# Cancer in Australia 1998

Incidence and mortality data for 1998

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is to improve the health and wellbeing of Australians by informing community discussion and decision making through national leadership in developing and providing health and welfare statistics and information.

The Australasian Association of Cancer Registries (AACR) is a collaborative body representing State and Territory cancer registries in Australia and New Zealand. Most are members of the International Association of Cancer Registries. The AACR was formed in November 1982 to provide a formal mechanism for promoting uniformity of collection, classification and collation of cancer data.

The purposes of the AACR are:

- to provide a continuing framework for the development of population-based cancer registration in Australia and New Zealand;
- to facilitate the exchange of scientific and technical information between cancer registries and to promote standardisation in the collection and classification of cancer data;
- to facilitate cancer research both nationally and internationally; and
- to facilitate the dissemination of cancer information.

The Australian Institute of Health and Welfare has joined with the AACR to produce national cancer statistics from the National Cancer Statistics Clearing House.

CANCER SERIES Number 17

# **Cancer in Australia 1998**

October 2001

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# Preface

The Australian Institute of Health and Welfare (AIHW) and the Australasian Association of Cancer Registries (AACR) are pleased to present *Cancer in Australia 1998*, the most recent report generated from the National Cancer Statistics Clearing House. This report contains national cancer incidence and mortality data and also includes data from another of the AACR members, New Zealand.

The AACR and the AIHW wish to acknowledge the efforts of all the cancer registries in compiling and providing timely data to the National Cancer Statistics Clearing House so that this report could be published. We intend to continue to improve the provision of data on cancer in Australia, undertake a work program that encourages further standardisation of cancer registry information and increase analysis of the national data collection (for example survival analysis).

Cancer registration is a legal requirement in all States and Territories. The data are collected to monitor cancer trends, assist national efforts to understand the causes of cancer, and assist prevention efforts and treatment decisions. Data confidentiality and the uses to which cancer registry data can be put are controlled by State and Territory registries (under State and Territory law) and within the AIHW under the *Australian Institute of Health and Welfare Act 1987*. The cancer registries, together with the AIHW and community organisations (for example cancer charity organisations), intend to promote further public awareness of their data collections and findings. Particular use has been made of the Internet in improving public access to data by a number of the registries. A home page for the AACR has been developed on the AIHW's web site http://www.aihw.gov.au/cancer with links to Australian and international cancer-related organisations. The national incidence data since 1983 are available on the same site.

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# Contributors

This joint report between the Australian Institute of Health and Welfare and the Australasian Association of Cancer Registries would not have been possible without the cooperation and effort of those who direct the operation, promotion and development of the State and Territory cancer registries. These people, identified below, have all worked to produce the national cancer incidence statistics in this publication.

Incidence information provided by State and Territory cancer registries is sourced predominantly from hospitals, pathologists and departments of radiation oncology, with supplementary information provided by medical practitioners in private practice. The major contributors of information on cancer deaths are the State and Territory Registrars of Births, Deaths and Marriages, and the Australian Bureau of Statistics. We thank them for their contribution.

Funding and support of cancer registries in Australia is undertaken by State and Territory Governments and various charity bodies. We recognise the support of the State and Territory Governments, the New South Wales Cancer Council, the Anti-Cancer Council of Victoria, the Queensland Cancer Fund, the Cancer Foundation of Western Australia, the Northern Territory Anti-Cancer Foundation and the Australian Cancer Society. Finally, the contributions of the staff and volunteers who work with the State and Territory cancer registries are acknowledged.

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# **Executive summary**

This report presents national cancer incidence and mortality statistics for 1998 and is part of a series of publications concerning cancer patterns in Australia. The State and Territory cancer registries provide the incidence data for this report whereas the mortality data are provided by the State and Territory Registrars of Births, Deaths and Marriages and coded by the Australian Bureau of Statistics.

The main findings are as follows.

## New cases of cancer and mortality

• Excluding non-melanocytic skin cancers, there were 80,864 new cancer cases and 34,270 deaths due to cancer in Australia in 1998. At the incidence rates prevailing in 1998, it would be expected that 1 in 3 men and 1 in 4 women would be directly affected by cancer in the first 75 years of life. Further, an estimated 260,000 potential years of life would be lost to the community each year as a result of people dying of cancer before the age of 75. Cancer currently accounts for 29% of male deaths and 25% of female deaths.

## Cancers in males and females

- In males, prostate cancer (9,869 new cases diagnosed in 1998) is the most common registrable cancer, followed by colorectal cancer (6,131), lung cancer (5,307) and melanoma (4,398). These four cancers account for 59% of all registrable cancers in males.
- In females, breast cancer (10,665) is the most common registrable cancer, followed by colorectal cancer (5,158), melanoma (3,493) and lung cancer (2,488). These four cancers account for 59% of all registrable cancers in females.

### Most common cancers causing death

• The most common cancers causing death are lung (4,817), prostate (2,544) and colorectal (2,475) cancers in males, and breast (2,526), colorectal (2,159) and lung (2,076) cancers in females.

## Age distribution

• The risk of cancer increases with age, with over twice as many cancers diagnosed in those over the age of 60 as in those under 60.

## Trends

- Between 1993 and 1998, age-standardised incidence rates for all cancers combined (except non-melanocytic skin cancers) declined for males by an average of 1.9% per year and rose for females by an average of 0.6% per year but death rates declined for both males and females by an average of 1.7% and 1.3% per year, respectively.
- A significant proportion of the rise in female incidence rates can be attributed to the continuing increase of breast cancer incidence which in turn can be attributed in part to detection of prevalent cancers by the breast screening programs. The recent fall in male incidence rates is strongly influenced by the decline in prostate and lung cancer rates. The introduction of prostate-specific antigen testing and its later fall in use has induced the rapid rise and subsequent fall in the rates of the incidence of prostate cancer in recent years.

• Despite a slight increase in incidence rates for cervical cancer over the last year, between 1993 and 1998 incidence and mortality fell rapidly by an average of 6.9% and 6.5% per annum, respectively.

### Smoking-related new cases and mortality

• Cigarette smoking is estimated to have directly caused 10,506 new cases of cancer (13% of all new cases of cancer) and 7,068 deaths (21% of cancer deaths) in 1998. Between 1993 and 1998, the male incidence rate for smoking-related cancers fell by an average of 1.2% per year, while the rate for females rose by 0.3% per year. Over the same period, mortality rates fell for both males and females by 1.8% and 0.4% per annum respectively.

### Alcohol-related new cases and mortality

• It is estimated that 715 new cases of cancer were directly attributable to hazardous and harmful alcohol consumption in 1998 at a rate of 3.6 cases per 100,000 population, as were 307 deaths at a rate of 1.5 per 100,000 population.

### Comparison with New Zealand

At an international level, New Zealand serves as a good comparison to Australia due to its similar heritage, economic development and patterns of cancer risk factors. The most frequently occurring cancers in both countries are very similar. However, when comparing age-standardised mortality rates, Australia's female rates are substantially lower than New Zealand's for several cancers, with cancers of the breast and lung showing the largest differences. Cancer incidence and mortality rates in New Zealand males are slightly higher than those of Australian males for most types of cancer. Incidence rates for melanoma in both Australia and New Zealand are among the highest in the world, with higher incidence rates observed in Australia and higher mortality rates in New Zealand.

# **1** Introduction

Cancer is a notifiable disease in all States and Territories and is the only major disease category for which an almost complete coverage of incidence data is available. Cancer is also a major cause of death in Australia. If this situation is to be changed, good information on the occurrence of different types of cancer, the characteristics of patients, and survival and mortality is essential. Such information facilitates the monitoring of trends and the impact of interventions, and provides a sound basis for epidemiological studies and the initiation of prevention and treatment programs.

## What is cancer?

Cancer describes a range of diseases in which abnormal cells proliferate and spread out of control. Other terms for cancer are tumours and neoplasms, although these terms can also be used for non-cancerous growths.

Normally, cells grow and multiply in an orderly way and have a specific function in the body. Occasionally, however, they multiply in an uncontrolled way after being affected by a carcinogen, or after developing from a random genetic mutation, and form a mass which is called a tumour or neoplasm. Tumours can be benign (not a cancer) or malignant (a cancer). Benign tumours do not invade other tissues or spread to other parts of the body, although they can expand to interfere with healthy structures.

The main features of a malignant tumour (cancer) are its ability to grow in an uncontrolled way and to invade and spread to other parts of the body (metastasise). Invasion occurs when cancer cells push between and break through other surrounding cells and structures. Spread to other parts of the body occurs when some cancer cells are carried by the bloodstream or the lymphatic system and lodge some distance away. They can then start a new tumour (a secondary cancer) and begin invading again. They can cause serious damage by destruction, crushing or blocking.

Cancer can develop from most types of cells in different parts of the body, and each cancer has its own pattern of growth and spread. Some cancers remain in the body for years without showing any symptoms. Others can grow, invade and spread rapidly, and are fatal less than a year after detection. Apart from the cancer's natural behaviour, its effects can also depend on how much room it has before it damages nearby structures, and whether it starts in a vital organ or is close to other vital organs.

Although a number of cancers share risk factors, most cancers have a unique set of risk factors that are responsible for their onset. Some cancers occur as a direct result of smoking, dietary influences, infectious agents or exposure to radiation (for example ultraviolet radiation), while others may be a result of inherited genetic faults. It should be noted that for most cancers the causes are unknown. While some of the causes are modifiable through lifestyle changes, some others are inherited and cannot be avoided. However, the risk of death due to particular cancers may be reduced through intensive monitoring of individuals at high risk, reducing external risk factors, detecting and treating cancers early in their development, and treating them in accordance with the best available evidence.

Many cancers can be serious and even fatal. However, medical treatment is often successful if the cancer is detected early. The aim is to destroy the cancer cells and stop them from returning. This can be done by surgery to cut out the growth or by other methods such as cancer-destroying drugs (chemotherapy) or ray treatment (radiation therapy). The growth of some cancers can also be controlled through hormone therapy.

The treatment approach often combines a number of these methods and uses them in stages. The first line of treatment aims to remove as many cancer cells as possible; the second line, which may go on for a long time, aims to ensure the cancer does not recur.

## **Cancer surveillance in Australia**

National data on cancer deaths have been available since the early 1900s, based on information in medical certificates of cause of death, as provided to the Registrar of Births, Deaths and Marriages in each State and Territory. The Australian Institute of Health and Welfare (AIHW) and the Australian Bureau of Statistics (ABS) use these data to report national cause of death statistics. Information concerning cancer deaths and non-cancer deaths of cancer cases is also collected by State and Territory cancer registries, based on death certificates and other diagnostic information.

The only effective method of obtaining cancer incidence data is through universal registration of cancer diagnoses. In Australia, cancer registration is required under State and Territory legislation. The cancer registrations are collated by cancer registries that are supported by a mix of State and Territory government and non-government charity organisations. Some State and Territory cancer registries have been operating for nearly 30 years and obtain their information from hospital, pathology, radiotherapy and physician records (Appendix D). It was not until 1982, however, that cancer registration was universal in Australia (data were published in *Cancer in Australia 1982* (Giles et al. 1987)). Before then, there was no registration in some States and in some others registries covered only particular areas, hospitals or cancer sites.

# **The National Cancer Statistics Clearing House**

In June 1984 the National Health and Medical Research Council endorsed the concept of a national collection of cancer statistics. In April 1985 the National Committee on Health and Vital Statistics agreed that the National Cancer Statistics Clearing House (NCSCH) should be operated by the then Australian Institute of Health under the supervision of the Australasian Association of Cancer Registries (AACR).

Following the enactment of Commonwealth legislation establishing the then Australian Institute of Health as a statutory body in 1987, and subsequent legislation providing for the protection of confidentiality of records supplied to it, the Institute and the AACR established the NCSCH. This provides a facility for compiling data produced by individual State and Territory registries on a continuing basis.

The aim of the NCSCH is to foster the development and dissemination of national cancer statistics for Australia and specifically to:

- enable computation and publication of national statistics on cancer;
- allow tracking of interstate movement of cancer cases via record linkage;

- facilitate exchange of scientific and technical information between cancer registries and promote standardisation in the collection and classification of cancer data; and
- facilitate cancer research both nationally and internationally.

The NCSCH receives data from individual State and Territory cancer registries on cancers diagnosed in residents of Australia. This commenced with cases first diagnosed in 1982. The data items provided to the NCSCH by the State and Territory cancer registries enable record linkage to be performed and the analysis of cancer by site and behaviour.

The NCSCH produces reports of national incidence and mortality data. Periodically, analyses of specific cancer sites, cancer histology, differentials in cancer rates by country of birth, geographical variation, trends over time and survival are undertaken on an accumulation of data which permits examination of the data in greater depth. The section 'Related publications' sets out the range of publications based on these data.

The Australian Health Ministers Advisory Council has funded a project during 2001 to improve data quality in cancer registry collections through establishing a national minimum data set of cancer registry definitions in the *National Health Data Dictionary*. While most of the data items used in the preparation of reports such as the Cancer in Australia series are collected and coded consistently by all State and Territory cancer registries, there are some differences in reporting practices among States, and in reporting between Australia and other countries.

Reports on national cancer survival patterns for the 20 most common cancers are planned for release in 2001. The analyses will focus on cancers diagnosed between 1982 and 1997, with a follow-up period extending to 1999. These will be the first national reports on cancer survival in Australia.

The NCSCH is able to make available a broad range of statistical data. Data identifying individuals may only be released to bona fide researchers after a strict scientific and ethical review process which involves the AACR executive, the AIHW Health Ethics Committee and the State and Territory cancer registries. General database enquiries and enquiries about the release of statistical data should be addressed to:

Australian Institute of Health and Welfare National Cancer Statistics Clearing House Attention: Dr Chris Stevenson GPO Box 570 Canberra ACT 2601 Phone: (02) 6244 1041 E-mail: chris.stevenson@aihw.gov.au

# Structure of this report

This report is divided into five major components:

- an introduction and overview of cancer in Australia in 1998;
- summary tables for all cancer sites for 1998;
- a series of data tables for the most common cancer sites, and some less common but topical cancer sites, for 1998;
- glossary and reference sections;
- appendixes comprising cancer coding system, methods, State and Territory registration features and a full set of statistical tables which are published separately on the AIHW's web site at http://www.aihw.gov.au/publications/can/ca98/index.html.

## Introduction and overview

The overview of cancer in Australia provides a selection of highlights from the data tables. It describes the patterns of cancer incidence and mortality by site, age, sex, and State and Territory. Trends in cancer incidence and mortality are discussed and a series of graphs are provided presenting the most common cancers by sex and age group, and trends in national cancer incidence (1983–1998) and mortality (1983–1999). A comparison between Australia and New Zealand is made for selected cancers.

## Summary tables

Summary tables of incidence and mortality for 1998 for all cancer sites are provided. These tables list numbers of new cases and deaths, and crude and age-standardised incidence and mortality rates for Australia. Cumulative rates are given for incidence, while the mortality tables provide estimates of the person-years of life lost. Sex ratios are presented in both the incidence and mortality tables.

## Series of data tables

The series of data tables for the most common or topical cancers in 1998 contain age-specific, crude, and age-standardised incidence and mortality rates for males, females and persons for each cancer site. The order of the tables is based on the International Classification of Diseases (World Health Organization 1977) (Appendix A). All rates are expressed per 100,000 population and, at the Australian level, are directly age-standardised (Appendix B) to both the total estimated resident population of Australia at 30 June 1991 and the World Standard Population (Appendix C). Included in these tables are estimates of the lifetime risk of contracting each cancer, the person-years of life lost and the numbers of each cancer as a proportion of the total (excluding non-melanocytic skin cancers).

The data tables also include average annual numbers of new cancer cases and deaths, and age-standardised incidence and mortality rates for each State and Territory. It should be noted that the State and Territory incidence and mortality rates have been directly age-standardised to the total estimated resident population of Australia at 30 June 1991. Therefore, particular care should be taken not to compare these State and Territory rates with previous Cancer Series publications—*Cancer in Australia 1989–1990 (with Projections to 1995), Cancer in Australia 1986–1988* or *Cancer in Australia 1983–1985*—

where age standardisation used the World Standard Population. The NCSCH is able to provide State and Territory rates that have been age-standardised to the World Standard Population on request or State and Territory cancer registries can be contacted directly.

## **Appendixes**

The appendixes include the International Classification of Diseases coding system; a methods section providing formulae, explanations and examples of the techniques used to present the data in the report; population data for Australia for 1998; and a summary table of State and Territory cancer registry characteristics.

This report, together with a comprehensive set of Excel tables for all cancer sites, is available on the AIHW's web site at http://www.aihw.gov.au/publications/can/ca98/index.html.

# 2 Cancer in Australia

# General

Excluding non-melanocytic skin cancers, there were 80,864 new cancer cases and 34,270 deaths due to cancer in Australia in 1998. At the incidence rates prevailing in 1998, it would be expected that 1 in 3 men and 1 in 4 women would be directly affected by cancer in the first 75 years of life. Further, an estimated 260,000 potential years of life would be lost to the community each year as a result of people dying of cancer before the age of 75. Cancer currently accounts for 29% of male deaths and 25% of female deaths.

In this publication the term 'cancer site' is used to represent cancers located in specific organs or tissues as well as systemic cancers such as leukaemia and lymphoma.

## **Cancers not reported**

Each year, approximately 270,000 new cancer cases of non-melanocytic skin cancer are diagnosed in Australia. Incidence data for this cancer are not collected on a routine basis by cancer registries. Estimates for the incidence numbers are derived from data collected by a national market research company in 1985, 1990 and 1995, and analysis by Staples, Marks and Giles (1998). In the 1995 survey, 63,745 people aged 14–95 years were interviewed about treatment for skin cancer and there was follow-up with treating physicians for 63% of the people who claimed to have had treatment for skin cancer in the last 12 months. From the survey data Staples, Marks and Giles produced age-standardised incidence rates (standardised to the World Standard Population) for treated non-melanocytic skin cancers in 1995 of an estimated 1,374 per 100,000 population for males and 857 per 100,000 population for females. These rates are nineteen times the next most common male cancer (prostate) and ten times the next most common female cancer (breast), using 1998 data. Despite nonmelanocytic skin cancer's high incidence rate it has a relatively low mortality rate at 1.6 per 100,000 population compared with the high mortality rates of male lung cancer at 53.2 per 100,000 population, female breast cancer (22.8) and prostate cancer (29.5). Non-melanocytic skin cancer is excluded from any further comparisons in this publication. The totality of other cancers is referred to as 'registrable cancers'.

## Most common cancers

## Persons

• Among all persons, the combination of cancers of the colon and rectum (11,289 new cases), often referred to as bowel or colorectal cancer, is the most common registrable cancer in 1998 (Table 1). Colorectal cancer, breast cancer (10,755), prostate cancer (9,869), melanoma (7,891), and lung cancer (7,795) together account for 59% of all registrable cancers in 1998.

## Males

• In males, the most common registrable cancers after prostate cancer are colorectal cancer (6,131 new cases diagnosed in 1998), lung cancer (5,307) and melanoma (4,398) (Table 1, Figure 1). These four cancers account for 59% of all registrable cancers in males.

## Females

• In females, breast cancer (10,665) is the most common registrable cancer, followed by colorectal cancer (5,158), melanoma (3,493) and lung cancer (2,488), which in total account for 59% of all registrable cancers in females.

## Cancers causing death

• The cancers most commonly causing death are lung (4,817), prostate (2,544) and colorectal (2,475) in males, and breast (2,526), colorectal (2,159) and lung (2,076) in females (Table 1).

## PYLL—Person-years of life lost

The number of person-years of life lost due to cancer is generally dominated by the most common cancers due to the large numbers of cases diagnosed, rather than by those less common cancers which occur earlier in life. Lung cancer is responsible for the highest number of person-years of life lost before 75 years of age (45,118 in 1998), followed by colorectal cancer (31,438) and breast cancer (29,373) (Table 1). Cancer of the brain and nervous system is responsible for the fourth-highest number of person-years of life lost (16,685). This contrasts with its ranking as the thirteenth most common cancer (1,327 new cases diagnosed in 1998). Further, the ratio of person-years of life lost to new cases for cancer of the brain and nervous system (12.6) is much higher than that for lung cancer (5.8), colorectal cancer (2.8) or breast cancer (2.7). This is a direct result of the relatively large number of younger people diagnosed with, and dying from, cancer of the brain and nervous system.

## The most common cancers by age

The most common cancers vary depending on age (Figure 2). In people aged less than 15, the most common cancers diagnosed are lymphatic leukaemia and cancers of the brain and central nervous system. These two cancer sites account for 49% of all cancers in this age group. In those aged 15–44, melanoma and breast cancer are the most common cancers, while breast, colorectal, melanoma, prostate and lung cancers are predominant in people aged over 45 years.

The ranking of the most frequently occurring cancers by age group (Figure 2) is based on the number of new cases, and for those cancers the number of deaths is also shown. However, some cancers that would be ranked in the top five cancers based on number of deaths (rather than new cases) are not presented in Figure 2. Cancers which have a substantial number of deaths in each age group that are not presented in Figure 2 are those of the other endocrine glands (16 deaths) in the 0–14 age group and cancer of the brain and nervous system (134) and cancer of the lung (102) in the 15–44 age group. In the age group 45–64, cancers of unknown primary site (483 deaths), pancreatic cancer (386), cancer of the brain and nervous system (379) and non-Hodgkin's lymphoma (348) are responsible for a substantial number of deaths. Cancers of unknown primary site (1,755 deaths), cancer of the pancreas (1,200) and non-Hodgkin's lymphoma (1,076) are also significant causes of death in the 65 and over age group.

	New cases				Deaths					
		% of all new		ACD	Lifotimo		% of all			
Cancer site	Number	cases	АЗК (A)	АЗК (W)	risk <sup>(c)</sup>	Number	deaths	АЗК (A)	ASR (W)	PYLL <sup>(c)</sup>
Males										
Prostate	9,869	22.6	109.5	73.6	1 in 11	2,544	13.1	29.5	16.5	6,128
Colorectal	6,131	14.1	66.7	47.5	1 in 17	2,475	12.8	27.4	18.5	18,128
Lung	5,307	12.2	58.2	40.3	1 in 20	4,817	24.8	53.2	35.8	30,660
Melanoma	4,398	10.1	46.4	36.1	1 in 26	635	3.2	6.9	5.0	7,315
Bladder	2,068	4.7	22.9	15.1	1 in 57	564	2.9	6.4	3.8	1,985
NHL	1,742	4.0	18.7	6.7	1 in 64	750	3.9	8.3	5.6	6,835
Unknown site	1,629	3.7	18.0	12.2	1 in 71	1,198	6.2	13.3	8.8	8,075
Kidney	1,333	3.1	14.1	10.6	1 in 78	495	2.6	5.4	3.8	4,158
Stomach	1,238	2.8	13.5	9.4	1 in 91	765	3.9	8.5	5.6	5,235
Pancreas	860	2.0	9.4	6.5	1 in 130	814	4.2	8.9	6.1	6,333
All cancers	43,595	100.0	474.6	340.9	1 in 3	19,400	100.0	215.3	143.5	141,030
Females										
Breast	10,665	28.6	101.3	83.2	1 in 11	2,526	17.0	22.8	17.4	29,255
Colorectal	5,158	13.8	46.2	33.2	1 in 26	2,159	14.5	18.5	12.7	13,310
Melanoma	3,493	9.7	34.1	28.0	1 in 36	344	2.3	3.0	2.2	3,740
Lung	2,488	6.7	23.0	16.7	1 in 47	2,076	14.0	18.8	13.3	14,458
Unknown site	1,538	4.1	13.1	8.9	1 in 105	1,102	7.4	9.2	6.1	6,038
NHL	1,466	3.9	13.4	10.0	1 in 90	759	5.1	6.6	4.5	5,020
Uterus	1,399	3.8	13.2	10.5	1 in 78	246	1.7	2.1	1.4	1,130
Ovary	1,216	3.3	11.5	9.0	1 in 99	769	5.2	6.9	5.0	6,548
Pancreas	869	2.3	7.5	5.0	1 in 175	805	5.4	6.9	4.5	4,058
Cervix	868	2.3	8.6	7.0	1 in 143	264	1.8	2.4	1.9	3,795
All cancers	37,269	100.0	346.5	268.7	1 in 4	14,870	100.0	130.1	91.9	119,010
Persons										
Colorectal	11,289	14.0	55.6	39.9	1 in 21	4,634	13.5	22.5	15.4	31,438
Breast	10,755	13.3	52.9	42.8	1 in 21	2,543	7.4	12.3	9.2	29,373
Prostate	9,869	12.2	49.0	33.9	1 in 12	2,544	7.4	11.9	6.9	6,128
Melanoma	7,891	9.8	39.6	31.7	1 in 30	979	2.8	4.8	3.5	11,055
Lung	7,795	9.6	38.8	27.6	1 in 28	6,893	20.1	34.0	23.6	45,118
NHL	3,208	4.0	15.9	12.0	1 in 75	1,509	4.4	7.3	5.0	11,855
Unknown site	3,167	3.9	15.3	10.4	1 in 86	2,300	6.7	11.0	7.3	14,113
Bladder	2,803	3.5	13.7	9.2	1 in 89	807	2.4	3.8	2.3	2,688
Kidney	2,191	2.7	10.8	8.2	1 in 101	843	2.4	4.1	2.8	6,228
Stomach	1,905	2.4	9.3	6.5	1 in 133	1,193	3.5	5.7	3.9	8,120
All cancers	80,864	100.0	400.5	299.7	1 in 3	34,270	100.0	166.4	144.6	260,040

Table 1: Most frequently occurring cancers in Australia, 1998<sup>(a), (b)</sup>

(a) Rates are expressed per 100,000 population and age standardised to the Australian 1991 Standard Population (ASR (A)) and to the World Standard Population (ASR (W)). The rates age standardised to the two populations (World and Australia 1991) differ due to the age distributions of these populations. For example the World population gives more weight to younger age groups where there are fewer cancers, and consequently the rate is lower compared with the Australian 1991 population. A greater weight is given to the older age groups in the Australian 1991 population where there are more cancers, and consequently these rates tend to be higher.

(b) Non-melanocytic skin cancer, known to be the most common cancer type, is excluded from this list as it is not a registrable cancer.

(c) These measures are calculated for ages 0–74 years; PYLL refers to person-years of life lost. Methods for the calculation of these measures are presented in Appendix B.

Note: NHL refers to non-Hodgkin's lymphoma.

Source: Cancer in Australia 1998, AIHW & AACR 2001.

### Most frequently occurring cancers





## Most frequently occurring cancers by age group

# Age and sex differences

Cancer occurs more commonly in males than females. The age-standardised incidence rate in 1998 for all cancers combined (excluding non-melanocytic skin cancers) was 474.6 new cases per 100,000 for males and 346.5 per 100,000 for females, resulting in an age-adjusted sex ratio of 1.4. Males have a higher incidence rate for every cancer site, except for monocytic leukaemia and for cancers of the breast, thyroid, gallbladder, peritoneum, other digestive organs and parts of the nervous system.

The risk of cancer increases with age. The age-standardised incidence rate in 1998 for all cancers combined (excluding non-melanocytic skin cancers) was 15.2 per 100,000 population for people aged less than 15 years; 94.1 per 100,000 population for 15–44 year olds; 657.8 per 100,000 population for 45–64 year olds; and 1,997.3 per 100,000 population for people aged 65 years and over.

