

HEALTH AND WELFARE EXPENDITURE SERIES

Number 21

# **Health system expenditure on disease and injury in Australia, 2000–01**

**Second edition**

**April 2005**

Australian Institute of Health and Welfare  
Canberra

AIHW cat. no. HWE 28

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ISSN 1323-5850

ISBN 1 74024 4664

### **Suggested citation**

Australian Institute of Health and Welfare (AIHW 2005). Health system expenditure on disease and injury in Australia, 2000-01. Second edition. AIHW cat. no. HWE 28 Canberra: AIHW (Health and Welfare Expenditure Series no. 21).

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Published by Australian Institute of Health and Welfare

Printed by Elect Printing

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# Preface

The report arising from the first comprehensive study of health expenditures by disease in Australia, using estimated expenditures by disease in 1993–94 was released in September 1998. The study involved a comprehensive accounting of disease costs across all chapters of the International Classification of Diseases Ninth Revision (ICD-9) (AIHW: Mathers et al. 1998a).

This report updates these numbers to 2000–01. The methodology has been revised in some areas and the analysis made across the disease and injury groups used in the first Australian Burden of Disease study (AIHW: Mathers et al. 1999). The underlying data use the ICD-10 Classification of Diseases and the International Classification of Primary Care Version 2 (ICPC 2).

The report provides an overview of total health system expenditures on disease and injury in Australia during 2000–01, based on the best possible estimates from currently available data sources. To maximise the validity of comparison between diseases, similar methods are used in estimating each disease.

These numbers provide a useful picture of health expenditure according to the clinically relevant category of disease. However, they should not be the sole determining factor in resource allocation decisions. 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.

This second edition of the disease expenditure publication differs from the first edition (AIHW 2004) in the following areas:

1. Expenditure on community mental health and public health cancer screening programs has been allocated by disease. This represents an additional \$972 million.
2. Otitis Media has been moved to the Respiratory chapter from the Nervous system chapter – a change of \$230 million, and expenditure for cervical screening has been moved from the Signs and symptoms etc chapter to the Neoplasms chapter – a change of \$26 million.
3. Changes in the underlying data base following reanalysis of the BEACH data which mostly affect the age sex distributions of expenditure for Out-of-hospital medical services and pharmaceuticals.

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# Acknowledgments

This report was prepared by John Goss, Angelique Jerga, Nick Mann, Jocelyn Ho and Chris Stevenson. Ian Titulaer, of the AIHW Hospitals and Mental Health Services Unit, carried out the analysis of the Institute's National Hospital Morbidity Database which was the basis for the allocation of hospital expenditure. Ruth Penm and Angela Frino, also of the Hospitals and Mental Health Services Unit, extracted and prepared the BEACH (Bettering the Evaluation and Care of Health) data 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 General Practice Statistics and Classification Unit, 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.

# Executive summary

This report provides a systematic analysis of Australian health expenditure allocated by disease in 2000–01. Disease and injury groups are defined according to the first Australian Burden of Disease (BoD) study (AIHW: Mathers et al. 1999).

These disease expenditure estimates allocate around 87.5% of recurrent health expenditure by disease, or \$50.1 billion in total. Expenditure not allocated by disease includes expenditure on community and public health services (except community mental health and public health cancer screening programs), health administration, ambulance services, and health aids and appliances.

## Main results

The seven disease groups that account for the greatest health expenditure in Australia are:

- Cardiovascular diseases – \$5.5 billion (10.9% of total allocated health expenditure)
- Nervous system disorders – \$4.9 billion (9.9%)
- Musculoskeletal diseases – \$4.6 billion (9.2%)
- Injuries – \$4.0 billion (8.0%)
- Respiratory diseases – \$3.7 billion (7.5%)
- Mental disorders \$3.7 billion (7.5%)
- Oral health – \$3.4 billion (6.9%)

These seven conditions together account for \$30 billion, or 60% of allocated health expenditure.

For 2000–01 cardiovascular disease was the most expensive group (\$5.5 billion), and also accounted for 38% of deaths.

Nervous system disorders was the second most expensive group (\$4.9 billion) and has increased significantly since 1993–94, mostly because of a large increase in expenditure for people with Alzheimer’s disease and other dementias in aged care homes.

## Expenditure in the National Health Priority Areas

The National Health Priority Areas (NHPAs) are cardiovascular health, cancer control, injury prevention and control, mental health, musculoskeletal conditions, diabetes mellitus, and asthma. Together, they account for \$22.3 billion, or 45.3% of allocated health system expenditure.

Four of the seven NHPAs rank within the top seven conditions listed above – cardiovascular disease, musculoskeletal diseases, mental disorders and injury. The fifth, neoplasms, ranks ninth (\$2.9 billion, or 5.8% of allocated expenditure); and the sixth, diabetes, ranks fifteenth (\$0.8 billion or 1.7% of allocated expenditure). Asthma is the seventh NHPA. It is contained within the respiratory diseases group and accounts for \$0.7 billion, or 1.4% of allocated health expenditure.

## **Health expenditure by age and sex**

Health system expenditures allocated by disease are 29% higher for females than for males – \$28.2 billion compared with \$21.9 billion. Expenditure per person is \$2,908 for females which is 27% higher than the \$2,291 for males. When maternal conditions are excluded, expenditure per person for females is 21% higher than for males.

Expenditure per person is higher for females than males for disease groups such as the nervous system, musculoskeletal conditions and oral health. It is higher for males for the cardiovascular, cancer and injury groups.

Health expenditure per person is \$1,864 on average per year for males aged 0 to 4 years. It then decreases to \$1,120 for boys aged 5 to 14 years and from there increases with age to \$14,186 for men aged 85 years and over. For females, the pattern is the same for children, but in adulthood expenditure peaks in the 25–34 years age group, reflecting child-bearing expenditure; it then declines for the age range 35 to 44 years and from there increases steadily with age to \$16,411 per year for women aged 85 years or over.

## **Changes in health expenditure by disease, 1993–94 to 2000–01**

Between 1993–94 and 2000–01 the growth in inflation-adjusted expenditure which could be allocated to disease was \$13.2 billion – which represents growth of 37%. This was an average annual increase of 4.6%.

Areas which showed above-average growth during the period were oral health (52%), nervous system disorders (42%) and digestive system diseases (38%). The high growth in nervous system disorders expenditure was the result of the large increase in expenditure on care for people with dementia in aged care homes.

Areas which showed below-average growth were respiratory diseases (29%), cardiovascular disease (28%), neoplasms (32%) and mental disorders (28%). The lower growth for mental disorders was due to the fact that these disease expenditure estimates do not include expenditure on community mental health services. Growth was 40% when this was included

# 1 Introduction

This publication presents estimates of health expenditure on disease and injury in Australia in 2000–01, classified by disease or injury group, age and sex. The estimates are available by area of expenditure – hospitals, high-level residential aged care, medical services, other professional services, pharmaceuticals and research.

The 2000–01 disease expenditure estimates were based on the 176 disease and injury conditions used in the first Australian burden of disease study (AIHW: Mathers et al. 1999), with the inclusion of some additional sub-categories. This report aggregates these conditions into the 19 broad disease groups used by the burden of disease study. Disease expenditure estimates are also presented for selected conditions in the seven National Health Priority Areas and by age and sex.

These disease expenditure estimates allocate 87.5% of total recurrent health expenditure in 2000–01, or \$50.1 billion. The expenditure not allocated by disease is capital expenditures, and expenditure on community health – except community mental health), public health programs – except cancer screening programs, health administration and health aids and appliances.

This update differs from the 2004 publication (AIHW 2004) in the following areas:

1. Otitis Media has been moved to the Respiratory chapter from the Nervous system chapter – a change of \$230 million.
2. Expenditure for cervical screening has been moved from the Signs and symptoms etc chapter to the Neoplasms chapter – a change of \$26 million.
3. Changes in this publication also reflect changes following reanalysis of the BEACH dataset. These revisions mostly affect the age sex distributions of expenditure for Out-of-hospital medical services and pharmaceuticals.
4. Expenditure on community mental health and public health cancer screening programs has been allocated by disease. This represents an additional \$972 million.
5. Table 2 has been included to show more clearly the alignment with the health expenditure categories published in *Health Expenditure Australia 2000–01*.

The disease expenditure database is comprehensive and expenditure estimates by source of funds (i.e. Commonwealth, state or private) for each area of expenditure are able to be produced. For some areas of expenditure, state and territory estimates will be available. Utilisation measures such as bed days, separations, number of medical encounters and services and pharmaceutical scripts can also be estimated.

## 1.1 Use and interpretation of expenditure estimates

Disease-specific expenditure estimates provide a useful perspective on the utilisation and costs of health services in Australia, as well as a reference source for planners and researchers interested in the costs and utilisation patterns for a particular disease group. The estimates presented in this report are derived in a consistent framework, but it is important that their interpretation and limitations be clearly understood. The most important points to note are:

- 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.
- Care should be taken when interpreting expenditure associated with disease treatment as an estimate of the savings that would result from prevention of disease. Conversion of the opportunity cost of resources being devoted to disease treatment, or the benefits forgone, into expenditure savings involves a number of additional considerations (see, for example, AIHW: Mathers et al. 1998b).
- Although the expenditure estimates reported here provide a broad picture of use of health system resources classified by disease group, they should be interpreted with caution for specific diseases because, although the methodology 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 analysis of actual costs incurred by patients with that disease.

Monetary expenditure on health services by itself tells us little about 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 dissected by disease categories.

Disease expenditure estimates cannot provide a comprehensive assessment of the impact of disease on the welfare of society. Nevertheless, they can be useful indicators of the economic burden individual diseases place on a society and can help identify how health resources are currently allocated to different diseases and population subgroups.

