Youth Cancer in Queensland

An overview-1982-2014

15-24 year olds

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Why develop the youth cancer report?

The Youth Cancer in Queensland report has been developed by the Cancer Alliance Queensland which brings together the Cancer Control Safety and Quality Partnership (The Partnership), Queensland Cancer Control Analysis Team (QCCAT) and the Queensland Cancer Register (QCR). The Cancer Alliance Queensland supports a clinician-led, safety and quality program for cancer across Queensland. The Partnership was gazetted as a quality assurance committee under Part 6, Division 1 of the Hospital and Health Boards Act 2011 in 2004. A key role of the Partnership is to provide cancer clinicians, Hospital and Health Services (HHSs), Hospitals and Queensland Health with cancer information and tools to deliver the best patient care.

The Youth Cancer in Queensland report is a tool for reviewing, comparing and sharing with the public, information about cancer incidence, mortality and survival for persons aged between 15-24. The Partnership has prepared this report to assist cancer clinicians and administrators to improve patient care. In some cases it may prompt a change in the delivery and organisation of cancer services to improve health outcomes and performance.

Where has the data come from?

Since 2004 QCCAT have compiled and analysed a vast amount of information about cancer incidence, morbidity, mortality, survival, cancer treatments and outcomes.

Key to QCCAT's program of work is the ability to match and link population based cancer information on an individual patient basis. This matched and linked data is housed in the Queensland Oncology Repository (QOR), a resource managed by QCCAT. The Queensland Oncology Repository (QOR) is a cancer patient database developed and maintained by the Queensland Cancer Control Analysis Team (QCCAT; Queensland Health) to support Queensland's cancer control, safety, and quality assurance initiatives. QOR consolidates cancer patient information for the state and contains data on cancer diagnoses from the Queensland Cancer Register (QCR) and deaths, Queensland Hospital Admissions Data Collection (QHAPDC), surgery, radiation therapy and intravenous systemic therapy. QOR also includes data collected in QOOL™ by clinicians at multidisciplinary team (MDT) meetings across the state. QOR contains approximately 32 million records between 1982 – 2014. Our matching and linking processes provide the 492,583 matched and linked records of cancer patients between 2005 – 2014 which provides the data for this report.

Message from the Chair

As Chair of the Queensland Cancer Control Safety and Quality Partnership I am pleased to introduce our first comprehensive epidemiological report of cancer incidence and survival for persons aged between 15-24 years of age who reside in Queensland. This report is a complementary report to the *Cancer in Queensland: A statistical overview 1982-2021, Annual Update 2012*. Once again, our aim with this publication is to provide 'data for today' and share the most up to date cancer data that is available.

The report begins with cancer projections for 2031 for 15-24 year olds. We follow up the projections with an analysis of cancer incidence, mortality and survival in Queensland for 15-24 year olds from 1982-2014. This data underpins our ability to estimate the impact of cancer in Queensland in 2031 for the 15-24 age group. It supports cancer services planning, evaluation and monitoring, and research.

We invite your feedback on the value and benefits of this report and hope that this information can make a positive contribution to the future of cancer care.

Professor David Theile AO
Chair
Queensland Cancer Control Safety and Quality Partnership

Highlights and summary

Youth Cancer in Queensland: An Overview 1982-2014, 15-24 year olds provides information on invasive cancer incidence and mortality for adolescents and young adults for the state. This report presents invasive cancer data for 2014 and projections for 2031, specifically for the 15-24 year age group. Comparative data for invasive cancer in children aged 0-14 years and adults aged 25-39 years in Queensland is also presented. This report aims to provide information on patterns and trends for invasive cancer, the largest cause of premature death and disability in Queensland[1].

Cancer incidence rates in Queensland for 15-24 year olds demonstrate a higher rate for males in outer regional areas and females in inner regional areas.

The growth in **new cases of cancer** for 15-24 year olds is largely being driven by population growth. The underlying cancer rate has increased only slightly since 1982:

- An annual average of 222 new cases of cancer for 15-24 year olds were diagnosed from 2012-2014; of these on average 108 were reported in males and 113 in females.
- Cancers have been classified in this report using the AYA SEER recode system[2]. Because thyroid carcinomas constitute a significant proportion of the total carcinoma group, have a different prognosis and treatment compared to other carcinomas, we have reported thyroid carcinomas separately from all other carcinomas in this report.
- The most common annual average cancer diagnoses in males aged 15-24 years were melanomas (22%, 24 cases), testicular germ cell tumours (20%, 22 cases) and lymphomas (18%, 19 cases). These three cancers account for a combined 60% of all 15-24 year old male cancers.
- The most common annual average cancer diagnoses in females were melanomas (29%, 33 cases) followed by assorted carcinomas (22%, 25 cases), thyroid carcinomas (13%, 15 cases) and lymphomas (13%, 15 cases) these cancers account for a combined total of 77% of cancers in females.
- In 2031, an estimated 280 new cases of cancer for 15-24 year olds will be diagnosed in Queensland.

The prevalence of cancer is increasing as more people are diagnosed with cancer and survival improves:

- By the end of 2014, 783 15-24 year olds were living with a diagnosis of cancer in the previous five years (0.12% of all 15-24 year old Queenslanders).
- Melanoma, followed by carcinomas and lymphomas were the most prevalent cancer diagnoses.

Cancer survival appears to be improving slightly for some cancers for 15-24 year olds:

- The average five-year relative survival for all cancers during 2010-2014 was 89%, compared to 85% during 1995-1999.
- The greatest gains in survival were observed for leukaemia and lymphoma.
- Five year relative survival decreased in males with bone sarcoma, and in both sexes for individuals diagnosed with various carcinomas.

Death from cancer in young people is rare. There were only a small number of cancer deaths for 15-24 year olds in Queensland:

- An annual average of 25 deaths each year were attributed to cancer in young people aged 15-24 years. On average, during 2012-2014, 13 deaths occurred in males and 11 deaths in females.
- In males, bone and soft tissue sarcoma was the most common cause of death from cancer, accounting for 38% of deaths. Central Nervous System (CNS) and Brain, and leukaemia (29% and 12% respectively) were the next most common causes of male cancer death.
- In females, carcinoma was the most common cause of cancer death accounting for 18% of deaths. CNS and Brain, and leukaemia (15% and 15%) were the next most common causes of female cancer death.

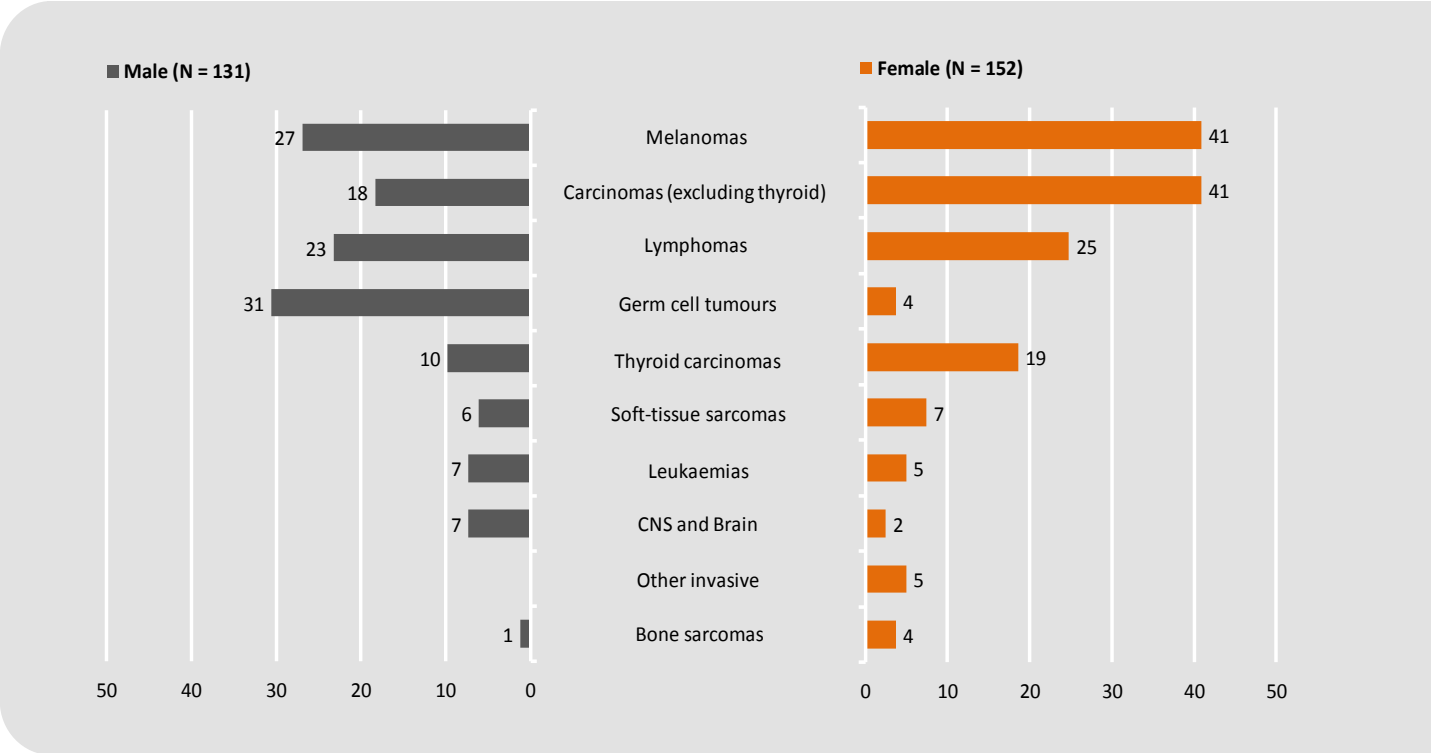
The mortality rate for cancer for 15-24 year olds across different geographical locations is generally low and consistent. Inner regional areas had slightly higher mortality rates for females while major city had higher mortality rates for males. These findings generally correspond with higher cancer incidence rates in regional areas compared with metropolitan areas.

Cancer projections

Cancer projections Queensland, 2031

In 2031, an estimated 280 new cases of invasive cancers will be diagnosed among 15-24 year old Queensland residents (Figure 1). In females, melanomas and carcinomas are expected to remain the most commonly diagnosed cancers. In males, testicular germ cell tumours and melanomas are expected to remain the most commonly diagnosed cancers.

Figure 1: Expected cancer incidence, common cancers, Queensland, 2031, 15-24 year olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team. The figures, which have been rounded to the nearest five cases, are provided as a guide and should be used with care. Projections are calculated by applying the most recent of cancer rates (2014), stratified by age and sex, to the expected Queensland population in 2031.

These projections provide an indication of the likely burden of cancer and the demand for cancer services in 2031. As with any forecast, these projections should be used with care and amended to reflect local trends wherever possible. Projection numbers for mortality were not included as the numbers were deemed too small to be projected.

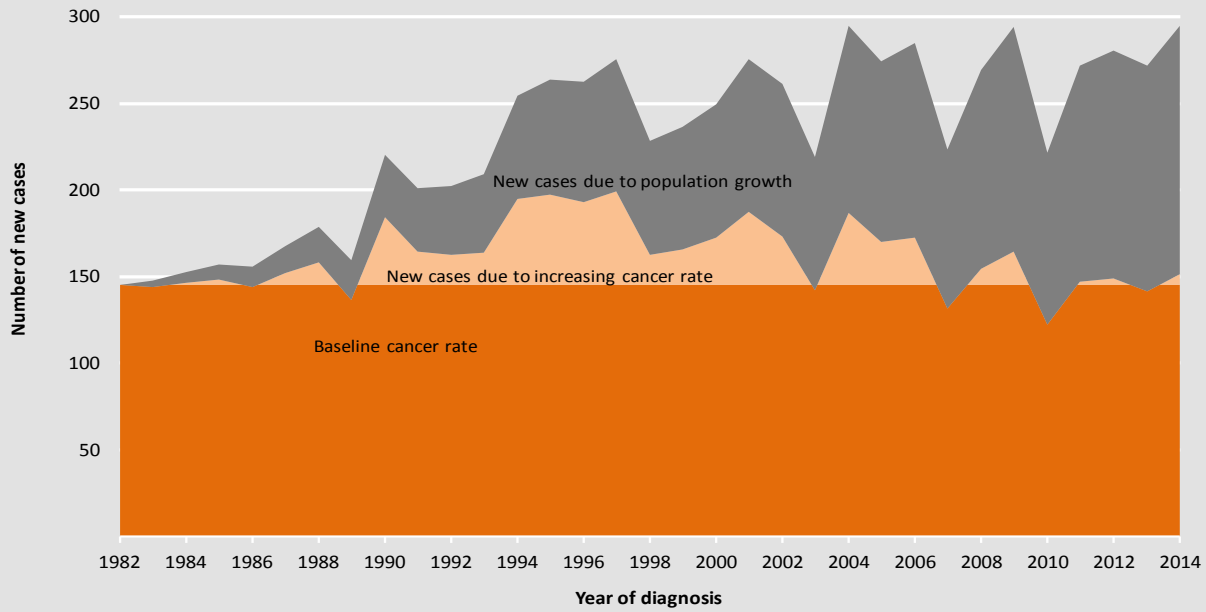
Youth Cancer in Queensland

Incidence and mortality

The annual average number of new cases of cancer among 15-24 year old Queensland residents has increased by 54% between 1984 and 2014. For males, the annual average number of new cases increased from 79 cases in 1984 to 107 cases (35% increase) in 2014; for females, the annual average number of new cases increased from 70 to 123 cases (76%). These increases are due largely to population growth (Figure 2).

Queensland's population increased from 2.4 million in 1982 to 4.7 million in 2013, an increase of 96%, making Queensland one of the fastest growing states in Australia and among the fastest in developed countries. Changes in the cancer incidence rate accounted for only a small proportion of the total increase in cancer diagnoses.

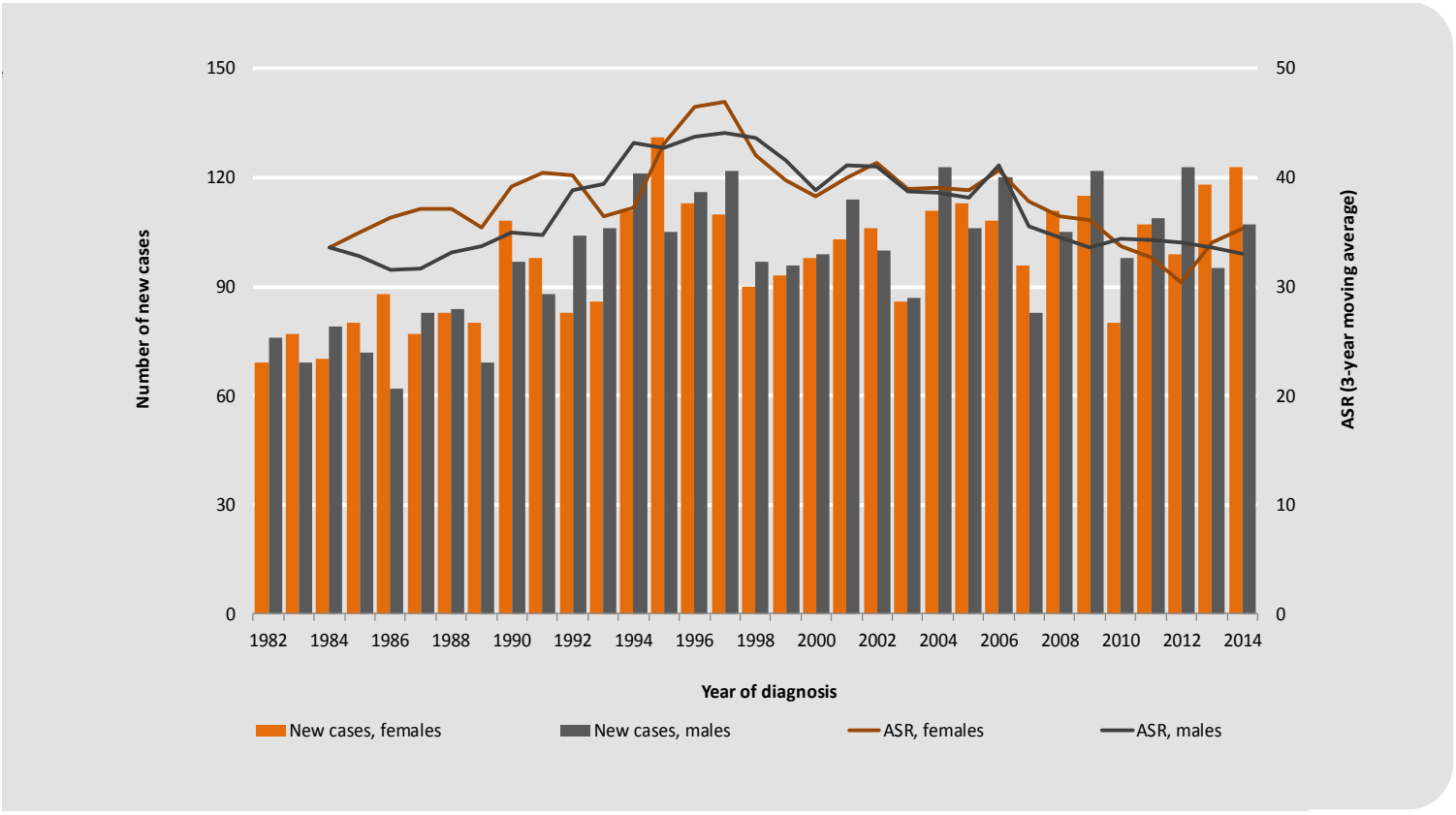
Figure 2: Growth in new cases of cancer, Queensland, 1982-2014, 15-24 year old



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

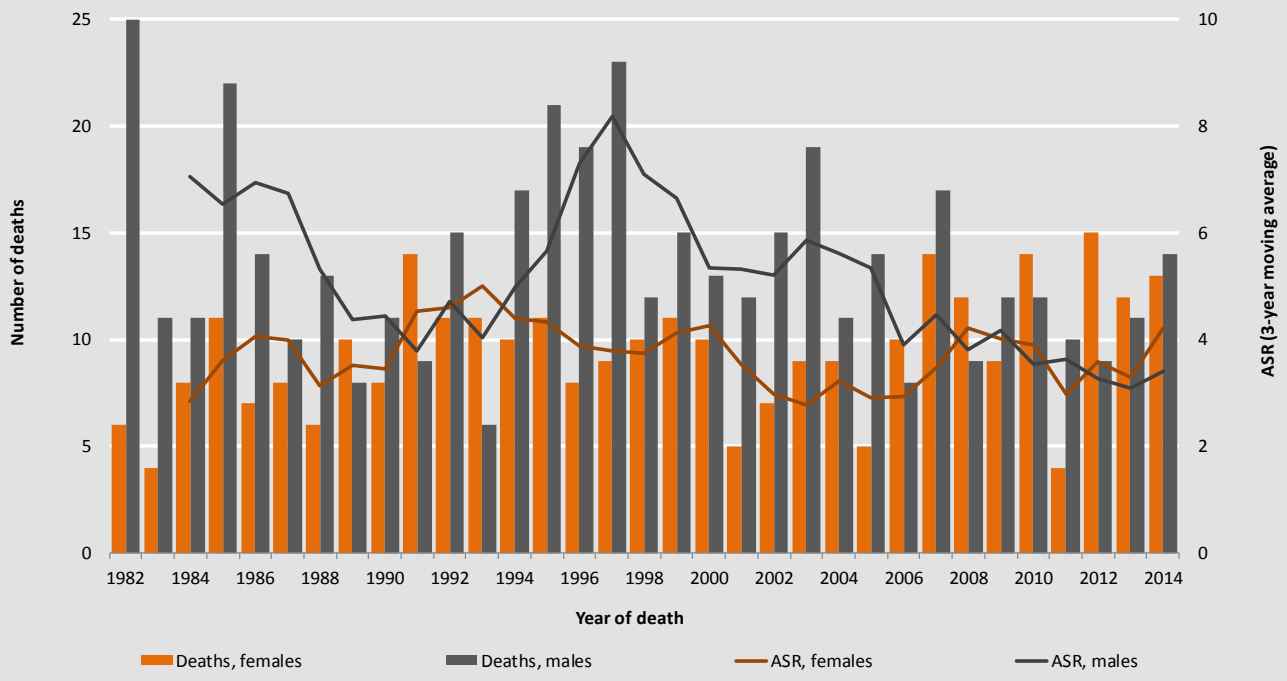
Trends in incidence rates for all invasive cancers and the number of new cases diagnosed annually for males and females, 15-24 years are summarised in figure 3. The incidence rate for all invasive cancers in 15-24 year olds rose in both males and females, reaching an annual average peak in males of 44 per 100,000 in 1996 and 47 per 100,000 in females in 1997. Incidence rates in current years have now fallen back to match what they were in 1984 with approximately 35 per 100,000 new cases in females and 33 per 100,000 new cases in males.

