

# Cardiovascular disease



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## Health care expenditure on cardiovascular diseases 2000–01

### Highlights

- Cardiovascular diseases are the most expensive group of diseases in Australia in terms of direct health care expenditure. Cardiovascular diseases were responsible for 11% of total allocated health system expenditure – \$5.48 billion in 2000–01.
- Hospital services accounted for nearly half of all health services expenditure for cardiovascular diseases, followed by pharmaceuticals (26%), medical services provided out of hospital (14%) and aged care homes (10%).
- Between 1993–94 and 2000–01, inflation-adjusted expenditure for cardiovascular diseases increased by 28%.

### Introduction

Cardiovascular diseases are Australia's largest health problem, accounting for 50,294 deaths in 2002 and affecting 3.67 million Australians in 2001 (AIHW 2004b). In 1998, 1.1 million Australians had disabling conditions associated with cardiovascular diseases.

Cardiovascular diseases are the most expensive diseases in Australia in terms of health expenditure. They were responsible for 11% of total allocated recurrent health system expenditure – \$5.48 billion in 2000–01 (AIHW 2004a).

The following is an overview of total allocated health system expenditure associated with cardiovascular diseases in Australia. These expenditure estimates are for the period 2000–01 and are the most up-to-date data currently available. Estimates are presented by area of expenditure: hospitals, high level services in aged care homes, out-of-hospital medical services, dental and other health professional services, pharmaceuticals and research.

These figures do not represent estimates of the total economic impact of cardiovascular diseases in the Australian community. As well as the direct health system expenditure described here, there is substantial indirect expenditure relating to absenteeism, lost productivity, the burden on carers and family, and lost quality and quantity of life.

## Methods and limitations

Direct expenditure is the fraction of total expenditure that relates to health system activity to prevent, diagnose and treat health problems. The AIHW calculates the direct expenditure on illness by apportioning estimates of recurrent health expenditure to diseases using Australian data on disease prevalence and use of health services. This approach gives estimates of the direct expenditure on health services for preventing, diagnosing and treating an illness incurred as a consequence of the prevalence of the illness during one year.

The figures presented here include health expenditure funded by the Commonwealth and State governments, by private health insurance and by individuals. These disease expenditure estimates allocate around 86% of the total recurrent health expenditure in 2000–01, or just under \$49.2 billion in total (AIHW 2004a). The expenditure not allocated by disease includes patient transport, capital expenditure, community health services, public health programs, health administration and health aids and appliances.

For admitted hospital patients, aged care homes, medical services provided out of hospital and prescription drugs, the figures shown here are based directly on 2000–01 data. For the remaining areas, the estimates were calculated by adjusting 1993–94 estimates for changes in population and changes in the total expenditure for that area.

Expenditure estimates were apportioned by health sector using data from hospital morbidity records and casemix, Medicare, the Pharmaceutical Benefits Scheme (PBS), the Pharmacy Guild Survey, the BEACH (Bettering the Evaluation and Care of Health) survey of general practice and the ABS Disability, Ageing and Carers Survey. Further details of the methods used are given in AIHW 2004a.

To allow comparisons with the first detailed Australian study of expenditure across disease groups, which referred to the year 1993–94 (see AIHW: Mathers et al. 1998), the 2000–01 estimates were derived using methods mostly consistent with those used previously.