Of people diagnosed with cancer, 0.7% of all cancers (excluding non-melanocytic skin cancers) occur in those aged less than 15 years, 10.1% in the 15–44 age group, 31.8% in the 45–64 age group, and 57.3% in those aged 65 and over. While the pattern of deaths across age groups is similar to that of incidence, a larger proportion (71.4%) of cancer deaths occurs in those aged 65 and over. Cervical and testicular cancers are exceptions to the age pattern, with the number of cases in the 15–44 age group exceeding that in the 45–64 and 65 and over age groups.

Age-specific incidence and mortality rates vary depending upon the cancer site (Figures 3–6). For example, lung cancer incidence and mortality rates parallel each other closely from age group 30–34, rising sharply from ages 25–29 through to 75–79 (men) and from ages 20–24 through to 70–74 (women) before falling slightly in the oldest age groups. The age-specific incidence rates for melanoma of the skin, on the other hand, rise much more steadily across the whole age range. Some cancers, however, have their highest rates in early or middle life and remain fairly constant in the higher age groups (for example cancer of the cervix) or even decline with age (for example cancer of the testis).



## Age-specific incidence and mortality rates-males

Note: Data for cancer of the testis have been averaged over 1994–1998 to provide more stable estimates. Source: Cancer in Australia 1998, AIHW & AACR 2001.

Figure 3: Age-specific incidence and mortality rates for melanoma and cancers of the lung, prostate and testis in males, Australia, 1998



### Age-specific incidence and mortality rates—females

Figure 4: Age-specific incidence and mortality rates for melanoma and cancers of the lung, breast and cervix in females, Australia, 1998



### Age-specific incidence and mortality rates—males

Figure 5: Age-specific incidence and mortality rates for colorectal cancer, cancers of the bladder and stomach, and non-Hodgkin's lymphoma in males, Australia, 1998



### Age-specific incidence and mortality rates—females

## Alcohol- and smoking-related cancers

Alcohol and smoking are risk factors for many cancers. In 1998, alcohol-related cancers accounted for 0.9% of all new cases of cancer, while smoking-related cases accounted for 13.0% of all new cases of cancer. Smoking-related cases also accounted for a large proportion of deaths from cancer in 1998 (20.6% of all cancer deaths). These data and those in Tables 27 and 28 are derived from a series of age- and sex-specific aetiological fractions developed by English et al. (1995) and from cancer incidence estimates for specific cancer sites for 1998. These fractions are based on an analysis of international and Australian studies and estimate the probability that a specific agent (alcohol or tobacco) causes a specific disease (cancer). The cancers thought to be directly attributable to smoking (excluding passive smoking) and alcohol are listed in Table 2.

Cancer site	Males (%)	Females (%)
Alcohol-related cancers		
Oropharynx	21	8
Oesophagus	14	6
Liver	18	12
Larynx	21	13
Female breast cancer	—	3
Smoking-related cancers		
Oropharynx	57	51
Oesophagus	54	46
Stomach	14	11
Anus	48	41
Pancreas	24	19
Larynx	73	66
Lung	84	77
Uterus	—	10
Cervix	—	19
Vulva	—	40
Penis	30	—
Bladder	43	36
Renal parenchyma	28	21
Renal pelvis	55	48

Table 2: Cancer site and percentage of cancers attributable to alcohol and smoking

Source: English et al. 1995.

It is estimated that 715 new cases of cancer were directly attributable to hazardous and harmful alcohol consumption in 1998 at a rate of 3.6 cases per 100,000 population, as were 307 deaths at a rate of 1.5 per 100,000 population. While other cancers may be indirectly caused by alcohol consumption in combination with other risk factors, alcohol is believed to be the primary causative agent for differing proportions of specific cancers. The mechanism by which alcohol causes cancer has not been fully determined, but the major metabolite of ethanol has been shown to be carcinogenic in animal experiments (English et al. 1995). The lifetime risk of an alcohol-related cancer is 1 in 237 for males and 1 in 289 for females. Between 1993 and 1998, the incidence rate for alcohol-related cancers in males fell by an average of 0.8% per annum, while the rate in females increased by 1.2% per annum.

Smoking-related cancers account for 18.0% of all new cases of cancer in males and 7.1% of all new cases of cancer in females. This large difference is attributable to the higher rates of smoking among men than women in the past 30 years. Twenty-five years ago smoking rates in men were almost double those in women. This is no longer the case. In 1998 25% of men and 20% of women aged over 14 years were current smokers (AIHW 1999). Organs associated with the respiratory system are the ones most affected by cigarette smoke, as a result of the known carcinogens in cigarette smoke such as polycyclic aromatic hydrocarbons (Table 2). Epidemiological evidence indicates that other cancers, including cancers of the upper digestive tract, bladder, renal pelvis (kidneys) and pancreas are also associated with cigarette smoking (English et al. 1995).

Cigarette smoking is estimated to have directly caused 10,500 new cases of cancer (52.4 new cases per 100,000 population) and 7,100 deaths (35.0 per 100,000 population) in 1998. Between 1993 and 1998, the male incidence rate for smoking-related cancers fell by an average of 1.2% per year, while the rate for females rose by 0.3% per year. Over the same period, mortality rates fell by 1.8% per annum for males and by 0.4% per annum for females (Figure 10).

To illustrate the improvement in the male mortality rate for smoking-related cancers: if the 1988 age-specific rates were applied to the 1998 male population there would be an additional 1,112 male deaths due to smoking in 1998. In contrast, the female mortality rate for smoking-related cancers has increased since 1988. There would be 38 fewer female deaths in 1998 if the 1988 rates were applied to the 1998 female population.

## Cancer rates in the States and Territories, 1994–1998

Cancer incidence and mortality are reported here for the combined period 1994–1998 for all States and Territories.

## Melanoma rates

Cancer incidence is generally similar among States and Territories. However, variation in the incidence of melanoma among States creates some differences in the overall incidence rates. An analysis of all cancers combined (excluding non-melanocytic skin cancers) showed that Queensland had the highest incidence in both males (526.3 per 100,000 population) and females (362.5 per 100,000 population), while the Northern Territory reported the lowest incidence with 432.4 cases per 100,000 for males and 323.9 per 100,000 for females (Figure 7, Table 9).

Melanoma risk is generally highest in the northern areas and lower in the more southerly areas, showing a correlation to exposure to ultra violet radiation (Jelfs et al. 1994). Agestandardised mortality ranges from 2.5 deaths per 100,000 population for the Northern Territory to 5.8 deaths per 100,000 population for Queensland (Table 14).

## Incidence rates excluding melanoma

When the impact of melanoma was removed from the comparison, the order of States and Territories with the highest and lowest cancer incidence rate for males changed with Tasmania reporting the highest incidence rate for all cancers combined (excluding non-melanocytic skin cancers and melanoma) among males (482.5 per 100,000 population), and

the Northern Territory reporting the lowest, with 403.1 cases per 100,000 population. The remaining States and Territories reported the following rates for males: South Australia 463.0 per 100,000 population, Queensland 458.3, Victoria 456.3, Australian Capital Territory 450.3, New South Wales 444.3 and Western Australia 434.8. For females, Tasmania reported the highest rate (321.6 per 100,000 population) and Western Australia reported the lowest (296.4 per 100,000 population). The remaining States and Territories reported the following rates for females: Victoria 317.9 per 100,000 population, Queensland 314.2, South Australia 309.4 the Northern Territory 306.1, New South Wales 305.0 and the Australian Capital Territory 304.2.

## **Mortality rates**

The cancer mortality rates reported for males across the States and Territories range from 218.4 per 100,000 population in New South Wales to 242.3 per 100,000 population in Tasmania. For females, the mortality rates vary from 131.2 per 100,000 population in Queensland to 169.3 in the Northern Territory (Table 9).

## Lung cancer and smoking-related cancers

Lung cancer incidence rates are highest in the Northern Territory (for males 79.5 cases per 100,000 population, for females 42.5) (Table 13). The lowest lung cancer incidence rates are reported for males in the Australian Capital Territory (41.6 per 100,000 population) and for females in South Australia (21.8).

State and Territory variations in smoking-related cancers generally reflect those observed for lung cancer (Table 28). The Northern Territory reported the highest incidence rates for males and females (110.4 and 42.2 per 100,000 population respectively). The Australian Capital Territory reported the lowest smoking-related cancer incidence rates for males (64.4 per 100,000 population) and South Australia had the lowest rate for females (22.4). Death rates from smoking-related cancers were highest in the Northern Territory for both males and females.

These patterns of incidence probably reflect smoking behaviour approximately 10–20 years ago, due to the time lag between exposure to carcinogens in the tobacco smoke and the diagnosis of cancer. Differentials in smoking rates between the States and Territories reported in the 1995 National Health Survey (ABS 1997) are likely to affect smoking-related cancer incidence rates in the future. Tasmania (57.3%) reported the highest proportion of current and ex-smokers, followed by the Northern Territory with 56.0%. The lowest smoking and ex-smoking rates were found in New South Wales at 49.2%. In the other States and the Australian Capital Territory the proportions of smokers and ex-smokers ranged from 50% to 53%.

## Breast cancer and prostate cancer

The Australian Capital Territory reported the highest incidence rates for breast cancer (104.0 per 100,000), closely followed by Victoria, South Australia, Western Australia and New South Wales (ranging from 100.9 to 100.0 cases per 100,000 population). The Northern Territory reported the lowest incidence rate (71.5 cases per 100,000 population) (Table 15). The Australian Capital Territory reported high rates of prostate cancer (169.6 per 100,000 population), while significantly lower rates were reported in the Northern Territory (84.0 per

100,000 population) (Table 19), a rate influenced by the low Indigenous population incidence rates (d'Espaignet et al. 1996). These interstate variations in prostate cancer incidence might also be explained by differences in the time and rate of uptake of prostate-specific antigen (PSA) testing in the States and Territories (Smith et al. 1998; Threlfall et al. 1998).

## **Cervical cancer**

There were differences in cervical cancer incidence among the States and Territories. This probably reflects in part the relative impact of the screening programs in each jurisdiction. Most of the large States show consistent rates of approximately 9–10 new cases per 100,000 population; however, South Australia shows a substantially lower rate of 7.1 per 100,000 population (Table 16). The Northern Territory, while having relatively small numbers of new cases, has a very high incidence rate of 18.0 per 100,000 population. A major contributor to this incidence rate is the high rate of cervical cancer among the Indigenous population, which d'Espaignet et al. (1996) indicated was up to three times the rate of the non-Indigenous population. This situation is also reflected in a high mortality rate (8.4 deaths per 100,000 population). This high mortality rate may be an indicator of late-stage detection of these cancers.

## **Explanations for variations**

Differences in State and Territory cancer incidence rates may be explained by variations in underlying cancer risk, the availability and utilisation of diagnostic procedures, reporting and coding inconsistencies, and normal incidence rate fluctuations. A case in point is bladder cancer (Table 21), where State and Territory comparisons vary by more than 100%. This is largely due to differences in local coding practices, particularly in regard to the inclusion or exclusion of tumours of uncertain behaviour. The AACR plans to address this issue in the near future by standardising coding practices.

Care should be taken when interpreting incidence rates, especially for less common cancers and for States and Territories with small populations. To reduce the problems of statistical variation due to a small number of cases, the numbers and rates presented for the States and Territories in Tables 9 to 28 in this publication are annual averages of the 5-year period 1994–1998. For annual sex- and cancer-specific data, or data cross-classified by other variables (for example age, geographic area), the State and Territory cancer registries should be contacted directly.



## All cancers and melanoma incidence rates by sex, States and Territories

Source: Cancer in Australia 1998, AIHW & AACR 2001.

Figure 7: Age-standardised incidence rates (95% confidence intervals) for all cancers (excluding non-melanocytic skin cancers) and for melanoma, States and Territories, 1994–1998

# International comparison

Cancer incidence and mortality patterns vary internationally. This variation may be the result of differences in risk factor exposure (for example smoking, diet and ultraviolet radiation), in genetic susceptibility, in the detection and treatment of cancer, in the level of cancer registration and in coding practices.

Australia and New Zealand are two of the few countries in which cancer registration occurs on a national basis. Many countries either have state/province, regional or hospital-based cancer registries to record cancer incidence, although most countries have national mortality collections. This publication compares Australia's cancer incidence and mortality rates with those of New Zealand. In *Cancer in Australia 1997*, Australian rates were also compared with those of several other countries. No more recent data have become available for those countries, apart from New Zealand. The broader international comparison found in *Cancer in Australia 1997* has consequently not been repeated in this report.

## **Cancer in New Zealand**

New Zealand shares a similar heritage to Australia and a similar level of economic development. The New Zealand population at 3.8 million is slightly larger than that of Queensland (3.4 million) and slightly smaller than that of Victoria (4.6 million). New Zealand serves as a good comparison for Australia in cancer patterns, as the two countries share similar patterns of cancer risk factors, for example diet, smoking patterns and ultraviolet radiation exposure, and also share some similarities in their cancer control programs, for example cervical and breast cancer screening. Both countries have sizeable Indigenous populations, which exhibit lower life expectancies than the rest of the population. New Zealand Maoris comprise approximately 14.5% of the total population and Australia's Aboriginal and Torres Strait Islander population represents approximately 2.1% of the total population.

The New Zealand Health Information Service has supplied 1997 incidence and 1998 mortality data (Table 3) that enable a direct comparison of recent rates for cancers between Australia and New Zealand. These rates have been standardised to the World Standard Population. Tables 3, 7 and 8 have been used for purposes of comparing the two countries' cancer patterns.

New Zealand has approximately 16,000 new cases of cancers diagnosed each year and 7,500 deaths as a result of cancer. The most frequently occurring cancers in Australia and New Zealand are very similar, with prostate, colorectal and lung cancers in males, and breast, colorectal and melanoma in females being the dominant cancers. The other common cancers are ranked similarly in the two countries, although the policy for reporting a combination of all leukaemias (New Zealand) and unknown primary (Australia) in the dominant cancers makes for some minor variations in the rankings (Tables 1 and 3).

There are differences in the age-standardised incidence rates for all cancers combined (excluding non-melanocytic skin cancer). New Zealand males (346.6 new cases per 100,000 population) and females (283.3) have rates approximately 2% higher than those of Australian males and 5% higher than those of Australian females. Mortality rates in males are 5% higher in New Zealand (151.0 deaths per 100,000 population compared to 143.5). However, female mortality rates in New Zealand (117.0 deaths per 100,000 population) are 27% higher than those of Australian females (91.9). This difference in female mortality rates appears to be spread across a range of cancers, some of which are described below.

Breast cancer incidence rates are similar in both Australian (83.2 new cases per 100,000 population) and New Zealand females (80.2). However, there is a substantial difference in mortality rates (New Zealand 22.5, Australia 17.4 deaths per 100,000 population). The breast screening program in Australia has been operating since about 1990 and may have had some impact on mortality rates. The New Zealand breast screening program only began in 1999 and benefits from this program may not be seen for some time.

Australian and New Zealand prostate incidence rates have been strongly influenced by the rapidly changing use of PSA testing, showing a dramatic rise and subsequent decline, although Australia's rates peaked one year earlier. Mortality rates are approximately 9% higher in New Zealand (18.0 deaths per 100,000 population compared to 16.5).

There are also differences in the patterns of colorectal cancer between the two countries. Males in New Zealand (49.5 new cases per 100,000 population) are slightly above their Australian counterparts (47.5). However, the New Zealand female incidence (38.7), male mortality (22.4) and female mortality rates (16.5) are substantially higher than the Australian rates (33.2, 18.5 and 12.7 respectively).

Both Australians and New Zealanders are known for their outdoor lifestyle, which places both populations at risk of melanoma and non-melanocytic skin cancers from the increased ultraviolet radiation exposure. This is reflected in high incidence rates of melanoma in both countries, with Australia having slightly higher rates than New Zealand. Of note in assessing the melanoma incidence rates is the relatively small difference between males and females in New Zealand, a sex ratio of 1.1, compared with a ratio of 1.3 for Australia. Australia had approximately the same sex ratio as New Zealand in the early 1980s. Since then there has been a significant divergence in rates. Melanoma has a relatively low mortality rate but New Zealand's female rate (3.5 deaths per 100,000 population) is about 60% higher than Australia's rate (2.2).

Lung cancer incidence and mortality rates in New Zealand males are approximately 7% lower than rates for Australian males. The incidence and mortality rates for New Zealand females are more than 30% higher than rates for Australian females.

In summary, there appear to be substantial differences in the reported cancer incidence and mortality rates between New Zealand and Australia for some of the most common cancers. This would suggest some differences in the impact of particular risk factors and, in relation to mortality, a difference in the stage at detection and treatment.

		New cases 1	997		Deaths 1998				
Cancer site	Number	% of all new cancer cases	ASR (W)	Lifetime risk <sup>(c)</sup>	Number	% of all cancer deaths	ASR (W)	PYLL <sup>(c)</sup>	
Males									
Prostate	2,336	27.7	91.4	1 in 10	524	13.5	18.0	1,200	
Colorectal	1,193	14.2	49.5	1 in 16	569	14.7	22.4	3,800	
Lung	936	11.1	37.6	1 in 22	855	22.1	33.6	5,325	
Melanoma	745	8.8	32.2	1 in 29	143	3.7	5.8	1,708	
Bladder	374	4.4	14.6	1 in 60	116	3.0	4.0	445	
NHL	304	3.6	13.0	1 in 65	150	3.9	6.2	1,718	
Leukaemia	287	3.4	12.6	1 in 84	133	3.4	5.2	1,460	
Stomach	241	2.9	9.9	1 in 82	183	4.7	7.1	1,390	
Kidney	233	2.8	9.8	1 in 92	116	3.0	4.0	445	
Brain	142	1.7	6.9	1 in 152	112	2.9	5.0	2,160	
Females									
Breast	1,990	26.2	80.2	1 in 12	629	17.3	22.5	7,903	
Colorectal	1,137	15.0	38.7	1 in 22	554	15.2	16.5	2,988	
Melanoma	736	9.7	29.2	1 in 33	105	2.9	3.5	1,270	
Lung	602	7.9	22.2	1 in 35	526	14.4	18.1	3,955	
Ovary	268	3.5	10.6	1 in 85	177	4.9	6.3	1,823	
NHL	283	3.7	9.9	1 in 87	166	4.6	5.1	1,178	
Uterus	272	3.6	10.7	1 in 76	85	2.3	2.7	603	
Cervix	218	2.9	8.9	1 in 114	77	2.1	2.9	1,143	
Leukaemia	235	3.1	8.9	1 in 117	124	3.4	4.0	1,513	
Pancreas	160	2.1	4.7	1 in 196	178	4.9	5.3	895	
Persons									
Prostate	2,336	14.6	40.9	1 in 19	524	7.0	7.4	1,200	
Colorectal	2,330	14.6	43.7	1 in 19	1,123	14.9	19.2	6,788	
Breast	2,001	12.5	41.7	1 in 22	633	8.4	11.9	7,950	
Melanoma	1,481	9.7	30.4	1 in 31	248	3.3	4.6	2,978	
Lung	1,538	9.6	28.8	1 in 27	1,381	18.4	24.8	9,280	
NHL	587	3.7	11.4	1 in 75	316	4.2	5.7	2,895	
Bladder	511	3.2	8.8	1 in 97	169	2.2	2.4	578	
Leukaemia	522	3.3	10.5	1 in 99	257	3.4	4.5	2,973	
Stomach	401	2.5	7.1	1 in 121	303	4.0	5.1	2,155	
Kidney	391	2.4	7.7	1 in 113	169	2.2	2.4	578	

Table 3: Most frequently occurring cancers in New Zealand<sup>(a), (b)</sup>

(a) Rates are expressed per 100,000 population and age standardised to the World Standard Population ASR (W).

(b) Non-melanocytic skin cancer, known to be the most common cancer type, is excluded from this list, as it is not a registrable cancer.

(c) These measures are calculated for ages 0–74 years; PYLL refers to person-years of life lost. Methods for the calculation of these measures are presented in Appendix B.

Note: NHL refers to non-Hodgkin's lymphoma.

Sources: New Zealand Health Information Service 2001; Cancer in Australia 1998, AIHW & AACR 2001.

# **3 Cancer trends**

# National trends in cancer incidence and mortality

National cancer incidence and mortality rates for the most common cancer sites are presented in Figures 8–14. Incidence data are presented for the period 1983–1998 while mortality data are presented for the period 1983–1999.

The trends in incidence and mortality rates vary with cancer site. Some rates have shown an increase since 1983 while others have remained relatively stable or decreased. In assessing these trends it is important to recognise that small changes in the trend in the most common cancers (for example breast, prostate) can mean a substantial shift in the numbers of new cases or deaths, whereas the same shift in less common cancers can have a relatively small impact. For example, a 1% increase in the breast cancer incidence rate results in an increase of approximately 106 new cases, whereas the same percentage increase in cervical cancer incidence would result in approximately 9 new cases.

Between 1993 and 1998, age-standardised incidence rates for all cancers combined (excluding non-melanocytic skin cancers) declined for males by an average of 1.9% per year and rose for females by an average of 0.6% per year (Figure 8). These incidence rates have been strongly influenced by the steady rise in breast cancer incidence and the rise and fall of prostate cancer incidence during this period. Mortality rates declined for both males and females by an average of 1.7% and 1.3% respectively per year. The decline in male lung cancer and prostate cancer deaths is the main contributor to the falling mortality rate for males.


### **Prostate cancer**

Prostate cancer incidence rates were relatively stable up until 1989 but between 1990 and 1994 there was a dramatic rise in the number of new cases of prostate cancer registered (Figure 9). This upward trend has been attributed to increased detection of the disease through increased investigations, particularly the introduction of PSA testing (introduced around 1990). However, from 1994 to 1997 the age-standardised prostate cancer incidence rate fell by 30%. There was virtually no change between the 1997 and 1998 rate. PSA tests are specifically designed to identify cancers before the onset of clinical symptoms. Many of these prevalent cancers may not show any symptoms, and therefore would not be detected except for PSA testing. Much of the rise in the incidence rate of prostate cancer can be attributed to detection of these prevalent cancers. The recent decline in the incidence rate indicates a return towards the underlying rate, removing the effect of these previously undetected cases. The incidence rate is also declining as the number of PSA tests conducted falls, reducing the number of prevalent cancer, which is significantly lower than the incidence rate, decreased 3.8% per annum between 1993 and 1998.

### **Breast cancer**

Among females, breast cancer is the most frequently diagnosed cancer and it is the most common cause of cancer-related death. The incidence of breast cancer in females rose from 92.7 cases per 100,000 population in 1993 to its highest ever level of 101.3 cases per 100,000 population in 1998. The breast cancer incidence rate increased on average 0.9% per annum between 1993 and 1998 (Figure 9). The increase in incidence in female breast cancer in the 50–69 year old age group in 1993 and 1994 was most likely case finding as a result of the introduction of the national breast cancer screening program, given that the 50–69 year olds were the main target age group. The breast cancer mortality rates were stable from 1983 to 1994 but have declined since then.

### **Colorectal cancer**

For colorectal cancer, both the male and female incidence rates have remained largely unchanged since 1993 while mortality rates have fallen steadily: the male rate decreased 1.7% per annum between 1993 and 1998, the female rate decreased 1.8% (Figure 9).

### Lung cancer

Between 1993 and 1998, the incidence and mortality of lung cancer among males fell by an average of 1.8% and 1.9% respectively per year (Figure 10). These declining rates are attributed to decreased tobacco smoking among men, and represent the lowest incidence rate (58.2 new cases per 100,000 population) recorded since national data collection began in 1982. In contrast, lung cancer incidence among females increased by 0.8% per annum between 1993 and 1998. However, the increase in lung cancer incidence is predominantly in women aged 65 years and over, while rates in younger women have generally remained stable or fallen. The death rate from lung cancer among females increased on average by 0.3% per annum between 1993 and 1998.

### Melanoma

The incidence rate for melanoma among males increased sharply between 1983 and 1988, some of this increase due to improved registration of this cancer. The rate declined markedly in 1989, increased consistently until 1997 but declined again sharply in 1998 (Figure 10). The pattern for women was similar although not quite as pronounced. Mortality rates for males

decreased by 1.6% per annum between 1993 and 1998 while the female rates increased by 2% per annum over the same period.

### Non-Hodgkin's lymphoma

The incidence of non-Hodgkin's lymphoma increased by an average of 1.8% per year in females and remained stable in males between 1993 and 1998 (Figure 11). The mortality rate in females with non-Hodgkin's lymphoma has risen steadily since 1983 and increased by 1.2% annually between 1993 and 1998. The male mortality rate has fluctuated markedly but on average declined 1.7% per annum between 1993 and 1998.

### Cancer of the bladder

The incidence of bladder cancer for males declined between 1983 and 1991 but has increased since then (Figure 11). It is likely that part of an increase in male incidence since 1991 is a result of the increased use of screening for prostate cancer leading to a diagnosis of bladder cancer as part of the diagnostic work-up. The female incidence rate had a similar pattern but was much less pronounced. Mortality rates have remained relatively stable throughout the period 1983–1993 but decreased for both males and females between 1993 and 1998—2.2% per annum and 0.9 % per annum respectively.

### Cancer of the stomach

Stomach cancer incidence fell by an average of 2.9% and 3.0% per year for males and females respectively over the period 1983–1991. This decline has continued for males between 1993 and 1998 but at a slightly reduced rate (2.7% per annum) while the female rate has decreased marginally (Figure 11). Mortality rates decreased substantially for both sexes over the 1983 to 1999 period.

### Leukaemias

The incidence rate for leukaemias in males and females decreased slightly between 1993 and 1998 although there were quite large annual fluctuations (Figure 12). During the same time the mortality rates decreased by 2.0% per annum for males and by 2.6% per annum for females.

### Brain cancer

Trends in brain cancer between 1983 and 1998 have remained fairly steady but have fluctuated from year to year (Figure 12).

### Cancer of the pancreas

Between 1993 and 1998, the male incidence and mortality rates for cancer of the pancreas fell annually by an average of 1.0% and 1.8% respectively. In contrast, over the same period, the female incidence rate increased by an average of 1.0% per year and the female mortality rate increased by an average of 0.7% per year (Figure 12).

### **Cervical cancer**

The age-standardised incidence rate for cervical cancer declined by an average of 6.9% per annum between 1993 and 1998 (Figure 13). This decline was achieved despite a sharp rise in new cases between 1993 and 1994 and between 1997 and 1998. Mortality rates have fallen by an average of 6.5% per year since 1993. These gains are due, in part, to the success of the National Cervical Screening Program.

### Cancer of the uterus

The incidence rates for cancer of the uterus have fluctuated from year to year, resulting in an average annual fall of 0.3% between 1993 and 1998. Mortality rates decreased 2.3% per annum in the same period (Figure 13).

### Cancer of the ovary

The incidence and mortality rates for cancer of the ovary have changed little since 1983 but the mortality rate decreased by 1.4% per annum between 1993 and 1998 (Figure 13).

### Cancer of the kidney

Between 1993 and 1998, male and female incidence rates for cancer of the kidney increased by an average of 1.7% per annum. Male mortality rates increased marginally while female rates declined by 2.7% per annum (Figure 14).

### Cancer of the testis

The incidence and mortality rates for testicular cancer increased by an average of 1.8% and 1.4% per annum respectively since 1993 (Figure 14).

### Cancers of unknown primary site

'Cancers of unknown primary site' is a category that captures cancer diagnoses which cannot be attributed to a particular body site. While some of these cancers have common features, at least in terms of aetiology, behaviour and outcome, others are a mixed collection. This makes it difficult to interpret with certainty the patterns of these cancers, particularly for mortality where often little histological evidence is available to identify a cancer site. Although there are many cancers in this category, it is important to know the current trends, given that this cancer group represents about 4% of new cases and 7% of deaths. Mortality rates remained fairly steady from 1983 to 1998. Between 1983 and 1990 there was little variation in incidence for both sexes; however, since 1993, male rates have shown an average annual decline of 1.6% (Figure 14). This may reflect a tendency for clinicians to investigate cancer cases more extensively, or for males to present earlier with symptoms, before further investigation becomes unfruitful.



