

Medicare and Department of Veterans' Affairs medical benefits data

This section describes the use of cardiovascular medical services covered by Medicare and the Department of Veterans' Affairs for the financial year 1994–95. Trend data for the period 1992–93 to 1994–95 are also presented. The data were provided by the Medicare Statistics Section of the Department of Health and Family Services and the Statistics Section of the Department of Veterans' Affairs. It should be noted that the data correspond to use of services for claims processed in the financial year under consideration, irrespective of when those services were provided. It should also be noted that Medicare data covers only about 75% of medical services (refer to the chapter *National data sources*).

Box 10: Cardiovascular medical diagnostic procedures and investigations codes

Information is provided here for the following groups of cardiovascular medical services:

Diagnostic procedures and investigations	Medical Benefits Schedule Item Number (as at 1 November 1995)
Cardiovascular	11700–11715
Pacemaker testing	11718, 11721
Therapeutic procedures (operations)—vascular	
Arterial surgery (Bypass or anastomosis for occlusive arterial disease, bypass, replacement, ligation of aneurysms, endarterectomy and arterial patch, embolectomy, thrombectomy and vascular trauma)	32700–32769, 33100–33172, 33500–33554, 33800–33848
Transluminal balloon angioplasty	35300–35305
Transluminal stent insertion	35306–35310
Therapeutic procedures (operations)—cardiothoracic	
Selective coronary arteriography	38215, 38218
Permanent pacemakers insertion / replacement	38250, 38253, 38259, 38470, 38473
Heart catheterisation, electrophysiological studies and other miscellaneous cardiac procedures	38200–38212, 38256
Valvular procedures	38480–38483, 38387–38489
Coronary artery bypass	38497, 38500, 38503
Congenital cardiac surgery	38700–38766
Therapeutic procedures (operations)—neurosurgical	
Cerebrovascular disease	39800–39818
Diagnostic imaging	
Cardiac ultrasound	55102–55130
Vascular ultrasound	55201–55237
Serial angiocardiology	59900–59906
Selective coronary arteriography	59912
Other angiography and report	59915–59924, 60000–60078
Cardiac nuclear medicine imaging	61300–61323

Appendix G provides detailed information on the procedures and investigations that make up these groups.

Use of cardiovascular medical services in 1994–95

Overall use

In 1994–95, Medicare processed claims for 188.1 million medical services and the Department of Veterans' Affairs (DVA) processed claims for 11.2 million medical services (Health Insurance Commission 1995; Statistics Section, Department of Veterans' Affairs, personal communication). In comparison to the overall use of medical services, the incidence of cardiovascular Medicare and DVA services is small. The cardiovascular services included here accounted for just over 1% (2.2 million services) of all Medicare and DVA medical services in 1994–95.

Of the 199.3 million medical services for which claims were processed by Medicare or the Department of Veterans' Affairs in 1994–95, 10.5 million services were for diagnostic imaging (10.0 million Medicare and 0.5 million DVA) and 5.6 million (5.1 million Medicare and 0.5 million DVA) were for operations. Cardiovascular diagnostic imaging accounted for 5% of all diagnostic imaging in 1994–95, while vascular, cardiothoracic and cerebrovascular operations accounted for 1% of all operations (Table 22).

Diagnostic procedures and investigations were the most frequently used services in 1994–95, accounting for 71% of all cardiovascular medical services (Table 22). The next three most common medical services for cardiovascular disease were cardiac ultrasound, vascular ultrasound and selective coronary arteriography.

The number of Medicare and DVA services for cerebrovascular operations and congenital cardiac surgery is small, however this may reflect higher 'public' hospital provision of these services rather than low service use (Table 22).

Use of cardiovascular medical services by age and sex

For both males and females, the incidence of cardiovascular Medicare and DVA services, except congenital cardiac surgery, tended to increase with age until age 75 years (Tables 23 & 24). Incidence rates for congenital cardiac surgery were highest among 0–24 year olds.

In most age groups and for all services except cerebrovascular operations and vascular ultrasound, incidence rates were higher among males than females. The difference in rates between males and females reduces slightly if only Medicare services are considered, however the differential remains. This is in contrast to the overall use of Medicare services which is higher for females than males (12.5 services per capita for females compared with 8.4 services per capita for males) (Australian Institute of Health and Welfare 1996a).

Table 22: Use of Medicare and Department of Veterans' Affairs cardiovascular services, 1994–95

Type of service	Medicare	Department of Veterans' Affairs	Total
		Number of services	
Diagnostic procedures and investigations			
Cardiovascular	1,425,304	115,103	1,540,407
Pacemaker testing	13,368	1,346	14,714
Vascular operations			
Arterial surgery	10,666	3,369	14,035
Transluminal balloon angioplasty	6,550	1,187	7,737
Transluminal stent insertion	1,008	188	1,196
Cardiothoracic operations			
Selective coronary arteriography	29,994	8,296	38,290
Permanent pacemaker insertion or replacement	3,858	952	4,810
Heart catheterisation and electrophysiological studies	2,521	317	2,838
Valvular procedures	1,674	293	1,967
Coronary artery bypass	7,819	1,390	9,209
Congenital cardiac surgery	915	0	915
Neurosurgical operations			
Cerebrovascular disease	440	28	468
Diagnostic imaging			
Cardiac ultrasound	192,638	14,396	207,034
Vascular ultrasound	186,279	17,491	203,770
Serial angiocardiology	28,932	3,219	32,151
Selective coronary arteriography	30,243	0	30,243
Other angiography and report	27,450	4,544	31,994
Cardiac nuclear imaging	11,334	3,431	14,765
Total	1,980,993	175,550	2,156,543

Note: These estimates do not include services for public patients in public hospitals.

Sources: Medicare Estimates and Statistics Section, Department of Health and Family Services; Statistics Section, Department of Veterans' Affairs.

Table 23: Age-specific incidence rates^(a) for cardiovascular Medicare and DVA services by type of service, males, 1994-95

Type of service	Age group (years)									All ages
	0-24	25-34	35-44	45-54	55-59	60-64	65-69	70-74	75+	
Diagnostic procedures and investigations										
Cardiovascular	746.7	2,632.2	6,124.7	12,869.5	20,857.5	27,732.7	34,508.2	41,350.5	38,995.2	9,241.7
Pacemaker testing	4.3	6.1	10.5	31.9	79.9	172.4	356.5	602.2	1,167.9	92.7
Vascular operations										
Arterial surgery	1.5	1.6	5.5	33.7	152.7	284.9	550.6	968.1	827.5	103.9
Transluminal balloon angioplasty	0.4	1.1	18.4	84.9	162.5	243.1	294.5	359.6	216.8	60.4
Transluminal stent insertion	(b)	(b)	2.6	13.3	29.1	43.2	50.5	53.4	30.7	9.7
Cardiothoracic operations										
Selective coronary arteriography	1.0	9.6	94.6	430.4	849.9	1,164.6	1,476.1	2,086.9	9417	306.9
Permanent pacemaker insertion or replacement	0.7	1.5	2.0	11.2	30.1	57.8	114.3	251.2	385.2	31.8
Heart catheterisation and electro-physiological studies	6.9	4.3	8.0	21.5	36.4	53.3	76.3	95.4	63.1	18.9
Valvular procedures	1.4	1.3	3.1	11.7	27.9	43.2	63.5	93.1	67.7	13.3
Coronary artery bypass	(b)	(b)	13.4	92.7	242.4	350.2	448.5	538.8	254.1	80.8
Congenital cardiac surgery	12.3	0.4	1.0	1.7	(b)	2.0	3.9	(b)	(b)	5.4
Neurosurgical therapeutic procedures										
Cerebrovascular disease	0.3	0.9	2.3	3.2	6.8	4.3	8.0	(b)	(b)	1.9
Diagnostic imaging										
Cardiac ultrasound	385.4	305.7	575.6	1,259.3	2,274.9	3,291.1	4,362.8	5,426.2	4,970.4	1,179.2
Vascular ultrasound	54.9	196.0	393.6	999.2	2,110.9	3,304.0	4,709.2	6,370.2	5,954.0	1,047.7
Serial angiocardiology	9.5	9.9	84.2	380.1	778.0	1,077.3	1,206.0	1,290.2	591.4	248.7
Selective coronary arteriography	0.5	9.9	96.0	425.0	848.9	1,115.9	1,132.1	825.6	397.4	233.7
Other angiography and report	14.2	21.0	48.8	162.7	436.2	728.5	1,130.0	1,538.5	1,243.1	218.8
Cardiac nuclear imaging	4.7	11.3	35.3	118.0	221.9	328.2	482.3	814.9	483.6	106.9
Total	1,244.7	3,213.3	7,519.4	16,949.9	29,146.9	39,996.9	50,973.1	62,670.0	56,591.7	13,002.6

(a) Incidence per 100,000 mid-1995 Australian population for each sex and age group.