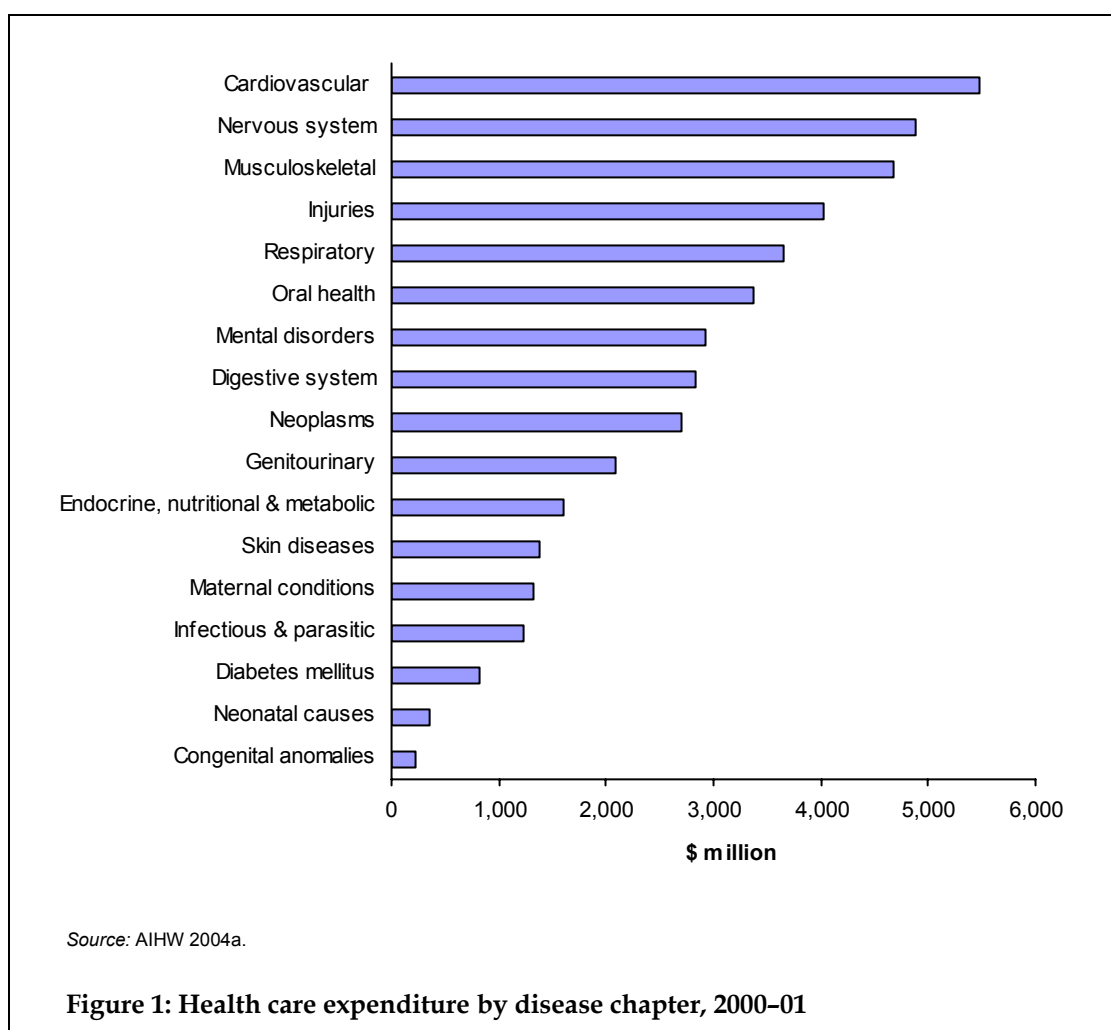
It is important to understand the limitations of these expenditure estimates. Direct expenditure on disease treatment does not equate to savings that would result from disease prevention because additional factors need to be considered (for further explanation, see AIHW: Mathers et al. 1998). Although the expenditure estimates are reliable at the broad disease group level (all cardiovascular diseases combined), they should be interpreted with caution for specific diseases as the method is less sensitive and accurate for any specific disease. As the method for distributing prescription drugs by disease is largely based on general practice prescription data, it may not produce an accurate reflection of prescription drug expenditure for diseases where a significant proportion of prescriptions are made by medical specialists, as may be the case with cardiovascular diseases.

Note also that dyslipidaemias such as high blood cholesterol levels are classified as 'endocrine and metabolic disorders' and therefore not included as part of cardiovascular

disease expenditure. This leads to an underestimation of the total expenditure on drugs used to prevent and treat cardiovascular diseases, as only some lipid-lowering drugs are counted as cardiovascular drugs. Similarly, pathology tests for dyslipidaemias would only be included in cardiovascular disease expenditure if the reason given for ordering the tests was a cardiovascular problem.

## All cardiovascular diseases

The total allocated health care expenditure for cardiovascular diseases in Australia during 2000–01 was \$5,484 million. The next highest cost group was nervous system diseases at \$4,878 million. Expenditure related to musculoskeletal conditions (\$4,684 million), injuries (\$4,031 million), respiratory diseases (\$3,654 million) and oral health (\$3,374 million) followed (Figure 1).



