

Executive summary

Introduction

Avoidable hospitalisations represent a range of conditions for which hospitalisation should be able to be avoided because the disease or condition has been prevented from occurring, or because individuals have had access to timely and effective primary care. This report addresses the level and extent of regional variation in Australia in a sub-set of avoidable hospitalisations, namely those arising from ambulatory care-sensitive (ACS) conditions.

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

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

The analysis is presented for the individual ambulatory care-sensitive conditions, and for these conditions grouped into three sub-categories: conditions that can be prevented through vaccination; acute conditions for which hospitalisations are commonly avoidable with antibiotics or other medical interventions available in primary care; and selected chronic conditions that can be managed by pharmaceuticals, patient education, and lifestyle.

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

Key points

In 2001/02, admissions resulting from ambulatory care-sensitive (ACS) conditions accounted for 8.7% of all hospital admissions in Australia. This equates to over 552,000 admissions, all of which are potentially avoidable.

Admissions for these conditions accounted for a markedly higher proportion of all admissions of males (9.5% of all admissions of males) than was the case for females (7.9% of all admissions of females).

Over one quarter (27.1%) of avoidable hospitalisations occurred in the 75 years and over age group, with more than one fifth (22.1%) in the 45 to 64 years age group. These two age groups alone contributed to 271,837 avoidable hospitalisations, almost half (49.2%) of all avoidable hospitalisations in this period.

The overall hospitalisation rate from ACS conditions for males was slightly higher than for females, with male rates 5.9% above those for females; however there was marked variation between the age groups. Males in the 0 to 14 year age group had 26% more admissions than the same aged females; with 38% more admissions of males at ages 65 to 74 years, 16% at ages 45 to 64 years and 34% at ages 75 years and over. Rates for males were lower than for females in the 15 to 24 (32% lower) and 25 to 44 (15%) year age groups.

Almost two-thirds of hospital admissions for ACS conditions are attributable to chronic conditions, just over one-third to acute conditions and a small proportion (3.0%) to vaccine-preventable conditions.

The high proportion of admissions for chronic conditions in this period can be primarily attributed to the large number of hospitalisations for diabetes complications (accounting for 25.6% of all avoidable hospitalisations), with a number of circulatory and respiratory conditions contributing to a further 34.0%: these are chronic obstructive pulmonary disease (9.9%), angina (9.0%), congestive heart failure (7.7%) and asthma (7.4%).

Dental conditions (7.9%); dehydration and gastroenteritis (6.8%); ear, nose and throat infections (5.8%); convulsions and epilepsy (5.6%); and cellulitis (5.1%) make the greatest contribution to hospitalisations for acute conditions.

Influenza and pneumonia (2.4%) is the main admission cause for vaccine-preventable conditions.

The Northern Territory, with 10.7%, and Tasmania, 9.5%, both had higher proportions of avoidable hospital admissions compared to the national average of 8.7%. Besides the Australian Capital Territory, where the proportion of total avoidable hospitalisations was below the national average, the five remaining States all had proportions consistent with the national average, ranging from 8.5% in Queensland and South Australia, to 8.8% in Victoria and Western Australia.

In all States and Territories, the highest rates of hospital admissions for ambulatory care-sensitive conditions were attributable to chronic conditions, with diabetes complications consistently the highest ranked condition.

There is a distinct, step-wise socioeconomic gradient evident in total avoidable hospitalisation rates in Australia, with each increase in disadvantage accompanied by an increase in admissions from these conditions. Overall, people in the most disadvantaged areas of Australia had 61.0% more hospitalisations for an ambulatory care-sensitive condition than those in the least disadvantaged areas.

While there is not a clear socioeconomic gradient for all States and Territories, the highest rates for avoidable hospitalisations in each case occur in the most disadvantaged areas.

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

3.1 Avoidable and unavoidable hospitalisations

In 2001/02, admissions resulting from ambulatory care-sensitive (ACS) conditions accounted for almost nine per cent of all hospital admissions in Australia (Table 3.1). This equates to over 552,000 admissions, all of which are potentially avoidable.

Admissions for these conditions accounted for a markedly higher proportion of all admissions of males (9.5% of all admissions of males) than was the case for females (7.9% of all admissions of females).

The overall rate of avoidable hospitalisations was 2,847.5 admissions per 100,000 population.

