

1 Introduction

1.1 Background and overview

This report on the health system costs of injury and musculoskeletal disorders is one of a series of reports on health system costs associated with specific diseases in Australia in 1993–94. Previous reports in this series have addressed all diseases and injury at the level of broad disease groups (Mathers et al. 1998a), specific cancers (Mathers et al. 1998b), and cardiovascular diseases and diabetes (Mathers & Penm 1998). A report on health system costs associated with mental health problems is forthcoming. Together, these reports provide detailed information on the health system resources used in Australia for the treatment and prevention of diseases and injury in each of the five National Health Priority Areas—cancer control, injury prevention and control, cardiovascular health, diabetes mellitus and mental health.

The total health system costs of disease and injury in Australia in 1993–94, summarised at the broad disease group level according to chapters of the International Classification of Diseases Version 9 (ICD-9), are shown in Figure 1, ranked in descending order of total costs.

Cardiovascular diseases and digestive system diseases are the two most expensive groups, the latter in part because of the large expenditure on dental services. Following these two groups are musculoskeletal disorders, with an estimated total expenditure of \$3,002 million in 1993–94, and then injury and poisoning, with an estimated total expenditure of \$2,601 million. Injury and poisoning and musculoskeletal disorders combined accounted for 18% of total

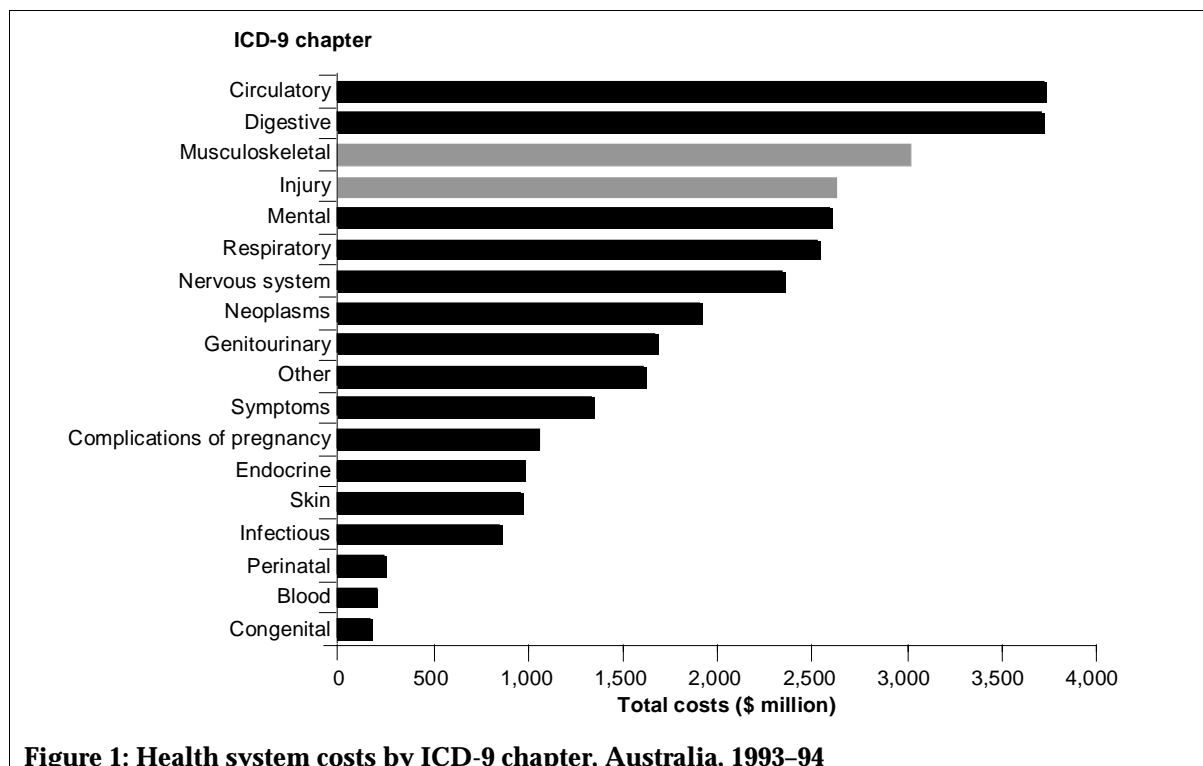


Figure 1: Health system costs by ICD-9 chapter, Australia, 1993–94

recurrent health expenditure in 1993–94. Disease costs at chapter level of ICD-9 have been examined in detail in a previous report (Mathers et al. 1998a).

