

**Health system costs of
cancer in Australia
1993–94**

The Australian Institute of Health and Welfare is an independent health and welfare statistics and information agency in the Commonwealth Health and Family Services portfolio. The Institute's mission is to inform community discussion and decision making through national leadership in the development and provision of authoritative and timely information on the health and welfare of Australians.

HEALTH AND WELFARE EXPENDITURE SERIES

Number 4

Health system costs of cancer in Australia 1993–94

**An analysis of costs, service use,
incidence and mortality by type of cancer**

**Colin Mathers, Ruth Penm, Rob Sanson-Fisher,
Rob Carter and Elizabeth Campbell**

1998

A joint report by the Australian Institute of Health and Welfare and the National
Cancer Control Initiative of the Commonwealth Department of Health and Family Services
Canberra

AIHW Cat. no. HWE 8

© Commonwealth of Australia 1998

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without written permission from AusInfo. Requests and enquiries concerning reproduction and rights should be addressed to the Manager, Legislative Services, AusInfo, GPO Box 84, Canberra ACT 2601.

A complete list of the Institute's publications is available from the Publications Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web-site at <http://www.aihw.gov.au>.

ISSN 1323-5850

ISBN 0 642 24780 3

Suggested citation

Mathers C, Penm R, Sanson-Fisher R, Carter R, Campbell E 1998. Health system costs of cancer in Australia 1993–94. AIHW Cat. No. HWE 4. Canberra: Australian Institute of Health and Welfare and National Cancer Control Initiative (Health and Welfare Expenditure Series no. 4).

Any enquiries about or comments on this publication should be directed to:

Colin Mathers
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601

Phone: (02) 6244 1138

Published by AIHW

Printed by Elect Printing

Contents

List of tables.....	vii
List of figures.....	viii
Preface	ix
Summary	xi
Acknowledgments.....	xiii
1 Introduction	
Usefulness of disease cost information.....	1
Direct and indirect costs of disease	2
Use and interpretation of direct costs of cancer	2
2 Methodology	
Data sources.....	4
Health sectors	4
Treatment and prevention.....	5
Classification of cancers.....	5
Disease impact.....	6
Limitations	6
3 Cancer costs in 1993–94	
Overview: cancer and other diseases.....	7
The 10 most expensive cancers	9
4 Most expensive cancers for males and females at various ages	
The 10 most expensive cancers for males and females	11
Health system costs of cancer by age and sex	13
The 5 most costly cancers: persons 0–24 years	15
The 5 most costly cancers: persons 25–44 years	16
The 5 most costly cancers: persons 45–64 years	17
The 5 most costly cancers: persons 65 years and over.....	18
5 Estimated average lifetime costs of cancer	19
6 Conclusions	
Health system costs of cancer in Australia	21
Improving the reliability of cancer costing	22
Conclusion	23
Glossary.....	25
References	29
Appendix A: Classification of health expenditure by cancer site	30

Appendix B: Disease costing methodology	32
Appendix C: Health system expenditure by cancer site 1993–94.....	38