Overall, males have slightly higher rates of hospitalisations for ambulatory care-sensitive conditions than females, as indicated by the rate ratio of 1.06** (Table 3.1). Females, however, have a higher rate of unavoidable (and total) hospitalisations, with 32,072.2 admissions per 100,000 population, compared to 27,836.0 admissions per 100,000 for males: the rate ratio of 0.87** indicates that males had 13.0% fewer unavoidable hospitalisations over this period than did females.

Figure 3.1 illustrates the pattern of hospitalisations from avoidable, unavoidable and total admissions for males and females.

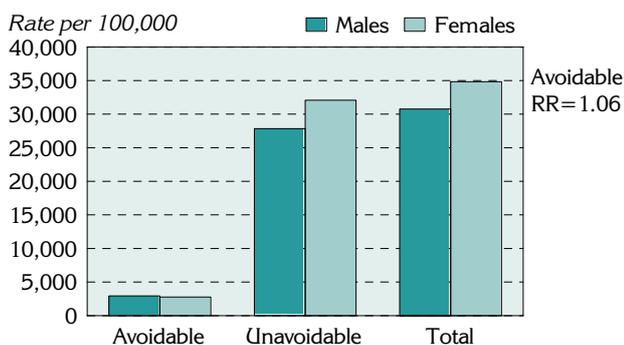
Table 3.1: Avoidable¹ and unavoidable hospitalisations, by sex, Australia, 2001/02

Hospitalisation category	Number			% of total	Rate per 100,000			Rate ratio M:F ²
	Males	Females	Total		Males	Females	Total	
Avoidable ¹	282,125	270,661	552,786	8.7	2,929.5	2,766.8	2,847.5	1.06**
Unavoidable	2,680,760	3,137,439	5,818,199	91.3	27,836.0	32,072.2	29,970.7	0.87**
Total	2,962,885	3,408,100	6,370,985	100.0	30,765.6	34,839.0	32,818.2	0.88**
Avoidable¹ (%)	9.5	7.9	8.7

¹ Admissions resulting from ACS conditions

² Rate ratio (M:F) is the ratio of male to female rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01

Figure 3.1: Avoidable¹ and unavoidable hospitalisations, by sex, Australia, 2001/02



¹ Admissions resulting from ACS conditions

3.2 Avoidable hospitalisations by age and sex

Over one quarter (27.1%) of admissions resulting from ambulatory care-sensitive (ACS) conditions occurred in the 75 years and over age group, with more than one fifth (22.1%) in the 45 to 64 years age group (Table 3.2). These two age groups alone contributed to 271,837 avoidable hospitalisations, almost half (49.2%) of all avoidable hospitalisations in this period. The 15 to 24 years age group had the lowest proportion with only 5.0%, with the next lowest proportion for people aged 25 to 44 years (13.4%).

The 75 years and over age group had the highest rate of avoidable admissions, 13,426.8 admissions per 100,000 population, followed by the 65 to 74 age group, with 7,344.8 admissions per 100,000 population. The highest rate among the remaining age groups was at ages 45 to 64 years.

Table 3.2: Avoidable hospitalisations¹ by age and sex, Australia, 2001/02

Age (years)	Number			% of total	Rate per 100,000			Rate ratio M:F ²
	Males	Females	Total		Males	Females	Total	
0-14	46,970	35,532	82,502	14.9	2,297.5	1,828.9	2,069.2	1.26**
15-24	11,317	16,080	27,397	5.0	837.4	1,233.4	1,031.8	0.68**
25-44	33,856	40,167	74,023	13.4	1,166.0	1,365.5	1,266.4	0.85**
45-64	65,865	56,311	122,176	22.1	2,921.5	2,518.7	2,721.0	1.16**
65-74	54,743	42,274	97,017	17.6	8,565.0	6,200.8	7,344.8	1.38**
75+	69,367	80,294	149,661	27.1	15,854.3	11,858.3	13,426.8	1.34**
Total	282,125	270,661	552,786	100.0	2,929.5	2,766.8	2,847.5	1.06**

