

A Summary of Childhood Cancer Statistics in Australia, 1983–2018

The impacts of a diagnosis of cancer for a child and their families are immense. Although large gains have been seen in survival over recent decades, cancer remains one of the most common causes of death among children aged under 15 years in Australia.

Beyond the loss of young lives, the burden of childhood cancer extends to the long-term adverse health effects experienced by a large proportion of childhood cancer survivors, either because of the cancer itself or as a result of treatment.

The information presented in this document summarises some of the latest findings from the Australian Childhood Cancer Registry, including data on incidence (how many children are diagnosed with cancer), survival (how many children with cancer remain alive for a given period of time, usually 5 years) and mortality (how many children die from cancer).

WHAT IS THE AUSTRALIAN CHILDHOOD CANCER REGISTRY (ACCR)?

- The ACCR is one of the longest-running and most comprehensive national registries of childhood cancer in the world.
- It includes all children aged under 15 who are diagnosed with cancer in Australia.
- The ACCR is funded and managed by Cancer Council Queensland.
- It operates in collaboration with the Australasian Association of Cancer Registries, all Australian State and Territory population cancer registries and all paediatric oncology treating hospitals.
- The purpose of the ACCR is to produce and publish statistical information about childhood cancer in Australia and thereby to facilitate research to continue to improve outcomes for children with cancer.
- Detailed and verified data is currently available in the ACCR for the period 1983–2018.

HOW MANY CHILDREN ARE DIAGNOSED WITH CANCER IN AUSTRALIA?

- On average, approximately 790 children aged 0–14 years old were diagnosed with cancer each year in Australia between 2014 and 2018, corresponding to an age-standardised rate of 172 cases per million children per year.
- Australia was estimated to have the sixth highest incidence rate of childhood cancers among countries in the G20, following Italy, Canada, Turkey, Germany and the United States (Figure 1).

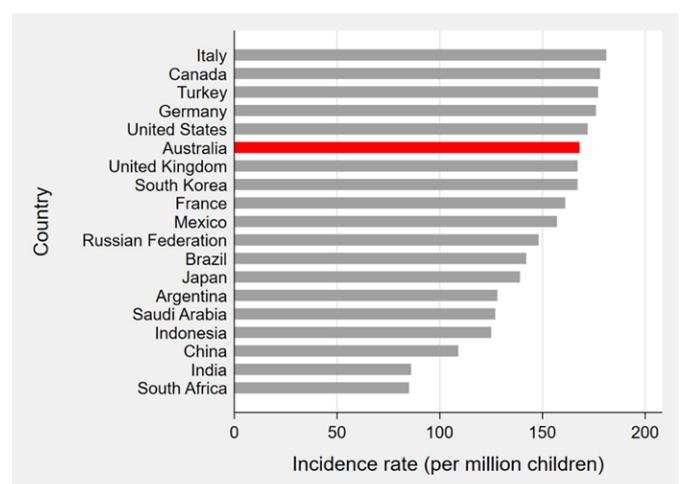


Figure 1: Estimated childhood cancer incidence rates for G20 countries, 2020
Source: Global Cancer Observatory, International Agency for Research on Cancer.

- Childhood cancer incidence rates were 11% higher for boys (181 per million boys per year) than for girls (163 per million girls per year).
- Almost half (46%) of all children diagnosed with cancer in Australia were aged 0–4 years old at diagnosis.
- The three most common types of childhood cancer were acute lymphoid leukaemia (24%), astrocytoma (10%) and neuroblastoma (6%).

HOW HAVE CHILDHOOD CANCER INCIDENCE RATES IN AUSTRALIA CHANGED OVER TIME?

- After adjusting for changes in the population, the modelled incidence rate of all childhood cancers combined in Australia increased by a total of 32% between 1983 and 2018 (Figure 2). The most recent trend has seen a slow but steady increase of 0.5% per year on average between 1993 and 2018 (12% increase in total over that period).