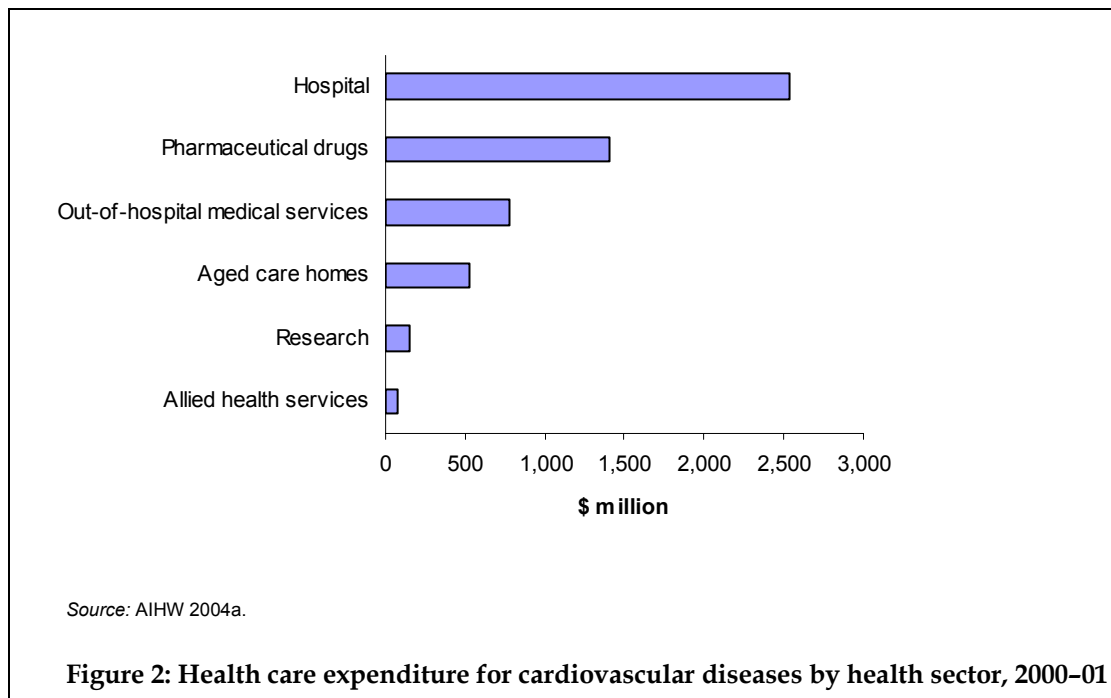
Coronary heart disease and stroke together accounted for 43% of the total allocated expenditure for cardiovascular diseases during 2000–01 (Table A1). Funds spent on coronary heart disease amounted to \$1,466 million, while for stroke they amounted to \$896 million. These amounts are underestimates for these two diseases because a significant amount of pharmaceutical use relevant to coronary heart disease and stroke, for example drugs to lower blood pressure or blood lipids, are allocated elsewhere. This

expenditure is counted either as part of 'other cardiovascular diseases' or as part of other disorders outside the cardiovascular diseases group such as high blood cholesterol (see methods and limitations section).

### Expenditure by health service

In 2000–01, hospital care was responsible for the majority of health services expenditure for cardiovascular diseases (\$2,533 million, representing 46% of the total). Prescription and non-prescription drugs expenditure was approximately \$1,411 million or 26% of total allocated expenditure. Medical services provided out of hospital accounted for \$782 million (14%). These include consultations with general practitioners and specialists as well as pathology tests, screening and other diagnostic services. The next largest contributor to expenditure was aged care homes at \$526 million (10%). The least expensive services were research (\$153 million, 3%) and allied health services (\$78 million, 1%) (Figure 2). The latter include services delivered outside of hospitals by professionals such as physiotherapists, occupational therapists, speech therapists, clinical massage therapists, clinical psychologists, and dietitians.

Note that of \$867 million spent on lipid-lowering drugs, only \$108 million was allocated to cardiovascular diseases and included in the figures given above. The bulk of lipid-lowering drugs (\$647 million) was prescribed for hyperlipidaemia and the rest (\$111 million) for other disorders, and therefore excluded from the total for cardiovascular diseases shown above. However the prime purpose of reducing hyperlipidaemia is to reduce the risk of cardiovascular diseases, so this \$647 million should be seen as part of expenditure to prevent or manage cardiovascular diseases.



