

14. Cancer

Cancer is a group of diseases in which cells become abnormal, grow in an uncontrolled way and spread to other parts of the body, a process known as metastasis. Cancers can develop from most types of cells in different parts of the body and are usually classified according to their organ or tissue of origin and histological features. Different types of cancers vary in their signs and symptoms, how fast they grow, how they spread and how they react to different treatments.

Cancers in children tend to differ from those observed in adults in appearance, site of origin and response to treatment. While most cancers in adults are carcinomas derived from epithelial tissues (skin and the lining of body cavities and glands), cancers in children are mostly sarcomas, which originate in tissues such as the bone marrow, nerve tissues, lymph nodes, bone and muscle (Simone & Lyons 2001). In children, leukaemia (a cancer of white blood cells) is the most common cancer, accounting for approximately one-third of all childhood cancers. The majority of leukaemia cases are acute lymphoblastic leukaemia, which affects immature lymphocytes. Brain tumours are the most common solid tumours in childhood and make up about a fifth of all children's cancers (Miller et al. 1995).

Childhood cancer is relatively uncommon – only 2% of all cancers occur in children – and the causes of most of these cancers remain unknown. Chromosomal and genetic abnormalities explain a small percentage of cancer cases. A number of environmental factors, such as exposure to chemicals or maternal infection, have also been linked with childhood cancer; however, it has proven difficult to substantiate the associations between these factors and childhood cancer (National Cancer Institute 1999). One recent study carried out in Western Australia found that children whose mothers had taken folate during pregnancy had a 60% reduced risk of developing acute lymphoblastic leukaemia (Thompson et al. 2001), suggesting there may also be as yet unknown factors which can protect against cancer.

Many cancers are serious and can be fatal. In 2000, cancer was the second leading cause of death in children aged 1–14 years. However, medical treatment is often successful if the cancer is detected early. The risk of death due to certain cancers can therefore be reduced through intensive monitoring, and early detection and treatment. Significant increases in survival rates have been reported for many types of childhood cancers over the last 2 years in association with clinical trials and the development of new treatments (Stiller 1994; National Cancer Institute 1999). For example, the 5-year survival rate in the USA for all childhood cancers combined increased from 55.6% in 1974–76 to 73.8% in 1989–94 (National Cancer Institute 1999).

This chapter presents a summary of childhood cancers. Information on cancer incidence is derived from data maintained by the National Cancer Statistics Clearing House (NCSCCH) at the AIHW. The NCSCCH collects statistics produced by the States and Territories cancer registries on the incidence of all cancers, excluding non-melanocytic skin cancer.¹ Other information presented in this chapter is derived from the AIHW Mortality Database and the AIHW National Hospital Morbidity Database.

1. Non-melanocytic skin cancers (ICD-9 code 173) are by far the biggest category of all skin cancers. Because of practical difficulties many of these are not required to be notified under legislation. This is because many of these cancers are treated in general practice and other non-specialist clinics.

Incidence of childhood cancer

The indicator for cancer incidence is the number of new cases of cancer diagnosed in children aged 0–14 years in a given year as a rate per 100,000 children. The incidence of all cancers in children aged 0–14 years between 1991 and 1998 is shown in Table 14.1.

