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Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.

Contents

Preface

This report provides an overview of total health expenditure on disease and injury in Australia during 2004–05, using the best achievable estimates based on currently available data sources. Some of the methodologies used have been revised since a previous report based on 2000–01 data. Despite this, the data sources used for the estimations have mainly remained the same, and comparisons between the two reports are possible for selected areas of expenditure.

These numbers provide a useful picture of health expenditure according to the clinically relevant category of disease. However, the proportion of health expenditure spent on a disease should not be used as an argument as to how much ought to be spent for that disease. The existing expenditure on a disease, no matter how large or small, does not in itself give an indication of the loss of health due to that disease, or the priority for intervention or need for additional health services expenditure. Resource allocation decisions require information not only on average costs and outcomes but also on the marginal costs and marginal outcomes associated with the specific interventions under consideration.

I trust that the information in this report will nevertheless inform future considerations of health resource allocation. Comments from readers are welcome.

Penny Allbon
Director
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Acknowledgments and authorship

This report was prepared by Gail Brien, Brett Rogers, John Sant and John Goss. Rebecca Bennetts and John Shelton Agar extracted the expenditure data used in the report and provided advice on content. John Goss also provided analytical and editorial comment. Nick Mann carried out the analysis of the Institute's National Hospital Morbidity Database, which was the basis for the allocation of hospital expenditure. He also extracted and prepared the data from BEACH (Bettering the Evaluation and Care of Health survey of general practice activity) used in the analysis of expenditure on out-of-hospital medical services.

In addition to providing valuable advice on the interpretation of the BEACH data, Helena Britt and Clare Bayram, of the Australian General Practice Statistics and Classification Centre, prepared a mapping from the International Classification of Primary Care Version 2 (ICPC-2), which is used to classify health conditions in the BEACH data, to the Burden of Disease condition categories used in this study.

Abbreviations

AIHW	Australian Institute of Health and Welfare
ATC	Anatomical Therapeutic Chemical
BEACH	Bettering the Evaluation and Care of Health survey of general practice activity
BoD	Burden of Disease
DALY	Disability-adjusted life year
DRG	Diagnosis Related Group
ICD-10	International Classification of Diseases Tenth Revision
ICPC-2	International Classification of Primary Care Version 2
NHPAs	National Health Priority Areas
PBS	Pharmaceutical Benefits Scheme
RPBS	Repatriation Pharmaceutical Benefits Scheme

Symbols

. .	not applicable
–	nil or rounded down to zero

Summary

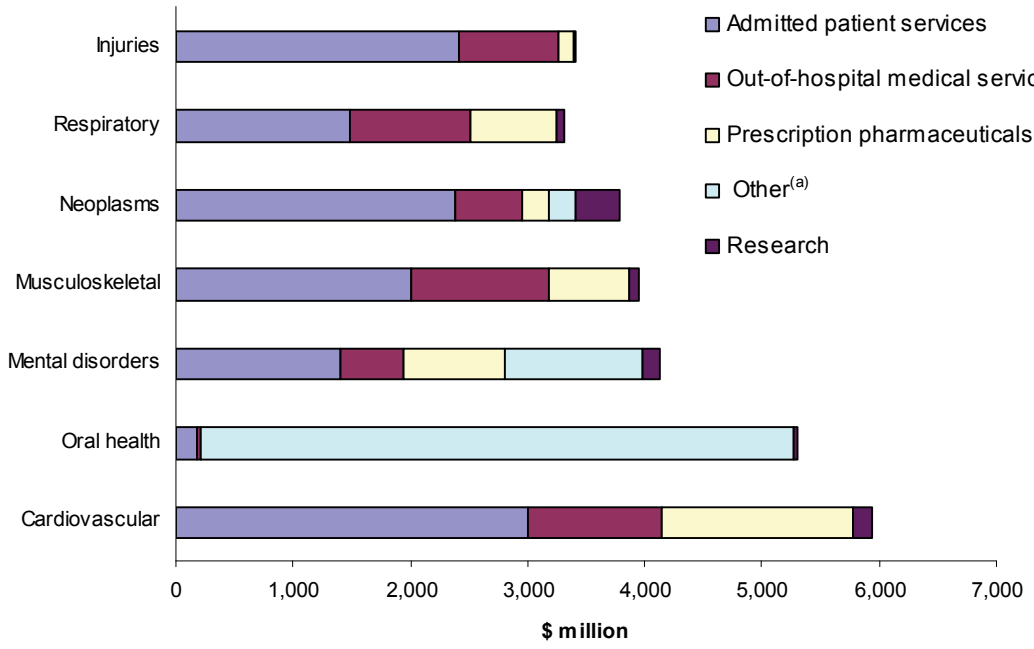
This report is the third in the Australian Institute of Health and Welfare's (AIHW) disease expenditure series and provides a systematic analysis of Australian health expenditure in 2004–05, allocated by disease. Disease and injury groups are defined as in the second Australian Burden of Disease (BoD) study (Begg et al. 2007).

Over two thirds (70%) of total recurrent health expenditure was able to be allocated by disease, or $52.7 billion in total. That expenditure was for admitted patient hospital services, out-of-hospital medical services, dental services, optometrical services, prescription pharmaceuticals, community mental health services, public health cancer screening services and research.

Main disease groups

In 2004–05, the following seven disease groups accounted for more than half (57% or $29.8 billion) of allocated health expenditure in Australia (Figure 1 and Table 2.4):

- cardiovascular diseases—$5.9 billion (11% of total allocated health expenditure)
- oral health—$5.3 billion (10%)
- mental disorders—$4.1 billion (8%)
- musculoskeletal diseases—$4.0 billion (8%)
- neoplasms—$3.8 billion (7%)
- injuries—$3.4 billion (7%)
- respiratory diseases—$3.3 billion (6%).



(a) Includes dental services, community mental health and cancer screening programs.

Source: AIHW disease expenditure database.

Figure 1: Expenditure on disease by type of health service for selected broad disease groups, 2004–05 ($ million)

Expenditure on National Health Priority Area conditions

Expenditure on the seven conditions agreed by Australian Health Ministers as National Health Priority Areas (NHPAs) was $22.8 billion, or 43% of total allocated health expenditure (Table 2.5).

Five of the seven NHPAs ranked within the top seven groups listed above—cardiovascular diseases, mental disorders, musculoskeletal diseases, neoplasms and injuries.

Health expenditure by age and sex

Health care costs are generally higher for older people because of the increased levels of chronic diseases and greater numbers with life-threatening illnesses in these age groups. In 2004–05, over one-fifth (21%) of total allocated health expenditure ($11.0 billion) was for people aged 75 years and older (Table 2.7).

In 2004–05, allocated health expenditure was 18% higher for females than for males—$28.6 billion compared with $24.1 billion.

On a per person basis, allocated health expenditure was:

- higher overall for females than for males—$2,781 for females compared with $2,380 for males. If maternal conditions are excluded, expenditure was $2,618 or 10% higher than for males (Table 2.8)
- higher for females than males for musculoskeletal diseases and genitourinary disorders, but lower for the cardiovascular and injury groups (Figure 2.5)
- higher for males in the early stages of life (up to 14 years of age) (Figure 2.6), mainly due to a higher incidence of congenital conditions and chronic illnesses, such as asthma (Begg et al. 2007)
- higher for females for all age groups between 15–24 years and 45–54 years (Figure 2.6), even when maternal conditions are excluded
- higher for males for all age groups 55 years and older (Figure 2.6), due in part to higher expenditure for cardiovascular diseases and neoplasms.

In a previous report of 2000–01 disease expenditures (AIHW 2005), allocated health expenditure per person was higher for females aged 85 years and over than for males in the same age group. This was because, in contrast to this report, expenditure on residential aged care was included in the analysis—an area where more females receive care.

Changes in health expenditure by disease, 2000–01 to 2004–05

A number of changes to the methods for allocating expenditure by disease since the 2000–01 report means that estimates between the two time periods are only comparable for admitted patient hospital services, out-of-hospital medical services and prescription pharmaceuticals. Between 2000–01 and 2004–05, adjusted for inflation, average growth in allocated health expenditure for these three comparable areas was 20% (or $7.2 billion).

Taking into account only the three comparable areas of expenditure between this report and the previous one, above-average growth was recorded for the following disease groups:

- endocrine, nutritional and metabolic (32%)
- musculoskeletal (26%)
- diabetes mellitus (26%)
- neoplasms (23%), and
- injuries (22%).

On a per person basis and adjusted for inflation, allocated health system expenditure averaged $2,170 in 2004–05, which was $249, or 13%, higher than in 2000–01. Allocated expenditure was also higher in 2004–05 than in 2000–01 for every age group.

1 Introduction

This report provides a detailed picture of how health expenditure in Australia for 2004–05 is distributed among disease and injury groups, by age and sex, and for the seven National Health Priority Areas. The report also analyses changes in selected areas of health expenditure between 2000–01 and 2004–05.

The background to this report is presented in this chapter. Chapter 2 presents disease expenditure estimates for the variables listed above and for the following areas of expenditure—admitted patient hospital services, out-of-hospital medical services, dental services, optometrical services, prescription pharmaceuticals, community mental health services, public health cancer screening services and research. Chapter 2 also shows a comparison with 2000–01 disease expenditure estimates (AIHW 2005).

Chapter 3 contains information on use and interpretation of the expenditure estimates used in this report and a description of data methods and sources for each area of expenditure. It also describes changes in methodology since the 2000–01 report.

1.1 Background

The expenditure on disease as presented in this report is an example of a satellite national account. Satellite accounts enable the linkage of non-monetary data sources and analysis to the monetary accounting system. In health, such accounts were first proposed by Stone in 1975 (United Nations 1975). The UN System of National Accounts 1993 introduced the concept of satellite accounts as a way of going beyond the rigidities of the National Accounts structure to provide a focus on data which is of relevance to specific policy areas (CEC et al. 1993).

