Cancer in Queensland

A statistical overview 1982-2021

Annual update 2014

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Queensland Cancer Control Analysis Team

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The report was prepared by Nancy Tran, Nathan Dunn, Julie Moore, Tracey Guan and Shoni Philpot. The 2014 edition of OASys was prepared by Nancy Tran.

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Message from the Chair

As Chair of the Queensland Cancer Control Safety and Quality Partnership I am pleased to introduce, *Cancer in Queensland: A statistical overview 1982-2021, Annual Update 2014*. This report is a comprehensive epidemiological report of cancer incidence and survival in Queensland and is a follow up to *Cancer in Queensland: A statistical overview 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 2021. We follow up the projections with an analysis of cancer incidence, mortality and survival in Queensland from 1982-2014. This data underpins our ability to estimate the impact of cancer in Queensland in 2021. It supports cancer services planning, evaluation and monitoring, and research.

For the first time a section focusing on Aboriginal and Torres Strait Islander people with cancer has been included in this report. This section highlights where differences in cancer outcomes exist between Indigenous and non-Indigenous Queenslanders. We anticipate this information will assist in addressing the Queensland Health policy and accountability framework '*Making track towards closing the gap in health outcomes Indigenous Queensland by 2033*' .

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 E Theile AO
Chair
Queensland Cancer Control Safety and Quality Partnership

Highlights and summary

Cancer in Queensland: A Statistical Overview 1982-2021, Annual update 2014 provides information on cancer incidence and mortality for the state of Queensland. This report presents cancer data for 2014 and projections for 2021 and is the third of a series which will provide information on patterns and trends for cancer, the leading cause of all deaths in 2014[1] and the leading cause of potential years of life lost among Queenslanders.

Cancer incidence rates in Queensland are among the highest in the world. Incidence rates are fairly uniform across the state, with a tendency to slightly lower rates recorded in remote and very remote areas.

The growth in **new cases of cancer** is largely being driven by population growth and ageing. The underlying cancer rate has increased only slightly since 1982:

- In 2014, 27,022 new cases of cancer were diagnosed; of these 15,061 were reported in males and 11,961 in females.
- The most common cancer diagnoses in males were prostate cancer (26%), melanoma (15%), followed by colorectal cancer (11%) and haematological cancers (11%).
- The most common cancer diagnoses in females were breast cancer (28%), melanoma (13%), followed by colorectal cancer (11%) and haematological cancers (10%).
- In children the most common diagnoses were haematological cancers (47%), cancers of the central nervous system (14%) and cancers of bone and soft tissue (13%).
- In 2021, an estimated 33,835 new cases of invasive cancer 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, more than 90,000 people were living with a diagnosis of cancer in the previous five years (nearly 2% of all Queenslanders).
- Prostate cancer followed by melanoma and breast cancer were the most prevalent.

Cancer survival appears to be improving for some cancers:

- The average five-year relative survival for 2010-2014 was 70% compared to 68% for 2005-2009.
- The greatest gains were observed for oesophageal, myeloma and kidney cancers.

The number of cancer deaths continues to increase in Queensland:

- In 2014, 5,073 deaths were attributed to cancer in males and 3,659 deaths to cancer in females.
- Lung cancer was the most common cause of cancer death, accounting for 22% of deaths in males and 19% of deaths in females.
- Prostate and colorectal cancers (12% and 11% respectively) were the next most common causes of cancer death in males, and breast and colorectal cancers (13% and 12% respectively) the next most common causes of cancer death in females.
- In 2021, an estimated 11,305 deaths will be attributed to cancer.

The mortality rate for cancer has been in decline since the mid-1990s. Mortality rates from cancer are slightly higher in remote and very remote areas compared to major cities.

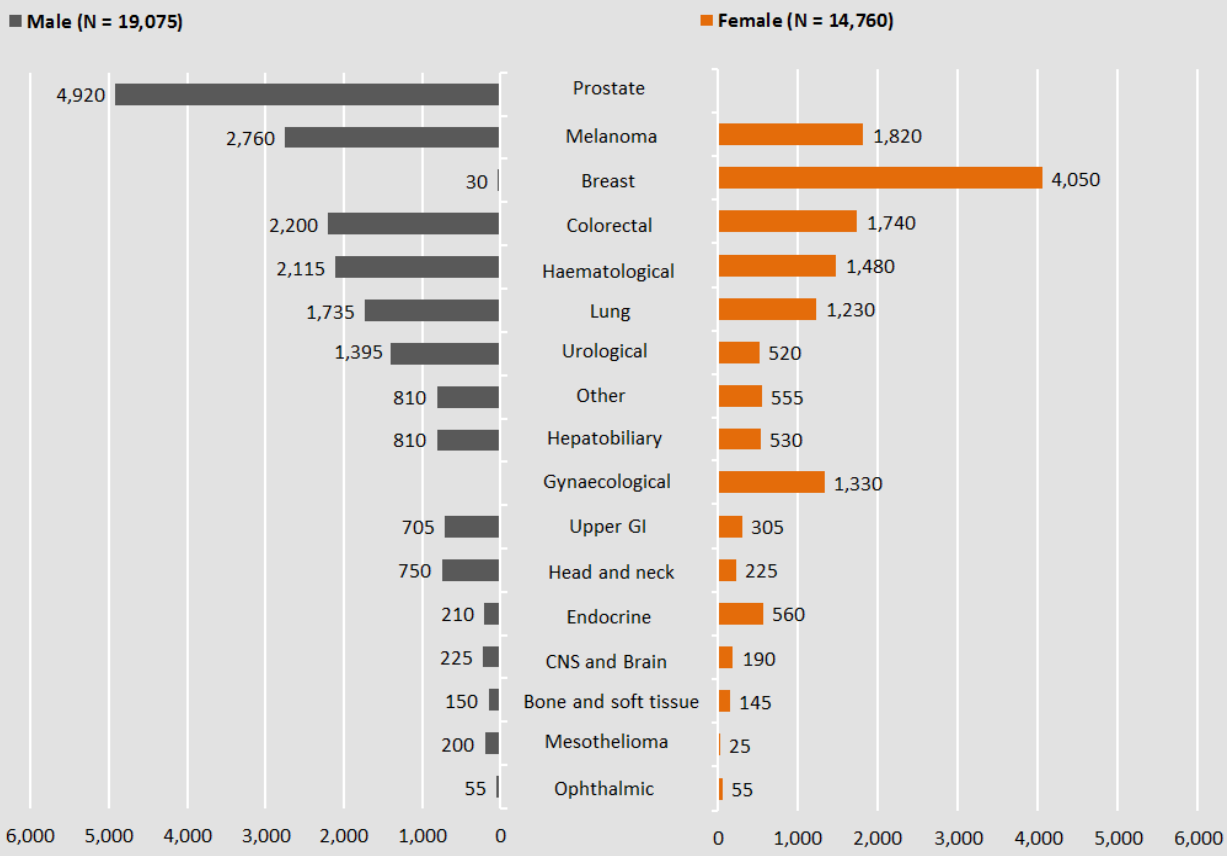
The presentation of **cancer data by Indigenous status** demonstrates the significant variation in the burden of cancer between Indigenous and non-Indigenous Queenslanders.

Cancer projections

Cancer projections Queensland, 2021

In 2021, an estimated 33,835 new cases of invasive cancers will be diagnosed among Queensland residents (Figure 1), while an estimated 11,305 Queenslanders will die of the disease (Figure 2).

Figure 1: Expected cancer incidence, common cancers, Queensland, 2021

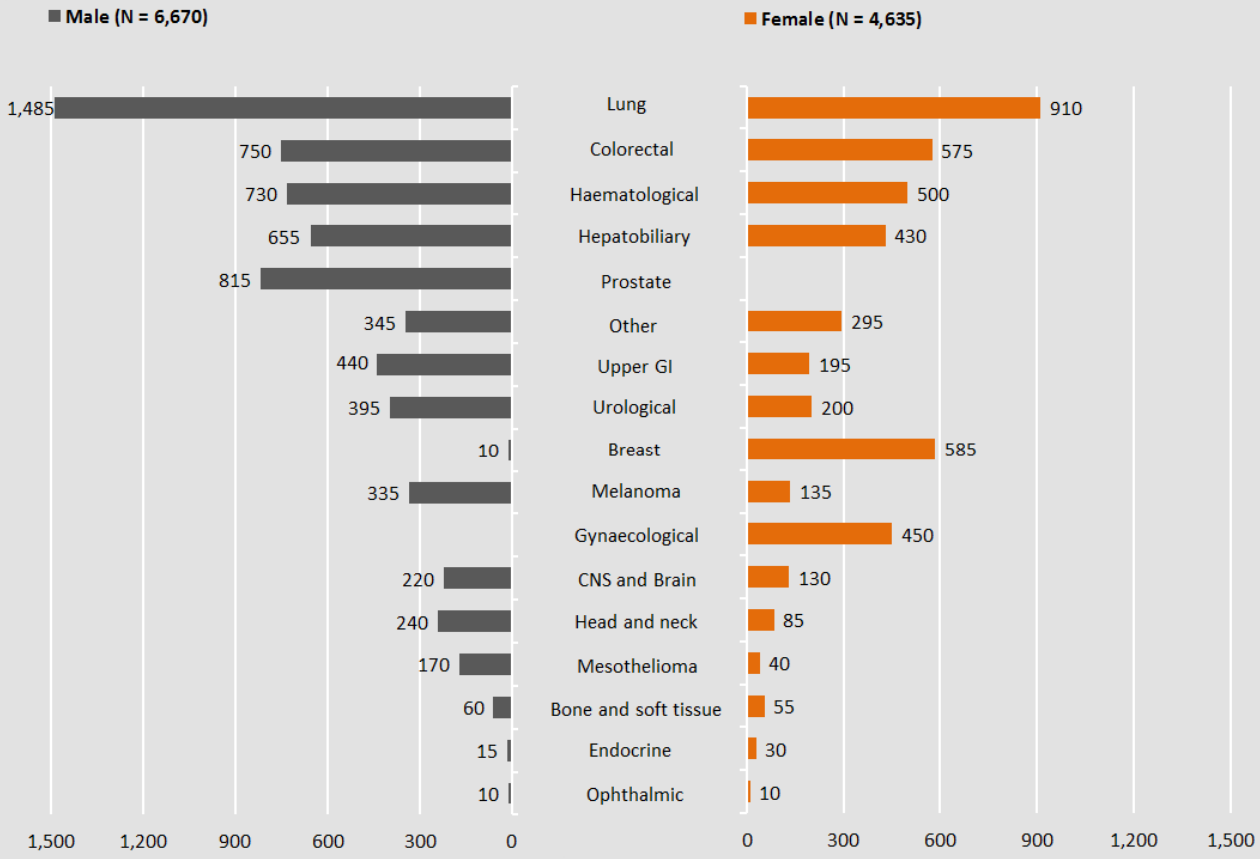


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team. The figures, which have been rounded to the nearest five cases, are provided as a guide and should be used with care. Projections are calculated by applying the most recent cancer incidence rates (2014), stratified by age and sex, to the expected Queensland population in 2021.