## 1.2 Background

The first detailed Australian study of expenditure across disease and injury groups was published in 1998 and referred to the year 1993–94 (AIHW: Mathers et al. 1998b). This study classified disease and injury according to the major chapter groupings of the International Classification of Diseases Ninth Revision (ICD-9).

The 1993–94 disease expenditure estimates were for the treatment costs of disease (and some prevention costs) by area of expenditure (i.e. hospitals, nursing homes, medical services, other professional services, and pharmaceuticals) and by age and sex groups (AIHW: Mathers et al. 1998a).

## 1.3 Methodology

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, IMF, OECD, UN & WB 1993).

To ensure consistency across the disease expenditure project and the associated burden of disease project, the disease groups used in the 2000–01 disease expenditure estimates were based on the 176 diseases that were published in the Australian burden of disease study (AIHW: Mathers et al. 1999). Extra categories were added to provide a more comprehensive list of diseases, and, as in 1993–94, the two categories of ‘Symptoms, signs and ill-defined conditions’ and ‘Other contact with health services’ were included to cover those health service expenditures which cannot be allocated by disease. Inclusion of these two categories allows for the allocation of all the ICD-10 codes.

The 2000–01 estimates were derived using a methodology which is consistent with that used for the 1993–94 estimates, in order to allow better comparisons between the estimates for the two years. The use of the burden of disease study categories, however, means that not all the expenditure estimates as published are directly comparable. In particular for the 2000–01 estimates:

- In the burden of disease categorisation, dementia (Part of ICD-10 chapter V: Mental and behavioural disorders) is included with Alzheimer’s disease (Part of ICD-10 chapter VI: Diseases of the nervous system). For these expenditure estimates, therefore, all dementia and Alzheimer’s disease expenditure is in the burden of disease chapter K: Nervous system and sense organ disorders.
- Diabetes is presented separately from the endocrine, nutritional & metabolic disorders group.
- Oral health is presented separately from the digestive system disorders group.

When comparisons of 2000–01 and 1993–94 are made later in this report, adjustments have been made to allow where possible for these differences, but comparisons made using *published* 1993–94 results will not be valid.

The full set of ICD-9 codes used in the burden of disease categories is in Annex Table A of *The Burden of Disease and Injury in Australia* (AIHW: Mathers et al. 1999).

Since the 1993–94 study, nursing homes and hostels have been integrated into a single residential aged care system. The ‘nursing home’ portion of 2000–01

residential aged care services expenditure is estimated on the basis of residents' level of dependency, with expenditure on high-dependency residents (RCS categories 1–4) taken as approximating expenditure on nursing homes.

Disease expenditure estimates for 2000–01 are available by the following areas of expenditure: hospitals, aged care homes, out-of-hospital medical services, pharmaceuticals, other professional services, dental, and research. A detailed analysis was undertaken for admitted hospital patients, aged care homes, out-of-hospital medical services, and pharmaceuticals requiring a prescription (72% of allocated expenditure). For other areas of expenditure, estimates were made by adjusting the 1993–94 estimates for changes in the age and sex structure of the population and then multiplying these by a factor that ensured they add to the known total 2000–01 expenditure for that area.

## **Areas of health expenditure**

### **Hospital: admitted 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 2001–02* (AIHW 2003a). Private hospital expenditure data are derived from the Australian Bureau of Statistics Private Health Establishments Survey.

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 Diagnostic 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 (e.g. ward costs and meals), whereas others are independent of length of stay (e.g. 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 DRG weights, and so assumes that the hospital has the same average costliness as the average for the state. The establishment's 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 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 (SNAP) study (Eagar et al. 1997). Per diem costs were applied and inflated to 2000–01 estimates using the implicit price deflator for final government consumption expenditure on hospital and nursing home care (AIHW 2002).

Estimates of expenditure on medical services for private patients in hospitals are included in admitted patient hospital costs. Expenditure for private medical services

in 2000–01 was \$1,822 million. This estimate comes from Health Insurance Commission 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.

### **Hospital: non-admitted patients**

Total expenditure for non-admitted patients comes from *Australian Hospital Statistics 2001–02* (AIHW 2003a). The figure was broken down by disease by adjusting the 1993–94 non-admitted patient disease expenditure pattern for demographic changes. These numbers are therefore, preliminary.

### **Aged care homes**

Since the 1993–94 disease costing study was undertaken, nursing homes and hostels have been integrated into a single residential aged care system. People receiving residential aged care are categorised according to the level of care they receive. Each resident is categorised into one of eight care categories on admission and this categorisation is periodically reviewed. The ‘nursing home’ portion of residential aged care services expenditure is estimated on the basis of this level of care. Levels 1 to 4 roughly relate to residents with high levels of dependency and are approximately equivalent to the services delivered by nursing homes in the past.

Expenditure for residents categorised to RCS levels 1 to 4 in aged care homes comes from *Health Expenditure Australia 2001–02* (AIHW 2003b). It is allocated to disease based on data from the Australian Bureau of Statistics 2003 Survey of Disability, Ageing and Carers which asks staff in aged care homes which health condition causes the most problems for residents.

### **Out-of-hospital medical services**

Data from the general practitioners survey, *Bettering the Evaluation and Care of Health*, or BEACH, was used to allocate private medical services provided by both GPs and specialists. The International Classification of Primary Care Version 2 codes used in BEACH were mapped to the disease costing groups to enable medical services expenditure to be allocated by disease.

Three years of the BEACH database, 1999–00 to 2001–02, were used in the analysis, which gave 296,000 encounters overall. The proportions of problems by disease were used to allocate medical expenditures. The total medical expenditures came from Medicare 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. Expenditure for ‘Optometry’ was allocated to the disease group ‘Disorders of refraction’ under chapter K: Nervous system and sense organ

disorders. Allocation of GP costs where there are multiple presenting conditions in the GP encounter was done on a pro-rata basis.

In-hospital medical expenditure for private patients is not included under medical services, but is allocated as part of admitted patient expenditure. (*Health Expenditure Australia 2001–02* (AIHW 2003b) includes this in-hospital medical expenditure in the category ‘medical services’).

## **Pharmaceuticals**

### **Prescription drugs**

The Department of Health and Ageing provided detailed costing data for pharmaceuticals issued 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. Prescription drugs were coded by the fifth edition of the Anatomical Therapeutic Chemical classification a system developed by the World Health Organization for classifying therapeutic drugs (WHO Collaborating Centre for Drug Statistics Methodology 2002). The codes were mapped to codes for prescription drugs used in the BEACH survey. As a result, data from BEACH were used to allocate expenditure on prescription drugs to each disease group, based on the medical 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 that are dispensed in hospitals are included in the estimates of hospital costs.

### **Over-the-counter drugs**

*Health Expenditure Australia 2001–02* (AIHW 2003b) separates expenditure on pharmaceuticals into ‘Benefit paid pharmaceuticals’ and ‘All other pharmaceuticals’. ‘All other pharmaceuticals’ include over-the-counter drugs but also pharmaceuticals for which a script is required such as private prescriptions and under-copayment drugs. The estimates in this report separate pharmaceuticals for which a script is required from over-the-counter drugs. Therefore, in order to calculate the expenditure on over-the-counter drugs, expenditure on private prescriptions and under-copayment drugs was subtracted from ‘All other pharmaceuticals’.

Expenditure on over-the-counter drugs in 2000–01 by disease is based on a revision to the 1993–94 disease costing estimates that allows for demographic change, and increases in the expenditure in this area and are therefore approximate.

### **Other professional services**

Total expenditure on 'Other professional services' was obtained from *Health Expenditure Australia 2001-02* (AIHW 2003b) and was allocated to disease by adjusting the 1993-94 disease figures for demographic change. 2000-01 disease expenditure estimates for 'Other professional services' are therefore approximations and should be used with caution.

### **Dental services**

Total expenditure on 'Dental services' was obtained from *Health Expenditure Australia 2001-02* (AIHW 2003b) and was allocated to the oral health category. The age and sex estimates for 2000-01 were obtained using the 1993-94 age-sex expenditure distribution against the 2000-01 age-sex population structure, and are therefore approximate.

### **Research**

Total expenditure on 'Research' was obtained from *Health Expenditure Australia 2001-02* (AIHW 2003b) 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 within that chapter.

# 2 Results

## 2.1 Total expenditure

Allocated recurrent expenditure has increased from \$30.4 billion in 1993–94 to \$50.1 billion in 2000–01, this represents a decrease of 1.5% in the proportion of total recurrent expenditure allocated to disease between 1993–94 and 2000–01 (Table 1).

Expenditure not allocated by disease includes capital expenditure and capital consumption, patient transport, health administration, and health aids and appliances (Table 1).

The community mental health portion of community health has been allocated by disease, and the cancer screening portion of public health has been allocated to neoplasms, but other areas of community and public health could not be allocated by disease. Welfare expenditures such as the Home and Community Care program and low-level care in aged care homes are not included.

**Table 1: Total health expenditure in Australia, 1993–94 and 2000–01 (\$ million)**

Expenditure	1993–94 <sup>(a)</sup>	% of total recurrent expenditure	2000–01	% of total recurrent expenditure
<b>Allocated recurrent expenditure</b>	<b>30,401</b>	<b>89.0%</b>	<b>50,146</b>	<b>87.5%</b>
<b>Unallocated recurrent expenditure</b>				
<i>Ambulance</i>	484	1.4%	994	1.7%
<i>Aids and appliances</i>	770	2.3%	2,108	3.7%
<i>Community and public health<sup>(e)</sup></i>	1,156	3.4%	2,123	3.7%
<i>Administration</i>	1,099	3.2%	1,924	3.4%
<i>Other non-institutional not elsewhere classified<sup>(b)</sup></i>	109	0.3%	1	0.0%
<i>Other institutional not elsewhere classified<sup>(c)</sup></i>	121	0.4%		
<b>Total unallocated</b>	<b>3,739</b>	<b>11.0%</b>	<b>7,150</b>	<b>12.5%</b>
<b>Total recurrent expenditure</b>	<b>34,141</b>	<b>100.0%</b>	<b>57,297</b>	<b>100.0%</b>
Capital expenditure/outlays <sup>(d)</sup>	1,852		2,631	
Capital consumption <sup>(d)</sup>	523		970	
<b>Total health expenditure</b>	<b>36,516</b>		<b>60,897</b>	

(a) The results for 1993–94 have been adjusted to align with the 2000–01 classifications for allocated and non-allocated areas of expenditure.