Figure 3: Trends in numbers and rates for all cancers, Queensland 1982-2014, 15-24 year olds



ASR: Age-standardised rate per 100,000, standardised to 2001 Australian population.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 4: Trends in numbers and rates for all cancer deaths, Queensland 1982-2014, 15-24 year olds



ASR: Age-standardised rate per 100,000, standardised to 2001 Australian population.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Mortality rates for 15-24 year olds due to cancer have been fairly low. Mortality rates for 15-24 year old males have been in decline since the late 1990s after sharply increasing in the early 1990s (Figure 4). Mortality rates for 15-24 year old females have generally continued to rise over time with a small decrease in the early 2000s.

Mortality rates have been in decline since the late 1990s for 15-24 year old males.

Most common cancers

In 2012-2014, there were an annual average of 222 new cases of cancer diagnosed in 15-24 years old (Figure 5). There were an annual average of 25 deaths attributable to cancer in 15-24 year olds. The four most commonly diagnosed cancers in 2012-2014, as an annual average, for 15-24 year olds were melanoma (26%, 57 cases), carcinomas (26%, 57 cases - of which 9%, 20 cases were thyroid), lymphomas (15%, 34 cases), and germ cell tumours (12%, 26 cases). These cancers combined accounted for 79% of all cancer diagnoses.

MELANOMA

Australia has the highest incidence rate of melanoma of any country and Queensland has the highest rate of any Australian state or territory.[3] Melanoma is the most common cancer in Queensland for 15-24 year olds from 2005-2014 (Figure 5, Table 1). There are an average of 57 new cases of melanoma diagnosed each year for 15-24 year olds. Incidence rates for melanoma are susceptible to fluctuations in public awareness. There have been an average of 1 mortality for melanoma per year for 15-24 year olds from 2005-2014 (Table 4).

CARCINOMAS

Carcinomas are the second most common cancer to be diagnosed in young people aged 15-24 years. As per the AYA SEER classification, this group includes neuroendocrine carcinoids. There are an average of 57 carcinomas diagnosed each year in young people, of which 34% (n=20) are thyroid carcinomas. Because thyroid carcinomas constitute a significant proportion of the total carcinoma group, have a different prognosis and treatment compared to other carcinomas, we have reported thyroid carcinomas separately from all other carcinomas in this report. Other common sites in young people include appendix, gastrointestinal tract and cervix; a significant proportion of appendix and other gastrointestinal track disease are neuroendocrine carcinoids, which do not require systemic treatment with chemotherapy. There are approximately three deaths each year in young people attributable to carcinoma.

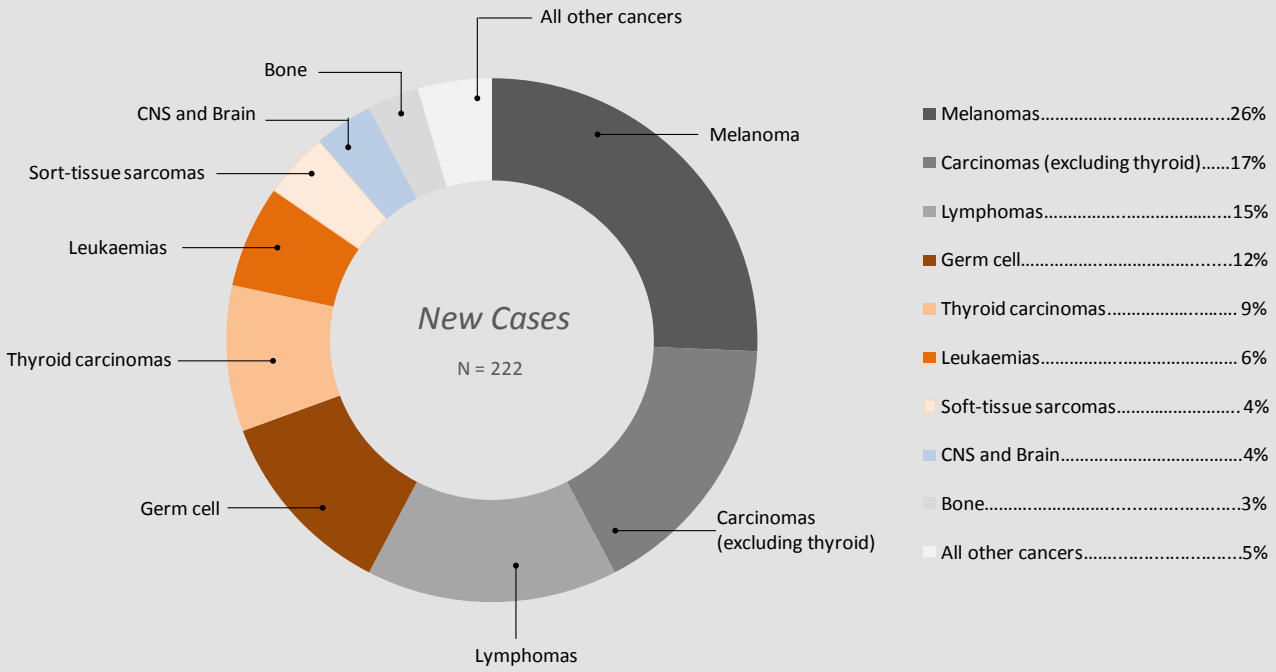
LYMPHOMAS

Lymphomas are the third most common cancer diagnosed in young people aged 15-24 years with an average of 34 diagnosed each year. Hodgkin Lymphoma is more commonly diagnosed compared with non-Hodgkin Lymphoma (annual average of 22 cases versus 12 cases). Together, these contribute to an average of 17% of cancers in this age group. There are an average of 2 deaths attributable to lymphoma each year.

GERM CELL TUMOURS

Germ cell tumours are the fourth most commonly diagnosed cancer with an average of 26 cases in young people aged 15-24 years accounting for 12% of all cancer diagnoses. Of these, 88% (n=22) are testicular tumours in males. There is an average of only one death per year attributable to germ cell tumours.

Figure 5: Most common cancer diagnoses, Queensland, Annual average 2012-2014, 15-24 year olds

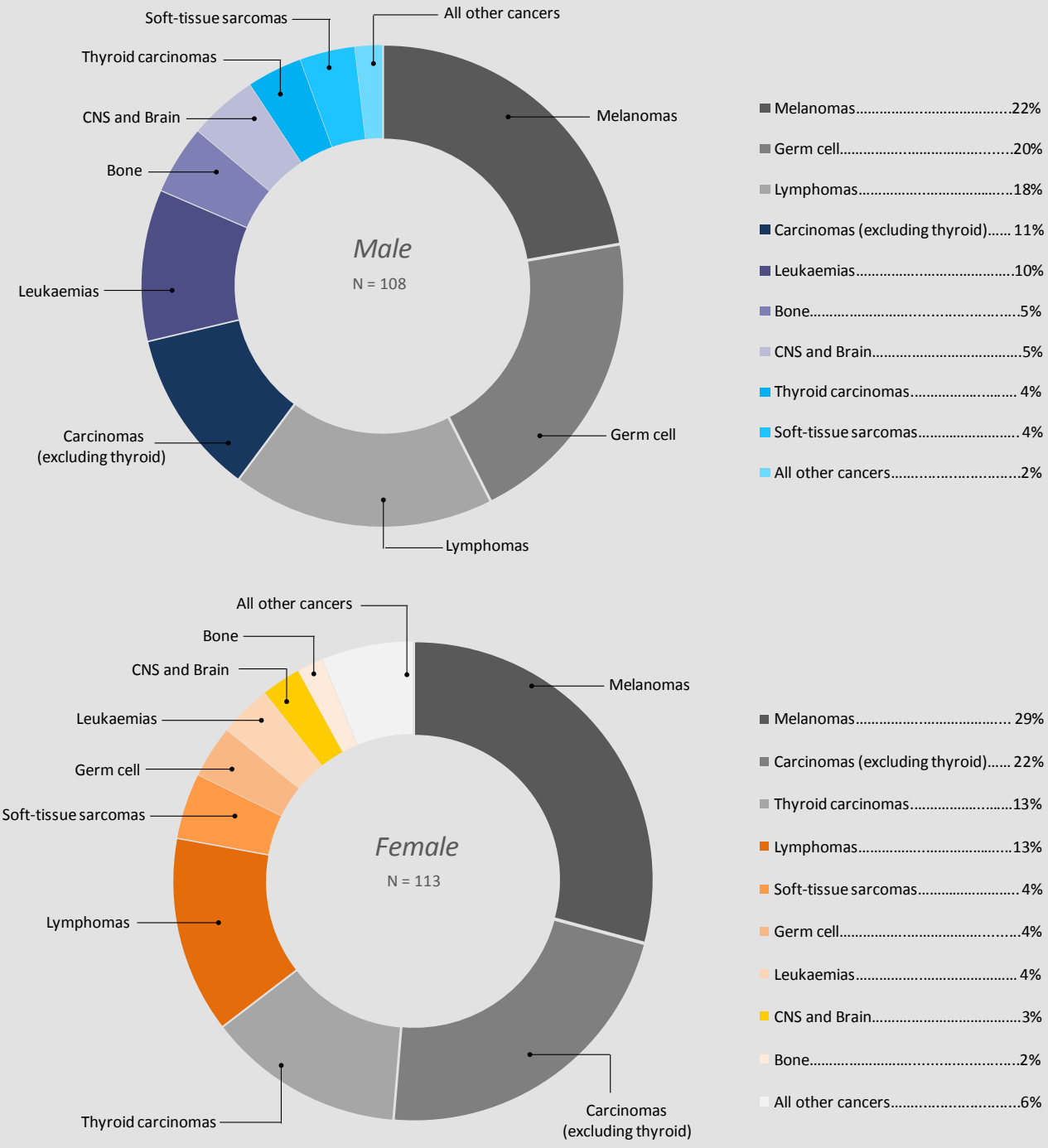


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

MOST COMMON CANCERS BY SEX

Cancers were equally common in males (108 new cases, annual average) and females (113 new cases, annual average) aged 15-24 years. In males, three cancer groupings accounted for over half of all incidence: melanoma cancers represented 22% of cases (24 cases), followed by testicular germ cell tumours (20%, 22 cases) and lymphoma (18%, 19 cases) accounting for a combined 60% of all 15-24 year old male cancers. For females, four cancers accounted for 77 % of all new cancers diagnoses; melanoma was also the most common cancer representing 29% of cases (33 cases), followed by carcinomas (22%, 25 cases), thyroid carcinoma (13%, 15 cases) and lymphoma (13%, 15 cases). Combining the lymphoma groups and leukaemia as haematological cancer results in haematological cancer being the most common cancer in 15-24 year old males. Combining thyroid carcinoma with all other carcinoma's results in carcinoma as the most common cancer diagnosed in females aged 15-24 years.

Figure 6: Most common cancer diagnoses by sex, Queensland, Annual average 2012-2014, 15-24 year olds

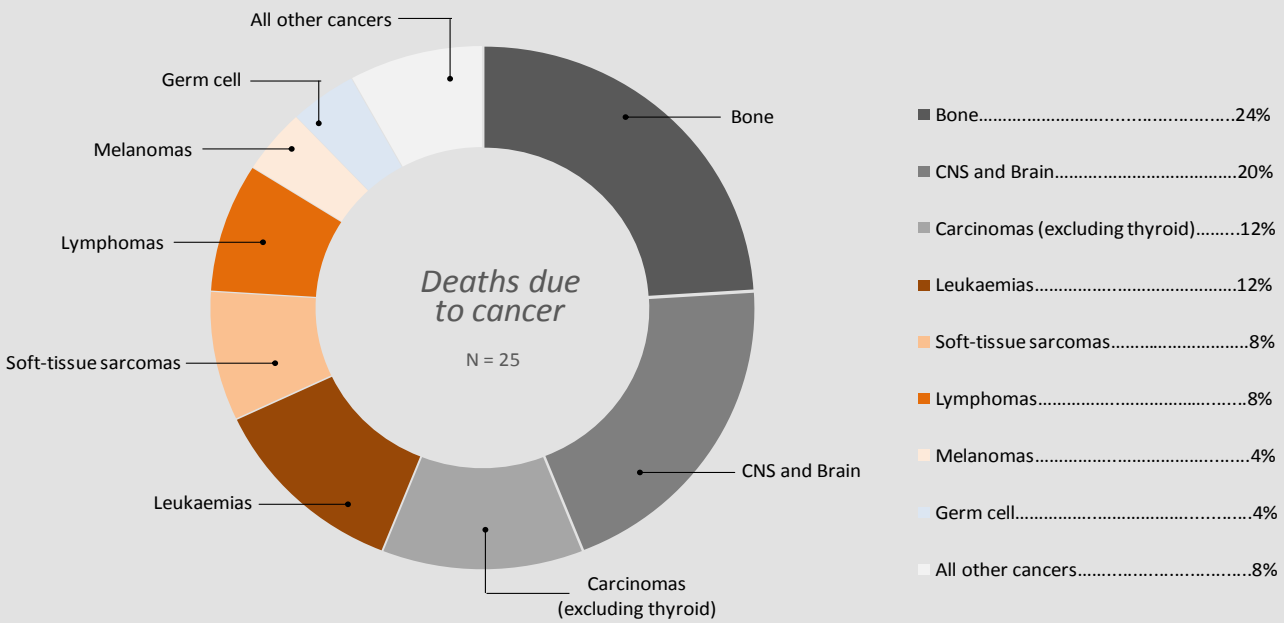


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Most common cancer deaths

During 2012-2014, bone cancer was the leading cause of cancer death for 15-24 year olds with an annual average of 8 deaths (24% of all deaths). CNS and Brain cancer with 5 deaths (20%) were the next most common cancer deaths followed by carcinomas and leukaemias (3 deaths each, 12%) (Figure 7). In 2012-2014, there were fewer 15-24 year old male cancer deaths recorded (11 deaths, annual average) compared to females (13 deaths, annual average). Bone cancer and CNS and Brain cancer accounted for the majority of deaths in males (67%). In females, carcinomas accounted for 18% of deaths, followed by CNS and Brain and leukaemias both accounting for 15% of deaths each (Figure 8).

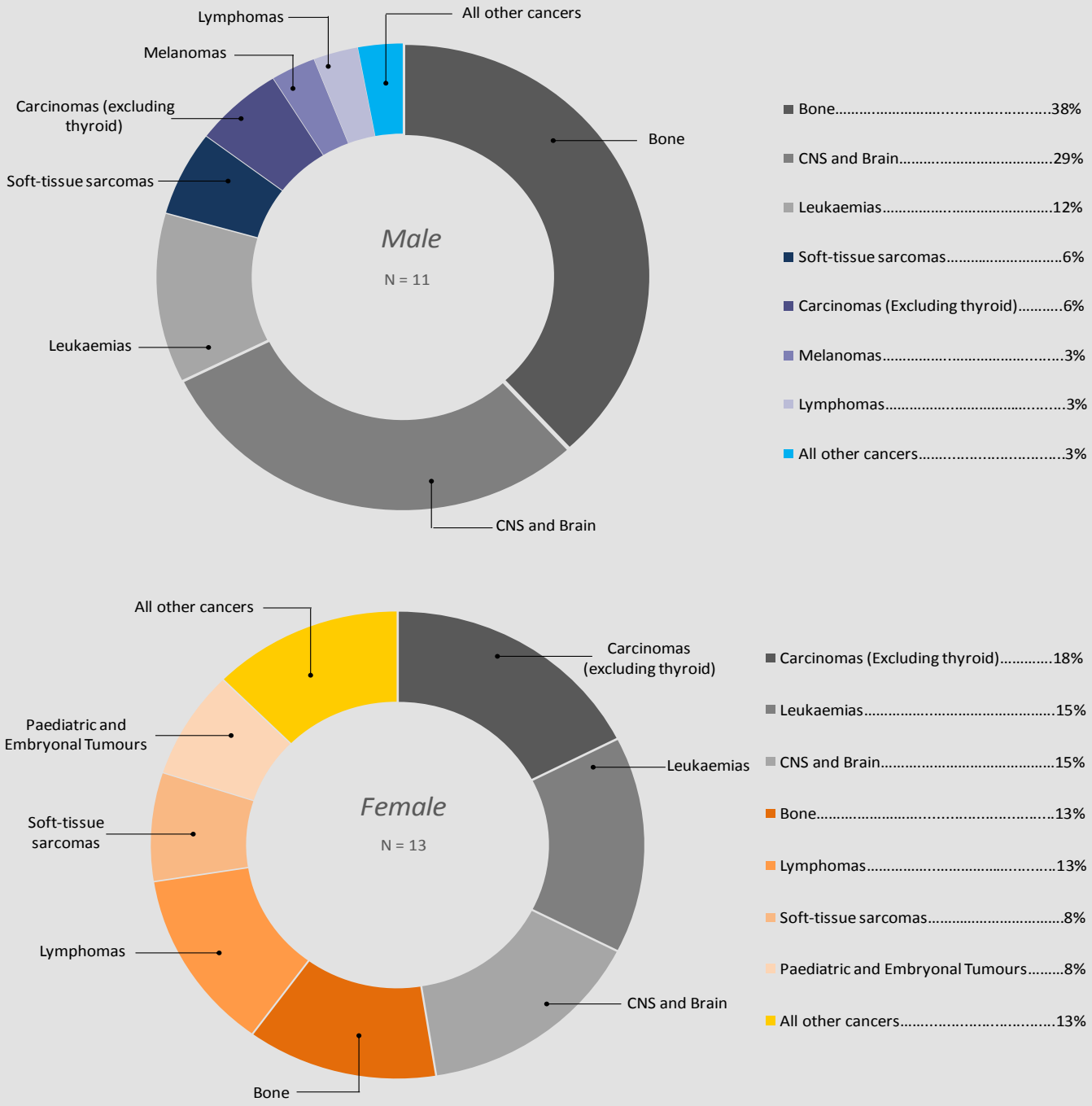
Figure 7: Most common cancer deaths, Queensland, Annual average 2012-2014, 15-24 years olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Bone cancers are the leading cause of cancer death in 15-24 year old Queenslanders followed closely CNS and Brain cancer.