Injury is the principal cause of death in people under 45 years of age, a leading cause of mortality, morbidity and permanent disability in Australia, as well as a major source of health costs. Injury and poisoning resulted in more than 7,000 deaths in 1994 (see Table 1) and accounted for 22.5% of all potential years of life lost (PYLL) before age 75. A recent report on injury prevention and control provides a profile of injury in Australia and an overview of prevention and control activities (DHFS & AIHW 1998).

Musculoskeletal disorders are not a significant cause of mortality, being responsible for less than 1,000 deaths per year in Australia. However, they are a leading cause of morbidity and short-term and long-term disability. Among people reporting disability in the 1993 Australian

Table 1: Diseases and injury by ICD-9 chapter: health system costs by health sector, 1993–94 (\$ million) and number of deaths, 1994

ICD-9 chapter	Total costs	Hospitals ^(a)	Medical ^(b)	Pharmaceuticals	Dental & allied health	Nursing home	Other ^(c)	No. of deaths 1994
Circulatory	3,719	1,657	503	715	40	587	218	54,888
Digestive ^(d)	3,715	1,070	284	275	1,849	35	202	3,859
Musculoskeletal	3,002	1,207	518	276	416	430	154	775
Injury	2,601	1,663	393	127	160	112	146	7,189
Mental	2,586	1,007	432	198	83	718	147	2,985
Respiratory	2,521	833	624	784	37	107	135	9,958
Nervous system	2,334	766	431	248	227	503	159	2,944
Cancer	1,904	1,327	261	53	12	32	219	34,206
Genitourinary	1,662	997	383	143	17	32	90	2,110
Symptoms	1,334	478	426	302	57	5	66	547
Complications of pregnancy	1,051	941	32	11	6	0	60	16
Endocrine	966	235	222	309	54	47	98	4,112
Skin	956	336	247	259	56	6	53	211
Infectious	849	246	316	193	15	13	65	1,042
Perinatal	239	221	1	0	0	3	14	695
Blood	192	101	42	24	1	5	18	401
Congenital	159	116	18	2	0	13	8	754
Other ^(e)	1,607	859	505	122	44	0	77	—
Total	31,397	14,062	5,640	4,042	3,075	2,647	1,932	126,692

(a) Public and private acute hospitals, repatriation hospitals and psychiatric hospitals. Includes public hospital non-inpatient services.

(b) Medical services for private patients in hospitals are included under 'Hospitals'.

(c) Includes breast, cervix, lung and skin cancer public health programs, research and other institutional, non-institutional and administration expenditure. Does not include other public health services, community health services, ambulances, or medical aids and appliances.

(d) Dental costs are classified to diseases of the digestive system and included under the allied health services sector.

(e) Other contact with health services: fertility control, reproduction and development, cosmetic surgery, general health examination, and treatment for unspecified disease.

Bureau of Statistics (ABS) Survey of Disability, Ageing and Carers, around 27% reported a musculoskeletal disorder as the main disabling condition (ABS 1993). In the 1995 ABS National Health Survey, chronic musculoskeletal conditions were reported by 29% of Australians aged 15 years and over, and 56% of Australians aged 60 years and over. An additional 7% of Australians aged 15 years and over reported recent musculoskeletal conditions that were not chronic.