Monetary expenditure on health services by itself does not tell us what is happening in the health system or about priorities for funding or interventions. If, however, these expenditures can be linked to output and outcome measures (such as number of hospital admissions and changes in health status) the expenditure information becomes more meaningful, especially if analysed by disease categories.

Expenditure data, output data and burden of disease data together provide a broad picture of the workings of the health system. For example, over time, expenditure on cancer treatment and prevention can be compared with the changes in the number of hospital separations, medical services used and pharmaceuticals dispensed for cancer, and with improvements in health status (see for example AIHW 2008; AIHW & AACR 2007; Britt et al. 2008).

Disease expenditure estimates, therefore, provide a useful description of the use and costs of health services in Australia, as well as a reference source for planners and researchers interested in costs and use patterns for particular disease groups. This report will be of interest to anyone involved in resource allocation, including health policy makers at Australian Government and state and local government levels, health planners and administrators, community and hospital practitioners and academic researchers, as well as the general public.

1.2 Previous reports

Since the 1990s, there have been several Australian studies on the cost of disease and injury, as well as on the disability and death arising from these diseases and injuries. The first detailed Australian study of expenditure across disease and injury groups was for 1993–94 (AIHW: Mathers et al. 1998a). That study classified disease and injury according to the codes and major chapter groupings of the International Classification of Diseases Ninth Revision (AIHW: Mathers et al. 1998b). It reported on the treatment costs of disease (and some prevention costs) by area of expenditure (that is, hospitals, nursing homes, medical services, other health practitioner services, and pharmaceuticals) and by age and sex groups.

Information on disability and death arising from disease and injury was published as part of the Australian Burden of Disease and Injury (BoD) studies. The first report provided estimates for Australia for 1996 (AIHW Mathers et al. 1999). That study classified disease and injury according to International Classification of Diseases Ninth Revision codes, but reported its estimates under groupings that more closely related to burden of disease and injury (BoD) chapter groupings. The report provided detailed estimates of the burden of mortality and disability for each disease and injury category by sex and age. It also assessed the burden attributable to each of ten major risk factors and inequalities in the disease burden associated with socioeconomic disadvantage. These estimates were updated through joint work by the University of Queensland and the AIHW and were released in 2007 (Begg et al. 2007). The estimates were based on International Classification of Diseases Tenth Revision (ICD-10) codes and used BoD chapter groupings.

A follow-up to the 1993–94 disease expenditure report, which covered 2000–01 disease expenditure data, was released in 2005. This report was based on ICD-10 codes and used chapter groupings as used in the second BoD study (Begg et al. 2007). This current report uses the same classification (see *Chapter 3 Technical notes* for further information on the method).

2 Results

Health expenditure in Australia includes expenditure funded by the Australian Government, state and territory governments, by private health insurance and by individuals and households.

In 2004–05, estimated total health expenditure was $81.1 billion—an increase of 33% from $60.9 billion in 2000–01 (tables 2.1 and 2.2). Recurrent health expenditure, which excludes capital expenditure and capital consumption, was $75.2 billion in 2004–05—a 31% increase since 2000–01.

Not all health expenditure can be allocated to disease and injury groups. In 2004–05, expenditure not allocated by disease included capital expenditure and capital consumption, and expenditure on non-admitted patients, over-the-counter pharmaceuticals, patient transport (ambulance), other health practitioner services apart from optometrical services (out-of-hospital non-medical health services), health aids and appliances and health administration. The community mental health portion of community health was allocated to mental health, and the cancer screening portion of public health was allocated to neoplasms, but other areas of community and public health could not be allocated by disease. Welfare expenditures, such as on the Home and Community Care program and on high- and low-level residential aged care were not included.

Several areas of expenditure included in the 2000–01 expenditure estimates have not been included in this analysis (see *Changes from the 2000–01 report* in Technical notes). As a result, comparisons between the two periods are only possible for the hospital, medical and pharmaceutical areas of expenditure. It is important to note that all comparisons with 2000–01 presented in this report refer only to the three areas of expenditure common to both reports.

2.1 Allocated expenditure

In 2004–05, the amount of recurrent health expenditure able to be allocated to disease and injury groups was $52.7 billion, or 70% of total recurrent health expenditure (Table 2.1). This was a lower proportion of recurrent health expenditure than was able to be allocated in 2000–01 (88%) for two reasons. For 2000–01, expenditure on non-admitted patients, over-the-counter pharmaceuticals and all other health practitioners was able to be allocated to disease and injury groups (Table 2.2). In addition, the 2000–01 report used a different definition of health, which included high-level residential aged care (see Technical notes for further information).

The disease expenditure data presented in this report can be reconciled against the areas of health expenditure used in *Health expenditure Australia 2005–06* tables, which contain 2004–05 data (AIHW 2007a). The majority of recurrent health expenditure in 2004–05 was for allocated expenditure on admitted patient hospital services (29%), out-of-hospital medical services (16%), prescription pharmaceuticals (11%) and dental (7%). The amount of unallocated recurrent health expenditure was highest for non-admitted patient expenditure (9%) and over-the-counter pharmaceuticals (4%) (Table 2.3).

Table 2.1: Total health expenditure in Australia, 2004–05 ($ million)

Expenditure	2004–05	Proportion of total recurrent expenditure (per cent)
Recurrent health expenditure allocated by disease and injury	**52,660**	70.0
Unallocated recurrent expenditure		
Non-admitted patient expenditure	*6,944*	9.2
Over-the-counter pharmaceuticals[(a)]	*3,022*	4.0
Ambulance	*1,413*	1.9
Other health practitioners[(b)]	*2,574*	3.4
Aids and appliances	*2,610*	3.5
Community and public health[(c)]	*3,592*	4.8
Administration	*2,382*	3.2
Total unallocated	**22,537**	30.0
Total recurrent expenditure	**75,196**	**100.0**
Capital expenditure/outlays	4,669	. .
Capital consumption	1,260	. .
Total health expenditure	**81,125**	. .

(a) Also includes injury compensation insurers' payments and some DoHA administered expense items.

(b) Excludes 'optometry' as this has been included in allocated recurrent health expenditure.

(c) Excludes expenditure for community mental health services ($1,177m) and public health cancer screening ($222m).

Note: Components may not add to totals due to rounding.

Source: AIHW Health expenditure and Disease expenditure databases.

Table 2.2: Total health expenditure in Australia, 2000–01 ($ million)

Expenditure	2000–01	Proportion of total recurrent expenditure (per cent)
Recurrent health expenditure allocated by disease and injury	**50,146**	87.5
Unallocated recurrent expenditure		
Ambulance	*994*	1.7
Aids and appliances	*2,108*	3.7
Community and public health[(a)]	*2,123*	3.7
Administration	*1,924*	3.4
Other non-institutional not elsewhere classified[(b)]	*1*	—
Total unallocated	**7,150**	12.5
Total recurrent expenditure	**57,297**	**100.0**
Capital expenditure/outlays	2,631	. .
Capital consumption	970	. .
Total health expenditure	**60,897**	. .

(a) Excludes expenditure for community mental health services ($842m) and public health cancer screening ($130m).

(b) 'Other non-institutional not elsewhere classified' is included in 'Community and public health' for 2004–05.

Note: Components may not add to totals due to rounding.

Source: AIHW Health expenditure and Disease expenditure databases.

Table 2.3: Total allocated recurrent health expenditure in 2004–05 by type of expenditure with reconciliation to areas of expenditure used in *Health expenditure Australia 2005–06*

	2004–05 ($ million)	Proportion of total (per cent)
Allocated recurrent health expenditure		
Hospitals	24,221	32.2
Admitted patient hospital services	21,474	28.6
Private medical services in-hospital[(a)]	2,746	3.7
Out-of-hospital medical services[(a)]	11,900	15.8
Unreferred attendances MBS	3,693	4.9
Imaging MBS	1,595	2.1
Pathology MBS	1,397	1.9
Specialist and other MBS	2,755	3.7
Other medical	2,460	3.3
Pharmaceuticals requiring a prescription	8,144	10.8
Benefit paid pharmaceuticals[(b)]	7,081	9.4
Under co-payment prescriptions[(c)]	520	0.7
Private prescriptions[(c)]	543	0.7
Other health practitioners (Optometry)	218	0.3
Dental	5,064	6.7
Community mental health[(d)]	1,177	1.6
Public health cancer screening[(d)]	222	0.3
Research	1,715	2.3
Total allocated recurrent health expenditure	*52,660*	*70.0*
Unallocated recurrent health expenditure		
Non-admitted patient expenditure	6,944	9.2
Over-the-counter pharmaceuticals[(e)]	3,022	4.0
Ambulance	1,413	1.9
Other health practitioners (excluding Optometry)	2,574	3.4
Aids and appliances	2,610	3.5
Other community and public health[(d)]	3,592	4.8
Administration	2,382	3.2
Total unallocated recurrent health expenditure	*22,537*	*30.0*
Total recurrent expenditure	**75,196**	**100.0**

(a) The Health expenditure database category 'Medical services' in *Health expenditure Australia 2005–06* (AIHW 2007a) includes private medical services in hospital as well as out-of-hospital medical services.

(b) Includes PBS and RPBS pharmaceuticals.

(c) The Health expenditure database category 'All other medications' in *Health expenditure Australia 2005–06* (AIHW 2007a) includes under co-payment prescriptions, private prescriptions, and over-the-counter drugs.

(d) The category 'Community health and other' in *Health expenditure Australia 2005–06* (AIHW 2007a) includes community mental health services, while the category 'Public health' includes public health cancer screening. The amount of $3,592 million in 'Other community and public health' does not include public health cancer screening or community mental health.