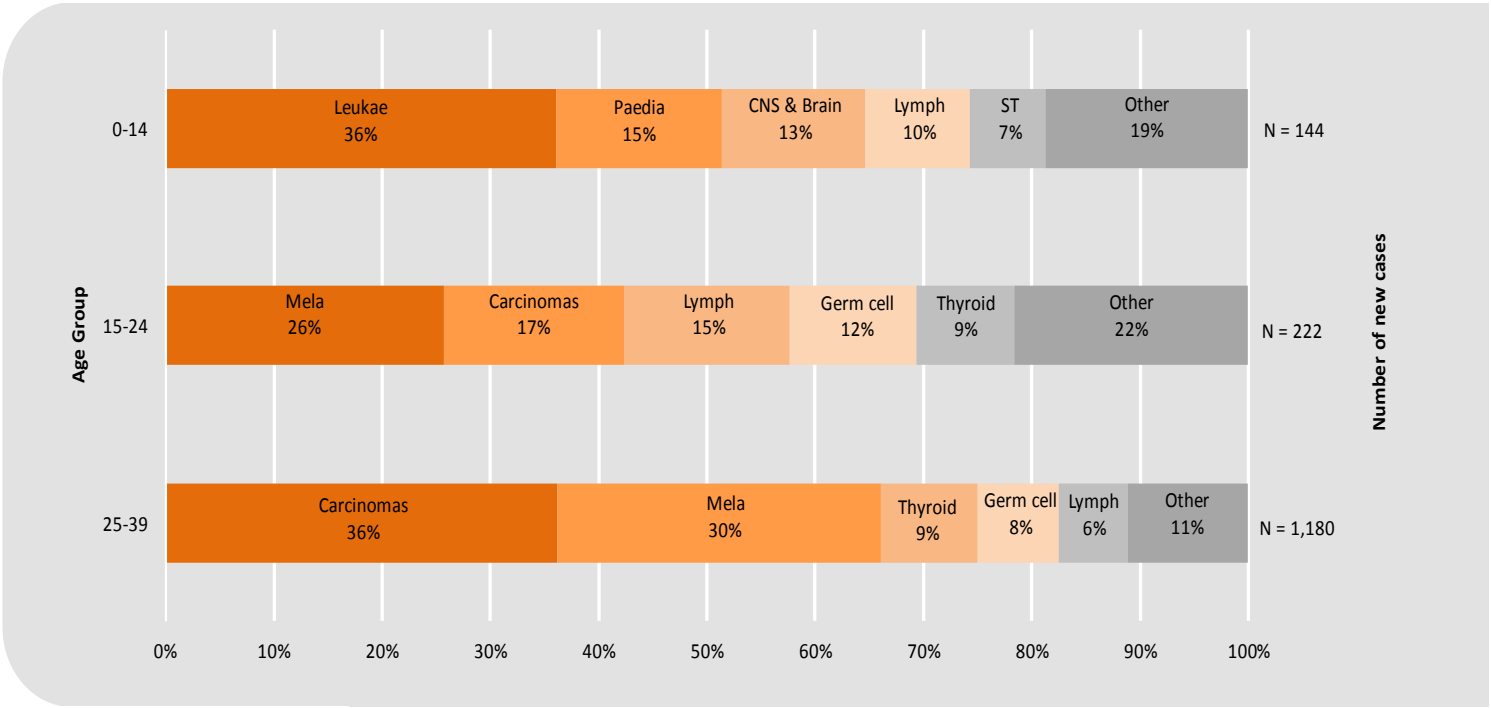
Figure 8: Most common cancer deaths by sex, Queensland, Annual average 2012-2014, 15-24 year olds



New cases by comparative age groups

The most common cancers diagnoses in adolescent and young adults aged 15-24 years are different to those diagnosed in children aged 0-14 years and adults aged 25-39 years (Figure 9). In adolescents and young adults 15-24 years, melanomas are the most commonly diagnosed cancer (26%), followed by carcinoma (17%) lymphoma (15%) and germ cell tumours (12%). In children aged 0-14 years, the most common cancer diagnosis is leukaemia (36%), followed by Paediatric and Embryonal tumours (15%) and CNS and Brain cancers (13%). In adults aged 25-39 years, the most common cancer diagnosis is Carcinomas (46%), followed by Melanomas (30%), and Thyroid (9%). This demonstrates the differences in cancer diagnoses associated with age.

Figure 9: Most common cancer diagnoses, Queensland, Annual average 2012-2014, 0-14, 15-24 and 25-39 year olds



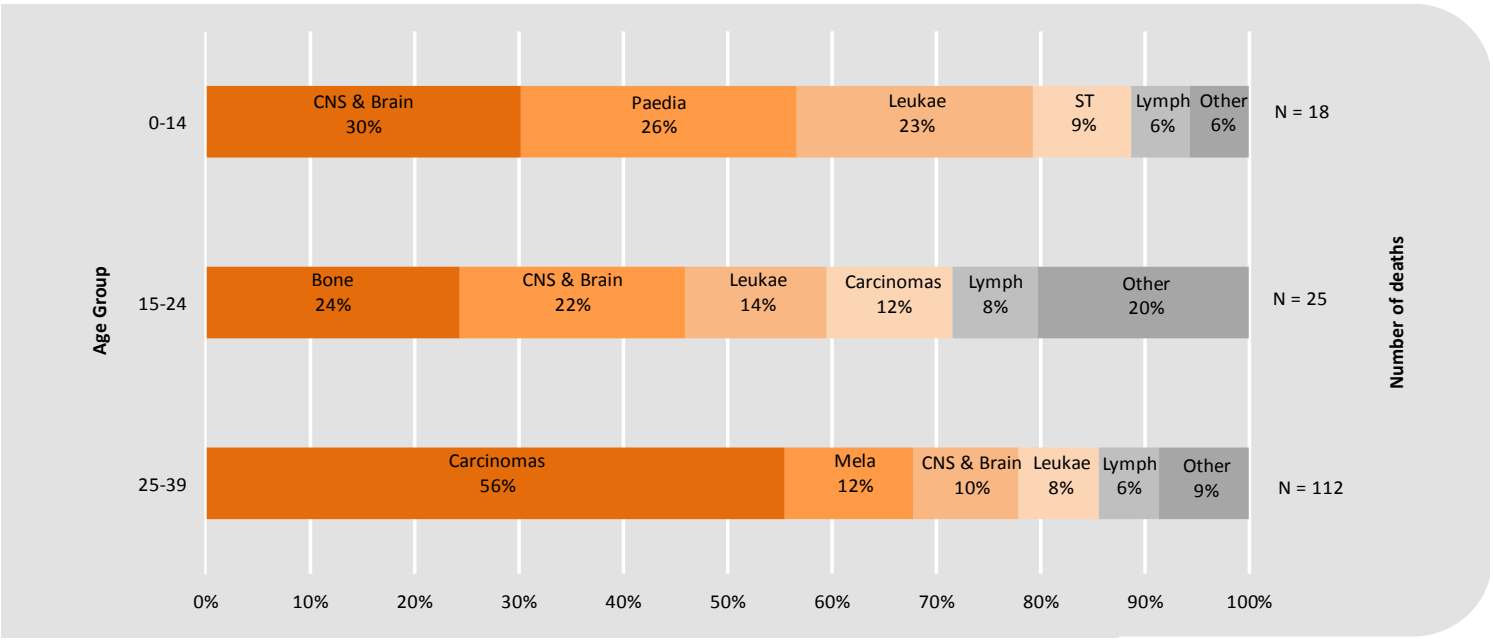
Abbreviations: Carcinomas: Carcinomas (excluding thyroid)/ CNS & Brain: Central nervous system and brain/ Leukae: Leukaemias/Lymph: Lymphomas/ Mela: Melanoma/ Paedia: Paediatric and Embryonal Tumours/ ST: Soft tissue sarcomas/ Thyroid: Thyroid carcinomas.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Death from cancer by comparative age groups

The most common deaths from cancer in adolescents and young adults aged 15-24 years, was from Bone Cancers (24%) followed by CNS and Brain cancer (22%) and leukaemia's (14%). Carcinomas accounted for 12% and lymphomas for 8% of deaths, five deaths, (20%) were attributed to other cancers including melanoma (1 death), paediatric and embryonal tumours (1 death), soft tissue sarcoma (2 deaths) and germ cell tumours (1 death) (Figure 10).

In children aged 0-14 years, the most common cancer deaths were from CNS and Brain cancer (30%) Paediatric and Embryonal tumours (26%) followed by Leukaemia (23%). In adults aged 25-39 years, the most common cause of cancer deaths were from Carcinomas (56%) followed by Melanomas (14%) and CNS and Brain cancer (10%).

Figure 10: Most common cancer deaths, Queensland, annual average 2012-2014, 0-14 year olds, 15-24 year olds and 25-39 years olds

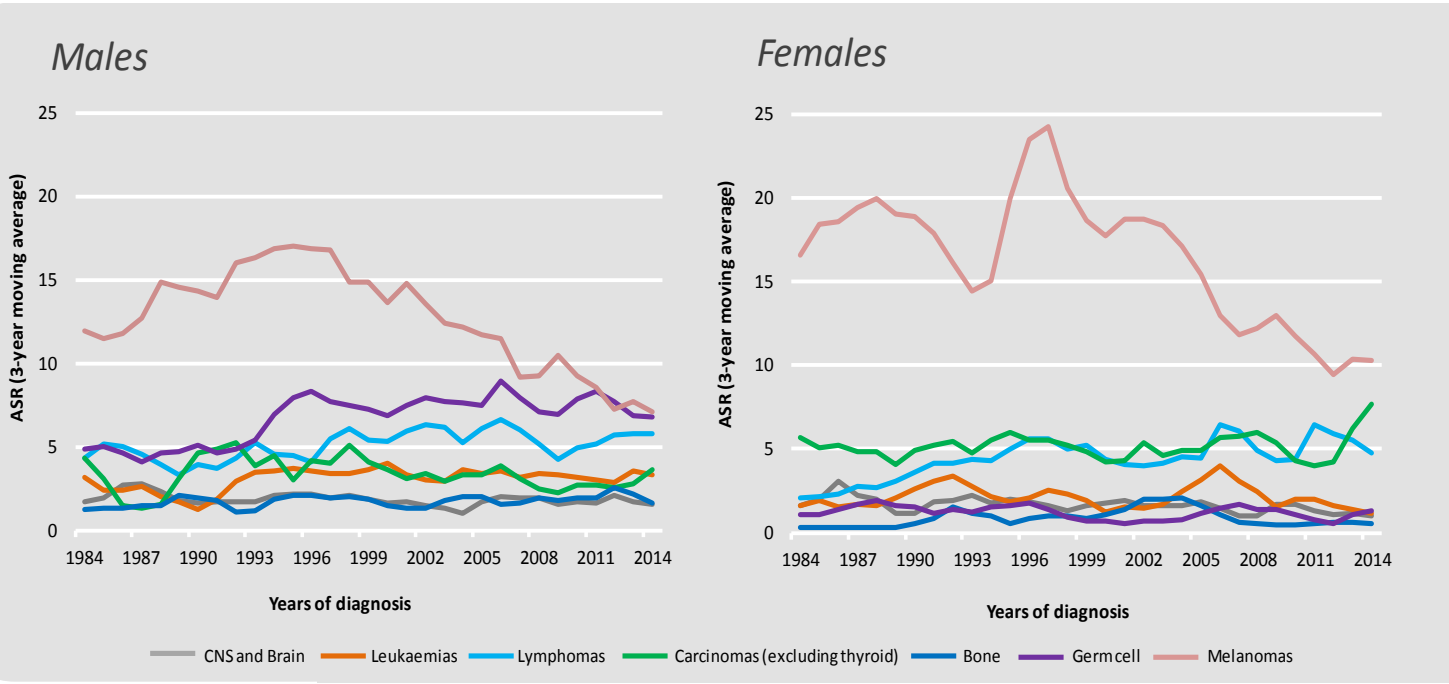


Abbreviations: Carcinomas: Carcinomas (excluding thyroid)/ CNS & Brain: Central nervous system and brain/ Leukae: Leukaemias/Lymph: Lymphomas/ Mela: Melanoma/ Paedia: Paediatric and Embryonal Tumours/ ST: Soft tissue sarcomas.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Incidence trends 15-24 year old, 1982-2014

Cancer incidence from 1984 to 2014 for the eight most common cancers in 15-24 years olds are represented in figure 11 and all cancers (2005-2014) are presented in Table 1. Melanoma had the highest incidence over the ten year period in both males and females followed by germ cell tumours and lymphoma in males, and carcinomas and lymphomas in females. Incidence of melanoma has substantially reduced over time (Figure 11).

Figure 11: Incidence trends cancers, Queensland, 1982-2014, 15-24 year olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

INCIDENCE COUNTS OVER 10 YEARS

Over a 10 year period, 2005-2014, in young people aged 15-24 years, Melanoma, followed by carcinomas and lymphomas accounted for the three most common cancers. Incidence counts of melanoma reduced from accounting for up to 34% of all cancer diagnosis in 2009 to 24% in 2014. These changes may be attributed to public health education related to sun protection and increased public awareness of melanoma. A change in procedures related to appendectomy has resulted in increased incidence count of carcinoma of the appendix after 2012. Incidence counts between 2005-2014 for all other cancers in 15-24 year olds have remained relatively stable (Table 1).

Table 1: Incidence counts over time by AYA Cancer Classification, Queensland 2005-2014, aged 15-24 years

Cancer Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MELANOMAS	63	57	60	72	81	41	59	60	56	55
	29%	25%	34%	33%	34%	23%	27%	27%	26%	24%
CARCINOMAS (EXCLUDING THYROID)	29	25	22	27	20	18	25	22	40	48
	13%	11%	12%	13%	8%	10%	12%	10%	19%	21%
Appendix	0	4	2	2	4	2	3	2	20	22
	0%	2%	1%	1%	2%	1%	1%	1%	9%	10%
Gastrointestinal tract	10	4	7	9	7	3	7	5	7	6
	5%	2%	4%	4%	3%	2%	3%	2%	3%	3%
Other head and neck	8	9	5	1	2	10	3	2	4	5
	4%	4%	3%	<1%	1%	6%	1%	1%	2%	2%
Genitourinary tract	1	0	3	0	0	0	3	2	2	4
	<1%	0%	2%	0%	0%	0%	1%	1%	1%	2%
Trachea, bronchus and lung	1	1	0	4	2	0	0	1	2	3
	<1%	<1%	0%	2%	1%	0%	0%	<1%	1%	1%
Breast	1	1	3	5	1	0	2	2	0	3
	<1%	<1%	2%	2%	<1%	0%	1%	1%	0%	1%
Cervix	3	5	0	5	0	2	4	5	4	3
	1%	2%	0%	2%	0%	1%	2%	2%	2%	1%
Other carcinoma	2	1	1	0	2	1	1	0	0	2
	1%	<1%	1%	0%	1%	1%	<1%	0%	0%	1%
Gonads	3	0	1	1	2	0	2	3	1	0
	1%	0%	1%	<1%	1%	0%	1%	1%	<1%	0%
LYMPHOMAS	37	45	20	22	35	29	45	36	27	39
	17%	20%	11%	10%	15%	16%	21%	16%	13%	17%
Hodgkin lymphoma	21	31	15	16	22	22	29	23	18	24
	10%	14%	8%	7%	9%	12%	13%	10%	8%	10%
Non-Hodgkin lymphoma	16	14	5	6	13	7	16	13	9	15
	7%	6%	3%	3%	5%	4%	7%	6%	4%	7%
GERM CELL	31	32	20	23	34	28	26	26	25	28
	14%	14%	11%	11%	14%	16%	12%	12%	12%	12%
Gonadal	27	24	19	21	32	27	25	24	23	26
	12%	11%	11%	10%	14%	15%	12%	11%	11%	11%
Non-gonadal	4	8	1	2	2	1	1	2	2	2
	2%	4%	1%	1%	1%	1%	<1%	1%	1%	1%
THYROID CARCINOMAS	16	19	23	21	20	14	17	18	18	23
	7%	8%	13%	10%	8%	8%	8%	8%	8%	10%
SOFT TISSUE	4	8	4	7	11	7	5	9	8	11
	2%	4%	2%	3%	5%	4%	2%	4%	4%	5%
Other soft-tissue sarcoma	3	5	4	7	7	7	3	6	8	11
	1%	2%	2%	3%	3%	4%	1%	3%	4%	5%
Rhabdomyosarcoma	1	3	0	0	4	0	2	3	0	0
	<1%	1%	0%	0%	2%	0%	1%	1%	0%	0%