### Cancers of the prostate and breast, and colorectal cancer

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### Cancer of the lung, melanoma and smoking-related cancers



### Non-Hodgkin's lymphoma, and cancers of the bladder and stomach



### Leukaemias, and cancers of the brain and pancreas

Figure 12: Trends in age-standardised incidence and mortality rates for leukaemias and cancers of the brain and pancreas, Australia, 1983–1999

### Cancers of the cervix, uterus and ovary





### Cancers of the kidney and testis, and cancers of unknown primary site

# Analysis of cancers of unknown primary site

# Definition

'Cancers of unknown primary site' is a term applicable to cancers for which the site of origin is undetermined, and is generally applicable only to some types of tumours. It does not generally include tumours of lymphohaematopoietic origin (such as lymphoma, leukaemia and myeloma) as these are regarded as systemic diseases, and are usually tabulated by their type, rather than the location at which they are found. It generally applies to carcinomas, sarcomas and other tumours for which the available information does not permit an assessment of the true site of origin.

Sometimes patients are diagnosed with metastatic cancer, but the primary cancer site is not known. When doctors cannot determine the location of the primary cancer site, patients are said to have cancer of unknown primary site.

For the purposes of this analysis, cancers of unknown primary site are analysed using the general-purpose grouping of malignant neoplasms proposed by Berg (1996).

### Sex

Between 1983 and 1990 there was little variation in the incidence of cancers of unknown primary site for both sexes; however, since 1993, male incidence rates have shown an average annual decline of 1.6% while the female rate declined marginally (Figure 14). The incidence rates for males are much higher than for females. This could indicate that males delay presentation and hence treatment and are more likely to present with an unknown primary cancer.

# **Histological groups**

There is more variation when the cancers are broken down into different histological groups (Figure 15). Among females, adenocarcinomas are the largest group, on average 60% larger than the second main contributor, epidermoid carcinomas. The situation is different for males, for whom the rates of these two groups are approximately equal, especially in the more recent years. Rates for epidermoid carcinoma for both males and females rose substantially up to 1989 but have remained relatively unchanged since then. 'Unspecified types of cancer' is the third largest group among cancers of unknown primary site. Both male and female rates declined sharply for this group in the mid-1980s. Since then the rates in males have varied from year to year and have declined slightly, on average; the female rates have remained fairly constant.

# Cancers of unknown primary site by State and Territory of residence

The Northern Territory reported the highest incidence rate for cancers of unknown primary site for the period 1994–1998 (21.5 per 100,000 population), while Victoria reported the lowest incidence rate (14.5 per 100,000 population) (Table 24). Most States and Territories averaged about 15 cases per 100,000 population. The State and Territory rates are more varied when the cancers are broken down into the different histological groups

(Tables 4 & 5). The Australian Capital Territory reported higher than average rates for adenocarcinomas for males. Tasmania and the Northern Territory reported high rates for unspecified types of cancer for both males and females. Queensland reported high rates for epidermoid cancers and very low rates for unspecified carcinomas and unspecified types of cancer for both males. In sharp contrast, South Australia reported very low rates for epidermoid carcinomas but higher rates for the unspecified groups and other specific carcinomas; these differences may be due to variations in reporting practices.

### Age

Both the incidence and mortality rates for unknown primary site for males and females were highest in 1998 in the 80–84 and 85 and over age groups (Table 24).

Table 4: Age-standardised incidence rates for cases of unknown primary site by cancer type for males, 1994–1998 combined

Cancer type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Adenocarcinomas	7.4	6.4	6.4	5.6	5.1	7.0	9.9	2.7	6.6
Epidermoid carcinomas	7.6	3.2	11.5	6.3	1.5	4.1	5.7	5.6	6.4
Other specific carcinomas	1.2	0.9	1.0	1.3	5.3	1.0	1.6	4.3	1.5
Other specified types of cancer	0.1	0.1	0.2	2.5	0.0	0.0	0.0	0.0	0.3
Sarcomas & other soft tissue tumours	0.0	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.1
Unspecified (carcinoma NOS)	0.5	0.6	0.1	0.1	1.2	0.0	0.7	3.3	0.5
Unspecified types of cancer	2.5	5.3	0.5	3.3	4.3	7.0	0.9	8.8	3.2

Table 5: Age-standardised incidence rates for cases of unknown primary site by cancer type for females, 1994–1998 combined

Cancer type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Adenocarcinomas	6.0	5.7	5.5	4.7	4.6	6.2	5.5	5.1	5.6
Epidermoid carcinomas	4.3	1.7	6.3	3.1	0.5	2.4	3.2	1.4	3.4
Other specific carcinomas	0.7	0.5	0.7	0.5	3.3	0.3	0.7	4.0	0.9
Other specified types of cancer	0.1	0.1	0.0	1.0	0.0	0.1	0.0	0.2	0.1
Sarcomas & other soft tissue tumours	0.1	0.1	0.1	0.2	0.0	0.0	0.2	0.0	0.1
Unspecified (carcinoma NOS)	0.2	0.4	0.0	0.1	0.7	0.2	0.2	0.0	0.3
Unspecified types of cancer	1.6	4.1	0.2	2.5	3.5	6.0	1.3	6.7	2.4

Table 6 shows the percentage of each major cancer grouping for which the primary site was unknown. All States and Territories reported that a large proportion of 'unspecified types of cancer' and 'unspecified carcinoma' were of unknown primary site, although the distribution between these two groups varied, possibly due to variations in reporting practices.

U	5		-						
Cancer type	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Adenocarcinomas	3.2	2.8	2.9	2.4	2.4	3.0	3.2	2.4	2.9
Epidermoid carcinomas	7.3	3.9	8.3	5.9	2.2	4.2	6.6	4.1	6.3
Leukaemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lymphomas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other specific carcinomas	7.6	5.8	6.6	6.4	10.6	5.1	9.3	9.1	7.7
Other specified types of cancer	0.1	0.2	0.1	2.7	0.0	0.1	0.0	0.4	0.4
Sarcomas & other soft tissue tumours	1.9	2.5	1.0	3.8	0.0	1.9	1.6	0.0	1.9
Unspecified (carcinoma NOS)	26.7	30.1	26.9	12.7	36.6	15.8	28.6	44.4	28.8
Unspecified types of cancer	29.5	14.1	23.5	43.6	17.7	21.1	35.3	23.7	18.8
All cancers	4.0	3.6	3.7	3.8	3.8	4.2	3.4	4.9	3.8

Table 6: Cases of unknown primary site as 5-year average percentage of specific cancers and all cancers (excluding non-melanocytic skin cancer) for persons, 1994–1998 combined



### Cancers of unknown primary site by cancer type and sex

# 4 Incidence and mortality tables

# Guide to interpreting incidence and mortality tables

This section provides information to assist in the interpretation of the tables in this report. More detailed information on methods is given in Appendix B.

# **Table features**

- Tables are ordered according to the International Classification of Diseases.
- All rates are presented per 100,000 population.
- Age-standardised rates are calculated by the 'direct method' (see definition in Appendix B Methods). Age-standardised rates for Australia use both the total 1991 Australian population and the World Standard Population as the standard populations. Age-standardised rates for the States and Territories use only the total 1991 Australian population as the standard population. Therefore, particular care should be taken not to compare these State and Territory rates with previous Cancer Series publications— *Cancer in Australia 1989–1990 (with Projections to 1995), Cancer in Australia 1986–1988* or *Cancer in Australia 1983–1985*—where age standardisation used the World Standard Population.
- The person-years of life lost (PYLL) and lifetime risk estimates are for the ages 0–74 years.
- The confidence intervals used for crude and age-standardised rates are at the 95% level.
- The 'all cancers' incidence and mortality estimates exclude non-melanocytic skin cancers.
- In this publication the term 'cancer site' is used to represent cancers located in specific organs or tissues as well as systemic cancers such as leukaemia and lymphoma.
- In this publication the term 'melanoma' refers to melanoma of the skin only. Melanomas generally occur on the skin, but may also occur on the eye and mucous membranes (such as the vaginal and nasal cavities).

# **Comparison of rates**

Care should be exercised when interpreting a comparison between incidence or mortality rates—for example, when comparing different cancers or when comparing the same cancer in different years. The confidence intervals indicate the likely range of fluctuation of each rate. Some fluctuations may be within expectations, while others may indicate a change in the patterns of cancer incidence or mortality. Where small annual numbers of cancer cases or

deaths are presented in a table, a direct comparison may produce a false perception of dramatic changes over time and, in these instances, averages over a period of time should be used. In general, cancer incidence and mortality rates change relatively slowly over time, although from year to year there may be marked fluctuations due to significant changes in diagnostic procedures. Changes over the longer term may also reflect changing exposures to risk factors.

### **Combining rates**

- Age-specific rates may be summed over cancer sites for a particular age and sex.
- Age-specific rates may not be summed across different ages or sexes, but should be recalculated from the raw data. However, if populations are similar, the crude rates for a 10-year age group will be approximated by the average of the two 5-year age-specific rates. For comparison within broader age groups, summary rates should be age standardised.

# State and Territory data

In June 2001 cancer incidence data were available to 1998 for all States and Territories, and to 1999 for Tasmania, South Australia and Western Australia.

The Australian data are presented as annual numbers and rates, while the data for each State and Territory are presented as average annual rates and numbers of cases and deaths based on the 5-year average 1994–1998. By presenting the data in this manner, natural statistical variation due to small numbers of cases or deaths within each State and Territory and cancer site are averaged across the period and provide a more stable and representative rate of incidence or mortality. Nonetheless, care should be taken in the interpretation of these rates, especially for less common cancers or for States and Territories with small populations.

All average numbers of cases or deaths per year in the State and Territory tables are rounded to the nearest integer. Occasionally, the number of cases or deaths will be zero but a small corresponding rate will appear. This indicates that there were, on average, fewer than 0.5 cases or deaths per year over the 5-year period and, although the rounding process has made the entry zero, a rate can still be presented at one decimal point.

The data in this report will not correspond exactly to data published by the individual State and Territory cancer registries due to the 5-year annual averaging, the use of different standard populations for age-standardisation and the continual updating of data sets by the cancer registries.

In this report, State and Territory incidence and mortality rates have been directly age standardised to the total estimated resident population of Australia at 30 June 1991. Care should be taken not to compare these State and Territory age-standardised rates with previous Cancer Series publications—*Cancer in Australia 1989–1990 (with Projections to 1995), Cancer in Australia 1986–1988* or *Cancer in Australia 1983–1985*—where age standardisation was done using the World Standard Population. However, the NCSCH is able to provide State and Territory rates that have been age standardised to the World Standard Population on request or the registries can be contacted directly.

Cancer incidence estimates provided in this publication were made at May 2001. These estimates may be updated at any time as case details are added, modified or deleted in the national database. These modifications may occur several years after the initial diagnosis as

additional case details are received by the State and Territory cancer registries from data suppliers and then passed to the NCSCH. This may have the impact of making incidence estimates for the same year incompatible between publications, but for the most part these changes are very small.

# Summary tables 1998

### Table 7: Incidence summary table, Australia, 1998

Australia	1998		Mal	es				Fem	ales	
ICD-9	– Cancer site	Number	AS rate (Aust 1991)	AS rate (World)	Cum. rate per cent	Sex ratio M:F	Number	AS rate (Aust 1991)	AS rate (World)	Cum. rate per cent
140–208	All cancers (excluding NMSC)	43,595	474.6	340.9	40.2	1.4	37,269	346.5	268.7	30.2
140	Lip	827	8.8	6.8	0.7	3.3	304	2.7	1.9	0.2
141	Tongue	281	3.0	2.4	0.3	2.1	150	1.4	1.1	0.1
142	Salivary gland	121	1.3	0.9	0.1	1.5	96	0.9	0.7	0.1
143	Gum	28	0.3	0.2	0.0	1.3	26	0.2	0.2	0.0
144	Floor of mouth	127	1.3	1.0	0.1	2.3	62	0.6	0.4	0.1
145	Other mouth	143	1.5	1.2	0.2	1.4	116	1.1	0.8	0.1
146	Oropharynx	216	2.2	1.9	0.2	4.0	58	0.5	0.4	0.1
147	Nasopharynx	76	0.8	0.7	0.1	3.1	25	0.3	0.2	0.0
148	Hypopharynx	142	1.5	1.1	0.2	8.3	20	0.2	0.1	0.0
149	Other lip, oral cavity and pharynx	49	0.5	0.4	0.0	4.1	14	0.1	0.1	0.0
141–149	Head and neck	1,183	12.4	9.8	1.2	2.4	567	5.3	4.0	0.5
150	Oesophagus	631	6.9	4.8	0.6	2.2	372	3.2	2.1	0.2
151	Stomach	1,238	13.5	9.4	1.1	2.3	667	5.8	3.9	0.4
152	Small intestine	131	1.4	1.0	0.1	1.3	121	1.1	0.8	0.1
153	Colon	3,680	40.2	28.0	3.4	1.3	3,572	31.9	22.6	2.7
154	Rectum	2,451	26.5	19.5	2.5	1.8	1,586	14.4	10.6	1.3
153–154	Colorectal	6,131	66.7	47.5	5.9	1.4	5,158	46.3	33.2	4.0
155	Liver	447	4.8	3.7	0.5	3.3	156	1.4	1.1	0.1
156	Gallbladder	252	2.8	1.9	0.2	0.9	356	3.1	2.1	0.2
157	Pancreas	860	9.4	6.5	0.8	1.3	869	7.5	5.0	0.6
158	Peritoneum	43	0.5	0.4	0.0	0.6	77	0.7	0.6	0.1
159	Other digestive organs	33	0.4	0.2	0.0	0.7	66	0.5	0.3	0.0
160	Nasal cavity	79	0.8	0.7	0.1	1.9	46	0.4	0.3	0.0
161	Larynx	558	5.9	4.4	0.6	10.3	61	0.6	0.4	0.1
162	Lung	5,307	58.2	40.3	5.2	2.5	2,488	23.0	16.7	2.2
163	Pleura	398	4.3	3.1	0.4	8.2	58	0.5	0.4	0.1
164	Other respiratory organs	37	0.4	0.4	0.0	1.3	30	0.3	0.3	0.0
170	Bone	91	1.0	0.9	0.1	1.2	78	0.8	0.8	0.1
171	Connective tissue	376	4.1	3.2	0.3	1.5	289	2.7	2.2	0.2
172	Skin—melanoma	4,398	46.4	36.1	4.0	1.4	3,493	34.1	28.0	2.9
173	Skin-non-melanocvtic (NMSC)*	,					-,			
174–175	Breast	90	1.0	0.7	0.1	<0.01	10.665	101.3	83.2	9.5
180	Cervix						868	8.6	7.0	0.7
181	Placenta						8	0.1	0.1	0.0
179+182	Uterus						1.399	13.2	10.5	1.3
183	Ovarv						1.216	11.5	9.0	1.0
184	Other female genital organs						270	2.4	1.7	0.2
#	Gynaecological						3.753	35.6	28.2	3.2
185	Prostate	9.869	109.5	73.6	9.1		-,			
186	Testis	561	6.1	5.3	0.4					
187	Penis & other male genital organs	90	10	0.7	0.1					
188	Bladder	2.068	22.9	15.1	1.8	3.5	735	6.5	4.4	0.5
189	Kidney	1 333	14 1	10.6	13	1.8	858	80	5.9	0.7
190	Fve	145	1.5	12	0.1	1.6	104	1.0	0.8	0.1
191	Brain	702	7.4	6.3	0.6	1.0	560	5.4	4 7	0.5
192	Other nervous system	31	0.3	0.3	0.0	1.0	34	0.3	0.4	0.0
193	Thyroid	273	2.8	2.3	0.2	0.4	723	7.3	6.3	0.6
194	Other endocrine	45	0.5	0.5	0.0	12	39	0.4	0.4	0.0
195_199	Linknown primary site	1 629	18.0	12.2	1.4	14	1 538	13.1	89	1.0
200+202	Non-Hodgkin's lymphoma	1 742	18.0	14.2	1.4	1.4	1,000	13.4	10.0	1.0
201	Hodgkin's disease	213	23	21	0.2	1.1	185	2.0	1.8	0.1
200_202	Lymphoma	1 955	21.0	16.3	1.7	1.4	1 651	15.4	11.8	13
200-202	Multiple myeloma	575	63	4.3	0.5	1.4	448	30	2.6	0.3
204	Lymphatic leukaemia	540	6.0	J 5 1	0.5	1.0	305	3.5	2.0	0.0
205	Myeloid leukaemia	572	0.0	0.1 1 A	0.5	1.0	750	3.1	0.0 2.0	0.3
205	Monocytic leukaemia	10	0.3	4.0 0.1	0.5	1.0	400	0.1	2.9	0.3
200 202	Other and unspecified loukoomic	12	0.1	0.1	0.0	1.9	10	0.1	0.1	0.0
201-200		1 200	U.O 12 2	10.0	1.0	1.0	00 709	0.0	0.3	0.0
20 <del>4</del> -200 #		1,209	13.2	10.3	1.0	1.0	220 091	0.2	ט. <i>ו</i> סס	0.0 0.2
#	Smoking_related	7 057	0.9 05.0	0.0 61 0	77	1.Z 2.4	2 6 1 0	3.3 25.0	2.0 10 0	0.3
π	Smoking-related	1,007	00.3	01.3	1.1	3.4	2,049	25.0	10.0	2.4

Note: Rates are expressed per 100,000 population and age-standardised (AS rate) to both the Australian 1991 Standard Population and the World Standard Population.

\* Non-melanocytic skin cancer incidence data is not routinely collected by State and Territory cancer registries.

# See Appendix A for ICD-9 codes.

Source: Cancer in Australia 1998, AIHW & AACR 2001.

### Table 8: Mortality summary table, Australia, 1998

Australia	1998		Mal	es				Fem	ales	
ICD-9	– Cancer site	Number	AS rate (Aust 1991)	AS rate (World)	PYLL (<75 yrs)	Sex ratio M:F	Number	AS rate (Aust 1991)	AS rate (World)	PYLL (<75 yrs)
140–208	All cancers (excluding NMSC)	19,400	215.3	143.5	141,030	1.7	14,870	130.1	91.9	119,010
140	Lip	8	0.1	0.1	110	3.2	4	0.0	0.0	3
141	Tongue	132	1.4	1.1	1,718	3.7	42	0.4	0.3	355
142	Salivary gland	49	0.5	0.3	285	2.7	25	0.2	0.1	103
143	Gum	17	0.2	0.1	165	2.2	11	0.1	0.1	80
144	Floor of mouth	31	0.3	0.3	398	4.2	9	0.1	0.1	45
145	Other mouth	36	0.4	0.3	435	1.3	35	0.3	0.2	183
146	Oropharynx	92	1.0	0.7	935	4.1	29	0.2	0.2	208
147	Nasopharynx	38	0.4	0.3	688	2.5	16	0.2	0.1	250
148	Hypopharynx	49	0.5	0.4	430	5.6	12	0.1	0.1	55
149	Other lip, oral cavity and pharynx	24	0.3	0.2	153	5.5	5	0.0	0.0	48
141–149	Head and neck	468	5.0	3.8	5,205	3.2	184	1.6	1.1	1,325
150	Oesophagus	653	7.2	4.9	4,773	2.7	330	2.7	1.7	1,248
151	Stomach	765	8.5	5.6	5,235	2.4	428	3.6	2.4	2,885
152	Small intestine	52	0.6	0.4	430	2.1	31	0.3	0.2	245
153	Colon	1,738	19.2	12.9	12,443	1.4	1,652	14.1	9.6	9,750
154	Rectum	737	8.1	5.5	5,685	1.8	507	4.4	3.1	3,560
153–154	Colorectal	2,475	27.4	18.5	18,128	1.5	2,159	18.5	12.7	13,310
155	Liver	425	4.6	3.3	3,840	2.5	215	1.9	1.3	1,610
156	Gallbladder	138	1.6	1.0	803	0.9	211	1.8	1.2	975
157	Pancreas	814	8.9	6.1	6,333	1.3	805	6.9	4.5	4,058
158	Peritoneum	32	0.3	0.3	370	0.9	41	0.4	0.3	388
159	Other digestive organs	119	1.4	0.8	615	1.4	125	1.0	0.6	490
160	Nasal cavity	35	0.4	0.3	313	2.3	20	0.2	0.1	163
161	Larynx	186	2.0	1.4	1,505	19.5	12	0.1	0.1	93
162	Lung	4,817	53.2	35.8	30,660	2.8	2,076	18.8	13.3	14,458
163	Pleura	211	2.3	1.6	1,370	10.2	26	0.2	0.2	183
164	Other respiratory organs	12	0.1	0.1	240	1.0	14	0.1	0.1	233
170	Bone	49	0.5	0.4	1,355	1.6	37	0.3	0.3	810
171	Connective tissue	111	1.2	0.9	1,595	1.3	97	0.9	0.7	1,420
172	Skin—melanoma	635	6.9	5.0	7,315	2.3	344	3.0	2.2	3,740
173	Skin—non-melanocytic (NMSC)	229	2.6	1.6	1,083	3.2	112	0.8	0.5	278
174–175	Breast	17	0.2	0.1	118	<0.01	2,526	22.8	17.4	29,255
180	Cervix						264	2.4	1.9	3,795
181	Placenta						0	0.0	0.0	0
179+182	Uterus						246	2.1	1.4	1,130
183	Ovary						769	6.9	5.0	6,548
184	Other female genital organs						91	0.7	0.4	298
#	Gynaecological						1,370	12.1	8.7	11,770
185	Prostate	2,544	29.5	16.5	6,128					
186	Testis	24	0.3	0.2	693					
187	Penis & other male genital organs	15	0.2	0.1	193					
188	Bladder	564	6.4	3.8	1,985	3.3	243	2.0	1.1	703
189	Kidney	495	5.4	3.8	4,158	1.8	348	3.0	2.0	2,070
190	Eye	16	0.2	0.1	230	1.9	12	0.1	0.1	60
191	Brain	573	6.1	4.9	9,370	1.4	445	4.2	3.4	7,033
192	Other nervous system	8	0.1	0.1	175	2.2	4	0.0	0.0	108
193	Thyroid	37	0.4	0.3	258	1.5	32	0.3	0.2	228
194	Other endocrine	27	0.3	0.3	948	1.2	24	0.2	0.2	640
195–199	Unknown primary site	1,198	13.3	8.8	8,075	1.5	1,102	9.2	6.1	6,038
200+202	Non-Hodgkin's lymphoma	750	8.3	5.6	6,835	1.3	759	6.6	4.5	5,020
201	Hodgkin's disease	31	0.3	0.3	533	1.6	21	0.2	0.2	600
200–202	Lymphoma	781	8.6	5.9	7,368	1.3	780	6.8	4.6	5,620
203	Multiple myeloma	328	3.6	2.4	1,963	1.6	275	2.3	1.5	1,335
204	Lymphatic leukaemia	245	2.7	2.1	4,163	1.8	173	1.5	1.2	2,583
205	Myeloid leukaemia	478	5.3	3.7	4,773	1.7	349	3.1	2.2	3,785
206	Monocytic leukaemia	4	0.0	0.0	3	0.7	8	0.1	0.0	25
207–208	Other and unspecified leukaemia	41	0.5	0.3	243	3.0	20	0.2	0.1	128
204–208	Leukaemias	768	8.5	6.0	9,180	1.8	550	4.8	3.5	6,520
#	Alcohol-related	210	2.2	1.8	2,603	2.4	96	0.9	0.7	1,191
#	Smoking-related	5,314	58.5	40.0	37,043	3.6	1,754	16.1	11.7	13,983

Note: Rates are expressed per 100,000 population and age-standardised (AS rate) to both the Australian 1991 Standard Population and the World Standard Population.

# See Appendix A for ICD-9 codes.

Source: Cancer in Australia 1998, AIHW & AACR 2001.

# Tables for selected cancers 1998

- Tables of new cases, deaths, incidence and mortality rates for Australia and the States and Territories for selected cancers.
- Tables for other cancer sites can be found on the AIHW's web site at http://www.aihw.gov.au or can be requested in hard copy from the AIHW.