(b) 'Other non-institutional not elsewhere classified' is included in 'Community and public health' for 2000–01.

(c) Almost all of 'Other institutional not elsewhere classified' is included in 'Allocated recurrent expenditure' for 2000–01.

(d) Capital expenditure and capital consumption for 1993–94 is from AIHW (2002).

(e) Excludes expenditure for community mental health (\$340 m), public health cancer screening (\$61.7 m) in 1993–94 and community mental health (\$842 m) and public health cancer screening (\$130 m) in 2000–01.

**Table 2: Total health expenditure 2000–01 by categories used in health expenditure Australia 2001–02.**

	<b>2000–01 (\$ million)</b>	<b>% total recurrent expenditure</b>
<b>Hospitals</b>	<b>22,030</b>	<b>38.4%</b>
Admitted patient	17,343	30.3%
<i>Admitted patient hospital services</i>	15,680	27.4%
<i>Private medical services in-hospital</i> <sup>(a)</sup>	1,663	2.9%
Non-admitted patients	4,686	8.2%
<b>High level residential aged care</b>	<b>3,899</b>	<b>6.8%</b>
<b>Out of hospital medical</b> <sup>(a)</sup>	<b>8,454</b>	<b>14.8%</b>
Unreferred attendances	3,509	6.1%
Imaging	1,496	2.6%
Pathology	1,317	2.3%
Other medical	2,132	3.7%
<b>Pharmaceuticals</b>	<b>8,085</b>	<b>14.1%</b>
Pharmaceuticals requiring a prescription	5,896	10.3%
<i>Benefit paid pharmaceuticals</i> <sup>(d)</sup>	5,091	8.9%
<i>Under co-payment prescriptions</i> <sup>(b)</sup>	439	0.8%
<i>Private prescriptions</i> <sup>(b)</sup>	366	0.6%
Over-the-counter <sup>(b)</sup>	2,189	3.8%
<b>Other health professionals</b>	<b>2,440</b>	<b>4.3%</b>
Optometry	163	0.3%
Other health professionals	2,277	4.0%
<b>Dental</b>	<b>3,084</b>	<b>5.4%</b>
<b>Community mental health</b> <sup>(c)</sup>	<b>842</b>	<b>1.5%</b>
<b>Public health cancer screening</b> <sup>(c)</sup>	<b>130</b>	<b>0.2%</b>
<b>Research</b>	<b>1,182</b>	<b>2.1%</b>
<b>Total allocated recurrent expenditure</b>	<b>50,146</b>	<b>87.5%</b>

*(continued)*

**Table 2 (continued): Total health expenditure 2000–01 by categories used in health expenditure Australia 2001–02.**

	2000–01 (\$ million)	% total recurrent expenditure
<b>Total allocated recurrent expenditure</b>	<b>50,146</b>	<b>87.5%</b>
<b>Unallocated expenditure</b>		
Ambulance	994	1.7%
Aids and appliances	2,108	3.7%
Other Community and public health <sup>(c)</sup>	2,123	3.7%
Administration	1,924	3.4%
Other non-institutional not elsewhere classified	1	0.0%
<b>Total recurrent expenditure</b>	<b>57,297</b>	

(a) The category 'Medical services' in the AIHW health expenditure publications (AIHW, 2003 p.75) includes private medical services in hospital as well as out of hospital medical services.

(b) The category 'All other pharmaceuticals' in the AIHW health expenditure publications (AIHW, 2003 p.75) includes under co-payment prescriptions, private prescriptions, and over-the-counter drugs. The estimate for expenditure on private prescriptions is based on cost data for approximately 30% of the total private prescriptions and should therefore be used with caution.

(c) The category 'Community and public health' in the AIHW health expenditure publications (AIHW, 2003 p.75) includes Community mental health, public health cancer screening and other community and public health. The amount of \$2,123 million in 'Other Community and public health' does not include public health cancer screening and community mental health.

(d) Includes PBS and RPBS pharmaceuticals, and stoma appliances.

Table 2 allows the data presented in this report to be reconciled with data presented in *Health Expenditure Australia 2001–02*.

Table 3 shows health expenditure in Australia in 2000–01, summarised at the broad disease group level. This expenditure includes expenditure funded by the Commonwealth and state governments, by private health insurance and by individuals and households. These disease expenditure estimates allocate 87.5% of total recurrent health expenditure in 2000–01, or \$50.1 billion. The seven disease groups that account for the greatest health expenditure in Australia (Table 3) are:

- Cardiovascular diseases – \$5.5 billion (10.9% of total allocated health expenditure)
- Nervous system disorders – \$4.9 billion (9.9%)
- Musculoskeletal diseases – \$4.6 billion (9.2%)
- Injuries – \$4.0 billion (8.0%)
- Respiratory diseases – \$3.7 billion (7.5%)
- Mental disorders – \$3.7 billion (7.5%)
- Oral health – \$3.4 billion (6.9%)

These seven conditions together account for \$30 billion, or 60% of allocated health expenditure.

**Table 3: Allocated recurrent expenditure in Australia, by broad disease group, 2000–01 (\$ million)**

Disease group	Hospitals			Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Other professional services <sup>(c)(f)</sup>	Pharmaceuticals <sup>(i)</sup>			Community and public health and Dental <sup>(g)</sup>	Research	Total expenditure allocated by disease
	Admitted patients <sup>(a)</sup>	Non-admitted services	Total				Prescription <sup>(d)</sup>	Over-the-counter <sup>(c)(e)</sup>	Total			
Infectious & parasitic	340	138	478	8	366	25	168	41	209	0	139	1,224
Respiratory	1,101	393	1,494	88	840	87	694	503	1,197	0	35	3,742
Maternal conditions	1,096	81	1,178	0	107	10	2	7	9	0	11	1,315
Neonatal causes	334	0	334	0	12	0	1	0	1	0	11	358
Neoplasms	1,716	272	1,988	37	343	22	167	16	183	130	215	2,918
Diabetes mellitus	231	58	289	38	183	33	221	13	234	0	35	812
Endocrine, nutritional and metabolic	284	108	392	14	340	59	663	51	714	0	68	1,587
Mental disorders	1,049	147	1,196	366	499	134	551	65	616	821	109	3,741
Nervous system disorders	811	246	1,057	2,168	573	519	333	67	400	21	204	4,942
Alzheimer's and other dementias	159	1	160	1,902	18	9	26	1	27	21	94	2,230
Other nervous system	652	244	897	267	555	510	307	66	373	0	110	2,712
Cardiovascular	2,235	298	2,533	526	782	73	1,158	253	1,411	0	153	5,479
Digestive system	1,382	190	1,571	34	347	191	499	138	637	0	31	2,811
Genitourinary	1,071	246	1,317	14	469	29	175	59	233	0	13	2,076
Skin diseases	307	255	562	13	341	96	126	218	344	0	13	1,370
Musculoskeletal	1,286	542	1,828	482	879	710	468	212	680	0	55	4,634

(continued)

**Table 3 (continued): Allocated recurrent expenditure in Australia by broad disease group, 2000–01 (\$ million)**

Disease group	Hospitals			Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Other professional services <sup>(c)(f)</sup>	Pharmaceuticals <sup>(i)</sup>			Community and public health and Dental <sup>(g)</sup>	Research	Total expenditure allocated by disease
	Admitted patients <sup>(a)</sup>	Non-admitted services	Total				Prescription <sup>(d)</sup>	Over-the-counter <sup>(c)(e)</sup>	Total			
Congenital anomalies	158	0	158	6	19	1	2	0	2	0	37	221
Oral health	133	56	189	0	15	24	8	26	34	3,084	27	3,372
Injuries	1,644	1,187	2,831	105	622	265	108	76	184	0	6	4,013
Signs, symptoms, ill-defined conditions and other contact with health system <sup>(h)</sup>	2,165	469	2,634	0	1,717	163	551	444	996	0	21	5,530
<b>Total</b>	<b>17,343</b>	<b>4,686</b>	<b>22,030</b>	<b>3,899</b>	<b>8,454</b>	<b>2,440</b>	<b>5,896</b>	<b>2,189</b>	<b>8,085</b>	<b>4,056</b>	<b>1,182</b>	<b>50,146</b>

(a) Includes a preliminary estimate of private medical services provided in hospital and expenditure on Highly specialised drugs.

(b) Includes expenditure on residents that require and receive a level of care that falls within one of the four highest levels in residential aged care services.

(c) Based on preliminary AIHW estimates.

(d) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions but excludes Highly Specialised Drugs.

(e) Includes 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.

(f) Includes services delivered outside of hospitals by paramedical professionals such as physiotherapists, chiropractors, occupational therapists, audiologists, speech therapists, hydropaths, podiatrists, therapeutic and clinical massage therapists, clinical psychologists, dietitians and osteopaths.

(g) Includes expenditure on community mental health, public health cancer screening programs and dental expenditure.

(h) '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 plastic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

(i) Expenditure for Highly Specialised Drugs (\$268 million) is included in Hospital expenditure.