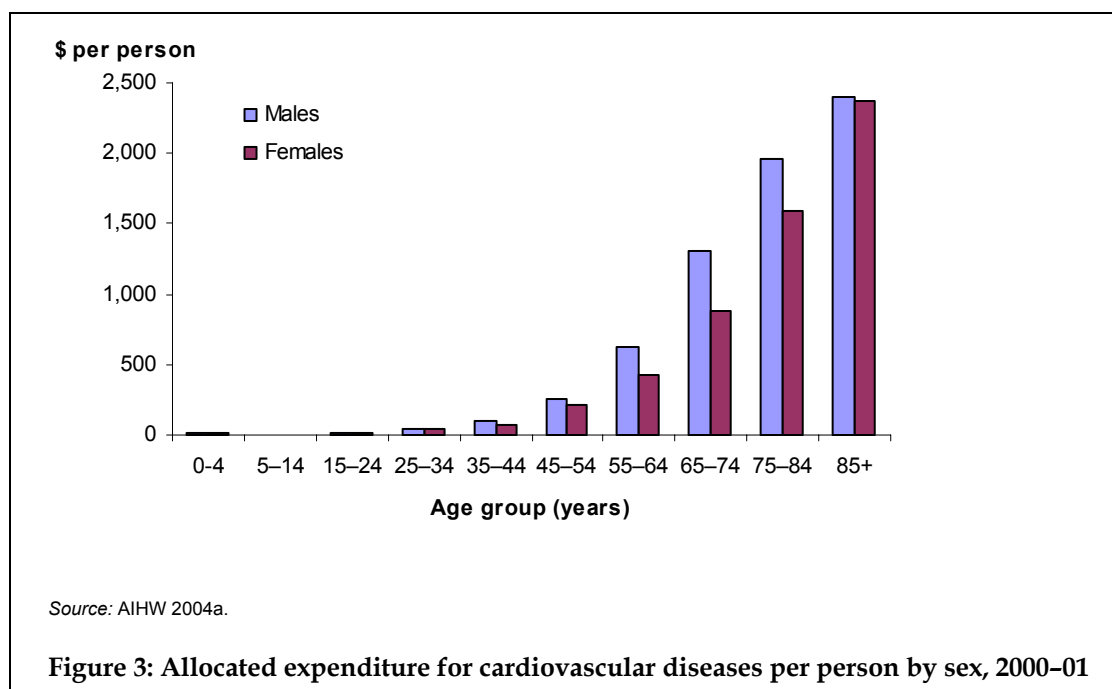
## Expenditure per person and per case

In 2000–01 allocated expenditure on cardiovascular diseases was \$284 per person in the population (AIHW 2004a). It is estimated that about 3.70 million Australians had cardiovascular diseases in 2001 including people living in private homes and in aged care homes. This figure is based on self-reports from the 2001 National Health Survey and the 1998 Survey of Disability, Ageing and Carers. Dividing the total expenditure for cardiovascular diseases by the estimated number of affected people gives an average of \$1,482 per case, including the care of new presentations of these diseases and the ongoing care of people with established diseases. This figure may be an overestimate because those who are unaware of having cardiovascular conditions and people in institutions such as hospitals and hostels are not counted in the number of people affected by cardiovascular diseases.

## Expenditure by age and sex

Expenditure for cardiovascular disease is relatively low at young ages until about the mid-forties when expenditure increases steeply with age, being largest for those aged 85 years and over (Figure 3 and Table A2).

At all ages males account for a larger proportion of expenditure for cardiovascular diseases than females. On average in 2000–01, \$297 was spent per person on males compared with \$273 for females. This reflects the greater propensity of males towards cardiovascular diseases and the fact that in men these diseases manifest earlier in life than in women.



## Changes from 1993–94 to 2000–01

After adjusting for overall health price inflation between 1993–94 and 2000–01, expenditure for cardiovascular diseases increased by 28% over that period – an increase of \$1,208 million expressed in 2000–01 prices (AIHW 2004a). This represents an average growth in cardiovascular diseases expenditure of 3.5% per year. These figures compare with a total increase of 37% (\$13,160 million) in expenditure for the whole health system, at an average of 4.6% per year (Table 1).

For cardiovascular diseases, the largest increase in expenditure was for pharmaceutical drugs (64%). As explained earlier, this excludes most lipid-lowering drugs. If these drugs were added to the cardiovascular diseases group, the increase in pharmaceutical expenditure would be even larger as the use of statins increased considerably between 1994 and 2000 (AIHW 2004b). Expenditure on hospitals grew by 27%, while that on aged care homes fell by 25% between 1993–94 and 2000–01. Only a small proportion of this fall is due to changes in methods used between the studies; most of it is explained by a reduction in the number of strokes in the period and an increase in cases of dementia treated in aged care homes.

