.4 Variations across PCPs

The rate of admissions for hypertension, average bed days and co-morbidity scores in various PCPs for the year 2000-2001 are summarised in table 3.

Table 3: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for hypertension 00/01

Region	Primary Care Partnership	Number of admissions	Rate per 1000		Average Bed-days		Average Comorbidity
			persons	lower 95% CI	upper 95% CI		
Grampians	Wimmera	70	1.61	1.25	1.97	2.67	0.14
Loddon-Mallee	Swan Hill/Gannawarra/Buloke	55	1.26	0.94	1.58	3.25	0.11
Hume	Mitchell/Murrindindi	25	0.77	0.48	1.06	3.92	0.84
Barwon S/W	Southern Grampians/Glenelg	25	0.63	0.39	0.87	4.48	0.16
Loddon-Mallee	Campaspe	25	0.63	0.40	0.86	4.96	0.20
Hume	Moira/Strathbogjie/Greater Shepparton	53	0.56	0.42	0.70	4.45	0.32
Gippsland	South Coast Health Services Consortium	30	0.47	0.31	0.63	3.50	0.53
Loddon-Mallee	Mildura	18	0.42	0.24	0.61	2.17	0.06
Grampians	Central Grampians	15	0.41	0.21	0.60	12.00	0.40
Gippsland	Wellington	17	0.39	0.22	0.57	3.65	0.06
Grampians	Central Highlands	42	0.34	0.24	0.43	4.88	0.62
Hume	Alpine/Delatite/Wangaratta	19	0.28	0.16	0.40	4.21	0.47
Loddon-Mallee	Mt Alexander/Central Goldfields/Macedon Ranges	17	0.27	0.15	0.39	3.12	0.47
Gippsland	Central West	20	0.21	0.12	0.30	3.95	0.30
Barwon S/W	South West	13	0.21	0.10	0.31	4.62	0.31
Northern Metro	North Central Metropolitan	51	0.20	0.15	0.25	3.27	0.47
Southern Metro	Inner South	58	0.20	0.15	0.25	3.38	0.48
Eastern Metro	Outer East	57	0.20	0.15	0.24	3.21	0.39
Gippsland	East Gippsland	10	0.19	0.08	0.31	2.00	0.20
Loddon-Mallee	Bendigo/Loddon	19	0.19	0.11	0.26	5.68	0.63
Southern Metro	Frankston and Peninsula	47	0.18	0.13	0.23	3.70	0.28
Southern Metro	Middle South	40	0.17	0.12	0.22	3.13	0.20
Western Metro	Inner West	23	0.16	0.10	0.23	3.61	0.17
Barwon S/W	Barwon	37	0.15	0.11	0.20	3.19	0.35
Western Metro	Brimbank/Melton	22	0.14	0.08	0.20	2.05	0.41
Southern Metro	South East	38	0.14	0.10	0.18	7.03	0.37
Northern Metro	Banyule/Nilumbik	22	0.14	0.08	0.19	1.86	0.09
Western Metro	West Bay	24	0.13	0.08	0.17	3.38	0.54
Northern Metro	Hume/Moreland	28	0.12	0.08	0.17	1.75	0.18
Eastern Metro	Boroondara	20	0.12	0.07	0.17	3.15	0.20
Eastern Metro	Monash/Whitehorse/Manningham	46	0.11	0.08	0.13	3.93	0.28
Hume	Indigo/Towong/Wodonga	3	0.07	0.00	0.15	7.33	0.33

There were only three admissions in Indigo/Towong/Wodonga in 2000-2001, an admission rate of 0.07/1000 (0.00-0.15). The next lowest admission rates of 0.11/1000 (0.08-0.13) were observed in Monash/Whitehorse/Manningham. The highest admission rates of 1.61/1000 (1.25-1.97) were in Wimmera. The average bed days during the same time period varied from 1.75 in Hume/Moreland to 12.00 in Central Grampians, while the comorbidity scores ranged from a low of 0.06 in Mildura and Wellington to 0.84 in Mitchell/Murrindindi.

The number and rates of admissions for hypertension in Metropolitan PCPs are summarised in table 4.

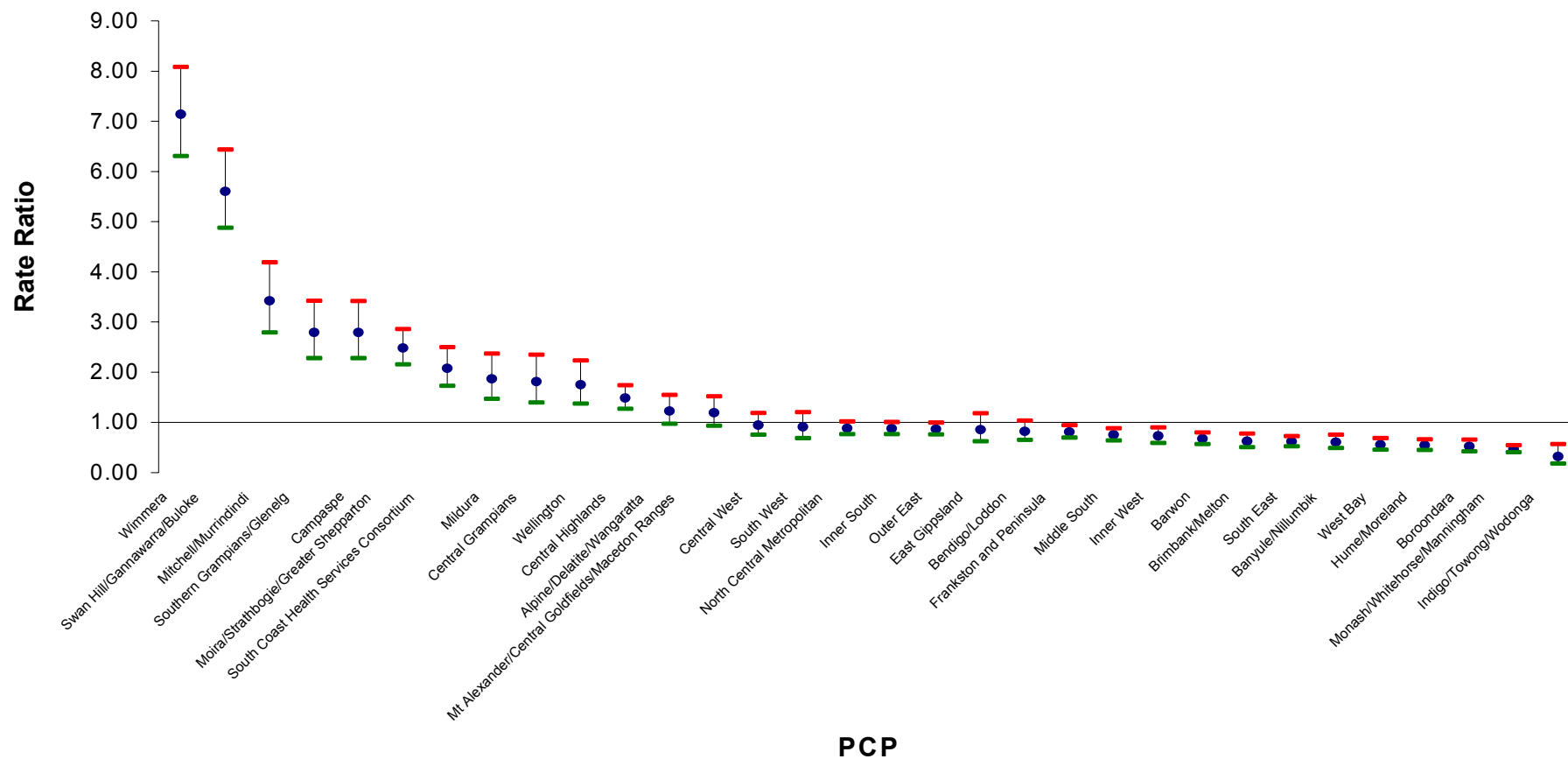
Table 4: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for hypertension in Metropolitan PCPs 00/01