(e) Also includes injury compensation insurers' payments and some DoHA-administered expense items.

Note: Components may not add to totals due to rounding.

Source: AIHW Health expenditure and Disease expenditure databases.

Disease and injury groups

Of the $52.7 billion of recurrent expenditure allocated to disease and injury groups in 2004–05, more than half (57% or $29.8 billion) was accounted for by the following seven groups (Table 2.4):

- cardiovascular diseases—$5.9 billion (11% of total allocated health expenditure)
- oral health—$5.3 billion (10%)
- mental disorders—$4.1 billion (8%)
- musculoskeletal diseases—$4.0 billion (8%)
- neoplasms—$3.8 billion (7%)
- injuries—$3.4 billion (7%)
- respiratory diseases—$3.3 billion (6%).

There is no necessary connection between how much is spent on a specific disease and the amount of burden (arising from premature deaths and disability) from that disease.

Oral health, for example, accounted for over 10% of allocated health expenditure in 2004–05, yet is responsible for less than 1% of the total disease and injury burden in Australia. On the other hand, neoplasms consumed 7% of allocated health expenditure, but are responsible for nearly one-fifth (19%) of premature death and disability in Australia (Table 2.4).Why is there no necessary connection between expenditure and burden? The burden estimates are estimates of the health problems that exist in spite of the current prevention and treatment strategies. They do not tell us what the burden would have been if no expenditure was devoted to those diseases.

The current commitment of resources to a particular disease—regardless of its contribution to total burden—may well represent a good investment if, without it, the burden would have been much higher. The only way to assess whether current levels of disease expenditure are 'worth it', is to consider the cost and effectiveness (in terms of burden avoided) of current programs. Such analysis is beyond the scope of this report.

As an example, the mental disorders burden is 13% of the total burden. This does not mean that mental disorders expenditure should be 13% of total expenditure. Policy makers would be required to consider whether there should be an increase in the current 8% of health expenditure spent on mental health, if a proposed new mental health program provides a benefit which exceeds the cost of the new program.

For all diseases combined, 46% of allocated health expenditure was within the hospital sector, 23% of expenditure was for out-of-hospital medical services, 15% for prescription pharmaceuticals, 10% for dental services, 3% for research and 3% for community mental health, public health cancer screening and optometrical services combined (Table 2.4).

Table 2.4: Allocated health expenditure in Australia, by disease group and area of health expenditure, 2004–05 ($ million)

Disease group	Admitted patients[(a)]	Out-of-hospital medical services	Optometrical and dental services	Prescription pharmaceuticals[(b)(c)]	Community and public health[(d)]	Research	Total expenditure allocated by disease	Per cent of total allocated expenditure	Per cent of DALYs in 2003[(e)]
Infectious & parasitic	482	451	. .	199	. .	184	1,315	2.5	1.7
Respiratory	1,477	1,039	. .	725	. .	69	3,311	6.3	8.4
Maternal conditions	1,539	116	. .	4	. .	12	1,671	3.2	0.1
Neonatal causes	422	20	. .	1	. .	12	455	0.9	1.3
Neoplasms	2,381	570	. .	236	222	378	3,787	7.2	19.4
Diabetes mellitus	371	288	. .	275	. .	55	989	1.9	5.5
Endocrine, nutritional and metabolic	448	500	. .	1,042	. .	110	2,100	4.0	1.1
Mental disorders	1,411	538	. .	854	1,177	148	4,128	7.8	13.3
Nervous system disorders	985	782	218	464	. .	291	2,739	5.2	11.9
Alzheimer's and other dementias	*169*	*32*	. .	*91*	. .	*35*	*327*	*0.6*	*3.6*
Other nervous system	*816*	*750*	*218*	*373*	. .	*256*	*2,412*	*4.6*	*8.3*
Cardiovascular	3,009	1,133	. .	1,636	. .	164	5,942	11.3	18.0
Digestive system	1,849	447	. .	764	. .	48	3,107	5.9	2.2
Genitourinary	1,431	779	. .	111	. .	24	2,345	4.5	2.5
Skin diseases	398	454	. .	102	. .	13	966	1.8	0.8
Musculoskeletal	2,003	1,181	. .	680	. .	92	3,956	7.5	4.0
Congenital anomalies	209	24	. .	2	. .	54	290	0.6	1.3
Oral health	186	22	5,064	6	. .	27	5,305	10.1	0.9
Injuries	2,422	845	. .	124	. .	14	3,405	6.5	7.0
Signs, symptoms, ill-defined conditions and other contact with health system[(f)]	3,195	2,712	. .	919	. .	22	6,848	13.0	0.7
Total	**24,221**	**11,900**	**5,282**	**8,144**	**1,399**	**1,715**	**52,660**	**100.0**	**100.0**

(a) Includes public and private acute hospitals, and psychiatric hospitals. Also includes medical services provided to private admitted patients in hospital.

(b) Includes all pharmaceuticals for which a prescription is needed, including benefit-paid prescriptions, private prescriptions and under co-payment prescriptions.

(c) Excludes over-the-counter medicaments such as vitamins and minerals, patent medicines, first aid and wound care products, analgesics, feminine hygiene products, cold sore preparations, and a number of complementary health products that are sold in both pharmacies and other retail outlets.

(d) Comprises expenditure on community mental health services and public health cancer screening programs.

(e) 'Disability-adjusted life years' (DALYs) comprise years lost due to premature death and years of 'healthy life' lost due to disability (Begg et al. 2007).

(f) 'Signs, symptoms and ill-defined conditions' includes diagnostic and other services for signs, symptoms and ill-defined conditions where the cause of the problem is unknown. 'Other contact with the health system' includes fertility control, reproduction and development; elective cosmetic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

Note: The total expenditure and proportions presented in this table are not comparable with total expenditure and proportions from 2000–01 due to the exclusion of a number of areas of expenditure from the 2004–05 estimates (see *Changes from 2000–01 report* in Technical notes).

Source: AIHW Disease expenditure database; Begg et al. 2007.

2.2 Expenditure on National Health Priority Area conditions

The National Health Priority Areas (NHPAs) initiative is a collaborative effort involving the Australian Government and state and territory governments. It seeks to focus public attention and health policy on those areas that are considered to contribute significantly to the burden of disease in Australia, and for which there is potential for health gain. The NHPAs agreed by the Australian Health Ministers are: cardiovascular health, mental health, musculoskeletal diseases, cancer control (neoplasms), injury prevention and control, diabetes mellitus and asthma. Together, the NHPAs accounted for $22.8 billion, or 43% of total allocated health expenditure in 2004–05 (Table 2.5).

Table 2.5: Expenditure on NHPAs as a proportion of allocated health expenditure, 2004–05

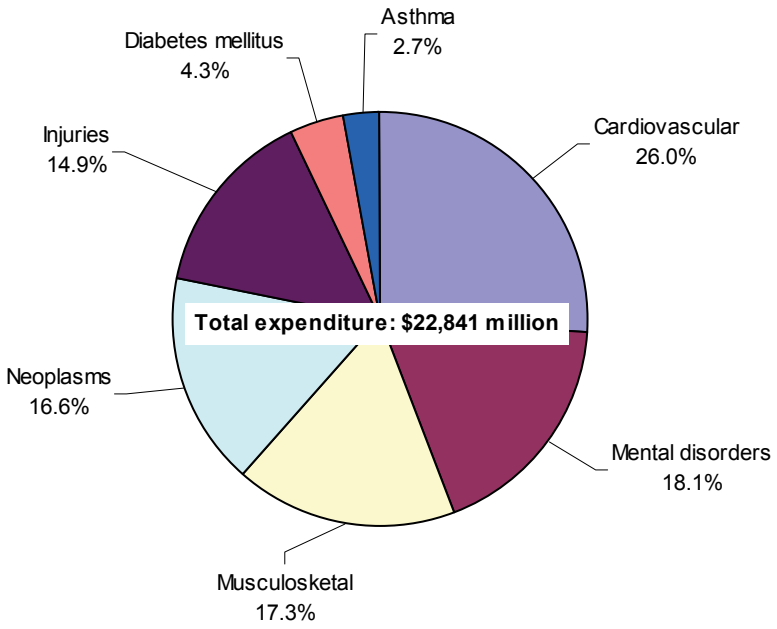
	Disease expenditure ($ million)	Each NHPA as per cent of total	Per cent of total NHPA expenditure
Cardiovascular	5,942	11.3	26.0
Mental disorders	4,128	7.8	18.1
Musculoskeletal	3,956	7.5	17.3
Neoplasms	3,787	7.2	16.6
Injuries	3,405	6.5	14.9
Diabetes mellitus	989	1.9	4.3
Asthma	606	1.2	2.7
Total by NHPAs	**22,814**	**43.3**	**100.0**
All other causes	**29,846**	**56.7**	
Total allocated health expenditure	**52,660**	**100.0**	

Note: The total expenditure and proportions presented in this table are not comparable with those from 2000–01 due to the exclusion of a number of areas of expenditure from the 2004–05 estimates (see *Changes from 2000–01 report* in Technical notes).

Source: AIHW Disease expenditure database.

Five of the seven NHPAs were ranked within the top seven groups of allocated expenditure listed in Section 2.1—cardiovascular diseases, mental disorders, musculoskeletal diseases, neoplasms and injuries. The sixth, diabetes mellitus, ranked fourteenth (Table 2.4) ($1.0 billion, or 2% of allocated expenditure). Diabetes is also a cause of other diseases, such as cardiovascular and renal diseases, so total allocated health expenditure attributable to diabetes would be greater than its $1.0 billion in direct allocated expenditure, if expenditure related to those diabetes-related diseases were included. Asthma is the seventh NHPA. It is contained within the respiratory diseases group and accounted for $0.6 billion, or 1% of allocated health expenditure.