(b) Rate not shown for confidentiality reasons.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Table 24: Age-specific incidence rates^(a) for cardiovascular Medicare and DVA services by type of service, females, 1994–95

Type of service	Age group (years)									
	0–24	25–34	35–44	45–54	55–59	60–64	65–69	70–74	75+	All ages
Diagnostic procedures and investigations										
Cardiovascular	776.8	2,491.0	5,071.3	10,001.5	15,728.7	20,494.2	25,283.7	29,319.8	28,068.2	7,833.1
Pacemaker testing	4.5	5.6	11.3	24.7	54.5	98.3	220.8	332.1	613.5	70.4
Vascular operations										
Arterial surgery	0.7	3.0	6.0	22.6	50.2	108.8	215.2	313.5	360.0	51.8
Transluminal balloon angioplasty	(b)	(b)	3.6	16.8	49.5	71.6	115.9	161.1	126.2	25.5
Transluminal stent insertion	0.0	0.0	0.7	3.4	7.3	12.2	19.4	16.8	14.5	3.5
Cardiothoracic operations										
Selective coronary arteriography	0.3	2.5	25.0	136.4	299.6	456.7	625.3	673.2	302.4	118.1
Permanent pacemaker insertion or replacement	1.1	1.7	1.9	6.1	12.1	28.7	59.9	106.1	203.3	21.6
Heart catheterisation and electro-physiological studies	5.7	6.1	10.3	15.5	26.3	23.9	31.5	32.9	27.4	12.5
Valvular procedures	0.9	0.6	2.3	7.9	14.1	23.3	30.9	55.9	35.2	8.5
Coronary artery bypass	(b)	(b)	0.9	10.7	35.1	86.9	124.9	159.5	76.9	21.5
Congenital cardiac surgery	10.8	1.0	0.7	1.4	2.3	2.6	2.8	3.4	1.1	4.8
Neurosurgical therapeutic procedures										
Cerebrovascular disease	0.4	2.0	2.5	8.4	7.6	6.8	9.8	5.9	3.3	3.2
Diagnostic imaging										
Cardiac ultrasound	377.6	501.1	667.7	1,129.8	1,875.1	2,589.5	3,3219.0	4,061.4	3,492.1	1,115.2
Vascular ultrasound	83.4	464.3	803.1	1,483.5	2,230.6	2,975.8	4,007.9	4,859.9	4,417.8	1,209.6
Serial angiocardiology	6.5	2.6	25.4	135.2	304.7	438.5	553.3	546.2	229.9	108.1
Selective coronary arteriography	0.4	2.5	25.1	132.8	293.3	442.5	522.9	488.8	228.1	101.9
Other angiography and report	12.7	24.6	49.9	110.4	224.2	338.6	477.3	709.8	668.9	136.0
Cardiac nuclear imaging	3.1	10.3	29.6	65.7	119.2	160.5	245.6	293.6	172.5	56.9
Total	1,285.3	3,519.5	6,737.1	13,312.7	21,334.4	28,359.3	35,866.1	42,139.8	39,041.3	10,902.3

(a) Incidence per 100,000 mid-1995 Australian population for each sex and age group.

(b) Rate suppressed for confidentiality reasons.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Use of cardiovascular medical services by State and Territory

There was a great deal of variation in the use of cardiovascular Medicare and DVA services by the States and Territories in 1994–95. Overall, New South Wales had the highest incidence with an age-standardised rate of 14,596 cardiovascular services per 100,000 population, while the Northern Territory had the lowest incidence (4,160 cardiovascular services per 100,000 population) (Table 25).

However, for specific cardiovascular services, the highest use of services did not always occur in New South Wales nor did the lowest always occur in the Northern Territory. In 1994–95, New South Wales had the highest age-standardised incidence rates of cardiovascular diagnostic procedures, transluminal stent insertion, heart catheterisation and electrophysiological studies, congenital cardiac surgery and most cardiovascular diagnostic imaging procedures (Table 25). The highest incidence of pacemaker testing occurred in Victoria, where the age-standardised rate was 2 times the national average. Victoria also had the highest rate of permanent pacemaker insertion or replacement. Transluminal balloon angioplasty was most frequently undertaken in Western Australia where the rate of use was almost 1.5 times the national average. The age-standardised incidence rate of selective coronary arteriography was also highest in Western Australia. The incidence of coronary artery bypass was highest in South Australia but New South Wales and Queensland also had rates that were higher than the national average. Use of cardiac nuclear imaging services in the Australian Capital Territory and New South Wales were 1.9 and 1.8 times higher than the Australian average, respectively.

While age-standardised rates have been compared to adjust for differences in age structures between States and Territories, there are other factors that may affect the differences observed. For example, State and Territory differences may reflect different mixes of public and private patients in hospital and different types of service provision. The lower use of most cardiovascular services in the Northern Territory may also be because a number of services provided to Aboriginal and Torres Strait Islander people are provided through programs other than Medicare and therefore are not included here (Australian Institute of Health and Welfare 1996a).

Table 25: Age-standardised incidence rates^(a) for cardiovascular Medicare and DVA services by type of service and State and Territory, 1994–95

Type of service	State/Territory								Australia
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	
Diagnostic procedures and investigations									
Cardiovascular	10521.6	7861.3	7061.3	6307.7	5965.4	5604.9	6896.2	2944.4	8234.6
Pacemaker testing	51.8	160.2	39.5	36.1	76.4	7.1	38.2	(b)	76.8
Vascular operations									
Arterial surgery	64.0	81.9	113.0	44.2	58.5	62.3	38.1	42.4	74.5
Transluminal balloon angioplasty	39.1	53.7	21.1	60.8	42.2	24.7	41.7	6.8	41.3
Transluminal stent insertion	7.9	5.9	5.9	5.8	5.5	2.9	4.9	0.0	6.4
Cardiothoracic operations									
Selective coronary arteriography	203.5	221.5	171.7	270.2	189.2	179.5	152.7	51.4	205.0
Permanent pacemaker insertion or replacement	23.7	31.2	21.2	28.1	21.5	15.8	19.7	(b)	25.1
Heart catheterisation and electrophysiological studies	19.7	13.5	10.3	14.8	16.8	9.0	17.8	4.7	15.4
Valvular procedures	9.9	10.8	12.0	9	12.9	6.8	7.4	3.7	10.5
Coronary artery bypass	56.4	41.3	51.6	40.9	59.3	33.0	35.8	16.5	49.6
Congenital cardiac surgery	6.5	6.3	1.1	6.3	5.2	5.7	2.2	4.7	5.2
Neurosurgical operations									
Cerebrovascular disease	2.6	3.0	2.4	1.2	2.4	3.5	(b)	(b)	2.5
Diagnostic imaging									
Cardiac ultrasound	1544.7	946.0	933.1	873.2	781.1	688.2	813.1	509.1	1118.1
Vascular ultrasound	1339.7	1070.0	1074.4	723.9	749.0	730.9	868.3	391.0	1088.7
Serial angiocardiology	219.6	175.4	126.6	172.5	148.0	3.8	75.6	41.4	173.0
Selective coronary arteriography	137.0	207.7	138.8	213.8	158.6	129.3	92.0	52.8	162.9
Other angiography and report	209.4	174.3	134.1	158.0	130.7	92.6	152.6	44.5	171.0
Cardiac nuclear imaging	138.6	73.7	18.4	20.4	31.6	74.8	150.9	41.0	78.9
Total	14595.7	11137.7	9936.3	8986.9	8454.3	7674.6	9408.4	4160.2	11539.5

(a) Rate per 100,000 population, age-standardised to the mid-1991 total Australian population.

(b) Rate suppressed for confidentiality reasons.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Trends in the use of cardiovascular medical services

Between 1992-93 and 1994-95, the use of most cardiovascular Medicare and DVA services increased or remained steady. This was true for both males and females (Tables 26 & 27).

Those services with the greatest increases were transluminal stent insertion and serial angiocardiology. Use of serial angiocardiology also grew rapidly between 1992-93 and 1993-94 but the rate of growth slowed considerably in the following financial year.

Transluminal stent insertion was included on the Medicare Benefits Schedule from 1 April 1992. Over the period from 1992-93 to 1994-95, use of transluminal stent insertion increased by an average of 110% per year, with the rate of growth between 1993-94 and 1994-95 being more than double that between 1992-93 and 1993-94.

The incidence of cardiac nuclear imaging services fell over the period 1992-93 to 1994-95, from 146 to 109 services per 100,000 population for males and from 82 to 53 services per 100,000 population for females. Use of arterial surgery also fell between 1992-93 and 1994-95.