<i>Region</i>	<i>Primary Care Partnership</i>	<i>Number of admissions</i>	<i>Rate per 1000 persons</i>	<i>lower 95% CI</i>	<i>upper 95% CI</i>	<i>Average Bed-days</i>	<i>Average Comorbidity</i>
Northern Metro	North Central Metropolitan	51	0.20	0.15	0.25	3.27	0.47
Southern Metro	Inner South	58	0.20	0.15	0.25	3.38	0.48
Eastern Metro	Outer East	57	0.20	0.15	0.24	3.21	0.39
Southern Metro	Frankston and Peninsula	47	0.18	0.13	0.23	3.70	0.28
Southern Metro	Middle South	40	0.17	0.12	0.22	3.13	0.20
Western Metro	Inner West	23	0.16	0.10	0.23	3.61	0.17
Western Metro	Brimbank/Melton	22	0.14	0.08	0.20	2.05	0.41
Southern Metro	South East	38	0.14	0.10	0.18	7.03	0.37
Northern Metro	Banyule/Nilumbik	22	0.14	0.08	0.19	1.86	0.09
Western Metro	West Bay	24	0.13	0.08	0.17	3.38	0.54
Northern Metro	Hume/Moreland	28	0.12	0.08	0.17	1.75	0.18
Eastern Metro	Boroondara	20	0.12	0.07	0.17	3.15	0.20
Eastern Metro	Monash/Whitehorse/Manningham	46	0.11	0.08	0.13	3.93	0.28

The three Metropolitan PCPs with the highest number of admissions for hypertension were Inner South, Outer East, and North Central Metropolitan. These three Metropolitan PCPs contribute about seventeen percent (n=166) of all admissions for hypertension in Victoria, which is fifteen percent of total bed days.

There were eleven PCPs with rate ratios significantly higher than Victoria (fig 10). The rate ratios varied from a high of 7.14 (6.31-8.08) in Wimmera to a low of 0.32 (0.18-0.57) in Indigo/Towong/Wodonga.

Figure 10 Hypertension ACSC Admission Rate Ratios for PCP's (Victoria=1), 2000/2001



3.5 Key Findings

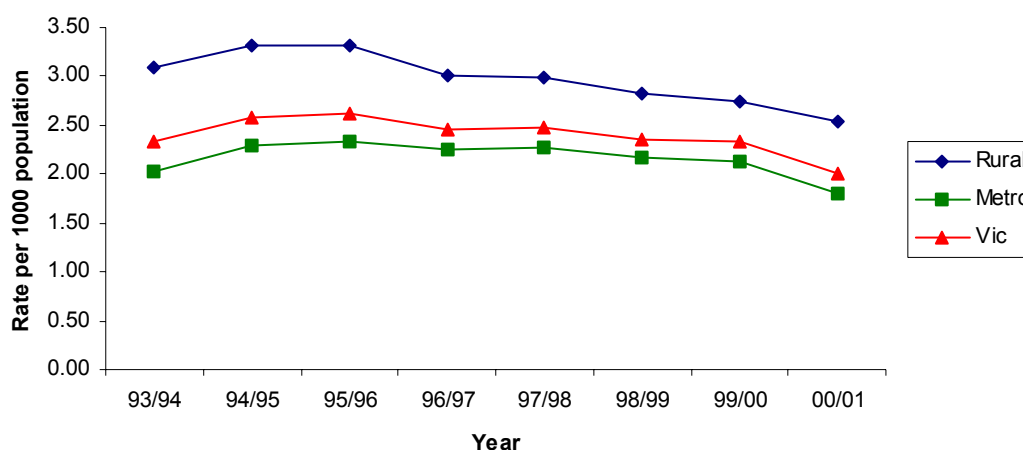
- There were 989 admissions for hypertension with an average of 3.76 bed days in 2000-2001 where hypertension was listed as the principal diagnosis. More than sixty percent (n=603) of these admissions were through the emergency department.
- A twenty percent reduction in number of admissions for hypertension would lead to a reduction of 743 bed days in Victoria.
- There has been a decline in the rates of hypertension admissions in rural areas but metropolitan areas show similar patterns over eight years.
- Admission rates for hypertension were higher in rural areas compared to metropolitan. This pattern was observed over the eight year period.
- The Grampians Region has the highest rate of admission while the Eastern Metropolitan Region has the lowest. Compared to Victoria, all rural regions except Barwon South Western, have rate ratios significantly higher than Victoria. All Metropolitan Regions have rate ratios significantly lower than Victoria.
- The three Metropolitan PCPs with the highest number of admissions for hypertension were Inner South, Outer East, and North Central Metropolitan.
- These three Metropolitan PCPs contribute about seventeen percent (n=166) of all admissions for hypertension in Victoria, which is fifteen percent of total bed days.
- There was more than twenty fold variation in admission rates for hypertension across PCPs.
- There were eleven PCPs with significantly higher admission rates than Victoria.
- These eleven PCPs with admission rates for hypertension significantly higher than Victoria, from highest to lowest, are Wimmera, Swan Hill/Gannawarra/Buloke, Mitchell/Murrindindi, Southern Grampians/Glenelg, Campaspe, Moira/Strathbogie/Greater Shepparton, South Coast Health Services Consortium, Mildura, Central Grampians, Wellington, Central Highlands.
- The average comorbidity score (0.31) for these eleven PCPs is similar to that of Victoria.
- These eleven PCPs contribute about thirty eight percent (n=375) of all admissions for hypertension in Victoria, which is about forty six percent of total bed days.
- A twenty percent reduction number of admissions for hypertension across all PCPs in Victoria equates to approximately \$2.5 million of hospital expenditure.