Over a quarter (26%) of total allocated expenditure on NHPAs was spent on cardiovascular diseases. A much lower proportion was spent on diabetes (4%) and asthma (3%) (Figure 2.1).



Source: AIHW Disease expenditure database.

Figure 2.1: Allocated health expenditure on NHPAs, Australia 2004–05

Area of health expenditure

For most NHPAs, allocated expenditure on admitted patient services was higher than on out-of-hospital medical services or prescription pharmaceuticals (Table 2.6; Figure 2.2). This was particularly the case for ischaemic heart disease, injuries and neoplasms. In contrast, allocated expenditure for depression and anxiety and asthma was higher on prescription pharmaceuticals ($503 million and $358 million respectively) than on admitted patient hospital services or out-of-hospital medical services. Such expenditures reflect not only the chronic nature of these diseases but also the nature of their treatment.

There were differences in how much was spent on each type of health service when comparing the NHPAs to all disease and injury groups. In 2004–05, allocated health system expenditure for the seven NHPAs on admitted patient services (51% of all NHPA expenditure) was higher than for all diseases (46%), as was pharmaceutical expenditure (18% and 16% respectively) (Table 2.6). In contrast, allocated expenditure on NHPAs for out-of-hospital medical services (21%), which include consultations with general practitioners (GPs) and specialists, and pathology and diagnostic imaging services, was lower than that for all diseases (23%).

Analysed from a different perspective, allocated expenditure on pharmaceuticals for all diseases was $8.1 billion—just over half of this was for the seven NHPAs (51%)—whereas less than half of allocated expenditure on out-of-hospital medical services was spent on NHPAs (39%). Thus, the NHPA disease and injury groups are more likely to have higher pharmaceutical costs than out-of-hospital medical services costs compared to all disease and injury groups.

Table 2.6: Allocated health expenditure on National Health Priority Areas, by area of expenditure, 2004–05 ($ million)

Disease group	Admitted patients[(a)]	Out-of-hospital medical services	Optometrical and dental services	Prescription pharma-ceuticals[(b)(c)]	Community and public health[(d)]	Research	Total
All cardiovascular diseases	3,009	1,133	. .	1,636	. .	164	5,942
Ischaemic heart disease	*1,306*	*177*	. .	*287*	. .	*51*	*1,820*
Stroke	*414*	*44*	. .	*62*	. .	*15*	*535*
Other conditions	*1,289*	*912*	. .	*1,288*	. .	*98*	*3,587*
All mental disorders	1,411	538	. .	854	1,177	148	4,128
Depression and anxiety	*324*	*292*	. .	*503*	*229*	*59*	*1,407*
Other conditions	*1,088*	*246*	. .	*350*	*948*	*89*	*2,721*
Musculoskeletal conditions	2,003	1,181	. .	680	. .	92	3,956
Arthritis	*933*	*233*	. .	*198*	. .	*32*	*1,396*
Other conditions	*1,070*	*948*	. .	*483*	. .	*59*	*2,560*
Neoplasms	2,381	570	. .	236	222	378	3,787
Injuries	2,422	845	. .	124	. .	14	3,405
Diabetes mellitus	371	288	. .	275	. .	55	989
Asthma[(e)]	98	138	. .	358	. .	13	606
Total NHPAs	**11,697**	**4,692**	**. .**	**4,163**	**1,399**	**863**	**22,814**
Per cent of NHPA total	51.3	20.6	. .	18.2	6.1	3.8	100.0
NHPAs as per cent of all diseases	48.3	39.4	—	51.1	100.0	50.3	43.3
All diseases	**24,221**	**11,900**	**5,282**	**8,144**	**1,399**	**1,715**	**52,660**
Per cent of all diseases total	**46.0**	**22.6**	**10.0**	**15.5**	**2.7**	**3.3**	**100.0**

(a) Includes public and private acute hospitals, and psychiatric hospitals. Also includes medical services provided to private admitted patients in hospital.

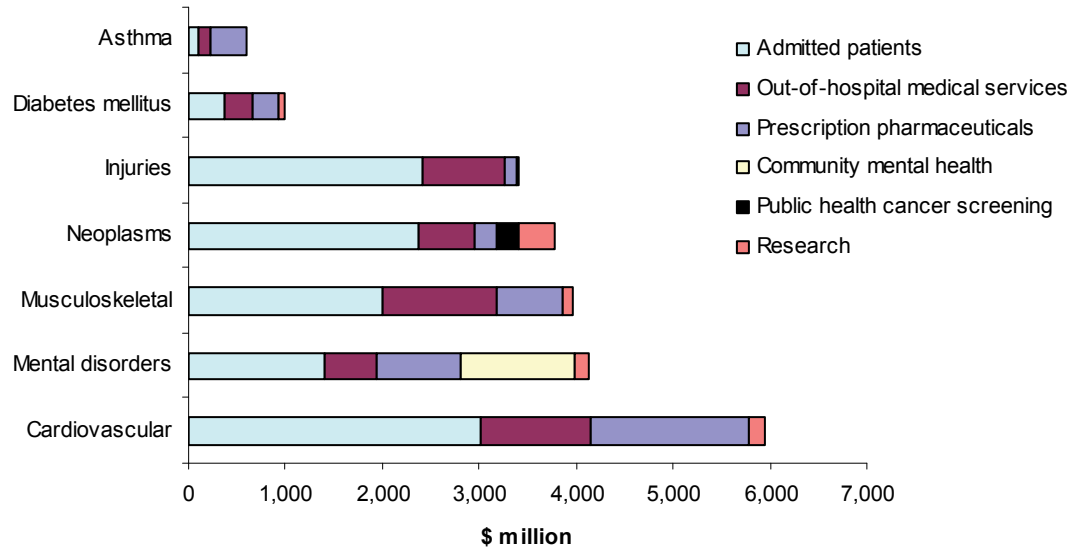
(b) Includes all pharmaceuticals for which a prescription is needed, including benefit-paid prescriptions, private prescriptions and under co-payment prescriptions.

(c) Excludes over-the-counter medicaments such as vitamins and minerals, patent medicines, first aid and wound care products, analgesics, feminine hygiene products, cold sore preparations, and a number of complementary health products that are sold in both pharmacies and other retail outlets.

(d) Comprises expenditure on community mental health services and public health cancer screening programs.

(e) Part of respiratory disease category.

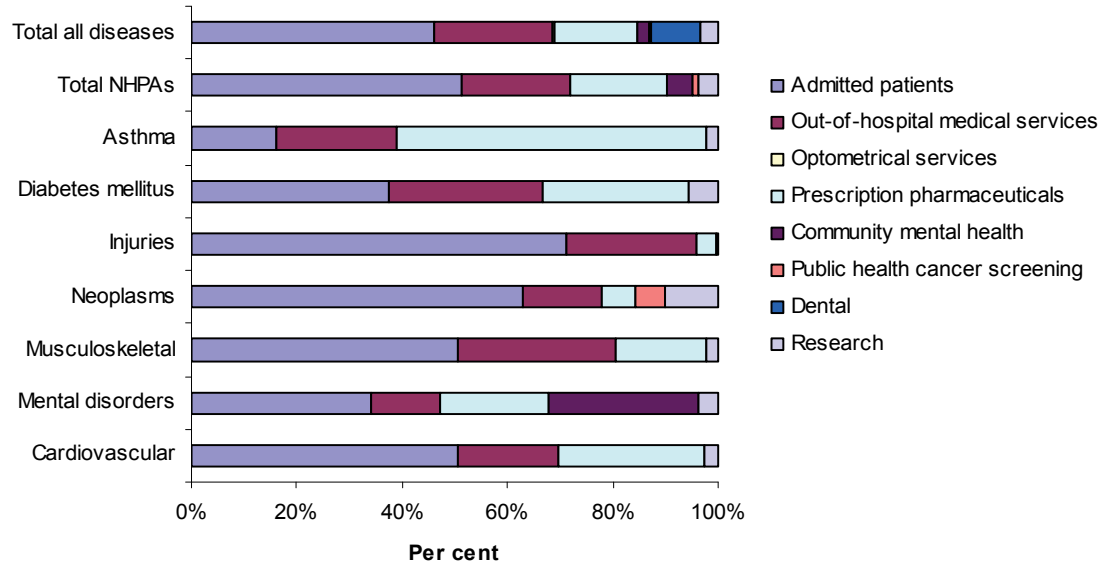
Source: AIHW Disease expenditure database.



Source: AIHW Disease expenditure database.

Figure 2.2: Disease and injury expenditure for NHPAs by selected area of health expenditure, Australia, 2004–05

Just over half (51%) of allocated expenditure on musculoskeletal conditions occurred in hospitals (Table 2.6 and Figure 2.3). This was even more likely when the condition was arthritis, for which over two-thirds (67%) of allocated expenditure was for treatments undertaken in hospitals, such as hip and knee replacement operations. Over 28% of allocated expenditure for mental health was for community-based mental health programs (Table 2.6).



Source: AIHW Disease expenditure database.

Figure 2.3: Proportion of disease and injury expenditure on NHPAs and all diseases by selected area of expenditure, Australia, 2004–05

2.3 Expenditure by age and sex

In 2004–05, of health system expenditure that could be allocated by disease, almost one-fifth (18%) more was spent on females than on males—$28.6 billion compared with $24.1 billion. When maternal conditions are excluded, allocated expenditure for females was $26.9 billion, or 11% higher than for males (Table 2.7).