Care should be exercised in interpreting the trends however, as changes in use of medical services over time can be influenced by many factors. These include changes in the Medicare Benefits Schedule; changes in the coverage of Medicare as a result of Government policy; changes in the mix of services provided in public and private hospitals; population growth and net migration; ageing of the population; the proportion of the population with private health insurance; and cost shifting (i.e. services previously provided free of charge by States and Territories, that are now only available under Medicare) (Commonwealth Department of Health and Family Services 1996a).

Table 26: Age-standardised incidence rates^(a) and standard errors for cardiovascular Medicare and DVA services by type of service, males, 1992–93 to 1994–95

Type of service	Year					
	1992–93		1993–94		1994–95	
	Rate	Standard error	Rate	Standard error	Rate	Standard error
Diagnostic procedures and investigations						
Cardiovascular	9,023.2	9.0	9,197.4	8.9	9,389.7	8.9
Pacemaker testing	(b)	(b)	74.9	1.0	102.5	1.1
Vascular operations						
Arterial surgery	117.4	1.2	117.3	1.2	110.1	1.1
Transluminal balloon angioplasty	32.8	0.6	55.9	0.8	61.1	0.8
Transluminal stent insertion	2.1	0.2	3.7	0.2	9.8	0.3
Cardiothoracic operations						
Selective coronary arteriography	251.2	1.7	288.5	1.8	308.5	1.9
Permanent pacemaker insertion or replacement	15.9	0.5	31.0	0.6	34.9	0.7
Heart catheterisation and electrophysiological studies	19.2	0.5	20.2	0.5	19.2	0.5
Valvular procedures	7.1	0.3	13.9	0.4	13.7	0.4
Coronary artery bypass	39.8	0.7	80.0	1.0	81.8	1.0
Congenital cardiac surgery	3.3	0.2	5.2	0.2	5.4	0.3
Neurosurgical operations						
Cerebrovascular disease	2.1	0.2	1.8	0.1	1.9	0.1
Diagnostic imaging						
Cardiac ultrasound	858.9	3.2	1,063.6	3.5	1,204.8	3.7
Vascular ultrasound	655.1	2.8	873.4	3.2	1,083.7	3.5
Serial angiocardiology	69.9	0.9	220.3	1.6	248.8	1.7
Selective coronary arteriography	202.5	1.5	222.9	1.6	231.8	1.6
Other angiography and report	332.9	2.0	210.2	1.6	227.1	1.6
Cardiac nuclear imaging	146.1	1.3	120.0	1.2	109.0	1.1
Total	11,804.4	9.7	12,600.1	9.7	13,243.8	9.6

(a) Rate per 100,000 population age-standardised to the mid-1991 total Australian population.

(b) Rate not presented because data are available for part of the year only.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Table 27: Age-standardised incidence rates^(a) and standard errors for cardiovascular Medicare and DVA services by type of service, females, 1992–93 to 1994–95

Type of service	Year					
	1992–93		1993–94		1994–95	
	Rate	Standard error	Rate	Standard error	Rate	Standard error
Diagnostic procedures and investigations						
Cardiovascular	6,894.4	7.8	7,034.6	7.8	7,215.4	7.8
Pacemaker testing	14.5	0.4	44.1	0.7	58.6	0.7
Vascular operations						
Arterial surgery	47.8	0.7	45.3	0.7	44.8	0.7
Transluminal balloon angioplasty	14.2	0.4	21.3	0.5	22.7	0.5
Transluminal stent insertion	0.9	0.1	1.2	0.1	3.2	0.2
Cardiothoracic operations						
Selective coronary arteriography	91.2	1.0	104.8	1.1	110.1	1.1
Permanent pacemaker insertion or replacement	8.6	0.3	15.3	0.4	17.7	0.4
Heart catheterisation and electrophysiological studies	10.9	0.4	12.5	0.4	12.0	0.4
Valvular procedures	3.9	0.2	8.0	0.3	7.7	0.3
Coronary artery bypass	8.3	0.3	19.4	0.5	19.8	0.5
Congenital cardiac surgery	2.3	0.2	5.3	0.3	5.0	0.2
Neurosurgical operations						
Cerebrovascular disease	3.1	0.2	2.6	0.2	3.1	0.2
Diagnostic imaging						
Cardiac ultrasound	775.3	2.9	939.5	3.1	1,048.3	3.3
Vascular ultrasound	669.5	2.7	875.2	3.0	1,112.6	3.3
Serial angiocardiology	27.1	0.6	92.3	1.0	101.8	1.0
Selective coronary arteriography	81.6	0.9	92.2	1.0	95.9	1.0
Other angiography and report	215.9	1.5	118.7	1.1	122.2	1.1
Cardiac nuclear imaging	81.6	0.9	60.9	0.8	52.8	0.7
Total	8,951.1	8.7	9,493.3	8.8	10,053.9	8.9

(a) Rate per 100,000 population age-standardised to the mid-1991 total Australian population.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Benefits paid for cardiovascular medical services in 1994–95

In 1994–95, the Health Insurance Commission paid \$5,697 million in Medicare benefits for claims processed in that year (Health Insurance Commission 1995). DVA medical benefits for the same year totalled \$695.0 million (Statistics Section, Department of Veterans' Affairs, personal communication). Benefits paid for cardiovascular Medicare and DVA services in 1994–95 totalled \$202 million, accounting for 3% of total benefits paid (Table 28).

In line with service use, the cardiovascular Medicare and DVA services for which the highest benefits were paid in 1994–95 were cardiovascular diagnostic procedures and investigations (\$54.1 million), cardiac ultrasound (\$42.8 million) and vascular ultrasound (\$31.8 million) (Table 28).

Table 28: Benefits paid (\$) for cardiovascular Medicare and DVA services by type of service, 1994–95

Type of service	Medicare	Department of Veterans' Affairs	Total
Diagnostic procedures and investigations			
Cardiovascular	50,105,497	3,959,430	54,064,927
Pacemaker testing	431,329	52,750	484,079
Vascular operations			
Arterial surgery	5,041,402	2,296,325	7,337,727
Transluminal balloon angioplasty	1,403,564	356,835	1,760,399
Transluminal stent insertion	376,064	87,689	463,753
Cardiothoracic operations			
Selective coronary arteriography	11,832,581	3,455,602	15,288,183
Permanent pacemaker insertion or replacement	900,793	291,168	1,191,961
Heart catheterisation and electrophysiological studies	1,122,932	165,002	1,287,934
Valvular procedures	1,343,030	292,242	1,635,272
Coronary artery bypass	9,234,614	2,138,349	11,372,963
Congenital cardiac surgery	629,930	0	629,930
Neurosurgical operations			
Cerebrovascular disease	604,254	47,097	651,351
Diagnostic imaging			
Cardiac ultrasound	39,355,384	3,408,623	42,764,007
Vascular ultrasound	28,644,222	3,172,228	31,816,450
Serial angiocardiology	2,542,520	374,645	2,917,165
Selective coronary arteriography	7,041,767	0	7,041,767
Other angiography and report	13,115,731	2,535,386	15,651,117
Cardiac nuclear imaging	3,444,457	1,922,004	5,366,461
Total	177,170,071	24,555,375	201,725,446

Sources: Medicare Estimates and Statistics Section, Department of Health and Family Services; Statistics Section, Department of Veterans' Affairs.

Trends in benefits paid for cardiovascular medical services

In general, trends in benefits paid between 1992–93 and 1994–95 were consistent with trends in the services (Table 29). One exception was arterial surgery, where benefits paid increased by an average of almost 5% per year over the 3-year period, but incidence fell by an average of 3.6% per year.

Table 29: Benefits paid (\$) for cardiovascular Medicare and DVA services by type of service, 1992–93 to 1994–95 (1994–95 prices^(a))

Type of service	Year		
	1992–93	1993–94	1994–95
Diagnostic procedures and investigations			
Cardiovascular	47,955,420	51,089,064	54,064,927
Pacemaker testing	113,347	335,484	484,079
Vascular operations			
Arterial surgery	6,693,652	6,827,406	7,337,727
Transluminal balloon angioplasty	1,018,178	1,581,667	1,760,399
Transluminal stent insertion	94,773	161,677	463,753
Cardiothoracic operations			
Selective coronary arteriography	12,242,600	14,260,172	15,288,183
Permanent pacemaker insertion or replacement	260,901	952,975	1,191,961
Heart catheterisation and electrophysiological studies	1,133,746	1,298,421	1,287,934
Valvular procedures	770,190	1,619,584	1,635,272
Coronary artery bypass	5,195,765	10,941,304	11,372,963
Congenital cardiac surgery	357,864	652,036	629,930
Neurosurgical operations			
Cerebrovascular disease	682,008	586,181	651,351
Diagnostic imaging			
Cardiac ultrasound	25,268,234	36,404,295	42,764,007
Vascular ultrasound	19,124,527	25,266,737	31,816,450
Serial angiocardiology	762,879	2,543,613	2,917,165
Selective coronary arteriography	5,908,465	6,661,476	7,041,767
Other angiography and report	9,364,364	13,826,391	15,651,117
Cardiac nuclear imaging	7,855,327	5,985,125	5,366,461
Total	144,802,241	180,993,608	201,725,446

(a) The 'Doctor' price index from the Private Final Consumption Expenditure (PFCE) deflators produced by the Australian Bureau of Statistics was used to adjust figures to 1994–95 prices.