Injury is a major factor in the aetiology of certain musculoskeletal conditions, particularly joint disruptions and osteoarthritis and perhaps back problems (although this connection may be more complex), and to some extent, some of the costs attributable to musculoskeletal conditions are late effects of injury. In addition, there is a somewhat arbitrary boundary between acute musculoskeletal damage (injury) and chronic musculoskeletal damage resulting from long-term microtrauma or old injury. Costs associated with the latter are generally classified to musculoskeletal disorders (refer, for example, to the Glossary entry for 'internal derangement of knee').

It is not possible to quantify the proportion of musculoskeletal disorder costs that are attributable to injury as an underlying cause and this is not attempted in this report. One indication of the importance of injury in causing musculoskeletal problems is given by the 1993 Survey of Disability, Ageing and Carers carried out by the Australian Bureau of Statistics. Analysis of unit record data from this survey (Mathers 1998) indicates that injury was stated to be the underlying cause by 27% of people whose main disabling condition was musculoskeletal. This is a much higher proportion than for all disabling conditions (17%).

This report provides estimates of health system costs and use for specific injuries, by type and external cause and for specific musculoskeletal disorders and examines the pattern of health expenditure on injuries and musculoskeletal disorders by age, sex and health system sector. The estimates in this report are derived using a methodology that ensures that they add across disease, age and sex groups to the total Australian health expenditure by health sector for 1993–94 as published by the Australian Institute of Health and Welfare (1996). Such estimates are not elsewhere available in a consistent format for disease groups, and 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.

There have been a number of previous studies of the costs for specific types of injury or external causes of injury (e.g. Walsh 1988) and at least one previous study that has estimated direct treatment costs for all injury (Watson & Ozanne-Smith 1995). This study used a bottom-up approach to estimate that treatment costs for unintentional injury (excluding adverse effects of medical treatment) were \$1.8 billion for Australia in 1992–93. This is quite similar to the \$2.0 billion estimated by this report for 1993–94. More recently, Watson and Ozanne-Smith (1997) have estimated direct and indirect costs for injury in Victoria in 1993–94 and used incidence data to make estimates of the lifetime costs of injury. We are not aware of previous studies of the direct costs of musculoskeletal disorders in Australia.

1.2 Uses of disease cost estimates

Cost of illness analysis often attempts to measure the total economic cost to society of illness by including not only the direct health sector costs but also indirect costs, which usually focus on lost production due to sickness and premature death, but can include as well costs impacting outside the health care sector. However, methodologies for measuring indirect costs are either contentious and/or at an early stage of development (Mathers et al. 1998c). The Institute has thus decided to focus on the analysis of direct health system costs in the Disease Costs and Impact project and to use, where appropriate, more direct measures of disease impact in health status terms, rather than dollar estimates of indirect costs.

Some important points should be kept in mind in interpreting the direct cost estimates presented in this report:

- Existing expenditure on a disease or injury does not, in itself, give an indication of the loss of health due to that disease or injury, or the priority for intervention or need for additional health services expenditure.
- Care should be taken in interpreting direct costs associated with disease treatment as an estimate of the savings that would result from prevention of disease. The conversion of the opportunity cost of resources being devoted to disease treatment, or benefits forgone, into expenditure savings involves a number of additional considerations (see Mathers et al. 1998c).
- Although the expenditure estimates reported here provide a broad picture of the health system resources usage classified by age, sex and disease group, they should be interpreted with caution for specific diseases because the methodology is a comprehensive satellite national accounts approach, which, while yielding consistency, good coverage and totals that add up to known expenditures, is not as sensitive or accurate for any specific disease as a detailed analysis of actual costs incurred by patients with that disease.
- Health service utilisation data, such as hospital separations, should not be interpreted as measures of number of incident injury events. To a differing extent for different types and causes of injury, a single injury event may be associated with more than one hospital episode or other health service contact.
- Some injuries may result in chronic musculoskeletal problems, and much of the costs associated with the latter will be included in the estimates for musculoskeletal disorders rather than injuries.