4 Congestive Cardiac Failure (CCF)

4.1 Trends in Victoria

There were 8,359 admissions for CCF with an average of 7.37 bed days in 2000-2001. Seventy four percent (n=6215) of these admissions were through the emergency department. The rates of admissions for CCF varied from 2.33/1000 (2.29-2.38) in 1993-94 to 2.00/1000 (1.94-2.03) in 2000-2001 (fig 11). Although there is a significant decline in the admission rates of CCF, it still accounts for about 10,000 admissions each year in Victorian hospitals.

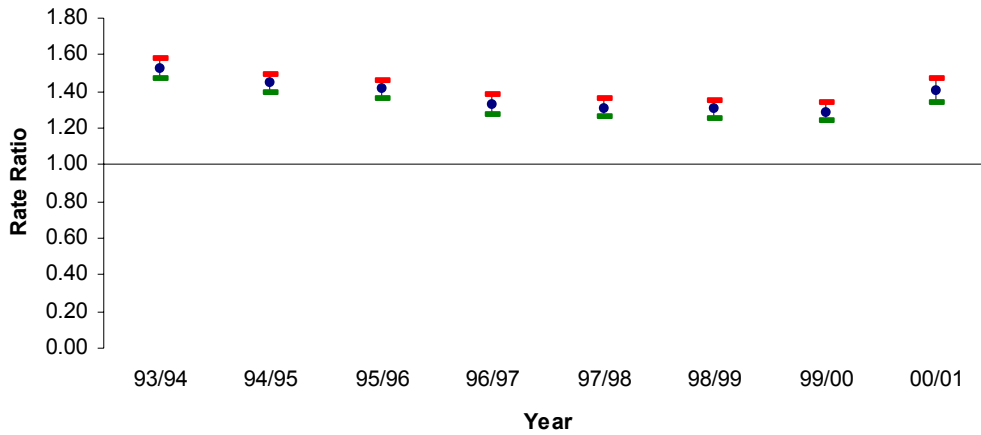
Figure 11 Congestive Cardiac Failure ACSC Admission Rates for Rural and Metropolitan Regions, 93/94-00/01



4.2 Rural and Metropolitan Differences

There was a significantly higher admission rate for CCF in rural areas compared to metropolitan, 2.53/1000 (2.44-2.62) and 1.80/1000 (1.75-1.85), respectively, in 2000-2001. The admission rates for CCF have declined in rural as well as metropolitan areas (fig 11). Rural areas have higher rate ratios compared to metropolitan areas over the eight year period (fig 12).

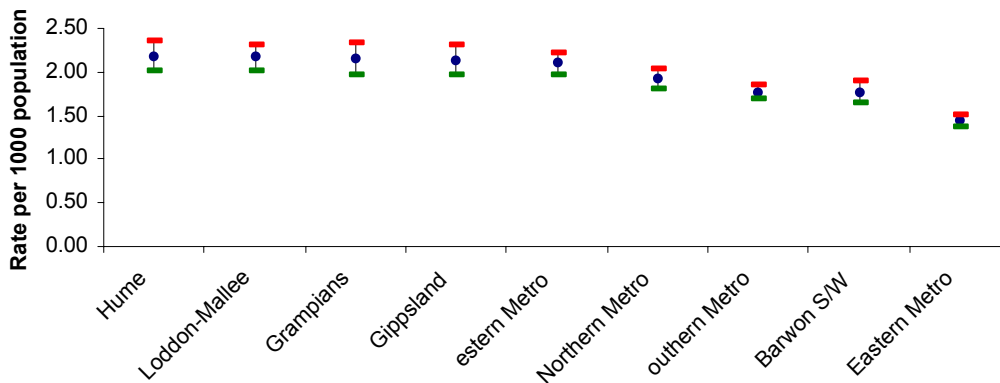
Figure 12 Congestive Cardiac Failure ACSC Admission Rate Ratios for Rural Areas (Metropolitan=1), 93/94-00/01



4.3 Variations across DHS Regions

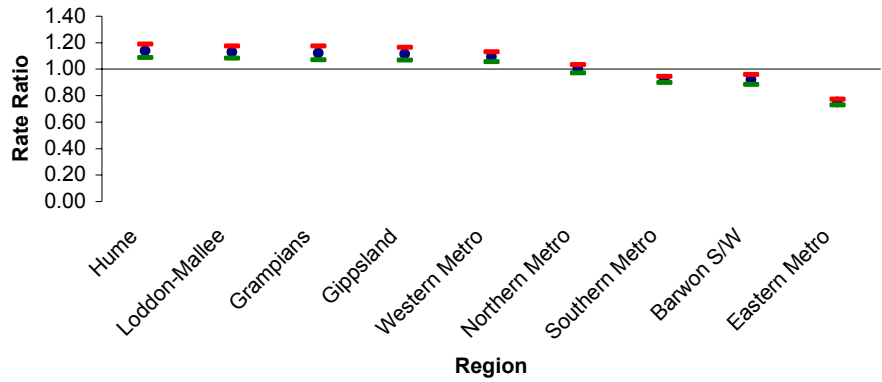
The highest admission rate for CCF was 2.19/1000 (2.01-2.36) in the Hume region, while the Eastern Metropolitan Region had the lowest rates of 1.44/1000 (1.37-1.52) (fig 13). Western Metropolitan Region has the highest admission rate of 2.10/1000 (1.97-2.23) compared to all other Metropolitan Regions.

Figure 13 Congestive Cardiac Failure ACSC Admission Rates by Region, 00/01



Compared to Victoria, Hume Region has the highest rate ratio while the Eastern Metropolitan Region has the lowest (fig 14). Western Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural region with a rate ratio significantly lower than Victoria.