List of tables

Table 1:	Cancers and other diseases and injury: health system costs (\$ million) by health sector, 1993–94 and numbers of deaths 1993.....	7
Table 2:	The 10 most expensive cancers: health system costs by sector, 1993–94 (\$ million) and numbers of new cases and deaths in 1993.....	9
Table 3:	The 10 most expensive cancers: health system costs (\$ million) by sex, and male/female ratio of health system costs, 1993–94.....	11
Table 4:	The 10 most expensive cancers for males and females: health system costs by sector, 1993–94 (\$ million) and numbers of new cases and deaths, 1993	12
Table 5:	Per cent distribution of health system costs for cancer by age group, males, females and persons, Australia, 1993–94.....	14
Table 6:	Total health system costs (\$ million) of cancer by health sector, age and sex, 1993–94 and numbers of new cases and deaths, 1993.....	14
Table 7:	Males and females aged 0–24 years: health system costs (\$ million) for all cancers and the 5 most expensive cancers, 1993–94	15
Table 8:	Health system costs (\$ million) for all cancers and the 5 most expensive cancers, males and females aged 25–44 years, 1993–94	16
Table 9:	Health system costs (\$ million) for all cancers and the 5 most expensive cancers, males and females aged 45–64 years, 1993–94	17
Table 10:	Health system costs (\$ million) for all cancers and the 5 most expensive cancers, males and females aged 65 years and over, 1993–94.....	18
Table 11:	Lifetime cancer costs per case: estimated treatment costs (\$) per new case, number of new cases 1993, and total treatment costs (\$ million) 1993–94, ranked by treatment cost per new case.....	20
Table A.1:	Classification of cancer sites in terms of ICD-9 codes for neoplasms	31
Table B.1:	Summary of methods: health system costs of cancer in Australia, 1993–94.....	37
Table C.1:	Estimated resident population of Australia, by age group and sex, 30 June 1994.....	38
Table C.2:	Total health system costs for neoplasms by health sector and cancer site, 1993–94 (\$ million).....	39
Table C.3:	Treatment costs of malignant neoplasms by health sector and cancer site, 1993–94 (\$ million)	40
Table C.4:	Estimated health service utilisation for neoplasms by health sector and cancer site, 1993–94	41
Table C.5:	Estimated health service utilisation for malignant neoplasms by health sector and cancer site, 1993–94.....	42

List of figures

Figure 1:	Total health system costs of cancer in Australia 1993–94, by health sector.....	8
Figure 2:	The 10 most expensive cancers in 1993–94: treatment costs for malignant neoplasms and total health system costs (all neoplasms) by site	10
Figure 3:	Total health system cancer costs (\$ million), by age group and sex, 1993–94	13
Figure 4:	Health system cancer costs (\$) per capita by age group and sex, 1993–94.....	13
Figure 5:	Estimated average lifetime treatment cost per new case for the 10 cancers with highest total health system costs, 1993–94.....	19

Preface

This is a joint report of the Australian Institute of Health and Welfare (AIHW) and the National Cancer Control Initiative on the health system costs of cancer in Australia. The AIHW started the Disease Costs and Impact Study (DCIS) in 1992 with funding from the Health Advancement Program of the then Commonwealth Department of Health, Housing, Local Government and Community Services and from the National Health and Medical Research Council. Originally conceived as part of a broader approach to evaluation, and referred to as the Macro Economic Evaluation Model, it estimated the economic impact of specific diseases and disease groups in Australia in 1989–90, both in relation to direct costs to the health system and a range of indirect costs. The study also developed a set of summary measures of disease impact in terms of potential years of life lost and health service use.

In collaboration with the Centre for Health Program Evaluation at Monash University, the methodology has been revised and extended to permit allocation of over 90% of recurrent health expenditure to disease categories. The revised methodology was used to carry out a comprehensive accounting of disease costs across all chapters of the ICD-9 Classification of Diseases for the year 1993–94 (Mathers et al. 1998a). In updating cost estimates to 1993–94 data, the DCIS has focused on the direct costs of health services, so that the disease costings form a disaggregation of national health expenditure. Other disease costing reports to be published by the AIHW during 1998 include:

- *Health System Costs of Diseases and Injury in Australia 1993–94*
- *Health System Costs of Cardiovascular Disease and Diabetes in Australia 1993–94*
- *Disease Costing Methodology used in the Disease Costs and Impact Study 1993–94.*

The Commonwealth Government, through the Department of Health and Family Services, has contracted the Australian Cancer Society to develop the initial phase of a National Cancer Control Initiative (NCCI). The NCCI will provide a national focus in Australia's response to cancer, one of the five National Health Priority Areas. As part of the initial phase, the NCCI has developed a Priority Issues Discussion Paper. This draws on a range of information about the impact and costs of cancer in Australia, including the health system cost estimates reported here.