Table 14.1: Incidence rates of cancer in children aged 0–14 years, 1991–98

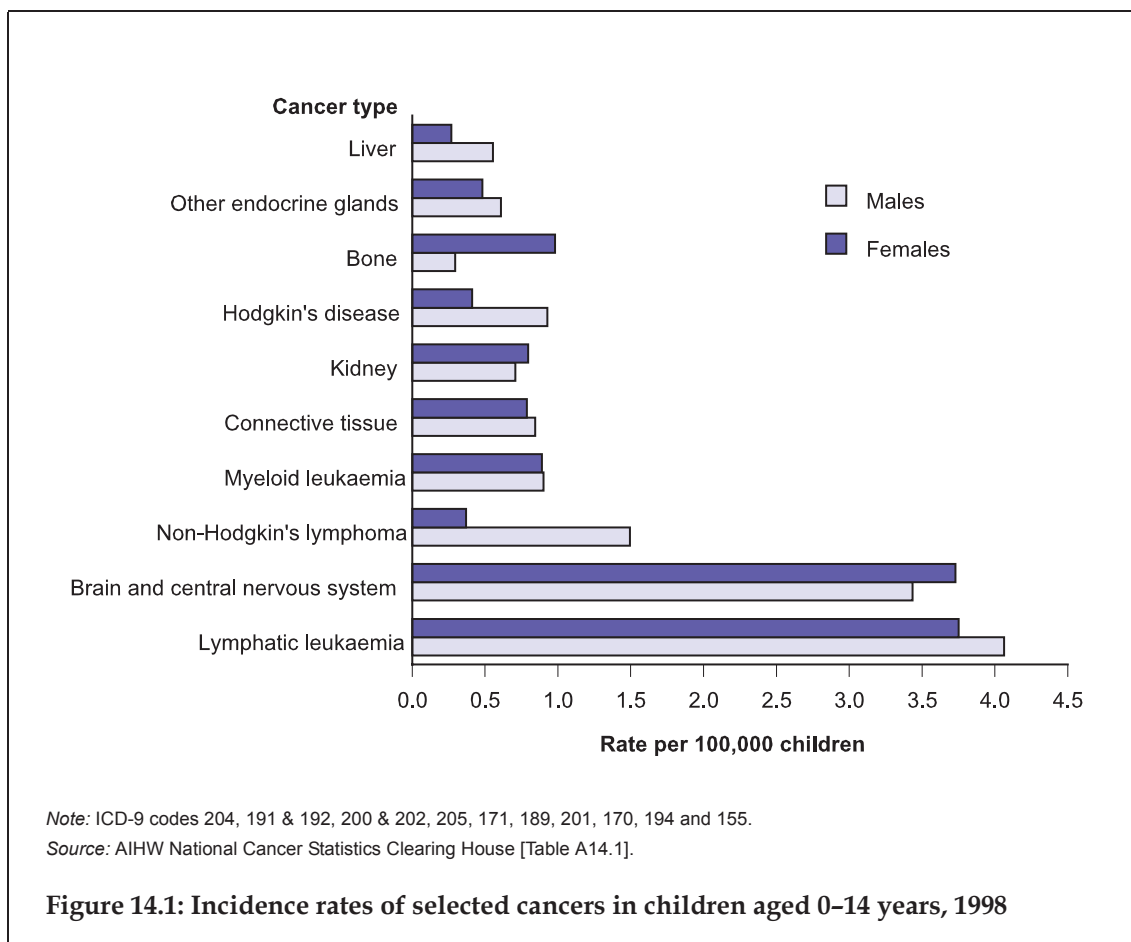
	Age (years)	1991	1992	1993	1994	1995	1996	1997	1998
Males	0–4	22.1	20.8	24.1	23.6	24.0	23.3	21.6	21.3
	5–9	11.6	13.9	10.4	13.2	13.6	10.9	12.8	13.3
	10–14	11.4	11.4	14.6	13.9	11.9	15.8	13.8	13.7
	0–14	15.1	15.4	16.4	16.9	16.5	16.7	16.1	16.1
Females	0–4	17.8	19.3	19.1	17.1	18.6	19.2	20.7	19.4
	5–9	9.5	10.4	8.3	10.9	9.5	12.1	7.0	11.2
	10–14	12.4	11.2	13.0	10.4	9.8	14.3	11.9	12.5
	0–14	13.2	13.7	13.5	12.8	12.7	15.2	13.2	14.4
Persons	0–14	14.2	14.5	15.0	14.9	14.7	15.9	14.7	15.2

Note: ICD-9 codes 140–208 (excluding 173).

Source: AIHW National Cancer Statistics Clearing House.

