1 Introduction

The aim of this report is to provide estimates of the health system costs associated with specific disease and injury groups, by age and sex, in Australia in 1993–94. These estimates 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 (1996a). Such estimates are not elsewhere available in a consistent format for all 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.

Disease costing

The Australian Institute of Health and Welfare started its disease costing analysis in 1992, as part of a broader approach to evaluation (Carter 1992). The underlying rationale is that judgements about priorities for illness prevention and health promotion should be guided by information on the public health significance of health problems. Significance can be measured by a range of indicators, including: mortality, morbidity and cost of illness; the theoretical preventability (efficacy) and practical preventability (effectiveness) of the health problems; and the relative cost-effectiveness (efficiency) of individual preventive measures aimed at achieving the potential prevention.

The main uses of disease cost data are in assisting to develop an economic justification for disease control action and as an input into evaluating the cost-effectiveness of interventions for the purpose of priority setting. Disease costing analysis can also be useful in describing the relationship between disease incidence or prevalence and the consequent structure and utilisation of health services.

Direct and indirect costs of disease

This report provides estimates of direct health system costs of different groups of diseases and injury. Direct costs are that part of total costs which relate to health system activity to prevent, diagnose and treat health problems. Like all economic costs, direct health system costs are the costs of forgone alternatives: if there were no illness, then the money spent on diagnosing, treating and caring for the sick, and the money spent on prevention could be put to other uses. Direct costs of health services are estimated by taking known aggregate expenditures on health care and apportioning them to disease categories using Australian data on casemix and cost.

Cost of illness (COI) 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 costs impacting outside the health care sector (such as police and court costs associated with drug abuse, for example). The Institute's previous disease cost

analyses for the period 1989–90 included an estimate of the indirect costs of illness (Australian Institute of Health and Welfare 1996b).

The 1989–90 methodology used the human capital approach to value the lost production associated with morbidity and mortality. In this method, an individual is perceived as producing a stream of output over time that is valued at market earnings (Hodgson & Meiners 1982; Max, Rice & MacKenzie 1990). Indirect costs associated with morbidity were estimated by applying average wage rates to absenteeism associated with receipt of hospital and medical services and the indirect costs due to mortality by the discounted stream of potential lifetime earnings (including an imputed value for unpaid household work) from age at death.

The indirect costs of disease can be defined in several ways, depending on the perspective and objective of analysis. If indirect costs are conceptualised in terms of the opportunity costs of lost production (whether for paid or unpaid labour), then the human capital approach will usually overestimate the costs of lost production. The actual loss of production will be restricted to a so-called friction period—the period needed to effectively replace the sick or dead worker, whether by recruiting someone else or by training someone to replace the lost worker (Koopmanschap & van Ineveld 1992; Koopmanschap et al. 1995). Such indirect costs will depend on the labour market situation and will also vary in different segments of the labour market.

Indirect costs of disease may also be defined to include the economic value that society, including the individual concerned, places on human life, and on the avoidance of other intangibles such as pain, suffering, anxiety, bereavement etc. From this perspective, the main criticism of the human capital methodology is that it excludes important intangibles, only counts earnings (whether actual or imputed), and places a low value on some groups such as low income earners, the unemployed and people not in the labour force. The preferred methodology in this case is a willingness-to-pay approach, which values life and health according to what people would be willing to pay for a change that reduces the probability of illness or death (Max, Rice & MacKenzie 1990).

The inclusion of indirect costs in cost of illness studies remains an area of debate and controversy. Since the two major objectives in measuring indirect costs lead to different methodologies (and very different magnitudes of estimates) and these methodologies are either contentious and/or at an early stage of development, the Australian Institute of Health and Welfare has decided to focus on the analysis of direct health system costs in the Disease Costs and Impact project and to include in reports, where appropriate, more direct measures of disease impact in health status terms, rather than in dollars.

Use and interpretation of direct costs of disease

The direct cost estimates presented in this report 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. These cost estimates are derived in a consistent framework, but it is important that their interpretation and limitations are 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 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. 1998a).
- 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.

The health system costs of disease presented in this report are an example of a satellite national account. Satellite accounts enable the linkage of non-monetary data sources and analysis to the monetary accounting system. Satellite health 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 particular relevance to specific policy areas.

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. But if these expenditures can be linked to output and outcome measures such as number of hospital admissions and changes in health status, then the expenditure information becomes more meaningful, especially if dissected by disease categories. In order to link together data on expenditure, work force, disease and other items in a useful way the definitions used in each of these areas need to be clearly spelt out. The Australian Institute of Health and Welfare is currently undertaking a Satellite Accounts project which involves developing a conceptual framework and documenting and refining the definitions and methodologies used in the health and welfare services expenditure area.

This information will be brought together in a publication *Health and Welfare Services Satellite Accounts: Concepts, Sources and Methods*, which will not only provide an integrating framework for the Institute's health and welfare services expenditure collections, but will be a useful framework for all Institute collections—including the disease costing work reported here.

In conclusion, disease costing is not able to provide a comprehensive assessment of the impact of disease on the welfare of society. Direct health system costs can, nevertheless, be useful indicators of the economic burden which individual diseases place on a society and can help identify and analyse how health resources are allocated among different diseases and population subgroups.