Sources: AIHW derived from data provided by the Medicare Estimates and Statistics Section of the Department of Health and Family Services, and the Statistics Section of the Department of Veterans' Affairs.

Estimates from the Australian Bureau of Statistics' National Health Survey 1995

Hospital use in the two weeks prior to interview for a recent cardiovascular condition

Hospital use in the two weeks prior to interview for a recent cardiovascular condition by age

Age-specific estimates were too small to report.

Hospital use in the two weeks prior to interview for a recent cardiovascular condition by sex

After adjusting for age, of those males reporting a recent cardiovascular condition, 8.0% also reported being hospitalised for the condition in the two weeks prior to interview, a rate much greater than that reported by females (1.0%). Males (8.4%) were more likely than females (0.3%) to report being hospitalised for heart disease in the two weeks prior to interview (Table 30).

Table 30: Percentage^(a) of people reporting a recent cardiovascular condition being hospitalised in the last two weeks by sex, 1995

Type of condition	Males	Females
	Per cent (SE)	
Heart disease	8.4 (2.2)	0.3 (0.1)
Other diseases of the circulatory system ^(b)	3.3 (0.9)	3.7 (1.0)
Ill-defined signs and symptoms of heart conditions	1.8 (0.7)	1.3 (0.5)
All cardiovascular^(c)	8.0 (1.5)	1.0 (0.2)

(a) Age-standardised to the mid-1991 total Australian population.

(b) Does not include atherosclerosis, cerebrovascular disease or after-effects of stroke.

(c) Includes atherosclerosis, cerebrovascular disease or after-effects of stroke.

SE: Standard error

Source: AIHW derived from the ABS National Health Survey 1995.

Of those reporting a recent cardiovascular condition, 3.4% of males and 2.7% of females reported visiting casualty/emergency/outpatients or a day clinic for the condition (Table 31).

Table 31: Percentage^(a) of people reporting a recent cardiovascular condition visiting casualty/emergency/outpatients or a day clinic by sex, 1995

Action taken	Males	Females
	Per cent (SE)	
Visited casualty/emergency/outpatients/day clinic	3.4 (0.4)	2.7 (0.4)

(a) Age-standardised to the mid-1991 total Australian population.

SE: Standard error

Source: AIHW derived from the ABS National Health Survey 1995.

Hospital use in the two weeks prior to interview for a recent cardiovascular condition by State and Territory

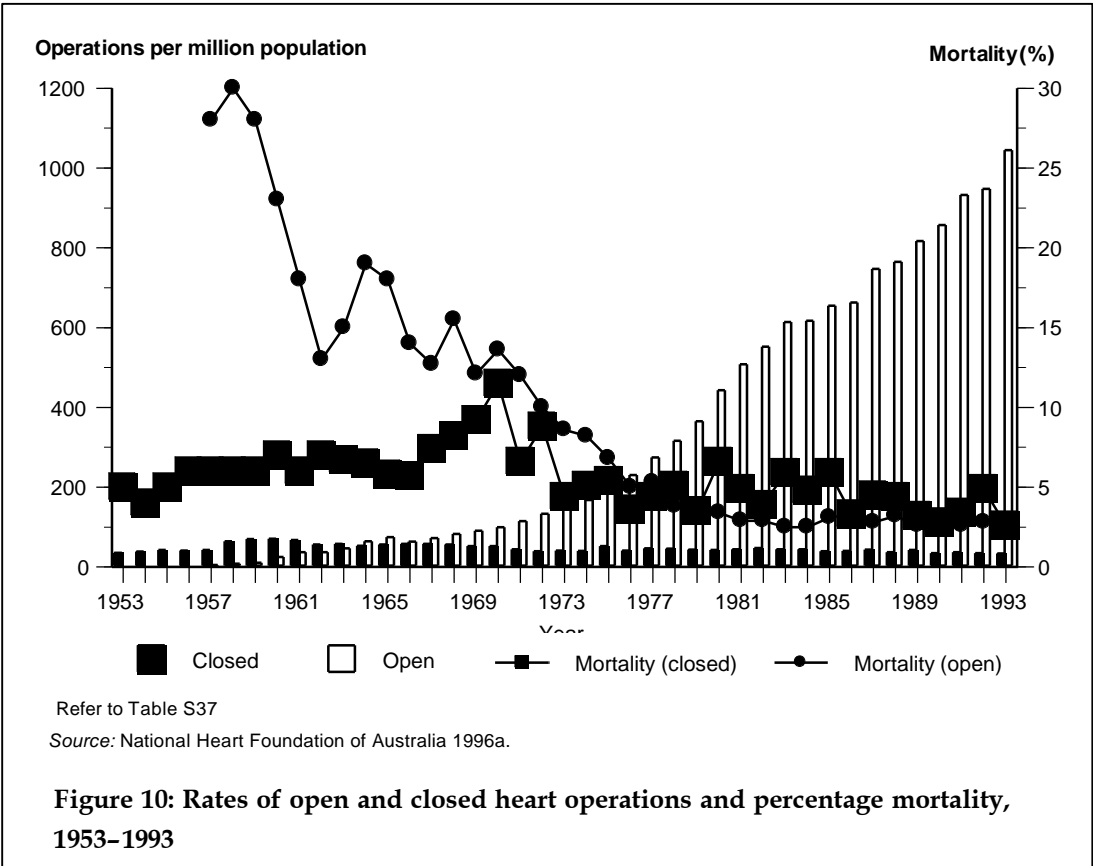
After adjusting for age, estimates by State or Territory were too small to report.

National Heart Foundation cardiac surgery register

In 1993, a total of 18,936 heart operations were performed in Australia (National Heart Foundation of Australia 1996a). Over 90% of all heart operations performed in 1993 were for acquired heart disease. Mortality associated with heart surgery (i.e. death within 30 days of the operation or during the post-operative period in hospital) in 1993 was 2.6% for closed operations and 2.5% for open operations.

Only 6% of open heart operations performed in 1993 were for congenital heart conditions (National Heart Foundation of Australia 1996a). In contrast, over 80% of all closed heart operations undertaken in that year were for congenital heart defects. Most congenital heart surgery performed between 1989 and 1993 was for ventricular and atrial septal defects.

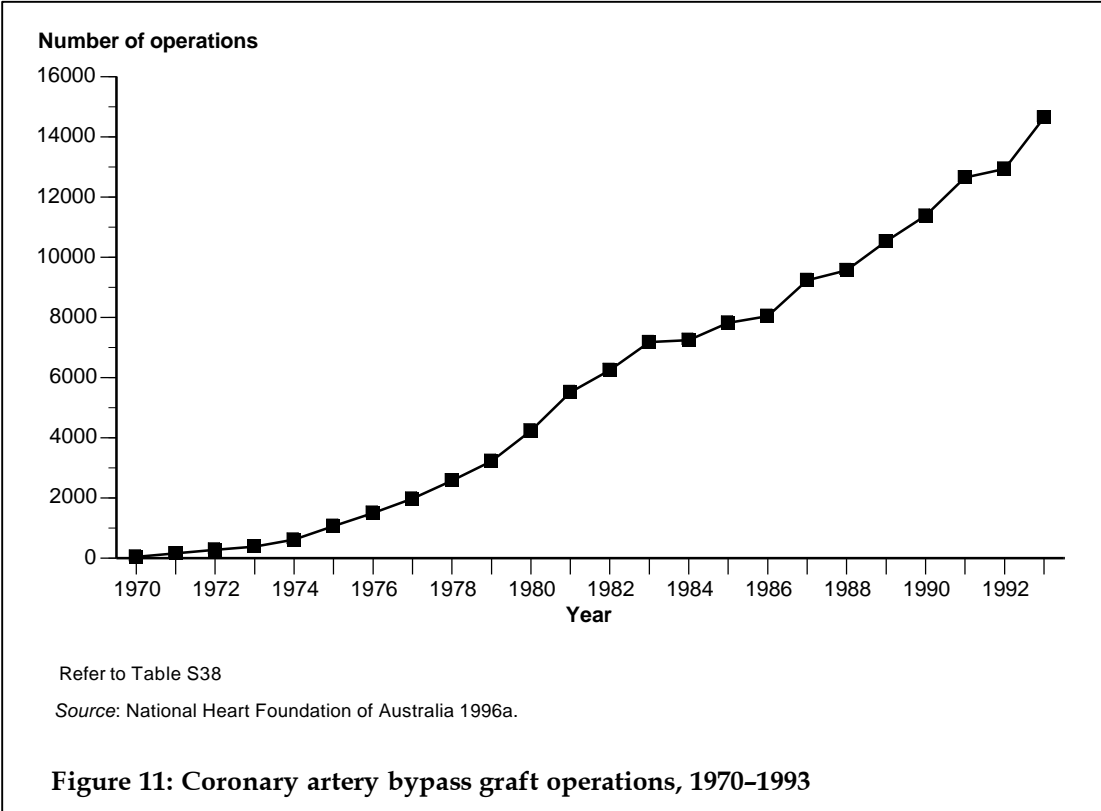
Since the mid-1950s the rate of open heart surgery in Australia has increased by an average of 19% per year, from 1.9 operations per million population in 1957 to 1042.0 operations per million population in 1993. Over the same period, mortality from open heart surgery has fallen by an average of 6.5% per year.