Nearly 60% of new cancers as well as cancer deaths will be among males. Prostate and breast cancers are expected to remain the most commonly diagnosed cancers in males and females respectively, while lung cancer will continue to be the leading cause of cancer death in both sexes. In Queensland melanoma diagnosis rates are expected to continue to be the highest in the world with more than 4,500 cases expected to be diagnosed in 2021.

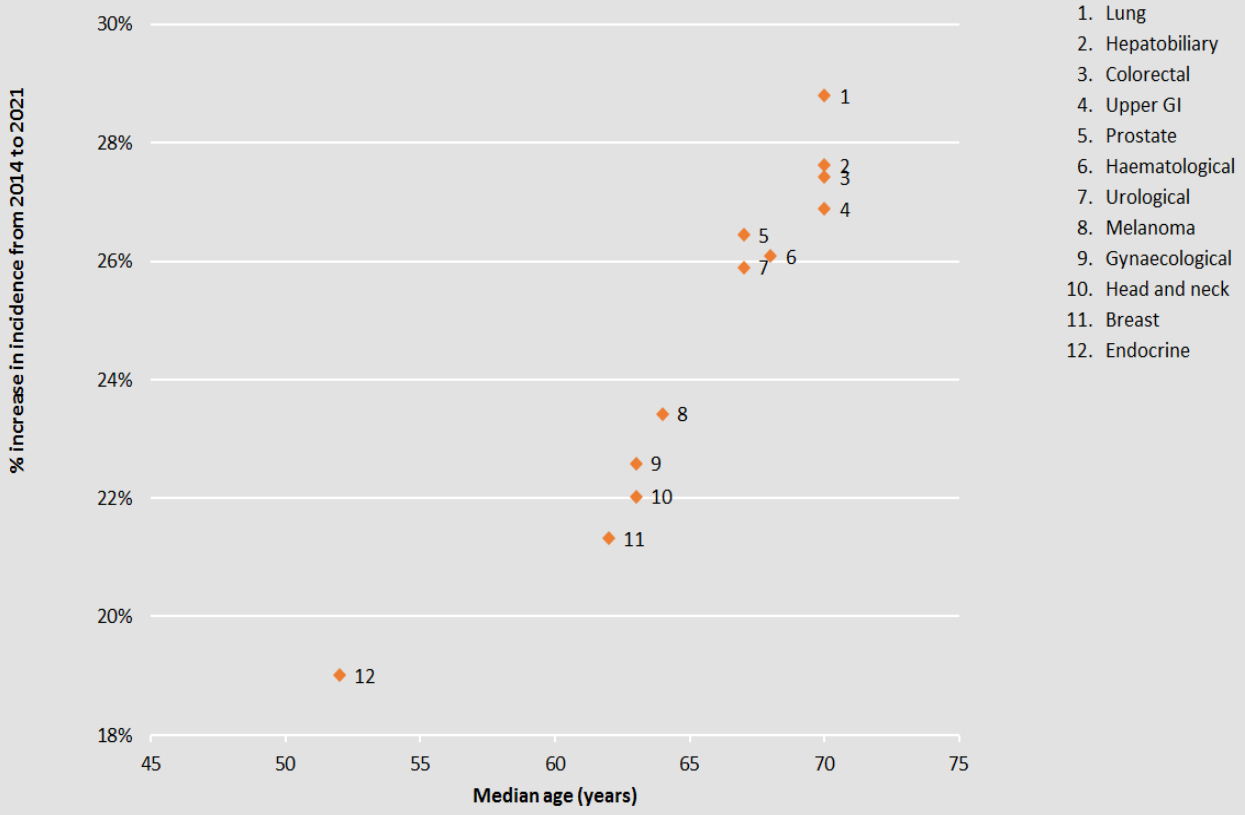
These projections provide an indication of the likely burden of cancer and the demand for the cancer services in 2021. As with any forecast, they should be used with care and amended to reflect local trends whenever possible.

Figure 2: Expected cancer mortality, common cancers, Queensland, 2021



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 cancer mortality rates (2014), stratified by age and sex, to the expected Queensland population in 2021.

Figure 3: Relationship between the projected increase in cancer incidence from 2014 to 2021 and the median age at diagnosis for common cancers (see text for details)



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

Figure 3 shows the expected relative increases in the incidence of common cancers from 2014 to 2021. Assuming no change in incidence rates over this period, cancers which are common in older persons (e.g. lung cancers) are projected to increase at a faster rate than cancers which are common in younger people (e.g. endocrine cancers). These trends are a direct consequence of projected changes in the age distribution of Queensland's population over this period, as the number of people aged 65 years and older is expected to grow at a much faster rate than the rest of the population.

Cancers which are more common in older people are projected to increase at a faster rate than cancers which are more common in younger people.

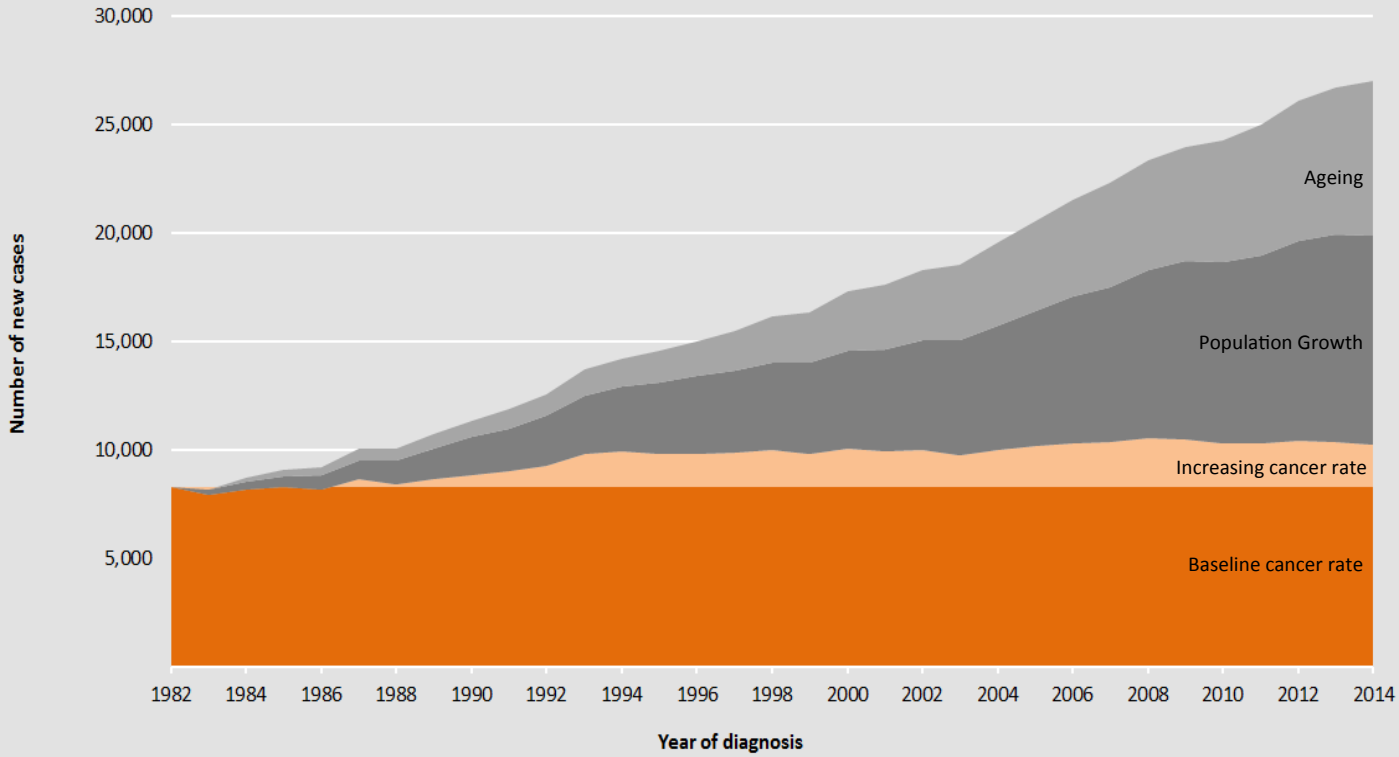
Cancer in Queensland

Incidence and mortality

The number of new cases of cancer among Queensland residents has increased by more than 226% between 1982 and 2014. For males, the number of new cases increased from 4,596 in 1982 to 15,061 (228%) in 2014; for females, the number of new cases increased from 3,681 in 1982 to 11,961 (225%). These increases are due largely to population growth and ageing (Figure 4).

Queensland's population increased from 2.4 million in 1982 to 4.6 million in 2014, an increase of 92%, making Queensland one of the fastest growing states in Australia and among the fastest in developed countries. The proportion of persons 65 years and older also increased, from 9.7% in 1982 to 14% in 2014. Changes in cancer incidence rate accounted for only a small proportion of the total increase in incidence.