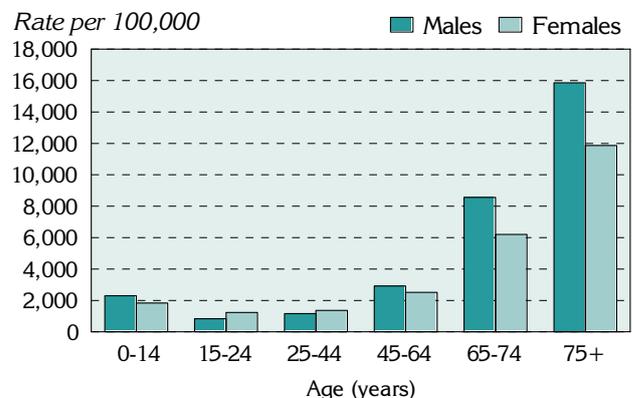
¹ Admissions resulting from ACS conditions

² Rate ratio (M:F) is the ratio of male to female hospitalisation rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01.

As noted, the overall hospitalisation rates for ambulatory care-sensitive conditions were similar for males and females, a rate ratio of 1.06**; however there was marked variation between the age groups (Figure 3.2). Males in the 65 to 74 year age group had 38.0% more admissions than the same aged females (a rate ratio of 1.38**); similarly, the 75 years and over age group had 34.0% more admissions. Males aged 0 to 14 years had 26.0% more avoidable admissions than females at these ages, while the rate for 45 to 64 year old males was 16.0% higher.

However, avoidable hospitalisation rates for males were lower than for females in the 15 to 24 (32.0% lower, a rate ratio of 0.68**), and 25 to 44 (15.0%) age groups.

Figure 3.2: Avoidable hospitalisations¹ by age and sex, Australia, 2001/02



¹ Admissions resulting from ACS conditions

Avoidable hospitalisations by condition and age

Table 3.5 shows variations in hospital admissions for the top four ambulatory care-sensitive conditions by selected age groups.

In the 0 to 14 year age group, asthma was the most common cause of hospitalisation, with a rate of 525.1 admissions per 100,000 population. The next highest causes of avoidable hospitalisation – ear, nose and throat infections (511.6 admissions per 100,000 population) and dental conditions (492.5 admissions per 100,000 population), together with asthma – accounted for almost three-quarters (73.8%) of all avoidable hospital admissions in this age group.

The rates, and therefore the proportion, of admissions for the top three causes of avoidable hospitalisations in the 15 to 24 year age group were similar. Ear, nose and throat infections accounted for 14.0% of avoidable admissions, a rate of 144.4 admissions per 100,000 population in this age group. Asthma; and dehydration and gastroenteritis were the conditions with the next highest admission rates, with 143.5 and 143.1 admissions per 100,000 population, respectively, each accounting for 13.9% of avoidable hospital admissions at these ages.

In the 25 to 44 year age group, diabetes complications were the leading cause of avoidable hospitalisation, with a rate of 208.9 per 100,000 population. Over half (53.5%) of all avoidable hospitalisations in this age group are attributable to the top four causes: 16.5% of admissions were from diabetes complications, 13.4% from dehydration and gastroenteritis, 12.8% from dental conditions and 10.8%, convulsions and epilepsy.

At ages 45 to 64 years, just over one-third (34.0%) of avoidable hospitalisations were attributable to diabetes complications, a rate of 924.1 admissions per 100,000 population. With a much lower rate and percentage, angina ranked second, 347.7 admissions per 100,000 population aged 45 to 64 years, accounting for 12.8% of avoidable hospital admissions. Chronic obstructive pulmonary disease accounted for 9.6% of admissions for this age group (a rate of 261.8 per 100,000 population), while dehydration and gastroenteritis contributed to 8.0% of admissions, or 217.3 admissions per 100,000 population aged 45 to 64 years.

Diabetes complications, chronic obstructive pulmonary disease and angina were also important causes of avoidable hospital admissions in the 65 to 74 year age group. Diabetes complications accounted for 39.8% of avoidable hospitalisations (a rate of 2,926.8 admissions per 100,000 population), and chronic obstructive pulmonary

disease for 17.9% of admissions (1,317.4 per 100,000 population). When combined, over one-fifth of avoidable hospital admissions in this age group were attributable to angina (12.9%) and congestive heart failure (8.8%).