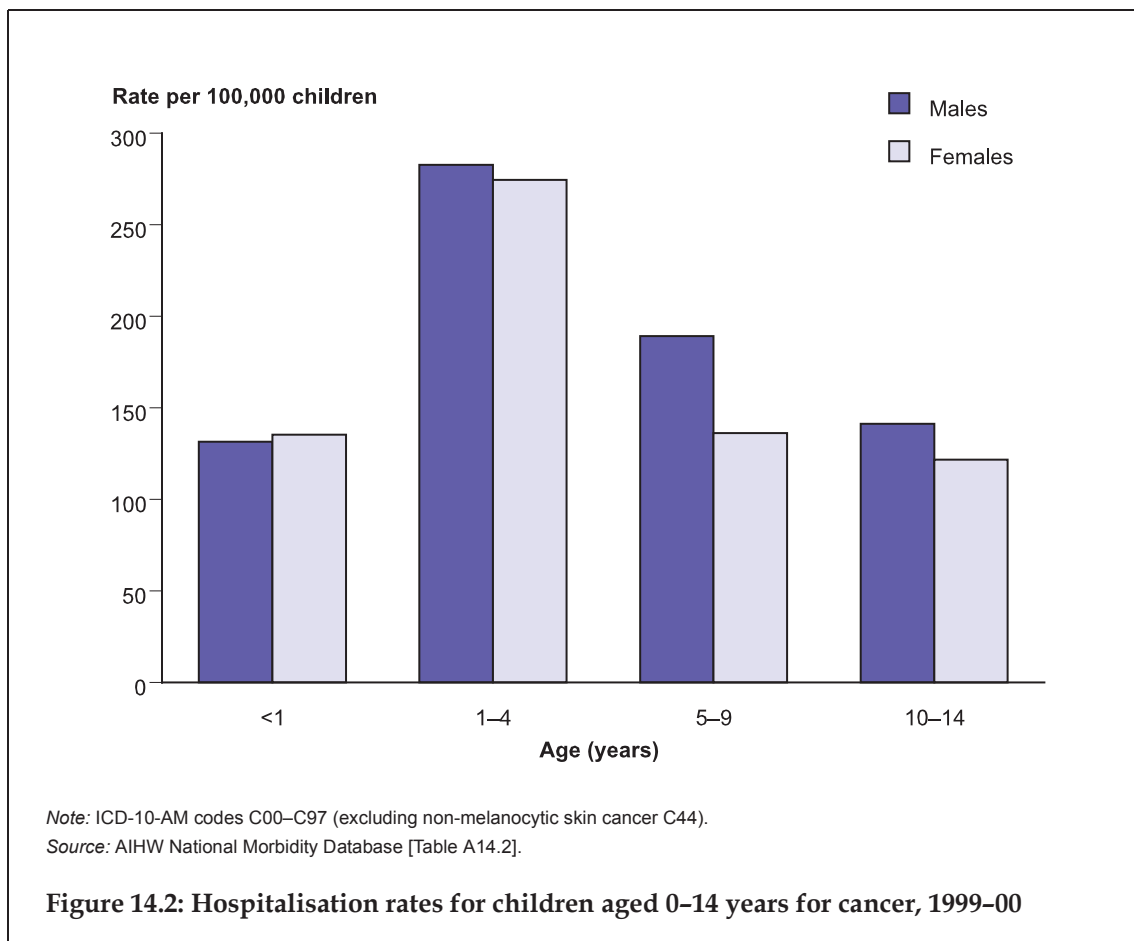
- Between 1991 and 1998, there were 4,603 new cases of cancer diagnosed in children aged 0–14 years, with 56% of the cases reported in boys and 44% in girls. Annual incidence rates ranged from 15.1 to 16.9 per 100,000 boys and from 12.7 to 15.2 per 100,000 girls. This is consistent with studies showing very little change in the incidence of cancer in children in the last two decades (Linnet et al. 1999).
- In all years examined, and in most age groups, rates were consistently higher for boys than for girls.
- In 1998, cancer incidence was highest in children aged 0–4 years (21.3 per 100,000 boys, 19.4 per 100,000 girls), followed by those aged 10–14 years (13.7 per 100,000 boys, 12.5 per 100,000 girls). This is a reflection of the fact that some types of cancers are more common in children of particular ages than others, although cancer can develop in children of any age. For example, Hodgkin's lymphoma tends to occur in children aged 10 years or older, while leukaemia, liver, kidney and endocrine cancers are more common among children aged less than 10 years, and most common among children aged 0–4 years.

The incidence rates for the most common types of cancer among children aged 0–14 years in 1998 are shown in Figure 14.1.



- The most common types of cancers among children aged 0-14 years in 1998 were lymphatic leukaemia (4.1 per 100,000 boys, 3.8 per 100,000 girls) and cancers of the brain and the central nervous system (3.4 for boys, 3.7 for girls). These accounted for nearly 44% of all cancers diagnosed in this age group (AIHW & AACR 2000).
- The incidence rate of non-Hodgkin's lymphoma was almost 4 times higher in boys than in girls (1.5 compared with 0.4), while rates for Hodgkin's disease were twice as high in boys as in girls (0.9 compared with 0.4).