Figure 4: Growth in new cases of cancer, Queensland 1982-2014

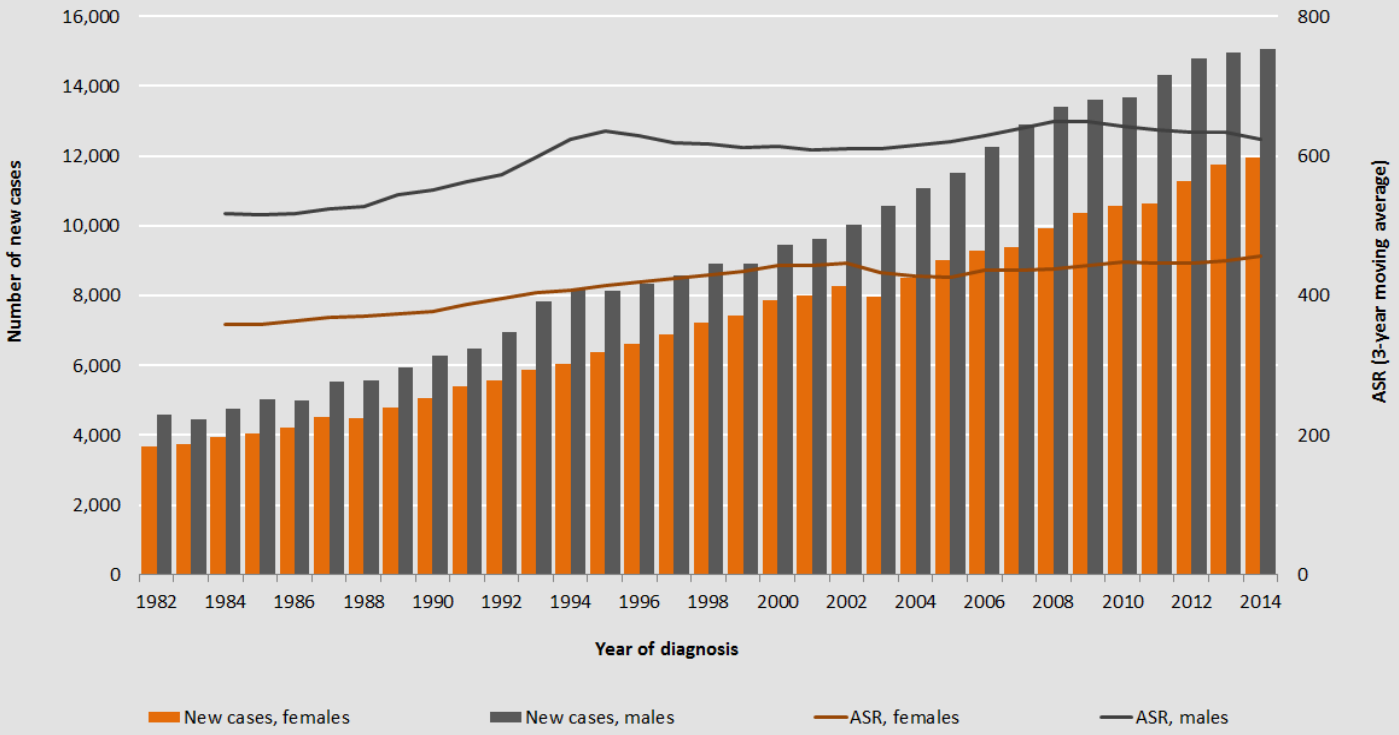


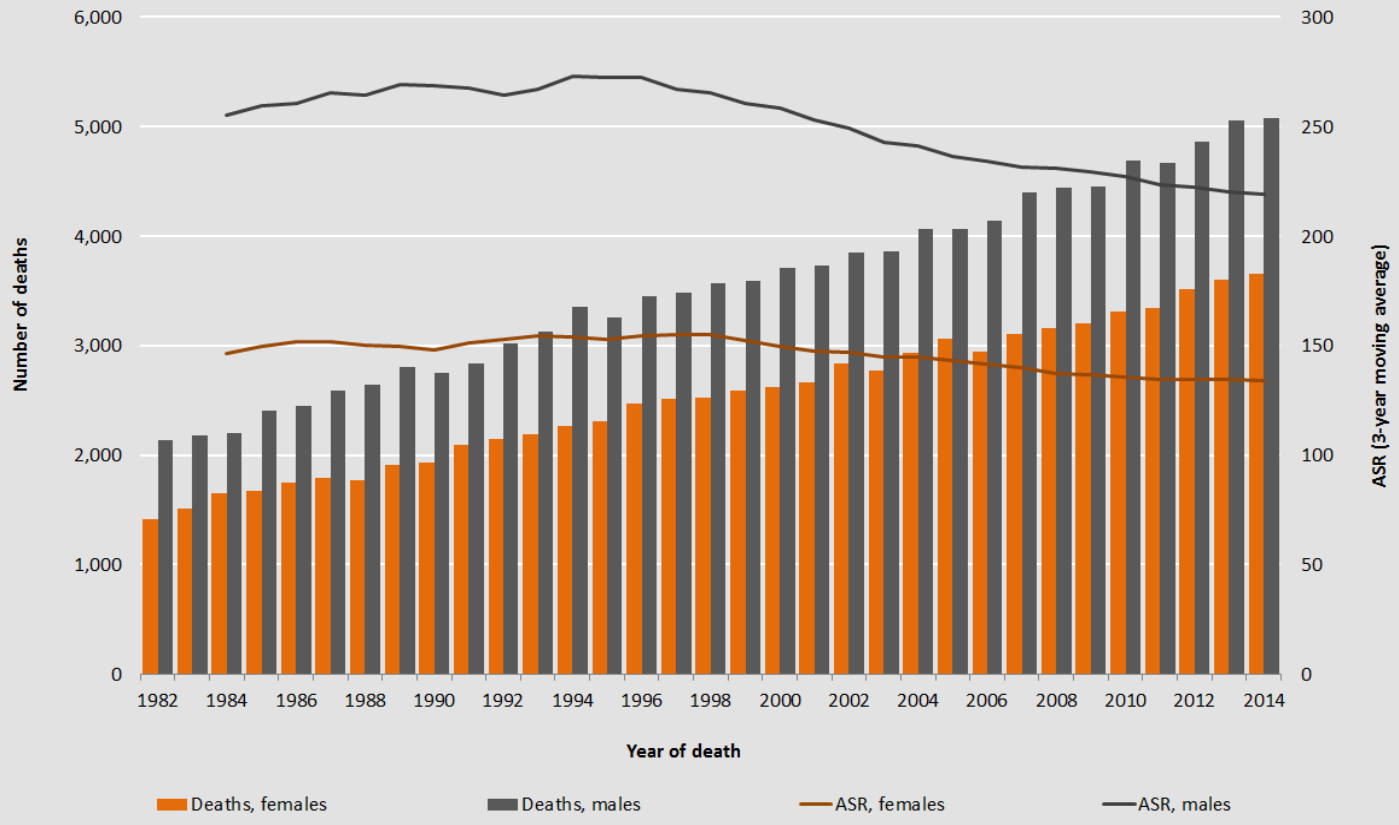
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Trends in incidence rates for all invasive cancers and the number of new cases diagnosed annually are summarised in Figure 5. Since 2009 the incidence rate (3-year moving average) for all invasive cancers among females has increased slightly from 442 to 456 per 100,000 population in 2014. For males the incidence rate (3-year moving average) has decreased from 650 in 2009 to 624 in 2014.

Mortality rates have been in decline since the mid-1990s for both males and females (Figure 5). The number of deaths, however, has continued to rise due to the increase in the number of new cases each year and the ageing population.

Figure 5: Trends in numbers and rates for all cancers, Queensland 1982-2014





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

Most common cancers and cancer deaths

FIVE MOST COMMON CANCERS

In 2014 there were 27,022 new cases of cancer diagnosed and there were 8,732 deaths attributed to cancer (Figures 6). The five most commonly diagnosed cancers in 2014 were prostate (3,891 cases), melanoma (3,711 cases), breast (3,363 cases), colorectal (3,092 cases) and haematological (2,851 cases). These cancers combined accounted for 63% for all cancer diagnoses.

MOST COMMON CANCERS BY SEX

Cancers were more common in males (15,061 new cases, 640 per 100,000) than in females (11,961 new cases, 505 per 100,000). For both sexes, three cancers accounted for over half of all incidence: in males, prostate cancer represented 26% of cases (3,891 cases), followed by melanoma (2,210 cases) and colorectal cancer (1,717 cases), accounting for 15% and 11% of all male cancers respectively. For females, breast cancer was the most common cancer representing 28% of cases (3,339 cases), followed by melanoma (1,501 cases) and colorectal cancer (1,375 cases), representing 13% and 11% respectively of cancers in females. Urological and head and neck cancers were much more common in males than in females; with incidence rates almost three times higher. Endocrine cancers were close to three times more common in females than males (Figure 7).

MOST COMMON CANCER DEATHS

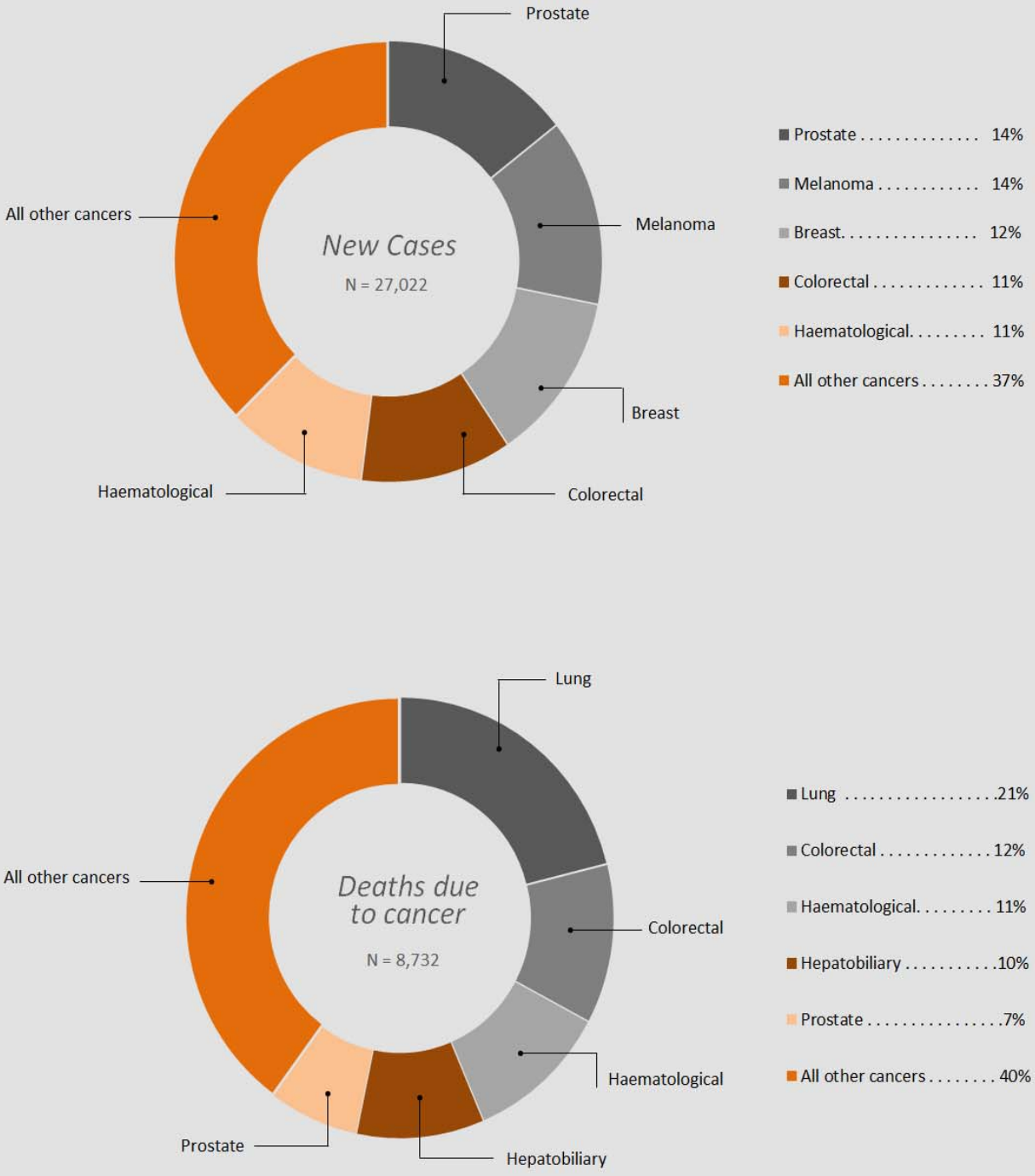
During 2014, lung cancer was the leading cause of death with 1,842 deaths (21%). Colorectal cancer was the next common cause of cancer death with 1,022 deaths (12%) followed by haematological cancer with 943 deaths (11%). More cancer deaths in Queensland were recorded for males (5,073, 216 per 100,000) than for females (3,659, 154 per 100,000). Lung, prostate, breast and colorectal cancers accounted for nearly half the deaths in both males (45%) and females (45%) (Figure 8).