Summary

Cancer costs the Australian community almost \$2 billion per year in direct health system costs, of which more than 80% are treatment costs. The estimated \$1,904 million health expenditure on cancer in 1993–94 represents 6% of total recurrent health expenditure. Cancer was responsible 33,176 deaths in 1993–94, or 27% of all deaths in Australia.

The cancer which contributes most to direct health system costs is non-melanoma skin cancer (NMSC), with estimated costs of \$232 million. Although only a small number of deaths are due to NMSC (379 in 1993), it dominates new cases, with over 243,000 in 1993 (78% of all new cancers). These cost estimates include health interventions for benign skin tumours and in-situ skin cancers, frequently aimed at excluding or preventing invasive cancer, as well as for invasive cancers.

Colorectal cancer is the second highest contributor to direct costs (an estimated \$205 million), ranks second in terms of cancer deaths (4,440 in 1993, 13% deaths), and ranks third in terms of new cases (9,538 cases in 1994). Breast cancer ranks third in terms of direct costs (\$184 million), third in terms of deaths (2,641, 8% deaths), and fourth in terms of new cases (8,448 cases). Breast cancer costs are about 80% of those for NMSC. Lung cancer accounts for the largest number of cancer deaths (6,393, 19% deaths), has approximately the same number of new cases as deaths (6,911), and ranks fifth in terms of costs (\$107 million).

Unlike most other disease groups, hospital inpatient expenditure accounts for the majority (over 70%) of the estimated health system costs of cancer. Medical service costs outside hospitals account for a further 14%, followed by research (4%), public health programs (4%) and pharmaceutical costs (3%).

Overall, health system treatment costs for cancers are estimated to be 14% higher for females than males. Health system costs for cancer rise with age, peaking in the 45–64 year age group for females and the 65–74 year age group for males, and then decline at older ages. Forty-five per cent of total health system costs of cancer relate to people aged 65 years and over, with a further 33% relating to people aged 45–64 years. Less than 3% of all cancer costs relate to children aged 0–14 years.

Estimated lifetime treatment costs for invasive cancers vary enormously, from around \$58,000 per leukemia to less than \$3,000 for melanomas and other skin cancers. The average lifetime treatment cost per new case of invasive cancer (excluding NMSC) is estimated to be around \$17,000.

The aim of this report has been to provide the best possible estimates of the health system resources directed at the prevention and treatment of cancer to assist in understanding the allocation of resources among the population, across different health sectors, and different cancers. Such information will assist in considering a variety of equity, access and utilisation issues in relation to the use of scarce health care resources.

Acknowledgments

The authors gratefully acknowledge the support and assistance of the following people who contributed to the preparation of this paper through comments on draft reports or provision of information: Graham Giles, Bruce Armstrong, Paul Jelfs, Geoff Sims, Richard Madden.

The disease costing methodology builds on the work carried out by former members of the Macro Economic Evaluation Model to develop the original methodology, particularly Rob Carter, Kathryn Antioch, Maneerat Pinyopusarerk, Anne-Marie Waters and Lyn Conway.

Many AIHW staff provided valuable advice on sources of data and analysis of datasets, particularly John Goss, Mark Cooper-Starbury, Deborah Schofield, Tony Hynes, Simon Eckermann, Elizabeth Moss and Michael Cook. We also thank Ross Saunders, head of the Medicare Statistics section of the Commonwealth Department of Health and Family Services for provision of summary data on medical services for 1993–94.

We would also like to gratefully acknowledge the assistance of the Family Medicine Research Unit of the University of Sydney for provision of a copy of all data contained in the Australian Morbidity and Treatment Survey and for helpful advice.

The preparation of this report was partly funded through the National Cancer Control Initiative, funded by the Commonwealth Government through the Department of Health and Family Services.