Hospitalisations

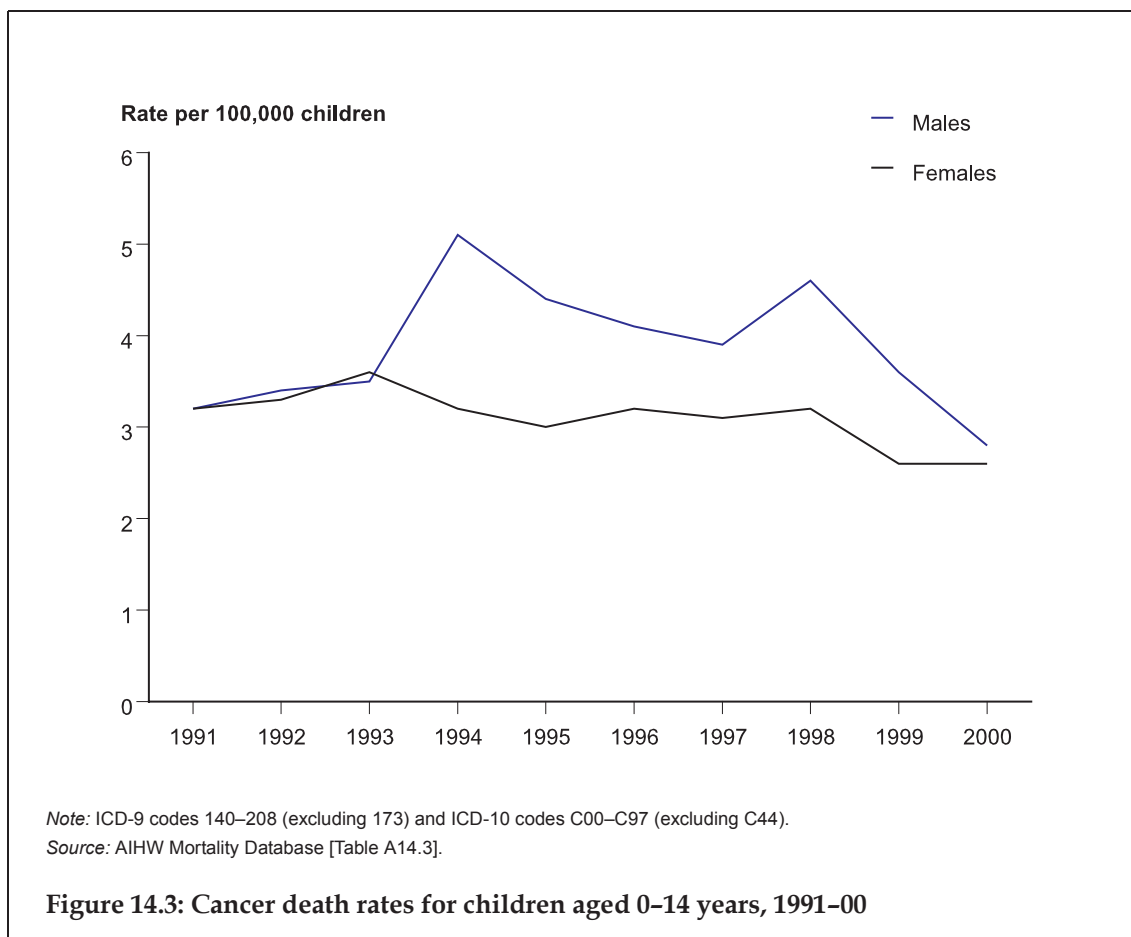


- In 1999–00, there were 7,094 hospitalisations of children aged 0–14 years for cancer. The overall rate of hospitalisation was 181.8 per 100,000 children.
- The rate for boys was 194.5, compared with 168.4 for girls. Older boys were hospitalised at a higher rate than girls, while among those aged under 5 years, the rates were very similar.
- The rate varied by age, with children aged 1–4 years hospitalised at the highest rate: 278.7, compared with 133.3 for infants, and 163.4 and 131.7 for children aged 5–9 and 10–14 years, respectively.