**Table 4: Diseases and injury by burden of disease chapter: health system costs by health sector, 2000–01 (\$ million) and number of deaths, 2001**

Burden of disease chapter	Hospitals <sup>(a)</sup>	Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Dental <sup>(d)</sup> and other professional services <sup>(c)(e)</sup>	Total pharmaceuticals <sup>(f)</sup>	Community and Public health <sup>(g)</sup>	Research	Total expenditure allocated by disease	% of total allocated expenditure	Number of deaths	% of total deaths
Cardiovascular	2,533	526	782	73	1,411		153	5,479	10.9	49,172	38.3
Nervous system	1,057	2,168	573	519	400	21	204	4,942	9.9	6,260	4.9
Musculoskeletal	1,828	482	879	710	680		55	4,634	9.2	899	0.7
Injuries	2,831	105	622	265	184		6	4,013	8.0	7,483	5.8
Respiratory	1,494	88	840	87	1,197		35	3,742	7.5	10,682	8.3
Mental disorders	1,196	366	499	134	616	821	109	3,741	7.5	939	0.7
Oral health	189	0	15	3,108	34		27	3,372	6.7	12	0.0
Digestive system	1,571	34	347	191	637		31	2,811	5.6	4,107	3.2
Neoplasms	1,988	37	343	22	183	130	215	2,918	5.8	37,615	29.3
Genitourinary	1,317	14	469	29	233		13	2,076	4.1	3,168	2.5
Endocrine, nutritional & metabolic	392	14	340	59	714		68	1,587	3.2	1,651	1.3
Skin diseases	562	13	341	96	344		13	1,370	2.7	266	0.2
Maternal conditions	1,178	0	107	10	9		11	1,315	2.6	12	0.0
Infectious & parasitic	478	8	366	25	209		139	1,224	2.4	1,746	1.4

(continued)

**Table 4 (continued): Diseases and injury by burden of disease chapter: health system costs by health sector, 2000–01 (\$ million), and number of deaths, 2001**

Burden of disease chapter	Hospitals <sup>(a)</sup>	Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Dental <sup>(d)</sup> and other professional services <sup>(c)(e)</sup>	Total pharmaceuticals <sup>(f)</sup>	Community and Public health <sup>(g)</sup>	Research	Total expenditure allocated by disease	% of total allocated expenditure	Number of deaths	% of total deaths
Diabetes mellitus	289	38	183	33	234		35	812	1.6	3,089	2.4
Neonatal causes	334	0	12	0	1		11	358	0.7	690	0.5
Congenital anomalies	158	6	19	1	2		37	221	0.4	623	0.5
Signs, symptoms, ill-defined conditions and other contact with the health system <sup>(h)</sup>	2,634	0	1,717	163	996		21	5,530	11.0	125	0.1
<b>Total</b>	<b>22,030</b>	<b>3,899</b>	<b>8,454</b>	<b>5,524</b>	<b>8,085</b>	<b>972</b>	<b>1,182</b>	<b>50,146</b>	<b>100.0</b>	<b>128,540</b>	<b>100.0</b>
<b>As percent of total</b>	<b>43.9</b>	<b>7.8</b>	<b>16.9</b>	<b>11.0</b>	<b>16.1</b>	<b>1.9</b>	<b>2.4</b>	<b>100.0</b>			

(a) Public and private acute hospitals and psychiatric hospitals. Includes a preliminary estimate of private medical services provided in hospital and expenditure on Highly specialised drugs.

(b) Includes expenditure on residents that require and receive a level of care that falls within one of the four highest levels in residential aged care services.

(c) Based on preliminary AIHW estimates.

(d) Expenditure on dental services was \$3,084 million and is all included in the 'Oral health' category.

(e) Includes services delivered outside of hospitals by paramedical professionals such as physiotherapists, chiropractors, occupational therapists, audiologists, speech therapists, hydropaths, podiatrists, therapeutic and clinical massage therapists, clinical psychologists, dietitians and osteopaths.

(f) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions, and includes 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. Excludes expenditure on Highly Specialised Drugs.

(g) Includes expenditure on community mental health and public health cancer screening programs.

(h) '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 plastic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

In 1993–94 these seven disease groups also accounted for the most health expenditure in Australia, but the proportions of expenditure were somewhat different. The top seven were cardiovascular diseases (12%), musculoskeletal diseases (10%), injuries (8%), respiratory diseases (8%), nervous system disorders (7.5%), mental disorders (6.4%) and oral health (6.2%) (calculated from AIHW: Mathers et al. 1998b).

Expenditure for mental disorders has increased from \$2,247 million to \$3,741 million in the period 1993–94 to 2000–01. This represents a change from 7.4% of total allocated health expenditure in 1993–94 to 7.5% in 2000–01. In the same period, expenditure on community mental health has increased from \$340 million to \$842 million. The increase in expenditure on community mental health represented a change of focus in mental health from hospital care to community care.

For 2000–01, cardiovascular disease was the most expensive group (\$5,479 million), and also accounted for a high proportion of deaths – 38% (Table 4).

Nervous system disorders was the second most expensive group and has increased significantly since 1993–94, mostly because of a large increase in expenditure for people with Alzheimer’s disease and other dementias in aged care homes. An estimate of 49% of expenditures for high-level care in aged care homes was to be due to Alzheimer’s and other dementias in 2000–01 (Table 3).

Cancer ranks ninth in terms of direct costs, but is the second highest contributor to deaths (37,615 deaths, or 29% of all deaths).

It is interesting to note that musculoskeletal diseases and injuries, which include many long-term chronic disorders with relatively low fatality rates but high levels of disability and reduced functionality, rank highly in the direct cost estimates.

Nervous system disorders, mental disorders, musculoskeletal diseases and injuries rank highly in terms of costs (\$17.2 billion, or 34.6% of allocated health system costs), but cause only 12% of deaths.

As the fifth most expensive disease group, respiratory diseases are the third-largest cause of death for 2000–01, about two-thirds of which are due to pneumonia and chronic obstructive pulmonary disease (COPD).

Ranked seventh is oral health, with 6.9% of expenditure but, of course, very few deaths.

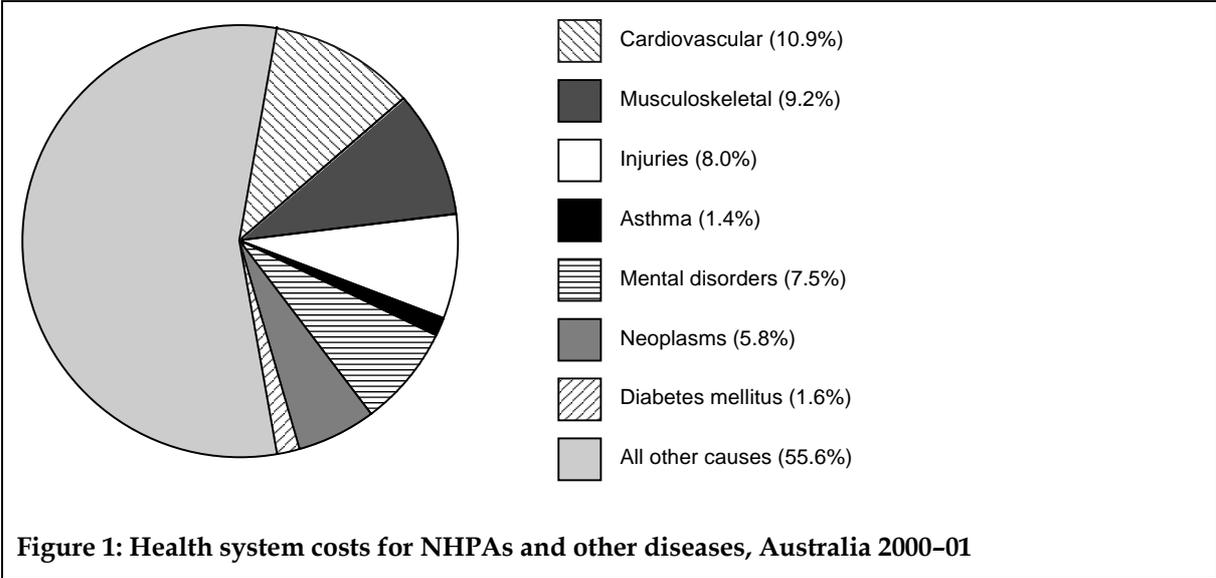
For all diseases, 43.9% of direct health system costs allocated by disease are within the hospital sector (which includes admitted patient and non-admitted patient services in public and private hospitals), 16.9% of costs are for out-of-hospital medical services, 16.1% for pharmaceuticals, 7.8% for the high-care component of aged care homes and 11% for dental services and other health professionals (Table 4).

It should be noted that expenditure in aged care homes is not entirely for health purposes. Much of this expenditure is on food, lodging and other necessities of daily life and occurs regardless of the disease a person has. Thus only a portion of aged care home expenditure should be considered to be a consequence of disease.

## 2.2 Expenditure on National Health Priority Area conditions

The National Health Priority Areas (NHPA) 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, cancer control, injury prevention and control, mental health, musculoskeletal conditions, diabetes mellitus and asthma. Table 4 shows expenditure on each of these areas in 2000–01. Together, the NHPAs account for \$22.3 billion, or 45.3% of allocated health system expenditure.

Four of the seven NHPAs rank within the top seven conditions listed in Section 2.1 – cardiovascular disease, musculoskeletal diseases, mental disorders and injury. The fifth, neoplasms, ranks ninth (\$2.9 billion, or 5.8% of allocated expenditure); and the sixth, diabetes, ranks fifteenth (\$0.8 billion or 1.6% of allocated expenditure). Diabetes also is a cause of other diseases such as cardiovascular and renal diseases, so total health expenditure attributable to diabetes is greater than \$0.8 billion. Asthma is the seventh NHPA. It is contained within the respiratory diseases group and accounts for \$0.7 billion, or 1.4% of allocated health expenditure (Figure 1).