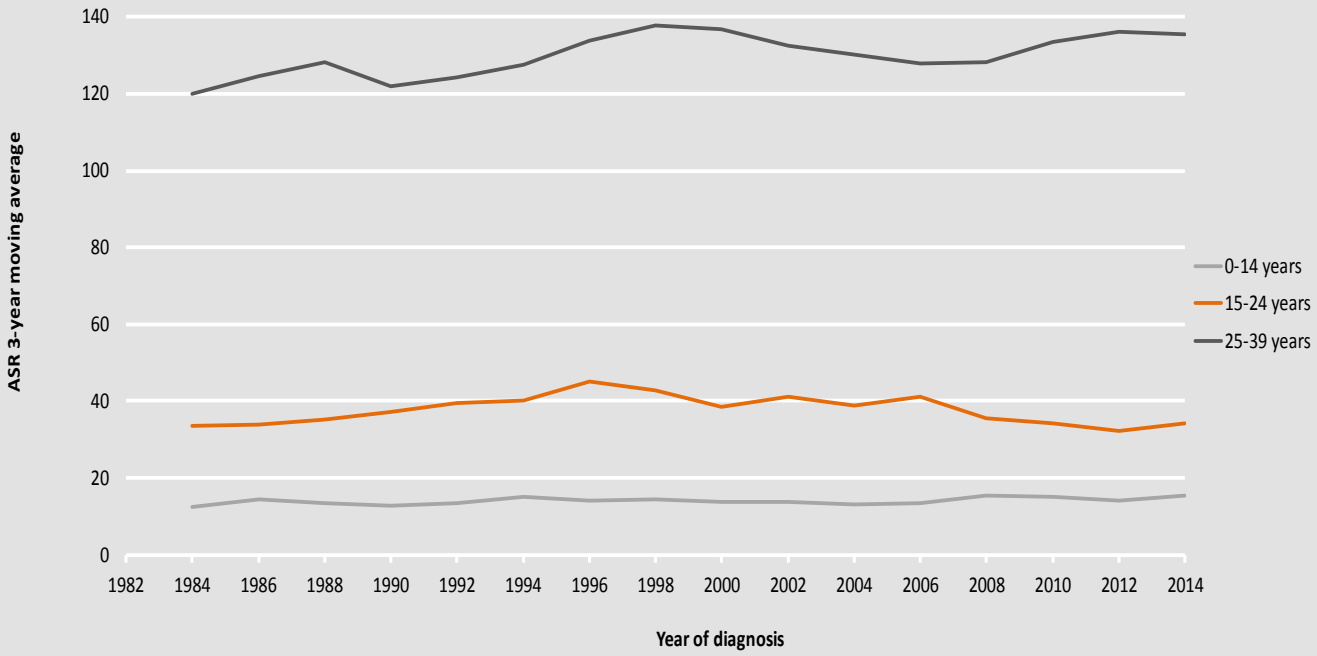
Table 1 (continued)

Cancer Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
LEUKAEMIAS	16	24	12	15	17	16	14	13	20	10
	7%	11%	7%	7%	7%	9%	6%	6%	9%	4%
Acute lymphoid leukaemia	7	13	6	7	4	7	6	6	11	7
	3%	6%	3%	3%	2%	4%	3%	3%	5%	3%
Acute myeloid leukaemia	6	8	4	4	10	6	6	4	5	3
	3%	4%	2%	2%	4%	3%	3%	2%	2%	1%
Other leukaemia	3	3	2	4	3	3	2	3	4	0
	1%	1%	1%	2%	1%	2%	1%	1%	2%	0%
CNS and BRAIN	12	6	7	13	9	9	10	11	6	8
	5%	3%	4%	6%	4%	5%	5%	5%	3%	3%
Other astrocytoma, glioma or ependymoma	6	3	3	8	4	7	3	1	3	5
	3%	1%	2%	4%	2%	4%	1%	<1%	1%	2%
Glioblastoma and anaplastic astrocytoma	3	3	2	4	4	1	5	6	2	3
	1%	1%	1%	2%	2%	1%	2%	3%	1%	1%
Medulloblastoma	1	0	1	0	1	1	1	2	0	0
	<1%	0%	1%	0%	<1%	1%	<1%	1%	0%	0%
Supratentorial PNET	1	0	0	1	0	0	0	1	1	0
	<1%	0%	0%	<1%	0%	0%	0%	<1%	<1%	0%
Other central nervous system tumour	1	0	1	0	0	0	1	1	0	0
	<1%	0%	1%	0%	0%	0%	<1%	<1%	0%	0%
BONE	6	6	7	9	4	9	10	11	6	4
	3%	3%	4%	4%	2%	5%	5%	5%	3%	2%
Ewing tumour	4	3	4	4	2	3	3	6	2	3
	2%	1%	2%	2%	1%	2%	1%	3%	1%	1%
Osteosarcoma	1	3	2	5	2	5	5	3	2	1
	<1%	1%	1%	2%	1%	3%	2%	1%	1%	<1%
Other bone tumour	1	0	1	0	0	1	2	2	2	0
	<1%	0%	1%	0%	0%	1%	1%	1%	1%	0%
OTHER INVASIVE CANCERS	4	5	4	6	6	6	4	15	5	4
	2%	2%	2%	3%	3%	3%	2%	7%	2%	2%
PAEDIATRIC and EMBRYONAL	1	1	0	1	0	1	1	1	2	0
	<1%	<1%	0%	<1%	0%	1%	<1%	<1%	1%	0%
TOTAL	***219***	***228***	***179***	***216***	***237***	***178***	***216***	***222***	***213***	***230***
	100%	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Comparative incidence trends by age groups: 1982-2014

Incidence of cancer rises dramatically with age. In children 0-14 years, and adolescents 15-24 years old, changes in incidence over time are attributable to population growth. After age 25, while still associated with population growth, incidence rates increase because of age (Figure 12).

Figure 12: Incidence by age group, Queensland, 1982-2014, 0-14 years, 15-24 years and 25-39 years



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

COMPARATIVE INCIDENCE COUNTS OVER TIME BY AGE GROUPS

Incidence counts in five-year time periods, 2000-2004, 2005-2009 and 2010-2014 were calculated using AYA cancer classification[2] for three comparative age groups, 0-14 years, 15-24 years and 25-39 years (Table 2). Data is organised by highest incidence in the adolescent and young adult group of 15-24 year olds. These data demonstrate changes in incidence counts over time across all age groups. Incidence of melanoma has decreased across all age ranges over time. Carcinomas have increased slightly across all age groups over time; of note is the marked increase in years 2010-2014 of increased incidence of appendix carcinoma. This is likely due to changes processes for collection and reporting of pathology specimens. There is a slight increase in lymphoma, (Hodgkin's) in adolescents and young adults 15-24 years over time. There is a slight increase in germ cell tumours in both age groups 0-14 years and 15-24 years. There is a decrease in leukaemia and bone sarcoma incidence over time in children 0-14 years. There is an increased incidence of paediatric and embryonal tumours in children 0-14 years over time. All other cancers have little changes in incidence patterns over time.

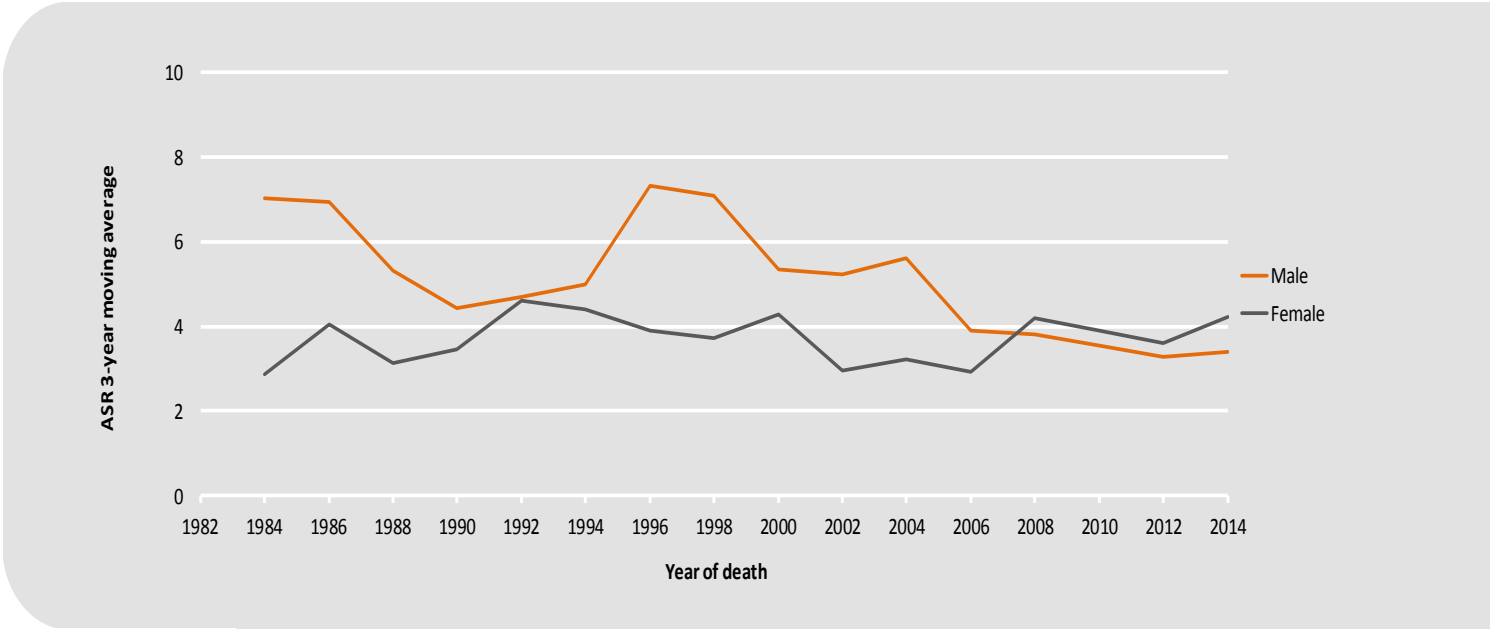
Table 2 Incidence counts over time by AYA Cancer Classification, Queensland 2005-2014, 0-14 year olds, 15-24 years and 25-39 years.

Cancer Type	2000-2004 Age in years (%)						2005-2009 Age in years (%)						2010-2014 Age in years (%)					
	0-14	%	15-24	%	25-39	%	0-14	%	15-24	%	25-39	%	0-14	%	15-24	%	25-39	%
MELANOMAS	**28**	5%	**399**	39%	**1567**	33%	**28**	4%	**333**	31%	**1620**	31%	**15**	2%	**271**	26%	**1752**	30%
CARCINOMAS (EXCLUDING THYROID)	**5**	1%	**105**	10%	**1614**	34%	**9**	1%	**123**	11%	**1784**	34%	**24**	3%	**153**	14%	**2111**	36%
Appendix	0	0%	6	1%	16	<1%	0	0%	12	1%	14	<1%	16	2%	49	5%	69	1%
Gastrointestinal tract	1	<1%	24	2%	260	5%	0	0%	37	3%	321	6%	0	0%	28	3%	430	7%
Other head and neck	2	<1%	22	2%	219	5%	5	1%	25	2%	217	4%	5	1%	24	2%	203	3%
Genitourinary tract	1	<1%	9	1%	105	2%	3	<1%	4	<1%	130	2%	2	<1%	11	1%	158	3%
Trachea, bronchus and lung	1	<1%	6	1%	55	1%	0	0%	8	1%	54	1%	1	<1%	6	1%	73	1%
Breast	0	0%	3	<1%	631	13%	0	0%	11	1%	716	14%	0	0%	7	1%	745	13%
Cervix	0	0%	17	2%	230	5%	1	<1%	13	1%	259	5%	0	0%	18	2%	333	6%
Other carcinoma	0	0%	9	1%	49	1%	0	0%	6	1%	28	1%	0	0%	4	<1%	44	1%
Gonads	0	0%	9	1%	49	1%	0	0%	7	1%	45	1%	0	0%	6	1%	56	1%
LYMPHOMAS	**59**	11%	**126**	12%	**279**	6%	**55**	9%	**159**	15%	**307**	6%	**73**	11%	**176**	17%	**363**	6%
Hodgkin lymphoma	25	5%	68	7%	102	2%	19	3%	105	10%	128	2%	21	3%	116	11%	146	2%
Non-Hodgkin lymphoma	34	6%	58	6%	177	4%	36	6%	54	5%	179	3%	52	8%	60	6%	217	4%
GERM CELL	**11**	2%	**106**	10%	**321**	7%	**34**	5%	**140**	13%	**389**	7%	**29**	4%	**133**	13%	**432**	7%
Gonadal	3	1%	96	9%	296	6%	11	2%	123	11%	368	7%	14	2%	125	12%	412	7%
Non-gonadal	8	2%	10	1%	25	1%	23	4%	17	2%	21	<1%	15	2%	8	1%	20	<1%
THYROID CARCINOMAS	**6**	1%	**59**	6%	**334**	7%	**8**	1%	**99**	9%	**462**	9%	**9**	1%	**90**	8%	**525**	9%
SOFT TISSUE	**19**	4%	**43**	4%	**106**	2%	**36**	6%	**34**	3%	**119**	2%	**42**	6%	**40**	4%	**108**	2%
Other soft-tissue sarcoma	8	2%	38	4%	102	2%	13	2%	26	2%	115	2%	16	2%	35	3%	106	2%
Rhabdomyosarcoma	11	2%	5	<1%	4	<1%	23	4%	8	1%	4	<1%	26	4%	5	<1%	2	<1%
LEUKAEMIAS	**212**	40%	**71**	7%	**131**	3%	**199**	31%	**84**	8%	**133**	3%	**242**	35%	**73**	7%	**154**	3%
Acute lymphoid leukaemia	164	31%	30	3%	25	1%	156	25%	37	3%	21	<1%	202	29%	37	3%	35	1%
Acute myeloid leukaemia	37	7%	26	3%	62	1%	31	5%	32	3%	57	1%	31	5%	24	2%	53	1%
Other leukaemia	11	2%	15	1%	44	1%	12	2%	15	1%	55	1%	9	1%	12	1%	66	1%
CNS and BRAIN	**65**	12%	**40**	4%	**145**	3%	**101**	16%	**47**	4%	**164**	3%	**87**	13%	**44**	4%	**167**	3%
Other astrocytoma, glioma or ependymoma	25	5%	26	3%	90	2%	48	8%	24	2%	101	2%	50	7%	19	2%	103	2%
Glioblastoma and anaplastic astrocytoma	14	3%	7	1%	44	1%	9	1%	16	1%	52	1%	11	2%	17	2%	53	1%
Medulloblastoma	10	2%	0	0%	6	<1%	23	4%	3	<1%	2	<1%	17	2%	4	<1%	5	<1%
Supratentorial PNET	14	3%	4	<1%	0	0%	18	3%	2	<1%	2	<1%	7	1%	2	<1%	0	0%
Other central nervous system tumour	2	<1%	3	<1%	5	<1%	3	<1%	2	<1%	7	<1%	2	<1%	2	<1%	6	<1%
BONE	**42**	8%	**48**	5%	**36**	1%	**36**	6%	**32**	3%	**34**	1%	**39**	6%	**40**	4%	**28**	<1%
Ewing tumour	24	5%	19	2%	8	<1%	17	3%	17	2%	13	<1%	22	3%	17	2%	2	<1%
Osteosarcoma	15	3%	20	2%	14	<1%	16	3%	13	1%	9	<1%	11	2%	16	2%	9	<1%
Other bone tumour	3	1%	9	1%	14	<1%	3	<1%	2	<1%	12	<1%	6	1%	7	1%	17	<1%
OTHER INVASIVE CANCERS	**8**	2%	**27**	3%	**210**	4%	**17**	3%	**25**	2%	**225**	4%	**13**	2%	**34**	3%	**232**	4%
PAEDIATRIC and EMBRYONAL	**69**	13%	**3**	<1%	**4**	<1%	**113**	18%	**3**	<1%	**2**	<1%	**114**	17%	**5**	<1%	**2**	<1%
TOTAL	**524**	100%	**1027**	100%	**4747**	100%	**636**	100%	**1079**	100%	**5239**	100%	**687**	100%	**1059**	100%	**5874**	100%

Mortality trends 15-24 year old, 1982-2014

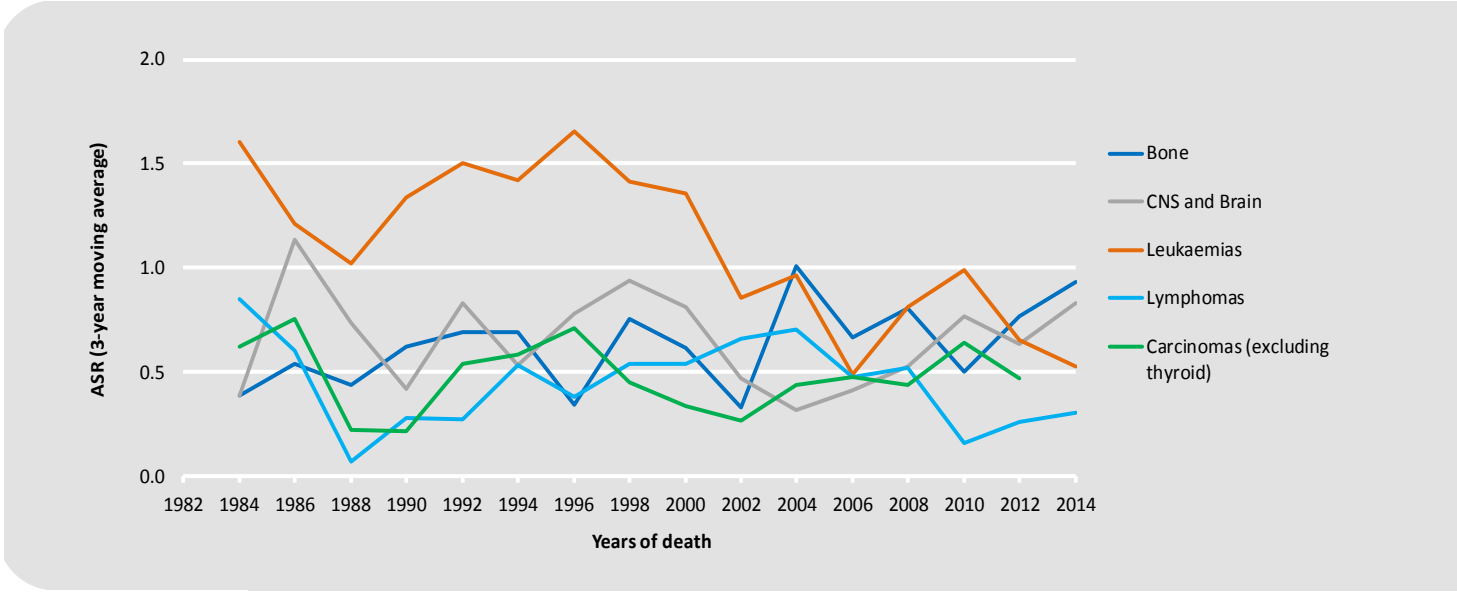
Males have higher deaths from cancer over time, at times double the amount of deaths compared with females. However since the early 2000's, this disparity in mortality has changed with similar deaths in both males and females recorded in the last 10 years (Figure 13). Deaths from Leukaemia have decreased since the early 2000's, other cancers remain relatively stable with generally low mortality (Figure 14).

