

Appendix A: Classification of cardiovascular diseases and diabetes

Diseases and injury are classified using the Ninth Revision of the World Health Organisation's International Classification of Disease (ICD-9). The disease categories used in this report are defined by groups of ICD-9 codes as shown in Table A.1. The International Classification of Primary Care (ICPC) codes used in the GP survey and the condition codes used in the 1989–90 National Health Survey (NHS) are mapped across to the ICD-9 codes as shown in Table A.1.

Treatment and prevention

The Disease Costs and Impact Study 1993–94 has attempted to classify health system costs for each disease group into two categories: treatment and prevention. Treatment includes all health system activities relating to the diagnosis, treatment, rehabilitation and palliation for diseases, injuries and symptoms. Prevention includes all activities relating to the primary prevention of diseases, including screening for asymptomatic disease. It is important to note that prevention will include some activities within the medical, hospital and allied health sectors as well as the public health sector.

The 1990–91 Survey of Morbidity and Treatment in General Practice in Australia (Bridges-Webb et al. 1992) collected up to four diagnoses for each patient encounter as well as pathology tests and imaging ordered, but did not link the latter tests to particular diagnoses. Screening and diagnostic tests are often not specific to a particular disease group, and the costs of such tests were attributed equally to all diagnoses in encounters where multiple diagnoses were given. Also, the ICPC codes do not always distinguish between preventive and diagnostic screening. As a result, some disease prevention activities in primary care will be costed in the general prevention category and the general treatment category (not specific to an ICD-9 chapter) and will not be included in the costs reported for specific disease groups at the ICD-9 chapter level. In addition, the majority of public health and community health expenditure has not yet been included in the Disease Costs and Impact Study.

For cardiovascular diseases, only \$11.6 million (or 0.3% of total expenditure) was identified as specifically for prevention—it is not possible to distinguish most preventive clinical activity from diagnosis or treatment with the available data sources. The expenditure on CVD prevention is almost certainly a significant underestimate, and for this reason, total health system costs for cardiovascular disease and diabetes have not been disaggregated into prevention and treatment categories for this report.

Table A.1: Classification of cardiovascular diseases and diabetes, 1993–94

Disease category	ICD-9 codes	ICPC codes	NHS codes
Diabetes mellitus	250	T90	78
Non-insulin dependent	250_0	(a)	78 ^(a)
Insulin dependent	250_1	(a)	78 ^(a)
Hypoglycemia and hyperinsulinism	251	T87	106
High blood cholesterol	272.0	T93 (% based on NHS)	108
Rheumatic heart disease	390–398	K71	19 ^(f) , 82 ^(f)
Hypertensive disease	401–405	K86, K87	72
Hypertension	401	K86	
Hypertension with organ involvement	402–405	K87	
Ischaemic heart disease	410–414	K74–K76	82 ^(f)
Acute myocardial infarction	410	K75	
Other	411–414	K74, K76	
Pulmonary circulatory diseases	415–417	K82, K93, K84 ^(b)	82 ^(f)
Other forms of heart disease	420–429		82 ^(f)
Cardiomyopathy, myocarditis, endocarditis, pericarditis	425	K70 ^(b) , K84 ^(b)	
Other diseases pericardium	423	K84 ^(b)	
Non-rheumatic valvular disease	424	K83, K84 ^(b)	
Cardiac dysrhythmias	426–427	K78–K80, K84 ^(b)	
Heart failure	428	K77	
Ill-defined heart disease	429	K70 ^(c) , K84 ^(b)	
Cerebrovascular disease	430–438	K89, K90, K92 ^(d)	119, 219
Diseases of arteries, arterioles and capillaries	440–448		
Atherosclerosis	440	K91	15
Aortic aneurysm	441	K99 ^(e)	19 ^(f)
Other peripheral arterial disease	440, 442–448	K92 ^(d) , K99 ^(e)	19 ^(f)
Diseases of veins, lymphatics and other diseases of the circulatory system	451–459		
Phlebitis and thrombophlebitis	451	K94	17 ^(f)
Varicose veins of leg	454	K95	17 ^(f)
Hemorrhoids	455	K96	18
Other diseases of circulatory system	452, 453, 456–459	K70 ^(c) , K88, K99 ^(e)	17 ^(f) , 19 ^(f)
Unspecified treatment and aftercare	V12.5, V15.1, V42.1, V42.2, V43.2, V43.3, V43.4, V45.0, V45.8, V53.3, V71.7	K28–K29	
Prevention and screening	V17.1, V17.3, V17.4, V81.0, V81.1, V81.2	K24–K27	

(a) Distributed according to type 1 and 2 distribution of diabetics who visited a doctor in last 2 weeks in the ABS National Health Survey (refer to text for more information). Types 1 and 2 are specified by the fifth digit of ICD-9 code 250.

(b) Distributed according to hospital separations for ICD 417 (pulmonary), 425 (cardiomyopathy), 423 (other diseases of the pericardium), 424 (valvular), 426–427 (dysrhythmias), 429 (ill-defined).