**Table 5: Allocated recurrent health expenditure on National Health Priority Areas, 2000-01 (\$ million)**

Disease group	Hospital			Aged care homes <sup>(b)</sup>	Out-of-hospital medical services	Other professional services <sup>(c)(f)</sup>	Pharmaceuticals			Research <sup>(c)</sup>	Community and public health <sup>(g)</sup>	Total expenditure allocated by disease
	Admitted patients <sup>(a)</sup>	Non-admitted services	Total				Prescription <sup>(d)</sup>	Over-the-counter <sup>(c)(e)</sup>	Total			
<b>All cardiovascular diseases</b>	<b>2,235</b>	<b>298</b>	<b>2,533</b>	<b>526</b>	<b>782</b>	<b>73</b>	<b>1,158</b>	<b>253</b>	<b>1,411</b>	<b>153</b>		<b>5,479</b>
Ischaemic heart disease	989	61	1,050	25	130	15	171	34	205	41		1,465
Stroke	331	30	360	442	27	9	25	6	31	25		894
Other conditions	915	208	1,123	59	625	49	963	213	1,175	87		3,119
<b>All musculoskeletal conditions</b>	<b>1,286</b>	<b>542</b>	<b>1,828</b>	<b>482</b>	<b>879</b>	<b>710</b>	<b>468</b>	<b>212</b>	<b>680</b>	<b>55</b>		<b>4,634</b>
Arthritis	521	114	635	325	160	97	127	68	195	17		1,429
Other conditions	765	428	1,193	157	718	612	341	144	485	38		3,205
<b>Injuries</b>	<b>1,644</b>	<b>1,187</b>	<b>2,831</b>	<b>105</b>	<b>622</b>	<b>265</b>	<b>108</b>	<b>76</b>	<b>184</b>	<b>6</b>		<b>4,013</b>
<b>Neoplasms</b>	<b>1,716</b>	<b>272</b>	<b>1,988</b>	<b>37</b>	<b>343</b>	<b>22</b>	<b>167</b>	<b>16</b>	<b>183</b>	<b>215</b>	<b>130</b>	<b>2,918</b>
<b>All mental disorders</b>	<b>1,049</b>	<b>147</b>	<b>1,196</b>	<b>366</b>	<b>499</b>	<b>134</b>	<b>551</b>	<b>65</b>	<b>616</b>	<b>109</b>	<b>821</b>	<b>3,741</b>
Depression	216	24	240	89	276	21	330	10	340	37	104	1,107
Other conditions	833	123	956	277	223	113	221	55	276	72	717	2,634
<b>Diabetes mellitus</b>	<b>231</b>	<b>58</b>	<b>289</b>	<b>38</b>	<b>183</b>	<b>33</b>	<b>221</b>	<b>13</b>	<b>234</b>	<b>35</b>		<b>812</b>
<b>Asthma</b>	<b>98</b>	<b>72</b>	<b>170</b>	<b>16</b>	<b>110</b>	<b>21</b>	<b>296</b>	<b>74</b>	<b>370</b>	<b>6</b>		<b>692</b>
<b>All NHPA</b>	<b>8,258</b>	<b>2,576</b>	<b>10,835</b>	<b>1,570</b>	<b>3,418</b>	<b>1,258</b>	<b>2,970</b>	<b>708</b>	<b>3,678</b>	<b>579</b>	<b>951</b>	<b>22,289</b>

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

(b) Includes expenditure on residents that require and receive a level of care that falls within one of the four highest levels in residential aged care services.

(c) Based on preliminary AIHW estimates.

(d) Includes all pharmaceuticals for which a prescription is needed, including private prescriptions and under-copayment prescriptions.

(e) Includes 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.

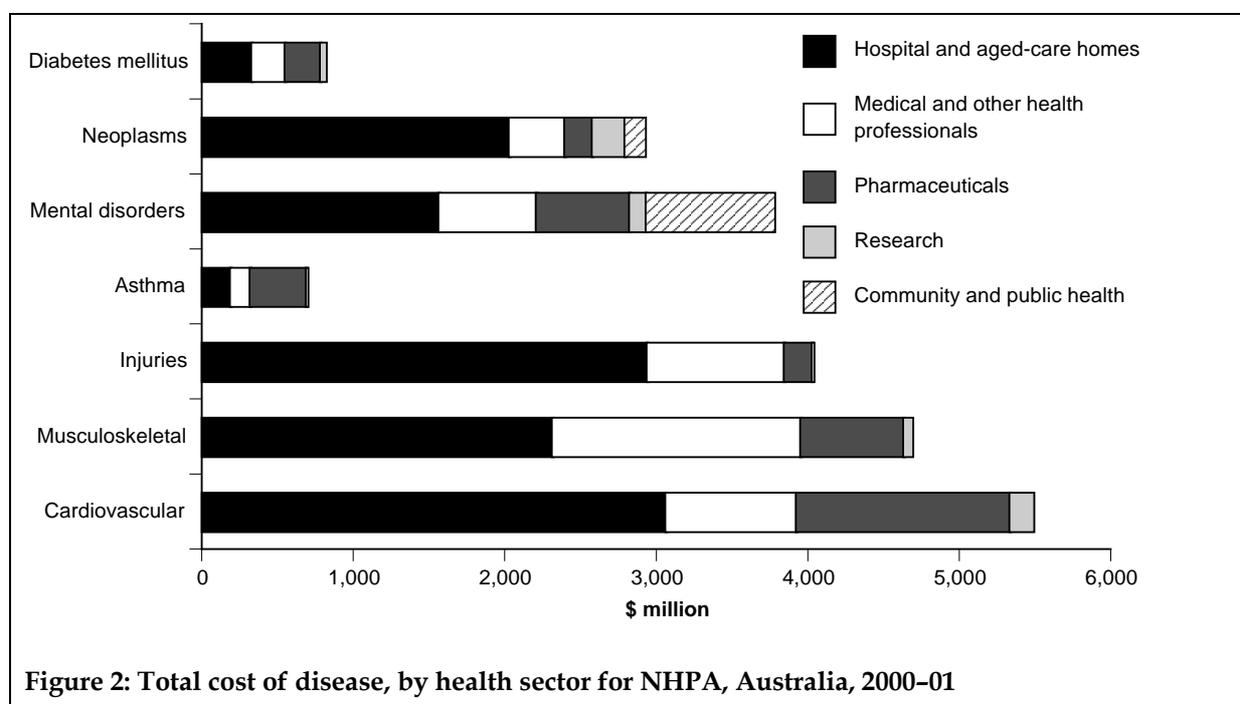
(f) Includes services delivered outside of hospitals by paramedical professionals such as physiotherapists, chiropractors, occupational therapists, audiologists, speech therapists, hydropaths, podiatrists, therapeutic and clinical massage therapists, clinical psychologists, dietitians and osteopaths.

(g) Includes only expenditure on community mental health and public health cancer screening services.

**Table 6: NHPA expenditure as a proportion of allocated health expenditure, 2000–01**

	Disease expenditure (\$ million)	Each NHPA as per cent of total	Per cent of total NHPA cost
Cardiovascular	5,479	10.9	24.6
Musculoskeletal	4,634	9.2	20.8
Injuries	4,013	8.0	18.0
Asthma	692	1.4	3.1
Neoplasms	2,918	5.8	13.1
Mental disorders	3,741	7.5	16.8
Diabetes mellitus	812	1.6	3.6
<b>Total by NHPAs</b>	<b>22,289</b>	<b>44.4</b>	<b>100.0</b>
<b>All other causes</b>	<b>27,857</b>	<b>55.6</b>	

Table 7 shows the cost components for each NHPA. Most health system expenditure for the seven NHPAs was in the hospital and aged care home sector (55.7% of all NHPA expenditure). Expenditure on NHPAs for the medical and other health professional sector (21.0%), which includes consultations with GPs and specialists, pathology and diagnostic imaging services, dentists and other health professionals was lower than that for all diseases (28.4%) (Table 6). The pharmaceutical cost for NHPAs amounted to 16.5% of NHPA expenditure, a proportion slightly higher than that of total pharmaceutical expenditure for the entire health system (16.4%).



**Figure 2: Total cost of disease, by health sector for NHPA, Australia, 2000–01**

**Table 7: Diseases and injuries in NHPAs: allocated health system costs, by health sector, Australia, 2000–01 (\$ million)**

<b>NHPA</b>	<b>Hospital and aged care homes<sup>(a)</sup></b>	<b>Medical and other health professionals<sup>(b)</sup></b>	<b>Pharmaceuticals</b>	<b>Research</b>	<b>Community and public health</b>	<b>All sectors</b>
Cardiovascular	3,060	855	1,411	153		5,479
Musculoskeletal	2,310	1,588	680	55		4,634
Injuries	2,936	887	184	6		4,013
Asthma <sup>(c)</sup>	186	130	370	6		692
Mental disorders <sup>(d)</sup>	1,561	633	616	109	821	3,741
Neoplasms <sup>(e)</sup>	2,025	365	183	215	130	2,918
Diabetes mellitus	327	216	234	35		812
<b>Total for NHPAs</b>	<b>12,405</b>	<b>4,676</b>	<b>3,678</b>	<b>579</b>	<b>951</b>	<b>22,289</b>
% of NHPAs sector total by total cost of NHPAs	55.7	21.0	16.5	2.6	4.3	100.0
<b>Total for all diseases</b>	<b>25,929</b>	<b>13,978</b>	<b>8,085</b>	<b>1,182</b>	<b>972</b>	<b>50,146</b>
% of NHPAs of all diseases, by sector	47.8	33.5	45.5	49.0	97.8	44.4
% of all diseases by total health system cost, by sector	52.7	28.4	16.4	2.4	2.0	102.0

(a) Public and private acute hospitals, psychiatric hospitals and high level care in aged care homes.