			Inciden	ce					Mortal	ity		
	Males	6	Female	es	Perso	ns	Male	5	Femal	es	Perso	ns
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	140	21.3	121	19.4	261	20.3	39	5.9	24	3.8	63	4.9
5–9	90	13.3	72	11.2	162	12.2	27	4.0	23	3.6	50	3.8
10–14	92	13.7	80	12.5	172	13.1	29	4.3	16	2.5	45	3.4
15–19	169	25.1	131	20.5	300	22.8	32	4.7	33	5.2	65	4.9
20–24	255	36.9	251	37.7	506	37.3	34	4.9	25	3.8	59	4.3
25–29	430	58.3	481	65.6	911	62.0	52	7.1	54	7.4	106	7.2
30–34	551	78.3	839	118.7	1,390	98.6	102	14.5	105	14.9	207	14.7
35–39	804	107.8	1,265	168.9	2,069	138.4	144	19.3	196	26.2	340	22.8
40–44	1,108	158.7	1,900	270.4	3,008	214.7	286	41.0	347	49.4	633	45.2
45–49	1,699	259.4	2,550	392.6	4,249	325.7	493	75.3	584	89.9	1,077	82.6
50–54	2,732	462.1	3,340	585.7	6,072	522.8	877	148.3	871	152.7	1,748	150.5
55–59	3,698	829.0	3,300	765.3	6,998	797.7	1,292	289.6	975	226.1	2,267	258.4
60–64	4,850	1,314.6	3,567	963.7	8,417	1,138.9	1,915	519.1	1,242	335.6	3,157	427.2
65–69	6,658	1,991.7	4,100	1,175.8	10,758	1,575.1	2,733	817.6	1,623	465.4	4,356	637.8
70–74	7,652	2,675.3	4,708	1,427.1	12,360	2,006.7	3,643	1,273.7	2,174	659.0	5,817	944.4
75–79	6,282	3,132.8	4,370	1,631.1	10,652	2,273.9	3,292	1,641.7	2,311	862.6	5,603	1,196.1
80–84	3,799	3,451.1	3,312	1,840.0	7,111	2,451.4	2,479	2,252.0	2,023	1,123.9	4,502	1,552.0
85 and over	2,586	3,786.5	2,882	1,847.4	5,468	2,437.8	1,931	2,827.4	2,244	1,438.4	4,175	1,861.3
Total	43,595		37,269		80,864		19,400		14,870		34,270	
Rates per 100,00	0 with 95 p	per cent co	nfidence in	tervals (95	5% CI)							
Crude rate		467.8		396.0		431.7		208.2		158.0		183.0
95% CI	463	3.4 – 472.2	39	2.0 – 400.1	42	8.8 – 434.7	20	5.2 – 211.1	15	5.5 – 160.6	18	1.0 – 184.9
AS rate (Aust 1991)		474.6		346.5		400.5		215.3		130.1		166.4
95% CI	470	0.1 – 479.1	34	3.0 – 350.1	39	7.7 – 403.3	21	2.2 – 218.3	12	8.0 – 132.3	16	4.7 – 168.2
AS rate (World)		340.9		268.7		299.7		143.5		91.9		114.6
95% CI	337	7.5 – 344.2	26	5.8 – 271.7	29	7.5 – 301.8	14	1.4 – 145.6		90.3 – 93.5	11	3.3 – 115.9
Lifetime risk (0-74)		1 in 3		1 in 4		1 in 3		1 in 7		1 in 10		1 in 8
PYLL (0-74)								141,030		119,010		260,040
Per cent of all cancers		100.0		100.0		100.0		100.0		100.0		100.0

### Average annual numbers and rates by State and Territory 1994–1998

			Mortality									
	Male	Males		Females		Persons		Males		es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	14,981	491.6	12,092	336.1	27,072	401.3	6,501	218.4	5,040	131.9	11,541	167.8
Vic	10,856	491.3	9,258	348.2	20,113	407.4	4,982	229.3	3,989	141.2	8,971	178.1
Qld	8,134	526.3	6,412	362.5	14,546	434.4	3,416	227.5	2,409	131.2	5,825	173.4
WA	3,735	483.9	3,006	331.7	6,741	397.4	1,653	222.7	1,253	134.5	2,906	172.2
SA	3,910	503.4	3,165	344.1	7,074	410.3	1,707	221.4	1,335	134.3	3,042	170.3
Tas	1,223	519.6	979	355.6	2,203	424.2	562	242.3	437	149.0	999	187.7
ACT	516	494.0	448	334.3	964	401.7	226	238.3	198	157.8	424	190.7
NT	206	432.4	160	323.9	366	381.1	89	224.4	61	169.3	149	198.2

			Incide	nce					Mortal	ity		
_	Male	s	Femal	es	Perso	ons	Male	S	Femal	es	Perso	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	0	0.0	1	0.2	1	0.1	0	0.0	1	0.2	1	0.1
20–24	2	0.3	1	0.2	3	0.2	2	0.3	0	0.0	2	0.1
25–29	8	1.1	4	0.5	12	0.8	1	0.1	2	0.3	3	0.2
30–34	7	1.0	8	1.1	15	1.1	2	0.3	3	0.4	5	0.4
35–39	19	2.5	8	1.1	27	1.8	8	1.1	6	0.8	14	0.9
40–44	21	3.0	22	3.1	43	3.1	11	1.6	14	2.0	25	1.8
45–49	47	7.2	25	3.8	72	5.5	14	2.1	15	2.3	29	2.2
50–54	90	15.2	29	5.1	119	10.2	47	7.9	21	3.7	68	5.9
55–59	86	19.3	28	6.5	114	13.0	48	10.8	13	3.0	61	7.0
60–64	136	36.9	50	13.5	186	25.2	73	19.8	31	8.4	104	14.1
65–69	177	52.9	71	20.4	248	36.3	102	30.5	39	11.2	141	20.6
70–74	232	81.1	100	30.3	332	53.9	152	53.1	53	16.1	205	33.3
75–79	200	99.7	106	39.6	306	65.3	133	66.3	65	24.3	198	42.3
80–84	123	111.7	94	52.2	217	74.8	89	80.9	68	37.8	157	54.1
85 and over	90	131.8	120	76.9	210	93.6	83	121.5	97	62.2	180	80.2
Total	1,238		667		1,905		765		428		1,193	
Rates per 100,00	0 with 95	per cent co	onfidence in	ntervals (95	5% CI)							
Crude rate		13.3		7.1		10.2		8.2		4.5		6.4
95% CI		12.5 – 14.0		6.5 – 7.6		9.7 – 10.6		7.6 – 8.8		4.1 – 5.0		6.0 - 6.7
AS rate (Aust 1991)		13.5		5.8		9.3		8.5		3.6		5.7
95% CI		12.7 – 14.3		5.3 – 6.2		8.9 – 9.7		7.9 – 9.1		3.2 – 3.9		5.4 – 6.1
AS rate (World)		9.4		3.9		6.5		5.6		2.4		3.9
95% CI		8.8 – 9.9		3.6 – 4.3		6.2 - 6.8		5.2 - 6.0		2.2 – 2.7		3.6 – 4.1
Lifetime risk (0-74)		1 in 91		1 in 234		1 in 133		1 in 157		1 in 415		1 in 232
PYLL (0-74)								5,235		2,885		8,120
Per cent of all												
cancers		2.8		1.8		2.4		3.9		2.9		3.5

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce			Mortality						
	Males		Females		Persons		Males		Femal	es	Perso	ns	
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	
NSW	419	13.8	224	5.8	643	9.4	251	8.4	139	3.5	390	5.6	
Vic	337	15.3	190	6.7	528	10.5	217	10.0	133	4.5	349	6.9	
Qld	201	13.3	107	5.7	308	9.2	131	8.8	70	3.6	201	5.9	
WA	105	13.8	61	6.5	166	9.9	72	9.6	44	4.6	116	6.9	
SA	106	13.7	61	6.0	167	9.3	76	9.9	49	4.8	125	6.9	
Tas	34	14.7	20	6.6	54	10.2	29	12.7	16	5.2	46	8.5	
ACT	13	12.7	8	6.9	21	9.4	9	9.8	7	5.9	16	7.6	
NT	4	11.4	2	4.5	6	7.8	1	2.5	2	4.9	3	3.7	

			Incide	ence					Morta	ality		
	Mal	es	Fema	ales	Pers	ons	Mal	les	Fema	ales	Pers	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	4	0.6	1	0.2	5	0.4	1	0.1	0	0.0	1	0.1
15–19	1	0.1	4	0.6	5	0.4	0	0.0	2	0.3	2	0.2
20–24	7	1.0	4	0.6	11	0.8	1	0.1	0	0.0	1	0.1
25–29	17	2.3	13	1.8	30	2.0	4	0.5	1	0.1	5	0.3
30–34	26	3.7	25	3.5	51	3.6	12	1.7	7	1.0	19	1.3
35–39	56	7.5	55	7.3	111	7.4	19	2.5	13	1.7	32	2.1
40-44	115	16.5	105	14.9	220	15.7	38	5.4	34	4.8	72	5.1
45–49	215	32.8	182	28.0	397	30.4	70	10.7	74	11.4	144	11.0
50-54	373	63.1	296	51.9	669	57.6	105	17.8	94	16.5	199	17.1
55-59	612	137.2	410	95.1	1,022	116.5	213	47.7	125	29.0	338	38.5
60-64	749	203.0	552	149.1	1,301	176.0	276	74.8	179	48.4	455	61.6
65–69	1,033	309.0	664	190.4	1,697	248.5	368	110.1	249	71.4	617	90.3
70-74	1,144	400.0	822	249.2	1,966	319.2	456	159.4	326	98.8	782	127.0
75-79	870	433.9	/8/	293.7	1,657	353.7	373	186.0	370	138.1	743	158.6
80-84	538	488.7	655	363.9	1,193	411.3	320	290.7	2//	153.9	597	205.8
85 and over	3/1	543.Z	583	373.7	954	425.3	219	320.7	408	201.5	627	279.5
Total	6,131		5,158		11,289		2,475		2,159		4,634	
Rates per 100,00	00 with 95	5 per cent co	nfidence	intervals (95	5% CI)							
Crude rate		65.8		54.8		60.3		26.6		22.9		24.7
95% CI		64.1 – 67.4		53.3 – 56.3		59.2 – 61.4		25.5 – 27.6		22.0 – 23.9		24.0 – 25.5
AS rate (Aust 1991)	)	66.7		46.3		55.6		27.4		18.5		22.5
95% CI		65.0 - 68.4		45.0 - 47.5		54.6 - 56.6		26.3 – 28.4		17.7 – 19.3		21.8 – 23.1
AS rate (World)		47.5		33.2		39.9		18.5		12.7		15.4
95% CI		46.3 - 48.7		32.2 – 34.2		39.1 – 40.6		17.7 – 19.2		12.1 – 13.3		14.9 – 15.8
Lifetime risk (0-74)		1 in 17		1 in 26		1 in 21		1 in 47		1 in 71		1 in 57
PYLL (0-74)								18,128		13,310		31,438
Per cent of all												
cancers		14.1		13.8		14.0		12.8		14.5		13.5

### Average annual numbers and rates by State and Territory 1994–1998

			Mortality									
	Males		Females		Persons		Males		Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	2,049	67.0	1,690	45.0	3,739	54.9	822	27.5	695	17.7	1,517	22.0
Vic	1,554	70.2	1,313	47.2	2,868	57.6	676	30.9	598	20.5	1,274	25.2
Qld	1,069	69.2	892	49.4	1,961	58.7	430	28.6	354	19.0	784	23.4
WA	499	65.0	400	43.6	899	53.3	217	28.9	177	18.6	394	23.3
SA	533	68.2	474	48.1	1,007	57.2	218	28.0	195	19.0	413	23.0
Tas	154	65.1	149	51.3	303	57.8	80	33.9	76	25.2	155	29.2
ACT	68	63.0	53	41.9	121	51.9	33	32.9	26	21.0	59	26.7
NT	24	54.4	15	42.0	39	49.1	8	20.5	7	20.2	15	20.8

	Incidence						Mortality						
	Males	6	Fema	les	Perso	ns	Male	s	Fema	les	Perso	ons	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	
Age group													
0-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
10–14	1	0.1	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	
15–19	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
20–24	1	0.1	2	0.3	3	0.2	0	0.0	0	0.0	0	0.0	
25–29	0	0.0	1	0.1	1	0.1	2	0.3	1	0.1	3	0.2	
30–34	2	0.3	0	0.0	2	0.1	3	0.4	0	0.0	3	0.2	
35–39	7	0.9	3	0.4	10	0.7	3	0.4	2	0.3	5	0.3	
40–44	14	2.0	8	1.1	22	1.6	14	2.0	8	1.1	22	1.6	
45–49	34	5.2	16	2.5	50	3.8	35	5.3	16	2.5	51	3.9	
50–54	60	10.1	34	6.0	94	8.1	44	7.4	31	5.4	75	6.5	
55–59	65	14.6	46	10.7	111	12.7	75	16.8	41	9.5	116	13.2	
60–64	89	24.1	80	21.6	169	22.9	79	21.4	65	17.6	144	19.5	
65–69	140	41.9	99	28.4	239	35.0	124	37.1	91	26.1	215	31.5	
70–74	157	54.9	144	43.6	301	48.9	144	50.3	130	39.4	274	44.5	
75–79	128	63.8	166	62.0	294	62.8	130	64.8	157	58.6	287	61.3	
80–84	83	75.4	133	73.9	216	74.5	82	74.5	126	70.0	208	71.7	
85 and over	79	115.7	137	87.8	216	96.3	79	115.7	137	87.8	216	96.3	
Total	860		869		1,729		814		805		1,619		
Rates per 100,0	00 with 95 j	per cent co	onfidence i	ntervals (95	5% CI)								
Crude rate		9.2		9.2		9.2		8.7		8.6		8.6	
95% CI		8.6 – 9.8		8.6 - 9.8		8.8 – 9.7		8.1 – 9.3		8.0 – 9.1		8.2 – 9.1	
AS rate (Aust 1991	I)	9.4		7.5		8.4		8.9		6.9		7.8	
95% CI		8.8 – 10.1		7.0 - 8.0		8.0 - 8.8		8.3 – 9.6		6.4 – 7.4		7.4 – 8.2	
AS rate (World)		6.5		5.0		5.7		6.1		4.5		5.3	
95% CI		6.1 – 7.0		4.6 - 5.4		5.4 - 6.0		5.7 – 6.6		4.2 – 4.9		5.0 - 5.6	
Lifetime risk (0-74	)	1 in 130		1 in 175		1 in 150		1 in 142		1 in 197		1 in 165	
PYLL (0-74)								6,333		4,058		10,390	
Per cent of all cancers		20		23		21		4 2		5 /		47	
000010		2.0		2.3		2.1		4.2		5.4		4.7	

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	282	9.4	285	7.3	568	8.2	259	8.6	277	7.0	536	7.7
Vic	219	9.9	211	7.2	429	8.5	211	9.7	209	7.1	420	8.3
Qld	148	9.7	129	7.0	278	8.3	142	9.4	124	6.6	266	7.9
WA	72	9.4	71	7.6	143	8.5	69	9.2	65	6.8	134	8.0
SA	73	9.3	79	7.6	151	8.4	70	8.9	73	6.8	142	7.8
Tas	22	9.7	25	8.5	48	9.0	22	9.4	24	7.7	45	8.5
ACT	9	9.2	9	7.3	17	8.0	10	10.4	8	6.7	18	8.3
NT	4	6.8	3	9.4	7	8.5	3	5.2	2	8.9	6	7.5

			Incide	nce					Morta	ality		
	Mal	es	Fema	les	Pers	ons	Mal	es	Fema	ales	Pers	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	1	0.2	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	0	0.0	2	0.3	2	0.2	1	0.1	0	0.0	1	0.1
20–24	3	0.4	1	0.2	4	0.3	2	0.3	0	0.0	2	0.1
25–29	1	0.1	2	0.3	3	0.2	1	0.1	1	0.1	2	0.1
30–34	5	0.7	10	1.4	15	1.1	2	0.3	4	0.6	6	0.4
35–39	24	3.2	20	2.7	44	2.9	13	1.7	9	1.2	22	1.5
40–44	58	8.3	43	6.1	101	7.2	40	5.7	29	4.1	69	4.9
45–49	113	17.3	84	12.9	197	15.1	93	14.2	58	8.9	151	11.6
50–54	267	45.2	151	26.5	418	36.0	201	34.0	117	20.5	318	27.4
55–59	379	85.0	209	48.5	588	67.0	327	73.3	164	38.0	491	56.0
60–64	667	180.8	269	72.7	936	126.6	551	149.3	203	54.8	754	102.0
65–69	978	292.6	392	112.4	1,370	200.6	833	249.2	305	87.5	1,138	166.6
70–74	1,156	404.2	497	150.6	1,653	268.4	1,056	369.2	415	125.8	1,471	238.8
75–79	922	459.8	406	151.5	1,328	283.5	855	426.4	355	132.5	1,210	258.3
80–84	440	399.7	255	141.7	695	239.6	520	472.4	252	140.0	772	266.1
85 and over	293	429.0	147	94.2	440	196.2	322	471.5	164	105.1	486	216.7
Total	5,307		2,488		7,795		4,817		2,076		6,893	
Rates per 100,00	0 with 95	i per cent co	nfidence	ntervals (9	5% CI)							
Crude rate		56.9		26.4		41.6		51.7		22.1		36.8
95% CI		55.4 – 58.5		25.4 – 27.5		40.7 – 42.5		50.2 – 53.1		21.1 – 23.0		35.9 – 37.7
AS rate (Aust 1991)	)	58.2		23.0		38.8		53.2		18.8		34.0
95% CI		56.6 - 59.8		22.0 - 23.9		37.9 – 39.6		51.6 – 54.7		18.0 – 19.6		33.2 - 34.8
AS rate (World)		40.3		16.7		27.6		35.8		13.3		23.6
95% CI		39.2 – 41.4		16.0 – 17.4		26.9 – 28.2		34.8 – 36.9		12.7 – 14.0		23.0 - 24.2
Lifetime risk (0-74)		1 in 20		1 in 47		1 in 28		1 in 23		1 in 59		1 in 33
PYLL (0-74)								30,660		14,458		45,118
Per cent of all												
cancers		12.2		6.7		9.6		24.8		14.0		20.1

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	1,811	59.6	834	22.8	2,646	39.0	1,607	53.3	703	18.8	2,309	33.8
Vic	1,343	60.8	635	23.4	1,978	40.0	1,231	56.1	554	20.1	1,786	35.9
Qld	965	63.0	389	22.1	1,354	40.9	858	56.6	318	18.0	1,176	35.5
WA	466	62.1	218	24.5	684	41.3	409	55.2	179	19.9	588	35.5
SA	477	60.9	206	21.8	684	38.9	415	53.2	165	17.1	581	32.8
Tas	162	68.0	72	25.8	234	44.8	144	61.2	57	20.2	201	38.3
ACT	40	41.6	31	25.2	71	32.2	46	47.7	25	20.6	71	32.4
NT	34	79.5	15	42.5	49	62.7	31	84.2	12	31.6	43	58.5

			Incide	ence					Mortal	ity		
	Male	s	Fema	les	Perso	ons	Male	s	Femal	es	Perso	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	0	0.0	1	0.2	1	0.1	0	0.0	0	0.0	0	0.0
5–9	1	0.1	1	0.2	2	0.2	0	0.0	0	0.0	0	0.0
10–14	6	0.9	6	0.9	12	0.9	0	0.0	0	0.0	0	0.0
15–19	27	4.0	38	5.9	65	4.9	0	0.0	1	0.2	1	0.1
20–24	53	7.7	93	14.0	146	10.8	1	0.1	0	0.0	1	0.1
25–29	120	16.3	150	20.5	270	18.4	11	1.5	5	0.7	16	1.1
30–34	156	22.2	242	34.2	398	28.2	13	1.8	11	1.6	24	1.7
35–39	232	31.1	259	34.6	491	32.9	21	2.8	12	1.6	33	2.2
40–44	261	37.4	311	44.3	572	40.8	22	3.2	16	2.3	38	2.7
45–49	395	60.3	308	47.4	703	53.9	40	6.1	19	2.9	59	4.5
50–54	457	77.3	355	62.2	812	69.9	49	8.3	19	3.3	68	5.9
55–59	445	99.8	286	66.3	731	83.3	41	9.2	21	4.9	62	7.1
60–64	420	113.8	296	80.0	716	96.9	75	20.3	29	7.8	104	14.1
65–69	487	145.7	276	79.1	763	111.7	74	22.1	30	8.6	104	15.2
70–74	502	175.5	266	80.6	768	124.7	109	38.1	41	12.4	150	24.4
75–79	452	225.4	265	98.9	717	153.1	75	37.4	37	13.8	112	23.9
80–84	239	217.1	171	95.0	410	141.3	60	54.5	46	25.6	106	36.5
85 and over	145	212.3	169	108.3	314	140.0	44	64.4	57	36.5	101	45.0
Total	4,398		3,493		7,891		635		344		979	
Rates per 100,00	0 with 95	per cent co	nfidence	intervals (95	5% CI)							
Crude rate		47.2		37.1		42.1		6.8		3.7		5.2
95% CI		45.8 – 48.6		35.9 - 38.3		41.2 – 43.1		6.3 – 7.3		3.3 – 4.0		4.9 – 5.6
AS rate (Aust 1991)		46.4		34.1		39.6		6.9		3.0		4.8
95% CI		45.0 - 47.8		33.0 - 35.2		38.7 – 40.4		6.3 – 7.4		2.7 – 3.4		4.5 – 5.1
AS rate (World)		36.1		28.0		31.7		5.0		2.2		3.5
95% CI		35.0 - 37.2		27.0 - 29.0		31.0 - 32.4		4.6 - 5.4		1.9 – 2.5		3.3 – 3.7
Lifetime risk (0-74)		1 in 26		1 in 36		1 in 30		1 in 177		1 in 433		1 in 254
PYLL (0-74)								7,315		3,740		11,055
Per cent of all												
cancers		10.1		9.4		9.8		3.3		2.3		2.9

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	1,471	47.3	1,067	31.2	2,538	38.3	231	7.6	112	3.0	343	5.1
Vic	796	35.0	765	30.4	1,561	32.2	130	5.8	79	2.8	209	4.2
Qld	1,100	68.0	830	48.3	1,930	57.3	131	8.4	66	3.6	197	5.8
WA	409	49.1	317	35.3	726	41.6	52	6.7	30	3.2	81	4.8
SA	312	40.3	293	34.7	604	36.9	40	5.1	26	2.9	66	3.9
Tas	88	37.1	88	34.0	176	35.1	10	4.1	6	2.3	16	3.1
ACT	55	43.7	43	30.1	98	36.3	6	5.6	5	3.5	10	4.2
NT	21	29.4	14	17.8	36	23.9	2	3.8	0	0.8	2	2.5

			Inciden	се					Morta	ality		
	Males		Female	s	Perso	ons	Male	es	Fema	ales	Pers	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	0	0.0	4	0.6	4	0.3	0	0.0	0	0.0	0	0.0
20–24	1	0.1	13	2.0	14	1.0	0	0.0	2	0.3	2	0.1
25–29	0	0.0	52	7.1	52	3.5	0	0.0	9	1.2	9	0.6
30–34	0	0.0	196	27.7	196	13.9	0	0.0	26	3.7	26	1.8
35–39	2	0.3	413	55.1	415	27.8	0	0.0	67	8.9	67	4.5
40-44	3	0.4	852	121.3	855	61.0	0	0.0	126	17.9	126	9.0
45–49	7	1.1	1,170	180.1	1,177	90.2	1	0.2	198	30.5	199	15.3
50–54	3	0.5	1,460	256.0	1,463	126.0	1	0.2	260	45.6	261	22.5
55–59	9	2.0	1,261	292.5	1,270	144.8	1	0.2	229	53.1	230	26.2
60–64	17	4.6	1,140	308.0	1,157	156.6	2	0.5	256	69.2	258	34.9
65–69	16	4.8	1,137	326.1	1,153	168.8	2	0.6	243	69.7	245	35.9
70–74	12	4.2	1,054	319.5	1,066	173.1	4	1.4	274	83.1	278	45.1
75–79	11	5.5	875	326.6	886	189.1	3	1.5	296	110.5	299	63.8
80-84	6	5.5	574	318.9	580	199.9	2	1.8	240	133.3	242	83.4
85 and over	3	4.4	464	297.4	467	208.2	1	1.5	300	192.3	301	134.2
Total	90		10,665		10,755		17		2,526		2,543	
Rates per 100,0	00 with 95 pe	er cent co	onfidence in	tervals (9	5% CI)							
Crude rate		1.0		113.3		57.4		0.2		26.8		13.6
95% CI		0.8 – 1.2	111	1.2 – 115.5		56.3 - 58.5		0.1 – 0.3		25.8 – 27.9		13.0 – 14.1
AS rate (Aust 1991	1)	1.0		101.3		52.9		0.2		22.8		12.3
95% CI		0.8 – 1.2	99	9.4 – 103.3		51.9 - 53.9		0.1 – 0.3		21.9 – 23.7		11.8 – 12.8
AS rate (World)		0.7		83.2		42.8		0.1		17.4		9.2
95% CI		0.6 - 0.9	8	81.5 – 84.8		41.9 - 43.6		0.1 – 0.2		16.7 – 18.2		8.8 – 9.5
Lifetime risk (0-74	) ^	1 in 1,110		1 in 11		1 in 21		1 in 6,484		1 in 53		1 in 103
PYLL (0-74)								118		29,255		29,373
Per cent of all				00.5		40.0		0.1		47.0		
Cancers		0.2		28.6		13.3		0.1		17.0		7.4

### Average annual numbers and rates by State and Territory 1994–1998

			Incide	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate										
NSW	26	0.8	3,493	100.0	3,519	52.4	6	0.2	880	24.0	886	13.0
Vic	18	0.8	2,604	100.9	2,622	53.3	6	0.3	718	26.5	724	14.5
Qld	14	0.9	1,698	96.7	1,712	50.1	4	0.3	432	23.8	436	12.7
WA	6	0.8	901	100.2	907	51.8	1	0.1	225	24.1	226	12.9
SA	6	0.8	886	100.5	892	53.0	1	0.2	242	25.4	243	13.9
Tas	3	1.1	254	94.9	257	49.9	0	0.2	65	22.8	65	12.3
ACT	1	1.3	147	104.0	148	55.0	0	0.2	40	31.0	40	17.0
NT	1	1.2	44	71.5	45	33.5	0	0.0	8	19.5	8	9.2

			Incidence						Mortality			
	Males		Females		Persons		Males		Females		Persons	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4			0	0.0					0	0.0		
5–9			0	0.0					0	0.0		
10–14			0	0.0					0	0.0		
15–19			1	0.2					0	0.0		
20–24			13	2.0					3	0.5		
25–29			47	6.4					6	0.8		
30–34			85	12.0					4	0.6		
35–39			101	13.5					20	2.7		
40–44			103	14.7					19	2.7		
45–49			110	16.9					16	2.5		
50–54			65	11.4					23	4.0		
55–59			55	12.8					14	3.2		
60–64			55	14.9					30	8.1		
65–69			60	17.2					22	6.3		
70–74			61	18.5					29	8.8		
75–79			44	16.4					23	8.6		
80–84			39	21.7					25	13.9		
85 and over			29	18.6					30	19.2		
Total			868						264			
Rates per 100,0	000 with 95 per	cent co	onfidence inter	vals (95	5% CI)							
Crude rate				9.2						2.8		
95% CI			8	.6 – 9.8					2.	5 – 3.1		
AS rate (Aust 199	1)			8.6						2.4		
95% CI			8	.0 – 9.2					2.	1 – 2.7		
AS rate (World)				7.0						1.9		
95% CI			6	.6 – 7.5					1.	6 – 2.1		
Lifetime risk (0-74	4)			1 in 143					1	in 499		
PYLL (0-74)										3,795		
Per cent of all cancers				2.3						1.8		

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW			319	9.5					113	3.1		
Vic			236	9.5					69	2.6		
Qld			176	10.3					52	3.0		
WA			92	10.2					30	3.2		
SA			58	7.1					20	2.1		
Tas			27	11.0					12	4.6		
ACT			13	8.5					5	3.5		
NT			11	18.0					4	8.4		

			Incidence						Mortality			
	Males		Females		Persons		Males		Females		Persons	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4			0	0.0					0	0.0		
5–9			0	0.0					0	0.0		
10–14			0	0.0					0	0.0		
15–19			0	0.0					0	0.0		
20–24			3	0.5					0	0.0		
25–29			4	0.5					0	0.0		
30–34			6	0.8					0	0.0		
35–39			24	3.2					0	0.0		
4044			48	6.8					1	0.1		
45–49			83	12.8					3	0.5		
50–54			152	26.7					7	1.2		
55–59			190	44.1					15	3.5		
60–64			203	54.8					19	5.1		
65–69			176	50.5					30	8.6		
70–74			194	58.8					53	16.1		
75–79			139	51.9					37	13.8		
80–84			98	54.4					38	21.1		
85 and over			79	50.6					43	27.6		
Total			1,399						246			
Rates per 100,0	000 with 95 per	cent co	onfidence inter	vals (95	5% CI)							
Crude rate				14.9						2.6		
95% CI			14.1	1 – 15.6					2.	3 – 2.9		
AS rate (Aust 199	1)			13.2						2.1		
95% CI			12.5	5 – 13.9					1.	8 – 2.4		
AS rate (World)				10.5						1.4		
95% CI			9.9	9 – 11.1					1.	2 – 1.6		
Lifetime risk (0-74	4)			1 in 78					1	in 570		
PYLL (0-74)										1,130		
Per cent of all cancers				3.8						1.7		

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW			436	12.2					89	2.3		
Vic			396	15.2					71	2.5		
Qld			237	13.6					45	2.4		
WA			101	11.4					23	2.4		
SA			138	15.1					25	2.4		
Tas			34	12.5					7	2.5		
ACT			18	14.4					3	2.9		
NT			5	9.7					2	5.6		

			Incidence						Mortality			
	Males		Females		Persons		Males		Females		Persons	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4			0	0.0					0	0.0		
5–9			1	0.2					0	0.0		
10–14			4	0.6					1	0.2		
15–19			4	0.6					1	0.2		
20–24			15	2.3					0	0.0		
25–29			27	3.7					2	0.3		
30–34			31	4.4					4	0.6		
35–39			47	6.3					4	0.5		
4044			46	6.5					17	2.4		
45–49			82	12.6					29	4.5		
50–54			120	21.0					70	12.3		
55–59			131	30.4					69	16.0		
60–64			116	31.3					71	19.2		
65–69			145	41.6					95	27.2		
70–74			140	42.4					112	33.9		
75–79			137	51.1					114	42.5		
80–84			101	56.1					106	58.9		
85 and over			69	44.2					74	47.4		
Total			1,216						769			
Rates per 100,0	000 with 95 per	cent co	onfidence inter	vals (98	5% CI)							
Crude rate				12.9						8.2		
95% CI			12.2	2 – 13.6					7.	6 – 8.7		
AS rate (Aust 199	1)			11.5						6.9		
95% CI			10.8	8 – 12.1					6.	4 – 7.4		
AS rate (World)				9.0						5.0		
95% CI			8	.5 – 9.6					4.	6 – 5.4		
Lifetime risk (0-74	4)			1 in 99					1	in 171		
PYLL (0-74)										6,548		
Per cent of all cancers				3.3						5.2		