Figure 13: Mortality count trends over time by sex, Queensland, 1982-2014, 15-24 year olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 14: Mortality trends over time for high lethality cancers



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

MORTALITY COUNTS OVER 10 YEARS

Over a 10 year period (2005-2014) in 15-24 years old, bone cancers had the highest mortality followed by CNS and Brain cancer and leukaemia. Cancer mortality counts from 2005 to 2014 for all cancers are represented in Table 3. Because of the small numbers, it is not possible to identify consistent patterns of change in mortality counts over time.

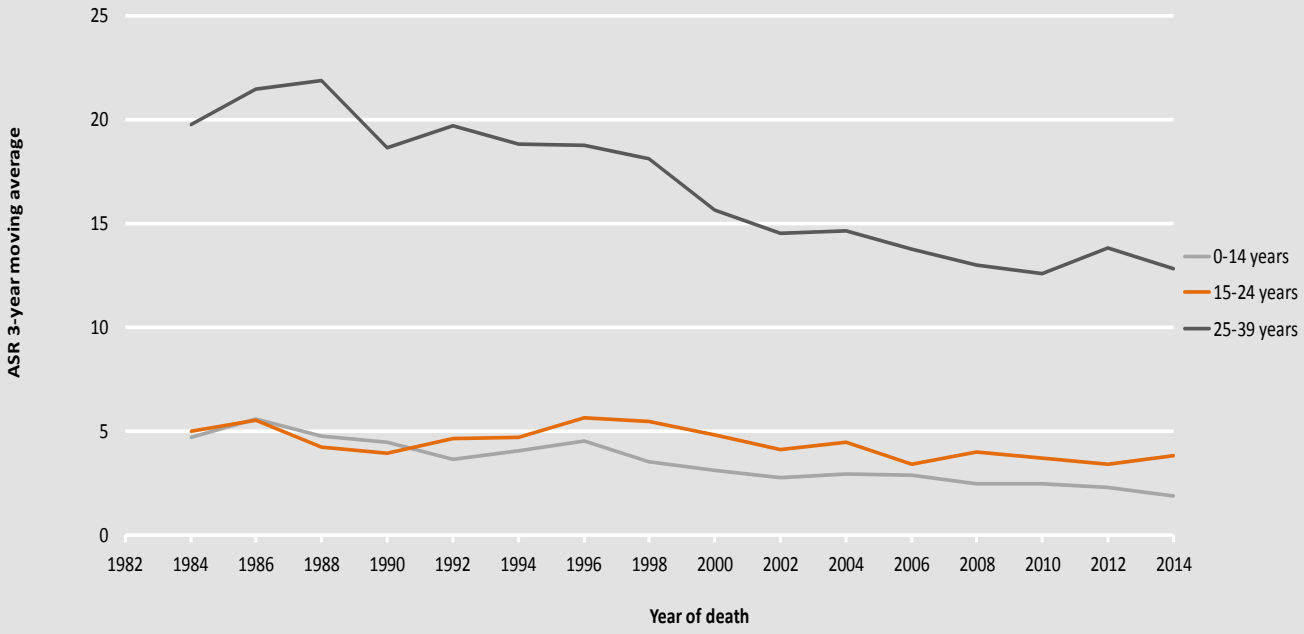
Table 3: Mortality counts over time by AYA Cancer Classification, Queensland 2005-2014, 15-24 year olds

Cancer Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
MELANOMAS	2 1%	0 0%	3 1%	1 <1%	1 <1%	1 <1%	0 0%	1 <1%	0 0%	1 <1%
CARCINOMAS (EXCLUDING THYROID)	3 1%	2 1%	1 <1%	5 2%	2 1%	5 2%	1 <1%	3 1%	2 1%	4 2%
Appendix	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 <1%	0 0%	0 0%
Gastrointestinal tract	2 1%	1 <1%	1 <1%	4 2%	1 <1%	4 2%	1 <1%	0 0%	1 <1%	2 1%
Other head and neck	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 <1%	0 0%
Genitourinary tract	1 <1%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 <1%
Breast	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 <1%	0 0%	0 0%
Cervix	0 0%	1 <1%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Other carcinoma	0 0%	0 0%	0 0%	1 <1%	0 0%	1 <1%	0 0%	1 <1%	0 0%	0 0%
Gonads	0 0%	0 0%	0 0%	0 0%	1 <1%	0 0%	0 0%	0 0%	0 0%	1 <1%
LYMPHOMAS	1 <1%	5 2%	3 1%	1 <1%	1 <1%	1 <1%	1 <1%	3 1%	1 <1%	2 1%
Hodgkin lymphoma	1 <1%	3 1%	2 1%	0 0%	0 0%	0 0%	1 <1%	2 1%	1 <1%	2 1%
Non-Hodgkin lymphoma	0 0%	2 1%	1 <1%	1 <1%	1 <1%	1 <1%	0 0%	1 <1%	0 0%	0 0%
GERM CELL	1 <1%	0 0%	2 1%	0 0%	0 0%	0 0%	1 <1%	0 0%	0 0%	2 1%
Gonadal	1 <1%	0 0%	1 <1%	0 0%	0 0%	0 0%	1 <1%	0 0%	0 0%	2 1%
Non-gonadal	0 0%	0 0%	1 <1%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
SOFT TISSUE	3 1%	0 0%	2 1%	3 1%	1 <1%	3 1%	1 <1%	2 1%	3 1%	0 0%
Other soft-tissue sarcoma	3 1%	0 0%	1 <1%	0 0%	0 0%	1 <1%	1 <1%	1 <1%	2 1%	0 0%
Rhabdomyosarcoma	0 0%	0 0%	1 <1%	3 1%	1 <1%	2 1%	0 0%	1 <1%	1 <1%	0 0%
LEUKAEMIAS	5 2%	1 <1%	6 3%	7 3%	6 3%	5 2%	2 1%	5 2%	4 2%	1 <1%
Acute lymphoid leukaemia	3 1%	1 <1%	3 1%	4 2%	3 1%	2 1%	2 1%	4 2%	1 <1%	0 0%
Acute myeloid leukaemia	1 <1%	0 0%	2 1%	2 1%	3 1%	3 1%	0 0%	1 <1%	3 1%	1 <1%
Other leukaemia	1 <1%	0 0%	1 <1%	1 <1%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
CNS and BRAIN	1 <1%	5 2%	3 1%	1 <1%	9 4%	4 2%	3 1%	5 2%	4 2%	7 3%
Glioblastoma and anaplastic astrocytoma	0 0%	2 1%	0 0%	0 0%	6 3%	3 1%	1 <1%	2 1%	3 1%	4 2%
Medulloblastoma	0 0%	1 <1%	0 0%	0 0%	0 0%	0 0%	1 <1%	0 0%	1 <1%	1 <1%
Other astrocytoma, glioma or ependymoma	1 <1%	2 1%	2 1%	1 <1%	1 <1%	1 <1%	1 <1%	3 1%	0 0%	2 1%
Supratentorial PNET	0 0%	0 0%	1 <1%	0 0%	2 1%	0 0%	0 0%	0 0%	0 0%	0 0%
BONE	1 <1%	3 1%	8 4%	3 1%	1 <1%	5 2%	5 2%	4 2%	7 3%	7 3%
Ewing tumour	0 0%	2 1%	3 1%	2 1%	0 0%	1 <1%	2 1%	2 1%	3 1%	3 1%
Osteosarcoma	1 <1%	1 <1%	2 1%	1 <1%	1 <1%	4 2%	3 1%	2 1%	4 2%	3 1%
Other bone tumour	0 0%	0 0%	3 1%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	1 <1%
OTHER INVASIVE CANCERS	1 <1%	2 1%	2 1%	0 0%	0 0%	1 <1%	0 0%	0 0%	2 1%	1 <1%
PAEDIATRIC and EMBRYONAL	1 <1%	0 0%	1 <1%	0 0%	0 0%	1 <1%	0 0%	1 <1%	0 0%	2 1%
TOTAL	***19*** ***<1%***	***18*** ***<1%***	***31*** ***<1%***	***21*** ***<1%***	***21*** ***<1%***	***26*** ***<1%***	***14*** ***<1%***	***24*** ***<1%***	***23*** ***<1%***	***27*** ***<1%***

Comparative mortality trends by age groups: 1982-2014

Mortality over time has decreased in children 0-14 years and remains a small proportion of deaths from cancer across all age groups. There are significantly more deaths in adults aged 25-39 years which is proportionate to the higher incidence of cancer in the age group. Adolescents and young adult s 15-24 years have had little changes in mortality over time and account for only a small proportion of deaths from cancer across all age groups (Figure 15).

Figure 15: Mortality by age group, Queensland 1982-2014, 0-14 years, 15-24 years and 25-39 years



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

COMPARATIVE MORTALITY COUNTS OVER TIME BY AGE GROUPS

Mortality counts in five-year time periods, 2000-2004, 2005-2009 and 2010-2014 were calculated using AYA cancer classification[2] for the three comparative age groups, 0-14 years, 15-24 years and 25-39 years. (Table 4) Data is organised by highest mortality in adolescents and young adults 15-24 years. There has been an increase in the number of deaths from bone cancer in the 15-24 year old group during 2010-2014, while in other age groups deaths from bone cancer has decreased. Osteosarcoma accounts for the largest number of bone tumour deaths between 2010-2014 in young people 15-24 years. There is an increase in the number of deaths from CNS and Brain cancer in both the 0-14 year and 15-24 years old group. Deaths from carcinomas have increased over time in both the 15-24 years and 25-29 years old group. Death from lymphoma has decreased over time in those aged 15-24 years. There has been a marked decrease in deaths due to melanoma in the 15-24 years old group over time. There is a decrease in death due to leukaemia in both children 0-14 years and the 15-24 year old group.

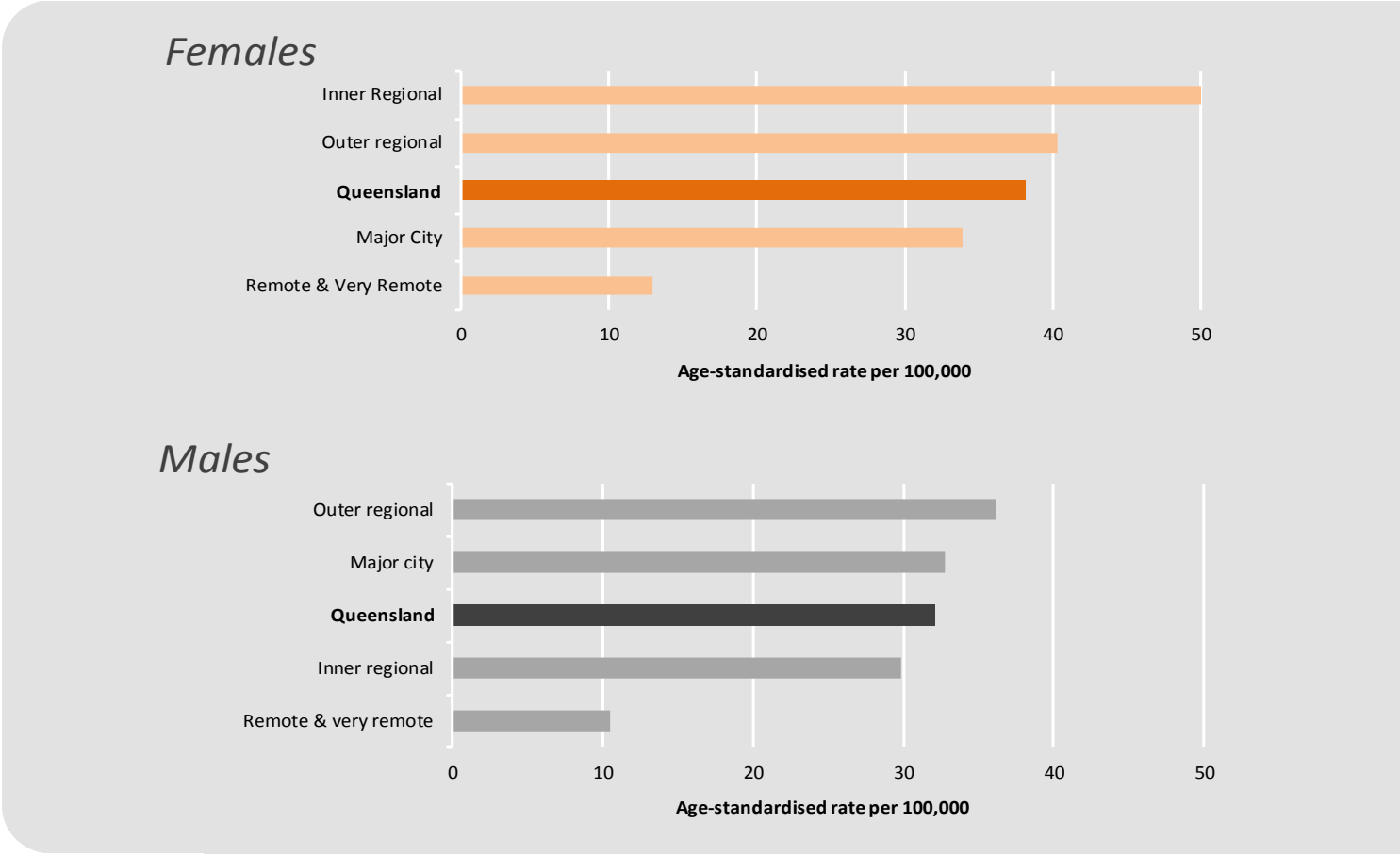
Table 4: Mortality counts over time, QLD 2005-2014, 0-14 year olds, 15-24 years and 24-39 years

Cancer Type	2000-2004 Age in years (%)						2005-2009 Age in years (%)						2010-2014 Age in years (%)					
	0-14	%	15-24	%	25-39	%	0-14	%	15-24	%	25-39	%	0-14	%	15-24	%	25-39	%
MELANOMAS	**0**	0%	**17**	15%	**61**	11%	**0**	0%	**7**	6%	**73**	14%	**1**	1%	**3**	3%	**71**	12%
CARCINOMAS (EXCLUDING THYROID)	**0**	0%	**9**	8%	**244**	44%	**0**	0%	**13**	12%	**254**	49%	**0**	0%	**15**	13%	**309**	53%
Appendix	0	0%	0	0%	2	<1%	0	0%	0	0%	3	1%	0	0%	1	1%	4	1%
Genitourinary tract	0	0%	0	0%	7	1%	0	0%	1	1%	12	2%	0	0%	1	1%	14	2%
Other head and neck	0	0%	1	1%	11	2%	0	0%	0	0%	13	3%	0	0%	1	1%	12	2%
Gastrointestinal tract	0	0%	5	5%	78	14%	0	0%	9	8%	81	16%	0	0%	8	7%	138	24%
Breast	0	0%	0	0%	64	12%	0	0%	0	0%	69	13%	0	0%	1	1%	54	9%
Cervix	0	0%	0	0%	29	5%	0	0%	1	1%	25	5%	0	0%	0	0%	36	6%
Other carcinoma	0	0%	2	2%	21	4%	0	0%	1	1%	11	2%	0	0%	2	2%	16	3%
Gonads	0	0%	1	1%	7	1%	0	0%	1	1%	9	2%	0	0%	1	1%	10	2%
LYMPHOMAS	**4**	4%	**16**	15%	**32**	6%	**3**	3%	**11**	10%	**27**	5%	**6**	6%	**8**	7%	**20**	3%
Hodgkin lymphoma	0	0%	3	3%	6	1%	0	0%	6	5%	12	2%	0	0%	6	5%	4	1%
Non-Hodgkin lymphoma	4	4%	13	12%	26	5%	3	3%	5	5%	15	3%	6	6%	2	2%	16	3%
GERM CELL	**3**	3%	**2**	2%	**15**	3%	**1**	1%	**3**	3%	**12**	2%	**1**	1%	**3**	3%	**10**	2%
Gonadal	0	0%	1	1%	9	2%	0	0%	2	2%	6	1%	0	0%	3	3%	7	1%
Non-gonadal	3	3%	1	1%	6	1%	1	1%	1	1%	6	1%	1	1%	0	0%	3	1%
THYROID	**0**	0%	**0**	0%	**0**	0%	**0**	0%	**0**	0%	**2**	<1%	**0**	0%	**0**	0%	**0**	0%
SOFT TISSUE	**1**	1%	**12**	11%	**18**	3%	**8**	8%	**9**	8%	**22**	4%	**6**	6%	**9**	8%	**16**	3%
Other soft-tissue sarcoma	0	0%	8	7%	16	3%	1	1%	4	4%	21	4%	1	1%	5	4%	14	2%
Rhabdomyosarcoma	1	1%	4	4%	2	<1%	7	7%	5	5%	1	<1%	5	5%	4	4%	2	<1%
LEUKAEMIAS	**37**	35%	**21**	19%	**50**	9%	**23**	22%	**25**	23%	**22**	4%	**20**	22%	**17**	15%	**40**	7%
Acute lymphoid leukaemia	27	25%	10	9%	14	3%	11	10%	14	13%	5	1%	11	12%	9	8%	17	3%
Acute myeloid leukaemia	6	6%	8	7%	22	4%	11	10%	8	7%	15	3%	7	8%	8	7%	17	3%
Other leukaemia	4	4%	3	3%	14	3%	1	1%	3	3%	2	<1%	2	2%	0	0%	6	1%
CNS and BRAIN	**31**	29%	**11**	10%	**76**	14%	**43**	41%	**19**	17%	**65**	13%	**30**	32%	**23**	20%	**69**	12%
Glioblastoma and anaplastic astrocytoma	11	10%	3	3%	35	6%	5	5%	8	7%	30	6%	7	8%	13	11%	29	5%
Medulloblastoma	5	5%	4	4%	0	0%	4	4%	1	1%	0	0%	6	6%	3	3%	2	<1%
Other astrocytoma, glioma or ependymoma	7	7%	3	3%	38	7%	24	23%	7	6%	28	5%	12	13%	7	6%	36	6%
Other central nervous system tumour	1	1%	0	0%	3	1%	0	0%	0	0%	3	1%	2	2%	0	0%	2	<1%
Supratentorial PNET	7	7%	1	1%	0	0%	10	9%	3	3%	4	1%	3	3%	0	0%	0	0%
BONE	**9**	8%	**19**	17%	**17**	3%	**6**	6%	**16**	15%	**14**	3%	**3**	3%	**28**	25%	**8**	1%
Ewing tumour	5	5%	12	11%	6	1%	4	4%	7	6%	7	1%	2	2%	11	10%	3	1%
Osteosarcoma	4	4%	6	5%	6	1%	2	2%	6	5%	4	1%	1	1%	16	14%	4	1%
Other bone tumour	0	0%	1	1%	5	1%	0	0%	3	3%	3	1%	0	0%	1	1%	1	<1%
OTHER INVASIVE CANCERS	**1**	1%	**3**	3%	**35**	6%	**1**	1%	**5**	5%	**23**	4%	**3**	3%	**4**	4%	**35**	6%
PAEDIATRIC and EMBRYONAL	**21**	20%	**0**	0%	**1**	<1%	**21**	20%	**2**	2%	**2**	<1%	**23**	25%	**4**	4%	**1**	<1%
TOTAL	**107**	100%	**110**	100%	**549**	100%	**106**	100%	**110**	100%	**516**	100%	**93**	100%	**114**	100%	**579**	100%

Regional, national and international variation in incidence[ii]

Incidence rates for all invasive cancers varied by remoteness for both males and females (Figure 16); see the Glossary for a definition of remoteness). Outer regional areas had the highest incidence rate for 15-24 year old males for all cancers compared to other regions while remote and very remote areas demonstrated the lowest. For 15-24 year old females inner regional areas had the highest incidence rate for all cancers compared to other regions while the remote & very remote areas demonstrated the lowest.