Between 1953 and 1960, closed heart surgery rates increased by an annual average of 11% (Figure 10). However since 1960, the rate of closed heart surgery in Australia has fallen. Mortality rates from closed heart surgery have varied from year to year with no real trend apparent.

The first coronary artery bypass operations in Australia were performed in 1970 (National Heart Foundation of Australia 1996a). Since that time, the number of coronary bypass graft operations has increased markedly from 50 operations to 14,638 operations in 1993 (Figure 11). Mortality associated with coronary artery bypass graft operations is currently around 2%. About 8% of coronary artery bypass graft operations were re-operations, with an associated mortality rate of 5.3%.

Ten per cent of coronary artery bypass operations performed in 1993 were undertaken with concomitant procedures such as valve surgery, excision of infarct or aneurysm, or surgery for ventricular septal defects (National Heart Foundation of Australia 1996a).



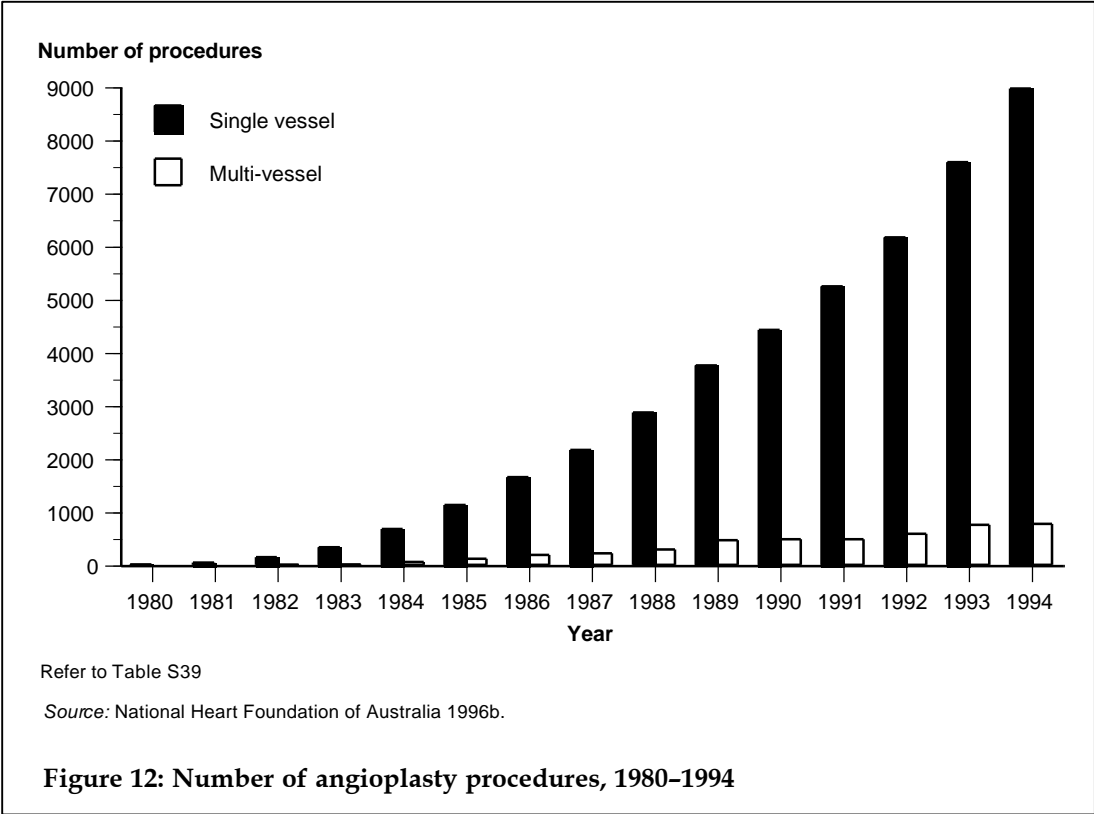
In 1993 there were 3,552 operations for heart valve defects, most of them in aortic (58%) and mitral (38%) valves. The majority of these procedures (81%) entailed replacing the damaged valves, most commonly with artificial prostheses (74%). About 4% of valve interventions were re-operations for valve failures.

National Heart Foundation coronary angioplasty register

Coronary angioplasty was first performed in Australia in 1980 (National Heart Foundation 1996b). Since that time the number of angioplasty procedures performed each year has increased rapidly (Figure 12).

In 1994, there were 9,732 coronary angioplasty procedures performed in Australia (National Heart Foundation 1996b). Most of these procedures were single vessel procedures (92%). Procedures involving two vessels accounted for 7.5% of angioplasty procedures, while procedures on more than two vessels accounted for only 0.5% of all angioplasty in 1994. On average, 1.14 lesions were attempted per procedure.

Information about repeat procedures was available for 9,431 of the angioplasties performed in 1994 (National Heart Foundation 1996b). One fifth of these procedures were repeat procedures. More than half of the repeat procedures (57%) were for patients who had undergone previous angioplasty in 1994. Among units where the information was available, 75% of repeat procedures where the previous angioplasty was in 1994 were to the same lesion. Where the previous angioplasty was performed before 1994, 52% of repeat procedures were to the same lesion.



In 1994, information about the indication for angioplasty was available for 8,472 procedures (National Heart Foundation 1996b). For 52% of angioplasty procedures in that year the indication was stable angina pectoris. Unstable angina and acute myocardial infarction accounted for another 40% and 7% of procedures, respectively. The remaining angioplasties were performed for prognostic and other reasons.

Information about the use of thrombolytic therapy before angioplasty was available for 7,173 procedures in 1994 (National Heart Foundation 1996b). In approximately 7% of angioplasties, thrombolytic therapy was administered prior to the procedure.

Stents were used in 9% of angioplasty procedures in 1994 (National Heart Foundation 1996b).

The National Heart Foundation coronary angioplasty register collects information about complications following the procedure that occur during the same hospital admission. Of the angioplasty procedures performed in 1994, 185 patients required coronary artery bypass graft surgery for angioplasty failure or complications during the same hospital admission (National Heart Foundation 1996b). This represents a rate of 1.9 coronary artery bypass grafts per 100 angioplasty procedures. The rate of coronary artery bypass grafting following angioplasty has fallen markedly since the early 1980s.

The rate of patients suffering acute myocardial infarction following angioplasty has also tended to fall since the early 1980s. Among the units for which data on acute myocardial

infarction following angioplasty were available in 1994, the rate of complication was 1.4 per 100 procedures (National Heart Foundation 1996b).
Deaths during the same hospital admission in which angioplasty was performed occurred at a rate of 0.45 per 100 procedures in 1994 (National Heart Foundation 1996b).

Australian casemix data

The term 'casemix' refers to the numbers of each diagnostic category a hospital treats and to the mix of treatments and procedures provided to patients (Australian Institute of Health and Welfare 1996a). It enables the use of resources in treating patients to be related to the number of patients treated and their diagnosis.

The most common casemix classifications used for describing admitted hospital patients are Diagnosis Related Groups (DRGs) (Australian Institute of Health and Welfare 1996a). These use information such as the patient's age, sex, diagnosis, comorbidities and procedures to group patient episodes of similar clinical condition and resource use.

The Commonwealth Department of Health and Family Services publishes the *Australian Casemix Report* annually. The report provides national information on public and private acute hospital activity for each financial year (Commonwealth Department of Health and Family Services 1997b). This hospital activity is measured by Australian National Diagnosis Related Groups (AN-DRGs).

Hospital separations for cardiovascular disease

In 1995–96, there were 3.6 million separations from public acute hospitals (Australian Institute of Health and Welfare 1997a). This represents a rate of 198.1 separations per 1,000 population. The average length of stay in public acute hospitals was 4.8 days in 1995–96.

For private acute and free-standing day facilities, there were 1.6 million separations in 1995–96, representing a rate of 87.7 separations per 1,000 population (Australian Institute of Health and Welfare 1997a). The average length of stay was 3.7 days.