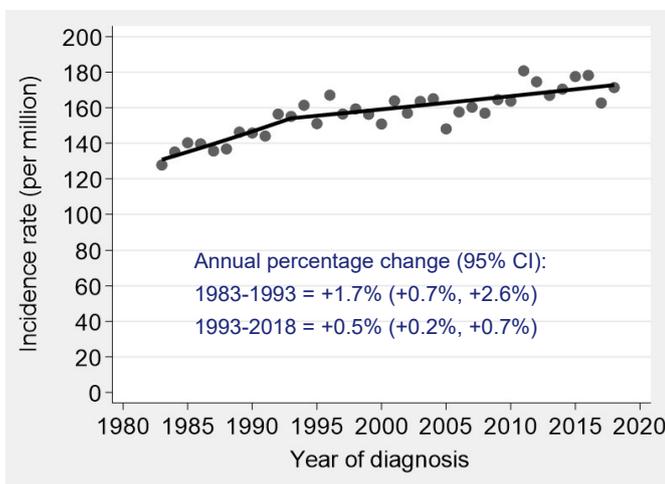


Figure 2: Incidence rate trend for all childhood cancers combined, Australia, 1983-2018. Rates were age-standardised to the 2001 Australian Standard Population. Trends modelled using joinpoint regression (<http://surveillance.cancer.gov/joinpoint/>).

- Significantly increasing trends in incidence rates over the entire period from 1983 to 2018 were observed for Burkitt lymphoma (+1.6% per year on average), germ cell tumours (+1.3%), osteosarcoma (+1.1%), intraspinal & intracranial embryonal tumours (mostly medulloblastoma, +0.6%) and lymphoid leukaemia (+0.5%). In contrast, there has been an ongoing decrease of 0.8% per year for non-Hodgkin lymphoma (excluding Burkitt lymphoma) over the entire period while incidence rates of melanoma have decreased rapidly by an average of 6.8% per year since 1996.
- Note that it is difficult to interpret incidence rate trends given the limited understanding of the causes of most cases of childhood cancer. Unlike adult cancer, lifestyle factors are rarely, if ever, involved. It is possible that diagnostic improvements and changes in data reporting may contribute to the observed increases, at least in part, but other factors are not clear.

WHAT ARE THE RATES OF SURVIVAL FOR CHILDREN IN AUSTRALIA FOLLOWING A DIAGNOSIS OF CANCER?

- As at the end of 2018, five-year relative survival¹ for all children diagnosed with cancer in Australia between 2008 and 2017 was 87%.

Table 1: Five-year relative survival by diagnostic group/subgroup, Australia, 2008-2017

Diagnostic group/subgroup (c)	Five-year relative survival estimate (a) (95% CI) (b)
I. Leukaemias, myeloproliferative & myelodysplastic diseases	90.4 (89.0-91.6)
Ia. Lymphoid leukaemias	93.3 (92.0-94.4)
Ib. Acute myeloid leukaemias	76.4 (71.1-80.8)
II. Lymphomas & reticuloendothelial neoplasms	95.4 (93.6-96.7)
IIa. Hodgkin lymphoma	99.7 (97.3-100)
IIb. Non-Hodgkin lymphoma	89.5 (84.6-92.8)
IIc. Burkitt lymphoma	94.3 (88.8-97.1)
III. Central nervous system & intracranial/intraspinal neoplasms (d)	77.8 (75.7-79.7)
IIIa. Ependymomas and choroid plexus tumours (d)	79.0 (71.7-84.6)
IIIb. Astrocytomas (d)	86.3 (83.4-88.7)
IIIc. Intracranial & intraspinal embryonal tumours (d)	61.8 (55.9-67.1)
IIId. Other gliomas (d)	49.5 (42.1-56.4)
IV. Neuroblastoma & other peripheral nervous cell tumours	78.3 (74.0-82.0)
IVa. Neuroblastoma & ganglioneuroblastoma	78.2 (73.8-81.9)
V. Retinoblastoma	99.0 (95.3-99.9)
VI. Renal tumours	92.2 (88.7-94.6)
VIa. Nephroblastoma & other nonepithelial renal tumours	93.2 (89.9-95.5)
VII. Hepatic tumours	80.0 (70.8-86.6)
VIIa. Hepatoblastoma	83.5 (74.0-89.8)
VIII. Malignant bone tumours	76.2 (70.1-81.3)
VIIIa. Osteosarcomas	64.7 (54.5-73.1)
VIIIc. Ewing tumours & related bone sarcomas	86.4 (78.3-91.6)
IX. Soft tissue & other extraosseous sarcomas	78.5 (73.8-82.4)
IXa. Rhabdomyosarcomas	78.5 (71.7-83.9)
X. Germ cell tumours, trophoblastic tumours & neoplasms of gonads (d)	97.3 (94.5-98.7)
XI. Other malignant epithelial neoplasms & melanomas	96.1 (93.4-97.8)
XIa. Melanomas	97.4 (89.6-99.5)