Figure 16: Cancer incidence rates by remoteness of residence, Queensland, 2014, 15-24 year olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

At the Hospital and Health Service (HHS) level, incidence rates varied across the state for all invasive cancers for 15-24 year olds collectively and for the most common cancers (Figure 17). Differences in regional variation in incidence rates were also evident for both sexes. Reasons for the variations are diverse and complex and include exposure to environmental factors, socioeconomic status, access to health services and chance.[4]

ii. In the interest of completeness, incidence and mortality rates have been included for all hospital and health services including those with fewer than 16 cases. Incidence and mortality rates based on small numbers of cases should be interpreted with caution due to the poor reliability of rate calculations based on small numbers. For example, the relative standard error (RSE) will be equal or greater than 25% when incidence rates are based on fewer than 16 cases. For more information, refer to the technical notes available at: http://www.cdc.gov/cancer/npcr/uscs/2007/technical_notes/stat_methods/supression.htm

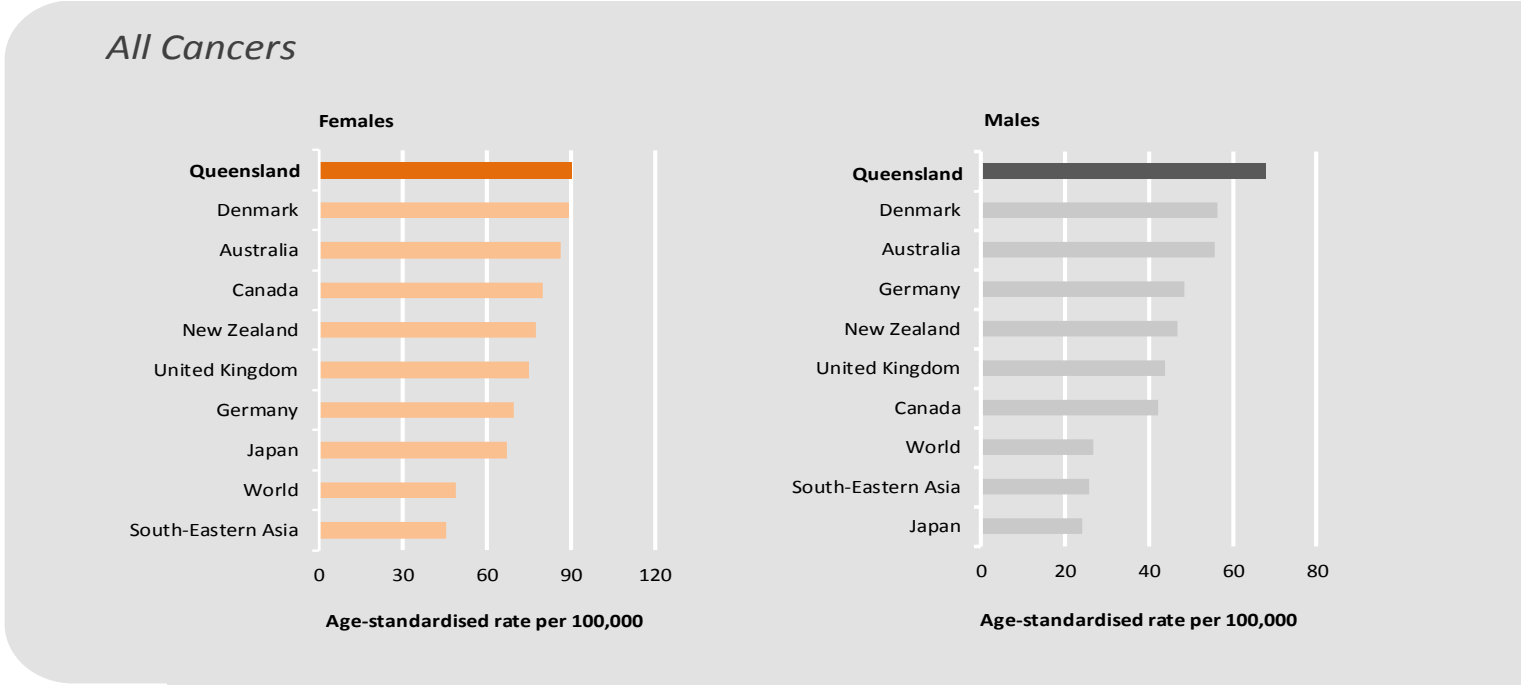
Figure 17: Cancer incidence rates by Hospital and Health Service, Queensland, Annual average 2012-2014, 15-24 year olds

Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

International variation incidence

Figure 18 shows cancer incidence rates for 15-39 year olds by various regions in the world and Queensland.[3] Cancer incidence rates in Queensland are the highest in the world for 15-39 year olds.

Figure 18: Cancer incidence rates in 15-39 years olds for selected international regions and Queensland, 2014



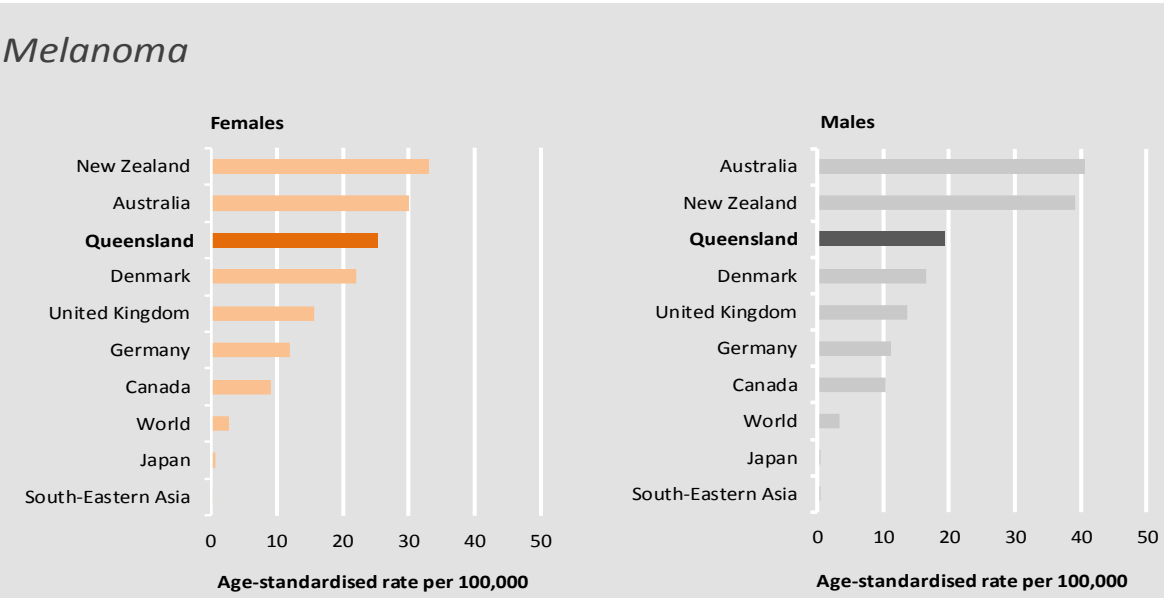
Cancer incidence is estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Cancer incidence by selected diagnosis is represented in Figures 19-23 for 15-39 years old by various regions in the world and Queensland. Queensland has the highest rate of melanoma in the world which contributes significantly to Queensland higher overall rate of all cancers (Figure 19).

Cancer incidence rates in Queensland for 15-39 year olds are the highest in the world. Geographic variation is a feature of cancer in Queensland.

Figure 19: Cancer incidence rates for Melanoma in 15-39 years olds for selected international regions and Queensland, 2014



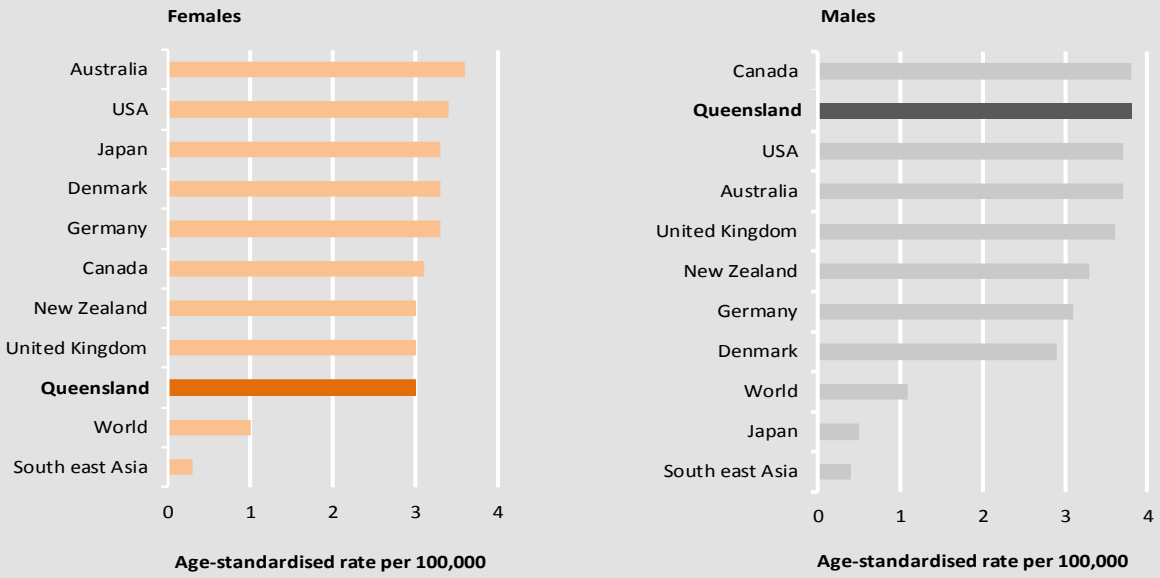
Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Figure 20: Cancer incidence rates for CNS and Brain cancer in 15-39 years olds for selected international regional and Queensland 2014

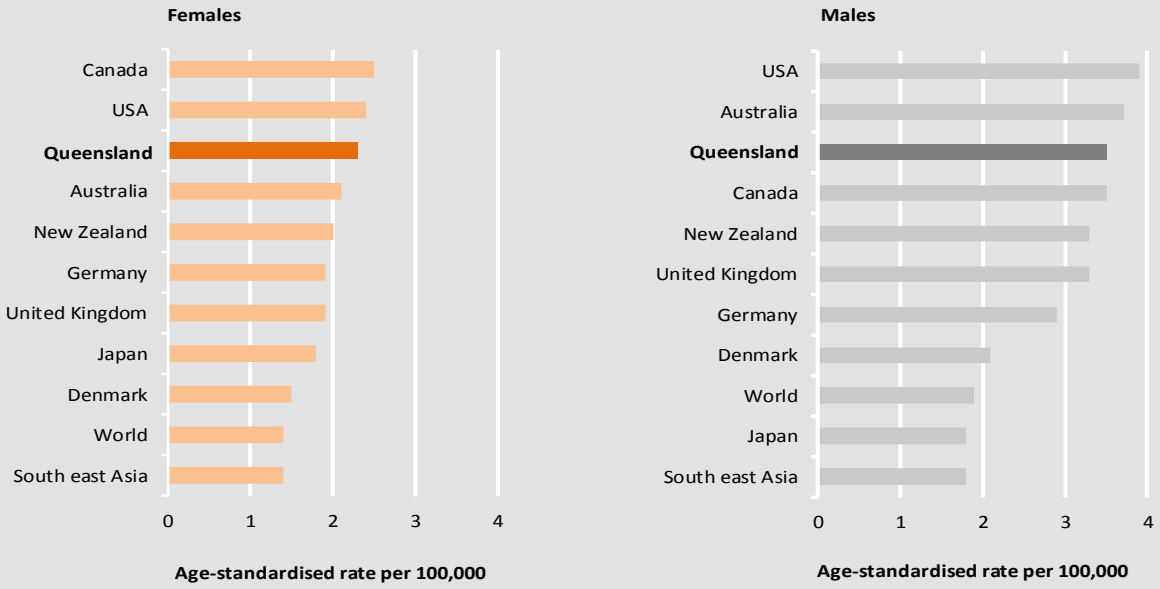
Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Figure 21: Cancer incidence rates of Hodgkin and Non-Hodgkin Lymphoma in 15-39 year olds for selected international regions and Queensland, 2014

Hodgkin Lymphoma



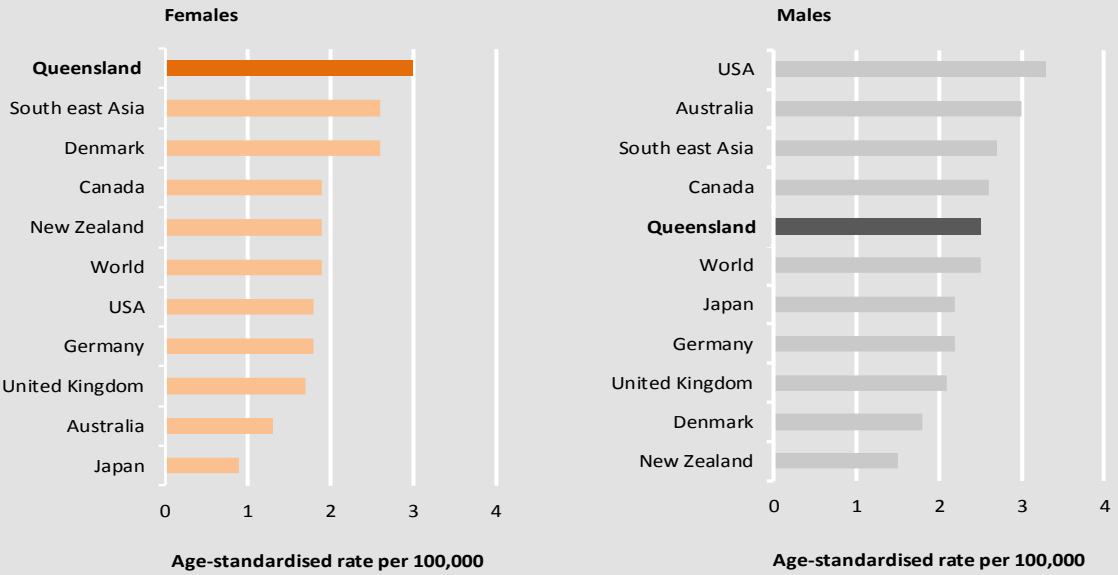
Non-Hodgkin Lymphoma



Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Figure 22: Cancer incidence rates of Leukaemia in 15-39 year olds for selected international regions and Queensland, 2014

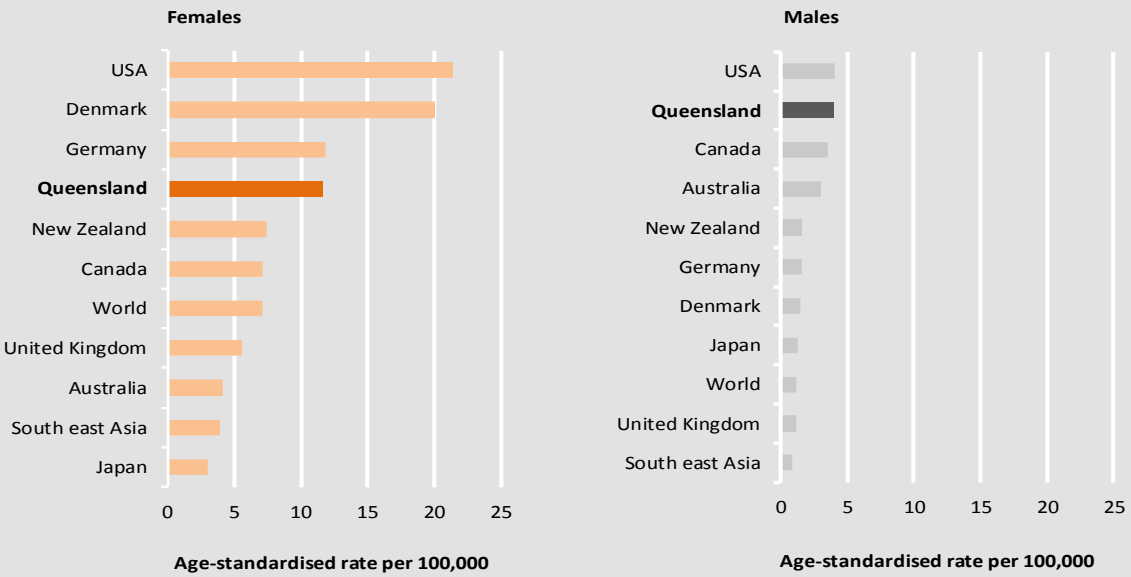
Leukaemias



Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Figure 23: Cancer incidence rates for thyroid carcinoma in 15-39 years olds for selected international regional and Queensland, 2014