The most common cancers in Queensland are cancers of the prostate and breast, colorectal cancer and melanoma.

Lung cancer is the leading cause of cancer death in Queensland.

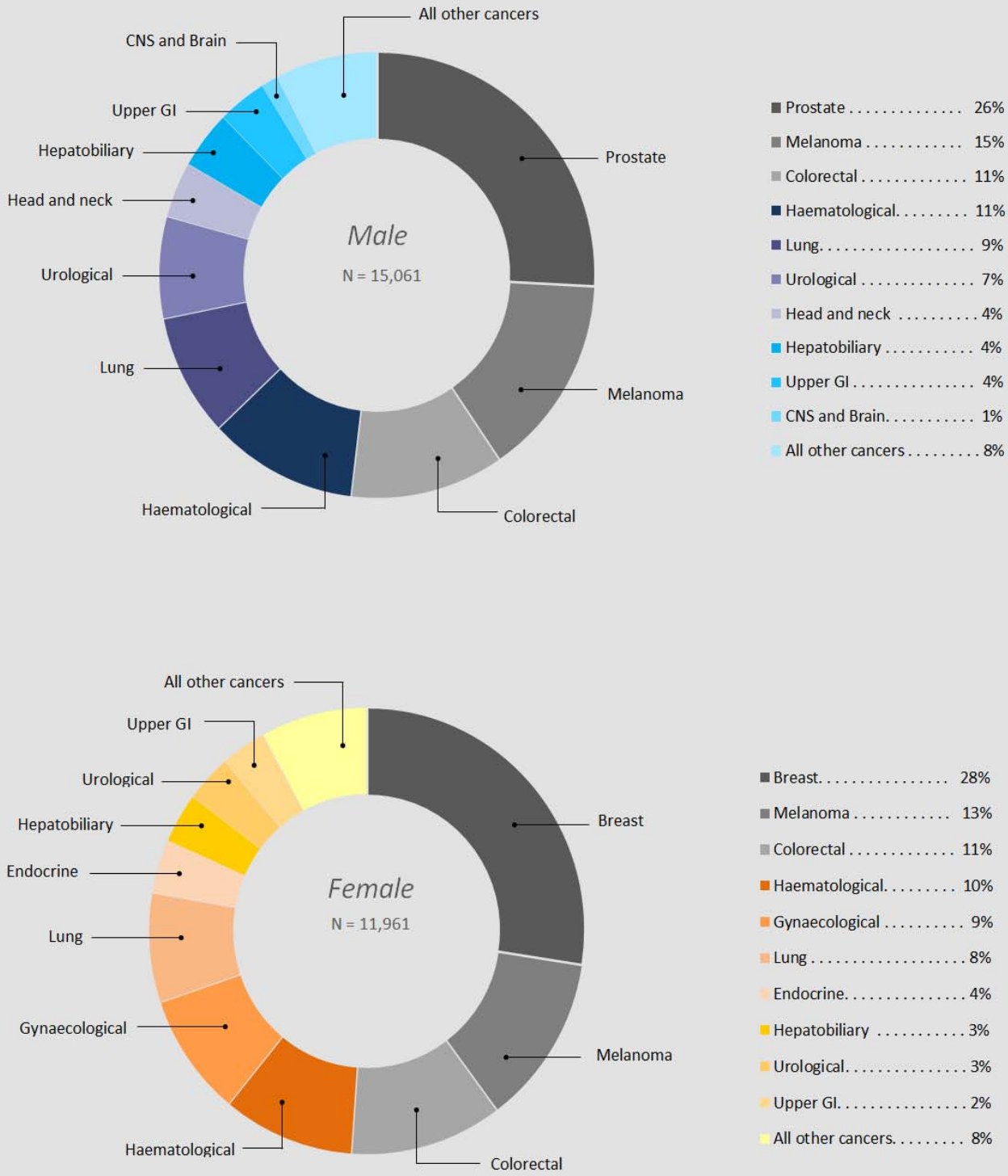
Mortality rates have been in decline since the mid 1990's for both males and females.

Figure 6: Five most common cancer diagnoses and deaths, Queensland, 2014



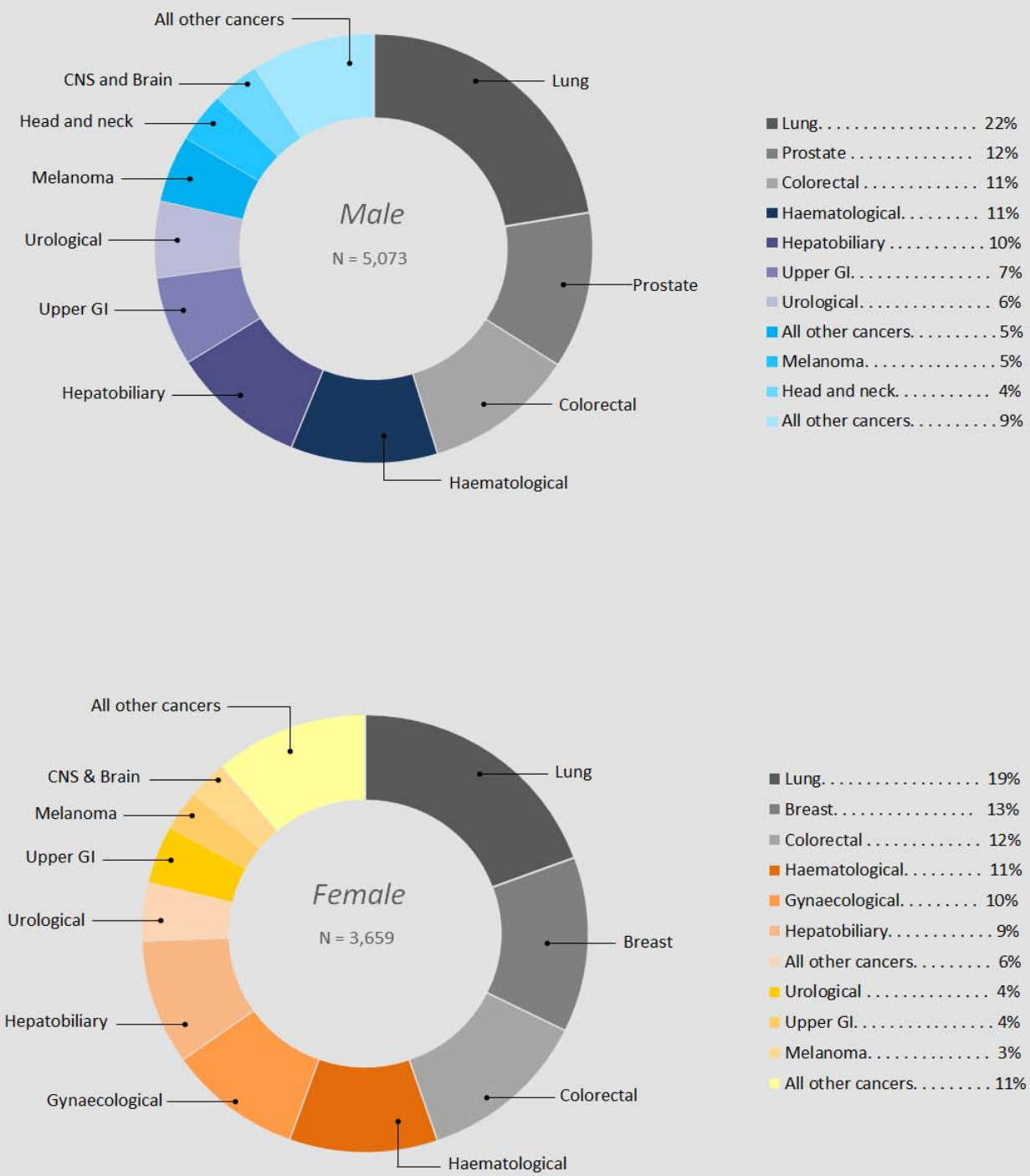
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 7: Most common cancer diagnoses, Queensland, 2014



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

Figure 8: Most common cancer deaths, Queensland, 2014



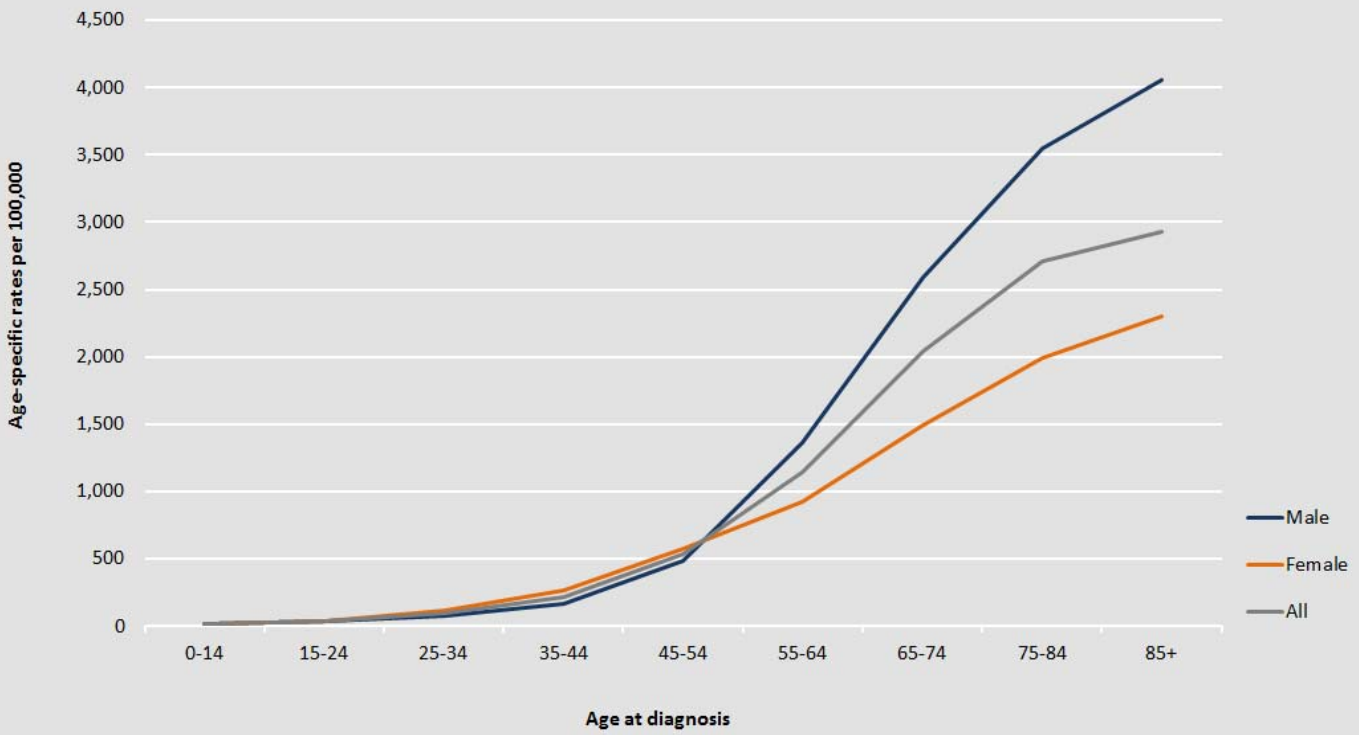
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