1.3 Methodology

This section provides an overview of the methodology, which is summarised in Appendix B and described in detail in Mathers et al. (1998c). Injuries, poisoning and musculoskeletal disorders have been classified according to the International Classification of Diseases—Ninth Revision (ICD-9) as shown in Appendix A.

Data sources

Total recurrent health expenditures for 1993–94, as estimated by the Australian Institute of Health and Welfare (AIHW 1996), are apportioned by sector using hospital morbidity and case mix data for 1993–94, Medicare and Pharmaceutical Benefits Scheme data for 1993–94, the Survey of Morbidity and Treatment in General Practice 1990–91, and the Australian Bureau of Statistics National Health Survey 1989–90.

Health sectors

The following sectors of expenditure are included in the disease cost estimates:

Hospital inpatients: inpatient (admitted patient) costs for public hospitals (including public psychiatric hospitals), repatriation (veterans') hospitals and private hospitals. Also included are private medical costs for private patients in public and private hospitals.

Hospital non-inpatients: hospital outpatient services and casualty/accident and emergency services.

Medical services: total costs of all private medical services except those to hospital inpatients (medical services for private patients in hospital are included under hospital inpatients). This sector includes consultations with general practitioners and specialists as well as pathology tests and screening and diagnostic imaging services. Pathology tests and imaging services are included with specialist medical services.

Pharmaceuticals: includes costs of prescription drugs (whether listed in the Pharmaceutical Benefits Scheme or not) and non-prescription (over the counter) medicines apart from those dispensed in hospitals (included in estimates of hospital costs).

Nursing homes: includes nursing homes for the aged but not residential homes for the young disabled (considered a welfare rather than health expenditure).

Dental and allied health services: includes costs of visits to allied health practitioners excluding pharmacists but including dentists, apart from allied health services provided by hospitals.

Other: includes expenditure for certain cancer prevention programs (national screening programs for breast and cervix cancer, and lung and skin cancer prevention programs), for health and medical research, and for administration and other institutional and non-institutional health expenditure (see Appendix B for more details of these sectors).

Total recurrent health expenditure in 1993–94 was \$34,141 million (AIHW 1996). The sectors listed above accounted for 92% of total recurrent health expenditure, or \$31,397 million. Recurrent expenditure on health care which has not yet been attributed to diseases (\$2,744 million) includes community health services, public health programs (apart from three cancer public health programs), ambulance services, and medical aids and appliances. Capital expenditure (\$1,833 million) is also excluded from the costings presented here.

Disease impact

This report also contains data for injuries on the number of deaths and potential years of life lost to age 75 in 1994. Deaths data are derived from the AIHW Mortality Database and classified using the underlying cause of death as coded by the Australian Bureau of Statistics from information provided on death certificates (and in some cases coronial findings). Potential years of life lost to age 75 are calculated by subtracting age at death from 75, for deaths at ages less than 75 years.

Estimates of the prevalence of total and treated musculoskeletal disorders are derived from the 1995 National Health Survey, based on self-report data on musculoskeletal disorders reported as either long-term conditions or recent conditions experienced in the last two weeks.

1.4 Limitations

It must be emphasised that the disease cost estimates reported here are based on attribution of total health expenditures based on available information on the mix of diseases treated and the costs of treatment. For medical and allied health services, and to some extent for drugs, utilisation data relate to 1989–90 or 1990–91 and so costs reported for these sectors will not reflect changes in clinical practice or disease patterns between then and 1993–94. Also, costs of specialist medical services are estimated using 1990–91 data on referral patterns by GPs and costed at the average cost within specialist type. For example, this means that all pathology tests are assumed to have the same average cost.

The injury classification used in the utilisation data for medical services relates to type of injury rather than external cause. Injury types have been mapped to external causes as described in Appendix A. This involved a number of assumptions and, for some types of injury, an assumption that the external cause distribution for these injuries as seen in general practice is similar to the external cause distribution for these injury types in hospital inpatients. As discussed in Appendix A, the available information suggests that this is a reasonable assumption.