Notes: a.) Relative survival estimates were calculated using the cohort method for children diagnosed with cancer between 1 Jan 2008 and 31 Dec 2017, with follow-up on mortality status to 31 Dec 2018. b.) 95% confidence interval shown in brackets. c.) Defined using the International Classification of Childhood Cancers, version 3 (ICCC-3). d.) Includes intracranial and intraspinal tumours of benign or uncertain behaviour.

- Survival rates varied widely depending on the type of cancer. Almost all children who were diagnosed with either Hodgkin lymphoma (>99%) or retinoblastoma (99%) survived for at least five years. Five-year relative survival rates were also high for children with melanoma (97%), germ cell tumours & neoplasms of gonads (97%), Burkitt lymphoma (94%), lymphoid leukaemia (93%) and nephroblastoma (Wilms tumour, 93%). In contrast, only 50% of children with other gliomas, 62% of those with intracranial & intraspinal embryonal tumours and 65% of those with osteosarcoma survived for at least 5 years from their date of diagnosis (Table 1).
- Five-year survival rates for childhood cancer in Australia generally compare favourably to recent estimates from similar countries in North America and Europe. For example, the latest overall five-year survival reported was 85% in the United States (2011–2017)² and 84% in the United Kingdom (2012–2016)³, compared to 87% in Australia (2008–2017).

¹ Relative survival measures the survival of children with cancer compared to the survival of children of the same age and sex in the general population.

² Source: SEER Cancer Statistics Review, 1975-2018 (https://seer.cancer.gov/csr/1975_2018/)

³ Source: Children, teenagers and young adults UK cancer statistics report 2021 (<http://www.ncin.org.uk/publications>)

HOW HAVE SURVIVAL RATES FOR CHILDREN WITH CANCER IN AUSTRALIA CHANGED OVER TIME?

- Five-year relative survival for all childhood cancers combined improved significantly from 73% for children diagnosed between 1983–1995 to 87% for those diagnosed between 2008–2017 (Figure 3).
- Large improvements in five-year relative survival have occurred over the previous three decades for lymphoid leukaemia (76% for children diagnosed between 1983–1995 compared to 93% for those diagnosed between 2008–2017), acute myeloid leukaemia (47% to 76%), non-Hodgkin lymphoma (77% to 90%), Burkitt lymphoma (76% to 94%), ependymoma and choroid plexus tumours (65% to 79%), astrocytoma (78% to 86%), intracranial and intraspinal embryonal tumours (51% to 62%), neuroblastoma (53% to 78%), Ewing sarcoma (64% to 86%), rhabdomyosarcoma (64% to 79%) and germ cell tumours & neoplasms of gonads (86% to 97%). However, there has been little or no improvement in survival for some other types of childhood cancer, most notably other gliomas, hepatoblastoma and osteosarcoma.
- Most of the gains in childhood cancer survival have occurred as a direct result of improvements in treatment through international collaborative clinical trials.

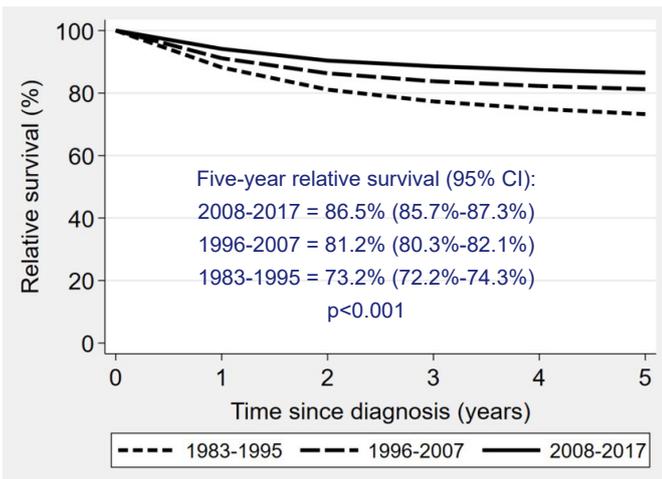


Figure 3: Relative survival for all childhood cancers combined by year of diagnosis, Australia, 1983–2017. Relative survival estimates were calculated using the semi-complete cohort method with follow-up on mortality status to 31 Dec 2018.