New cases and deaths by age

AGE-SPECIFIC INCIDENCE RATES

Cancer incidence rates increase with age in both sexes (Figure 9). After childhood, incidence rates are slightly lower for males than females until around the age of 50, beyond which incidence rates for males increase sharply. The higher rate for males over 55 reflects the higher rates for cancers common in older males, including prostate, colorectal and lung cancer. The slightly higher rate for females in the younger age groups reflects the contribution of breast cancer to the cancer burden in this cohort.

Figure 9: Incidence rates for all cancers, by age at diagnosis, Queensland, 2010-2014

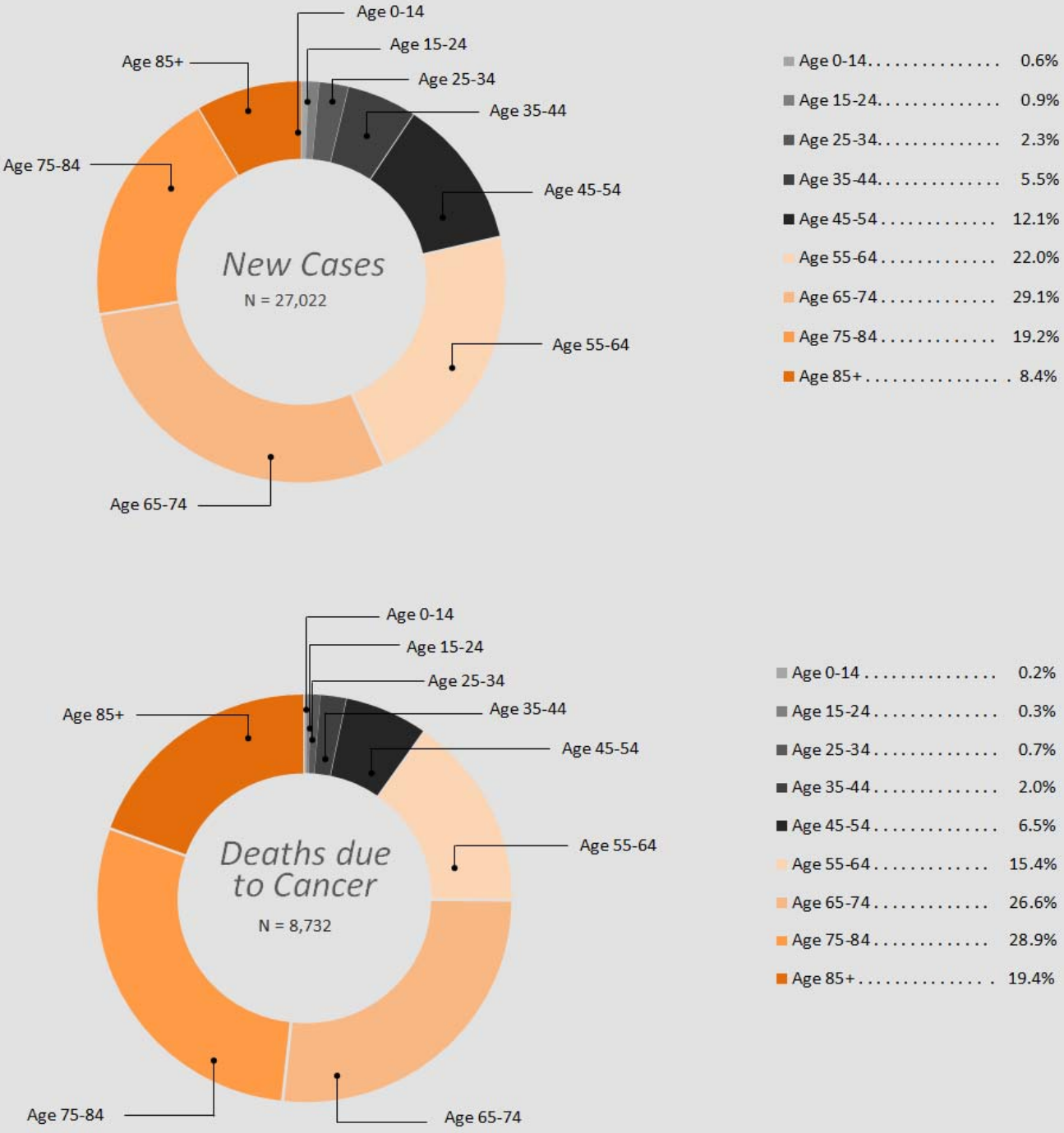


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

CANCER BY AGE GROUP

Cancers in childhood (0-14 years) represent 0.6% of all newly diagnosed cancers; cancers in adolescents and young adults (aged 15-24 years) represent 0.9% of cancers and among adults aged 25-34 years and 35-44 years represent 2.3% and 5.5% respectively (Figure 10). The incidence of new cancers is highest in adults aged 65-74 years (29.1%), followed by adults aged 55-64 years (22.0%) and adults aged 75-84 years (19.2%).

Figure 10: Cancer by age group, Queensland, 2014



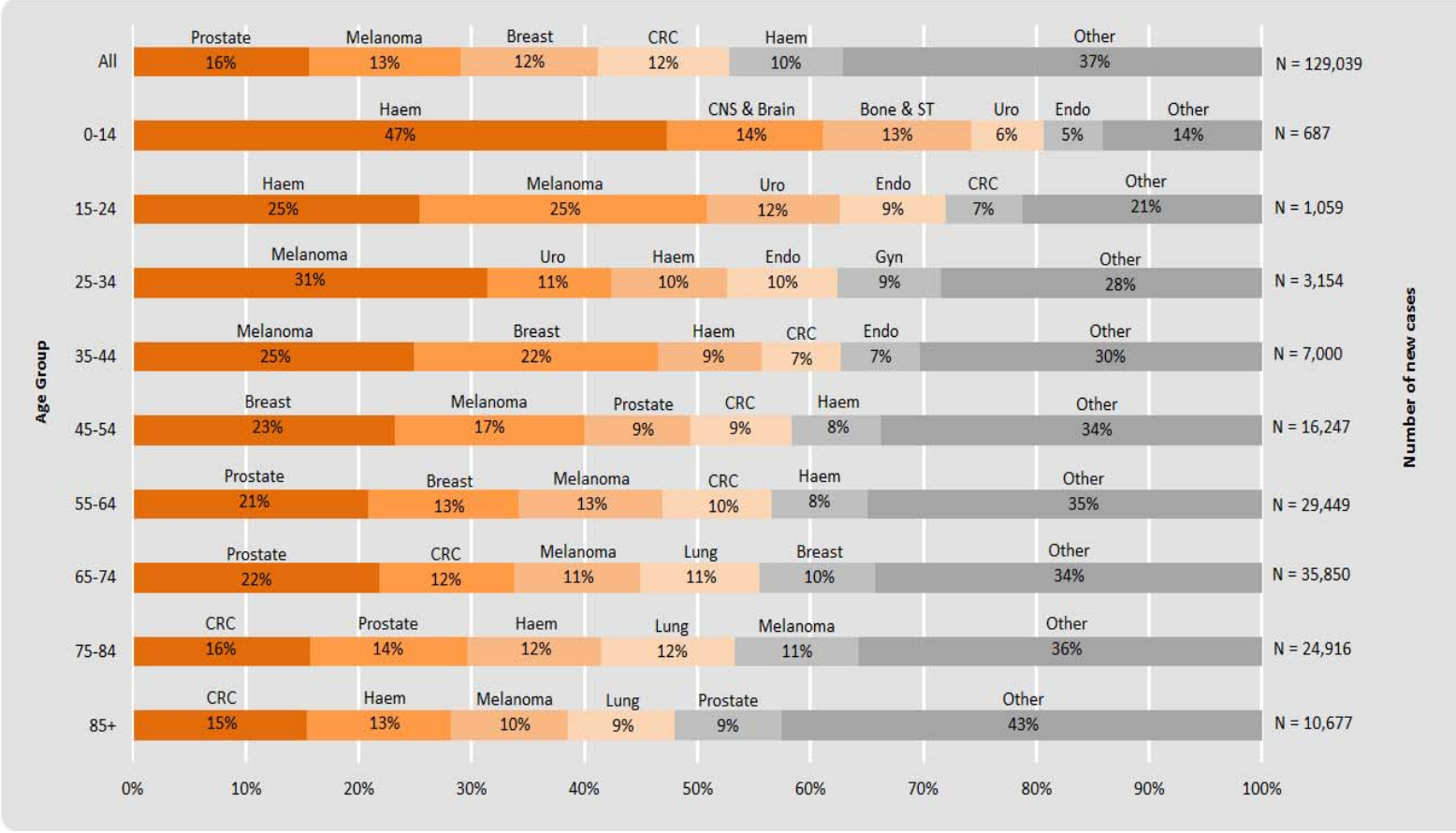
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Cancer deaths are most common in adults aged 65 years and older with three out of every four cancer deaths occurring after age 65. Cancer mortality rates were 991 and 4 per 100,000 in older (65+) and younger adults (aged 15-24) repectively. Deaths due to cancer are relatively uncommon in persons under 45 years of age, accounting for less than 5% of all cancer deaths.

MOST COMMON CANCERS BY AGE GROUP

Haematological cancers[i] were the most common cancer diagnosis in childhood (47%) followed by cancers of the CNS and brain (14%) and bone and soft tissue (13%)(Figure 11).