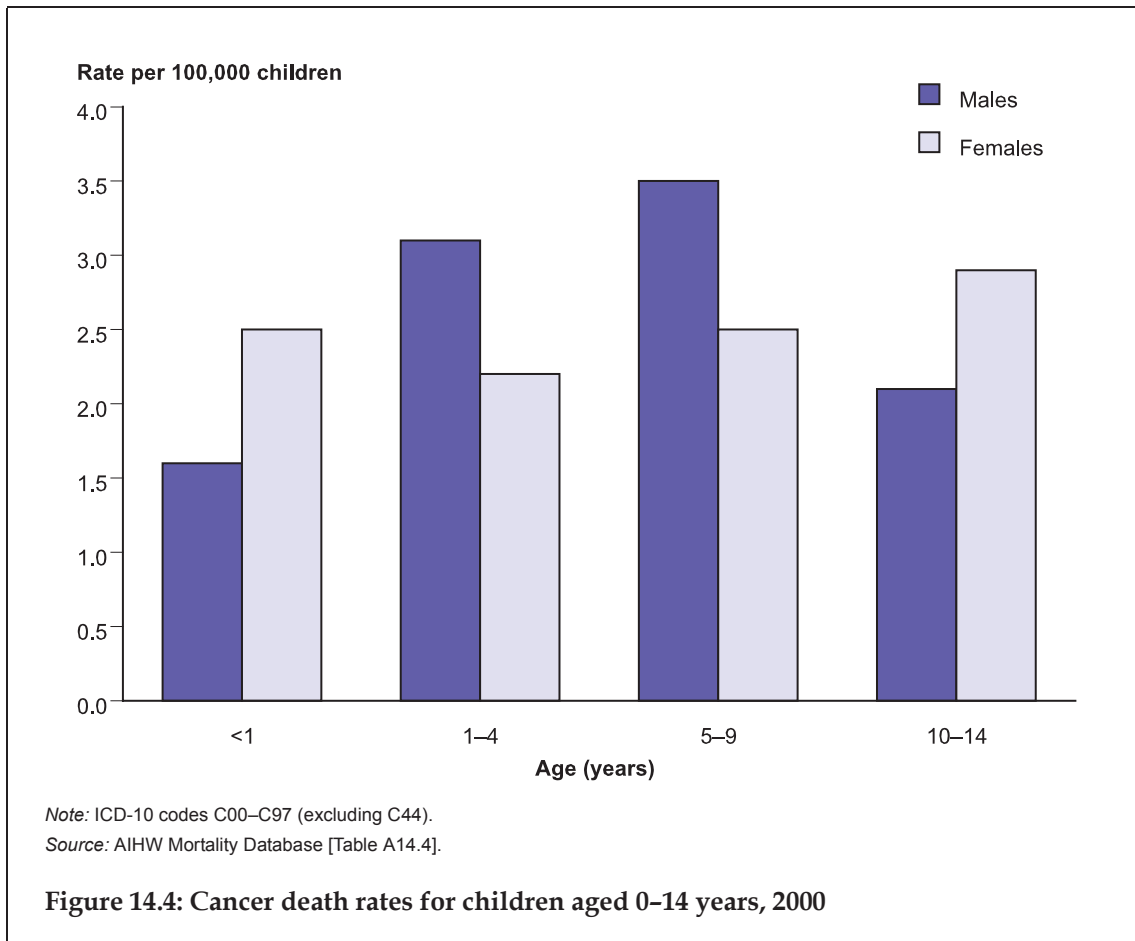
The impact of cancer can also be examined in terms of the length of time children spent in hospital. In 1999–00, there were 25,441 hospital bed days for which cancer was the principal diagnosis, with an average length of stay in hospital of 3.5 days. Cancer was also responsible for an additional 9,836 bed days where it was not the main reason for hospital stay but where it had to be managed during hospitalisations for other conditions.

Deaths

The indicator for cancer deaths is the number of deaths from cancer in children aged 0–14 years in a given year as a rate per 100,000 children.