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	ice					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW			369	10.4					256	6.9		
Vic			366	14.1					218	8.0		
Qld			192	10.9					115	6.4		
WA			89	10.0					64	7.0		
SA			87	9.6					66	7.0		
Tas			36	13.3					24	8.2		
ACT			14	10.2					11	8.1		
NT			5	8.6					2	4.4		

_			Incidenc	e					Mortality			
	Males		Females	6	Persons	6	Males		Females		Persons	3
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	1	0.2					0	0.0				
5–9	0	0.0					0	0.0				
10–14	0	0.0					0	0.0				
15–19	0	0.0					0	0.0				
20–24	0	0.0					0	0.0				
25–29	0	0.0					0	0.0				
30–34	0	0.0					1	0.1				
35–39	2	0.3					0	0.0				
40–44	16	2.3					2	0.3				
45–49	83	12.7					8	1.2				
50–54	347	58.7					26	4.4				
55–59	816	182.9					51	11.4				
60–64	1,215	329.3					119	32.3				
65–69	1,795	537.0					227	67.9				
70–74	1,999	698.9					453	158.4				
75–79	1,720	857.8					535	266.8				
80–84	1,122	1,019.3					590	536.0				
85 and over	753	1,102.6					532	779.0				
Total	9,869						2,544					
Rates per 100,0	00 with 95 p	er cent co	onfidence int	ervals (95	5% CI)							
Crude rate		105.9						27.3				
95% CI	103	.8 – 108.0					2	6.2 – 28.4				
AS rate (Aust 1991	)	109.5						29.5				
95% CI	107	.4 – 111.7					2	8.4 – 30.7				
AS rate (World)		73.6						16.5				
95% CI	7	2.1 – 75.1					1	5.8 – 17.2				
Lifetime risk (0-74)	)	1 in 11						1 in 73				
PYLL (0-74)								6,128				
Per cent of all cancers		22.6						13.1				

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Males	S	Femal	es	Perso	ns	Male	S	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	3,913	130.1					870	30.9				
Vic	2,701	124.3					685	33.2				
Qld	1,713	115.3					458	32.5				
WA	990	132.6					202	29.6				
SA	1,126	144.7					232	31.0				
Tas	343	147.5					83	37.2				
ACT	161	169.6					27	33.9				
NT	28	84.0					5	20.6				

			Incidence						Mortality	,		
	Males		Females		Persons		Males		Females		Persons	j.
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	6	0.9					0	0.0				
5–9	0	0.0					0	0.0				
10–14	1	0.1					0	0.0				
15–19	25	3.7					1	0.1				
20–24	54	7.8					0	0.0				
25–29	91	12.3					2	0.3				
30–34	110	15.6					6	0.9				
35–39	92	12.3					2	0.3				
40-44	85	12.2					1	0.1				
45–49	34	5.2					4	0.6				
50–54	31	5.2					0	0.0				
55–59	12	2.7					2	0.4				
60–64	4	1.1					2	0.5				
65–69	7	2.1					1	0.3				
70–74	2	0.7					0	0.0				
75–79	6	3.0					0	0.0				
80–84	1	0.9					2	1.8				
85 and over	0	0.0					1	1.5				
Total	561						24					
Rates per 100,0	00 with 95 pe	r cent co	onfidence inte	rvals (95	5% CI)							
Crude rate		6.0						0.3				
95% CI		5.5 – 6.5						0.2 – 0.4				
AS rate (Aust 1991	1)	6.1						0.3				
95% CI		5.6 – 6.6						0.2 – 0.4				
AS rate (World)		5.3						0.2				
95% CI		4.9 – 5.8						0.1 – 0.3				
Lifetime risk (0-74	)	1 in 244					1	in 5,580				
PYLL (0-74)								693				
Per cent of all		4.5						. ·				
cancers		1.3						0.1				

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Morta	ity		
	Males	S	Femal	es	Perso	ons	Male	s	Fema	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	188	6.1					10	0.3				
Vic	133	5.9					7	0.3				
Qld	97	5.9					7	0.4				
WA	50	5.5					2	0.2				
SA	47	6.5					2	0.3				
Tas	14	6.3					0	0.1				
ACT	12	7.5					0	0.1				
NT	4	3.5					0	0.0				

			Incide	nce					Morta	lity		
	Male	s	Fema	les	Perso	ons	Male	es	Fema	les	Perso	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	1	0.2	1	0.1	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
20–24	2	0.3	3	0.5	5	0.4	0	0.0	0	0.0	0	0.0
25–29	4	0.5	2	0.3	6	0.4	0	0.0	0	0.0	0	0.0
30–34	5	0.7	7	1.0	12	0.9	0	0.0	1	0.1	1	0.1
35–39	12	1.6	6	0.8	18	1.2	0	0.0	1	0.1	1	0.1
40-44	31	4.4	2	0.3	33	2.4	1	0.1	1	0.1	2	0.1
45–49	50	7.6	18	2.8	68	5.2	7	1.1	0	0.0	7	0.5
50–54	97	16.4	26	4.6	123	10.6	16	2.7	7	1.2	23	2.0
55–59	123	27.6	35	8.1	158	18.0	18	4.0	3	0.7	21	2.4
60–64	187	50.7	73	19.7	260	35.2	33	8.9	9	2.4	42	5.7
65–69	303	90.6	93	26.7	396	58.0	55	16.5	23	6.6	78	11.4
70–74	443	154.9	136	41.2	579	94.0	104	36.4	38	11.5	142	23.1
75–79	360	179.5	134	50.0	494	105.5	125	62.3	44	16.4	169	36.1
80-84	260	236.2	110	61.1	370	127.6	100	90.8	62	34.4	162	55.8
85 and over	191	279.7	89	57.0	280	124.8	105	153.7	54	34.6	159	70.9
Total	2,068		735		2,803		564		243		807	
Rates per 100,00	00 with 95	per cent co	onfidence i	ntervals (95	5% CI)							
Crude rate		22.2		7.8		15.0		6.1		2.6		4.3
95% CI		21.2 – 23.1		7.2 – 8.4		14.4 – 15.5		5.6 - 6.6		2.3 – 2.9		4.0 - 4.6
AS rate (Aust 1991)	)	22.9		6.5		13.7		6.4		2.0		3.8
95% CI		21.9 – 23.9		6.0 - 7.0		13.2 – 14.2		5.9 – 7.0		1.7 – 2.2		3.5 – 4.1
AS rate (World)		15.1		4.4		9.2		3.8		1.1		2.3
95% CI		14.4 – 15.7		4.1 – 4.8		8.9 – 9.6		3.5 – 4.1		1.0 – 1.3		2.1 – 2.4
Lifetime risk (0-74)		1 in 57		1 in 189		1 in 89		1 in 287		1 in 874		1 in 442
PYLL (0-74)								1,985		703		2,688
Per cent of all												
cancers		4.7		2.0		3.5		2.9		1.6		2.4

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	553	18.5	202	5.2	755	10.9	191	6.7	83	2.0	274	3.9
Vic	661	30.2	213	7.5	874	17.4	141	6.7	59	1.9	200	3.8
Qld	452	29.9	152	8.4	605	18.1	97	6.8	45	2.3	142	4.2
WA	103	14.3	31	3.4	134	8.1	42	6.0	17	1.7	59	3.5
SA	126	16.4	44	4.2	170	9.5	54	7.2	23	2.1	77	4.1
Tas	67	28.7	21	6.9	87	16.5	15	6.7	7	2.0	21	3.9
ACT	17	18.7	4	3.6	21	10.0	8	9.9	3	2.2	11	5.3
NT	5	12.5	1	2.8	6	7.7	3	7.9	1	1.8	3	4.7

_			Incide	nce					Mortal	ity		
	Males	s	Fema	les	Pers	ons	Male	S	Femal	es	Perso	ns
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	10	1.5	9	1.4	19	1.5	2	0.3	1	0.2	3	0.2
5–9	3	0.4	5	0.8	8	0.6	1	0.1	1	0.2	2	0.2
10–14	1	0.1	1	0.2	2	0.2	0	0.0	0	0.0	0	0.0
15–19	1	0.1	2	0.3	3	0.2	2	0.3	0	0.0	2	0.2
20–24	2	0.3	1	0.2	3	0.2	0	0.0	1	0.2	1	0.1
25–29	7	0.9	3	0.4	10	0.7	1	0.1	0	0.0	1	0.1
30–34	15	2.1	10	1.4	25	1.8	3	0.4	0	0.0	3	0.2
35–39	23	3.1	23	3.1	46	3.1	3	0.4	3	0.4	6	0.4
40-44	44	6.3	29	4.1	73	5.2	11	1.6	3	0.4	14	1.0
45–49	83	12.7	36	5.5	119	9.1	9	1.4	9	1.4	18	1.4
50–54	128	21.7	54	9.5	182	15.7	31	5.2	12	2.1	43	3.7
55–59	154	34.5	64	14.8	218	24.8	47	10.5	24	5.6	71	8.1
60–64	131	35.5	76	20.5	207	28.0	55	14.9	27	7.3	82	11.1
65–69	183	54.7	127	36.4	310	45.4	69	20.6	33	9.5	102	14.9
70–74	241	84.3	140	42.4	381	61.9	85	29.7	58	17.6	143	23.2
75–79	168	83.8	134	50.0	302	64.5	84	41.9	60	22.4	144	30.7
80–84	94	85.4	92	51.1	186	64.1	54	49.1	65	36.1	119	41.0
85 and over	45	65.9	52	33.3	97	43.2	38	55.6	51	32.7	89	39.7
Total	1,333		858		2,191		495		348		843	
Rates per 100,00	0 with 95	per cent co	onfidence i	ntervals (95	5% CI)							
Crude rate		14.3		9.1		11.7		5.3		3.7		4.5
95% CI		13.5 – 15.1		8.5 – 9.7		11.2 – 12.2		4.8 – 5.8		3.3 – 4.1		4.2 – 4.8
AS rate (Aust 1991)		14.1		8.0		10.8		5.4		3.0		4.1
95% CI		13.4 – 14.9		7.4 – 8.5		10.4 – 11.3		4.9 – 5.9		2.7 – 3.3		3.8 – 4.4
AS rate (World)		10.6		5.9		8.2		3.8		2.0		2.8
95% CI		10.0 – 11.2		5.5 - 6.4		7.8 – 8.5		3.4 – 4.1		1.8 – 2.2		2.6 - 3.0
Lifetime risk (0-74)		1 in 78		1 in 142		1 in 101		1 in 234		1 in 448		1 in 310
PYLL (0-74)								4,158		2,070		6,228
Per cent of all												
cancers		3.1		2.3		2.7		2.6		2.3		2.5

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	432	13.9	300	8.2	732	10.8	159	5.3	131	3.4	290	4.2
Vic	302	13.4	188	7.1	490	10.0	122	5.6	77	2.7	199	4.0
Qld	234	14.9	153	8.6	387	11.6	87	5.7	61	3.3	148	4.4
WA	77	9.8	55	6.0	132	7.8	35	4.7	27	2.9	62	3.7
SA	114	14.6	64	6.9	179	10.4	44	5.6	26	2.6	69	4.0
Tas	36	15.0	20	6.9	55	10.7	16	6.9	9	3.0	25	4.7
ACT	14	12.6	8	6.3	22	9.3	6	6.1	5	4.3	11	5.1
NT	6	11.8	3	6.2	9	9.2	1	2.6	1	5.4	2	4.4

_			Incide	nce					Mortal	ity		
	Males		Femal	es	Persor	าร	Males	6	Femal	es	Perso	ns
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	17	2.6	22	3.5	39	3.0	15	2.3	10	1.6	25	1.9
5–9	25	3.7	23	3.6	48	3.6	5	0.7	7	1.1	12	0.9
10–14	19	2.8	15	2.3	34	2.6	1	0.1	2	0.3	3	0.2
15–19	13	1.9	12	1.9	25	1.9	5	0.7	3	0.5	8	0.6
20–24	18	2.6	10	1.5	28	2.1	2	0.3	7	1.1	9	0.7
25–29	22	3.0	19	2.6	41	2.8	9	1.2	3	0.4	12	0.8
30–34	16	2.3	20	2.8	36	2.6	15	2.1	12	1.7	27	1.9
35–39	28	3.8	27	3.6	55	3.7	16	2.1	8	1.1	24	1.6
40–44	35	5.0	27	3.8	62	4.4	22	3.2	28	4.0	50	3.6
45–49	52	7.9	33	5.1	85	6.5	40	6.1	30	4.6	70	5.4
50–54	63	10.7	34	6.0	97	8.4	68	11.5	35	6.1	103	8.9
55–59	70	15.7	38	8.8	108	12.3	53	11.9	37	8.6	90	10.3
60–64	71	19.2	47	12.7	118	16.0	64	17.3	49	13.2	113	15.3
65–69	67	20.0	40	11.5	107	15.7	76	22.7	37	10.6	113	16.5
70–74	75	26.2	68	20.6	143	23.2	73	25.5	63	19.1	136	22.1
75–79	64	31.9	54	20.2	118	25.2	63	31.4	42	15.7	105	22.4
80–84	30	27.3	38	21.1	68	23.4	27	24.5	39	21.7	66	22.8
85 and over	17	24.9	33	21.2	50	22.3	19	27.8	33	21.2	52	23.2
Total	702		560		1,262		573		445		1,018	
Rates per 100,0	00 with 95 pe	er cent co	onfidence i	ntervals (95	5% CI)							
Crude rate		7.5		6.0		6.7		6.1		4.7		5.4
95% CI		7.0 – 8.1		5.5 – 6.4		6.4 – 7.1		5.6 – 6.7		4.3 – 5.2		5.1 – 5.8
AS rate (Aust 1991	I)	7.4		5.4		6.4		6.1		4.2		5.1
95% CI		6.9 - 8.0		5.0 - 5.9		6.0-6.8		5.6 - 6.6		3.8 – 4.6		4.8 – 5.4
AS rate (World)		6.3		4.7		5.5		4.9		3.4		4.1
95% CI		5.8 – 6.8		4.3 – 5.2		5.2 – 5.8		4.5 – 5.3		3.1 – 3.8		3.9 – 4.4
Lifetime risk (0-74	)	1 in 157		1 in 222		1 in 184		1 in 186		1 in 271		1 in 221
PYLL (0-74)								9,370		7,033		16,403
Per cent of all												
cancers		1.6		1.5		1.6		3.0		3.0		3.0

### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce					Mortal	ity		
	Male	s	Femal	es	Perso	ns	Male	s	Femal	es	Perso	ns
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	239	7.7	174	5.1	413	6.3	196	6.3	144	4.1	340	5.1
Vic	184	8.1	143	5.7	327	6.8	143	6.3	115	4.4	258	5.3
Qld	130	8.0	92	5.3	222	6.6	106	6.6	73	4.2	179	5.3
WA	58	7.0	43	4.8	101	5.8	52	6.4	35	3.9	87	5.1
SA	63	8.2	47	5.7	111	6.9	49	6.3	38	4.4	87	5.2
Tas	19	7.9	13	5.2	32	6.5	17	7.0	11	4.3	28	5.5
ACT	12	10.0	6	4.2	18	6.8	9	8.0	8	5.7	17	6.7
NT	4	4.1	3	6.8	7	5.4	2	2.4	2	4.8	4	3.6

_			Incid	ence					Morta	ality		
	Male	es	Fema	ales	Pers	ons	Ma	les	Fema	ales	Pers	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	2	0.3	2	0.3	4	0.3	1	0.2	0	0.0	1	0.1
5–9	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0	1	0.1
10–14	0	0.0	1	0.2	1	0.1	0	0.0	1	0.2	1	0.1
15–19	1	0.1	3	0.5	4	0.3	0	0.0	0	0.0	0	0.0
20–24	3	0.4	3	0.5	6	0.4	0	0.0	1	0.2	1	0.1
25–29	6	0.8	3	0.4	9	0.6	1	0.1	0	0.0	1	0.1
30–34	7	1.0	5	0.7	12	0.9	11	1.6	4	0.6	15	1.1
35–39	12	1.6	13	1.7	25	1.7	5	0.7	10	1.3	15	1.0
40–44	33	4.7	30	4.3	63	4.5	18	2.6	9	1.3	27	1.9
45–49	53	8.1	55	8.5	108	8.3	37	5.6	39	6.0	76	5.8
50-54	82	13.9	72	12.6	154	13.3	46	7.8	35	6.1	81	7.0
55-59	116	26.0	92	21.3	208	23.7	76	17.0	67	15.5	143	16.3
60–64	162	43.9	115	31.1	277	37.5	110	29.8	73	19.7	183	24.8
65–69	243	72.7	147	42.2	390	57.1	179	53.5	105	30.1	284	41.6
70-74	310	108.4	222	67.3	532	86.4	219	76.6	141	42.7	360	58.4
75-79	257	128.2	267	99.7	524	111.9	211	105.2	188	70.2	399	85.2
80-84	197	179.0	235	130.6	432	148.9	149	135.4	182	101.1	331	114.1
85 and over	145	212.3	273	175.0	418	186.4	134	196.2	247	158.3	381	169.9
Total	1,629		1,538		3,167		1,198		1,102		2,300	
Rates per 100,00	0 with 95	per cent co	onfidence	intervals (9	5% CI)							
Crude rate		17.5		16.3		16.9		12.9		11.7		12.3
95% CI		16.6 – 18.3		15.5 – 17.2		16.3 – 17.5		12.1 – 13.6		11.0 – 12.4		11.8 – 12.8
AS rate (Aust 1991)		18.0		13.1		15.3		13.3		9.2		11.0
95% CI		17.1 – 18.9		12.5 – 13.8		14.8 – 15.8		12.6 – 14.1		8.6 – 9.7		10.6 – 11.5
AS rate (World)		12.2		8.9		10.4		8.8		6.1		7.3
95% CI		11.5 – 12.8		8.4 – 9.4		10.0 – 10.8		8.3 – 9.3		5.7 – 6.5		7.0 – 7.6
Lifetime risk (0-74)		1 in 71		1 in 105		1 in 86		1 in 103		1 in 162		1 in 127
PYLL (0-74)								8,075		6,038		14,113
Per cent of all												
cancers		3.7		4.1		3.9		6.2		7.4		6.7

### Average annual numbers and rates by State and Territory 1994–1998

	Incidence						Mortality					
	Males		Females		Persons		Males		Females		Persons	
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	576	19.3	513	13.0	1,089	15.7	418	14.1	379	9.4	797	11.5
Vic	365	16.7	369	12.6	733	14.5	271	12.5	273	9.1	544	10.6
Qld	297	19.6	238	12.8	535	15.9	208	13.9	172	9.1	380	11.3
WA	144	19.2	116	12.1	259	15.3	98	13.4	90	9.3	188	11.1
SA	134	17.4	131	12.7	265	14.8	119	15.5	106	10.0	225	12.4
Tas	45	19.3	47	15.4	91	17.0	34	14.8	36	11.8	70	13.0
ACT	19	18.9	14	11.2	33	14.9	14	15.5	13	10.6	27	12.8
NT	11	24.6	7	17.5	18	21.5	8	20.2	5	15.4	13	17.9
			Incide	ence					Morta	lity		
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	Male	s	Fema	ales	Perso	ons	Male	S	Fema	les	Perso	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0-4	12	1.8	3	0.5	15	1.2	1	0.2	0	0.0	1	0.1
5–9	7	1.0	3	0.5	10	0.8	2	0.3	1	0.2	3	0.2
10–14	11	1.6	1	0.2	12	0.9	2	0.3	0	0.0	2	0.2
15–19	22	3.3	4	0.6	26	2.0	2	0.3	2	0.3	4	0.3
20–24	20	2.9	7	1.1	27	2.0	7	1.0	0	0.0	7	0.5
25–29	26	3.5	13	1.8	39	2.7	4	0.5	4	0.5	8	0.5
30–34	33	4.7	35	5.0	68	4.8	5	0.7	4	0.6	9	0.6
35–39	80	10.7	47	6.3	127	8.5	5	0.7	8	1.1	13	0.9
40–44	77	11.0	50	7.1	127	9.1	27	3.9	11	1.6	38	2.7
45–49	98	15.0	88	13.5	186	14.3	27	4.1	21	3.2	48	3.7
50–54	144	24.4	110	19.3	254	21.9	44	7.4	43	7.5	87	7.5
55–59	140	31.4	104	24.1	244	27.8	54	12.1	37	8.6	91	10.4
60–64	176	47.7	132	35.7	308	41.7	68	18.4	54	14.6	122	16.5
65–69	233	69.7	169	48.5	402	58.9	100	29.9	85	24.4	185	27.1
70–74	239	83.6	196	59.4	435	70.6	110	38.5	126	38.2	236	38.3
75–79	213	106.2	210	78.4	423	90.3	138	68.8	132	49.3	270	57.6
80–84	128	116.3	166	92.2	294	101.4	90	81.8	117	65.0	207	71.4
85 and over	83	121.5	128	82.0	211	94.1	64	93.7	114	73.1	178	79.4
Total	1,742		1,466		3,208		750		759		1,509	
Rates per 100,00	0 with 95	per cent co	nfidence	intervals (95	5% CI)							
Crude rate		18.7		15.6		17.1		8.0		8.1		8.1
95% CI		17.8 – 19.6		14.8 – 16.4		16.5 – 17.7		7.5 – 8.6		7.5 – 8.6		7.6 – 8.5
AS rate (Aust 1991)		18.7		13.4		15.9		8.3		6.6		7.3
95% CI		17.9 – 19.6		12.7 – 14.1		15.3 – 16.5		7.7 – 8.9		6.1 – 7.0		6.9 – 7.7
AS rate (World)		14.2		10.0		12.0		5.6		4.5		5.0
95% CI		13.5 – 14.8		9.4 – 10.5		11.5 – 12.4		5.2 - 6.0		4.1 – 4.8		4.7 – 5.3
Lifetime risk (0-74)		1 in 65		1 in 90		1 in 75		1 in 170		1 in 199		1 in 183
PYLL (0-74)								6,835		5,020		11,855
Per cent of all												
cancers		4.0		3.9		4.0		3.9		5.1		4.4

#### Average annual numbers and rates by State and Territory 1994–1998

			Incider	nce		Mortality						
	Males		Females		Perso	ns	Male	s	Femal	es	Persons	
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate
NSW	580	18.8	487	13.3	1,067	15.8	263	8.7	246	6.3	508	7.4
Vic	437	19.5	371	13.8	808	16.4	215	9.8	194	6.8	409	8.1
Qld	278	17.6	220	12.3	498	14.8	121	7.9	108	5.8	229	6.8
WA	133	16.6	107	11.9	240	14.1	59	7.8	55	6.0	114	6.7
SA	141	18.3	140	15.1	281	16.5	69	9.0	65	6.4	134	7.6
Tas	42	17.7	40	14.5	82	15.9	20	8.4	21	7.3	41	7.7
ACT	21	18.8	20	15.9	41	17.0	11	12.1	10	8.6	21	10.0
NT	7	12.4	5	10.2	12	11.4	1	1.0	1	3.7	2	2.3

Note: AS rates use Australian 1991 Standard Population unless World Standard Population is indicated. All rates are expressed per 100,000 population. Source: Cancer in Australia 1998, AIHW & AACR 2001.

			Incide	ence					Morta	lity		
_	Male	es	Fema	les	Perso	ons	Male	es	Fema	les	Perso	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	51	7.7	45	7.2	96	7.5	15	2.3	5	0.8	20	1.6
5–9	35	5.2	27	4.2	62	4.7	9	1.3	12	1.9	21	1.6
10–14	15	2.2	18	2.8	33	2.5	16	2.4	9	1.4	25	1.9
15–19	28	4.2	10	1.6	38	2.9	13	1.9	14	2.2	27	2.1
20–24	20	2.9	11	1.7	31	2.3	9	1.3	7	1.1	16	1.2
25–29	13	1.8	16	2.2	29	2.0	6	0.8	7	1.0	13	0.9
30–34	32	4.5	19	2.7	51	3.6	11	1.6	11	1.6	22	1.6
35–39	17	2.3	30	4.0	47	3.1	15	2.0	12	1.6	27	1.8
4044	36	5.2	19	2.7	55	3.9	11	1.6	10	1.4	21	1.5
45–49	51	7.8	22	3.4	73	5.6	13	2.0	11	1.7	24	1.8
50–54	79	13.4	50	8.8	129	11.1	33	5.6	18	3.2	51	4.4
55–59	69	15.5	55	12.8	124	14.1	43	9.6	26	6.0	69	7.9
60–64	103	27.9	54	14.6	157	21.2	61	16.5	29	7.8	90	12.2
65–69	142	42.5	78	22.4	220	32.2	87	26.0	49	14.1	136	19.9
70–74	182	63.6	102	30.9	284	46.1	130	45.5	58	17.6	188	30.5
75–79	163	81.3	120	44.8	283	60.4	135	67.3	85	31.7	220	47.0
80-84	94	85.4	111	61.7	205	70.7	81	73.6	82	45.6	163	56.2
85 and over	79	115.7	110	70.5	189	84.3	80	117.1	105	67.3	185	82.5
Total	1,209		897		2,106		768		550		1,318	
Rates per 100,00	00 with 95	per cent co	onfidence	intervals (95	5% CI)							
Crude rate		13.0		9.5		11.2		8.2		5.8		7.0
95% CI		12.2 – 13.7		8.9 – 10.2		10.8 – 11.7		7.7 – 8.8		5.4 – 6.3		6.7 – 7.4
AS rate (Aust 1991	)	13.2		8.2		10.5		8.5		4.8		6.5
95% CI		12.5 – 14.0		7.7 – 8.8		10.1 – 11.0		7.9 – 9.1		4.4 – 5.2		6.1 – 6.8
AS rate (World)		10.3		6.7		8.4		6.0		3.5		4.7
95% CI		9.7 – 11.0		6.2 – 7.2		8.0 - 8.8		5.6 - 6.5		3.2 – 3.8		4.4 - 4.9
Lifetime risk (0-74)		1 in 97		1 in 165		1 in 123		1 in 167		1 in 317		1 in 221
PYLL (0-74)								9,180		6,520		15,700
Per cent of all												
cancers		2.8		2.4		2.6		4.0		3.7		3.8

#### Average annual numbers and rates by State and Territory 1994–1998

		Incidence							Mortality				
	Males		Females		Perso	ns	Male	s	Femal	es	Persons		
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	
NSW	406	13.4	300	8.2	706	10.5	249	8.4	186	4.9	435	6.4	
Vic	275	12.6	218	8.0	493	10.0	179	8.2	138	4.8	316	6.3	
Qld	237	15.3	176	9.8	414	12.4	137	9.1	94	5.0	231	6.9	
WA	91	11.6	67	7.3	157	9.2	60	7.9	42	4.5	102	6.0	
SA	132	17.2	98	10.6	231	13.5	77	10.2	53	5.3	130	7.4	
Tas	27	11.4	24	8.6	50	9.7	15	6.6	14	4.6	29	5.4	
ACT	12	11.0	12	9.1	25	9.9	12	11.5	8	6.0	20	8.5	
NT	4	5.2	5	9.4	9	7.2	2	3.1	3	7.0	5	5.0	

Note: AS rates use Australian 1991 Standard Population unless World Standard Population is indicated. All rates are expressed per 100,000 population. Source: Cancer in Australia 1998, AIHW & AACR 2001.