HOW MANY CHILDREN DIE FROM CANCER IN AUSTRALIA?

- There were an average of approximately 94 deaths per year due to cancer among children under 15 years in Australia between 2014 and 2018, equating to an age-standardised mortality rate of 21 deaths per million children per year.
- Australia was estimated to have the lowest childhood cancer mortality rate among all G20 countries, equal to Japan and somewhat less than either the United States or the United Kingdom (Figure 4).

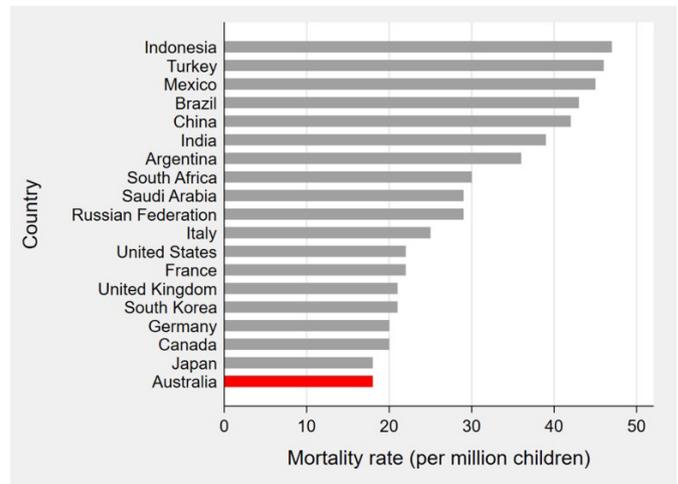


Figure 4: Estimated childhood cancer mortality rates for G20 countries, 2020. Source: Global Cancer Observatory, International Agency for Research on Cancer.

- Tumours of the central nervous system (mainly brain tumours) accounted for the largest number of cancer deaths among children under 15 years in Australia (43%), followed by leukaemia (24%) and neuroblastoma (10%).

HOW HAVE CHILDHOOD CANCER MORTALITY RATES IN AUSTRALIA CHANGED OVER TIME?

- Overall childhood cancer mortality rates decreased by an average of 2.8% per year between 1998 and 2018, a total decrease of 43% based on the modelled estimates (Figure 5).
- There was a very large reduction in mortality rates for childhood leukaemia between 1998 and 2007 (59% in total), but mortality rates for leukaemia have remained fairly stable since then. There were smaller, ongoing reductions in mortality of around 1% per annum for tumours of the central nervous system and between 2–3% per annum for all other childhood cancers combined.

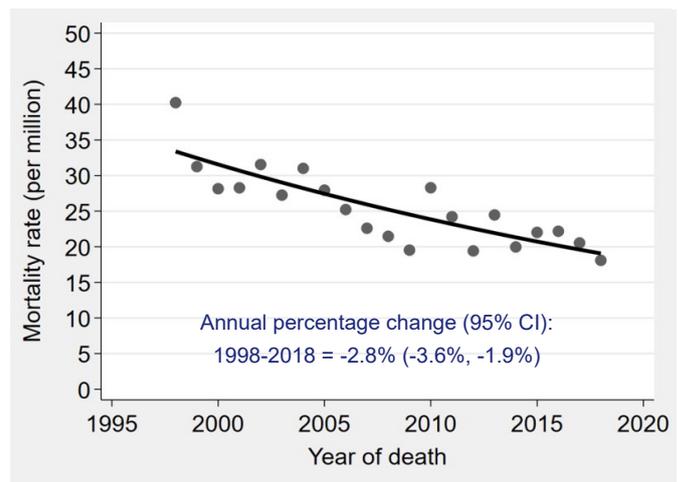


Figure 5: Cancer mortality rate trend for all children aged 0–14 combined, Australia, 1998–2018. Excludes children who died from cancer aged 15 years or older. Rates are age-standardised to the 2001 Australian Standard Population. Trends modelled using joinpoint regression (<http://surveillance.cancer.gov/joinpoint/>).

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 Data source (unless otherwise stated): Australian Childhood Cancer Registry, July 2022 extract.