Figure 14 Congestive Cardiac Failure ACSC Admission Rate Ratios for Regions (Victoria=1), 00/01



4.4 Variations across PCPs

The rate of admissions for CCF, average bed days and co-morbidity scores in various PCPs for the year 2000-2001 are summarised in table 5.

Table 5: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for CCF 00/01

Region	Primary Care Partnership	Number of admissions	Rate per 1000		Average Bed-days	Average Comorbidity	
			persons	lower 95% CI			upper 95% CI
Gippsland	Wellington	125	2.97	2.48	3.47	6.87	1.68
Loddon-Mallee	Swan Hill/Gannawarra/Buloke	133	2.83	2.37	3.28	7.24	1.77
Hume	Mitchell/Murrindindi	93	2.81	2.27	3.35	7.96	1.94
Western Metro	Brimbank/Melton	299	2.58	2.30	2.87	6.54	2.17
Barwon S/W	Southern Grampians/Glenelg	117	2.41	1.99	2.83	14.07	1.85
Loddon-Mallee	Campaspe	101	2.36	1.92	2.80	7.29	2.01
Grampians	Central Grampians	91	2.33	1.88	2.79	7.51	1.87
Northern Metro	North Central Metropolitan	569	2.27	2.09	2.44	6.08	2.02
Loddon-Mallee	Mildura	108	2.26	1.85	2.66	6.17	1.45
Grampians	Wimmera	123	2.22	1.85	2.60	5.45	1.65
Gippsland	South Coast Health Services Consortium	151	2.21	1.87	2.54	6.89	1.79
Barwon S/W	South West	155	2.20	1.87	2.53	8.37	1.70
Hume	Moira/Strathbogie/Greater Shepparton	214	2.20	1.92	2.48	7.62	1.85
Loddon-Mallee	Bendigo/Loddon	229	2.15	1.89	2.41	10.04	1.91
Western Metro	West Bay	376	2.14	1.94	2.35	6.18	2.22
Hume	Alpine/Delatite/Wangaratta	155	2.11	1.79	2.42	6.03	1.59
Grampians	Central Highlands	270	2.08	1.85	2.32	9.10	1.98
Gippsland	Central West	197	1.98	1.71	2.24	8.19	2.24
Northern Metro	Hume/Moreland	421	1.96	1.79	2.14	7.65	1.92
Hume	Indigo/Towong/Wodonga	83	1.91	1.52	2.30	7.60	1.95
Southern Metro	Inner South	617	1.90	1.75	2.04	7.84	1.96
Southern Metro	Frankston and Peninsula	528	1.86	1.71	2.01	6.70	1.66
Southern Metro	South East	408	1.81	1.65	1.98	6.57	2.02
Eastern Metro	Outer East	482	1.73	1.59	1.88	7.26	1.86
Gippsland	East Gippsland	90	1.72	1.38	2.05	6.78	2.04
Western Metro	Inner West	246	1.67	1.47	1.86	7.33	1.96
Loddon-Mallee	Mt Alexander/Central Goldfields/Macedon Ranges	103	1.55	1.27	1.83	7.60	1.75
Barwon S/W	Barwon	402	1.54	1.39	1.68	7.77	2.07
Southern Metro	Middle South	431	1.51	1.37	1.64	6.13	1.78
Eastern Metro	Monash/Whitehorse/Manningham	634	1.45	1.35	1.56	7.59	1.85
Northern Metro	Banyule/Nilumbik	196	1.29	1.11	1.46	7.10	1.76
Eastern Metro	Boroondara	212	1.00	0.87	1.13	9.86	1.62

The rates in 2000-2001 varied from 1.00/1000 (0.87-1.13) in Boroondara to 2.97/1000 (2.48-3.47) in Wellington. The average bed days during the same time period varied from 5.45 in Wimmera to 14.07 in Southern Grampians/Glenelg, while the comorbidity scores ranged from a low of 1.45 in Mildura to 2.24 in Central West.

The number and rates of admissions for CCF in Metropolitan PCPs are summarised in table 6.

Table 6: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for CCF Metropolitan PCPs 00/01