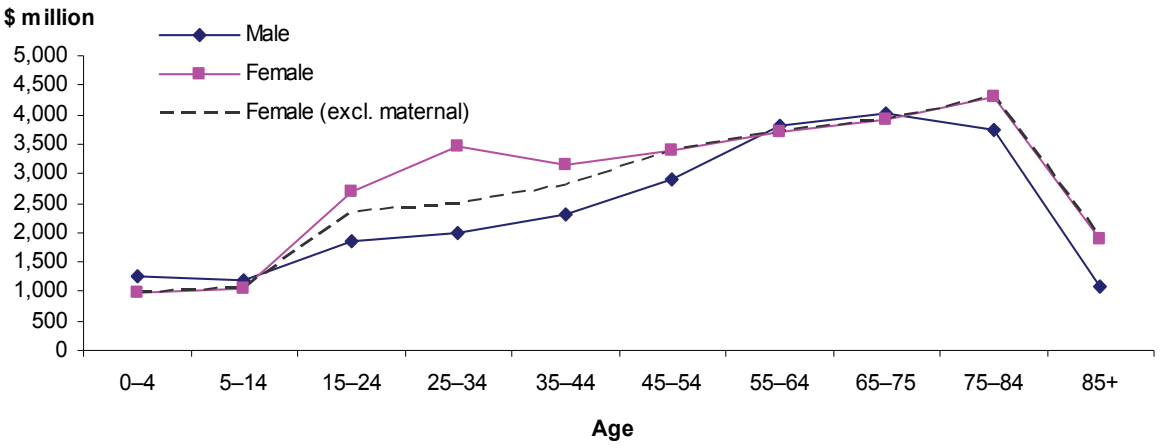
Health care costs are generally higher in the older age groups—$8.0 billion in allocated health expenditure was for those aged 75 to 84 years (Figure 2.4)—because of the higher levels of chronic diseases and greater number of people with life-threatening illnesses in these age groups. The lower expenditure for those aged 85 years and over reflects the smaller number of people in this age group. The greatest difference between the sexes occurs in the 25–34 year age group, when women are in their child bearing years. Expenditure for females in this age group was $3.5 billion, compared to $2.0 billion for males (Table 2.7).

Table 2.7: Allocated health expenditure by age and sex, Australia, 2004–05 ($ million)

	Age (years)										
	0–4	**5–14**	**15–24**	**25–34**	**35–44**	**45–54**	**55–64**	**65–74**	**75–84**	**85+**	**Total**
Male	1,265	1,175	1,851	1,976	2,300	2,895	3,801	4,029	3,732	1,085	24,109
Female	994	1,048	2,690	3,477	3,149	3,401	3,715	3,899	4,298	1,880	28,551
Female (excl. Maternal)	994	1,048	2,345	2,495	2,809	3,397	3,714	3,899	4,298	1,880	26,880
All persons	**2,259**	**2,223**	**4,541**	**5,453**	**5,448**	**6,296**	**7,516**	**7,929**	**8,030**	**2,965**	**52,660**

Source: AIHW Disease expenditure database.

Analysing allocated health expenditure on a per person basis removes the effect of variation in age group size. For example, expenditure for adults aged 65–74 years was only 5% more than adults aged 55–64 years ($7.9 billion and $7.5 billion respectively) (Table 2.7). However, on a per person basis, adults aged 65–74 years were responsible for 66% more of the expenditure ($5,714) compared to the younger age group ($3,443) (Table 2.8).



Source: AIHW Disease expenditure database

Figure 2.4: Allocated health expenditure by age and sex, Australia, 2004–05 ($ million)

In 2004–05, allocated expenditure per person was $2,618 for females (excluding maternal conditions), which was 10% higher than the $2,380 for males (Table 2.8). When maternal conditions are included, expenditure per person for females was $2,781 or 17% higher than for males.

Males are generally more likely to receive health care than females in their early years because of a higher incidence of congenital conditions and chronic illnesses, such as asthma (Begg et al. 2007). Allocated expenditure per person for males was higher than for females for age groups up to 14 years (for example, $1,917 for males aged 0–4 years compared to $1,589 for females) and for age groups over 54 years (Table 2.8).

Allocated expenditure per person was higher for females than for males for all age groups between 15–24 years and 45–54 years, even when maternal conditions were excluded. For example, for people aged 25–34 years expenditure per person was $1,369 for males and $1,727 for females (Table 2.8). This is mostly explained by the greater use of health services by females for genitourinary diseases and endocrine, nutritional and metabolic disorders (Figure 2.5).

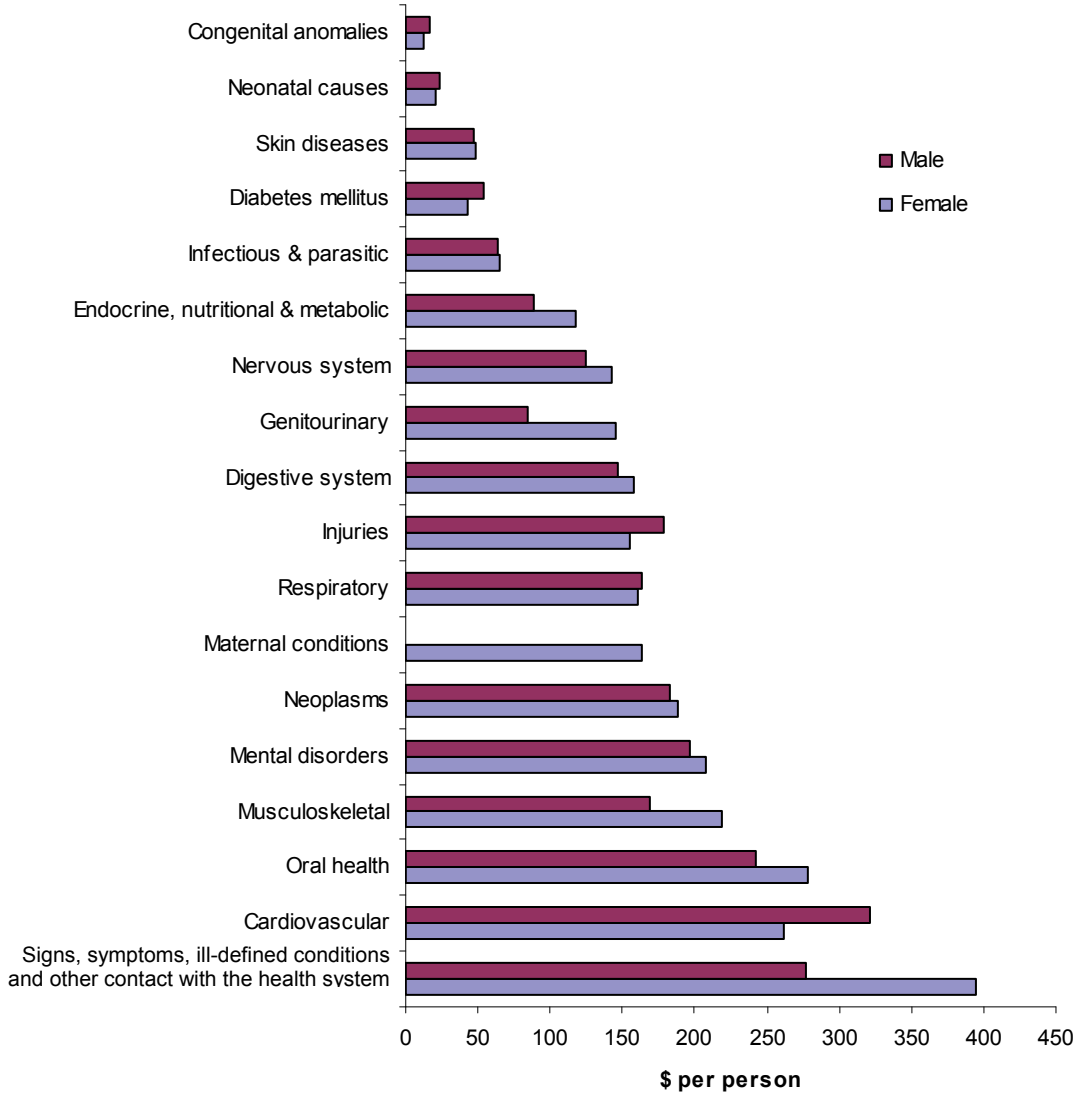
Table 2.8: Allocated health expenditure per person by age, sex and selected disease group, Australia, 2004–05 ($)

Disease group and sex	Age										Total
	0–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75–84	85+	
Cardiovascular											
All persons	10	7	14	36	85	229	533	1,091	1,718	1,858	291
Male	11	7	14	37	94	276	652	1,333	1,990	2,195	322
Female	8	7	14	34	77	183	414	861	1,511	1,699	261
Neoplasms											
All persons	32	18	28	44	88	188	353	656	831	755	186
Male	32	19	22	30	61	134	350	732	1,115	1,157	183
Female	33	18	33	59	116	241	356	584	613	567	189
Musculoskeletal											
All persons	15	27	46	71	119	207	373	612	777	611	194
Male	16	28	53	76	125	190	327	513	652	561	169
Female	15	26	40	67	114	224	419	705	872	634	218
Nervous system											
All persons	73	49	41	57	80	115	168	339	643	731	134
Male	81	49	36	51	73	111	163	330	664	854	125
Female	64	48	47	63	86	119	174	347	627	673	143
Injuries											
All persons	74	84	147	124	115	126	165	267	571	1,099	167
Male	82	102	203	165	140	142	178	264	502	916	178
Female	65	65	89	84	90	110	151	270	623	1,185	156
Maternal conditions											
Female	—	—	249	679	223	3	—	—	—	—	163
Other causes[(a)]											
All persons	1,554	628	1,204	1,216	1,201	1,379	1,851	2,749	3,959	4,663	1,528
Male	1,695	633	952	1,011	1,037	1,227	1,800	2,782	4,191	5,447	1,403
Female	1,404	623	1,467	1,421	1,363	1,529	1,903	2,717	3,782	4,296	1,651
Total											
All persons	1,757	812	1,601	1,888	1,801	2,246	3,443	5,714	8,499	9,717	2,582
Male	1,917	837	1,279	1,369	1,530	2,080	3,469	5,955	9,114	11,131	2,380
Female	1,589	786	1,937	2,407	2,068	2,409	3,416	5,485	8,028	9,053	2,781
Female (excluding maternal causes)	1,589	786	1,689	1,727	1,845	2,406	3,416	5,485	8,028	9,053	2,618

(a) 'Other causes' includes infectious & parasitic, respiratory, neonatal causes, oral health, diabetes mellitus, endocrine, nutritional & metabolic, mental disorders, digestive system, genitourinary, skin diseases, congenital anomalies, and signs, symptoms, ill-defined conditions and other contact with the health system.