			Inciden	ice					Mortali	ty		
	Males		Female	es	Person	S	Males	6	Female	S	Perso	ns
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	0	0.0	0	0.1	1	0.0	0	0.0	0	0.0	0	0.0
20–24	1	0.1	1	0.1	2	0.1	0	0.0	0	0.0	0	0.0
25–29	3	0.5	2	0.3	5	0.4	1	0.1	1	0.1	1	0.1
30–34	3	0.5	5	0.7	8	0.6	1	0.2	1	0.1	2	0.1
35–39	5	0.7	10	1.3	15	1.0	2	0.3	2	0.3	4	0.3
40-44	20	2.8	27	3.9	47	3.4	8	1.1	4	0.6	12	0.9
45–49	29	4.4	39	5.9	67	5.1	10	1.6	7	1.2	18	1.4
50–54	49	8.4	51	8.9	100	8.6	24	4.1	11	1.9	35	3.0
55–59	56	12.5	44	10.2	99	11.3	26	5.9	9	2.2	36	4.1
60–64	68	18.4	42	11.3	110	14.8	41	11.0	11	3.1	52	7.0
65–69	62	18.6	45	12.9	107	15.7	39	11.8	14	3.9	53	7.8
70–74	51	17.7	46	13.9	96	15.7	35	12.2	17	5.1	52	8.4
75–79	19	9.6	13	4.9	32	6.9	14	7.1	7	2.7	22	4.6
80–84	6	5.5	9	4.8	15	5.0	5	4.7	6	3.1	11	3.7
85 and over	3	4.4	7	4.7	10	4.6	3	4.3	6	4.0	9	4.1
Total	376		339		715		210		96		307	
Rates per 100,0	000 with 95 pe	r cent co	onfidence in	tervals (95	5% CI)							
Crude rate		4.0		3.6		3.8		2.3		1.0		1.6
95% CI		3.6 – 4.4		3.2 – 4.0		3.5 – 4.1		2.0 – 2.6		0.8 – 1.2		1.5 – 1.8
AS rate (Aust 199	1)	3.9		3.3		3.6		2.2		0.9		1.5
95% CI		3.5 – 4.3		2.9 – 3.7		3.3 – 3.9		1.9 – 2.5		0.7 – 1.1		1.4 – 1.7
AS rate (World)		3.3		2.8		3.0		1.8		0.7		1.2
95% CI		2.9 – 3.6		2.5 – 3.1		2.8 – 3.3		1.5 – 2.0		0.6 - 0.9		1.1 – 1.4
Lifetime risk (0-74	4)	1 in 237		1 in 289		1 in 261		1 in 415		1 in 1,088		1 in 606
PYLL (0-74)								2,603		1,191		3,794
Per cent of all cancers		0.9		0.9		0.9		1.1		0.6		0.9

#### Average annual numbers and rates by State and Territory 1994–1998

		Incidence							Mortality				
	Males		Femal	es	Perso	ns	Male	s	Femal	es	Persons		
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	
NSW	126	3.9	111	3.2	237	3.6	72	2.3	34	1.0	106	1.6	
Vic	90	3.9	83	3.3	173	3.6	54	2.4	28	1.1	82	1.7	
Qld	69	4.2	54	3.2	123	3.7	37	2.3	16	0.9	53	1.6	
WA	32	3.8	29	3.3	61	3.5	19	2.3	9	1.0	28	1.6	
SA	25	3.1	27	3.1	52	3.1	15	1.9	9	0.9	24	1.4	
Tas	9	3.5	8	3.2	17	3.3	5	2.1	3	0.9	8	1.5	
ACT	4	3.2	5	3.3	9	3.2	2	2.0	1	1.1	4	1.6	
NT	5	8.7	2	2.9	7	6.1	2	4.6	0	1.3	3	3.1	

Notes

AS rates use Australian 1991 Standard Population unless World Standard Population is indicated. All rates are expressed per 100,000 population.
 Cancers attributable to alcohol are oropharynx, oesophagus, liver, larynx and female breast cancer.

Source: Cancer in Australia 1998, AIHW & AACR 2001.

			Incide	ence					Morta	ality		
_	Mal	es	Fema	ales	Pers	ons	Mal	les	Fema	ales	Pers	ons
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Age group												
0–4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5–9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
10–14	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
15–19	7	1.1	2	0.4	10	0.7	1	0.2	1	0.1	2	0.2
20–24	31	4.5	8	1.2	39	2.8	2	0.3	1	0.1	3	0.2
25–29	51	6.9	21	2.9	72	4.9	4	0.6	3	0.4	7	0.5
30–34	69	9.8	43	6.0	112	7.9	9	1.3	6	0.9	16	1.1
35–39	113	15.2	61	8.1	174	11.7	22	3.0	14	1.8	36	2.4
4044	195	27.9	82	11.7	277	19.8	58	8.3	31	4.4	89	6.3
45–49	289	44.1	129	19.8	418	32.0	127	19.3	59	9.1	186	14.2
50–54	513	86.8	180	31.6	693	59.7	260	43.9	116	20.4	376	32.4
55–59	657	147.3	224	52.0	881	100.5	393	88.0	149	34.5	541	61.7
60–64	961	260.4	288	77.7	1,248	168.9	624	169.1	182	49.3	806	109.1
65–69	1,333	398.6	406	116.3	1,738	254.5	905	270.6	261	74.9	1,166	170.7
70–74	1,517	530.6	505	152.9	2,022	328.3	1,116	390.1	355	107.6	1,471	238.8
75–79	1,141	569.2	397	148.1	1,538	328.4	887	442.3	298	111.3	1,185	253.0
80–84	587	533.4	180	100.1	767	264.5	545	495.2	158	88.0	704	242.5
85 and over	393	574.9	124	79.4	517	230.3	363	530.9	119	76.3	482	214.7
Total	7,857		2,649		10,506		5,314		1,754		7,068	
Rates per 100,00	00 with 95	i per cent co	onfidence	intervals (9	5% CI)							
Crude rate		84.3		28.2		56.1		57.0		18.6		37.7
95% CI		82.4 - 86.2		27.1 – 29.2		55.0 – 57.2		55.5 – 58.6		17.8 – 19.5		36.9 – 38.6
AS rate (Aust 1991	)	85.3		25.0		52.4		58.5		16.1		35.0
95% CI		83.4 - 87.2		24.0 - 25.9		51.4 – 53.4		56.9 - 60.0		15.3 – 16.9		34.1 – 35.8
AS rate (World)		61.3		18.8		38.7		40.0		11.7		24.7
95% CI		59.9 – 62.7		18.0 – 19.6		37.9 – 39.5		38.8 – 41.1		11.1 – 12.3		24.1 – 25.3
Lifetime risk (0-74)		1 in 14		1 in 42		1 in 21		1 in 21		1 in 66		1 in 32
PYLL (0-74)								37,043		13,983		51,026
Per cent of all				_								
cancers		18.0		7.1		13.0		27.4		11.8		20.6

#### Average annual numbers and rates by State and Territory 1994–1998

		Incidence							Mortality				
	Males		Females		Perso	ns	Male	s	Femal	es	Persons		
	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	Number	AS rate	
NSW	2,561	83.6	884	24.7	3,446	51.2	1,778	58.8	604	16.4	2,383	35.0	
Vic	1,991	89.5	668	25.3	2,659	54.1	1,358	61.8	467	17.2	1,825	36.8	
Qld	1,501	96.6	452	26.1	1,954	58.9	951	62.5	278	15.9	1,230	37.1	
WA	641	83.5	225	25.5	867	51.9	453	60.6	152	17.1	605	36.5	
SA	651	83.3	206	22.4	857	49.6	456	58.4	141	14.8	596	33.9	
Tas	235	98.9	77	28.5	313	60.4	157	66.5	50	18.0	207	39.4	
ACT	67	64.4	30	24.3	97	42.1	54	56.1	22	17.7	76	34.3	
NT	53	110.4	18	42.2	71	78.9	35	90.2	12	28.3	47	60.2	

Notes

1. AS rates use Australian 1991 Standard Population unless World Standard Population is indicated. All rates are expressed per 100,000 population.

2. Cancers attributable to smoking are oropharynx, oesophagus, stomach, anus, pancreas, larynx, lung, uterus, cervix, vulva, penis, bladder, renal parenchyma and renal pelvis.

Source: Cancer in Australia 1998, AIHW & AACR 2001.

# **Appendixes**

## Appendix A: International Classification of Diseases, Ninth Revision—cancer site—codes and combinations

Buccal cavity	
Lip	140
Tongue	141
Salivary glands	142
Gum	143
Floor of mouth	144
Other and unspecified parts of mouth	145
Pharynx	
Oropharynx	146
Nasopharynx	147
Hypopharynx	148
Other sites within the lip, oral cavity and pharynx	149
Head and neck	141–149
Digestive organs and peritoneum	
Oesophagus	150
Stomach	151
Small intestine	152
Colon	153
Rectum	154
Colorectal	153–154
Liver and intrahepatic bile ducts	155
Gallbladder and extrahepatic bile ducts	156
Pancreas	157
Retroperitoneum and peritoneum	158
Unspecified digestive organs	159
Respiratory system	
Nasal cavities, middle ear and accessory sinuses	160
Larynx	161
Trachea, bronchus and lung	162
Pleura	163
Respiratory systems, ill-defined and other intrathoracic organs	164–165
Bone, connective tissue, skin and breast	
Bone and articular cartilage	170
Connective and other soft tissue	171
Melanoma	172
Non-melanocytic skin cancer (NMSC)	173
Breast	174–175
Genitourinary organs	
Cervix	180
Placenta	181
Corpus uteri	179+182
Ovary and other uterine adnexae	183
Other and unspecified female	
genital organs	184

Prostate	185
Testis	186
Penis and other male genital organs	187
Bladder	188
Kidney, ureter and urethra	189
Gynaecological cancers	179–180, 182–184
Other and unspecified organs	
Eve	190
Brain	191
Other and unspecified parts of the nervous system (NS)	192
Thyroid gland	193
Other endocrine glands	194
Unknown primary site	195–199
Lymphatic and haematopoietic tissue	
Non-Hodgkin's lymphomas (NHL)	200+202
Lymphosarcoma and reticulosarcoma	200
Hodgkin's disease	201
Other neoplasms of lymphoid and	202
l ymphomas	200–202
Multiple myeloma and	
immunoproliferative neoplasms	203
Lymphatic leukaemia	204
Acute lymphatic leukaemia	204.0
Chronic lymphatic leukaemia	204.1
Myeloid leukaemia	205
Acute myeloid leukaemia	205.0
Chronic myeloid leukaemia	205.1
Monocytic leukaemia	206
Other and unspecified leukaemias	207–208
Leukaemias	204–208
Smoking-related cancers (aetiological fractions are applied to the following	140, 141, 143–151.
codes)	154.3–154.4, 157,
	161, 162, 180,
	179+182, 184.4,
	186, 188, 189.0, 189.1
Alcohol-related cancers (aetiological	141, 143–146.
fractions are applied to the following	148–149, 150,
codes)	155, 161, 174
<i>Note:</i> Abbreviated versions of these name in this report.	es may be used

Source: World Health Organization 1977.

# **Appendix B: Methods**

This section describes the methods used to calculate the estimates presented in the tables in this report. The calculations in the example below are applicable to both incidence and mortality.

## **Example table**

	No. of cases	Australian 1998 male	Age-specific rate per 100,000 population	Australian 1991 Population Standard**	Expected number
Age group	column 1	column 2	column 3	column 4	column 5
0-4	1	658,557	0.2	1,271,703	2.5
5–9	0	679,115	0.0	1,272,208	0.0
10–14	0	671,916	0.0	1,241,619	0.0
15–19	0	674,294	0.0	1,364,074	0.0
20–24	3	691,414	0.4	1,396,764	5.6
25–29	1	737,171	0.1	1,399,663	1.4
30–34	5	703,307	0.7	1,425,735	10.0
35–39	24	745,555	3.2	1,328,387	42.5
40–44	58	698,248	8.3	1,294,271	107.4
45–49	113	654,875	17.3	1,029,145	178.0
50–54	267	591,213	45.2	846,934	382.8
55–59	379	446,092	85.0	725,950	617.1
60–64	667	368,937	180.8	736,868	1,332.3
65–69	978	334,283	292.6	671,390	1,964.5
70–74	1,156	286,022	404.2	510,755	2,064.5
75–79	922	200,522	459.8	384,495	1,767.9
80–84	440	110,080	399.7	229,828	918.6
85+	293	68,296	429.0	154,247	661.7
Total	5,307	9,319,897	56.9	17,284,036	58.2

Trachea, bronchus and lung cancer incidence (ICD 162)-males

\* Australian Bureau of Statistics 2000.

\*\* Australian Bureau of Statistics 1993.

## Crude rates—all age groups

A crude incidence rate is defined as the number of new cases of cancer divided by the population at risk in a specified time period. A crude mortality rate substitutes deaths for new cases in this calculation. Both are conventionally expressed as annual rates per 100,000 population and may be calculated for males, females or persons, or for subsets of the population (for example, see age-specific rates). The total rate calculated in this way without adjustment for age or other factors is known as the 'crude rate'.

The crude rate is calculated by dividing the total number of cases across all age groups by the total population, for example

Crude incidence rate for lung cancer =  $\frac{\text{Column 1 total}}{\text{Column 2 total}}$  x 100,000 =  $\frac{5,307}{9,319,897}$  x 100,000 = 56.9 per 100,000

## Age-specific rates

Age-specific rates are calculated by dividing the number of cases occurring in each specified age group by the corresponding population in the same age group expressed as a rate per 100,000 population. This rate may be calculated for particular age and sex groupings, for example

Age-specific lung cancer incidence rates in males aged 75–79 =  $\frac{\text{Column 1 for this age}}{\text{Column 2 for this age}}$  x 100,000 =  $\frac{922}{200,522}$  x 100,000 = 459.8 per 100,000

## Age-standardised rates (AS rate)

Rates are adjusted for age to facilitate comparisons between populations which have different age structures, for example between youthful and aging communities. There are two different methods commonly used to adjust for age. In this publication direct standardisation is used, in which age-specific rates are multiplied against a constant population (the Australian 1991 Population Standard or the World Standard Population). This effectively removes the influence of age structure on the summary rate which is described as the age-standardised rate. The method may be used for both incidence and mortality calculations. The method used for this calculation comprises three steps which can be followed by reference to the example table on the previous page.

- *Step 1* Calculate the age-specific rate (as shown above) for each age group (column 3).
- Step 2 Calculate the expected number of cases in each 5-year age group by multiplying the age-specific rates (column 3) by the corresponding standard population (column 4) and dividing by 100,000, giving you the expected number of cases (column 5).

*Step 3* To give the age-standardised rate, sum the expected number of cases in each age group (total column 5). Divide this sum by the total of the standard population used in the calculation and multiply by 100,000.

## **Confidence intervals (CI)**

The age-standardised and crude incidence and mortality rates presented in the body of this report also show 95% confidence intervals. These confidence intervals indicate the variation that might be expected in such estimates purely by chance. The confidence intervals are calculated using the methods presented in Holman et al. (1987).

A relatively simple approximation of the confidence limits that readers might use when examining State and Territory age-standardised rates is as set out below.

95% CI approximation = AS rate 
$$\pm$$
 1.96 x  $\sqrt{\frac{\text{AS rate}}{\text{Number of cases}}}$ 

## Lifetime risk and cumulative rate

Lifetime risk is a measure which approximates the risk of contracting a particular cancer in a lifetime if the risks at the time of estimation remained throughout life. It is based on a mathematical relationship with the cumulative rate and is calculated in this publication for ages 0–74.

Cumulative rate is a directly standardised rate calculated by summing age-specific rates from equal age groups, for example 5–9, 10–14 years. An example is provided below.

Cumulative rate  $= \frac{5 \times (\text{Sum of the age-specific rates}) \times 100}{100,000}$  $= \frac{5 \times 1,038 \times 100}{100,000}$ = 5.19%

The factor of 5 is used to indicate the 5 years of life in each age group and the factor of 100 is used to present the result as a percentage. As age-specific rates are presented per 100,000 population (column 3), the result is divided by 100,000 to return the age-specific rates to a division of cases by population. Cumulative risk is related to cumulative rate by the expression:

Cumulative risk = 
$$(1 - e^{-rate/100})$$

where rate is expressed as a percentage.

Lifetime risk is expressed as a '1 in n' proportion by taking the inverse of the above formula:

$$n = \frac{1}{\left(1 - e^{-rate/100}\right)}$$

For lung cancer in men, the cumulative rate was 5.19% (see previous page), therefore:

n = 
$$\frac{1}{(1 - e^{-5.19/100})}$$
  
= 19.75

That is, for men, the lifetime risk (0–74 years) of developing lung cancer is 1 in 20, providing they remain at risk for the whole period and the 1998 age-specific rates apply throughout their lives. Note that no account has been taken of specific cancer risk factors, for example the risk for men who smoke would be higher than that for those who have never smoked.

## Per cent of all cancers

The 'per cent of all cancers' measure is the proportion of all causes accounted for by a particular cancer. The measure may be computed for cancer incidence or mortality. Using an incidence example, the measure is calculated by taking the number of new cases of a particular cancer, for example lung cancer, and dividing that by the total number of all new cancer cases and multiplying by 100 to express it as a percentage. This is undertaken for each sex and for total persons. Note that for this publication the incidence and mortality of non-melanocytic skin cancers is not included in total new cancer cases.

## Sex ratio

This measure indicates the relative incidence or mortality between the sexes. It can be calculated on the basis of observed numbers, crude rates, age-standardised rates or cumulative rates per cent. In this publication it is calculated using the age-standardised rates where the male rate is divided by the female rate for each cancer. Ratios greater than 1 indicate an excess in males while ratios less than 1 indicate an excess in females.

It is preferable to use either the age-standardised rates or the cumulative rate as these both adjust for age variations between male and female populations. In addition, the use of cumulative rate per cent discounts the occurrence of cancer in people aged over 75. This gives more emphasis, therefore, to early cancer diagnosis or death, and diminishes the impact of variable diagnostic investigation of the elderly.

### Person-years of life lost

Person-years of life lost is a concept which attempts to measure the number of years of life lost per annum due to death as a result of a specific cause, for example lung cancer, given life expectancies at specific ages. Age groups 0–4 up to 70–74 were used for the calculations,

as deaths before age 75 are regarded as premature for both men and women. The method used in this publication for the calculation of person-years of life lost is an aggregation of years between age at death and 75 for each person for each cancer, for example a person dying at age 50 contributes 25 years to the measure of person-years of life lost.

## Average annual rates of change

To indicate the extent of change in age-standardised rates over time, a linear line of best fit is calculated for the time frame in question. Average annual rates of change are then calculated using the geometric formula:

Average rate of change  $= ((P_n / P_o)^{1/N} - 1) \times 100$ where  $P_n$  = rate at later year n $P_o$  = rate at earlier year oN = n - o.

This process averages out variations in the actual annual changes that may have occurred between the two points in time.

# **Appendix C: Population data**

		1998	
Age	Males	Females	Total
0–4	658,557	624,234	1,282,791
5–9	679,115	645,215	1,324,330
10–14	671,916	640,736	1,312,652
15–19	674,294	639,297	1,313,591
20–24	691,414	665,691	1,357,105
25–29	737,171	733,145	1,470,316
30–34	703,307	706,925	1,410,232
35–39	745,555	748,913	1,494,468
40–44	698,248	702,629	1,400,877
45–49	654,875	649,539	1,304,414
50–54	591,213	570,287	1,161,500
55–59	446,092	431,183	877,275
60–64	368,937	370,123	739,060
65–69	334,283	348,707	682,990
70–74	286,022	329,909	615,931
75–79	200,522	267,923	468,445
80–84	110,080	180,000	290,080
85+	68,296	156,006	224,302
Total	9,319,897	9,410,462	18,730,359

## Australian resident population 1998

Source: Australian Bureau of Statistics 2000.

## Australian Standard Population and World Standard Population

	Australian Standard	Population* (1991)	World Standard Population**(1966) % of total			
Age		% of total				
0–4	1,271,703	7.4	12,000	12.0		
5–9	1,272,208	7.4	10,000	10.0		
10–14	1,241,619	7.2	9,000	9.0		
15–19	1,364,074	7.9	9,000	9.0		
20–24	1,396,764	8.1	8,000	8.0		
25–29	1,399,663	8.1	8,000	8.0		
30–34	1,425,735	8.2	6,000	6.0		
35–39	1,328,387	7.7	6,000	6.0		
40–44	1,294,271	7.5	6,000	6.0		
45–49	1,029,145	6.0	6,000	6.0		
50–54	846,934	4.9	5,000	5.0		
55–59	725,950	4.2	4,000	4.0		
60–64	736,868	4.3	4,000	4.0		
65–69	671,390	3.9	3,000	3.0		
70–74	510,755	3.0	2,000	2.0		
75–79	384,495	2.2	1,000	1.0		
80–84	229,828	1.3	500	0.5		
85+	154,247	0.9	500	0.5		
Total	17,284,036	100.0	100,000	100.0		

\* Australian Bureau of Statistics 1993.

\*\* Doll et al. 1966.

## **Appendix D: Cancer registration in Australia**

The table below provides information about cancer registration in Australia. Each State and Territory operates its own registry. Generally, operational guidelines for each of the registries are similar and coincide with the objectives of the International Association of Cancer Registries. Although some registries operate under different coding systems for site, morphology and other variables, the bulk of information is directly comparable and has been reconciled for this publication. The reporting sources of the registries vary according to the local conditions and those bodies named in the legislation. Every attempt is made to report all cancer cases, although not every case will be identified. Cancer registries are dependent upon their reporting sources. Variation in reporting of cancers by age, sex, type, geographical location, country of birth or other variables does occur and may have effects on the final statistics. Occasionally, delays in reporting some case information may extend over several years but this has a minimal effect on the final reported data. In order to minimise the effects on the final reported registration, multiple reporting sources are used to compile case information where possible. Case information is exchanged between registries where there is cause for suspicion of duplicate registration. Further information regarding registry coding practices may be obtained by contacting the Registrar in each State or Territory.

States and Territories	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Total population (1998)	6,333,515	4,654,937	3,453,477	1,829,145	1,486,418	471,700	308,057	189,937
Per cent of Australian population	33.8	24.9	18.4	9.8	7.9	2.5	1.6	1.0
Per cent of population older than age 65	12.7	12.6	11.3	10.5	14.2	13.1	7.8	3.3
No. new cancers (1994–1998)**	27,072	20,113	14,546	6,741	7,074	2,203	964	366
First year of population registration	1972	1982	1982	1982	1977	1978	1972	1981
Year of legislation	1972	1982	1982	1981	1977	1992	1994	1991
Funding source	Pvte-Govt	Pvte-Govt	Govt	Govt	Govt	Pvte-Govt	Govt	Govt
ICD site coding	ICD-O-2	ICD-9	ICD-9	ICD-O-2	ICD-9	ICD-9	ICD-O-2	ICD-9
Morphology coding	ICD-O-2	ICD-O-2	ICD-O-2	ICD-O-2	SNOMED-II	ICD-O-2	ICD-O-2	SNOMED-II
Reporting sources								
Public hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	Yes
Private hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	No
Repatriation hospitals	Yes	Yes	Yes	No*	Yes	Yes	Yes	No
Pathology laboratories	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Radiotherapy units	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Nursing homes	Yes	No	Yes	No	No	No*	Yes	No
Registrar of Births, Deaths and Marriages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Doctors	No*	No*	No*	No*	No*	No*	No*	No*

\* Data are provided on special request only.

\*\* Refers to the average number of new cases over the 5-year period 1994-1998.