The 75 year and over age group had the highest admission rates for these conditions, overall and for each of the conditions shown, ranging from 1,762.0 admission per 100,000 for angina, to 4,087.7 admissions per 100,000 for diabetes complications. The top two causes accounted for half of all avoidable hospitalisations for this age group; diabetes complications accounted for a further 30.4% of admissions, and congestive heart failure for 19.1%.

Table 3.5: Avoidable hospitalisations¹ by selected condition and age, Australia, 2001/02

Age (years)	Condition	Number	Rate ²	Per cent ³
0-14	Asthma	20,936	525.1	25.4
	Ear, nose and throat infections	20,400	511.6	24.7
	Dental conditions	19,635	492.5	23.8
	Convulsions and epilepsy	10,504	263.4	12.7
	Other	11,027	276.5	13.4
	Total		82,502	2,069.2
15-24	Ear, nose and throat infections	3,833	144.4	14.0
	Asthma	3,810	143.5	13.9
	Dehydration and gastroenteritis	3,800	143.1	13.9
	Dental conditions	3,534	133.1	12.9
	Other	12,420	467.9	45.3
	Total		27,397	1,031.8
25-44	Diabetes complications	12,208	208.9	16.5
	Dehydration and gastroenteritis	9,892	169.2	13.4
	Dental conditions	9,497	162.5	12.8
	Convulsions and epilepsy	7,984	136.6	10.8
	Other	34,442	589.2	46.5
	Total		74,023	1,266.4
45-64	Diabetes complications	41,493	924.1	34.0
	Angina	15,614	347.7	12.8
	Chronic obstructive pulmonary disease	11,754	261.8	9.6
	Dehydration and gastroenteritis	9,759	217.3	8.0
	Other	43,556	970.0	35.6
	Total		122,176	2,721.0
65-74	Diabetes complications	38,660	2,926.8	39.8
	Chronic obstructive pulmonary disease	17,401	1,317.4	17.9
	Angina	12,476	944.5	12.9
	Congestive heart failure	8,573	649.0	8.8
	Other	19,907	1,507.0	20.5
	Total		97,017	7,344.8
75+	Diabetes complications	45,563	4,087.7	30.4
	Congestive heart failure	28,629	2,568.5	19.1
	Chronic obstructive pulmonary disease	24,057	2,158.3	16.1
	Angina	19,646	1,762.0	13.1
	Other	31,766	2,850.1	21.2
	Total		149,661	13,426.8

¹ Admissions resulting from ACS conditions

² Age standardised rate per 100,000 population

³ Per cent is the proportion of total ACS conditions within the relevant age group

Avoidable hospitalisations by condition, age and sex

The main ambulatory care-sensitive conditions impacting on rates of avoidable hospital admissions at different ages show interesting variations when further analysed by sex (Table 3.6).

Apart from the 65 to 74 and (to a lesser extent) 75 and over age groups, there were clear differences in the rankings of the main conditions for avoidable admissions for males and females.

In the 0 to 14 year age group, asthma was the reported principal diagnosis for 28.5% of avoidable admissions for males and 21.2% for females; moreover males had a hospitalisation rate 69.0%

higher than females (a rate ratio of 1.69**). Ear, nose and throat infections were responsible for 24.7% of avoidable hospitalisations for both males and females. Again, males had a higher admission rate for this condition (26.0% higher, a rate ratio of 1.26**). Dental conditions (ranked highest for females) accounted for 22.2% of hospitalisations for males and 25.9% for females in this age group. Convulsions and epilepsy was the fourth ranked cause of admission for both males and females, accounting for 12.2% and 13.4%, respectively.

In the 15 to 24 year age group, the rank order for major conditions attributed to avoidable admissions varied markedly for males and females.

Convulsions and epilepsy were responsible for 15.3% of male avoidable hospitalisations (ranked first), but just 8.8% of female avoidable hospitalisations (ranked sixth) in this age group. The rates for convulsions and epilepsy were 127.8 per 100,000 for males and 108.3 per 100,000 for females, a difference of 18.0%. For males, the conditions with the next highest rates of avoidable hospital admissions were ear, nose and throat infections; dental conditions; and dehydration and gastroenteritis; each contributing to between 13.4% and 13.9% of total hospitalisations for males in this age group. For females, avoidable hospitalisations for asthma ranked highest, accounting for 14.7% of avoidable admissions in this age group, with a rate of 180.9 admissions per 100,000 females. Dehydration and gastroenteritis; and ear, nose and throat infections were the next two highest ranked conditions leading to avoidable hospitalisations in females aged 15 to 24 years, accounting for 14.2% and 14.1% of hospital admissions, respectively.