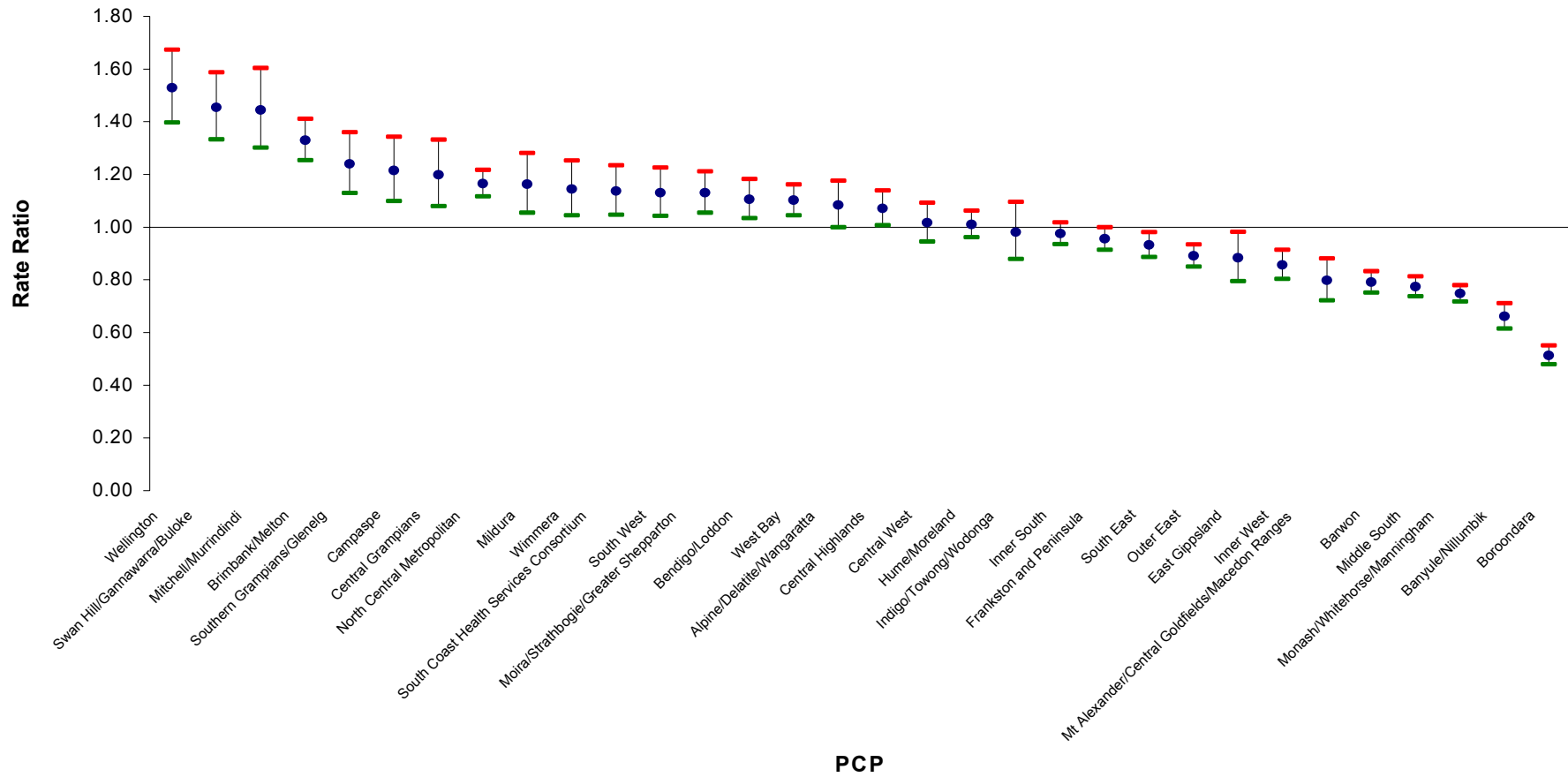
in

<i>Region</i>	<i>Primary Care Partnership</i>	<i>Number of admissions</i>	<i>Rate per 1000 persons</i>	<i>lower 95% CI</i>	<i>upper 95% CI</i>	<i>Average Bed-days</i>	<i>Average Comorbidity</i>
Western Metro	Brimbank/Melton	299	2.58	2.30	2.87	6.54	2.17
Northern Metro	North Central Metropolitan	569	2.27	2.09	2.44	6.08	2.02
Western Metro	West Bay	376	2.14	1.94	2.35	6.18	2.22
Northern Metro	Hume/Moreland	421	1.96	1.79	2.14	7.65	1.92
Southern Metro	Inner South	617	1.90	1.75	2.04	7.84	1.96
Southern Metro	Frankston and Peninsula	528	1.86	1.71	2.01	6.70	1.66
Southern Metro	South East	408	1.81	1.65	1.98	6.57	2.02
Eastern Metro	Outer East	482	1.73	1.59	1.88	7.26	1.86
Western Metro	Inner West	246	1.67	1.47	1.86	7.33	1.96
Southern Metro	Middle South	431	1.51	1.37	1.64	6.13	1.78
Eastern Metro	Monash/Whitehorse/Manningham	634	1.45	1.35	1.56	7.59	1.85
Northern Metro	Banyule/Nilumbik	196	1.29	1.11	1.46	7.10	1.76
Eastern Metro	Boroondara	212	1.00	0.87	1.13	9.86	1.62

The three Metropolitan PCPs with the highest number of admissions were Monash/Whitehorse/Manningham, Inner South, and North Central Metropolitan. These three Metropolitan PCPs contribute about twenty two percent (n=1,820) of all admissions for CCF in Victoria, which is twenty one percent of total bed days. Brimbank/Melton, West Bay and North Central Metropolitan were the only Metropolitan PCPs with rate ratios significantly higher than Victoria (fig 15).

There were seventeen PCPs with rate ratios significantly higher than Victoria (fig 15). Wellington had the highest rate ratio of 1.53 (1.40-1.67), while Boroondara had the lowest 0.51(0.48-0.55).

Figure 15 Congestive Cardiac Failure ACSC Admission Rate Ratios for PCP's (Victoria=1), 2000/2001



4.5 Key Findings

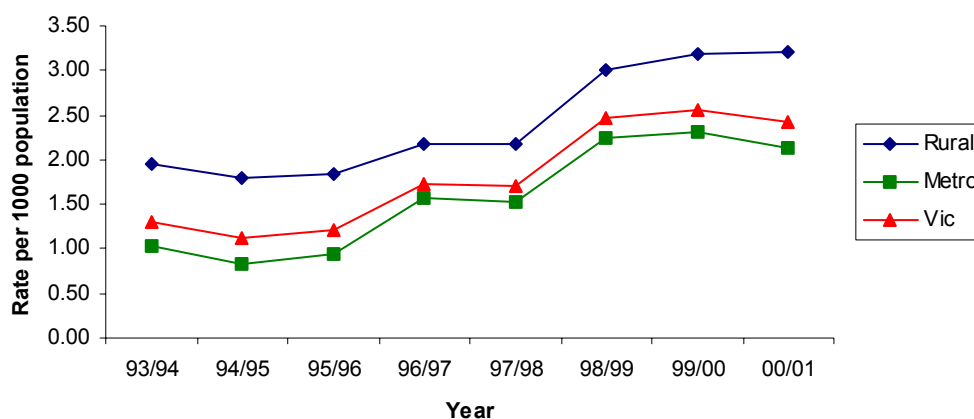
- There were 8,359 admissions for CCF with an average of 7.37 bed days in 2000-2001. More than seventy four percent (n=6215) of these admissions were through the emergency department.
- A twenty percent reduction in the number of admissions for CCF would lead to a reduction of 12,321 bed days in Victoria.
- Although there has been a significant decline in the admission rates of CCF, it still accounts for about 10,000 admissions each year to Victorian hospitals.
- Admission rates for CCF were higher in rural areas compared to the metropolitan. This pattern was observed over the eight year period.
- The Hume Region has the highest rate of admission while the Eastern Metropolitan Region has the lowest.
- Western Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Barwon South Western is the only Rural region with a rate ratio significantly lower than Victoria.
- There were seventeen PCPs with significantly higher admission rates for CCF compared to Victoria.
- These seventeen PCPs with admission rates significantly higher than Victoria, from highest to lowest, are Wellington, Swan Hill/Gannawarra/Buloke, Mitchell/Murrindindi, Brimbank/Melton, Southern Grampians/Glenelg, Campaspe, Central Grampians, North Central Metropolitan, Mildura, Wimmera, South Coast Health Services Consortium, South West, Moira/Strathbogie/Greater Shepparton, Bendigo/Loddon, West Bay, Alpine/Delatite/Wangaratta, Central Highlands.
- The three Metropolitan PCPs with the highest number of admissions were Monash/Whitehorse/Manningham, Inner South, and North Central Metropolitan.
- These three Metropolitan PCPs contribute about twenty two percent (n=1,820) of all admissions for CCF in Victoria, which is twenty one percent of total bed days.
- The average comorbidity score (1.85) for these seventeen PCPs is similar to that of Victoria.
- These seventeen PCPs contribute about forty percent (n=3309) of all admissions in Victoria, which is about forty one percent of total bed days.
- A thirty percent reduction in number of admissions for CCF in these seventeen PCPs and thirteen percent reduction in the remaining PCPs would lead to a twenty percent reduction in the number of admissions for CCF in Victoria, which equates to approximately \$4.7 million of hospital expenditure.