**Table 1: Change in inflation-adjusted expenditure, 1993–94 to 2000–01**

	Hospitals	Aged care homes	Pharmaceutical drugs	Other <sup>(a)</sup>	Total
	Per cent				
Cardiovascular diseases	27	-25	64	40	28
Whole health system	31	23	67	34	37

(a) Includes out-of-hospital medical, other health professionals and research.

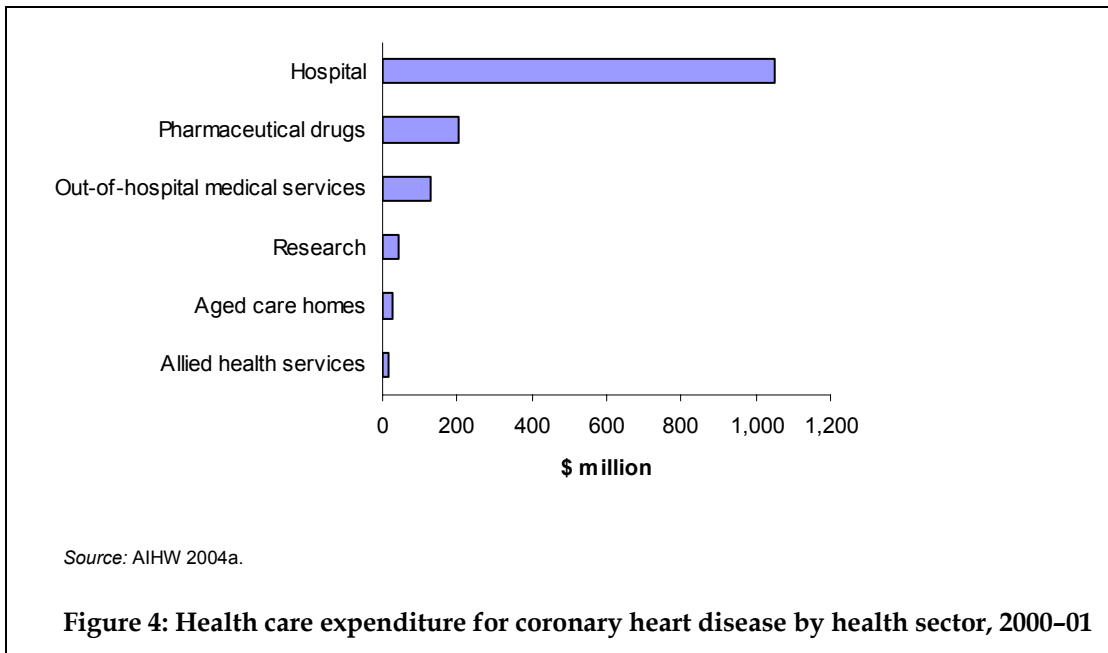
Source: AIHW 2004a.

## Coronary heart disease

Coronary heart disease is the largest single cause of death in Australia, claiming 26,063 lives in 2002. Based on self-reports from the 2001 National Health Survey and the 1998 Survey of Disability, Ageing and Carers, an estimated 356,800 Australians have manifestations of coronary heart disease. There were about 48,700 coronary events among Australians aged 40–90 years in 2001–02 (AIHW 2004b).