(b) Includes out-of-hospital medical services, dental and other health professional services.

(c) Part of Respiratory disease category.

(d) Includes expenditure on community mental health services.

(e) Includes public health expenditure for cancer screening programs.

Different illnesses require different treatment modes (Figure 3). For cardiovascular diseases, injuries, neoplasms and mental disorders, expenditure in hospitals and aged care homes account for a relatively high proportion of total expenditure, reflecting these conditions' demand for labour-intensive health services.

Pharmaceutical costs for asthma, diabetes, cardiovascular conditions and mental disorders constitute a significant part of the total cost of treating these diseases. Such expenditures reflect not only the chronic nature of these diseases but also the nature of their treatment. Musculoskeletal diseases, injuries and diabetes top the list of demand for medical and other health professional services. Nearly a quarter (22%) of expenditure for mental health is community based mental health programs.

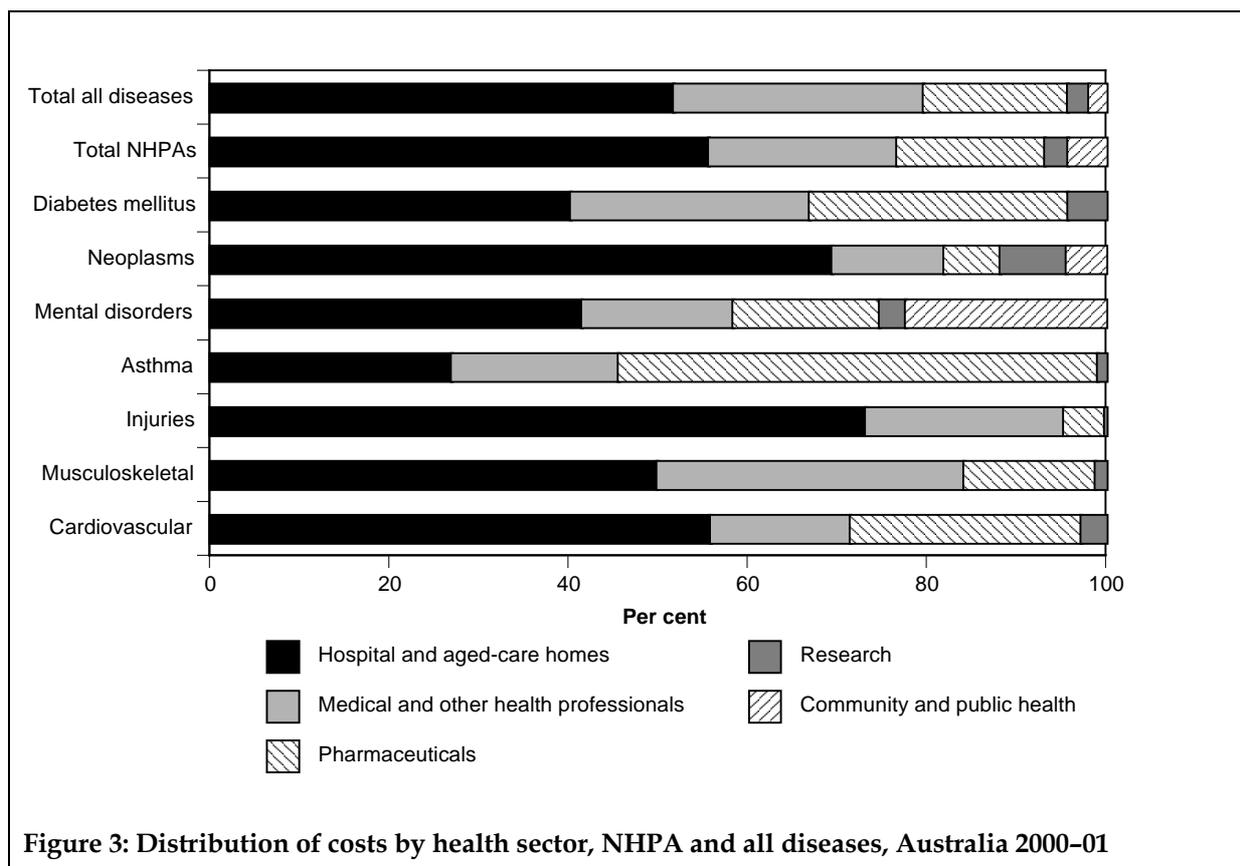


Figure 3: Distribution of costs by health sector, NHPA and all diseases, Australia 2000-01

## 2.3 Expenditure by age and sex

Health system expenditures allocated by disease are 29% higher for females than for males – \$28.2 billion compared with \$21.9 billion. Expenditure per person is \$2,908 for females which is 27% higher than the \$2,291 for males (Table 7). When maternal conditions are excluded, expenditure per person for females is 21% higher than for males.

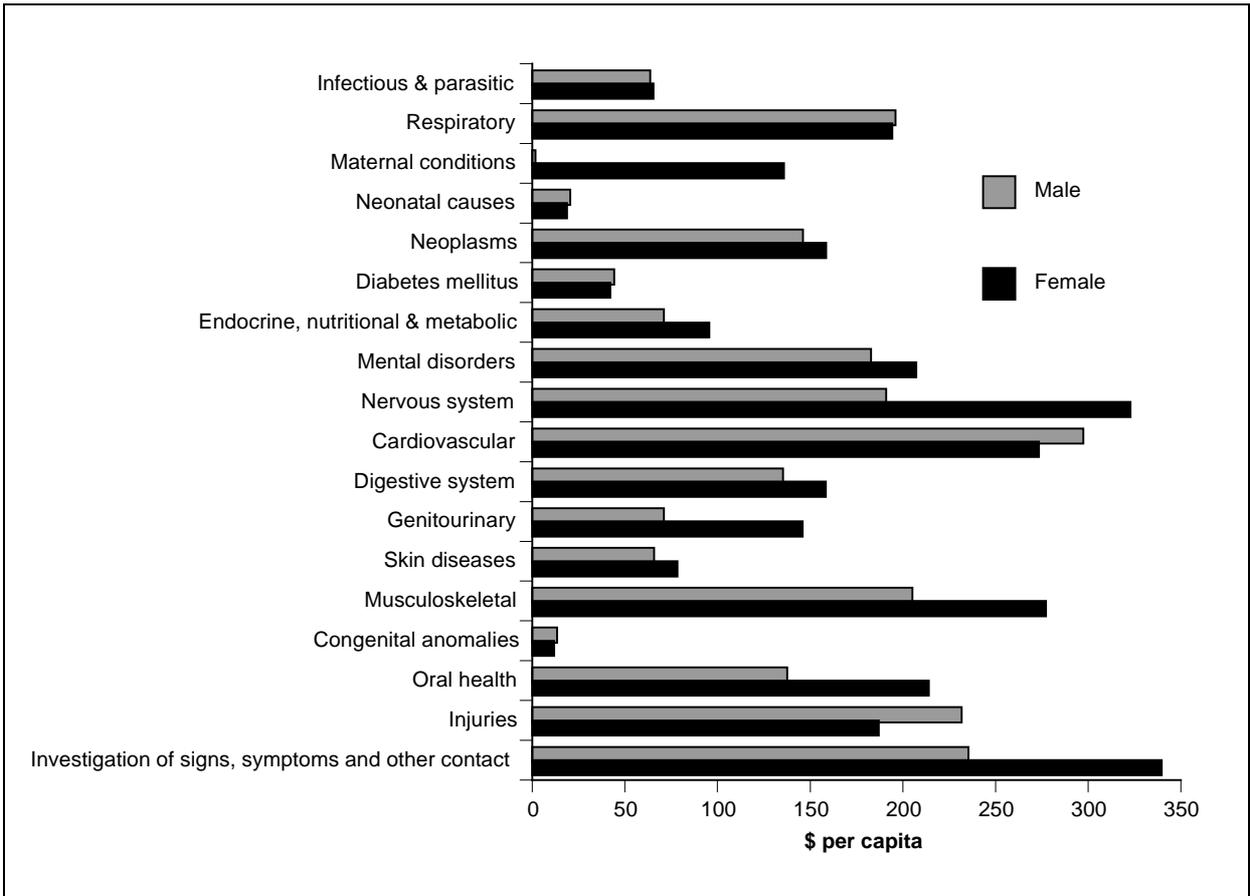
Expenditure per person is higher for females than males for disease groups such as the nervous system, musculoskeletal diseases and oral health. It is higher for males for the cardiovascular, cancer and injury groups.

Health expenditure per person is \$1,864 on average per year for males aged 0 to 4 years. It then decreases to \$1,120 for boys aged 5 to 14 years and from there increases with age to \$14,186 for men aged 85 years and over. For females, the pattern is the same for children, but in adulthood expenditure peaks in the 25-34 years age group, reflecting child-bearing expenditure; it then declines for the age range 35 to 44 years and from there increases steadily with age to \$16,411 per year for women aged 85 years or over.