Source: AIHW Disease expenditure database.

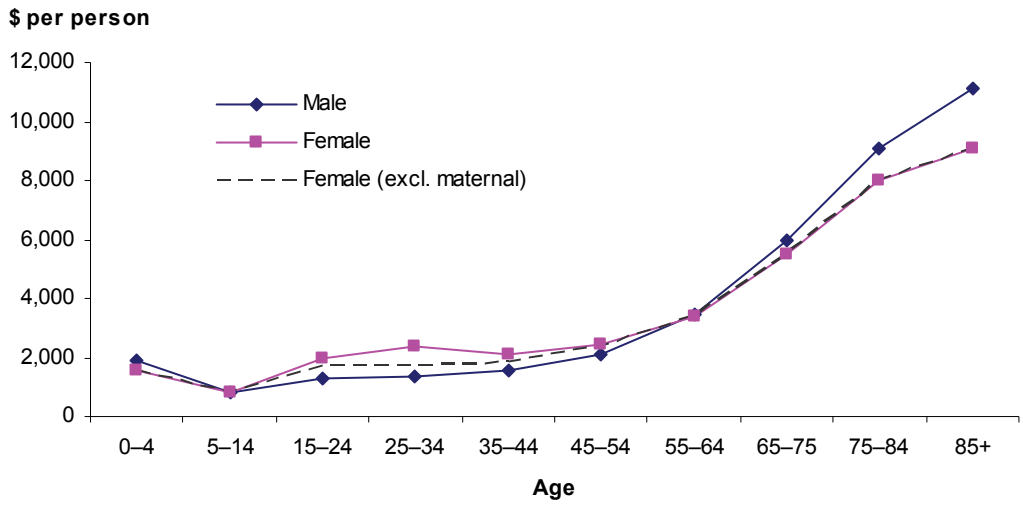
Allocated expenditure per person was higher for females than males for musculoskeletal diseases and genitourinary disorders, partly reflecting women's higher prevalence of arthritis and other age-related musculoskeletal disorders, due to their longer life expectancy (Begg et al. 2007). It was higher for males for the cardiovascular and injury groups. The greatest difference in allocated per person expenditure between the sexes was for 'Signs, symptoms, ill-defined conditions and other contact with the health system' for which expenditure per person was $117 higher for females than males. Fertility control, reproduction and development and elective cosmetic surgery, which are components of 'other contact with the health system', are services known to be more intensively used by females. Other disease groups that showed a distinct difference between the sexes were genitourinary disease (higher for females) and cardiovascular disease (higher for males) (Figure 2.5 and Table 2.8).



Source: AIHW Disease expenditure database.

Figure 2.5: Allocated health expenditure per person by disease group and sex, Australia, 2004–05 ($)

Allocated expenditure per person for males aged 85 and over was $11,131 compared with $9,053 for females in the same age group (Table 2.8 and Figure 2.6). This partly reflects the higher expenditure for males on cardiovascular diseases and neoplasms. In the previous report on disease expenditure in 2000–01 (AIHW 2005), expenditure was higher for females aged 85 years and over than for males in this age group, because of the inclusion in that report of expenditure on residential aged care; an area where more females than males receive care.



Source: AIHW Disease expenditure database.

Figure 2.6: Allocated health expenditure per person by age and sex, Australia, 2004–05 ($)

2.4 Changes from 2000–01 to 2004–05

Total recurrent expenditure on health goods and services in Australia in 2004–05 was estimated at $75.2 billion (8.4% of GDP), of which $52.7 billion could be allocated by disease (Table 2.1). For 2000–01, total recurrent health expenditure was $57.3 billion (8.6% of GDP), of which $50.1 billion was allocated by disease (Table 2.2).

Expenditure on non-admitted patients, high-level residential aged care, over-the-counter pharmaceuticals and other health practitioner services were allocated by disease in 2000–01; of these categories only the optometrical services component of other health practitioner services could be allocated in 2004–05. Thus, to enable better comparisons, the data that follow for 2000–01 do not allocate non-admitted patients, high-level residential aged care, over-the-counter pharmaceuticals and other health practitioner services. The analysis of changes from 2000–01 to 2004–05 only includes expenditure on admitted patient hospital services, out-of-hospital medical services and prescription pharmaceuticals, as these three areas of expenditure can be compared on a per person basis.

After adjusting for inflation between 2000–01 and 2004–05, the estimate of health expenditure allocated to diseases for 2004–05 was $44.3 billion, compared to $37.0 billion in 2000–01 (Table 2.9)—a growth in inflation-adjusted expenditure of $7.2 billion, or 20% (Table 2.10). This represents an average annual increase of 4.6%. The Australian population grew by 5.1% during the period, an average annual increase of 1.3%.

In 2000–01, considering just the comparable areas of expenditure (admitted patient hospital services, out-of-hospital medical services and prescription pharmaceuticals), the following seven disease groups accounted for the greatest expenditure, in 2004–05 prices, in Australia:

- cardiovascular diseases ($4.9 billion or 13% of allocated expenditure)
- respiratory and musculoskeletal diseases (both $3.1 billion or 8%)
- injuries ($2.8 billion or 7%)
- digestive system and neoplasms (both $2.6 billion or 7%)
- mental disorders ($2.5 billion or 7%) (Table 2.9).

In 2004–05, the top seven disease groups that accounted for the greatest expenditure had changed, with spending on respiratory diseases being surpassed by that on musculoskeletal diseases and injuries. Expenditure for musculoskeletal diseases increased from $3.1 billion (8% of allocated expenditure) in 2000–01 to $3.9 billion (9%) in 2004–05. Expenditure on neoplasms (cancers) increased from $2.6 billion (7%) to $3.2 billion (7%), and on mental disorders from $2.5 billion (7%) to $2.8 billion (8%) (tables 2.4 and 2.9).

Table 2.9: Allocated health expenditure in Australia for selected areas of health expenditure[(a)] by disease group, 2000–01 and 2004–05, constant prices[(b)], ($ million)

	Total selected areas of health expenditure[(a)]				
Disease group	**2000–01**	**2004–05**	**$ million change (2004–05 prices)**	**Change from 2000–01 to 2004–05 (%)**	**Change in per person expenditure (%)**
Infectious & parasitic	1,021	1,132	111	11	5
Respiratory	3,078	3,242	164	5	—
Maternal conditions	1,408	1,659	252	18	11
Neonatal causes	405	444	38	9	3
Neoplasms	2,600	3,188	587	23	16
Diabetes mellitus	742	934	192	26	19
Endocrine, nutritional and metabolic	1,503	1,990	487	32	25
Mental disorders	2,452	2,803	351	14	8
Nervous system disorders	2,006	2,231	225	11	5
Cardiovascular	4,877	5,778	901	18	12
Digestive system	2,603	3,060	457	18	11
Genitourinary	2,003	2,321	317	16	9
Skin diseases	904	953	49	5	—
Musculoskeletal	3,076	3,864	788	26	19
Congenital anomalies	209	235	26	13	6
Oral health	182	213	31	17	11
Injuries	2,773	3,391	618	22	16
Signs, symptoms, ill-defined conditions and other contact with the health system[(c)]	5,179	6,826	1,647	32	25
Total	**37,023**	**44,265**	**7,242**	**20**	**13**

(a) Comprises admitted patients, out-of-hospital medical services and prescription pharmaceuticals.

(b) 2000–01 expenditures have been converted to 2004–05 prices using the total health price deflator (AIHW 2007a).

(c) 'Signs, symptoms and ill-defined conditions' includes diagnostic and other services for signs, symptoms and ill-defined conditions where the cause of the problem is unknown. 'Other contact with the health system' includes fertility control, reproduction and development; elective cosmetic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

Source: AIHW Disease expenditure database.

Disease groups that showed above-average growth from 2000–01 to 2004–05 were endocrine, nutritional & metabolic (32%), musculoskeletal and diabetes (both 26%), neoplasms (23%) and injuries (22%). Groups which showed below-average growth include skin diseases and respiratory diseases (both 5%), neonatal causes (9%) and nervous system disorders (11%) (Table 2.9).

Admitted patient hospital expenditure grew by 20% in inflation-adjusted terms, as did expenditure on out-of-hospital medical care. However, not all diseases showed this pattern of growth. For the injuries category, admitted patient hospital expenditure increased by 26% and prescription pharmaceuticals decreased by 2%. In contrast, for maternal conditions, the increase for admitted patients expenditure was 20% compared with an increase for prescription pharmaceuticals of 71% ($2.3 million to $4.0 million). Increases in diabetes expenditure were concentrated in admitted patients and out-of-hospital medical services (38% and 35% respectively) with a 7% increase in pharmaceuticals expenditure (Table 2.10). This reflects the different types of treatment required for individual diseases.