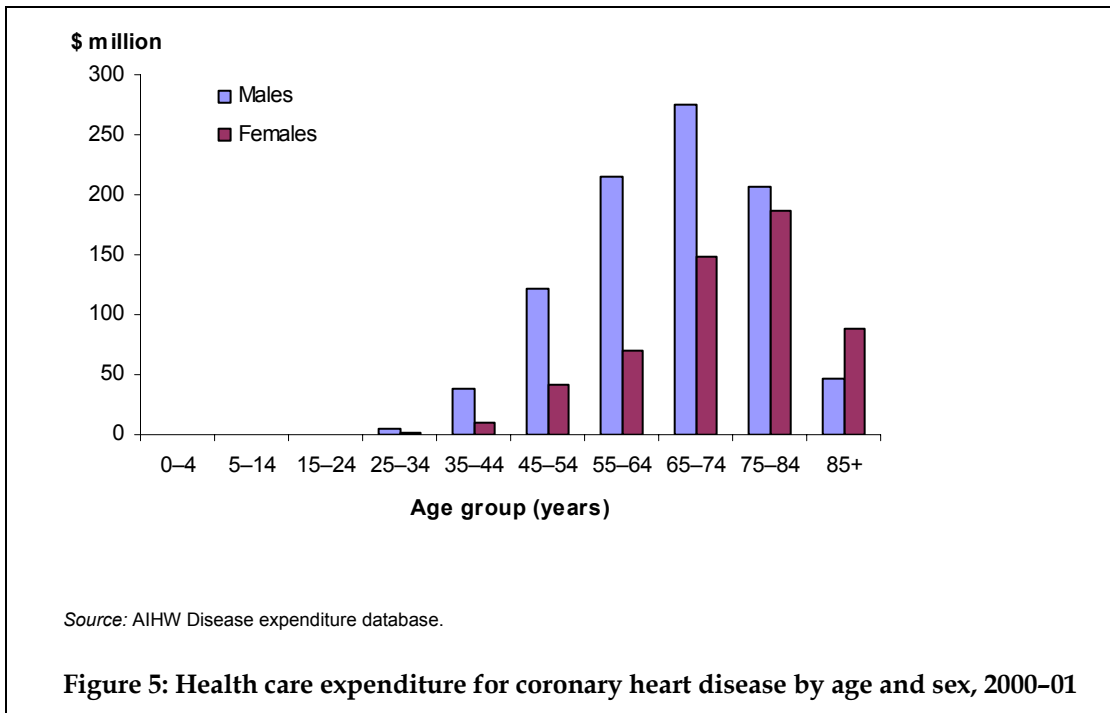
Given these figures, it is not surprising that coronary heart disease is the highest cost individual disease in Australia, consuming 3% of the total allocated health system expenditure. In 2000–01, \$1,466 million was spent for coronary heart disease, representing 27% of the total cardiovascular diseases expenditure (Table A1).

The largest proportion of funds allocated to coronary heart disease was spent on hospitals (\$1,050 million, 72%). Pharmaceutical drugs accounted for 14% (\$205 million), while medical services provided out of hospital made up 9% (\$130 million). Much less was spent on research (\$42 million, 3%), aged care homes (\$25 million, 2%) and allied health services (\$16 million, 1%) (Figure 4 and Table A1).



Based on the estimated number of people affected by coronary heart disease, the average expenditure is \$4,109 per case, including the care of new and chronic cases. This is likely to be an overestimate of the real figure as those who are unaware of having coronary heart disease and people in hospitals or other institutions are not included in the total number of people affected by the disease.

Expenditure for coronary heart disease increases steeply with age from about 35 years for both men and women. Considerably more (140% more) is spent on men than on women up to age 75, when the expenditure levels become similar for both sexes, while in those aged 85 years and over women account for a greater proportion of expenditure. This is because men are at greater risk of coronary heart disease and it manifests at a younger age than in women, whereas women tend to get the disease later in life and there are more elderly women than men (Figure 5 and Table A3). Per capita expenditure for men aged 85 years and over at \$613 is still higher than the \$512 for women in this age group.