Diabetes complications accounted for 19.8% of male avoidable hospitalisations at ages 25 to 44 years, a rate of 231.4 admissions per 100,000 males, with convulsions and epilepsy ranked second, accounting for 14.1% of male hospitalisations. Admissions from dehydration and gastroenteritis ranked highest for females in this age group, and were responsible for 14.6% of avoidable admissions for females, a rate of 199.8 admissions per 100,000 females. Diabetes complications ranked second, contributing to 13.7% of female hospitalisations in this age group, followed by dental conditions (12.9%). The proportion of male avoidable admissions for dental conditions was similar to that for females in this age group, at 12.7%; however, male admission rates were 16.0% lower (a rate ratio of 0.84**), with 176.3 admissions per 100,000 females, compared to the male rate of 148.5 admissions per 100,000 males.

Diabetes complications were the main ambulatory care-sensitive condition leading to hospitalisation for both males and females in the 45 to 64 year age group. There were over 50% more admissions resulting from diabetes complications for males in this age group (a rate ratio of 1.57**), 1,129.3 admissions per 100,000 males, compared to 717.2 admissions per 100,000 females. The rates of avoidable admissions resulting from chronic obstructive pulmonary disease were similar for males and females in this age group, 261.3 and 262.2, respectively. Males in this age group had a 46.0% higher rate of hospitalisation for cellulitis than females (a rate ratio of 1.46**), and had almost twice the rate of admissions for angina (a rate ratio of 1.94**). In contrast, males in this age group had a 37.0% lower rate of admission for dehydration and gastroenteritis.

The top four ambulatory care-sensitive conditions were the same for males and females in the 65 to 74 year old age group; however the rates of admission for males and females varied substantially. Diabetes complications was again the main admission condition, contributing 42.6% of male admissions, or 3,646.8 admissions per 100,000 males aged from 65 to 74 years old. The rate of avoidable hospitalisations for diabetes complications in females in this age group was 2,251.9 admissions per 100,000 women, and accounted for 36.3% of admissions for avoidable conditions. Chronic obstructive pulmonary disease was the next most common diagnosis, with rates of 1,569.0 admissions per 100,000 males and 1,081.5 admissions per 100,000 females. Furthermore, the rates of avoidable admissions for angina and congestive heart failure are both over 50% higher for males than for females, with rate ratios of 1.59** and 1.57**, respectively.

For both males and females, diabetes complications were the main contributor to avoidable hospitalisations in the 75 years and over age group, with rates at 5,178.6 admissions per 100,000 males and 3,382.7 admissions per 100,000 females. One fifth (20.3%) of male admissions in this age group were due to chronic obstructive pulmonary disease, with a further 17.7% of admissions attributable to congestive heart failure. The admission rates for males with chronic obstructive pulmonary disease were over two times the female rates (a rate ratio of 2.17**), with 3,210.5 admissions per 100,000 males compared with 1,478.3 admissions per 100,000 women in this age group. Angina was the third most common ambulatory care-sensitive condition for females aged 75 years and over, accounting for 13.6% of avoidable hospitalisations in this age group; for males, it was the fourth most common admission, contributing to 12.5% of avoidable hospitalisations in this age group.

Table 3.6: Avoidable hospitalisations¹ by selected condition, age and sex, Australia, 2001/02

