What is the Australian Paediatric Cancer Registry (APCR)?

- The APCR is one of only a few national registries of childhood cancer in the world.
- It covers all Australian children aged 0-14 years old at diagnosis.
- Information is collected on cancer diagnosis, stage, treatment and survival, with the assistance of all Australian State and Territory cancer registries and major paediatric oncology hospitals.
- Detailed and verified data is currently available for the period 1983-2013.

How many children are diagnosed with cancer in Australia? (2009-2013)

- On average, about 710 children aged 0-14 years old were diagnosed with cancer each year in Australia between 2009 and 2013, corresponding to an age-standardised rate of 165 cases per million children per year.
- Australia has the fifth highest incidence rate of childhood cancers among countries in the G20, following Germany, the United States, South Korea and Canada.
- Leukaemias were the most common type of cancer diagnosed among Australian children (Figure 1), accounting for around one third (34%) of all cases, followed by tumours of the central nervous system (mainly brain tumours, 23%) and lymphomas (10%).
- Cancer incidence rates were higher for boys (179 per million boys per year) than for girls (151 per million girls per year).
- Almost half (48%) of all children diagnosed with cancer in Australia were aged 0-4 years old at diagnosis, with a median age of 5.

![Figure 1: Average number of cases of childhood cancer diagnosed per year by diagnostic group, Australia, 2009-2013](image)
How have childhood cancer incidence rates in Australia changed over time? (1983-2013)

- The overall incidence rate of childhood cancer increased significantly from 1983 until the mid-1990s, but has remained fairly constant since then (Figure 2).
- Significantly increasing trends in incidence rates were observed for leukaemias (0.8% per year on average), lymphomas (0.7%), tumours of the central nervous system (0.7%), hepatic tumours (2.5%) and germ cell tumours (1.7%) from 1983 to 2013. In contrast, the incidence rate trend for the diagnostic group of other malignant epithelial tumours (which includes melanoma) peaked in 1993 and has been decreasing by an average of 2.4% per year since then.
- It is difficult to interpret differences in incidence rate trends given the limited understanding of the causes of most cases of childhood cancer.

Figure 2: Incidence rates (observed and trend) for all childhood cancers, Australia, 1983-2013
What are the survival rates of children in Australia following a diagnosis of cancer?

- Relative survival* for all childhood cancers combined in Australia for the period 2004-2013 was 93% by the end of the first year after diagnosis and decreased to 84% after 5 years and 82% after 10 years.
- Survival rates for childhood cancer in Australia are among the best in the world. For example, the latest overall 5-year survival reported was 87% in Switzerland, 85% in Germany, 83% in the United States and Canada, 82% in the United Kingdom and France and 81% in the Netherlands, compared to 84% in Australia.
- There were quite large differences in survival rates according to the type of cancer. Almost all children (98%) who were diagnosed with retinoblastoma survived for at least 5 years. Five-year relative survival rates also exceeded 90% for lymphomas, germ cell tumours and other malignant epithelial neoplasms (including melanoma). In contrast, 5-year relative survival was more moderate (70-75%) for children with hepatic tumours (liver cancer), tumours of the central nervous system (mainly brain tumours), or neuroblastoma (Table 1).

### Table 1: Five-year relative survival by diagnostic group, Australia, 2004-2013

<table>
<thead>
<tr>
<th>Diagnostic group</th>
<th>Five-year relative survival estimate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinoblastoma</td>
<td>97.9 (94.0-99.4)</td>
</tr>
<tr>
<td>Lymphomas</td>
<td>93.6 (91.4-95.3)</td>
</tr>
<tr>
<td>Other malignant epithelial neoplasms</td>
<td>92.2 (88.1-94.9)</td>
</tr>
<tr>
<td>Germ cell tumours</td>
<td>90.3 (86.0-93.4)</td>
</tr>
<tr>
<td>Renal tumours</td>
<td>89.6 (85.7-92.5)</td>
</tr>
<tr>
<td>Leukaemias</td>
<td>88.2 (86.8-89.5)</td>
</tr>
<tr>
<td>Malignant bone tumours</td>
<td>78.9 (73.4-83.4)</td>
</tr>
<tr>
<td>Soft tissue sarcomas</td>
<td>76.5 (71.8-80.4)</td>
</tr>
<tr>
<td>Neuroblastoma</td>
<td>73.9 (69.4-77.9)</td>
</tr>
<tr>
<td>Tumours of the central nervous system</td>
<td>73.8 (71.5-76.0)</td>
</tr>
<tr>
<td>Hepatic tumours</td>
<td>72.1 (62.2-79.9)</td>
</tr>
</tbody>
</table>

Abbreviation: 95% CI = 95% confidence interval.

*Note: Relative survival measures the survival of children with cancer compared to the survival of children of the same age in the general population.
How have survival rates for children with cancer in Australia changed over time?

- Five-year relative survival for all childhood cancers combined improved from 72% for the period 1983-1993 to 84% for 2004-2013 (Figure 3).
- Significant improvements in survival were found for the diagnostic groups of leukaemias, lymphomas, neuroblastoma and malignant bone tumours. There has been little or no improvement in survival for several other types of childhood cancer over recent years, particularly hepatic tumours.
- 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 by risk period for all childhood cancers, Australia, 1983-2013](image-url)
How many children die from cancer in Australia? (2009-2013)

- On average, there were approximately 100 deaths per year due to cancer for children under the age of 15 in Australia between 2009 and 2013.
- Australia has the lowest childhood cancer mortality rate among all G20 countries (Figure 5).
- Tumours of the central nervous system (mainly brain tumours) account for the largest number of cancer deaths for children in Australia (40%), followed by leukaemias (23%) and neuroblastoma (12%).

![Graph showing cancer mortality rates for G20 countries, 2012](source: Globocan, International Agency for Research on Cancer.)
How have childhood cancer mortality rates in Australia changed over time? (1998-2013)

- Overall childhood cancer mortality rates decreased by an average of 3.0% per year between 1998 and 2013, or a total decrease of 37%.
- This reduction in mortality rates is mainly being driven by a large decreasing trend in deaths due to leukaemia (-7.3% per year on average).

Figure 5: Mortality rates (observed and trend) for all childhood cancers, Australia, 1998-2013

Data source: Australian Paediatric Cancer Registry, May 2016 extract (including incidence and mortality data for 1983 to 2013 except for NSW and ACT where data was imputed for 2012 and 2013).