(c) Distributed according to hospital separations for ICD 420–422 (cardiomyopathy etc), 429.89 (ill-defined heart disease), 459.9 (other diseases of the circulatory system).

(d) Distributed according to hospital separations for ICD 433+437 (cerebrovascular), 443+444 (other peripheral artery).

(e) Distributed according to hospital separations for ICD 442+446, 447, 448 (other peripheral artery), 456+457+459 (other diseases of the circulatory system).

(f) Distributed in proportion to hospital separations.

Attribution of medical costs to high blood cholesterol

The ICPC does not have a specific code for high blood cholesterol. Code T93 covers all lipid metabolism disorders. Data from the 1989–90 National Health Survey on numbers of doctor visits for ‘high cholesterol’ and ‘other endocrine, metabolic, nutritional and immunity disorders’ were used to estimate the proportion of visits coded to T93 which were attributable to high cholesterol. These proportions are shown in Table A.2. Medicare claims data for 1993–94 were used to estimate the pathology costs associated with high cholesterol separately (\$18.1 million—see Appendix B and Table B.1). Costs associated with GP services (\$15.3 million) and with other specialist medical services (\$9.0 million) were estimated using the fractions shown in Table A.2 and are given in full in Table C.26.

Table A.2: Proportion of GP visits for lipid metabolism disorders (T93) attributed to high blood cholesterol

Age group	Males	Females
0–4	0.00	0.00
5–14	0.00	0.00
15–24	0.08	0.08
25–34	0.20	0.40
35–44	0.40	0.50
45–54	0.86	0.86
55–64	0.86	0.86
65–74	0.44	0.44
75+	0.44	0.44

Diabetes Types 1 and 2

Diabetes mellitus is recorded as code T90 in the GP survey. Type 1 (insulin dependent) and Type 2 (non-insulin dependent) diabetes were not identified separately. The 1989–90 methodology used the proportion of Type 1 diabetes in hospital inpatients to estimate the proportion of GP visits attributable to Type 1. This fraction was around 50%.

The 1995 National Health Survey obtained self-report data on diabetes Type 1 and Type 2 as a long-term conditions and as a reason for doctor visits in the last two weeks. Overall, 11% of people who reported that they had diabetes were classified as Type 1. Among those people who visited the doctor in the last two weeks, a considerably higher proportion were classified as Type 1. As the total numbers of people involved was quite small (87 respondents), a single proportion for both sexes was estimated for each age group as shown in Table A.3.

Table A.3: Proportion of GP visits for diabetes (T90) attributed to Type 1 diabetes

	Age group								
	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75+
Type 1 proportion	1.00	1.00	1.00	0.60	0.50	0.40	0.30	0.40	0.45

Complications attributable to Type 2 diabetes

Crowley et al. (1992) estimated the costs of long-term complications for Type 2 diabetes (non-insulin dependent) using attributable fractions based on United States estimates by Huse et al. (1989). These attributable fractions are shown in Table A.4 and are used in Section 4 of this report to estimate total health system costs attributable to diabetes mellitus.

The appropriateness of these fractions to Australia depends on the prevalence rates of Type 2 diabetes and of the Type 2 diabetes-related conditions listed in Table A.4. The reported prevalence by age and sex of Type 2 diabetes in Australia in 1995 is broadly comparable but somewhat lower than that for the US population in 1984–86. Improving the reliability of such estimates will require estimation of the relevant attributable fractions based on Australian data. This is being undertaken as part of an Australian Burden of Disease Study currently being carried out by the Australian Institute of Health and Welfare.

Table A.4: Per cent of prevalence of complications attributable to Type 2 diabetes by age and sex

Condition	ICD-9 codes	<65 years old		65 years and over	
		Males	Females	Males	Females
Circulatory disorders		%	%	%	%
Hypertension	401–405	2.0	2.2	4.1	6.4
Ischaemic heart disease	410–414	4.8	6.8	8.4	9.8
Cerebrovascular disease	430–438	4.8	5.0	17.0	10.1
Heart failure	428, 429.2–429.3, 429.9	4.8	6.8	8.4	9.8
Atherosclerosis	440	6.1	5.3	11.5	10.0
Peripheral vascular disease	443, 459.8–459.9	6.1	5.3	11.5	10.0
Visual disorders					
Glaucoma	365	7.5	8.4	9.5	9.8
Cataract	366	5.0	5.6	5.7	5.9
Blindness	369	11.6	12.9	48.1	49.1
Other disorders					
Nephropathy ^(a)	580–586	18.0	18.0	18.7	19.3
Chronic skin ulcer	707	5.0	5.6	26.9	27.6
Absence of extremities	736	3.1	3.5	18.5	19.1

(a) Huse et al. estimated the attributable fractions for nephropathy to be 3.2% and 3.6% for males and females aged under 65 years. Data from the Australian and New Zealand Dialysis and Transplant Register for 1996 indicate that 18.5% of new patients had diabetic nephropathy as the primary renal disease, and this proportion was higher for patients under 65 years than for those aged 65 and over (Disney 1997). For this reason, the attributable fractions for nephropathy under age 65 were adjusted to 18% for both males and females.

Source: Huse et al. (1989).