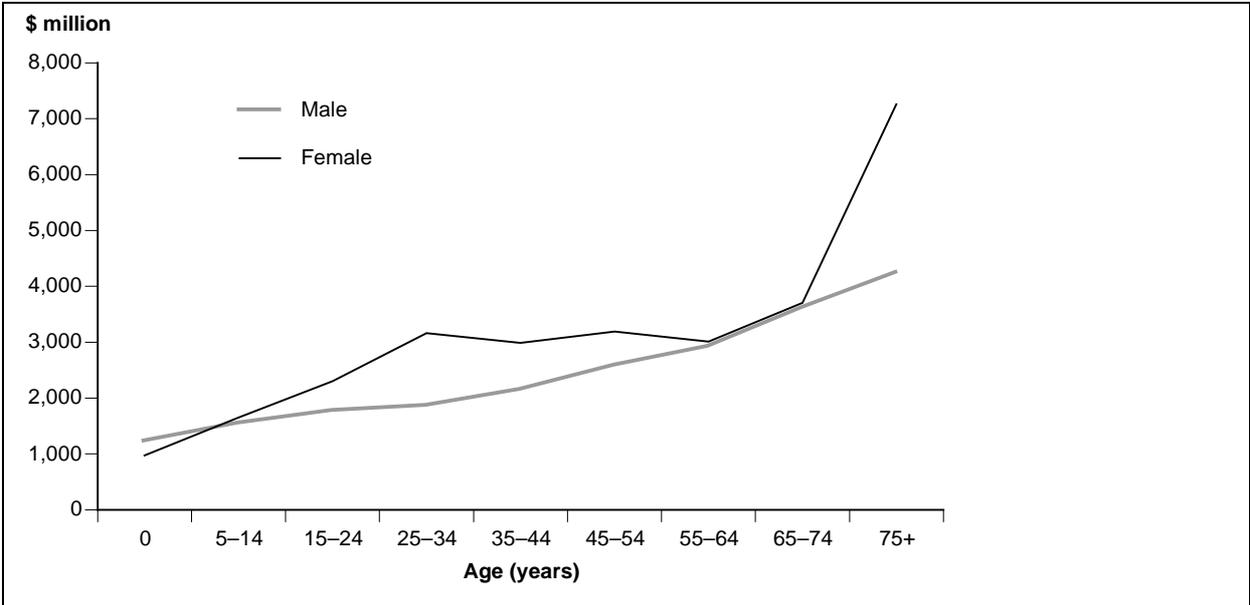
**Table 8: Allocated health expenditure per person by age, sex and burden of disease chapter, Australia, 2000–01**

Burden of disease chapter and sex	Age (years)										Total
	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	
<b>Cardiovascular</b>											
All persons	11	6	15	39	83	236	524	1,086	1,745	2,378	284
Male	13	7	17	36	95	262	619	1,301	1,954	2,401	296
Female	9	4	13	41	70	210	426	886	1,595	2,367	272
<b>Neoplasms</b>											
All persons	22	15	26	47	80	174	288	529	680	679	151
Male	25	12	17	25	42	120	277	639	956	1,089	145
Female	19	18	36	68	117	228	299	426	482	497	158
<b>Musculoskeletal</b>											
All persons	26	36	80	139	185	259	391	578	933	1,656	240
Male	24	42	84	154	187	242	355	500	695	912	204
Female	29	29	77	124	183	276	428	652	1,103	1,987	276
<b>Nervous system</b>											
All persons	112	59	58	78	87	132	185	486	1,590	5,273	256
Male	129	62	48	69	82	123	181	453	1,340	3,597	190
Female	95	56	69	87	92	142	189	518	1,769	6,019	322
<b>Injuries</b>											
All persons	127	146	238	176	148	154	186	296	553	1,142	208
Male	151	160	337	234	172	164	207	295	503	1,051	231
Female	101	131	136	120	125	145	165	298	589	1,183	186
<b>Maternal conditions</b>											
Female	8	1	236	535	150	2	0	0	0	0	135
<b>Other causes<sup>(a)</sup></b>											
All persons	1,409	926	1,015	999	1,076	1,240	1,726	2,591	3,443	4,598	1,393
Male	1,515	836	821	784	883	1,054	1,571	2,502	3,535	5,137	1,224
Female	1,296	1,019	1,217	1,211	1,267	1,425	1,885	2,674	3,378	4,357	1,559
<b>Total</b>											
<b>All persons</b>	<b>1,714</b>	<b>1,187</b>	<b>1,549</b>	<b>1,746</b>	<b>1,734</b>	<b>2,196</b>	<b>3,299</b>	<b>5,567</b>	<b>8,944</b>	<b>15,725</b>	<b>2,602</b>
<b>Male</b>	<b>1,864</b>	<b>1,120</b>	<b>1,325</b>	<b>1,302</b>	<b>1,461</b>	<b>1,965</b>	<b>3,210</b>	<b>5,689</b>	<b>8,983</b>	<b>14,186</b>	<b>2,291</b>
<b>Female</b>	<b>1,556</b>	<b>1,258</b>	<b>1,782</b>	<b>2,186</b>	<b>2,004</b>	<b>2,428</b>	<b>3,391</b>	<b>5,453</b>	<b>8,917</b>	<b>16,411</b>	<b>2,908</b>
<b>Female (Excl Maternal)</b>	<b>1,548</b>	<b>1,257</b>	<b>1,546</b>	<b>1,651</b>	<b>1,854</b>	<b>2,426</b>	<b>3,391</b>	<b>5,453</b>	<b>8,917</b>	<b>16,411</b>	<b>2,773</b>

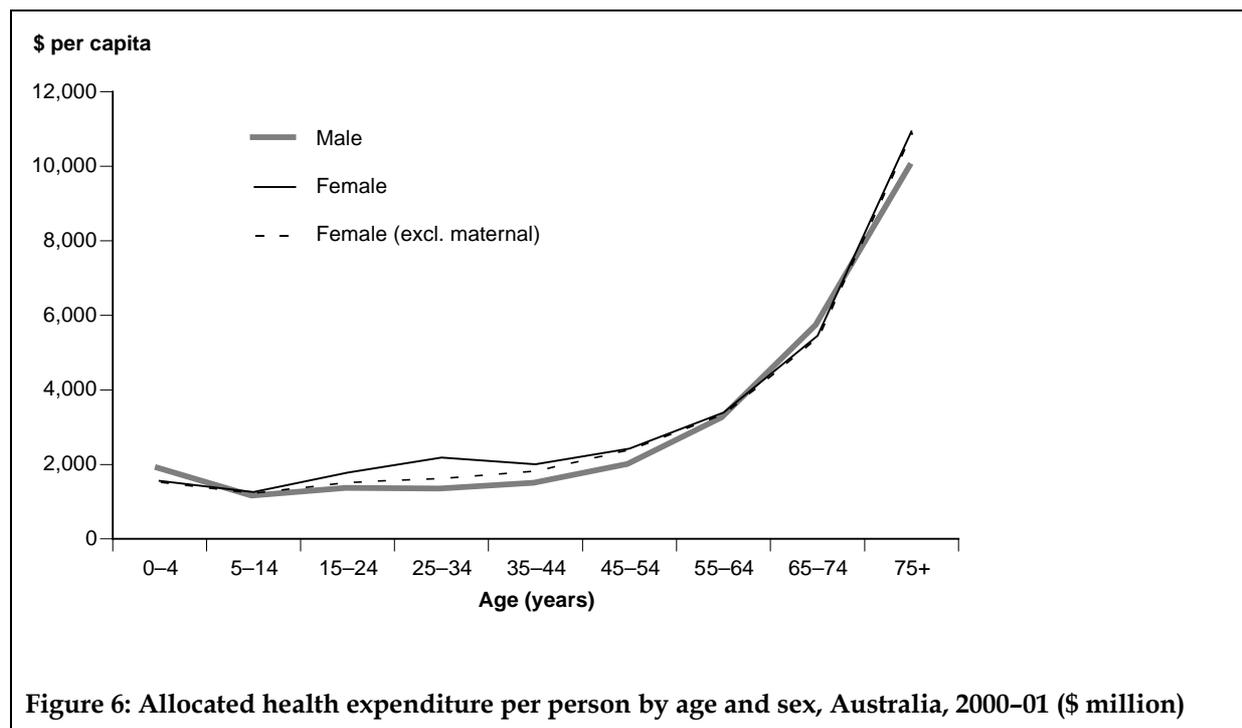
(a) 'Other causes' includes infectious & parasitic, respiratory, neonatal causes, oral health, diabetes mellitus, endocrine, nutritional & metabolic, mental disorders, digestive system, genitourinary, skin diseases, congenital anomalies, and signs, symptoms, ill-defined conditions and other contact with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



**Figure 4: Allocated per capita health expenditure by disease and injury group and sex, Australia, 2000-01 (\$)**



**Figure 5: Allocated health expenditure by age and sex, Australia, 2000-01 (\$ million)**



## 2.4 Changes from 1993-94 to 2000-01

The changes from 1993-94 to 2000-01 have been analysed excluding community mental health and public health cancer screening expenditure. Total recurrent expenditure on health goods and services in Australia in 2000-01 was estimated at \$57.3 billion (8.6% of GDP), of which \$49.2 billion could be allocated by disease. For 1993-94 total recurrent health costs were \$34.1 billion (7.7% of GDP), of which \$31.4 billion was allocated by disease. For 1993-94, expenditure on administration, public health and non-institutional services not elsewhere classified were allocated by disease; these categories were not allocated in 2000-01. Thus, to enable better comparisons, the data that follow for 1993-94 do not allocate administrative, public health expenditure and other non-institutional expenditure not elsewhere classified.

The estimate of health expenditure allocated to diseases for 1993-94 that is comparable with 2000-01 is almost \$30 billion (Table 1). After adjustment for health price inflation of 20%, the allocated health system cost for 1993-94 in 2000-01 prices was \$36.0 billion. Therefore, between 1993-94 and 2000-01 the growth in inflation-adjusted expenditure was from \$36.0 to \$49.2 billion – \$13.2 billion, or 37%. This represents an average annual increase of 4.6%. The Australian population grew by 10% during the period, an average annual increase of 1.4%.

Because expenditure has been adjusted for overall health price inflation between 1993-94 and 2000-01, it is possible to compare the specific disease expenditures for these two years and to examine the differences in growth for the different disease groups (Table 9).