Table 2.10: Change in allocated health expenditure, by area of expenditure and disease group, constant prices[a], 2000–01 to 2004–05, per cent

Disease group	Admitted patients[b]	Out-of-hospital medical	Prescription pharma-ceuticals[c][d]	Total percentage change
Infectious & parasitic	21	5	1	11
Respiratory	15	6	–11	5
Maternal conditions	20	–7	71	18
Neonatal causes	8	45	–17	9
Neoplasms	19	42	21	23
Diabetes mellitus	38	35	7	26
Endocrine, nutritional and metabolic	35	26	35	32
Mental disorders	15	–8	33	14
Nervous system disorders	4	17	19	11
Cardiovascular	15	24	21	18
Digestive system	15	10	31	18
Genitourinary	14	42	–46	16
Skin diseases	11	14	–31	5
Musculoskeletal	33	15	24	26
Congenital anomalies	13	10	—	13
Oral health	20	24	–35	17
Injuries	26	16	–2	22
Signs, symptoms, ill-defined conditions and other contact with health system[e]	26	35	43	32
Total percentage change	**20**	**20**	**18**	**20**
$ millions (2004–05 prices)	**3,961**	**2,024**	**1,257**	

(a) 2000–01 expenditures have been converted to 2004–05 prices using the total health price deflator (AIHW 2007a).

(b) Includes public and private acute hospitals, and psychiatric hospitals. Also includes medical services provided to private admitted patients in hospital.

(c) Includes all pharmaceuticals for which a prescription is needed, including benefit-paid prescriptions, private prescriptions and under co-payment prescriptions.

(d) Excludes over-the-counter medicaments such as vitamins and minerals, patent medicines, first aid and wound care products, analgesics, feminine hygiene products, cold sore preparations, and a number of complementary health products that are sold in both pharmacies and other retail outlets.

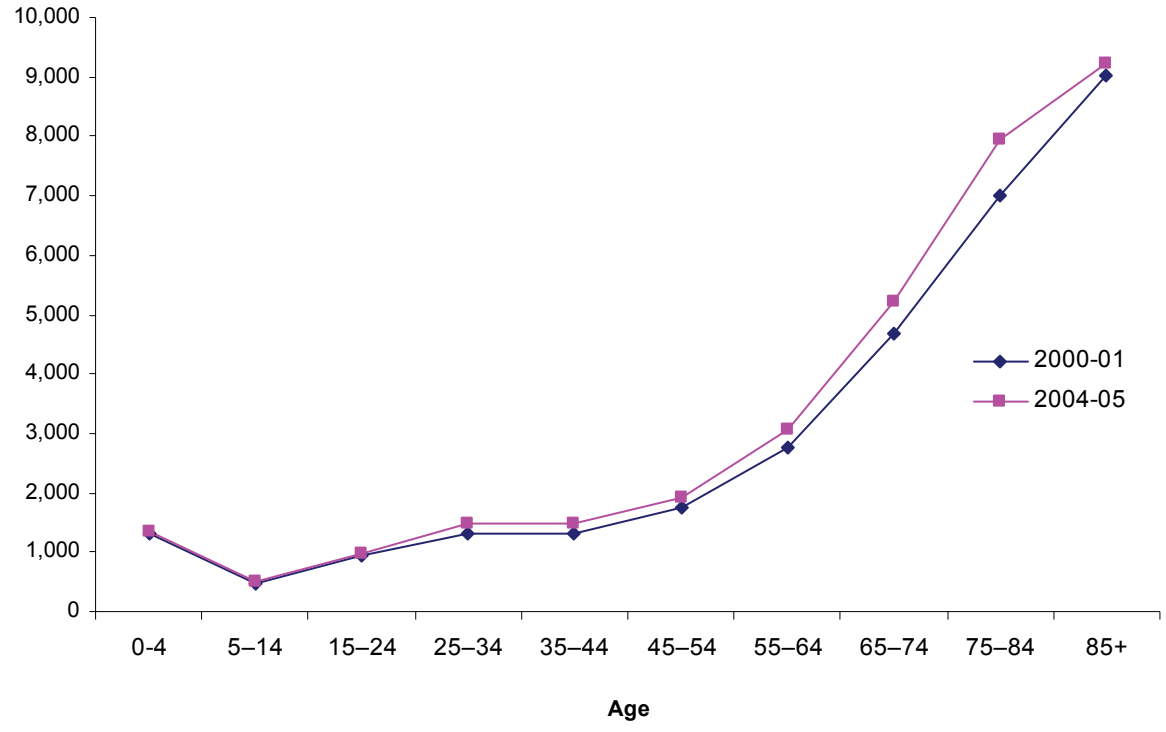
(e) 'Signs, symptoms and ill-defined conditions' includes diagnostic and other services for signs, symptoms and ill-defined conditions where the cause of the problem is unknown. 'Other contact with the health system' includes fertility control, reproduction and development; elective cosmetic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

Source: AIHW Disease expenditure database.

By examining allocated health expenditure on a per person basis, the influence of change in the overall size of the population is removed from the analysis.

In 2004–05, allocated health expenditure per person (for the areas of expenditure comparable between this report and the previous one—that is, admitted patients, out-of-hospital medical services, and prescription pharmaceuticals) averaged $2,170, which was $249, or 13%, higher than in 2000–01 (Table 2.9). Expenditure was higher in 2004–05 than 2000–01 for every age group, and the difference increased with age from those aged 5–14 years to those aged 75–84 years (Figure 2.7).

The allocated per person health expenditure for each area of expenditure followed a similar trend to the total (data not shown). Expenditure for admitted patient services was higher in 2004–05 than 2000–01 for every age group, and—with the exception of people aged 0–4 years and 85 years and above—the same pattern was observed for out-of-hospital medical services. Expenditure on prescription pharmaceuticals, however, was lower in 2004–05 than 2000–01 for people aged up to 34 years.



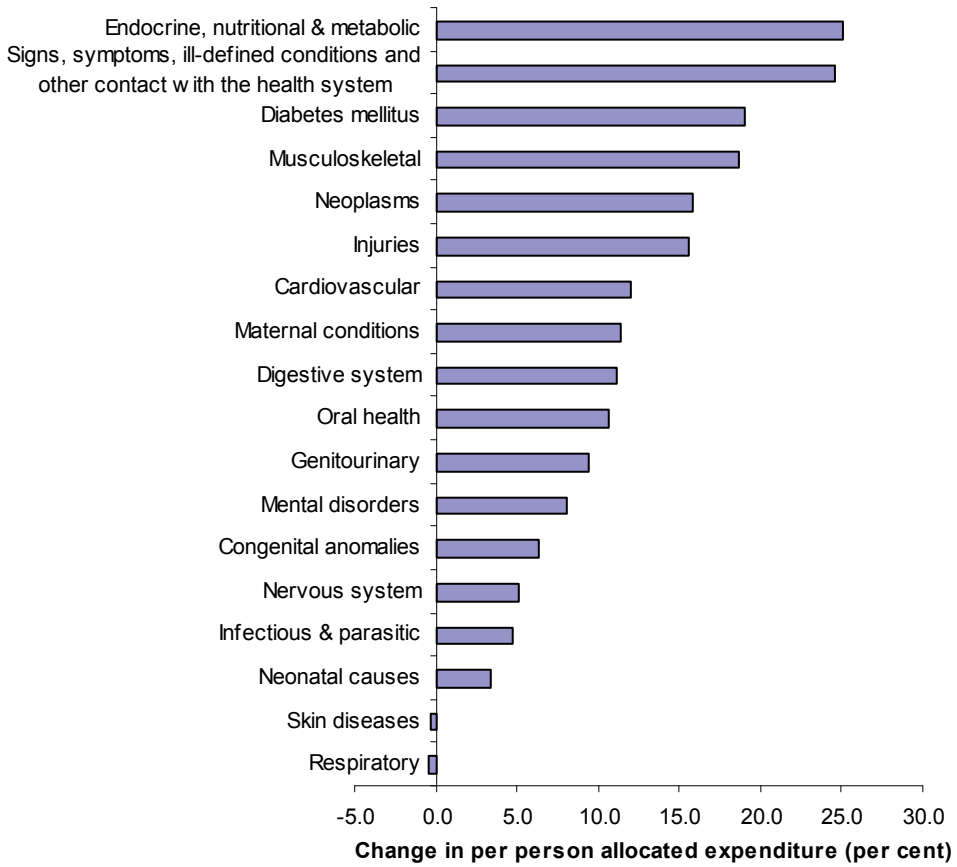
Source: AIHW Disease expenditure database.

Figure 2.7: Allocated per person health expenditure, by age, constant prices, 2000–01 and 2004–05

Allocated per person health expenditure also increased for all of the disease groups except respiratory and skin diseases, which both recorded a decline of around 1%. Expenditure on all other conditions in 2004–05 was between 3% and 25% higher than in 2000–01 (Table 2.9; Figure 2.8).

The disease groups recording the highest real increase in allocated expenditure per person in 2004–05 compared with 2000–01 were:

- endocrine, nutritional and metabolic (25%)
- signs, symptoms, ill-defined conditions and other contact with the health system (25%)
- diabetes mellitus (19%)
- musculoskeletal (19%).



Source: AIHW Disease expenditure database.

Figure 2.8: Per cent change in per person allocated health expenditure, constant prices, by disease group, 2000–01 to 2004–05

3. Technical notes

3.1 General

It is not possible to allocate all expenditure on health goods and services by disease. Expenditure on most community and public health programs, for instance, support the treatment and prevention of many conditions and cannot be allocated to one specific disease or injury. This is also true of capital expenditure on health facilities and equipment, which has the added problem of being characterised by large outlays that fluctuate greatly from year to year. The method used to derive the estimates in this report, however, ensures that the estimates add across disease, age and sex groups to the total amount of health expenditure that was able to be allocated by disease in 2004–05—around two thirds (70%) of total recurrent health expenditure ($52.7 billion).

The expenditure that was not able to be allocated by disease includes: capital expenditure; non-admitted patient hospital services; over-the-counter drugs; all other health practitioner services excluding optometry; community health expenditure (except community mental health); expenditure on public health programs (except cancer screening programs); health administration; health aids and appliances, and patient transport (ambulance).