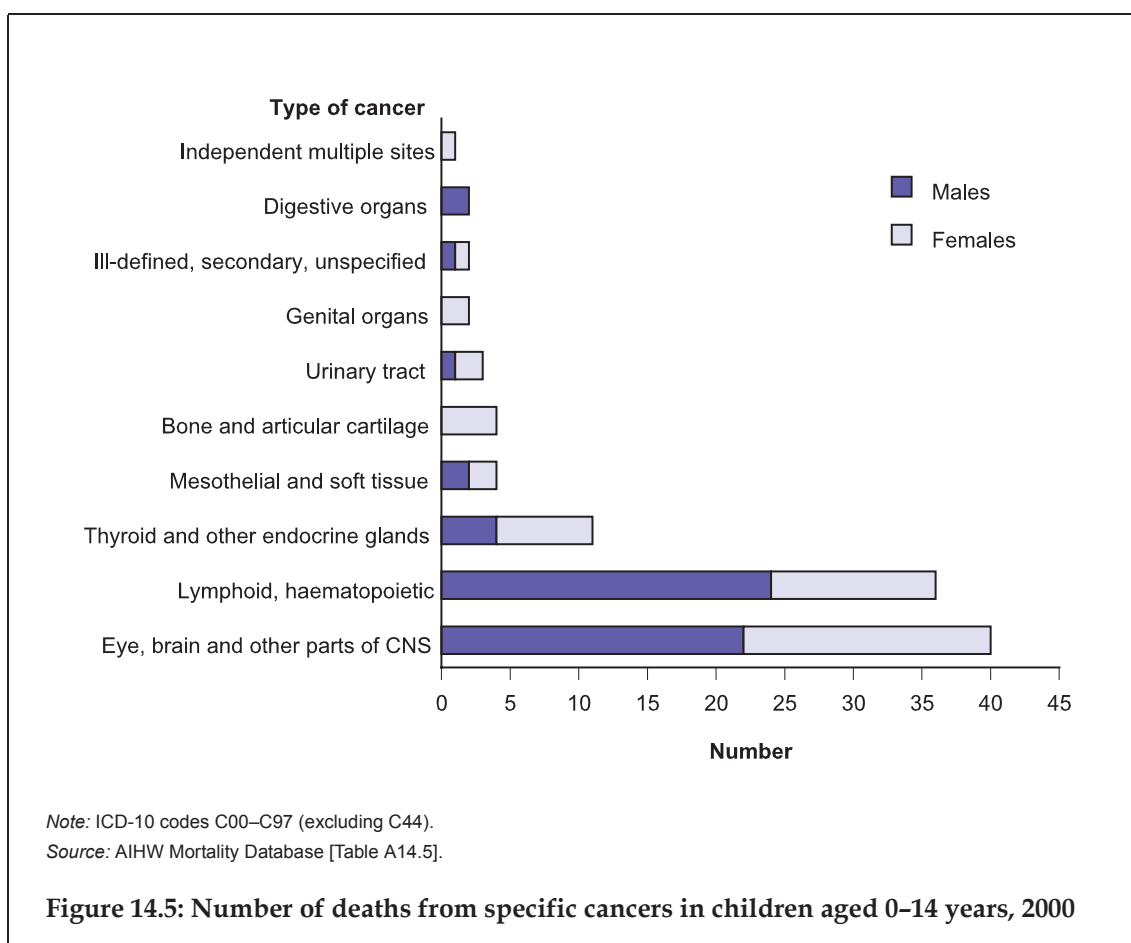


- Between 1991 and 2000, 1,353 children aged 0–14 years died from cancer, with a higher proportion of deaths of boys (57%) than girls (43%).
- The death rate ranged between 3.1 and 4.2 per 100,000. Boys generally had a higher rate than girls.
- The highest mortality rate for boys was 5.1 in 1994 and the lowest was 2.8 in 2000. The rate for girls in 1999 and 2000 was the lowest over the 10-year period (2.6 in both years).



- In 2000, for children aged 1–4 and 5–9 years, the death rate from cancer was higher for boys than for girls. However, the opposite was true for infants and those aged 10–14 years.
- The rate for most cancers was highest for children aged 0–4 years and lowest for those aged 10–14. This may partly reflect the different survival rates for the types of cancer affecting different age groups.

Deaths from specific cancers are shown in Figure 14.5.



- In 2000, 105 children died from cancer. More boys (53%) died than girls (47%).
- Most of the deaths (38%) were due to cancer of the eye, brain and other parts of the central nervous system; 34% were due to cancers of lymphoid and haematopoietic tissues.
- The cancers with the highest incidence were not necessarily the ones causing the most deaths. This is due to differences between cancers in treatment success and survival rates.