Thyroid carcinoma

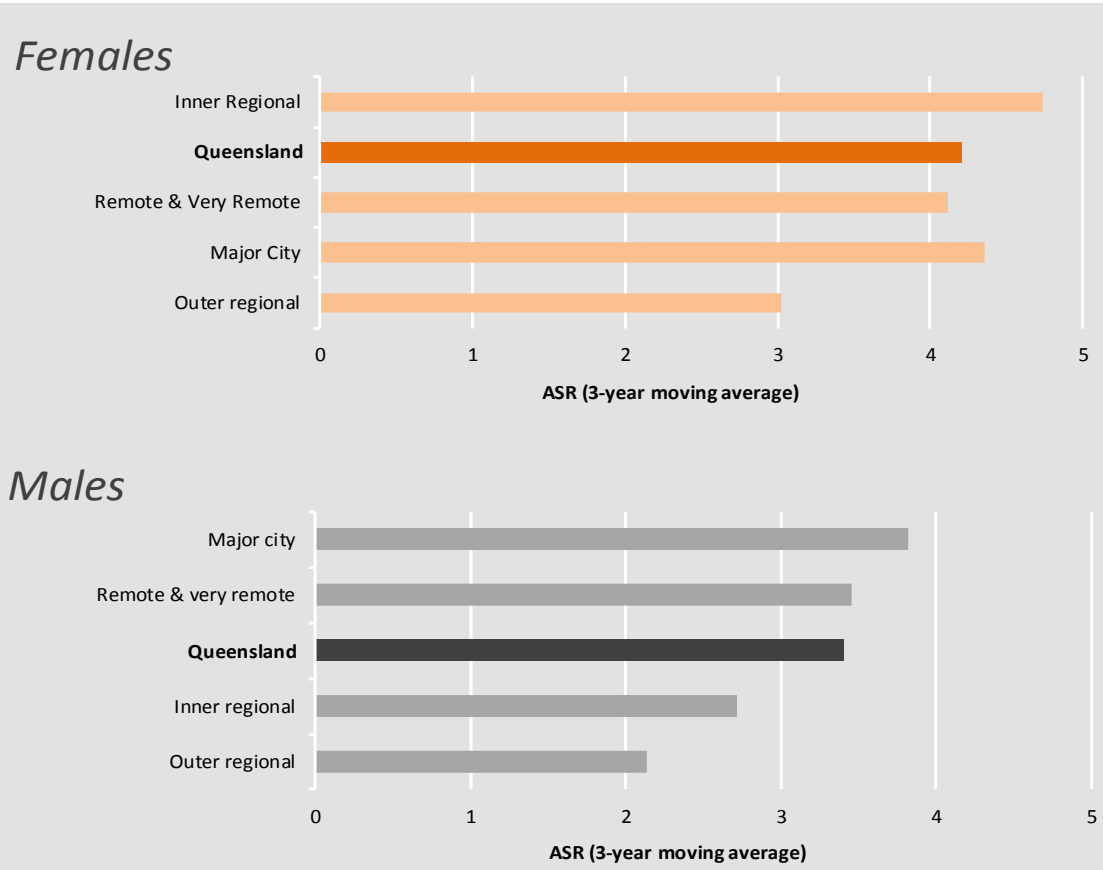


Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.

Regional, national and international variation in mortality

Mortality rates for all invasive cancers were highest in the inner regional and remote & very remote areas of Queensland for 15-24 year old females (Figure 24). For 15-24 year old males major cities and remote and very remote areas had a higher cancer mortality rate compared to regional areas of Queensland.

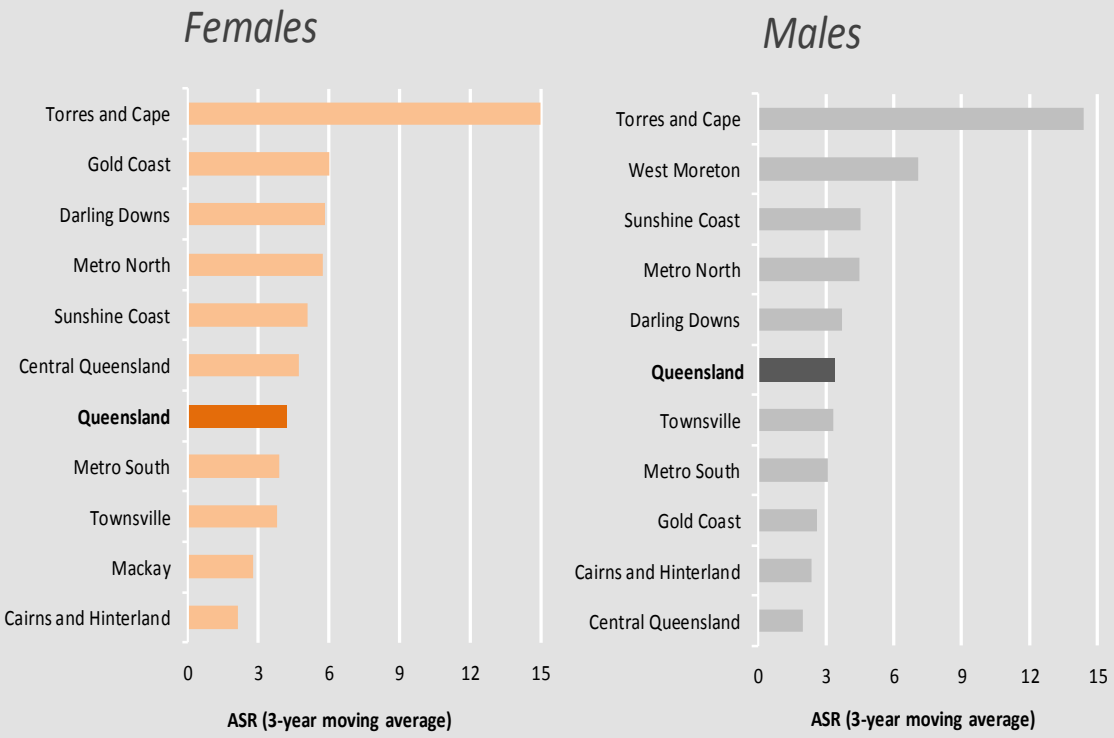
Figure 24: Cancer mortality rates by remoteness of residence, Queensland, Annual average 2012-2014, 15-24 year olds



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

At the Hospital and Health Service (HHS) level, mortality rates for 15-24 year olds varied across the state for all invasive cancers considered collectively as well as for the most common cancers (Figure 25). Torres and Cape HHS appears to be over-represented. It should be noted that remote HHS such as Torres and Cape have small populations and estimates of mortality rates based on such small numbers may not be as accurate as those areas with larger populations. Reasons for the variations are diverse and complex and include exposure to environmental factors, socioeconomic status, access to health services and chance.

Figure 25: Cancer mortality rates by Hospital and Health Service, Queensland, Annual average 2012-2014, 15-24 year olds

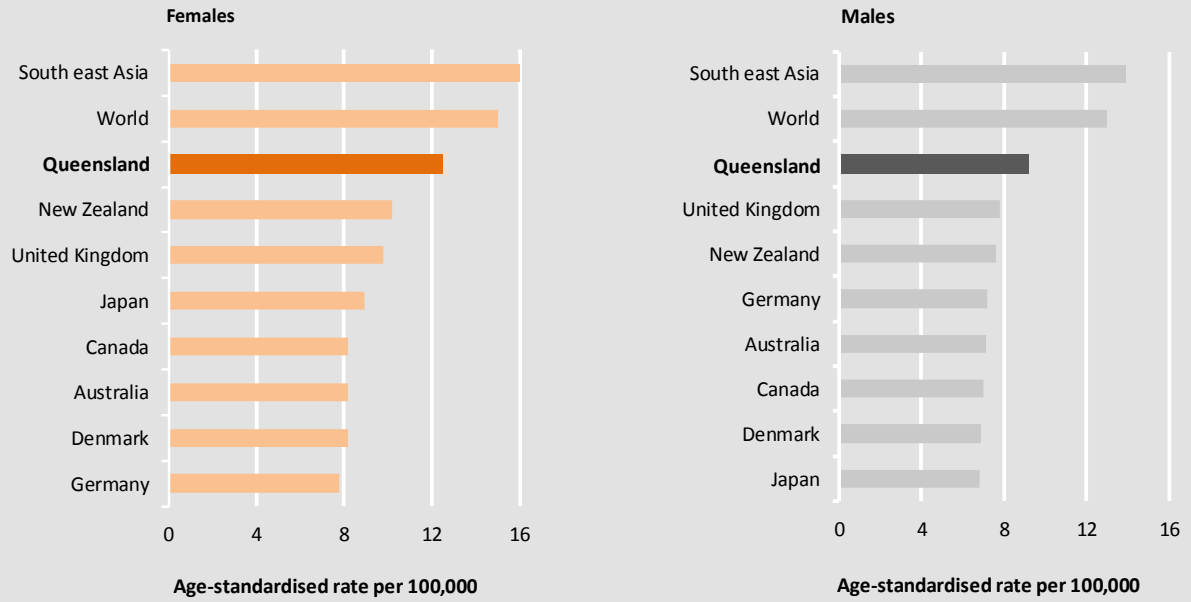


Note: Where no cases were reported during 2012-2014, the graph is intentionally left blank
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

While cancer incidence rates in Queensland for 15-39 year olds are the highest in the world (Figure 18), mortality rates overall compare favourably with other regions (Figure 26).[3]

Figure 26: Cancer mortality rates for selected international regions and Queensland, 2014, 15-39 year olds

All Cancers



Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2012. All rates are standardised to World Standard Population.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Cancer mortality rates in Queensland for 15-39 year olds compare favourably with other nations.

Prevalence

Prevalence represents the number of people living with a condition, such as cancer, and is a measure of the burden of disease in individuals, families and society. As treatment for cancer changes, particularly with the increasing availability of immunotherapies, more people are living with cancer as a chronic condition. As such, the prevalence of cancer in Queensland is rising. While children and adolescents represent only a small proportion of the total cancer burden, young people have the longest time to live with the on-going consequences of a cancer diagnoses. In children 0-14 years, leukaemia had the highest prevalence due to high incidence and relatively good survival. Prevalence in children 0-14 years is summarised in table 5. In adolescents and young adults 15-24 years, melanomas followed by carcinomas had the highest prevalence, again attributable to higher incidence and good survival. Prevalence in young people 15-24 years is summarised in Table 6.

Table 5: Five-year prevalence cancers, Queensland, 31 December 2014, 0-14 year olds

	Female		Male		Total	
Type of cancer	Count	% of population	Count	% of population	Count	% of population
Total cancers	244	0.054%	295	0.061%	539	0.058%
Leukaemia	104	0.023%	114	0.024%	218	0.023%
Paediatric & Embryonal	48	0.011%	50	0.010%	98	0.010%
CNS and Brain	22	0.005%	41	0.009%	63	0.007%
Lymphomas	9	0.002%	39	0.008%	48	0.005%
Soft-tissue sarcomas	16	0.004%	16	0.003%	32	0.003%
Bone	13	0.003%	11	0.002%	24	0.003%
Germ cell	8	0.002%	12	0.002%	20	0.002%
Carcinomas (excluding thyroid)	14	0.003%	5	0.001%	19	0.002%
All other cancers	5	0.001%	4	0.001%	9	0.001%
Thyroid carcinomas	3	0.001%	2	<0.001%	5	0.001%
Melanomas	2	<0.001%	1	<0.001%	3	<0.001%

** Percent of 0-14 year old Queensland population as at 30 December 2014 (935,242) (Australian Bureau of Statistics)*
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Table 6: Five-year prevalence cancers, Queensland, 31 December 2014, 15-24 year olds

	Female		Male		Total	
Type of cancer	Count	% of population	Count	% of population	Count	% of population
Total cancers	390	0.123%	393	0.120%	783	0.121%
Melanomas	114	0.036%	71	0.022%	185	0.029%
Lymphomas	68	0.021%	87	0.026%	155	0.024%
Carcinomas (excluding thyroid)	69	0.022%	37	0.011%	106	0.016%
Germ cell	15	0.005%	86	0.026%	101	0.016%
Thyroid carcinomas	49	0.015%	17	0.005%	66	0.010%
Leukaemia	19	0.006%	41	0.012%	60	0.009%
Soft-tissue sarcomas	20	0.006%	12	0.004%	32	0.005%
CNS and Brain	11	0.003%	16	0.005%	27	0.004%
Bone	7	0.002%	20	0.006%	27	0.004%
All other cancers	17	0.005%	4	0.001%	21	0.003%
Paediatric & Embryonal	1	<0.001%	2	0.001%	3	<0.001%

** Percent of 0-14 year old Queensland population as at 30 December 2014 (935,242) (Australian Bureau of Statistics)*
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

In adults 25-39 years, carcinomas followed by melanomas had the highest five year prevalence. Prevalence in adults 25-39 years old is summarised in Table 7.

Table 7: Five-year prevalence cancers, Queensland, 31 December 2014, 25-39 year olds

	Female		Male		Total	
Type of cancer	Count	% of population	Count	% of population	Count	% of population
Total cancers	2711	0.549%	1887	0.386%	4598	0.468%
Melanomas	847	0.172%	629	0.129%	1476	0.150%
Carcinomas (excluding thyroid)	1072	0.217%	357	0.073%	1429	0.145%
Thyroid carcinomas	357	0.072%	98	0.020%	455	0.046%
Germ cell	28	0.006%	389	0.080%	417	0.042%
Lymphomas	143	0.029%	166	0.034%	309	0.031%
All other cancers	106	0.021%	52	0.011%	158	0.016%
CNS and Brain	55	0.011%	69	0.014%	124	0.013%
Leukaemia	46	0.009%	67	0.014%	113	0.012%
Soft-tissue sarcomas	41	0.008%	48	0.010%	89	0.009%
Bone	15	0.003%	12	0.002%	27	0.003%
Paediatric & Embryonal	1	0.000%	0	0.000%	1	0.000%

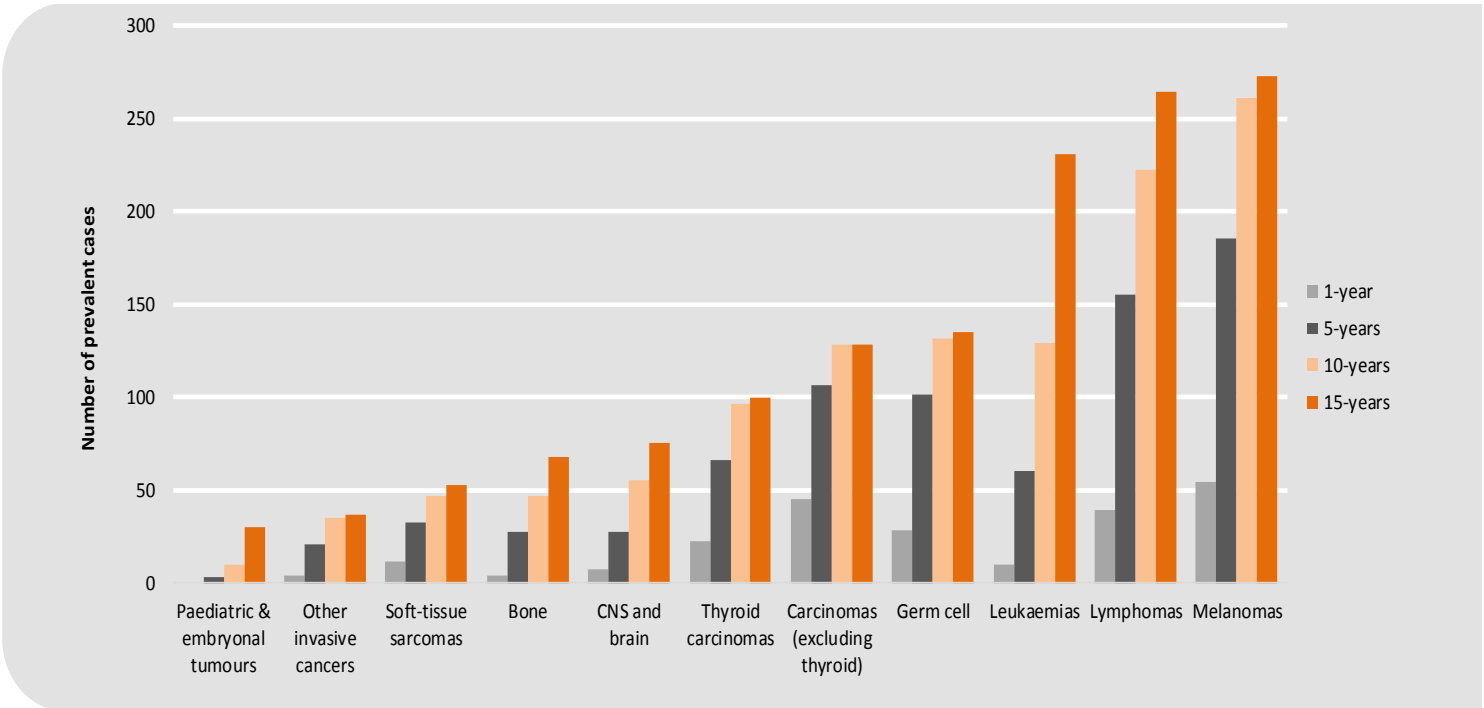
** Percent of 0-14 year old Queensland population as at 30 December 2014 (935,242) (Australian Bureau of Statistics)*

Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

PREVALENCE OVER TIME OF CANCER IN 15-24 YEARS OLDS

Over time, the highest prevalence is noted for melanoma, which is also the most common cancer diagnosed in young people aged 15-24 years. Of note is the increase in prevalence for leukaemia, this may be attributed to changes in practice with treating adolescents on paediatric protocols which has been demonstrated to improve survival (Figure 27).