5 Chronic Obstructive Pulmonary Disease (COPD)

5.1 Trends in Victoria

There were 10,137 admissions for COPD with an average of 7.33 bed days in 2000-2001. More than seventy six percent (n=7727) of these admissions were through the emergency department. The rates of admissions for COPD varied from 1.29/1000 (1.26-1.33) in 1993-94 to 2.43/1000 (2.38-2.47) in 2001-2001 (fig 16). There was a two fold increase in the number of admissions as well as admission rates over the eight year period.

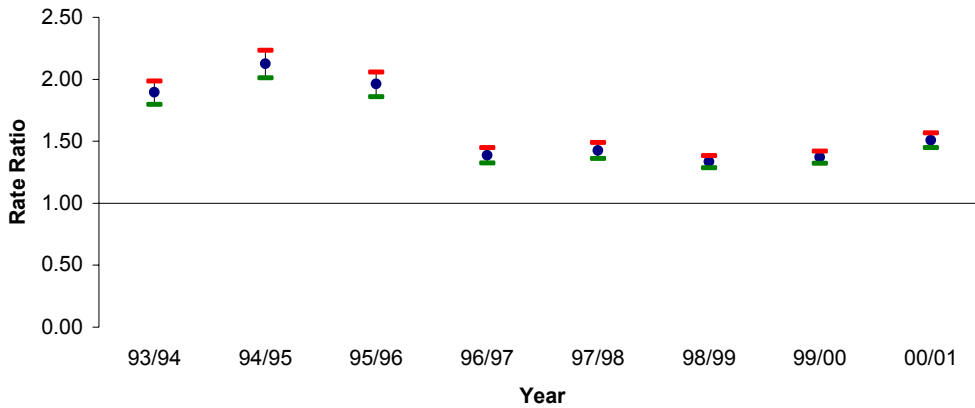
Figure 16 Chronic Obstructive Pulmonary Disease ACSC Admission Rates for Rural and Metropolitan Regions, 94/94-00/01



5.2 Rural and Metropolitan Differences

There was a significantly higher admission rate for COPD in rural areas compared to metropolitan, 3.20/1000 (3.10-3.31) and 2.12/1000 (2.07-2.17), respectively, in 2000-2001. Rural areas show higher admission rates and rate ratios over the eight year period compared to metropolitan (fig 16 & fig 17).

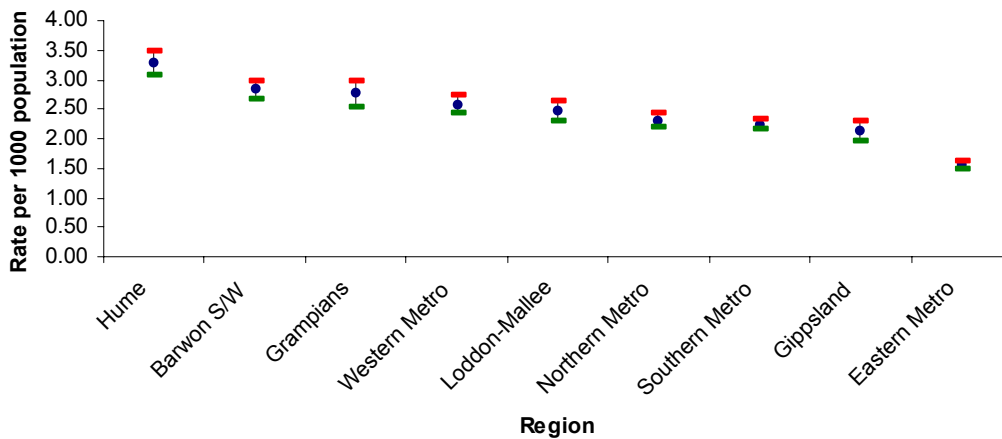
Figure 17 Chronic Obstructive Pulmonary Disease ACSC Rate Ratios for Rural Areas (Metropolitan=1), 93/94-00/01



5.3 Variations across DHS Regions

The highest admission rate for COPD was 3.29/1000 (3.07-3.50) in the Hume region, while the Eastern Metropolitan Region had the lowest rates of 1.55/1000 (1.48-1.63) (fig 18). Western Metropolitan Region has the highest admission rate of 2.59/1000 (2.45-2.73) compared to all other Metropolitan Regions.

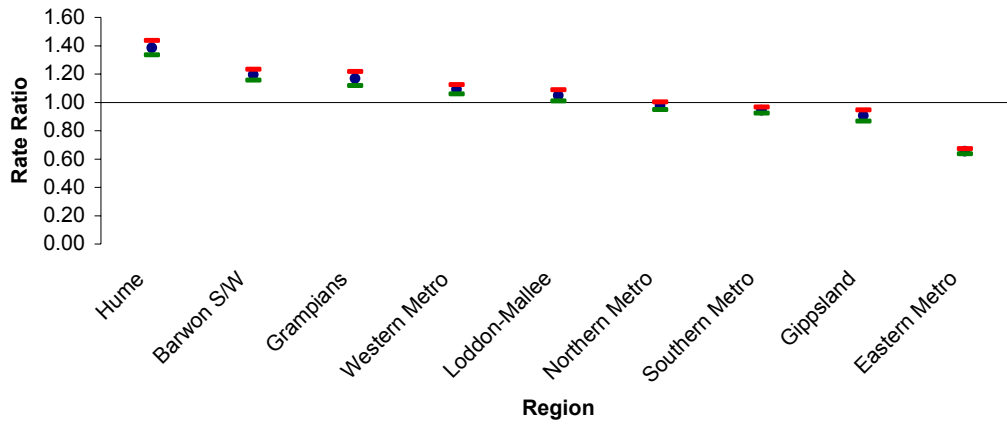
Figure 18 Chronic Obstructive Pulmonary Disease ACSC Admission Rates by Region, 00/01



Compared to Victoria, Hume Region has the highest rate ratio while Eastern Metropolitan Region has the lowest (fig 19). Western Metropolitan Region is the only

Metropolitan Region with a rate ratio significantly higher than Victoria, while Gippsland is the only Rural region with a rate ratio significantly lower than Victoria.