Aboriginal and Torres Strait Islander children

Between 1998 and 2000 in Queensland, Western Australia, South Australia and the Northern Territory, 7 Aboriginal and Torres Strait Islander children aged 0–14 years died from cancer. Of these children, 3 were boys and 4 were girls.

Children in metropolitan, rural and remote areas

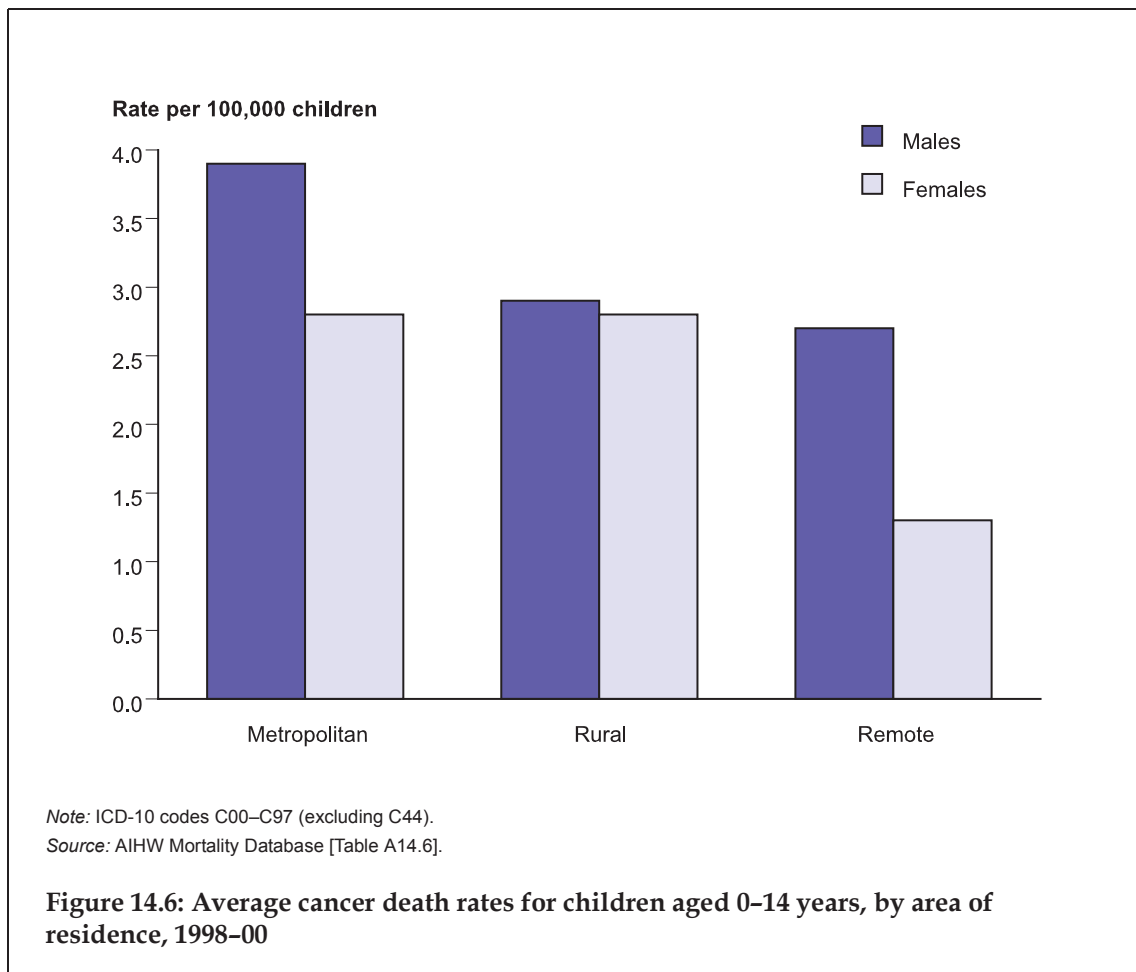
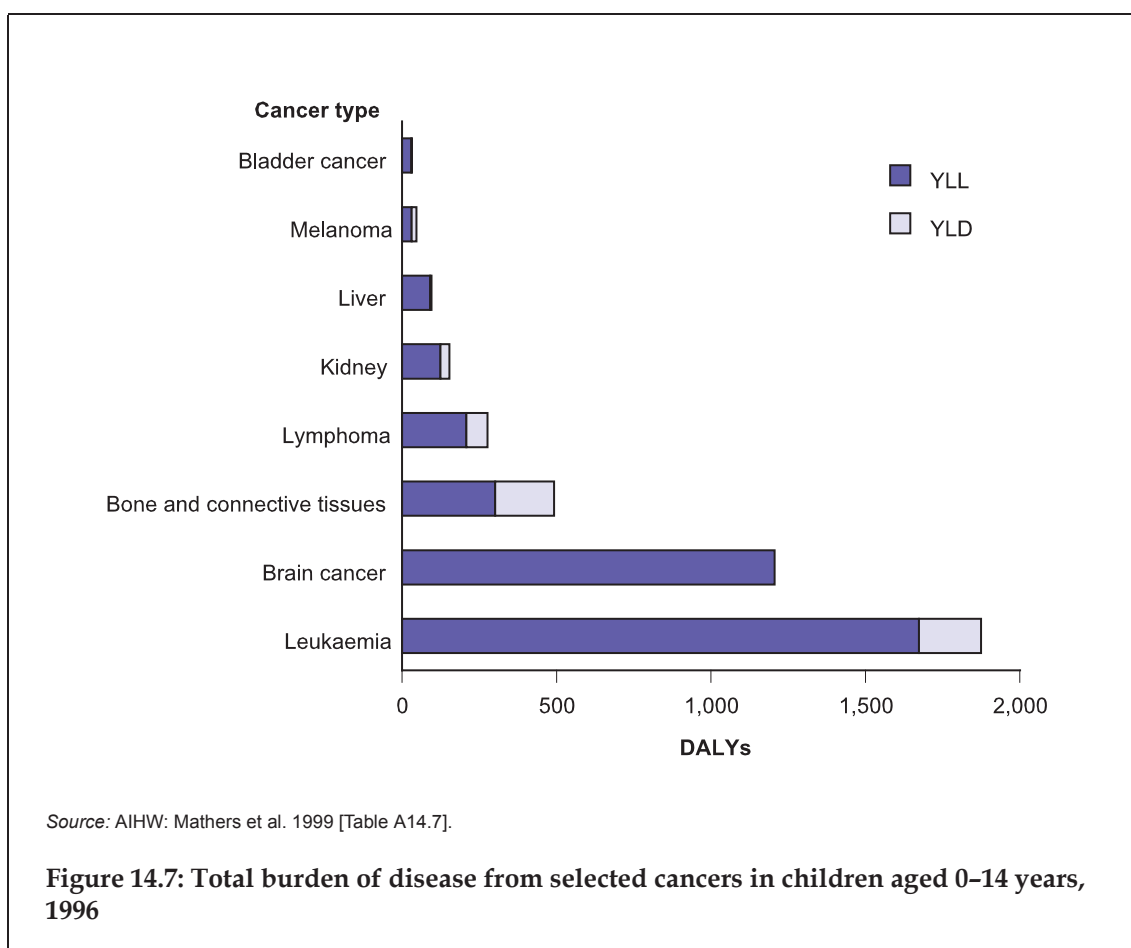


Figure 14.6: Average cancer death rates for children aged 0-14 years, by area of residence, 1998-00

- Cancer death rates in 1998-00 were higher for children living in metropolitan and rural areas than for those living in remote areas (3.4 and 2.9 per 100,000 children in metropolitan and rural areas and 2.1 per 100,000 children in remote areas).
- In all areas, rates were higher for boys than girls.

Burden of disease attributable to cancer

In 1996, cancer was estimated to account for 0.2% of the total disease burden in children aged 0-14 years (4,960 DALYs). The total burden of disease was higher in boys (57% of total) than in girls (43%). Cancer caused a far greater mortality burden (4,307 YLL; 87% of total) than disability burden (654 YLD; 13%) (Figure 14.7).



- The cancers responsible for the greatest proportion of the total burden of disease in 1996 were leukaemia (38% of the cancer disease burden), brain cancer (24%), and cancer of the bone and connective tissues (10%).