Figure 11: The top five most common cancer diagnoses by age group, Queensland, 2010-2014



Abbreviations: Bone & ST: Bone and soft tissue / CNS & brain: Central nervous system and brain / CRC: Colorectal / Endo: Endocrine / Gyn: Gynaecological / Haem: Haematological / Uro: Urological
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Among adolescents and young adults (15-24 years), haematological cancers were the most frequently diagnosed (25%), followed by melanoma cancers (25%) and urological cancers (12%). Melanoma, haematological and urological cancers were also the 3 most frequent cancers for people aged 25-34 years. Melanoma and breast cancer were the most common cancers diagnosed at age 35-44 (25% and 22% respectively), with haematological and colorectal cancers accounting for 9% and 7% of new cases respectively. Prostate cancer was more commonly diagnosed in older Queenslanders, representing 21% of the total in the 55-64 age group and 22% in the 65-74 age group. Colorectal cancer was similarly more common in these age groups representing 10% in the 55-64 year olds and 12% in those aged 65-74. Colorectal cancer is the most commonly diagnosed cancer in the 75-84 age group and the 85+ age group.

For more detailed analysis of cancer in children, adolescents and young adults refer to *Youth Cancer in Queensland*[19] report at https://qccat.health.qld.gov.au

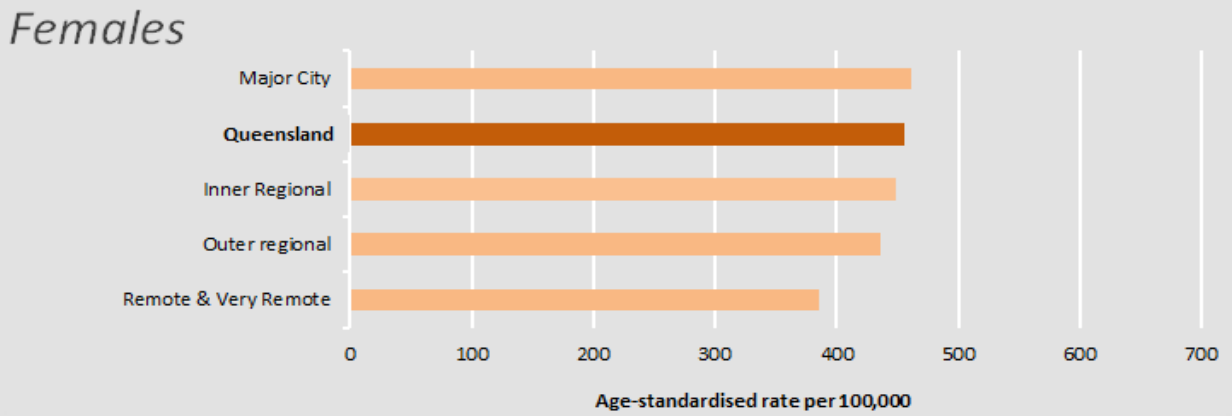
i. The term 'haematological cancers' includes all haematological malignancies, for example, Hodgkin's lymphoma, non-Hodgkin lymphoma and the leukaemias.

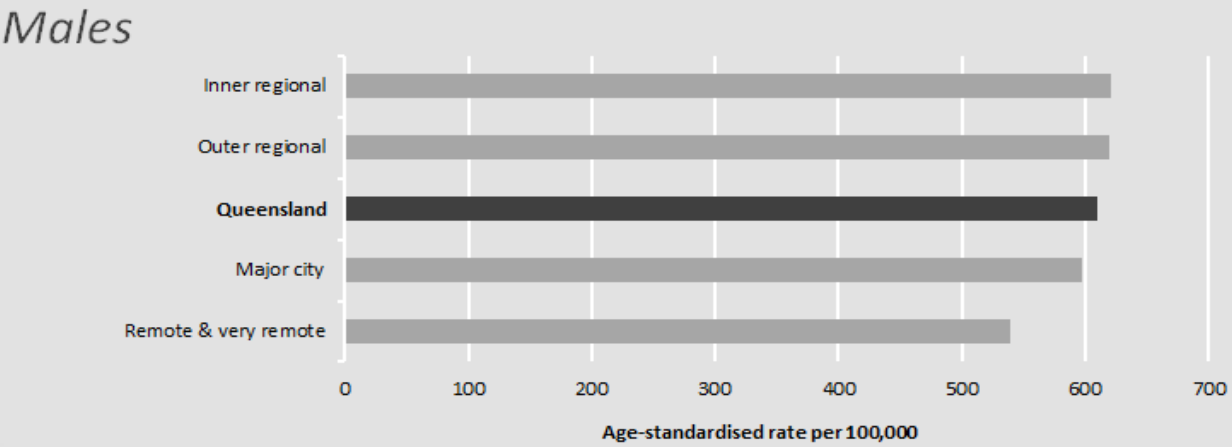
Most cancers and cancer-related deaths occur in Queenslanders after the age of 55 years.
The pattern of cancers noted in childhood and adolescents is completely different to the patterns recognised in adult cohorts.

Regional, national and international variation in incidence[ii]

Incidence rates for all invasive cancers varied by remoteness for both males and females (Figure 12; see the Glossary for a definition of remoteness). Remote and very remote areas tended to have a lower incidence rate for all cancers compared to other regions.

Figure 12: Cancer incidence rates by remoteness of residence, Queensland, 2014



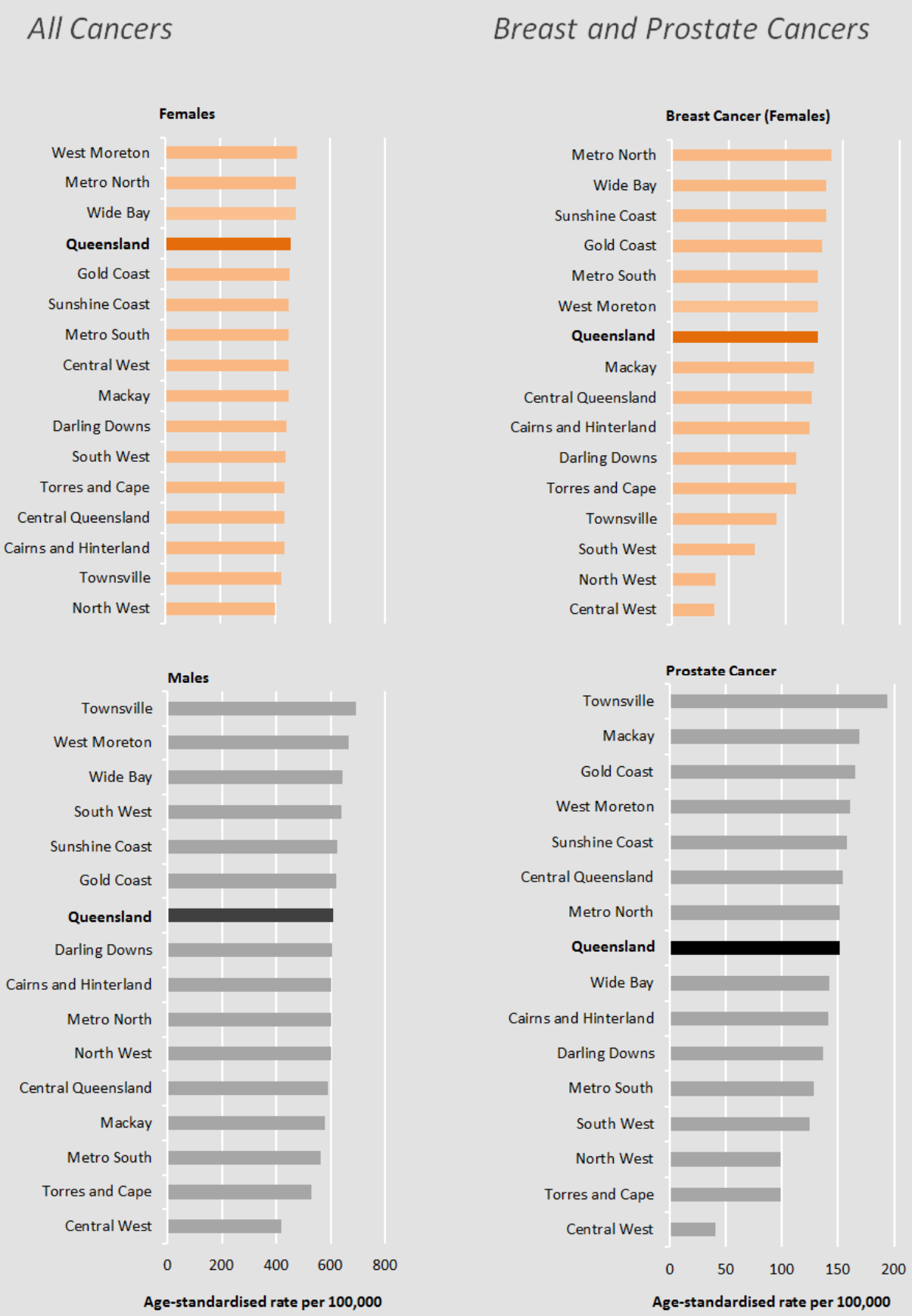


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

At the Hospital and Health Service (HHS) level, age-standardised incidence rates varied across the state for all invasive cancers considered collectively and for the most common cancers (Figure 13). 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, socio-economic status, access to health services and chance.[2]

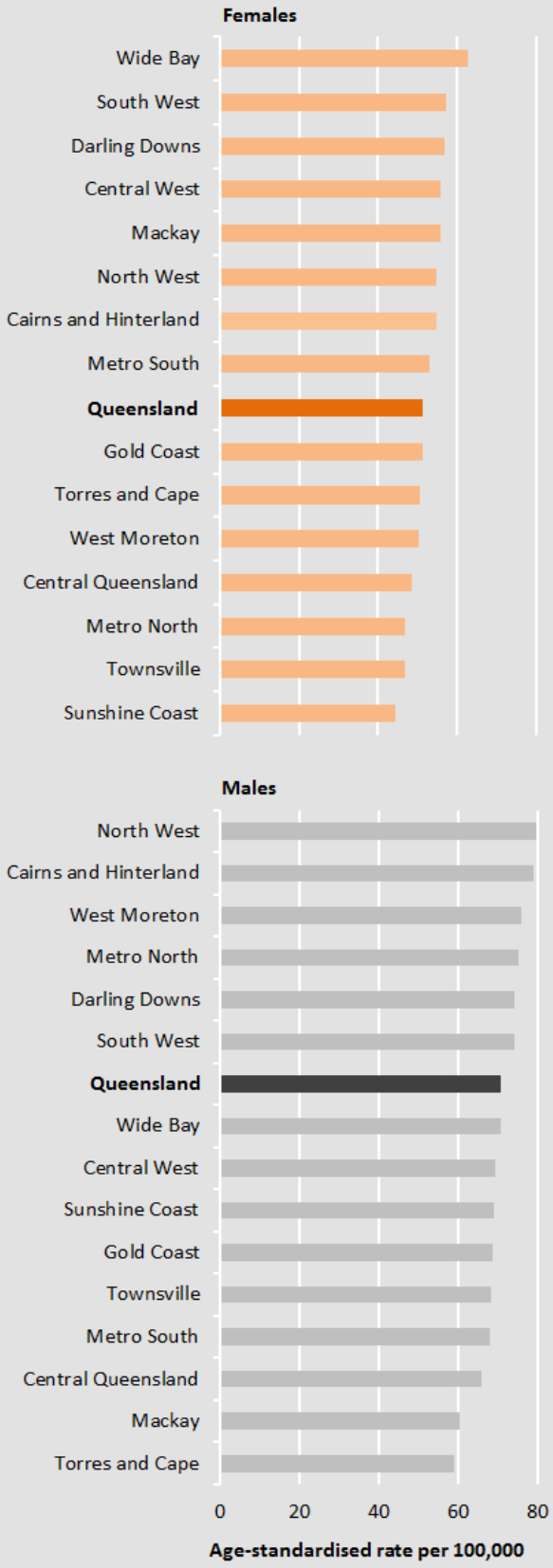
ii. In the interest of completeness, incidence and mortality rates have been included for all hospital and health services including those with fewer than 16 cases. Incidence and mortality rates based on small numbers of cases should be interpreted with caution due to the poor reliability of rate calculations 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 13: Cancer incidence rates by Hospital and Health Service regions, Queensland, 2014

