

1 Introduction

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 lump 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 are its ability to grow in an uncontrolled way and to invade and metastasise, i.e. spread to other parts of the body. 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.

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.

Each year there are about 350,000 new cancer cases diagnosed, of which about 270,000 are non-melanocytic skin cancers (AIHW & AACR 2000). Despite the high incidence rate for non-melanocytic skin cancers, estimated at 1,374 new cases per 100,000 population for males and 857 per 100,000 population for females (Staples et al. 1998), the mortality rate is relatively low (about 1.8 per 100,000 population). Cancer registries do not routinely collect data for non-melanocytic skin cancers and they have been excluded from the analyses in this report.

Excluding non-melanocytic skin cancers, there were 79,538 new cancer cases and 33,966 deaths due to cancer in Australia in 1997 (AIHW & AACR 2000).

Content of this report

The report is presented in three parts. This part (Part 1) reports on national measures of survival for 20 cancer sites, presenting one-, five- and ten-year relative survival proportions by year of diagnosis and age at diagnosis, and provides detailed tables for all cancers combined. In addition to this information, international comparisons are presented for a selected group of countries for five-year relative survival. Part 2 supports the findings in Part 1, presenting detailed tables for each cancer site. Part 2 will be published as tables on the AIHW web site <http://www.aihw.gov.au>.

Part 3, to be published later, will present five-year relative survival for the States and Territories, geographical categories and Socio Economic Index for Areas (SEIFA) quintiles.

Measurement

Measures of progress in reducing the impact of cancer in the population include incidence, mortality and survival.

Cancer incidence

Cancer incidence refers to new occurrences of cancer during a given period. It is possible for one person to have more than one cancer and therefore to be counted twice in incidence statistics, if it is decided that the cancers are not of the same origin.

Cancer mortality

Mortality is a measure of the number of deaths due to a particular cause during a given period. Cancer mortality is influenced by the number of new cases of cancer and the length of time lived after a diagnosis of cancer is made. For instance, mortality due to a particular cancer might be relatively low if those diagnosed with the cancer have long survival periods, thus increasing the chance of death due to other causes.

Survival

In general terms, survival is the length of time lived after the initial diagnosis of cancer. Relative survival and other measures of survival are defined in Chapter 2. By convention, the proportion of people surviving is measured at one, two, or three years and at five years and ten years after diagnosis (Supramaniam et al. 1998; NCI 1998; Bonnett et al. 1992). These periods reflect different stages of management during the life of a person diagnosed. For instance, the proportion of people surviving after one year can be a measure of the success of the interventions on the immediately detectable cancer, whereas five- and ten-year measurements are strong indicators for remission or cure.

Previous studies

This report follows the most recent publications of cancer survival measures for the States of South Australia (SACR 2000), New South Wales (Supramaniam et al. 1999), Western Australia (Threlfall & Brameld 2000), and Queensland (Baade et al. 2000a). A national breast cancer survival study has also been produced as a joint report by the Australian Institute of Health and Welfare, the Australasian Association of Cancer Registries and the NHMRC National Breast Cancer Centre (AIHW, AACR & NHMRC National Breast Cancer Centre 1998).

International studies

There are few international reports on national cancer survival statistics for other countries. Neither Canada nor New Zealand, the two countries with health systems and population age structures most similar to Australia, had published cancer survival data at the time of writing this report.

Hence, countries chosen to provide comparisons with Australia in this report were selected mainly on the basis of available published statistics. Table 1.1 lists these countries, the diagnosis period and the coverage proportion of the country to which their survival proportions relate.

The major references are:

- *The EUROCARE-2 Study*: This is a comprehensive report describing relative survival rates throughout Europe. From this study, the cancer registries of Finland, Scotland, Denmark, Iceland and Italy have been chosen, as well as a weighted average of total Europe. The cancers diagnosed in EUROCARE were all diagnosed between 1978 and 1985, with follow-up for at least six years (Berrino et al. 1999).
- *The United States National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program*: This provides a survival analysis for the United States using thirteen cancer registries in Connecticut, New Mexico, Utah, Iowa, Hawaii, Atlanta, Detroit, Seattle–Puget Sound and San Francisco–Oakland. The cancers used in the SEER data were diagnosed between 1989 and 1994 with follow-up to the end of 1997 (Ries et al. 1999).
- *Cancer Survival Trends in England and Wales, 1971–1995: Deprivation and NHS region*: This explores survival trends among almost three million cancer patients diagnosed in England, Scotland and Wales between 1971–1990, with follow-up to the end of 1995 (Coleman et al. 1999).

Not all countries produce or have recent national cancer survival figures.

Table 1.1: Coverage of national population and diagnosis period of countries involved in comparison

Country	Coverage of national population (%)	Diagnosis period
Australia	100	1987–1991
Denmark	100	1985–1989
England	100	1986–1990
Finland	100	1985–1989
Iceland	100	1985–1989
Italy	10	1985–1989
Scotland	100	1985–1989
United States	14	1984–1990
Wales	100	1986–1990