Figure 27: Prevalence for cancer in 15-24 years old by time since diagnosis, Queensland 2014

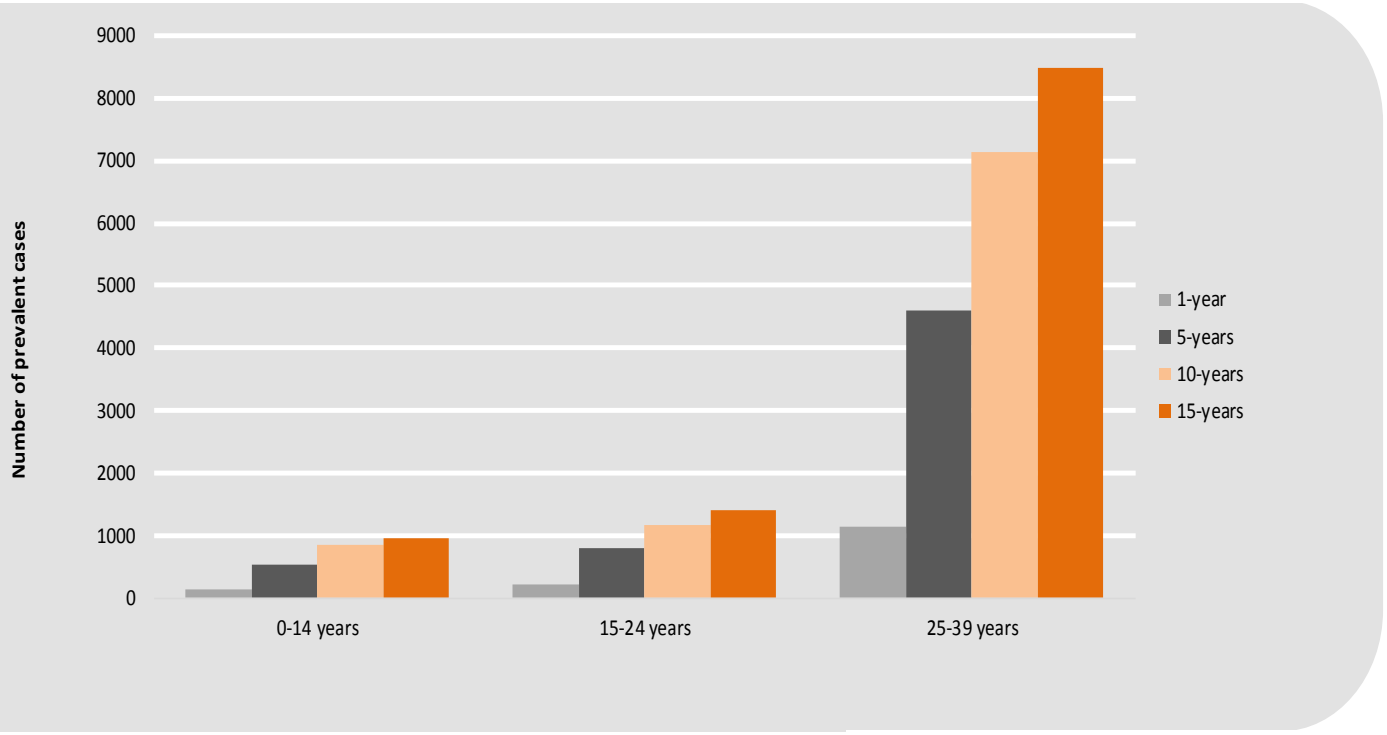


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Prevalence of all cancers by comparative age groups

The prevalence of all cancers for childhood (0-14 years), adolescent and young adults (15-24 years) and adults (25-39 years) by time since diagnosis is shown in Figures 28. Adult cancers (25– 39 year age group) demonstrated the highest proportional increase in prevalence over time. It has been pointed out that the time periods used for prevalence approximate different periods of the patient journey, from post-diagnosis and primary treatment (<1 year), through to follow-up (1 to 5 years) and long-term survivorship (>5 years).[4]

Figure 28: Prevalence for all cancers 0- 14 years, 15-24 years, and 25-39 years by time since diagnosis, Queensland, 31 Dec 2014



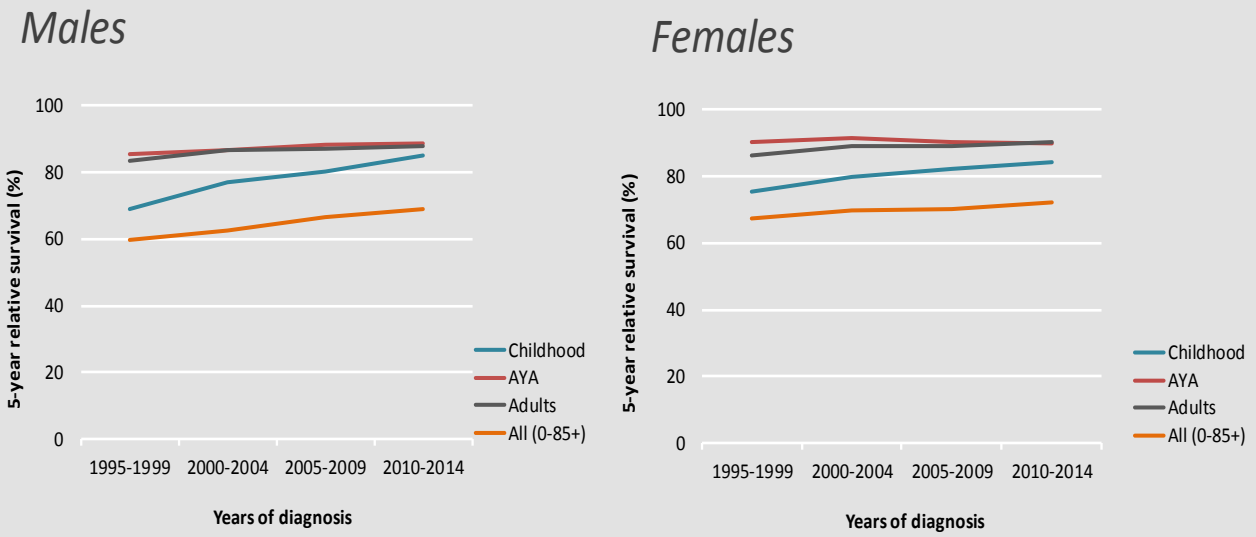
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Survival

Relative survival is a measure of the survival of a group of persons with a condition, such as cancer, relative to a comparable group from the general population without the condition. For cancer, five-year relative survival represents the proportion of patients alive five years after diagnosis, taking into account age, gender and year of diagnosis.

Survival varies widely and depends on the type of cancer. Thus, five year survival ratios from 2010-2014 vary for different age groups with 85% overall survival for 0-14 year olds, 89% for 15-24 year olds, 88% for 25-39 year olds year and 70% for all age groups combined 0- 85+ years (Figure 29).

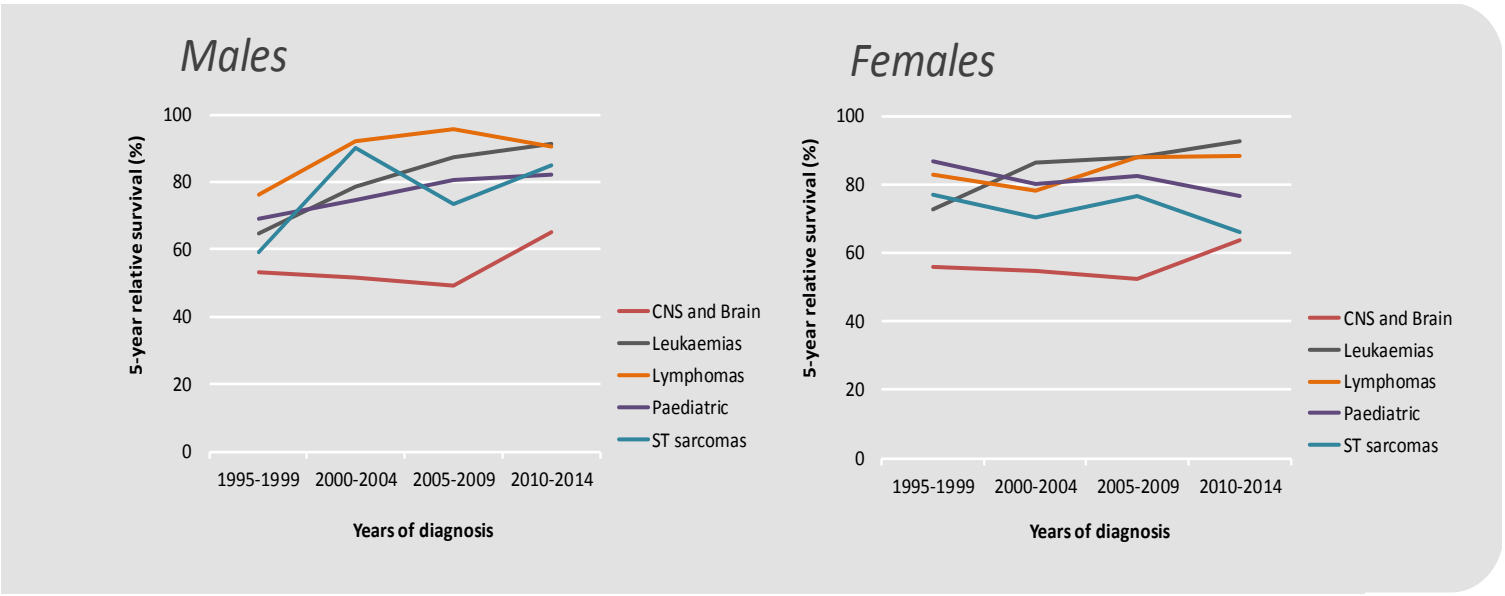
Figure 29: Five-year relative survival for all cancers by age group, Queensland, 1995-2014



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

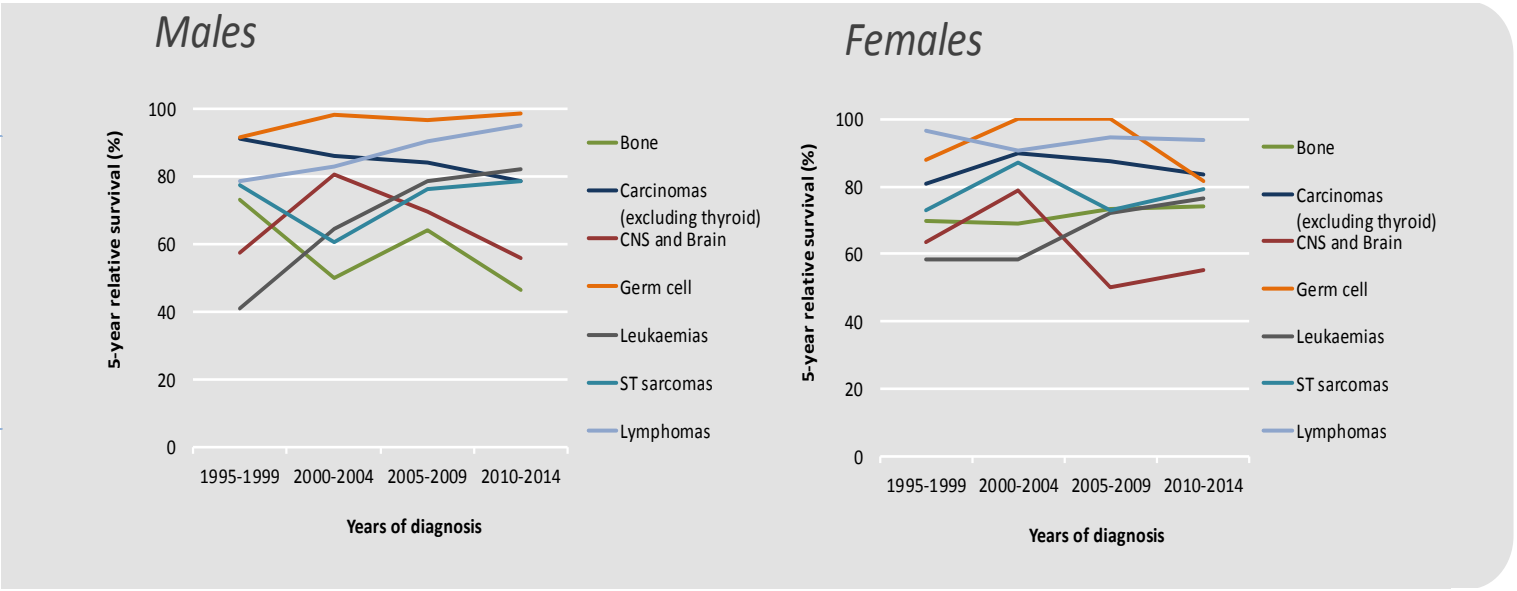
Five-year survival ratios from 1995-2014 vary for 0-14 year olds between the common cancers from 93% for female leukaemia to approximately 64% for male or female CNS & Brain cancer (Figure 30). Once again, the relative survival ratios for many common cancers appears to be improving, with improvements noted in most male cancers. Female cancers do not appear to have made the same gains in survival in children aged 0-14 years.

Figure 30: Five-year relative survival for selected cancers children 0-14 years, Queensland, 1995-2014



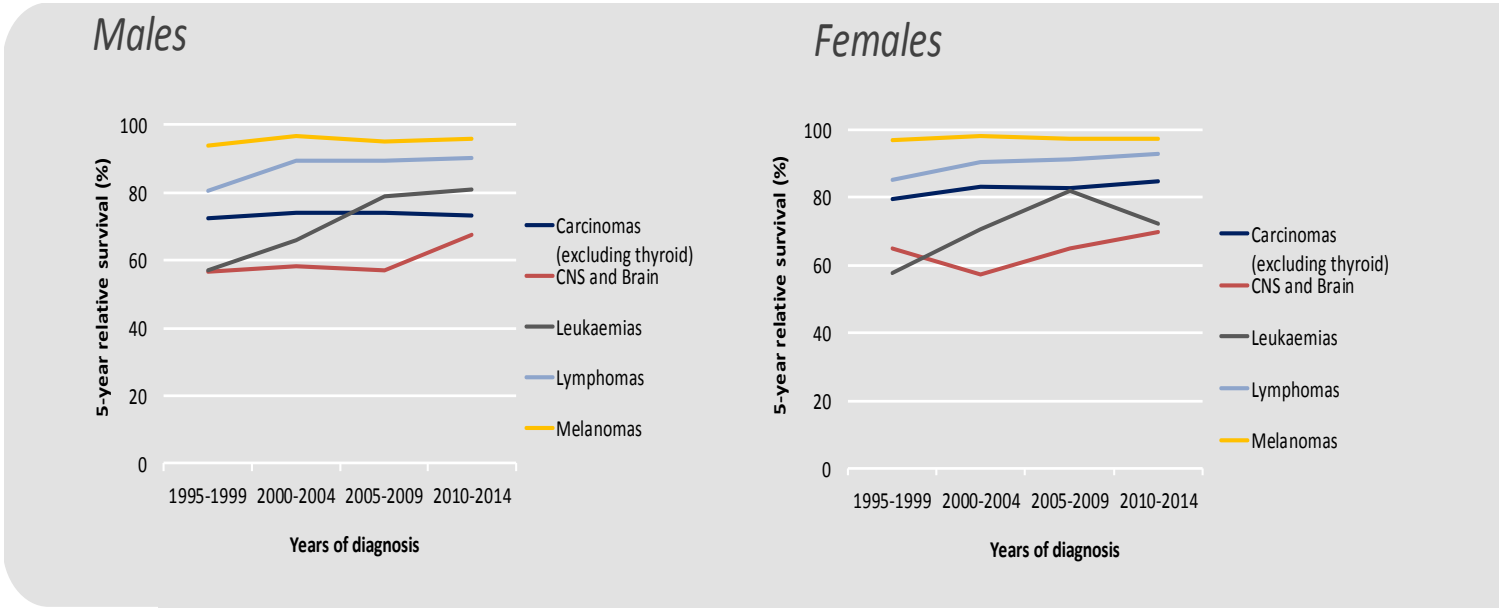
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 31: Five-year relative survival for selected cancers adolescents and young adults 15-24 years Queensland, 1995-2014



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 32: Five year relative survival for selected cancers adults 25-39 years, Queensland, 1995-2014



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Five-year survival ratios from 2010-2014 vary for 15-24 year olds between the common cancers from 100% for thyroid carcinoma in both males and females, to approximately 55% for CNS and Brain cancers in both males and females. (Figure 31). The relative survival ratios for many common cancers appear to be improving, with the greatest gains in leukaemias. Relative five year survival for leukaemia in 1995-1999 was 41% in males and 58% in females; this has risen to 82% in males and 76% in females for 2010-2014. There appears to be a decrease in relative five year survival in males with bone sarcoma from 73% in 1995-1999 to 47% in 2010-2014. Because of the small number of deaths, these data should be interpreted with caution. Decreases in survival are also noted in carcinomas and CNS and Brain cancers in both males and females. Females were also observed to have a decrease in survival of germ cell tumours. Again due to the small number of deaths attributed to germ cell tumours in females these data should be interpreted with caution.

Five-year survival ratios from 1995-2014 vary for adults 25-39 years between common cancers from 98% for female melanoma cancer to approximately 68% for CNS and Brain cancer (Figure 32). Once again, the relative survival ratios for many common cancers appear to be improving.

Appendix

Glossary and common abbreviations

Incidence (new cases)

The number of new cases of cancer diagnosed in a defined population during a specified time period. For example, 2012 incidence is the number of cancers which were first diagnosed between 1 January 2012 and 31 December 2012.

Incidence/mortality rate

The number of new cases/deaths attributed to a cancer in a defined group during a year divided by the number of persons in the group during the year, expressed as a rate per 100,000 persons in that year.

Mortality (deaths)

The number of deaths attributed to cancer in a defined population during a specified time period regardless of when the diagnosis of cancer was made.

Prevalence

The number of Queenslanders with a diagnosis of cancer who were alive on 31 December 2012.

Queensland Hospital and Health Service (HHS)

For residence considerations, the Hospital and Health Service is a geographic area defined by a collection of Statistical Local Areas (SLA). For public hospitals and health service facilities, the term Hospital and Health Service is synonymous with a group of Queensland Health facilities and staff responsible for providing and delivering health resources and services to an area which may consist of one or more residential areas.

Relative survival

The rate of survival of persons diagnosed with cancer relative to the expected survival rate of the general population. Five-year relative survival represents the proportion of patients alive five years after diagnosis, taking into account age, gender and year of diagnosis.

Remoteness

The relative remoteness of residence at time of diagnosis, based on the Australian Standard Geographical Classification

(ASGC)[5]. In this report, remoteness is classified into four groups: Major City, Inner Regional, Outer Regional, and Remote & Very Remote.

Projections

Projections are calculated using the most recent age-specific incidence and mortality rates (2013) and applying these to the population projections produced by the Australian Bureau of Statistics (ABS).

For more details on the calculations and the definitions of terms, go to OASys on https://qccat.health.qld.gov.au/OASys/ and open the Help file.

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