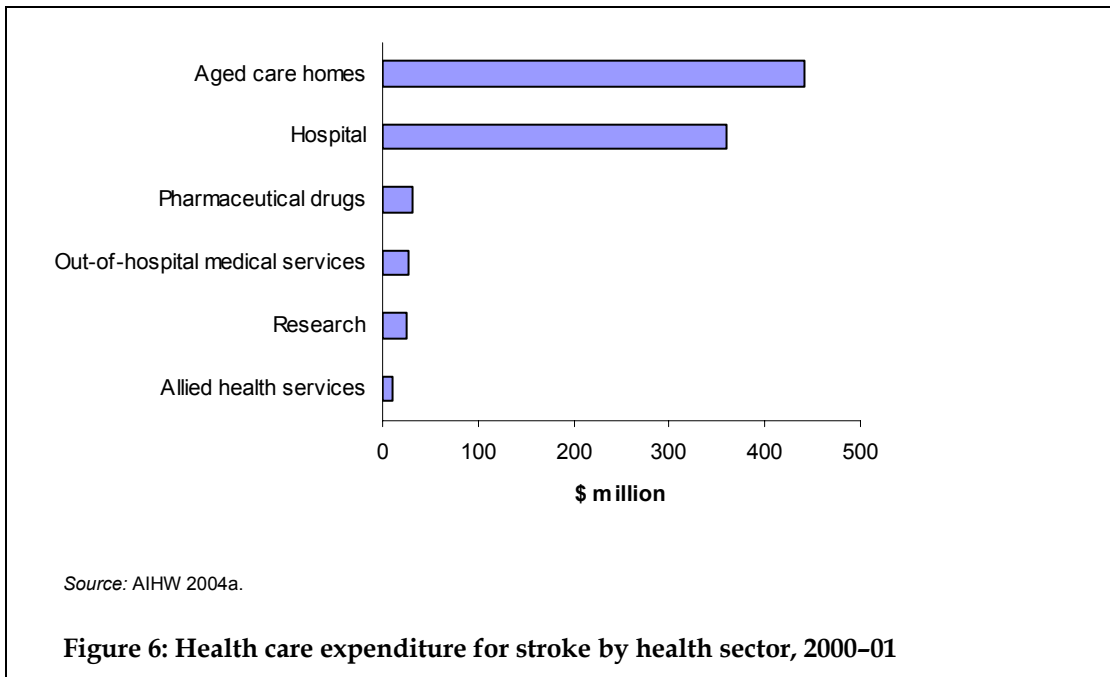
## Stroke

Stroke is Australia's second leading single cause of death, taking 12,533 lives in 2002. The 2001 National Health Survey showed that around 217,500 Australians living in private homes had had a stroke some time in their lives. In addition, about 19,950 people living in aged care homes were affected by stroke. It is estimated that each year there are about 40,000-48,000 stroke events among Australians (AIHW 2004b).

In 2000-01, allocated expenditure for stroke amounted to \$896 million (Table A1). This represents 16% of total cardiovascular diseases expenditure and 1.8% of total health system expenditure.

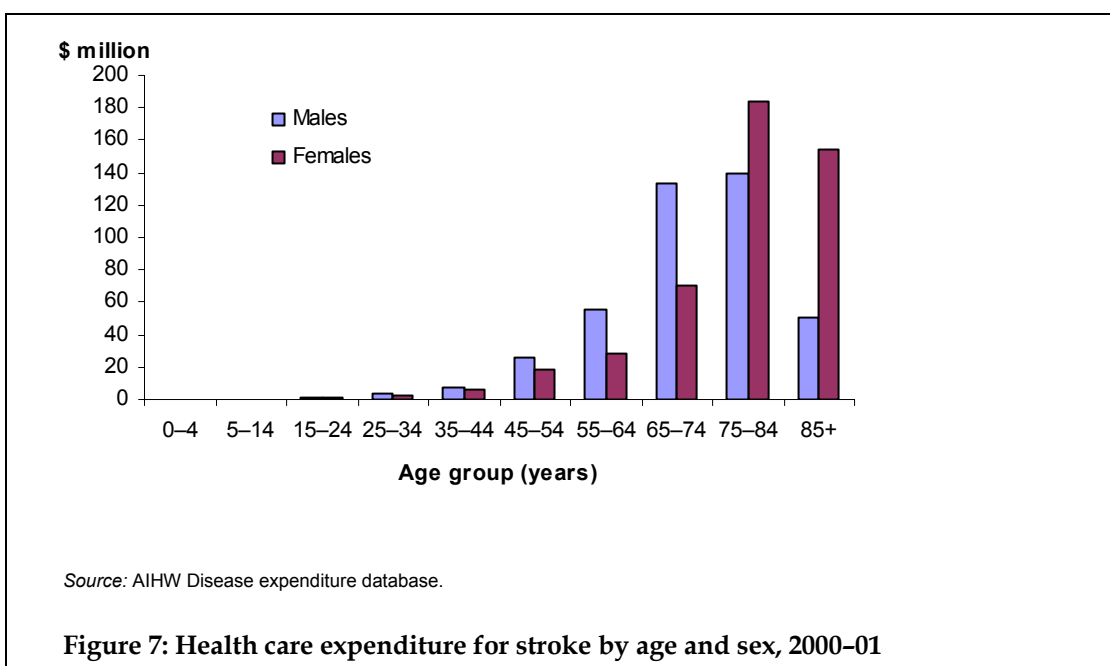
The largest component of expenditure for stroke was aged care homes (\$442 million, 49%). This reflects both the disabling nature of the disease and its greater tendency to affect older people. Hospitals consumed 40% (\$360 million) of funds allocated to stroke. Other areas accounted for a relatively small proportion of expenditure for stroke: out-of-hospital medical services (\$27 million, 3%), pharmaceutical drugs (\$31 million, 3%), allied health services (\$10 million, 1%) and research (\$26 million, 3%) (Figure 6 and Table A1).