It is important that the interpretation and limitations of these estimates be clearly understood. The most important points to note are that the estimates:

- are a conservative estimate based on 70% of total recurrent health expenditure
- are only one measure of the size of the disease burden on the community (that is, the 'size of the problem')
- are not the same as loss of health due to disease
- do not mean that the disease with the highest expenditure should necessarily be the top priority for intervention
- should not be regarded as how much would be saved if a specific disease or all diseases were prevented, and
- are not an estimate of the total economic impact of diseases in the Australian community. This is because the estimates do not include costs that are not accrued by the health system, such as travel costs of patients, costs associated with the social and economic burden on carers and family, and owing to lost quality and quantity of life.

3.2 Changes from the 2000–01 report

This study largely follows the methods and data sources used in the 2000–01 study. In most cases, the data sources used for the estimations have remained the same, but a number of changes to the methods make comparisons of disease expenditure between the two reports somewhat problematic.

Several areas of expenditure included in the 2000–01 report have not been included in this report. In the 2000–01 study, expenditure on non-admitted hospital services, over-the-counter drugs, and other health practitioner services were estimated by adjusting estimates, previously made for 1993–94 expenditure (AIHW 1998), for demographic changes.

To reduce uncertainty in the 2004–05 estimates, expenditure on these areas has not been allocated by disease.

In addition, high-level residential aged care was classified as part of health expenditure for the 2000–01 report. For this report, this is now classified as welfare expenditure.

These changes have reduced the amount of total health expenditure, and the amount that can be allocated by disease. As a result, expenditure on conditions such as nervous system disorders—which included $246 million in non-admitted hospital services, $519 million in other professional services, and over $2 billion in aged care homes in 2000–01—is significantly lower in this report.

Comparisons between these two time periods are possible for admitted patient hospital services, out-of-hospital medical services and prescription pharmaceuticals.

3.3 Use and interpretation of expenditure estimates

The expenditure estimates reported here provide a broad picture of the use of health system resources classified by disease group. The method for estimating disease expenditure however, is a 'top–down' approach where total expenditure across the health system is estimated and then allocated to the relevant conditions. Although this method yields consistency, good coverage, and totals that add up to known expenditures, it is not as sensitive or accurate for any specific disease as a detailed 'bottom–up' analysis of actual costs incurred by patients with that disease.

Readers also need to bear in mind that cost-of-illness studies such as this only provide estimates of the impact of a disease on health system expenditures. As stated elsewhere in this report, the estimates of the cost of treating and/or preventing a disease cannot be used to indicate the loss of health due to that disease. Nor can they be used to determine the priority for intervention or additional health expenditure—resource allocation decisions such as this require information not only on average costs and outcomes but also on the marginal costs and outcomes associated with the specific interventions under consideration.

Care should be taken not to interpret expenditure associated with disease treatment as simply an estimate of the savings that would result from prevention of disease. Conversion of the opportunity cost—or the benefits forgone—of resources being devoted to disease treatment into expenditure savings, involves a number of additional considerations (see, for example, AIHW: Mathers et al. 1998a).

3.4 Data and methods used to provide estimates

To ensure consistency across the disease expenditure project and the associated burden of disease project, the disease groups used in the 2004–05 disease expenditure estimates were based on the 176 diseases that were published in the Australian BoD studies (AIHW: Mathers et al. 1999 and Begg et al. 2007). Extra categories were added to provide a more comprehensive list of diseases and, as in 2000–01, the two categories of 'Symptoms, signs and ill-defined conditions' and 'Other contact with health services' were included to cover some health service expenditures which cannot be allocated by disease.

The full set of ICD-10 codes used in the burden of disease categories is available in Annex Table 1 of *The Burden of Disease and Injury in Australia* (Begg et al. 2007).

Areas of health expenditure

Admitted hospital patients

The proportions of total public acute hospital expenditure which relate to admitted patients are estimated using the admitted patient fractions estimated by each state and territory, and published in *Australian Hospital Statistics 2004–05* (AIHW 2006). Private hospital expenditure data are derived from the Australian Bureau of Statistics' Private Health Establishments Collection and admitted patient fraction estimated by using the AIHW's National Hospital Morbidity Database.

The hospital morbidity expenditure method estimates acute hospital admitted patient costs by apportioning the total admitted patient expenditure to individual episodes of hospitalisation with an adjustment for the resource intensity of treatment for the specific episode (using the Diagnosis Related Groups, or DRGs) and the length of stay. The length of stay adjustment is made in such a way as to reflect the fact that some costs are proportional to length of stay (for example, ward costs and meals), whereas others are independent of length of stay (for example, theatre costs). The subdivision of episode costs into these cost 'buckets' was made using National Hospital Costs Data Collection data.

An adjustment is also made for the actual hospital where the treatment is provided. The standard DRG method for estimating costs uses state and territory DRG weights, and so assumes that the hospital has the same average costliness as the average for the state or territory. The National Public Hospital Establishments Database contains the actual cost of treating admitted patients at each hospital, so these data are used to scale up or down the estimate that comes from using state and territory DRG weights.

For sub-acute and non-acute patients, where there are no DRG weights, the most recent data on costs comes from the July to December 1996 sub-acute and non-acute patient study (Eagar et al. 1997). Per diem costs were applied and inflated to 2004–05 estimates using the implicit price deflator for final government consumption expenditure on hospital care (AIHW 2007a).

Estimates of expenditure on medical services for private patients in hospitals are included in admitted patient hospital costs. Expenditure for private medical services in 2004–05 was $2,746 million. This estimate comes from Medicare Australia data on the fee charged by private medical practitioners for in-hospital services. Sometimes specialists accept a discounted amount as full payment for the services, so the fee-charged data will be a slight overestimate of actual expenditure for private medical services in hospitals.

Out-of-hospital medical services and optometrical services

Data from the general practitioners survey, BEACH, were used to allocate private medical services provided by both GPs and specialists. The ICPC-2 codes used in BEACH were mapped to the disease costing groups (which are based on ICD-10) to enable out-of-hospital medical services expenditure to be allocated by disease.

Three years of BEACH data—2003–04, 2004–05 and 2005–06—were used in the analysis, providing 297,000 encounters overall. The proportions of problems by disease were used to allocate out-of-hospital medical services expenditure, based on the total medical expenditure available from Medicare data and the AIHW health expenditure database.

Expenditures for 'Unreferred attendances', 'Imaging' and 'Pathology' were allocated to disease on the basis of GP encounters, while expenditure for 'Other medical services' (mostly specialist services) was allocated to disease on the basis of the referral pattern in BEACH. Allocation of GP costs where there are multiple presenting conditions in the GP encounter was done on a pro-rata basis. Expenditure for 'Optometry' was allocated to the disease group 'Disorders of refraction' under Chapter K: Nervous system and sense organ disorders.

In-hospital medical expenditure for private patients was not included under medical services, but was allocated as part of admitted patient expenditure.

Pharmaceuticals

Prescription drugs

The Australian Government Department of Health and Ageing provided detailed costing data for pharmaceuticals subsidised under the Pharmaceutical Benefits Scheme (PBS) and the Department of Veterans' Affairs Repatriation Pharmaceutical Benefits Scheme (RPBS). It also provided volume data for private prescriptions and under-copayment drugs. These data originally came from a Pharmacy Guild survey and were adjusted by the Department to represent volume figures for all of Australia. Costing figures were applied to these prescription drugs, to obtain a total expenditure figure for each prescription drug. These were coded by the fifth edition of the Anatomical Therapeutic Chemical (ATC) classification—a system developed by the World Health Organization for classifying therapeutic drugs (WHO Collaborating Centre for Drug Statistics Methodology 2002). The ATC codes were mapped to the 'in-house' codes for prescription drugs used in the BEACH survey. This enabled data from BEACH to be used to allocate expenditure on prescription drugs to each disease group, based on the problem in the GP encounter that related to the prescribing of the particular drug. An assumption was made that the pattern of diseases relating to each type of prescription drug is the same when prescribed by a GP and by a specialist. This assumption was applied because there are no data that permit allocation of specialist-written prescriptions to diseases.

Pharmaceuticals dispensed in hospitals were included in the estimates of hospital costs.

Community mental health

Total expenditure on 'Community mental health' was obtained from *Health expenditure Australia 2005–06* (AIHW 2007a) and was allocated to the mental disorders category.

Expenditure on community mental health services by age and sex was allocated in accordance with the number of community mental health service contacts reported by age and sex in *Mental health services in Australia 2004–05* (AIHW 2007b). The principal diagnosis for the reported contacts was used to allocate the funds across the disease categories.

Public health cancer screening

Data were obtained from the *National public health expenditure report 2005–06* (AIHW 2008), which reports government expenditure on breast cancer screening and cervical screening. The expenditure was allocated to the neoplasms disease group (for females only) and was split across the national BreastScreen Australia and National Cervical Screening Program target age groups; that is, expenditure on breast cancer screening was allocated across

women in the 45–74 year age groups, and expenditure on cervical screening was allocated across women 15–74 years.

Dental services

Total expenditure on 'Dental services' was obtained from *Health expenditure Australia 2005–06* (AIHW 2007a) and was allocated to the oral health category.

Expenditure by age and sex was assumed to be in the same relative proportion as the combined expenditure on admitted patients, out-of-hospital medical services and prescription pharmaceuticals that was allocated to the oral health disease group.

Research

Total expenditure on 'Research' was obtained from *Health expenditure Australia 2005–06* (AIHW 2007a) and was allocated to disease using data from the latest Australian Bureau of Statistics research and experimental development surveys. Most of the research data is classified at a fairly high level, but it does give a fairly good picture of the distribution of research expenditure at the burden of disease chapter level. Within a chapter, research is allocated in proportion to the distribution of all other expenditure by disease.

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