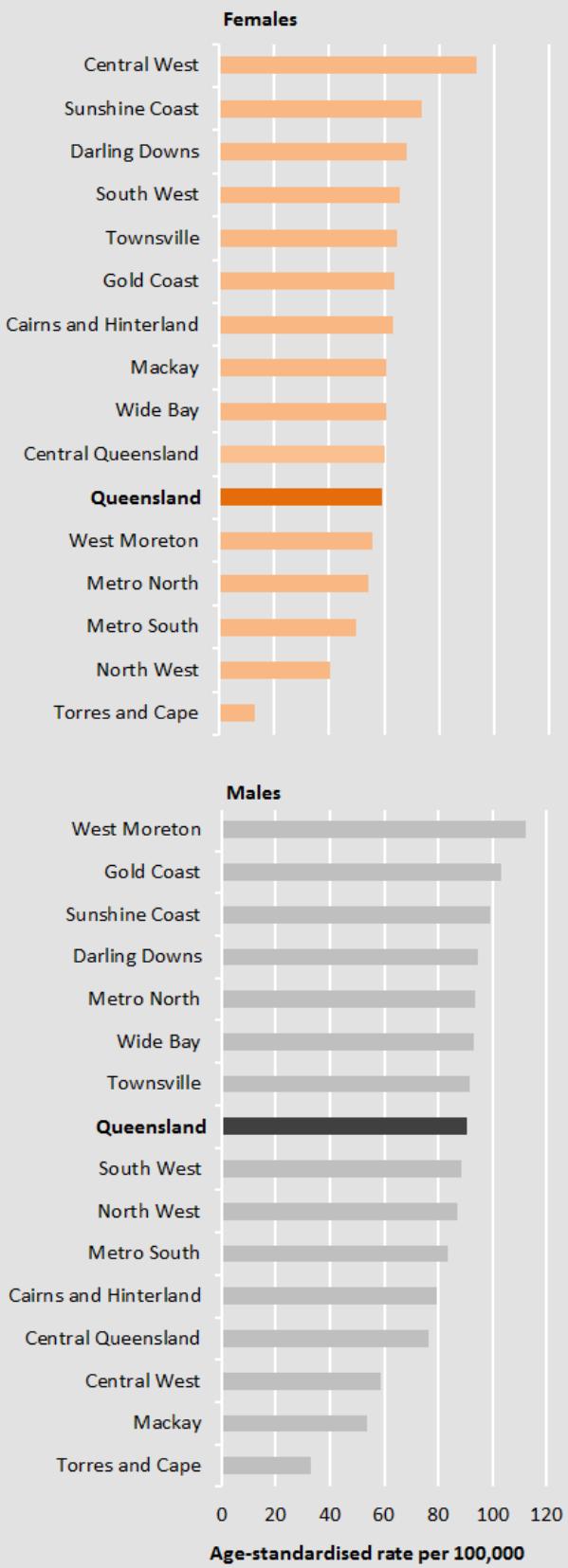


Note: Incidence rates for hospital and health services with fewer than 16 cases should be treated with caution.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Colorectal Cancer



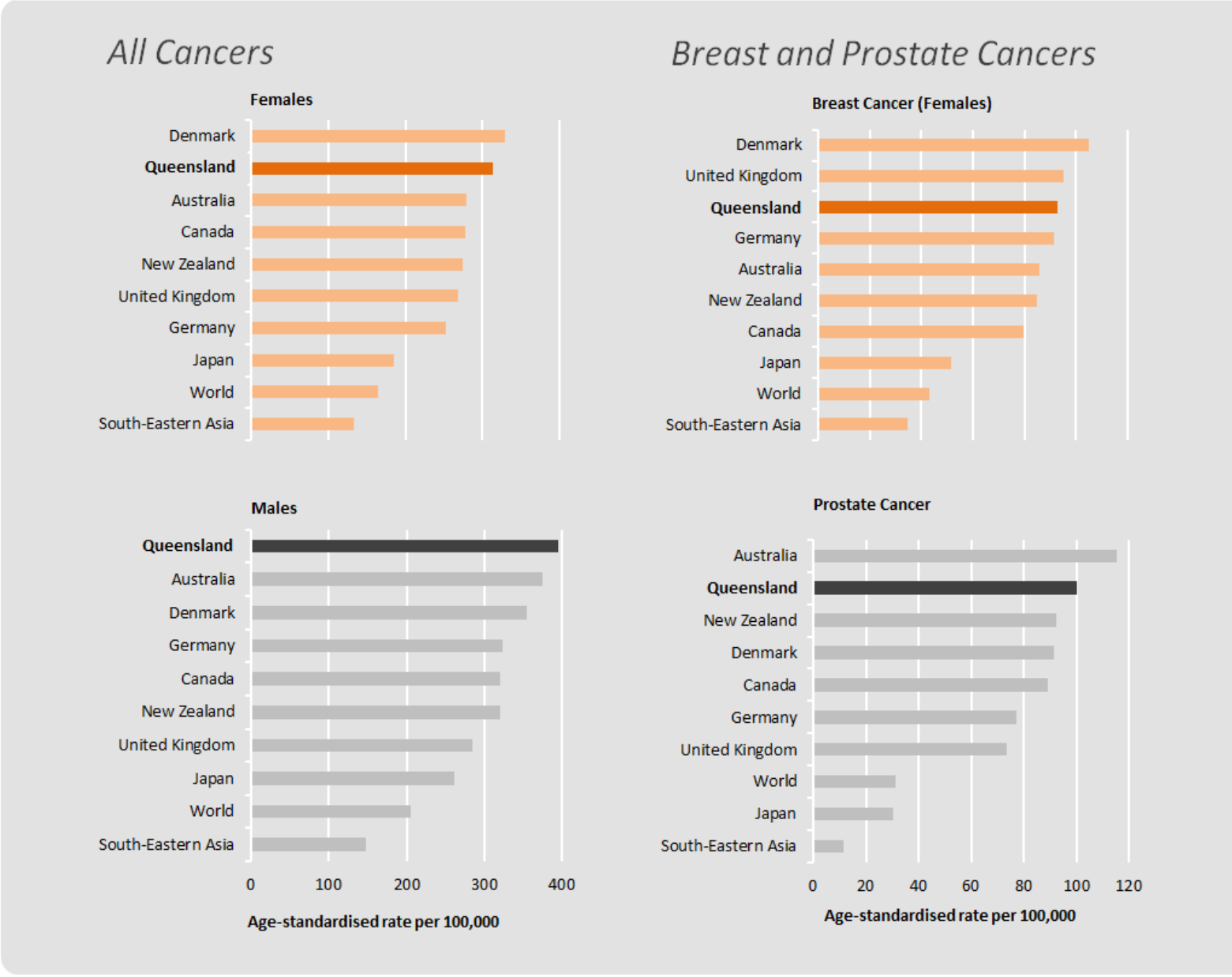
Melanoma



Note: Incidence rates for hospital and health services with fewer than 16 cases should be treated with caution.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

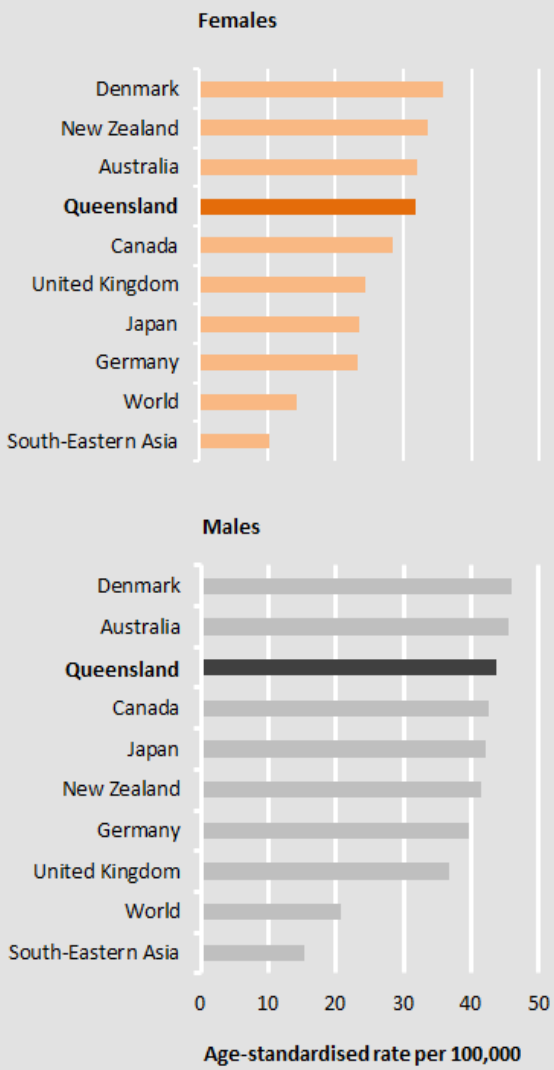
Cancer incidence rates in Queensland are among the highest in the world (Figure 14). Cancer rates are somewhat higher than most other developed parts of the world and substantially higher than the less developed regions.