## **Appendix E: Cancer registries contact list**

#### **NSW Central Cancer Registry**

NSW Cancer Council LMB 1 KINGS CROSS NSW 1340

Phone: +61 2 9334 1902 Fax: +61 2 9368 0843 E-mail: ccr@nswcc.org.au Home page: www.nswcc.org.au

Director: Professor Bruce Armstrong E-mail: brucea@nswcc.org.au Phone: +61 2 9334 1837

Registry Manager: Ms Elizabeth Tracey E-mail: etracey@nswcc.org.au Phone: +61 2 9334 1974

#### Victorian Cancer Registry

Anti-Cancer Council of Victoria 1 Rathdowne Street CARLTON SOUTH VIC 3053

Phone: +61 3 9635 5000 Fax: +61 3 9635 5210 Home page: www.accv.org.au

Director: Professor Graham Giles E-mail: ggg@accv.org.au Phone: +61 3 9635 5154

Director Information Systems: Ms Helen Farrugia E-mail: helenf@accv.org.au Phone: +61 3 9635 5318

Statistician: Mrs Vicky Thursfield E-mail: vickyt@accv.org.au Phone: +61 3 9635 5162

#### **Queensland Cancer Registry**

Locked Bag 1450 SPRING HILL POST OFFICE QLD 4004

Phone: +61 7 3258 2331 Fax: +61 7 3258 2345

Director: Dr Ian Ring E-mail: ian\_ring@health.qld.gov.au Phone: +61 7 3234 0921 Fax: +61 7 3234 1529

Registrar: Mrs Judy Symmons E-mail: judith\_symmons@health.qld.gov.au Phone: +61 7 3258 2333 Fax: +61 7 3258 2345

#### Western Australian Cancer Registry

Health Information Centre Health Department of Western Australia PO Box 8172 Stirling Street PERTH WA 6849

Phone: +61 8 9222 4022/4249 Fax: +61 8 9222 4236 E-mail: wacanreg@health.wa.gov.au Home page: www.health.wa.gov.au

Director & Registrar: Dr Tim Threlfall E-mail: tim.threlfall@health.wa.gov.au

#### South Australian Cancer Registry

Epidemiology Branch, Dept of Human Services PO Box 6 RUNDLE MALL SA 5000 Phone: +61 8 8226 6372 Fax: +61 8 8226 6291 Home page: www.dhs.sa.gov.au/pehs/ disease-control-status.htm

Director: Dr Colin Luke E-mail: Colin.Luke@dhs.sa.gov.au Phone: +61 8 8226 6360

Registrar: Ms Lesley Milliken E-mail: Lesley.Milliken@dhs.sa.gov.au Phone: +61 8 8226 6372

Medical Officer (Public Health Physician): Dr Wayne Clapton E-mail: Wayne.Clapton@dhs.sa.gov.au Phone: +61 8 8226 6362

#### **Tasmanian Cancer Registry**

Menzies Centre for Population Health Research GPO Box 252-23 HOBART TAS 7001

Phone: +61 3 6226 7706 Fax: +61 3 6226 7704

Director: Dr Alison Venn E-mail: Alison.Venn@utas.edu.au Phone: +61 3 6226 7706

Registrar: Shevaun Pavlides E-mail: shevaun.pavlides@utas.edu.au Phone: +61 3 6226 7714 Fax: +61 3 6226 7704

#### Northern Territory Cancer Registry

Epidemiology & Statistics Branch Territory Health Services PO Box 40596 CASUARINA NT 0811

Phone: +61 8 8999 2977 Fax: +61 8999 2618

Director & Registrar: Dr John Condon E-mail: john.condon@nt.gov.au Phone: +61 8 8999 2977 Fax: +61 8 8999 2600

Epidemiologist: Mr Michael Pearce E-mail: michael.pearce@dwnhhse.health.nt.gov.au Phone: +61 8 8999 2540

#### New Zealand Cancer Registry

Clinical Coding Services New Zealand Health Information Service Level 6, WestpacTrust House 119–125 Willis Street PO Box 5013 Wellington New Zealand

Phone: +64 4 922 1800 Fax: +64 4 922 1897

Team Leader: Christine Fowler E-mail: christine.fowler@nzhis.govt.nz Phone: +64 4 922 1864

Chief Analyst: Jim Fraser E-mail: jim.fraser@nzhis.govt.nz Phone: +64 4 922 1862

#### Australian Capital Territory Cancer Registry

ACT Cancer Registry Clinical Epidemiology & Health Outcomes Centre Level 1, Building 5, The Canberra Hospital PO Box 11 WODEN ACT 2606

Phone: +61 2 6244 4276 Fax: +61 2 6244 4138

Director: Dr Bruce Shadbolt E-mail: bruce.shadbolt@act.gov.au Phone: +61 2 6244 4288 Fax: +61 2 6244 4138

Registrar: Ms Barbara Stuart-Harris E-mail: barbara.stuartharris@act.gov.au Phone: +61 2 6244 4285

## Appendix F: Tables published on the Internet

- Table 1:All cancers (except non-melanocytic skin cancers) (ICD-9 140–172, 174–208)
- Table 2:Cancer of the lip (ICD-9 140)
- Table 3:Cancer of the tongue (ICD-9 141)
- Table 4: Cancer of the salivary gland (ICD-9 142)
- Table 5: Cancer of the gum (ICD-9 143)
- Table 6:Cancer of the floor of mouth (ICD-9 144)
- Table 7: Cancer of other and unspecified parts of mouth (ICD-9 145)
- Table 8: Cancer of the oropharynx (ICD-9 146)
- Table 9:Cancer of the nasopharynx (ICD-9 147)
- Table 10: Cancer of the hypopharynx (ICD-9 148)
- Table 11: Cancer of other sites within the lip, oral cavity and pharynx (ICD-9 149)
- Table 12: Cancer of the head and neck (ICD-9 141–149)
- Table 13: Cancer of the oesophagus (ICD-9 150)
- Table 14: Cancer of the stomach (ICD-9 151)
- Table 15:Cancer of the small intestine (ICD-9 152)
- Table 16: Cancer of the colon (ICD-9 153)
- Table 17: Cancer of the rectum (ICD-9 154)
- Table 18:Cancer of the colon and rectum (ICD-9 153–154)
- Table 19: Cancer of the liver and intrahepatic bile ducts (ICD-9 155)
- Table 20: Cancer of the gallbladder and extrahepatic bile ducts (ICD-9 156)
- Table 21:Cancer of the pancreas (ICD-9 157)
- Table 22: Cancer of the retroperitoneum and peritoneum (ICD-9 158)
- Table 23:
   Cancer of the unspecified digestive organs (ICD-9 159)
- Table 24: Cancer of the nasal cavities, middle ear and accessory sinuses (ICD-9 160)
- Table 25: Cancer of the larynx (ICD-9 161)
- Table 26: Cancer of the trachea, bronchus and lung (ICD-9 162)
- Table 27:Cancer of the pleura (ICD-9 163)
- Table 28: Cancer of the other respiratory organs (ICD-9 164–165)
- Table 29: Cancer of the bone and articular cartilage (ICD-9 170)
- Table 30: Cancer of the connective and other soft tissue (ICD-9 171)
- Table 31: Cancer of the skin—melanoma (ICD-9 172)
- Table 32: Cancer of the skin—non-melanocytic (ICD-9 173)
- Table 33: Cancer of the breast (ICD-9 174–175)
- Table 34: Cancer of the cervix (ICD-9 180)
- Table 35: Cancer of the placenta (ICD-9 181)
- Table 36:Cancer of the uterus (ICD-9 179+182)
- Table 37: Cancer of the ovary and other uterine adnexae (ICD-9 183)

- Table 38: Cancer of the other and unspecified female genital organs (ICD-9 184)
- Table 39: Gynaecological cancers (ICD-9 179–180, 182–184)
- Table 40: Cancer of the prostate (ICD-9 185)
- Table 41: Cancer of the testis (ICD-9 186)
- Table 42: Cancer of the penis and other male genital organs (ICD-9 187)
- Table 43: Cancer of the bladder (ICD-9 188)
- Table 44: Cancer of the kidney and other and unspecified urinary organs (ICD-9 189)
- Table 45: Cancer of the eye (ICD-9 190)
- Table 46: Cancer of the brain (ICD-9 191)
- Table 47: Cancers of other central nervous system (ICD-9 192)
- Table 48: Cancers of the brain and nervous system (ICD-9 191–192)
- Table 49: Cancer of the thyroid gland (ICD-9 193)
- Table 50: Cancers of other endocrine glands (ICD-9 194)
- Table 51: Cancers of unknown primary site (ICD-9 195–199)
- Table 52: Lymphosarcoma and reticulosarcoma (ICD-9 200)
- Table 53: Hodgkin's disease (ICD-9 201)
- Table 54: Lymphoid and histiocytic tissue (ICD-9 202)
- Table 55: Non-Hodgkin's lymphoma (ICD-9 200+202)
- Table 56: Lymphomas (ICD-9 200–202)
- Table 57: Multiple myeloma (ICD-9 203)
- Table 58: Lymphatic leukaemia (ICD-9 204)
- Table 59: Acute lymphatic leukaemia (ICD-9 204.0)
- Table 60:Chronic lymphatic leukaemia (ICD-9 204.1)
- Table 61: Myeloid leukaemia (ICD-9 205)
- Table 62: Acute myeloid leukaemia (ICD-9 205.0)
- Table 63: Chronic myeloid leukaemia (ICD-9 205.1)
- Table 64: Monocytic leukaemia (ICD-9 206)
- Table 65: Other specified leukaemia (ICD-9 207)
- Table 66: Unspecified leukaemia (ICD-9 208)
- Table 67: Other and unspecified leukaemia (ICD-9 207–208)
- Table 68:Leukaemias (ICD-9 204–208)
- Table 69:Alcohol-related cancers
- Table 70: Smoking-related cancers

# Glossary

AACR: Australasian Association of Cancer Registries.

ABS: Australian Bureau of Statistics.

**ACT:** Australian Capital Territory—a land-locked Territory of Australia situated within the State of New South Wales on the eastern seaboard, with a population of 308,057 (1998). Its capital city is Canberra, which is also Australia's capital city.

**AIHW:** Australian Institute of Health and Welfare.

AS rate (ASR): age-standardised rate. See Appendix B: Methods for definition.

**Cancer (malignant neoplasm):** a term used to describe one of several diseases which result when the process of cell division, by which tissues normally grow and renew themselves, becomes uncontrolled and leads to the development of malignant cells. These cancer cells multiply in an uncoordinated way, independently of normal growth control mechanisms, to form a tumour. This tumour may expand locally by invasion or systemically by metastasis via the lymphatic or vascular systems. If left untreated most malignant tumours will eventually result in death. (*See* What is cancer? on page 1.)

**Cancer death:** a death for which the underlying cause is indicated as cancer. Persons with cancer who die of other causes are not counted in the death statistics in this publication.

**CI:** confidence interval.

**CNS:** central nervous system.

**Epidemiology:** the quantitative study of the distribution and determinants of health-related states and events in populations, and the application of this study to the control of health problems.

**ICD-9:** International Classification of Disease—a coding system used to identify the primary site of the malignancy. This publication uses the ninth revision of the ICD classification.

#### Incidence: see new cancer case

ML: myeloid leukaemia.

#### Mortality: see cancer death

NCSCH: National Cancer Statistics Clearing House.

**New cancer case:** a person who has a new cancer diagnosed for the first time. One person may have more than one cancer and therefore may be counted twice in incidence statistics if it is decided that the two cancers are not of the same origin. This decision is based on a series of principles set out in more detail in a publication by Jensen et al. (1991).

NHL: non-Hodgkin's lymphoma.

**NOS:** not otherwise specified.

NS: nervous system.

NMSC: non-melanocytic skin cancers.

**NSW:** New South Wales—a State of Australia on the eastern seaboard which has the largest capital city in Australia, Sydney, and a population of 6,333,515 (1998).

**NT:** Northern Territory—a Territory in the north of Australia, with a population of 189,937 (1998) and Darwin as its capital city.

**PSA:** prostate-specific antigen.

**PYLL:** person-years of life lost.

**Qld:** Queensland—a State in the north-east of Australia, with a population of 3,453,477 (1998) and Brisbane as its capital city.

**SA:** South Australia—a State in the southern part of Australia, with a population of 1,486,418 (1998) and Adelaide as its capital city.

**SNOMED:** Systematised Nomenclature of Medicine.

**Tas:** Tasmania—an island State in the south-east of Australia, with a population of 471,700 (1998) and Hobart as its capital city.

**Vic:** Victoria—a State in the south-east of Australia, with a population of 4,654,937 (1998) and Melbourne as its capital city.

**WA:** Western Australia—the western-most State of Australia, with a population of 1,829,145 (1998) and Perth as its capital city.

# Data sources

## National Cancer Statistics Clearing House database

Cancer is a notifiable disease in all States and Territories. The data are collected by cancer registries and include clinical and demographic information about people with newly diagnosed cancer. This information is obtained from hospitals, pathologists, radiation oncologists, cancer treatment centres and nursing homes.

The AIHW is responsible for the national collection of cancer incidence statistics through the National Cancer Statistics Clearing House. National statistics are available for all years from 1982 to 1998.

## National mortality database

Registration of deaths in Australia is the responsibility of the State and Territory Registrars of Births, Deaths and Marriages. Information on the cause of death is supplied by the medical practitioner certifying the death or by a coroner. Other information about the deceased is supplied by a relative or other person acquainted with the deceased or by an official institution where the death occurred. Registration of death is a legal requirement in Australia, and compliance is virtually complete.

The Registrars provide deaths data to the ABS for coding and compilation into national statistics. The AIHW also holds these data without unique identifiers in a national mortality database.

## New Zealand data

The incidence and mortality data for New Zealand was supplied by the New Zealand Health Information Service. Incidence data was supplied for 1997 and mortality data for 1998.

# References

Australian Bureau of Statistics (ABS) 1993. Estimated resident population by sex and age, States and Territories of Australia, June 1987 to June 1992. Cat. no. 3201.0. Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (ABS) 1997. National Health Survey, summary results, Australian States and Territories. Cat. no. 4368.0. Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (ABS) 2000. Australian demographic statistics, September quarter 2000. Cat no. 3101.0. Canberra: Australian Bureau of Statistics.

Australian Institute of Health and Welfare (AIHW) 1999. 1998 National Drug Strategy Household Survey: first results. AIHW cat. no. PHE 15. Canberra: AIHW (Drug Statistics Series).

Berg JW 1996. Morphological classification of human cancer. In: Schottenfeld D & Fraumeni JF (eds). Cancer Epidemiology and Prevention, 2nd edition. Oxford: Oxford University Press, chapter 3 of section 1.

d'Espaignet ET, Measey ML, Condon JR, Jelfs P & Dempsey KE 1996. Cancer in the Northern Territory 1987–1993. Darwin: Territory Health Services.

Doll R, Payne P & Waterhouse J. A. H (1966). Cancer incidence in five continents. Volume I, Geneva: UICC, Berlin, Springer.

English DR, Holman CDJ, Milne E, Winter MG, Hulse GK, Codde JP et al. 1995. The quantification of drug caused morbidity and mortality in Australia 1995. Canberra: Commonwealth Department of Human Services and Health.

Giles GG, Armstrong BK & Smith LN 1987. Cancer in Australia 1982. Canberra: Australasian Association of Cancer Registries and the Australian Institute of Health and Welfare.

Holman CDJ, Hatton WM, Armstrong BK & English DR 1987. Cancer mortality trends in Australia. Volume II 1910–1984. Perth: Health Department of Western Australia.

Jelfs P, Giles G, Shugg D et al. 1994. Cutaneous malignant melanoma in Australia, 1989. The Medical Journal of Australia 161:182–7.

Jensen OM, Parkin DM, Machennan R & Muir C (eds) 1991. Cancer registration: principles and methods. Lyon: International Agency for Research on Cancer.

Smith DP, Armstrong BK & Saunders R 1998. Patterns of prostate specific antigen (PSA) testing in Australia in 1992 to 1996: an examination of Medicare data. Sydney: NSW Cancer Council.

Staples M, Marks R & Giles G 1998. Trends in the incidence of non-melanocytic skin cancer (NMSC) treated in Australia 1985–1995: are primary prevention programs starting to have an effect? International Journal of Cancer 78:144–8.

Threlfall TJ, English DR & Rouse IL 1998. Prostate cancer in Western Australia: trends in incidence and mortality from 1985 to 1996. Medical Journal of Australia 169:21–4.

World Health Organization 1977. International classification of diseases. Manual of the international statistical classification of diseases, injuries and causes of death. Ninth Revision conference 1975. Geneva: World Health Organization.

# **Related publications**

A list of related publications from State and Territory cancer registries follows.

# **New South Wales**

Vajdic CM, Kricker A, Giblin M, McKenzie J, Aitken J, Giles GG & Armstrong BK 2001. Eye color and cutaneous nevi predict risk of ocular melanoma in Australia. International Journal of Cancer 15;92(6):906-12.

Marrett LD, Nguyen HL & Armstrong BK 2001. Trends in the incidence of cutaneous malignant melanoma in New south Wales, 1983–1996. International Journal of Cancer (in press).

Brennan P, Coates M, Armstrong B, Colin D & Boffetta P 2000. Second primary neoplasms following non-Hodgkin's lymphoma in New South Wales, Australia. British Journal of Cancer 82:1344–7.

Kricker A, Smoothy V & Armstrong BK 2000. Ductal carcinoma in situ in NSW women in 1995 to 1997. Sydney: NHMRC National Breast Cancer Centre.

Goumas C, Hughes AM, Kricker A, Smith D & Armstrong B 2000. Non-Hodgkin's lymphoma in NSW, 1973 to 1996. Cancer Information Update no. 9. Sydney: NSW Cancer Council.

Coates MS & Tracey EA 2000. Cancer in New South Wales. Incidence and mortality 1997. Sydney: NSW Cancer Council.

Osborn M, Armstrong B, Kricker A & Coates M 1999. Current recording and registration practices for carcinoma in situ (CIS) of the breast in Australasian State and Territory cancer registries. Sydney: NHMRC National Breast Cancer Centre.

Coates M, Kricker A & Armstrong B 1999. Breast cancer in New South Wales in 1997. Cancer Information Update no. 7. Sydney: NSW Cancer Council, February.

Supramaniam R, Smith D, Coates M & Armstrong B 1999. Survival from cancer in New South Wales in 1980 to 1995. Sydney: NSW Cancer Council.

Lewis N, Nguyen H, Smith D, Coates M & Armstrong B 1999. Cancer maps for New South Wales: variation by Local Government Area 1991 to 1995. Sydney: NSW Cancer Council.

Farac K, Smith D, Sweeny A, Kricker A, Bilous M & Armstrong B 1999. Pathology of breast cancer in New South Wales women in 1995. Sydney: NSW Cancer Council.

Coates M 1999. Pancreatic cancer in New South Wales, 1972 to 1996. Melanoma rates still rising. Cervical cancer rates continue to fall. Cancer Information Update no. 8. Sydney: NSW Cancer Council, June.

Armstrong B 1999. The role of cancer registries in cancer control: a reassessment from experience of the New South Wales Central Cancer Registry. Journal of Registry Management 26:51–5.

Grulich A, Wan X, Law M, Coates M & Kaldor J 1999. Risk of cancer in people with AIDS. AIDS 13:839–44.

Kricker A, Armstrong B, Smith D, Bilous M, Camaris C, Mayer A & Pisarianos T 1999. An audit of breast cancer pathology reporting in Australia in 1995. British Journal of Cancer 80:563–8.

Kricker A, Farac K, Smith D, Sweeny A, McCredie M & Armstrong B 1999. Breast cancer in New South Wales in 1972–1995: tumour size and the impact of mammographic screening. International Journal of Cancer 81:877–80.

McCredie M, Williams S & Coates M 1999. Cancer mortality in east and south-east Asian migrants to New South Wales, Australia 1975–1995. British Journal of Cancer 79:1277–82.

McCredie M, Williams S & Coates M 1999. Cancer mortality in migrants from the British Isles and continental Europe to New South Wales, Australia, 1975–1995. International Journal of Cancer 83:179–82.

Supramaniam R, Smith D, Coates M, Hayes L & Armstrong B 1998. Breast cancer survival in New South Wales in 1997 to 1995. Sydney: NSW Cancer Council.

McGeechan K, Kricker A, Armstrong B & Stubbs J 1998. Evaluation of linked cancer registry and hospital records of women with breast cancer. Australian and New Zealand Journal of Public Health 22:765–70.

Smith DP & Armstrong BK 1998. Prostate-specific antigen testing in Australia and association with prostate cancer incidence in New South Wales. Medical Journal of Australia 169:17–20.

French J 1998. Hereditary bowel cancer registers. Cancer Information Update no. 5. Sydney: NSW Cancer Council.

Smith D 1998. Colorectal cancer in NSW: increasing incidence, falling mortality. Cancer Information Update no. 5. Sydney: NSW Cancer Council.

Coory M & Armstrong B 1998. Cancer incidence and projections for Area and Rural Health Services in New South Wales. Sydney: NSW Cancer Council.

Coates M, Smith D & Mon M 1998. Brain cancer in NSW. Incidence and mortality increasing over two decades. Cancer Information Update no. 4. Sydney: NSW Cancer Council, January.

McCredie M 1998. Second primary cancers in NSW. Cancer Information Update no. 4. Sydney: NSW Cancer Council, January.

Smith DP, Armstrong BK & Saunders R 1998. Patterns of prostate specific antigen (PSA) testing in Australia in 1992 to 1996: an examination of Medicare data. Sydney: NSW Cancer Council.

Smith DP, Supramaniam R, Coates MS & Armstrong BK 1998. Prostate cancer in New South Wales in 1972 to 1994. Sydney: NSW Cancer Council.

Armstrong BK & Jong KE 1998. Brain tumours and mobile phones. Medical Journal of Australia 168:308.

Supramaniam R 1997. Cervical cancer in NSW: incidence and mortality, 1995. Cancer Information Update no. 3. Sydney: NSW Cancer Council.

Reeson L 1997. The NSW pap test register and cervical screening program. Cancer Information Update no. 3. Sydney: NSW Cancer Council.

Brown AM, Christie D, Taylor RJ, Seccombe MA & Coates MS 1997. The occurrence of cancer in a cohort of NSW coal miners. Australian and New Zealand Journal of Public Health 21:29–32.

Bell J, McCredie M, Coates MS & Armstrong BK 1997. Trends in colorectal cancer incidence and mortality in New South Wales 1973–1992. Medical Journal of Australia 166:178–1.

McCredie M, Macfarlane G, Bell J & Coates M 1997. Second primary cancers following cancers of the colon and rectum in New South Wales, Australia, 1972–1991. Cancer Epidemiology, Biomarkers and Prevention 6:155–60.

Nguyen HL, Armstrong BK & Coates MS 1997. Cutaneous melanoma in NSW in 1983 to 1995. Sydney: NSW Cancer Council.

Taylor R 1997. Breast cancer five-year survival, by New South Wales regions, 1980 to 1991. Australian and New Zealand Journal of Public Health 21:206–10.

Taylor R & Coates M 1997. Breast cancer five-year survival in NSW women 1972–1991. Australian and New Zealand Journal of Public Health 21:199–205.

Taylor R & McNeil D 1997. Projections of incidence of major cancers in NSW to 2001. Sydney: NSW Cancer Council.

Green A, McCredie M, Giles G & Jackson L 1996. Occurrence of melanomas on the upper and lower limbs in eastern Australia. Melanoma Research 6:387–94.

McCredie M, Bell J, Lee A & Rogers J 1996. Differences in patterns of care of prostate cancer, New South Wales, 1991. Australian and New Zealand Journal of Surgery 66:727–30.

McCredie M 1996. Breast cancer incidence increasing, mortality steady. Cancer Information Update no. 1. Sydney: NSW Cancer Council.

Bell J, Coates M, Day P & Armstrong B 1996. Colorectal cancer in NSW in 1972 to 1993. Sydney: NSW Cancer Council.

Grulich AE, Wan X, Coates M, Day P & Kaldor J 1996. Validity of a non-personally identifying method of linking cancer and AIDS register data. Journal of Epidemiology and Biostatistics 1:207–12.

Kricker A, Bell J, Coates M & Taylor R 1996. Cancer of the cervix in New South Wales in 1972–92. Sydney: NSW Cancer Council.

McCredie M, Coates M, Bilous M, Kricker A & Hoyer A 1996. Rising incidence of breast cancer in New South Wales, Australia: real increase or earlier detection? Journal of Epidemiology and Biostatistics 1:25–9.

McCredie M, Coates M, Churches T & Rogers J 1996. Rising incidence of prostate cancer in Australia—a result of 'screening'? Journal of Epidemiology and Biostatistics 1:99–105.

McCredie MRE, Macfarlane GJ, Coates MS & Osborn RA 1996. Risk of second malignant neoplasms following female genital tract cancers in New South Wales (Australia), 1972–91. International Journal of Gynaecological Cancer 6:362–8.

McCredie M, Macfarlane G, Stewart JH & Coates M 1996. Second primary cancers following cancers of the kidney and prostate in New South Wales (Australia), 1972–91. Cancer Causes Control 7:337–44.

Smith D, Taylor R & Coates M 1996. Socio-economic differentials in cancer incidence and mortality in urban New South Wales, 1987–1991. Australian and New Zealand Journal of Public Health 20:129–37.

Taylor R, Bell J, Coates M, Churches T & Wain G 1996. Cervical cancer in NSW women: five-year survival 1972–1991. Australian and New Zealand Journal of Public Health 20:413–20.

Smith D 1996. Socioeconomic status and cancer in urban New South Wales. Coates M. Breast cancer incidence, 1995. Cancer Information Update no. 2. Sydney: NSW Cancer Council.

Bilous M, McCredie M & Porter L 1995. Adequacy of histopathology reports for breast cancer in New South Wales. Pathology 27:306–11.

Christie DGS, Brown AM, Taylor R, Seccombe MA & Coates MS 1995. Mortality in the New South Wales coal industry, 1973–1992. Medical Journal of Australia 163:19–21.

Kricker A, Høyer A, McCredie M & Porter L 1995. Breast cancer in NSW women: a shift in tumour size. Medical Journal of Australia 163:79–81.

Macfarlane GJ, McCredie M, Pompe-Kirn V, Sharp L & Coates M 1995. Second cancers occurring after cancers of the mouth and pharynx: data from three population-based registries in Australia, Scotland and Slovenia. Oral Oncology. European Journal of Cancer 31B:315–8.

McCredie M, Coates M, Day P & Bell J 1995. Changes in cancer incidence and mortality in New South Wales, 1973–77 to 1988–92. Medical Journal of Australia 163:520–3.

Fritschi L, Coates M & McCredie M 1995. Incidence of cancer among New South Wales adolescents: which classification scheme describes adolescent cancers better? International Journal of Cancer 60:355–60.

Grulich A, McCredie M & Coates M 1995. Cancer incidence in Asian migrants to New South Wales, Australia. British Journal of Cancer 71:400–8.

McCredie M 1995. Is the marked increase in reported incidence of prostate cancer due to earlier detection? Cancer Forum 19:7–12.

# Victoria

Giles GG & Thursfield V 2001. Trends in cancer mortality Australia 1910–1999. CANSTAT 33.

Giles GG, Severi G, McCredie MRE et al. 2001. Smoking and prostate cancer; findings from an Australian case-control study. Annals of Oncology 12:1–5.

Cui J, Staples MS, Hopper JL, English DR, McCredie MRE & Giles GG 2001. Segregation analyses of 1476 population-based Australian families affected by prostate cancer. American Journal of Human Genetics 68(5):1207–18.

Buchbinder R, Forbes A, Hall S, Dennett R & Giles GG 2001. Incidence of cancer in biopsyproven inflammatory myopathy: a population-based cohort study. Annals of International Medicine 134:1087–1095.

Cui J, Antoniou AC, Dite GS, Southey MC, Venter DJ, Easton DF, Giles GG, McCredie MRE & Hopper JL 2001. After BRCA1 and BRCA2—what next? Multifactorial segregation analyses of three generational population-based Australian female breast cancer families. American Journal of Human Genetics 68:420–431.

Vajdic CM, Kricker A, Giblin M, McKenzie J, Aitken J, Giles GG & Armstrong BK 2001. Eye color and cutaneous nevi predict risk of ocular melanoma in Australia. International Journal of Cancer 15; 92(6):906–12.

Giles G, Russell I, Reed R & Kavanagh A 2001. The In-Situ and Small Invasive Breast Cancer Register in Victoria, 1988 to 1992: tumour characteristics and patient management. Australian and New Zealand Journal of Surgery 71(51):266–270.

McCredie MRE, Dite GS, Porter L, Maskiell J, Giles GG, Phillips KA, Redman S & Hopper JL (2001). Prevalence of self-reported arm morbidity following treatment for breast cancer in the Australian Breast Cancer Family Study. (In press The Breast).

Toner GC, Neerhut GJ, Schwarz MA, Thursfield VJ, Sandeman TF, Giles GG & Snow RM 2001. The management of testicular cancer in Victoria. Medical Journal of Australia 174: 328–331.

McCredie MRE, Staples M, Johnson W, English D & Giles GG 2001. Prevalence of urinary symptoms in a population-based sample of Australian men. Journal of Epidemiological Biostatistics 6:211–8.

Autier P, Boniol M, Pedeux R, Severi G, Giles GG & Doré JF 2001. The body—site distribution of melanocytic nevi in 6 to 7 year old European children. Melanoma Research 11(2):123–31.

Giles GG, Whitfield K & Thursfield V 2000. Cancer in Victoria 1998. CANSTAT 32.

Giles GG, Whitfield K & Thursfield V 2000. Testicular cancer. CANSTAT 31.

Hopper JL, Firgaira FA, Dite GS, Giles GG, McCredie MRE, Southey M, Venter DJ, Seshadri R & McEvoy CR 2000. (letter) HRAS1 rare minisatellite alleles and breast cancer in Australian women under the age of 40 years. Journal of the National Cancer Institute 92(9):756–7.

Jianfeng Xu & International Consortium for Prostate Cancer Genetics 2000. Combined analysis of hereditary prostate cancer linkage to *1q24-25*: results from 772 hereditary prostate cancer families from the International Consortium for Prostate Cancer Genetics. American Journal of Human Genetics 66(3):945–57.

Spurdle AB, Webb PE, Chen X, Martin N, McCredie MRE, Giles GG, Hopper JL & Chenevix-Trench G 2000. Androgen receptor Exon 1 CAG repeat length and ovarian cancer risk. International Journal of Cancer 87:637-43.

Firgaira FA, Seshadri R, McEvoy CRE, Dite G, Giles GG, McCredie MRE, Southey M, Venter DJ & Hopper JH 1999. Rare minisatellite alleles at the h-ras locus and risk of breast cancer before the age of 40 in Australian women. Journal of the National Cancer Institute 91: 2107–11.

Tesoriero A, Andersen C, Southey M, Somers G, McKay M, Armes J, McCRedie M, Giles G, Hopper JL & Venter D 1999. De novo BRCA1 mutation in a patient with breast cancer and an inherited BRCA2 mutation. American Journal of Human Genetics 65: 567–569.

Spurdle AB, Dite GS, Chen X, Mayne C, Southey ME, Batten LE, Chy H, Armes J, Venter DJ, Trute L, McCredie MRE, Giles GG, Hopper JL & Chenevix-Trench G 1999. Androgen receptor Exon 1 CAG Repeat Length is not a risk factor for breast cancer in women before age 40. Journal of the National Cancer Institute 91:961–6.