Figure 19 Chronic Obstructive Pulmonary Disease ACSC Admission Rate Ratios for Regions (Victoria=1), 00/01



5.4 Variations across PCPs

The rate of admissions for COPD, average bed days and co-morbidity scores in various PCPs for the year 2000-2001 are summarised in table 7.

Table 7: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for COPD 00/01

Region	Primary Care Partnership	Number of admissions	Rate per 1000 persons		Average Bed-days		Average Comorbidity
			lower 95% CI	upper 95% CI			
Grampians	Central Grampians	160	4.24	3.62	4.86	7.19	1.40
Barwon S/W	Southern Grampians/Glenelg	161	3.71	3.16	4.26	7.80	1.43
Hume	Mitchell/Murrindindi	122	3.69	3.07	4.31	7.78	1.48
Barwon S/W	South West	233	3.53	3.10	3.96	6.68	1.43
Hume	Moira/Strathbogrie/Greater Shepparton	341	3.48	3.13	3.83	8.18	1.43
Grampians	Wimmera	173	3.47	2.98	3.96	6.92	1.46
Loddon-Mallee	Swan Hill/Gannawarra/Buloke	157	3.30	2.81	3.79	6.06	1.40
Hume	Alpine/Delatite/Wangaratta	213	3.07	2.68	3.46	6.31	1.28
Loddon-Mallee	Campaspe	121	2.95	2.45	3.44	7.19	1.52
Hume	Indigo/Towong/Wodonga	130	2.90	2.43	3.37	5.99	1.60
Western Metro	West Bay	521	2.89	2.66	3.13	6.77	1.66
Western Metro	Brimbank/Melton	346	2.71	2.43	2.99	6.46	1.58
Northern Metro	Hume/Moreland	571	2.59	2.39	2.80	6.91	1.47
Southern Metro	Frankston and Peninsula	702	2.56	2.38	2.74	7.51	1.44
Northern Metro	North Central Metropolitan	641	2.53	2.34	2.71	7.80	1.46
Barwon S/W	Barwon	637	2.50	2.31	2.68	6.17	1.44
Southern Metro	South East	562	2.37	2.18	2.56	7.31	1.52
Loddon-Mallee	Bendigo/Loddon	232	2.34	2.05	2.62	9.03	1.47
Gippsland	Central West	231	2.30	2.02	2.59	7.06	1.52
Loddon-Mallee	Mt Alexander/Central Goldfields/Macedon Ranges	145	2.25	1.90	2.59	7.28	1.36
Western Metro	Inner West	307	2.21	1.97	2.44	6.68	1.49
Gippsland	East Gippsland	110	2.09	1.71	2.46	7.38	1.49
Gippsland	South Coast Health Services Consortium	142	2.07	1.75	2.39	8.94	1.32
Eastern Metro	Outer East	565	2.06	1.90	2.22	7.27	1.45
Grampians	Central Highlands	253	2.05	1.81	2.29	8.40	1.64
Southern Metro	Inner South	626	2.05	1.89	2.20	7.33	1.50
Southern Metro	Middle South	515	1.98	1.82	2.15	7.03	1.44
Gippsland	Wellington	82	1.97	1.56	2.37	7.17	1.38
Loddon-Mallee	Mildura	94	1.95	1.58	2.33	5.33	1.19
Northern Metro	Banyule/Nillumbik	231	1.56	1.37	1.75	9.22	1.35
Eastern Metro	Monash/Whitehorse/Manningham	630	1.45	1.34	1.56	8.49	1.57
Eastern Metro	Boroondara	183	1.06	0.91	1.21	8.22	1.43

The rates in 2000-2001 varied from 1.06/1000 (0.91-1.21) in Boroondara to 4.24/1000 (3.62-4.86) in Central Grampians. The average bed days during the same time period varied from 5.33 in Mildura to 9.22 in Banyule/Nillumbik, while the comorbidity scores ranged from a low of 1.19 in Mildura to 1.66 in West Bay.

The number and rates of admissions for COPD in Metropolitan PCPs are summarised in table 8.

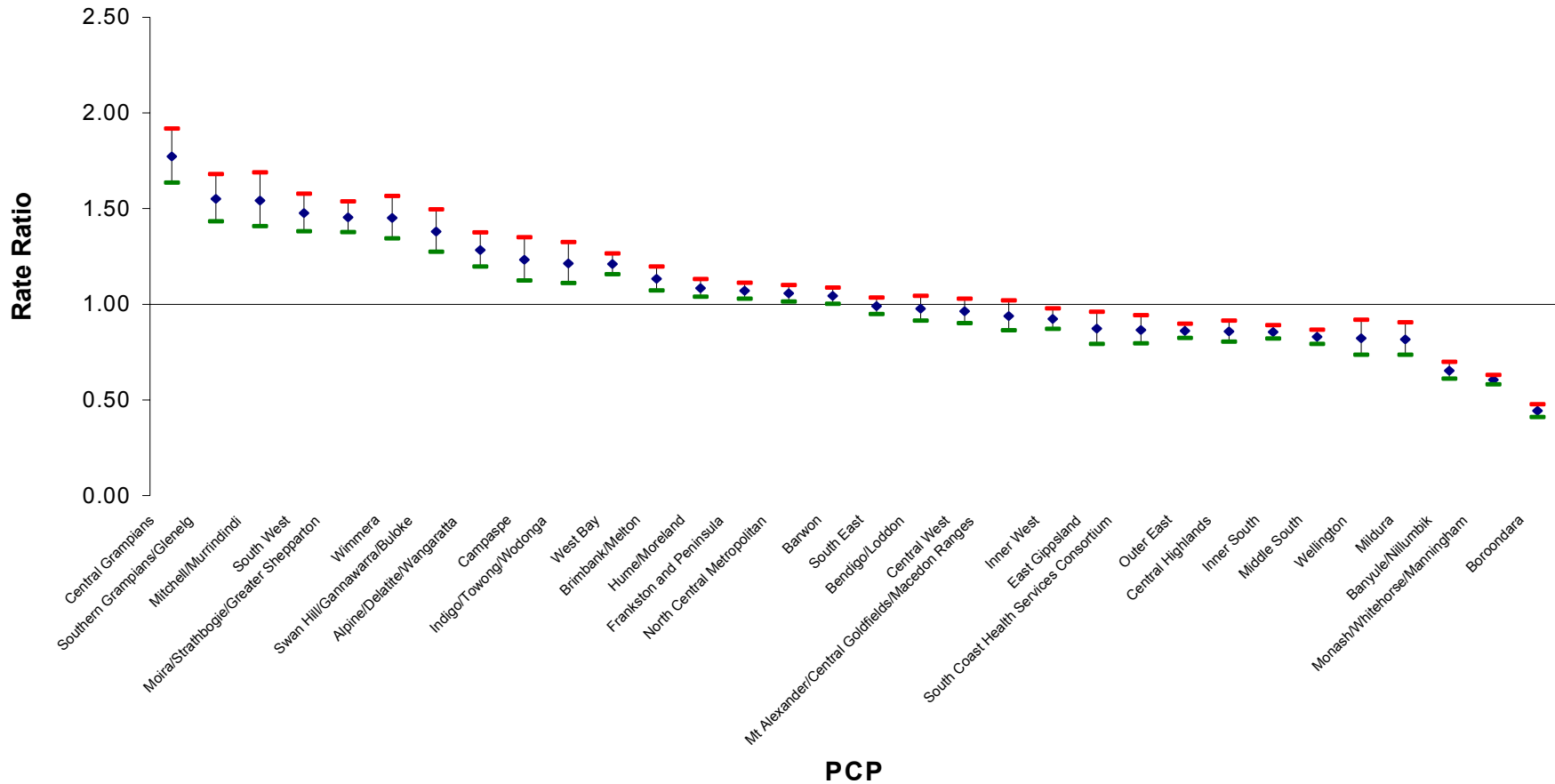
Table 8: Rates of admission and 95% confidence intervals, average bed days and comorbidity score for COPD in Metropolitan PCPs 00/01