Version 3.0 of the AN-DRG classification was released in July 1995 (Commonwealth Department of Health and Family Services 1996b). Only information about the most common AN-DRGs for cardiovascular disease is presented here. Detailed information can be found in the report by the Commonwealth Department of Health and Family Services (Commonwealth Department of Health and Family Services 1997b) and in *Australian Hospital Statistics 1995–96* (Australian Institute of Health and Welfare 1997a).

In terms of public acute hospital separations in 1995–96, 'heart failure & shock' (AN-DRG 252) was the leading cardiovascular AN-DRG with 32,700 separations (Table 32). Overall, it accounted for 1% of all public acute hospital separations and was ranked 10th highest for public acute hospital separations in that year (Australian Institute of Health and Welfare 1997a). The most common principal diagnoses for 'heart failure & shock' were congestive heart failure (ICD-9-CM 428.0) and left heart failure (ICD-9-CM 428.1). Just over half (50.4%) of all separations for 'heart failure & shock' were for females, and 95% of separations were for persons aged 55 years and over.

'Chest pain' (AN-DRG 261) was the second leading cardiovascular AN-DRG for public acute hospital separations in 1995–96 (Table 32). It ranked 18th highest among all AN-DRGs for public acute hospitals (Australian Institute of Health and Welfare 1997a).

Six of the top 10 cardiovascular AN-DRGs for public acute hospital separations were also among the top 10 for private acute hospital separations in 1995–96 (Table 32). However, the ranking of cardiovascular AN-DRGs differed between the public and private hospitals.

Table 32: The 10 cardiovascular AN-DRGs (V3.0) that account for the highest number of hospital separations by type of hospital, Australia, 1995–96

Hospital type / AN-DRG	Description	Number of separations	% of total separations for hospital type	Average length of stay (days)
Public acute				
252	Heart Failure & Shock	32,700	0.9	9.0
261	Chest Pain	28,088	0.8	2.2
274	Circ Dsr W/O AMI W Invas Card Inves Proc W/O Comp Dx & W/O Maj C	21,252	0.6	1.8
270	Unstable Angina W/O CC	19,432	0.5	3.8
249	Circ Disorders W AMI W/O Invasive Cardiac Inves Proc W/O Major CC	17,521	0.5	6.7
037	Cerebrovascular Disorders Except TIA W CC	13,378	0.4	17.6
256	Coronary Atherosclerosis W/O CC	13,314	0.4	3.5
280	Non-Major Arrhythmia & Conduction Disorders Age>69 or W N-Maj CC	12,564	0.3	4.1
269	Unstable Angina W CC	12,074	0.3	5.5
038	Cerebrovascular Disorders Except TIA W/O CC	11,804	0.3	12.6
Private acute				
274	Circ Dsr W/O AMI W Invas Card Inves Proc W/O Comp Dx & W/O Maj C	15,925	1.0	1.7
239	Vein Ligation & Stripping	9,941	0.6	2.4
252	Heart Failure & Shock	6,594	0.4	11.8
297	Trans-Vascular Percutaneous Cardiac Intervention	5,135	0.3	3.6
261	Chest Pain	4,475	0.3	2.4
291	Coronary Bypass W/O Invasive Cardiac Inves Proc W/O Major CC	3,576	0.2	10.0
273	Circ Dsr W/O AMI W Invas Card Inves Proc W Comp Dx or W Maj CC	3,136	0.2	3.2
280	Non-Major Arrhythmia & Conduction Disorders Age>69 or W N-Maj CC	2,817	0.2	5.0
256	Coronary Atherosclerosis W/O CC	2,742	0.2	7.3
038	Cerebrovascular Disorders Except TIA W/O CC	2,414	0.2	18.8

Notes: AMI—Acute Myocardial Infarction

Card—Cardiac

CC—Complications and Comorbidities

Circ—Circulatory

Comp—Complicated

Dsr—Disorder

Dx—Diagnosis

Invas—Invasive

Inves—Investigation

N—No

Proc—Procedure

TIA—Transient Ischaemic Attack

W—With

W/O—Without

Source: Australian Institute of Health and Welfare 1997a.

Hospital length of stay for cardiovascular disease

'Heart failure and shock' was the leading cardiovascular AN-DRG for public acute hospital patient days in 1995-96 (Table 33). Further, it ranked eighth highest among all AN-DRGs for overall public hospital patient days in that year (Australian Institute of Health and Welfare 1997a).

Other cardiovascular AN-DRGs that featured among the top 20 AN-DRGs for public hospital patient days in 1995-96 were 'cerebrovascular disorders except transient ischaemic attack with complications and comorbidities' (AN-DRG 037), 'circulatory disorders with acute myocardial infarction without invasive cardiac investigation procedure without major complications and comorbidities' (AN-DRG 249), and 'cerebrovascular disorders except transient ischaemic attack without complications and comorbidities' (AN-DRG 038) (Table 33).

For AN-DRG 037 (see above), the most common principal diagnosis in 1995-96 was cerebrovascular accident (ICD-9-CM 436) which accounted for 35.6% of public hospital separations for this group (Commonwealth Department of Health and Family Services 1997b). Just over 51% of public hospital episodes for AN-DRG 037 were for females, and 95% of episodes were for persons aged 50 years and over.

Cerebrovascular accident (ICD-9-CM 436) was the most common principal diagnosis for public hospital episodes of AN-DRG 038 in 1995-96 (Commonwealth Department of Health and Family Services 1997b). Slightly more than half (51.4%) of public hospital separations for AN-DRG 038 were for males, and 86% were for persons aged 50 years and over.

In 1995-96, acute myocardial infarction was the most common principal diagnosis for public acute hospital episodes of AN-DRG 249 (Commonwealth Department of Health and Family Services 1997b). Almost two thirds of public hospital separations for AN-DRG 249 in 1995-96 were for males, and almost 90% were for persons aged 50 years and over.

Only five of the top 10 cardiovascular AN-DRGs for public hospital patient days were among the top 10 for private hospital patient days. 'Heart failure and shock' was the leading cardiovascular AN-DRG for private acute hospital patient days in 1995-96 (Table 33). Further, it ranked 10th highest among all AN-DRGs for private hospital patient days in that year (Australian Institute of Health and Welfare 1997a).

The leading cardiovascular AN-DRGs for average length of stay in 1995-96 were very different from those for separations and patient days (Table 34). 'Cardiothoracic/vascular procedures for neonates' (AN-DRG 704) ranked first for length of stay in public hospitals. 'Amputation for circulatory system except upper limb & toe' (AN-DRG 233) had the highest length of stay in private acute hospitals. Seven of the 10 cardiovascular AN-DRGs with the highest average length of stay in public acute hospitals were also among the top 10 for private acute hospitals.

Table 33: The 10 cardiovascular AN-DRGs (V3.0) that account for the highest number of hospital patient days by type of hospital, Australia, 1995–96

Hospital type / AN-DRG	Description	Number of patient days	% of total patient days for hospital type	Average length of stay (days)
Public acute				
252	Heart Failure & Shock	294,074	1.7	9.0
037	Cerebrovascular Disorders Except TIA W CC	235,796	1.4	17.6
038	Cerebrovascular Disorders Except TIA W/O CC	149,249	0.9	12.6
249	Circ Disorders W AMI W/O Invasive Cardiac Inves Proc W/O Major CC	117,567	0.7	6.7
270	Unstable Angina W/O CC	73,372	0.4	3.8
269	Unstable Angina W CC	65,983	0.4	5.5
261	Chest Pain	61,548	0.4	2.2
291	Coronary Bypass W/O Invasive Cardiac Inves Proc W/O Major CC	59,334	0.3	8.8
280	Non-Major Arrhythmia & Conduction Disorders Age>69 or W N-Maj CC	51,175	0.3	4.1
255	Coronary Atherosclerosis W CC	48,814	0.3	6.6
Private acute				
252	Heart Failure & Shock	77,806	1.3	11.8
038	Cerebrovascular Disorders Except TIA W/O CC	45,294	0.8	18.8
037	Cerebrovascular Disorders Except TIA W CC	43,438	0.7	18.3
291	Coronary Bypass W/O Invasive Cardiac Inves Proc W/O Major CC	35,936	0.6	10.0
274	Circ Dsr W/O AMI W Invas Card Inves Proc W/O Comp Dx & W/O Maj C	26,314	0.4	1.7
239	Vein Ligation & Stripping	24,101	0.4	2.4
256	Coronary Atherosclerosis W/O CC	19,987	0.3	7.3
297	Trans-Vascular Percutaneous Cardiac Intervention	18,495	0.3	3.6
288	Coronary Bypass W Invasive Card Inves Proc Age>64 or W N-Maj CC	17,155	0.3	14.1
255	Coronary Atherosclerosis W CC	15,077	0.3	9.0

Notes: AMI—Acute myocardial infarction

Card—Cardiac

CC—complications and comorbidities

Circ—Circulatory

Comp—Complicated

Dsr—Disorder

Dx—Diagnosis

Invas—Invasive

Inves—investigation

Proc—procedure

TIA—Transient Ischaemic Attack

W—With

W/O—Without

Source: Australian Institute of Health and Welfare 1997a.