Based on the estimated number of people affected by stroke, the average expenditure is \$3,773 per case, including the care of new and chronic cases. The total number of people affected by the disease takes into account people living in private homes and in aged care homes but not those in hospitals or other institutions so this figure is likely to overestimate the real expenditure per case.

Expenditure for stroke increases with age from about 45 years for both men and women. Although more (80% more) is spent on men than on women up to age 75, the disparity in expenditure is not so marked because the risk of stroke is similar for both sexes. As stroke is predominantly a disease of the elderly and there are more elderly women than men, it is not surprising that among those aged 75+, expenditure for this disease is much higher in women (Figure 7 and Table A3).



## References and further reading

AIHW 2004a. Health system expenditure on disease and injury in Australia, 2000–01. AIHW Cat. No. HWE 26. Canberra: AIHW (Health and Welfare Expenditure Series No. 19).

AIHW 2004b. Heart, stroke and vascular diseases – Australian Facts 2004. AIHW Cat. No. CVD 27. Canberra: AIHW and National Heart Foundation of Australia (Cardiovascular Disease Series No. 22).

AIHW: Mathers C, Stevenson C, Carter R et al. 1998. Disease costing methodology used in the disease costs and impact study 1993–94. AIHW Cat. No. HWE 7. Canberra: AIHW (Health and Welfare Expenditure Series No. 3).

Gross PF, Leeder SR & Lewis MJ 2003. Australia confronts the challenge of chronic disease. *Med J Aust* 179:233–234.

## Acknowledgments

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**Table A1: Allocated health expenditure in Australia, 2000-01**

Disease	Hospitals			Pharmaceutical drugs							
	Admitted patients <sup>(a)</sup>	Non-admitted services	Total	Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Other professional services <sup>(c)(f)</sup>	Prescription <sup>(d)</sup>	Over-the-counter <sup>(e)</sup>	Total	Research	Total
<b>All cardiovascular diseases</b>	<b>2,235</b>	<b>298</b>	<b>2,533</b>	<b>526</b>	<b>782</b>	<b>78</b>	<b>1,158</b>	<b>253</b>	<b>1,411</b>	<b>153</b>	<b>5,484</b>
Coronary heart disease	989	61	1,050	25	130	11	171	34	205	42	1,466
Stroke	331	30	360	442	27	10	24	6	31	26	896
<b>Total all disease groups</b>	<b>17,347</b>	<b>4,683</b>	<b>22,030</b>	<b>3,899</b>	<b>8,454</b>	<b>2,440</b>	<b>5,896</b>	<b>2,189</b>	<b>8,085</b>	<b>1,182</b>	<b>49,174</b>

(\$ million)

(a) Includes a preliminary estimate of private medical services provided in hospital.

(b) Includes expenditure on residents receiving care within the highest four levels in residential aged care services.

(c) Based on preliminary estimates.

(d) All pharmaceutical drugs for which a prescription is needed, including those subsidised under the Pharmaceutical Benefits Scheme, private prescriptions and under-copayment prescriptions.

(e) Includes products such as vitamins, patent medicines, first aid and wound products, pain killers, feminine hygiene products, and complementary health products sold in pharmacies and other retail outlets.

(f) Includes services delivered outside of hospitals by allied health professionals such as physiotherapists, occupational therapists, speech therapists, clinical massage therapists, clinical psychologists, and dietitians.

Source: AIHW 2004a.

**Table A2: Allocated health expenditure for all cardiovascular diseases in Australia per person by age and sex, 2000-01**

	Age group (years)											Total
	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+		
Males	13	7	17	36	96	262	620	1,302	1,957	2,404	297	
Females	9	4	13	41	70	210	426	887	1,597	2,369	273	

Source: AIHW 2004a.

**Table A3: Allocated health expenditure for coronary heart disease and stroke in Australia by age and sex, 2000-01**

	Age group (years)											Total
	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+		
Coronary heart disease												
Males	0	0	0	5	39	123	216	277	207	47	917	
Females	0	0	0	1	10	43	70	150	186	89	549	
Stroke												
Males	0	0	1	4	7	27	56	135	139	51	423	
Females	0	0	1	3	6	19	29	71	184	154	472	

Source: AIHW Disease expenditure database.