<i>Region</i>	<i>Primary Care Partnership</i>	<i>Number of admissions</i>	<i>Rate per 1000 persons</i>	<i>lower 95% CI</i>	<i>upper 95% CI</i>	<i>Average Bed-days</i>	<i>Average Comorbidity</i>
Western Metro	West Bay	521	2.89	2.66	3.13	6.77	1.66
Western Metro	Brimbank/Melton	346	2.71	2.43	2.99	6.46	1.58
Northern Metro	Hume/Moreland	571	2.59	2.39	2.80	6.91	1.47
Southern Metro	Frankston and Peninsula	702	2.56	2.38	2.74	7.51	1.44
Northern Metro	North Central Metropolitan	641	2.53	2.34	2.71	7.80	1.46
Southern Metro	South East	562	2.37	2.18	2.56	7.31	1.52
Western Metro	Inner West	307	2.21	1.97	2.44	6.68	1.49
Eastern Metro	Outer East	565	2.06	1.90	2.22	7.27	1.45
Southern Metro	Inner South	626	2.05	1.89	2.20	7.33	1.50
Southern Metro	Middle South	515	1.98	1.82	2.15	7.03	1.44
Northern Metro	Banyule/Nilumbik	231	1.56	1.37	1.75	9.22	1.35
Eastern Metro	Monash/Whitehorse/Manningham	630	1.45	1.34	1.56	8.49	1.57
Eastern Metro	Boroondara	183	1.06	0.91	1.21	8.22	1.43

The three Metropolitan PCPs with the highest number of admissions were Frankston and Peninsula, North Central Metropolitan, and Monash/Whitehorse/Manningham. These three Metropolitan PCPs contribute about nineteen percent (n=1,973) of all admissions for COPD in Victoria, which is twenty one percent of total bed days. North Central Metropolitan, Frankston and Peninsula, Brimbank/Melton and West Bay were the only Metropolitan PCPs with rate ratios significantly higher than Victoria (fig 20).

There were sixteen PCPs with rate ratios significantly higher than Victoria (fig 20). Central Grampians had the highest rate ratio of 1.77 (1.64-1.92), while Boroondara had the lowest 0.44 (0.41-0.48).

Figure 20 Chronic Obstructive Pulmonary Disease ACSC Admission Rate Ratios for PCP's (Victoria =1), 2000/2001



5.5 Key Findings

- There were 10,137 admissions for COPD with an average of 7.33 bed days in 2000-2001. More than seventy six percent (n=7727) of these admissions were through the emergency department.
- A twenty percent reduction in number of admissions for COPD would lead to a reduction of 14,860 bed days in Victoria.
- There was a two fold increase in the number of admissions as well as admission rates over the eight year period.
- Rural areas show higher admission rates and rate ratios over the eight year period compared to metropolitan.
- The Hume region has the highest rate of admission while the Eastern Metropolitan Region has the lowest.
- Western Metropolitan Region is the only Metropolitan Region with a rate ratio significantly higher than Victoria, while Gippsland is the only Rural region with a rate ratio significantly lower than Victoria.
- There were sixteen PCPs with significantly higher admission rates for COPD compared to Victoria.
- These sixteen PCPs with admission rates of COPD significantly higher than Victoria, from highest to lowest, are Central Grampians, Southern Grampians/Glenelg, Mitchell/Murrindindi, South West, Moira/Strathbogie/Greater Shepparton, Wimmera, Swan Hill/Gannawarra/Buloke, Alpine/Delatite/Wangaratta, Campaspe, Indigo/Towong/Wodonga, West Bay, Brimbank/Melton, Hume/Moreland, Frankston and Peninsula, North Central Metropolitan, Barwon.
- The three Metropolitan PCPs with the highest number of admissions were Frankston and Peninsula, North Central Metropolitan, and Monash/Whitehorse/Manningham.
- These three Metropolitan PCPs contribute about nineteen percent (n=1,973) of all admissions for COPD in Victoria, which is twenty one percent of total bed days.
- The average comorbidity score (1.47) for these sixteen PCPs is similar to that of Victoria.
- These sixteen PCPs contribute about fifty two percent (n=5,229) of all admissions in Victoria, which is about forty nine percent of total bed days.
- A thirty percent reduction in number of admissions for COPD in these sixteen PCPs and ten percent reduction in the remaining PCPs would lead to a twenty

percent reduction in the number of admissions for COPD in Victoria, which equates to approximately \$6.1 million of hospital expenditure.

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