Age (years)	Selected condition	Males				Females				RR-M:F ⁵
		No.	Rate ²	% ³	Rank ⁴	No.	Rate ²	% ³	Rank ⁴	
0-14	Asthma	13,400	655.5	28.5	1	7,536	387.9	21.2	3	1.69**
	Ear, nose and throat infections	11,617	568.2	24.7	2	8,783	452.1	24.7	2	1.26**
	Dental conditions	10,425	509.9	22.2	3	9,210	474.1	25.9	1	1.08**
	Convulsions and epilepsy	5,725	280.0	12.2	4	4,779	246.0	13.4	4	1.14**
	Other	5,803	283.9	12.3	..	5,224	268.8	14.7	..	1.06**
	Total	46,970	2,297.5	100.0	..	35,532	1,828.9	100.0	..	1.26**
15-24	Convulsions and epilepsy	1,727	127.8	15.3	1	1,412	108.3	8.8	6	1.18**
	Ear, nose and throat infections	1,573	116.4	13.9	2	2,260	173.4	14.1	3	0.67**
	Dental conditions	1,558	115.3	13.8	3	1,976	151.6	12.3	4	0.76**
	Dehydration and gastroenteritis	1,520	112.5	13.4	4	2,280	174.9	14.2	2	0.64**
	Asthma	1,451	107.4	12.8	5	2,359	180.9	14.7	1	0.59**
	Other	3,488	258.0	30.9	..	5,793	444.3	36.0	..	0.58**
Total	11,317	837.4	100.0	..	16,080	1,233.4	100.0	..	0.68**	
25-44	Diabetes complications	6,719	231.4	19.8	1	5,489	186.6	13.7	2	1.24**
	Convulsions and epilepsy	4,776	164.5	14.1	2	3,208	109.1	8.0	6	1.51**
	Dental conditions	4,312	148.5	12.7	3	5,185	176.3	12.9	3	0.84**
	Cellulitis	4,066	140.0	12.0	4	2,003	68.1	5.0	7	2.06**
	Dehydration and gastroenteritis	4,015	138.3	11.8	5	5,877	199.8	14.6	1	0.69**
	Asthma	2,107	72.6	6.2	6	4,291	145.9	10.7	4	0.50**
	Other	7,861	270.7	23.2	..	14,114	479.7	35.1	..	0.56**
	Total	33,856	1,166.0	100.0	..	40,167	1,365.5	100.0	..	0.85**
45-64	Diabetes complications	25,459	1,129.3	38.7	1	16,034	717.2	28.5	1	1.57**
	Angina	10,324	457.9	15.7	2	5,290	236.6	9.4	4	1.94**
	Chronic obstructive pulmonary disease	5,892	261.3	8.9	3	5,862	262.2	10.4	3	1.00
	Cellulitis	4,189	185.8	6.4	4	2,848	127.4	5.1	8	1.46**
	Dehydration and gastroenteritis	3,803	168.7	5.8	5	5,956	266.4	10.6	2	0.63**
	Other	16,198	718.5	24.6	..	20,321	908.9	36.1	..	0.79**
	Total	65,865	2,921.5	100.0	..	56,311	2,518.7	100.0	..	1.16**
65-74	Diabetes complications	23,308	3,646.8	42.6	1	15,352	2,251.9	36.3	1	1.62**
	Chronic obstructive pulmonary disease	10,028	1,569.0	18.3	2	7,373	1,081.5	17.4	2	1.45**
	Angina	7,465	1,168.0	13.6	3	5,011	735.0	11.9	3	1.59**
	Congestive heart failure	5,104	798.6	9.3	4	3,469	508.8	8.2	4	1.57**
	Other	8,838	1,382.6	16.1	..	11,069	1,623.6	26.2	..	0.85**
	Total	54,743	8,565.0	100.0	..	42,274	6,200.8	100.0	..	1.38**
75+	Diabetes complications	22,658	5,178.6	32.7	1	22,905	3,382.7	28.5	1	1.53**
	Chronic obstructive pulmonary disease	14,047	3,210.5	20.3	2	10,010	1,478.3	12.5	4	2.17**
	Congestive heart failure	12,256	2,801.2	17.7	3	16,373	2,418.1	20.4	2	1.16**
	Angina	8,693	1,986.8	12.5	4	10,953	1,617.6	13.6	3	1.23**
	Other	11,713	2,677.2	16.9	..	20,053	2,961.6	25.0	..	0.90**
	Total	69,367	15,854.3	100.0	..	80,294	11,858.3	100.0	..	1.34**

¹ Admissions resulting from ACS conditions

² Age-sex standardised rate per 100,000 population

³ Per cent is the proportion of total ACS conditions within the relevant age-sex group

⁴ Rank is the rank order of the rates for the top four causes of avoidable hospitalisations for males and females; note that in some cases the rank order differs between males and females, resulting in the inclusion of more than four causes

⁵ RR-M:F is the ratio of male to female hospitalisation rates; rate ratios differing significantly from 1.0 are shown with

* p < 0.05; ** p < 0.01