Between 1993–94 and 2000–01 there was a 64% increase in inflation-adjusted expenditure allocated to the category ‘Signs, symptoms, ill defined conditions and other contact with the health system’. This partly reflects changes in methods between 1993–94 and 2000–01, though it also reflects a relative increase in diagnostic expenditure. The growth in inflation-adjusted expenditure in all areas excluding this category was 33%.

Areas that showed above-average growth from 1993–94 to 2000–01 were nervous system disorders (42%), digestive system diseases (38%) and oral health (52%). Areas which showed below-average growth were respiratory diseases (29%) mental disorders (28%), cardiovascular disease (28%) and neoplasms (32%).

The growth of only 28% for mental disorders is affected by the fact that community health expenditure was not able to be allocated by disease for this table, so the considerable increase in community mental health expenditure since 1993–94 is not included in the numbers in this table. If this is included, the growth is 40%.

The lower birth rate led to below-average growth for maternal conditions, neonatal causes and congenital anomalies.

Expenditure on pharmaceuticals (67% growth) and dental services (50%) grew significantly faster in inflation adjusted terms than expenditure in other sectors. Hospital expenditure grew by 31% and expenditure on aged care homes grew by 23% in inflation-adjusted terms. Not all diseases showed this pattern of high growth for pharmaceuticals and lower growth in hospitals and aged care homes. The nervous system category showed an 89% increase in aged care homes expenditure compared with a 34% increase in pharmaceutical expenditure. This is the result of the large increase in expenditure on care for people with dementia in aged care homes. For the injuries category, pharmaceuticals increased only 20% and hospitals increased a much higher amount (42%). In contrast, for cardiovascular diseases the increase for hospitals was 27% compared with an increase for pharmaceuticals of 64%. (Note that cholesterol-lowering drugs are classified as part of the ‘Endocrine’ category not ‘Cardiovascular’. If these were included with cardiovascular diseases, the pharmaceutical expenditures for cardiovascular disease would show an even greater increase.)

Although the numbers in Table 9 have been adjusted to make 1993–94 as comparable as possible with 2000–01, there are differences in the classification systems and the methods used in the two years, so the comparisons must be recognised as approximate only.

**Table 9: Change in inflation-adjusted<sup>(a)</sup> health system expenditure<sup>(d)</sup>, 1993–94 to 2000–01**

Burden of disease chapter	Hospital	Aged care homes	Pharmaceuticals	Dental services	Other <sup>(b)</sup>	Total	\$ million (2000–01 prices)
	(per cent)						
Infectious & parasitic	62	n.a.	–10	n.a.	n.a.	25	<b>249</b>
Respiratory	49	n.a.	27	n.a.	17	29	<b>851</b>
Maternal conditions	4	n.a.	–32	n.a.	100	9	<b>107</b>
Neonatal causes and congenital anomalies	22	n.a.	14	n.a.	159	27	<b>122</b>
Neoplasms	25	n.a.	188	n.a.	39	32	<b>678</b>
Diabetes mellitus	n.a.	60	74	n.a.	131	n.a.	<b>n.a.</b>
Endocrine, nutritional & metabolic	36	–64	169	n.a.	32	67	<b>641</b>
Mental disorders <sup>(d)</sup>	10	16	161	n.a.	16	28	<b>640</b>
Nervous system	2	89	34	n.a.	31	42	<b>1,416</b>
Cardiovascular	27	–25	64	n.a.	40	28	<b>1,209</b>
Digestive system	31	–18	111	n.a.	16	38	<b>780</b>
Musculoskeletal	26	–7	105	n.a.	47	36	<b>1,235</b>
Oral health	128	n.a.	22	50	n.a.	52	<b>1,149</b>
Injuries	42	–22	20	n.a.	29	35	<b>1,042</b>
Signs, symptoms, ill-defined conditions and other contact with the health system <sup>(c)</sup>	64	n.a.	95	n.a.	n.a.	64	<b>2,163</b>
<b>Total</b>	<b>31</b>	<b>23</b>	<b>67</b>	<b>50</b>	<b>34</b>	<b>37</b>	<b>13,160</b>
<b>\$ million (2000–01 prices)</b>	<b>5,149</b>	<b>721</b>	<b>3,233</b>	<b>1,021</b>	<b>3,036</b>	<b>13,160</b>	

(a) 1993–94 expenditures have been converted to 2000–01 prices using the total health price deflator (AIHW 2003:67).

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

(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 plastic surgery; general prevention, screening and health examination; and treatment and aftercare for unspecified disease.

(d) Does not include expenditure for community and public health.

n.a. Not applicable. (Growth rate not displayed as methodology changed between the two years, numbers too small to be meaningful or zero in both years).

## 3 Conclusion

This is the second comprehensive national report on health expenditure by disease group. Its aim is to provide an overview as well as a systematic, comprehensive analysis of the total health system costs of disease and injury in Australia during 2000–01, based on the best possible estimates of health system resources directed at the prevention and treatment of diseases and injuries.

Cardiovascular diseases represent the most expensive group (\$5.4 billion), and also account for a high proportion of deaths – 38% (Table 3).

Expenditure for nervous system disorders has shown a very large increase since 1993–94 – mainly because of the increase in expenditure on Alzheimer’s disease and other dementias, which is strongly affected by the growth and ageing of the population.

The seven National Health Priority Areas (NHPAs) account for \$21.4 billion, or 43.5% of allocated health system expenditure.

Expenditure per person is \$2,821 for females, which is 24% higher than the \$2,277 for males.

Health expenditure per person is \$2,426 on average per year for males aged 0 to 4 years. It then decreases to \$1,146 for boys aged 5 to 14 years and from there increases steadily with age to \$10,719 for men aged 75 years and over. For females, the pattern is the same for children but in adulthood expenditure peaks in the 25–34 years age group, reflecting child-bearing and health expenditure related to the genitourinary system; it then declines for the age range 35 to 44 years and from there increases with age to \$11,346 for women aged 75 years or over.

The following points should be borne in mind when considering these results:

- This study is a sequel to the 1993–94 study, so methods used and the source of data used for the estimations have in most cases remained the same to enable comparison over time.
- The costs are direct costs only; indirect costs, caregiver costs and other intangible costs are not included.
- It has been possible to allocate only 88% of recurrent health expenditures by disease. The costs estimated for each disease group are therefore conservative.

Furthermore, cost-of-illness studies such as this only provide estimates of the impact of a disease on health system expenditures. Because they describe only the monetary burden of treating and/or preventing a disease, they cannot provide a measure of the extent to which this burden can be alleviated or the resulting cost savings that would be achieved; nor can they suggest how much should be spent on prevention and treatment.

Expenditure for each disease category that is included in this publication gives a picture of expenditure that is more clinically relevant than expenditure split only by administrative category: the administrative category view of expenditure is subject to

the vagaries of the way the health system happens to be organised at a particular point in time.

It is important to understand that expenditure is an input measure only, and inputs are but one part of the health system. The output and outcomes that derive from this expenditure and from other inputs are also of relevance. The output data for each disease category – e.g. the number of separations and bed-days, medical services and pharmaceutical scripts used – will be published at a later date.

In addition, information on disability and death that arise through disease and injury will be published as part of the Australian burden of disease project. The burden of disease was first estimated for Australia for 1996 – see AIHW: Mathers et al (1999). These estimates are now being updated through joint work by the University of Queensland and the Australian Institute of Health and Welfare, and will be released progressively during the next 12 months.

Expenditure data, output data and burden of disease data together can be used to provide a broad picture of the workings of the health system. For example, expenditure on cancer treatment and prevention over time can be compared with the changes in the number of hospital separations, medical services used and pharmaceuticals dispensed for cancer, and with the improvements in health status.

This report will be of interest to anyone involved in resource allocation, including health policy makers at Commonwealth, state and local government levels, health planners and administrators, community and hospital practitioners and academic researchers, as well as the general public.

# References

- AIHW (2002). Australian health expenditure 2000–01. AIHW Cat. No. HWE 20. Canberra, AIHW (Health and Welfare Expenditure Series No. 14).
- AIHW (2003a). Australian hospital statistics 2001–02. AIHW cat. no. HSE 25. Canberra, AIHW (Health Services Series no. 20).
- AIHW (2003b). Health expenditure Australia 2001–02. Canberra, AIHW.
- AIHW: Mathers, C., C. Stevenson, et al. (1998a). Disease costing methodology used in the Disease Costs and Impact Study 1993–94. AIHW Cat. No. HWE 7. Canberra, AIHW (Health and Welfare Expenditure Series No. 3).
- AIHW: Mathers, C., R. Penm, et al. (1998b). Health system costs of diseases and injury in Australia 1993–94. AIHW Cat. No. HWE 5. Canberra, AIHW (Health and Welfare Expenditure Series No. 2).
- AIHW (2004). Health system expenditure on disease and injury in Australia 2000–01. AIHW Cat. No. HWE 26 Canberra: AIHW (Health and Welfare Expenditure Series no. 19).
- AIHW: Mathers, C., T. Vos, et al. (1999). The burden of disease and injury in Australia. AIHW Cat. No. PHW 17. Canberra, AIHW.
- Commission of the European Communities, International Monetary Fund, et al. (1993). System of National Accounts 1993. Brussels / Luxembourg, New York, Paris, Washington, DC, United Nations.
- Eagar, K. et al. (1997). The Australian National Sub-Acute and Non-Acute Patient (AN-SNAP) Casemix Classification: report of the National Sub-Acute and Non-Acute Casemix Classification Study. Wollongong, Centre for Health Service Development, University of Wollongong.
- United Nations (1975). Towards a system of social and demographic statistics. UN Department of Economic and Social Affairs, Studies in Methods Series F/18. New York, United Nations.
- WHO Collaborating Centre for Drug Statistics Methodology (2002). Guidelines for ATC classification and DDD assignment. Oslo, Norway, WHO Collaborating Centre for Drug Statistics Methodology.