Table 34: The 10 cardiovascular AN-DRGs (V3.0) with the highest average length of stay by type of hospital, Australia, 1995–96

Hospital type / AN-DRG	Description	Number of separations	Average length of stay (days)
Public acute			
704	Cardiothoracic/Vascular Procedures for Neonates	284	38.0
233	Amputation for Circ System Except Upper Limb & Toe	1,425	27.3
228	Major Reconstruct Vascular Proc W/O Pump W Major CC	1,302	22.8
221	Cardiac Valve Proc W Pump W Invasive Cardiac Inves Proc W CC	250	19.9
008	Heart Transplant	99	19.3
287	Coronary Bypass W Invasive Card Inves Proc W Major CC	483	18.4
251	Infective Endocarditis	615	17.8
037	Cerebrovascular Disorders Except TIA W CC	13,378	17.6
160	Major Chest Procedures W Major CC	524	17.4
234	Upper Limb & Toe Amputation for Circ System Disorders	682	16.2
Private acute			
233	Amputation for Circ System Except Upper Limb & Toe	260	31.3
228	Major Reconstruct Vascular Proc W/O Pump W Major CC	430	20.7
251	Infective Endocarditis	88	19.3
038	Cerebrovascular Disorders Except TIA W/O CC	2,414	18.8
275	Skin Ulcers for Circulatory Disorders	249	18.5
037	Cerebrovascular Disorders Except TIA W CC	2,374	18.3
221	Cardiac Valve Proc W Pump W Invasive Cardiac Inves Proc W CC	220	17.6
287	Coronary Bypass W Invasive Card Inves Proc W Major CC	350	17.1
257	Hypertension W CC	416	16.4
234	Upper Limb & Toe Amputation for Circ System Disorders	188	15.5

Notes: Card—Cardiac

CC—complications and comorbidities

Circ—Circulatory

Comp—Complicated

Dx—Diagnosis

Invas—Invasive

Inves—investigation

Proc—procedure

TIA—Transient Ischaemic Attack

W—With

W/O—Without

Source: Australian Institute of Health and Welfare 1997a.

Waiting times for elective surgery in Australian public hospitals

The Australian Institute of Health and Welfare has conducted two surveys on elective surgery waiting times, one in 1994 and the other in 1995 (Mays 1995; Moon 1996). These surveys aimed to collect nationally consistent information about elective surgery waiting times in as many public acute hospitals in Australia as possible. The surveys did not collect information about waiting lists or waiting times in private hospitals or for medical or emergency treatment. The results of the 1995 survey are published in the report *Waiting for Elective Surgery in Australian Public Hospitals, 1995* (Moon 1996).

Throughput data for 1995 indicate that overall there were more additions to waiting lists during the survey period than total deletions (total deletions includes admissions for the awaited procedure plus removals for admissions other than admission). This was also true for the specialities of cardiothoracic surgery and vascular surgery.

Thirty per cent of all patients admitted during the survey period were classified as Category 1 patients. The proportions of patients admitted for cardiothoracic surgery, neurosurgery and vascular surgery who were classified as Category 1 patients were 46%, 44% and 44% respectively. For coronary artery bypass graft surgery, 53% of patients admitted were classified as Category 1.

At the census date, 94% of all patients on waiting lists were classified as Category 2 and the remaining 6% as Category 1. Just over 1% of all patients were waiting for cardiothoracic surgery, 2% were waiting for vascular surgery, and another 1% were waiting for neurosurgery. Patients in these 3 speciality groups were more likely to be Category 1 patients compared with the other groups. Eighteen per cent of cardiothoracic patients were classified as Category 1, while 10% of patients in each of the neurosurgery and vascular surgery groups were classified as Category 1. Under 1% of all patients were waiting for coronary artery bypass surgery, and 17% of these were classified as Category 1 patients.

The estimated clearance time for the total waiting lists was 2.7 months. The clearance times for cardiothoracic surgery, coronary artery bypass grafting, and neurosurgery were lower than the aggregate clearance time (1.1 months, 1.4 months and 1.3 months respectively). For patients in the vascular surgery group the estimated clearance time was 2.5 months.

When split by urgency classification the estimated clearance times were:

- All patients – 0.6 months for Category 1 and 3.5 months for Category 2;
- Cardiothoracic surgery – 0.5 months for Category 1 and 1.5 months for Category 2;
- Neurosurgery – 0.4 months for Category 1 and 1.9 months for Category 2;
- Vascular surgery – 0.5 months for Category 1 and 3.9 months for Category 2; and
- Coronary artery bypass graft – 0.6 months for Category 1 and 2.2 months for Category 2.

Admission data indicate that 10.5% of Category 1 patients waited more than 30 days before admission for elective surgery in 1995, and 3.8% of Category 2 patients waited more than 12 months before admission. For cardiothoracic patients, 10.7% of Category 1 patients and 1.0% of Category 2 patients had an extended wait (i.e. Category 1 waited for over 30 days; and Category 2 waited for over 12 months). The corresponding proportions for neurosurgery were 5.5% (Category 1) and 0.6% (Category 2); for vascular surgery were 9.2% (Category 1) and 3.7% (Category 2); and for coronary artery bypass grafting were 13.3% (Category 1) and 1.3% (Category 2).

Box 11: Waiting times explanatory notes

The results presented in this section are a summary of results from Waiting for elective surgery in Australian public hospitals, 1995 (Moon 1996). The information is based on data from all States and Territories except Queensland. Information is available by State and Territory, and by type of hospital (i.e. teaching and non-teaching). However, only national estimates (excluding Queensland) are presented here because of the differences between States and Territories that may affect estimates. These differences are discussed in detail by Moon (1996).

The 1995 survey included data collected by the State and Territory health authorities. Two types of information were collected:

- *information about patients added to and removed from waiting lists during the survey period and, for patients admitted, the lengths of time prior to admission (throughput data); and*
- *information about 'ready for care' patients (i.e. patients who are prepared to accept an offer of a hospital admission or to begin the process leading directly to admission) waiting to be admitted for elective surgery on the census date (census data).*

All States and Territories, except South Australia and Queensland, provided data relating to the period 1 January 1995 to 30 June 1995. For South Australia the survey period was 1 February 1995 to 31 July 1995. Data for Queensland covered the period 1 October to 30 November 1995; however, due to the difference in survey period Queensland data are not comparable with those obtained from the other States and Territories. For all States and Territories, the census date fell on the last day of the survey period.

The 1995 survey collected throughput and census data for 11 surgical specialties – cardiothoracic; ear, nose and throat; general; gynaecology; neurosurgery; ophthalmology; orthopaedic; plastic/reconstructive; urology; vascular; and other (refers to data about elective surgery patients who were not classified into one of 10 categories). In addition, data are collected for 15 indicator procedures, one of which is coronary artery bypass graft.

There are two urgency categories:

- *Category 1 – admission desirable within 30 days; and*
- *Category 2 – admission desirable within 31 days and over (there is no time limit placed on Category 2 patients).*

Clearance time is the theoretical length of time that it would take to clear the waiting list of all patients waiting at a point in time if the rate of clearance remained constant and patients could be treated at any hospital. It is calculated as the number of patients waiting at a point in time (the census count) divided by the mean number cleared (admitted and removed) from the waiting list per month. Where the clearance time for patients is longer than the desirable maximum wait (30 days for Category 1 patients), the system is unlikely to provide timely care for all patients.

At the census date, an estimated 27% of all Category 1 patients were overdue for surgery (i.e. had been on an elective surgery waiting list for more than 30 days), and 11% of all Category 2 patients had been on waiting lists for more than 12 months. Proportionately less patients were overdue for cardiothoracic surgery (14% Category 1 and 3% Category 2), coronary artery bypass surgery (20% Category 1 and 2% Category 2) and neurosurgery (11% Category 1 and 8% Category 2). For vascular surgery, 19% of Category 1 patients and 22% of Category 2 patients were overdue for surgery at the census date.

Cardiothoracic transplants

The Australian and New Zealand Cardiothoracic Organ Transplant Registry has collected information about all heart and heart-lung transplants performed in Australia and New Zealand since February 1984, when heart transplants were first done in Australia. Annual reports are produced, the latest of which covers the period from February 1984 to December 1996 (Australian and New Zealand Cardiothoracic Organ Transplant Registry 1997). The transplant units which supply data to the register are Alfred Hospital (Melbourne), Prince Charles Hospital (Brisbane), Royal Children's Hospital (Melbourne), Royal Perth Hospital, St Vincent's Hospital (Sydney) and Green Lane Hospital (Auckland). These are the only units performing heart transplant surgery in Australia and New Zealand.