Armes JE, Trute L, White D, Southey M, Hammet F, Tesoriero A, Hutchins A, Dite GS, McCredie MRE, Giles G, Hopper J & Venter DJ 1999. Distinct molecular pathogeneses of early-onset breast cancers in BRCA1 and BRCA2 mutation carriers: a population-based study. Cancer Research 59:2011–17.

Southey MC, Tesoriero AA, Anderson CR, Jennings KM, Brown SM, Dite GS, Jenkins MA, Osborne RH, Maskill JA, Porter L, Giles GG, McCredie MRE & Venter DJ 1999. BRCA1 mutations and other sequence variants in a population-based sample of Australian women with breast cancer. British Journal of Cancer 79: 34–39.

Giles GG & Thursfield V 2000. Prostate cancer. CANSTAT 30.

Giles GG, Whitfield K, Thursfield V & Staples M 2000. Cancer in Victoria 1997. CANSTAT 29.

Giles GG & Gonzales M 2000 (in press). The epidemiology of brain tumours and factors in prognosis. In: A Kaye & E Laws (eds). Brain tumours: an encyclopedic approach. Edinburgh: Churchill Livingstone.

Severi G, Giles G, Robertson C, Boyle P & Autier P 2000. Mortality from cutaneous melanoma: evidence for contrasting trends between populations. British Journal of Cancer 2(11):1887–91.

Kavanagh AM, Giles GG, Mitchell H & Cawson J 2000. The sensitivity, specificity and positive predictive value of screening mammography and symptomatic status. Journal of Medical Screening 7(2):105–10.

Richardson GE, Thursfield VJ & Giles GG 2000. Reported management of lung cancer in Victoria in 1993: comparison with best practice. Medical Journal of Australia 172:321–4.

Frydenberg M, Giles GG, Mameghan H, Thursfield VJ, Millar J, Wheelahan JB, Bolton DM & Syme RR 2000. Prostate cancer in Victoria 1993: patterns of reported management. Medical Journal of Australia 172:270–4.

Kavanagh A, Mitchell H & Giles G 2000. Use of hormone replacement therapy and the accuracy of mammographic screening. The Lancet 355:270–4.

Giles GG, Whitfield K, Thursfield V & Staples M 1999. Cancer in Victoria 1996. CANSTAT 28.

Hopper JL, Chenevix-Trench G, Jolley D, Dite GS, Jenkins MA, Venter DJ, McCredie MRE & Giles GG 1999. Design and analysis issues in a population-based case-control family study of the genetic epidemiology of breast cancer, and the Co-operative Family Registry for Breast Cancer Families (CFRBCF). Journal of National Cancer Institute Monographs (26):95–100.

Venn A, Watson L, Bruinsma F, Giles GG & Healy D 1999. Fertility drugs, in vitro fertilisation and cancer risk. Lancet 354(9190):1586–90.

Hopper JL, Southey MC, Dite GS, Jolley DJ, Giles GG, McCredie MRE, Easton DF & Venter DJ for the Australian Breast Cancer Family Study 1999. Population-based estimate of the average age-specific cumulative risk of breast cancer for a defined set of protein truncating mutations in BRCA1 and BRCA2. Australian Breast Cancer Family Study. Cancer Epidemiology, Biomarkers & Prevention 8:741–7.

Green A, McCredie M, Giles G, MacKie R, Young P, Jackman L & Thursfield T 1999. A case-control study of melanomas of the soles and palms (Australia and Scotland). Cancer Causes and Control 10:21–5.

Kavanagh A, Mitchell H, Farrugia H & Giles G 1999. Monitoring interval cancers in an Australian mammographic screening program. Journal of Medical Screening 6(3):139–43.

Harmer C, Staples M & Kavanagh A 1999. Evaluation of breast cancer incidence: is the increase due entirely to mammographic screening? Cancer Causes Control 10(5):333–7.

Schlehofer B, Blettner M, Preston-Martin S, Niehoff D, Wharendorf J, Arslan A, Ahlbom A, Choi W, Giles GG, Howe G, Little J, Menegoz F & Ryan P 1999. The role of medical history in brain tumour development. Results from the international adult brain tumour study. International Journal of Cancer 82(2):155–60.

Preston-Martin S, Pogoda JM, Schlehofer B, Blettner M, Howe GR, Ryan P, Menegoz F, Giles GG et al. 1998. An international case-control study of adult glioma and meningioma: the role of head trauma. International Journal of Epidemiology 27:579–86.

Lord RVN, Law MG, Ward RL, Thomas RJS, Giles GG, Thursfield V et al. 1998. Rising incidence of oesophageal adenocarcinoma in men in Australia. Journal of Gastroenterology and Hepatology 13(4):356–62.

Altmann AE, Halliday JL & Giles GG 1998. Associations between congenital malformations and childhood cancer. A register-based case-control study. British Journal of Cancer 78:1244–49.

Kavanagh AM, Brown R, Fortune D, Mulvany N, Scurry J & Giles GG 1998. Misclassification of microinvasive cervical cancer and carcinoma-in-situ of the cervix. International Journal of Gynaecological Cancer 8:46–50.

Staples M, Marks R & Giles G 1998. Skin cancer trends in Australia 1985 to 1995: evidence of the effectiveness of sun protection campaigns. International Journal of Cancer 78:144–48.

Giles GG 1998. The epidemiology of brain cancer. Cancer Forum 22:126–30.

Giles GG, Whitfield K, Thursfield V & Staples M 1998. Cancer in Victoria 1995. CANSTAT 27.

Giles GG & Thursfield V 1997. Bowel cancer. CANSTAT 26.

Giles GG & Thursfield V 1997. Cancer in Victoria 1994. CANSTAT 25.

Giles GG & Thursfield V 1997. Trends in cancer mortality, Australia 1910–1994. CANSTAT 24.

Giles GG 1997. Cancer registration and cancer control in Australia. Proceedings of the International Symposium 'Cancer Epidemiology and Control in the Asia–Pacific Region', Kobe, Japan, 1–3 December 1997.

Thompson SC, Lin A, Warren R, Giles GG & Crofts N 1997. Risk factors associated with hepatocellular carcinoma notified to the Anti-Cancer Council in Victoria 1991–92. Australian and New Zealand Journal of Public Health 21:626–30.

Giles GG 1996. Cancer in Australia: the experience of men. Cancer Forum 20:117-20.

Giles GG, Armstrong BK, Burton RC, Staples MP & Thursfield V 1996. Has melanoma mortality in Australia stopped rising? British Medical Journal 312:1121–5.

Giles GG & Thursfield V 1996. Trends in skin cancer in Australia. Cancer Forum 20:188–91.

Giles GG & Thursfield V 1996. Cancer in adolescents and young adults. CANSTAT 23.

Green A, McCredie M & Giles G 1996. Occurrence of melanomas on the upper and lower limbs in eastern Australia. Melanoma Research 6:387–94.

McMichael A & Giles GG 1996. Have increases in ultraviolet solar exposure contributed to the rise in incidence of non-Hodgkin's lymphoma? British Journal of Cancer 73:945–50.

Mitchell H & Giles GG 1996. Cancer diagnosis after a report of negative cervical cytology. Medical Journal of Australia 164:270–73.

Thomas RJS, Lade S, Giles GG & Thursfield V 1996. The epidemiology of oesophageal carcinoma in Victoria with emphasis on incidence trends. Australian and New Zealand Journal of Surgery 66:271–75.

Giles GG, Staples M, McCredie MRE, Coates M & Farrugia H 1995. Multiple primary melanomas: an analysis of cancer registry data from Victoria and New South Wales. Melanoma Research 5:433–38.

Giles GG, Waters K, Thursfield V & Farrugia H 1995. Childhood cancer in Victoria, Australia, 1970–1989. International Journal of Cancer 63:794–97.

Thursfield V, Giles GG & Staples M 1995. Skin cancer. CANSTAT 20.

Venn A, Watson L, Lumley J, Giles G, King C & Healy D 1995. Incidence of breast and ovarian cancer after infertility and IVF. Lancet 346:995–1000.

# Queensland

Queensland Cancer Registry 2001. Cancer in Queensland. Incidence and mortality 1982–1998. Brisbane: Health Information Centre, Queensland Health.

Coory M, Thompson A & Ganguly I 2000. Cancer among people living in rural and remote Indigenous communities in Queensland. Medical Journal of Australia 173:301–4.

Coory M 2000. Lung cancer: still a significant problem among Queensland men and an increasing problem among Queensland women. Information Circular no. 53. Brisbane: Health Information Centre, Queensland Health.

Baade P, Coory M & Ring I 2000. Cancer survival in Queensland, 1982 to 1995. Brisbane: Health Information Centre, Queensland Health.

Baade P, Coory M & Ring I 2000. National health priority cancers in Queensland (1982 to 1997). Brisbane: Health Information Centre, Queensland Health.

Queensland Cancer Registry 2000. Cancer in Queensland. Incidence and mortality 1982–1997. Brisbane: Health Information Centre, Queensland Health.

Baade P, Coory M & Ring I 2000. Cancer in Queensland: trends in incidence and mortality for selected cancer sites 1982 to 1996. Brisbane: Health Information Centre, Queensland Health.

Coory M & Tong S 1999. An update on screening for colorectal cancer. Information Circular no. 47. Brisbane: Health Information Centre, Queensland Health.

Coory M & Byrne D 1999. Breast cancer and BreastScreen Queensland. Information Circular no. 48. Brisbane: Health Information Centre, Queensland Health.

Coory M, Thompson A & Muller J 1999. Cervical cancer and the Queensland cervical screening program. Information Circular no. 49. Brisbane: Health Information Centre, Queensland Health.

Baade P 2000. Cancer in Queensland. Information Circular no. 52. Brisbane: Health Information Centre, Queensland Health (in press).

Queensland Cancer Registry 1999. Cancer in Queensland. Incidence and mortality 1982–1996. Brisbane: Health Information Centre, Queensland Health.

Queensland Cancer Registry 1998. Cancer in Queensland. Incidence and mortality 1986–1995. Brisbane: Health Information Centre, Queensland Health.

Health Information Centre 1996. Health of Queenslanders, status report. Brisbane: Queensland Health.

# Western Australia

Threlfall TJ & Thompson JR 2000. Cancer incidence and mortality in Western Australia, 1998. Statistical Series no. 61. Perth: Health Department of Western Australia.

Threlfall TJ & Brameld K 2000. Cancer survival in Western Australian residents, 1982–1997. Statistical Series no. 60. Perth: Health Department of Western Australia.

Threlfall TJ & Thompson JR 1999. Cancer incidence and mortality in Western Australia, 1997. Statistical Series no. 57. Perth: Health Department of Western Australia.

Threlfall TJ, English DR & Rouse IL 1998. Prostate cancer in Western Australia: trends in incidence and mortality from 1985 to 1996. Medical Journal of Australia 169:21–4.

Threlfall TJ & Thompson JR 1998. Cancer incidence and mortality in Western Australia, 1996. Statistical Series no. 55. Perth: Health Department of Western Australia.

Threlfall TJ & Thompson JR 1997. Cancer incidence and mortality in Western Australia, 1995. Statistical Series no. 51. Perth: Health Department of Western Australia.

Threlfall TJ 1997. Cancer incidence and mortality projections for Western Australia, 1996–2001. Statistical Series no. 50. Perth: Health Department of Western Australia.

Threlfall TJ, Whitfort MJ & Thompson JR 1997. Cancer incidence and mortality in Western Australia, 1992–1994. Statistical Series no. 45. Perth: Health Department of Western Australia.

Threlfall TJ & Morgan A 1996. Malignant mesothelioma in Western Australia 1960 to 1994. Data from the WA Mesothelioma Register. Statistical Series no. 46. Perth: Health Department of Western Australia.

Thompson JR & FitzGerald P 1995. Childhood cancer incidence, mortality and survival in Western Australia 1982–1991. Perth: Health Department of Western Australia, Health Statistics Branch.

# South Australia

South Australian Cancer Registry 2001. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 2000. Incidence and mortality 2000. Analysed by type and geographical location. Twenty-four years of data. Adelaide: Openbook Publishers (in press).

South Australian Cancer Registry 2000. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1999. Incidence and mortality 1999. Analysed by type and geographical location. Twenty-three years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1999. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1998. Incidence and mortality 1998. Analysed by type and geographical location. Twenty-two years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1998. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1997. Incidence and mortality 1997. Analysed by type and geographical location. Twenty-one years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1997. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1996. Incidence and mortality 1996. Analysed by type and geographical location. Twenty years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1996. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1995. Incidence and mortality 1995. Analysed by type and geographical location. Nineteen years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1995. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1994. Incidence and mortality 1994. Analysed by type and geographical location. Eighteen years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1994. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1993. Incidence and mortality 1993. Analysed by type and geographical location. Seventeen years of data. Adelaide: Openbook Publishers.

South Australian Cancer Registry 1993. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1992. Incidence and mortality 1992. Analysed by type and geographical location. Sixteen years of data. Adelaide: Lutheran Publishing House. Bonett A, Dickman P, Roder D, Gibberd R & Hakulinen T 1992. Survival of cancer patients in South Australia 1977–1990. Adelaide: Lutheran Publishing House.

Bonet A, Roder D, McCaul K & Milliken L 1992. Epidemiology of cancer in South Australia. Incidence, mortality and survival 1977 to 1991. Incidence and mortality 1991. Analysed by type and geographical location. Fifteen years of data. Adelaide: Lutheran Publishing House.

Clapton W, Roder D & Luke C 2000. South Australian Cancer Registry figures for 1999. The South Australian Medical Review (in press).

Clapton WK, Roder DM, Luke CG & Kirke DK 2000. The South Australian Cancer Registry: case study of a public health cancer epidemiological monitoring system. Presented at HIC 2000, the eighth national Health Informatics Conference, 'Integrating Information for Health Care', Adelaide, 3–5 September 2000 (proceedings in press).

Beckmann KR, Kirke BA, McCaul KA & Roder DM 2000. Use of fake tanning lotions in the South Australian population. Medical Journal of Australia (in press).

Kirke B & Roder D 2000. Using Cancer Registry data to target melanoma: early detection interventions in South Australia. Australian Cancer Society Cancer Forum 24(1):16–17.

Clapton W 1999. 1999 Cancer Registry report. The South Australian Medical Review 12(8):19.

Clapton W 1998. 1998 Cancer Registry report. The South Australian Medical Review 11(9):21.

Hardingham JE, Butler WJ, Roder D, Dobrovic A, Dymock RB, Sage RE & Roberts-Thomson IC 1998. Somatic mutations, acetylator status, and prognosis in colorectal cancer. Gut 42(5):669–72.

Hoffmann D, Moore J & Roder D 1997. Trends in survival from colonic cancer: the impact of subspecialization. Australian & New Zealand Journal of Surgery 67(12):842–5.

Birrell SN, Roder DM, Horsfall DJ, Bentel JM & Tilley WD 1995. Medroxyprogesterone acetate therapy in advanced breast cancer: the predictive value of androgen receptor expression. Journal of Clinical Oncology 13(7):1572–7.

McCaul KA, Luke CG & Roder DM 1995. Trends in prostate cancer incidence and mortality rates in South Australia, 1977–1993. Medical Journal of Australia 162(10):520–2.

Roder DM, Luke CG, McCaul KA & Esterman AJ 1995. Trends in prognostic factors of melanoma in South Australia, 1981–1992: implications for health promotion. Medical Journal of Australia 162(1):25–9.

Shugg D, Allen BJ, Blizzard L, Dwyer T & Roder D 1994. Brain cancer incidence, mortality and case survival: observations from two Australian cancer registries. International Journal of Cancer 59(6):765–70.

Hunt R, Bonett A & Roder D 1993. Trends in the terminal care of cancer patients: South Australia, 1981–1990. Australian & New Zealand Journal of Medicine 23(3):245–51.

Bonett A, Roder D & Milliken L 1992. The South Australian Cancer Registry: a means of assessing cancer incidence, mortality and case survival. European Journal of Cancer 28A(11):1923–6.

Higgins GD, Davy M, Roder D, Uzelin DM, Phillips GE & Burrell CJ 1991. Increased age and mortality associated with cervical carcinomas negative for human papillomavirus RNA. Lancet 338(8772):910–3.

Woodward A, Roder D, McMichael AJ, Crouch P & Mylvaganam A 1991. Radon daughter exposures at the Radium Hill uranium mine and lung cancer rates among former workers, 1952–87. Cancer Causes & Control 2(4):213–20.

Bonett A, Roder D & Esterman A 1991. Case-survival rates for infiltrating ductal carcinomas by category of hospital at diagnosis in South Australia. Medical Journal of Australia 154(10):695–7.

North B, Reilly P, Blumbergs P, Roder D & Esterman A 1990. Malignant astrocytoma in South Australia: treatment and case survival. Medical Journal of Australia 153(5):250–4.

Bonett A, Dorsch M, Roder D & Esterman A 1990. Infiltrating ductal carcinoma of the breast in South Australia. Implications of trends in tumour diameter, nodal status and case-survival rates for cancer control. Medical Journal of Australia 152(1):19–23.

Bonett A, Davy M & Roder D 1989. Cervical cancer in South Australia: trends in incidence, mortality and case survival. Australian & New Zealand Journal of Obstetrics & Gynaecology 29(3 Pt 1):193–6.

Bonett A, Roder D & Esterman A 1989. Epidemiological features of melanoma in South Australia: implications for cancer control. Medical Journal of Australia 151(9):502–4, 506–9.

McLennan G & Roder DM 1989. Lung cancer in Australia. Medical Journal of Australia 150(4):206–7, 210–3.

Schloeffel P, Hains D, Roder D, Bonett A & Esterman A 1989. The use of State and hospitalbased cancer-registry data to describe the epidemiological and clinical characteristics of laryngeal cancer in South Australia. Medical Journal of Australia 150(5):252–5.

McMichael AJ, Bonett A & Roder D 1989. Cancer incidence among migrant populations in South Australia. Medical Journal of Australia 150(8):417–20.

Bonett A, Roder D & Esterman A 1988. Cancer case-survival rates for South Australia: a comparison with US rates and a preliminary investigation of time trends. Medical Journal of Australia 148(11):556–9.

Roder D, Bonett A, Hunt R & Beare M 1987. Where patients with cancer die in South Australia. Medical Journal of Australia 147(1):11–3.

Bonett A, Roder D & MacHarper T 1986. A perspective of the cancer problem in South Australia. Community Health Studies 10(3):330–5.

Bonett A, Roder D & Esterman A 1986. Melanoma case survival rates in South Australia by histological type, thickness and level of tumour at diagnosis. Medical Journal of Australia 144(13):680–2.

Roder D, Bonett A & Esterman A 1985. Promotion of breast self-examination in South Australia. A short-term evaluation. Medical Journal of Australia 142(1):9–11.

Bonett A, Roder D & Esterman A 1984. Determinants of case survival for cancers of the lung, colon, breast and cervix in South Australia. Medical Journal of Australia 141(11):705–9.

Roder D & Wilson D 1983. Oral cancer in South Australia—incidence and case survival. Australian Dental Journal 28(5):312–5.

Bonett A, Roder D & Esterman A 1983. Infiltrating ductal carcinoma of the breast in South Australia. Sizes of primary lesions and histological evidence of axillary nodal metastases. Medical Journal of Australia 2(1):26–8.

Bonett A & Roder DM 1982. Survival of South Australian cancer patients: a study of the State's Cancer Registry data. Medical Journal of Australia 1(13):559–62.

# Tasmania

The Tasmanian Cancer Registry, Menzies Centre for Population Health Research 2001. Cancer in Tasmania: incidence and mortality 1998. Hobart: Menzies Centre for Population Health Research, University of Tasmania.

Ashbolt R, Dwyer T & Blizzard L (eds) 2000. Cancer in Tasmania: incidence and mortality 1997. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Blizzard L (eds) 1999. Cancer in Tasmania: incidence and mortality 1996. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Couper D (eds) 1998. Cancer in Tasmania: incidence and mortality 1995. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Blizzard L (eds) 1997. Cancer incidence and mortality in Tasmania 1994. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Couper D (eds) 1996. Cancer incidence and mortality in Tasmania 1993. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Blizzard L (eds) 1995. Cancer incidence and mortality in Tasmania 1992. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T, Blizzard L & Ansari M (eds) 1994. Cancer incidence and mortality in Tasmania 1991. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T, Blizzard L & Ansari M (eds) 1994. Cancer incidence and mortality in Tasmania 1990. Hobart: Menzies Centre for Population Health Research.

Shugg D, Dwyer T & Blizzard L (eds) 1993. Cancer incidence and mortality in Tasmania 1989. Hobart: Menzies Centre for Population Health Research.

Shugg D 1992. Cancer incidence and mortality in Tasmania 1988. Hobart: Menzies Centre for Population Health Research.

Shugg D 1991. Cancer incidence and mortality in Tasmania 1987. Hobart: Menzies Centre for Population Health Research.

Shugg D 1990. Cancer incidence and mortality in Tasmania 1986. Hobart: Menzies Centre for Population Health Research.

Shugg D 1989. Cancer incidence and mortality in Tasmania 1985. Hobart: Menzies Centre for Population Health Research.

Blizzard L & Dwyer T. Declining lung cancer mortality of young Australian women despite increased smoking is linked to reductions in cigarette 'tar' yields. British Journal of Cancer. In press.

Dwyer T, Prota G, Blizzard L, Ashbolt R & Vincensi M 2000. Melanin density and melanin type predict melanocytic naevi in 19–20 year olds of Northern European ancestry. Melanoma Research 10: 387–394.

Burgess J, Dwyer T, McArdle K, Tucker P & Shugg D 2000. The changing incidence and spectrum of thyroid cancer in Tasmania (1978–1998) during a transition from iodine sufficiency to iodine deficiency. Journal of Clinical Endocrinology & Metabolism 85:1513–17.

Hill D, Jamrozik K, White V, Collins J, Boyages J, Shugg D, Pruden M, Giles G & Byrne M 1999. Surgical management of breast cancer in Australia in 1995. Sydney: NHMRC National Breast Cancer Centre.

Dwyer T, Muller HK, Blizzard L, Ashbolt R & Phillips G 1998. The use of spectrophotometry to estimate melanin density in Caucasians. Cancer Epidemiology, Biomarkers and Prevention 7:203–206.

Blizzard CL, Dwyer T & Ashbolt R 1997. Self-reported skin type associated with experience of sunburn in 14–15 year old adolescents of Northern European descent. Melanoma Research 7:339–346.

Dwyer T, Blizzard L, Gies PH, Ashbolt R & Roy C 1996. Assessment of habitual sun exposure in adolescents via questionnaire—a comparison with objective measurement using polysulphone badges. Melanoma Research 6:231–239.

Dwyer T, Blizzard L & Ashbolt R 1995. Sunburn associated with the increased number of naevi in darker as well as lighter skinned adolescents of Northern European descent. Cancer Epidemiology, Biomarkers and prevention 4:825–30.

Shugg D, Allen B, Blizzard L, Dwyer T & Roder D 1994. Brain cancer incidence, mortality and case survival: observations from two Australian cancer registries. International Journal of Cancer 59:765–70.

Dwyer T, Blizzard L, Shugg D, Hill D & Ansari MZ 1994. Higher lung cancer rates in young women than young men: Tasmania 1983 to 1992. Cancer Causes and Control 5:351–58.

Jelfs PL, Giles G, Shugg D, Coates M, Durling G, Fitzgerald P & Ring I 1994. Cutaneous malignant melanoma in Australia, 1989. Medical Journal of Australia 161:182–7.

Kaldor J, Shugg D, Young B, Dwyer T & Wang YG 1993. Non-melanoma skin cancer: ten years of cancer registry based surveillance. International Journal of Cancer 53:886–91.

Jones M, Shugg D, Dwyer T, Young B & Bonnett A 1992. Interstate difference in incidence and mortality from melanoma—a re-examination of the latitudinal gradient. Medical Journal of Australia 157:373–77.

Shugg D, Hill D, Cooper D & Shepherd J 1990. Practice of breast self examination and the treatment of breast cancer. Australian and New Zealand Journal of Surgery 60:455–62.

Hill D & Shugg D 1989. Breast self examination practices and attitudes among breast cancer, benign breast disease and general practice patients. Health Education Research Theory and Practice 2:193–203.

# **Australian Capital Territory**

Briscoe N 1996. Cancer in the Australian Capital Territory 1983–1992. Canberra: ACT Department of Health and Community Care.

Fritschi L, Coates M, Shadbolt B & Taylor R 1994. Cancer in the Australian Capital Territory 1982–91. Canberra: ACT Department of Health.

# **Northern Territory**

d'Espaignet ET, Measey ML, Condon JR, Jelfs P & Dempsey KE 1996. Cancer in the Northern Territory 1987–1993. Darwin: Territory Health Services.

# Australian Institute of Health and Welfare

National Breast Cancer Centre, Australasian Association of Cancer Registries, BreastScreen Australia, Commonwealth Department of Health and Aged Care & Australian Institute of Health and Welfare 2000. Ductal carcinoma in situ. Cancer Monitoring no. 1. Canberra: AIHW.

Australian Institute of Health and Welfare (AIHW) 2000. Cervical screening in Australia 1997–1998. AIHW cat. no. CAN 9. Canberra: AIHW (Cancer Series no. 14).

Australian Institute of Health and Welfare (AIHW) 2000. BreastScreen achievement report 1997–1998. AIHW cat. no. CAN 8. Canberra: AIHW (Cancer Series no. 13).

Australian Institute of Health and Welfare (AIHW) and Australasian Association of Cancer Registries (AACR) 1999. Cancer in Australia 1996: incidence and mortality data for 1996 and selected data for 1997 and 1998. AIHW cat. no. CAN 7. Canberra: AIHW (Cancer Series).

Australian Institute of Health and Welfare (AIHW), Australasian Association of Cancer Registries & NHMRC National Breast Cancer Centre 1999. Breast cancer in Australian women 1982–1996. Canberra: AIHW (Cancer Series).

Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 1998. Cancer in Australia 1995: incidence and mortality data for 1995 and selected data for 1996. AIHW cat. no. CAN 5. Canberra: AIHW (Cancer Series no. 10).

Australian Institute of Health and Welfare (AIHW) 1998. Breast and cervical cancer screening in Australia 1996–1997. AIHW cat. no. CAN 3. Canberra: AIHW (Cancer Series no. 8).

Australian Institute of Health and Welfare (AIHW), Australasian Association of Cancer Registries & NHMRC National Breast Cancer Centre 1998. Breast cancer survival in Australian women 1982–1994. AIHW cat. no. CAN 4. Canberra: AIHW (Cancer Series no. 9).

Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries (AACR) 1998. Cancer in Australia 1991–1994 (with projections to 1999). Canberra: AIHW (Cancer Series no. 7).

Kricker A & Jelfs P 1996. Breast cancer in Australian women 1921–1994. Canberra: AIHW (Cancer Series no. 6).

Jelfs P, Coates M, Giles G et al. 1996. Cancer in Australia 1989–1990 (with projections to 1995). Canberra AIHW (Cancer Series no. 5).

Giles G, Jelfs P & Kliewer E 1995. Cancer mortality in migrants to Australia 1979–1988. Canberra: AIHW (Cancer Series no. 4).

Jelfs P 1995. Cervical cancer in Australia. Canberra: AIHW (Cancer Series no. 3).

Australian Institute of Health and Welfare (AIHW) 1994. Cancer in Australia 1986–1988. Canberra: AIHW (Cancer Series no. 2).

Jelfs P, Giles, Shugg D et al. 1994. Cutaneous malignant melanoma in Australia, 1989. The Medical Journal of Australia 161:182–87.

Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 1992. Cancer in Australia 1983–1985. Canberra: AGPS (Cancer Series no. 1).