Since 1984, there have been 919 heart transplants performed in Australia (Table 35). The age of recipients ranges from 1 to 68 years with a mean age of 45 years. Over 80% of recipients are males.

Table 35: Number of heart and heart-lung transplants, Australia, 1986–1996

Type of transplant	Year													Total
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	
Heart ^(a)	14	19	32	28	51	85	97	98	104	106	94	101	90	919
Heart-lung	0	0	1	1	2	14	12	19	18	13	13	13	7	113

(a) Includes 3 heterotopic transplants.

Source: Australian and New Zealand Cardiothoracic Organ Transplant Registry, 1997.

The main diagnoses for which heart transplants have been performed since 1984 are coronary artery disease (41%) and idiopathic cardiomyopathy (39%). Other diagnoses are congenital heart disease (5%), myocarditis (3%), familial cardiomyopathy (2%), peripartum cardiomyopathy (2%), and miscellaneous (9%).

Since 1984, the average waiting time for heart transplants has tended to increase (Table 36). It is important to bear in mind that waiting times for heart transplants are affected by the availability of a suitable donor organ, and do not necessarily reflect resource constraints. Overall, the average waiting time was 122 days with a range of 1 to 1,687 days. In contrast, average length of stay for heart transplants has decreased since 1984 (Table 36). Currently, the average length of stay is 17 days.

Actuarial survival rates for Australian and New Zealand heart transplant recipients are 87% at one year, 84% at two years and 77% at five years.

There have been 113 heart-lung transplants performed in Australia since 1984 (Table 35). The mean age of heart-lung transplant recipients is 33 years (range 11–52), and 48% of recipients are males.

The main diagnoses leading to heart-lung transplants performed since 1984 are primary pulmonary hypertension (28%) and Eisenmenger's syndrome (25%). Congenital heart disease was the main diagnosis for 13% of heart-lung transplants.

Actuarial survival rates for Australian heart-lung transplant recipients are 79% at one year, 72% at two years and 43% at five years.

Table 36: Average waiting time and average length of stay for heart transplants by year of transplant, Australia and New Zealand, 1984–1996

Year	Waiting time (days)			Length of stay (days)		
	Mean	Standard deviation	Min-max	Mean	Standard deviation	Min-max
Days						
1984	44	77	4–295	50	14	32–79
1985	48	54	3–209	72	100	2–383
1986	71	78	3–295	29	16	3–88
1987	61	80	3–424	27	16	1–58
1988	77	103	1–400	27	18	1–106
1989	85	86	1–445	25	24	1–199
1990	99	154	1–842	23	20	1–107
1991	102	129	1–633	22	39	1–379
1992	88	119	1–790	20	14	2–87
1993	118	129	1–626	19	35	1–373
1994(a)	185	205	1–876	16	13	1–62
1995(b)	184	200	3–835	16	10	1–61
1996	165	195	2–>1000	17	14	1–93

(a) 1 patient who waited 1403 days was not included in the mean data for waiting time.

(b) 3 patients who waited 1005, 1117, 1687 days were not included in the mean data for waiting time.

Source: Australian and New Zealand Cardiothoracic Organ Transplant Registry, 1997.

Newcastle MONICA project

The Newcastle MONICA Project was part of a World Health Organization international epidemiological project which monitored trends and determinants in cardiovascular disease over a 10-year period.

The Newcastle MONICA centre collected data on all suspected cases of heart attack or coronary death among residents aged 25 to 69 years in the local government areas of Newcastle, Lake Macquarie, Maitland, Cessnock and Port Stephens.

Results from the Newcastle MONICA study have been published in two reports – *Newcastle MONICA Data Book – Coronary Events 1984–1994* and *Newcastle MONICA Data Book – Acute Care 1984–1994* (Steele & McElduff 1995a; Steele & McElduff 1995b). A coronary event was defined as a MONICA diagnosis of non-fatal definite myocardial infarction (MI), non-fatal possible MI, fatal definite MI, fatal possible MI or fatal coronary events with insufficient information for further classification. A fatal event is defined as one in which the patient was dead 28 days after the date of onset of symptoms.

Acute care data have been published for the following time periods (Steele & McElduff 1995b):

- August 1984– December 1985
- July 1988– December 1989
- 1990 – calendar year
- 1991 – calendar year
- 1992 – calendar year

- 1993 – calendar year
- January 1994–March 1994.

Acute coronary care 1984–94

Most coronary events registered in the Newcastle MONICA Project were managed in hospital (Table 37). An average of 16% of coronary events were medically unattended. The proportion of events managed in hospital tended to increase over the data registration period, while the proportion of those that were medically unattended generally fell.

Table 37: Place of management for patients suffering coronary events, persons aged 25 to 69 years, Newcastle, 1984–1994

Place of management	Year										
	1984 ^(a)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994 ^(b)
	Number of events										
In hospital	235	893	1,005	1,092	1,007	1,019	1,053	984	991	1,056	245
In nursing home	1	6	10	12	8	4	6	5	4	11	2
At home by doctor	1	2	0	0	2	0	0	0	0	0	0
Medically unattended	55	186	227	215	192	213	196	182	180	149	25
Other medical consultation without bed rest, in hospital or at home	7	13	0	4	2	0	5	8	5	1	0
Insufficient data	14	52	21	12	14	0	0	0	0	0	0
Total	313	1,152	1,263	1,335	1,225	1,236	1,260	1,179	1,180	1,217	272
	Per cent of events										
In hospital	75.1	77.5	79.6	81.8	82.2	82.4	83.6	83.5	84.0	86.8	90.1
In nursing home	0.3	0.5	0.8	0.9	0.7	0.3	0.5	0.4	0.3	0.9	0.7
At home by doctor	0.3	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Medically unattended	17.6	16.1	18.0	16.1	15.7	17.2	15.6	15.4	15.3	12.2	9.2
Other medical consultation without bed rest, in hospital or at home	2.2	1.1	0.0	0.3	0.2	0.0	0.4	0.7	0.4	0.1	0.0
Insufficient data	4.5	4.5	1.7	0.9	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) From 27 August 1984.

(b) To 31 March 1994.

Source: Steele & McElduff 1995a.

Approximately two thirds of patients suffering coronary events were admitted to a coronary (cardiac) care or intensive care unit (Table 38). The average length of stay in a coronary care unit tended to increase over the data registration period (Table 39). In contrast the average length of stay in hospital tended to decrease (Table 39).

Table 38: Admission to coronary (cardiac) care or intensive care unit for patients suffering coronary events, persons aged 25 to 69 years, Newcastle, 1984–1994

Admission to coronary (cardiac) care or intensive care unit	Year						
	1984–85	1988–89	1990	1991	1992	1993	1994
Number of events							
Yes	884	1,080	813	805	715	717	180
No	194	250	228	173	266	331	61
Did not go to hospital	243	335	207	193	188	159	26
Unknown	144	202	12	8	11	10	5
Total	1,465	1,867	1,260	1,179	1,180	1,217	272
Per cent of events							
Yes	60	58	65	68	61	59	66
No	13	13	18	15	23	27	22
Did not go to hospital	17	18	16	16	16	13	10
Unknown	10	11	1	1	1	1	2
Total	100	100	100	100	100	100	100

Source: Steele & McElduff 1995b.

Table 39: Days in hospital for patients suffering coronary events, persons aged 25 to 69 years, Newcastle, 1984–1994

	Year						
	1984–85	1988–89	1990	1991	1992	1993	1994
Duration in coronary care unit							
Number of cases	884	1077	812	801	713	716	180
Mean (days)	2.8	3.1	3.2	3.3	3.6	4.0	3.9
Standard deviation (days)	2.5	2.7	2.4	2.6	2.7	3.2	3.5
Number of days in hospital altogether							
Males							
Number of cases	691	862	702	676	684	713	167
Mean (days)	9.4	7.9	7.4	6.7	6.7	6.8	6.9
Standard deviation (days)	5.7	5.2	5.0	5.1	4.9	5.2	5.4
Females							
Number of cases	315	386	319	286	294	330	75
Mean (days)	9.5	7.3	7.7	6.9	6.8	7.4	6.4
Standard deviation (days)	6.8	5.7	5.5	5.1	5.5	5.4	4.9
Persons							
Number of cases	1006	1248	1021	962	978	1043	242
Mean (days)	9.4	7.7	7.5	6.8	6.7	7.0	6.7
Standard deviation (days)	6.0	5.4	5.2	5.1	5.1	5.2	5.2

Source: Steele & McElduff 1995b.