Figure 14: Cancer incidence rates for selected international regions and Queensland, 2014

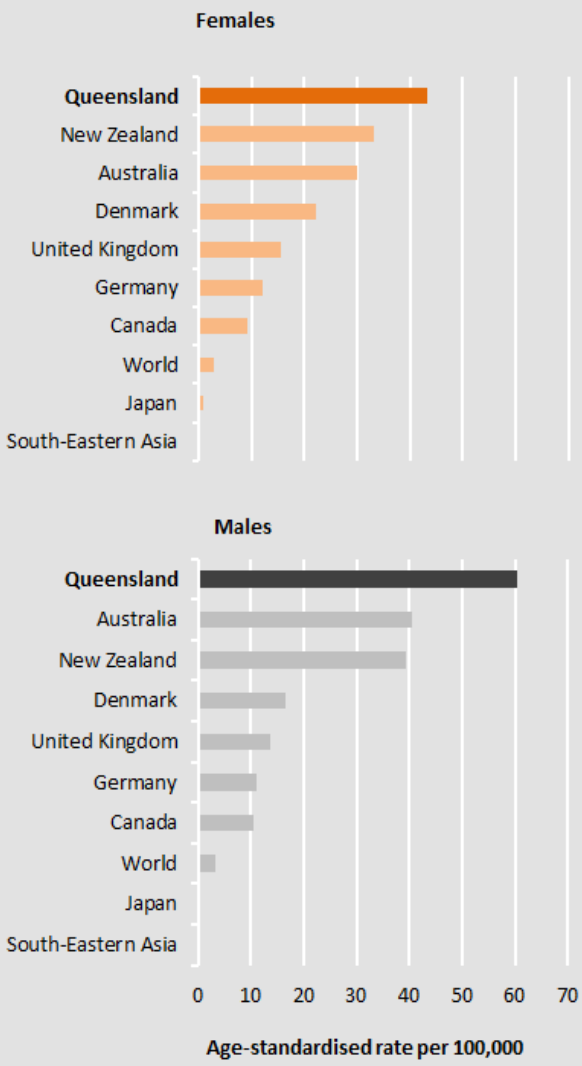


Note: Cancer incidence estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.
Source: Oncology Analysis System, Queensland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

Colorectal Cancer



Melanoma



Note: Cancer incidence 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 rates in Queensland are among the highest in the world. Geographic variation is a feature of cancer in Queensland.

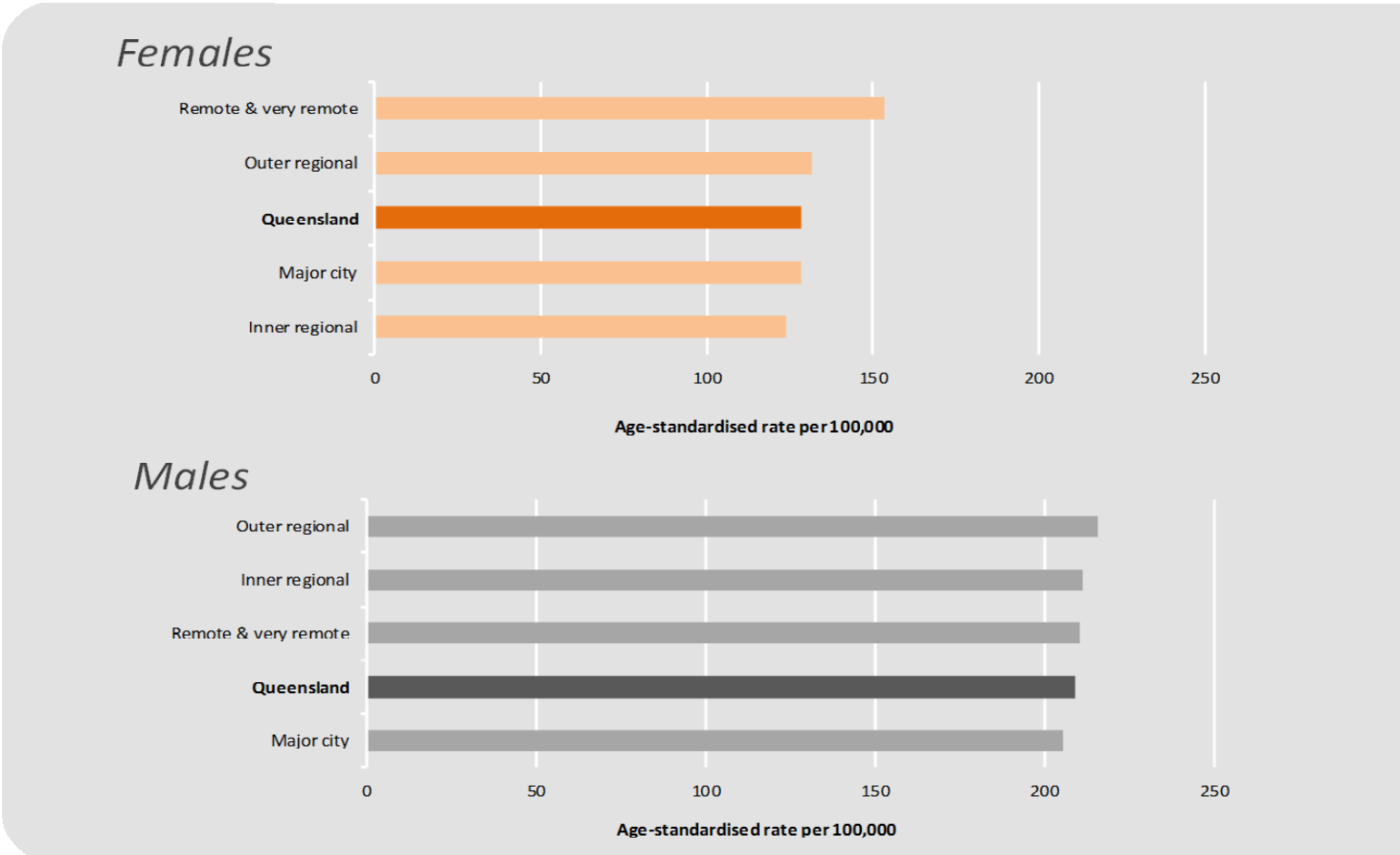
Regional, national and international variation in mortality

Mortality rates for all invasive cancers varied only slightly by remoteness for both males and females (Figure 15). Remote and very remote areas had higher cancer mortality rates than other areas among females.

At the Hospital and Health Service (HHS) level, age-standardised mortality rates varied across the state for all invasive cancers considered collectively as well as for the most common cancers (Figure 16). Reasons for the variations are diverse and complex and include exposure to environmental factors, socioeconomic status, access to health services and chance. It should be noted that remote HHS have small populations and estimates of mortality rates based on such small numbers may not be as accurate as those areas with larger populations.

While cancer incidence rates in Queensland are among the highest in the world (Figure 16), mortality rates overall compare favourably with other regions (Figure 17). Cancer mortality rates vary widely according to the cancer site and by sex. Mortality rates attributable to breast cancer are lower than most of the selected international regions, while rates due to prostate cancer are somewhat higher. Lung cancer mortality rates for males are on average lower compared to most other selected countries. For females lung cancer mortality rates are similar to European countries but higher compared to selected Asian countries (Figure 17).

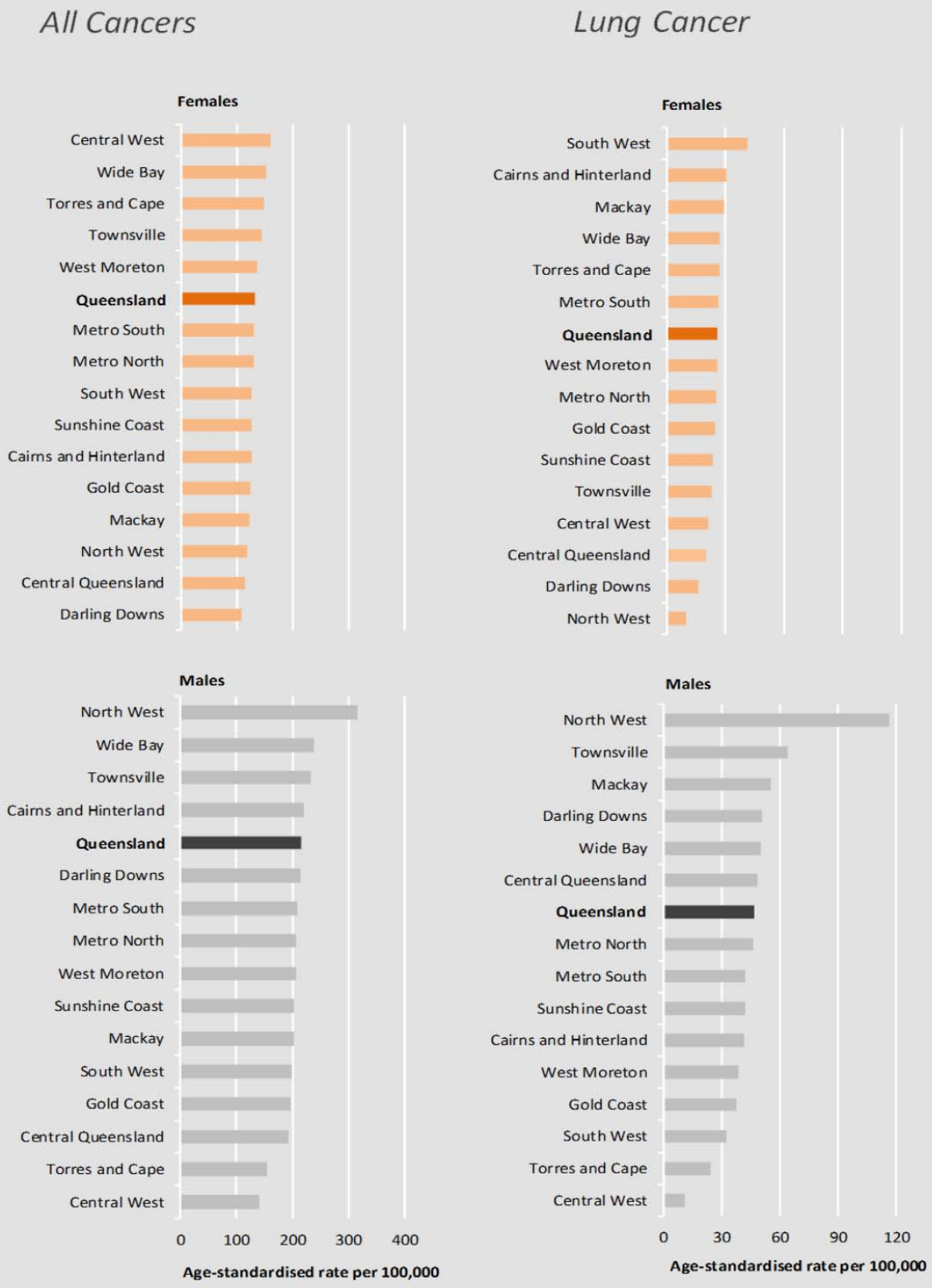
Figure 15: Cancer mortality rates by remoteness of residence, Queensland, 2014



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

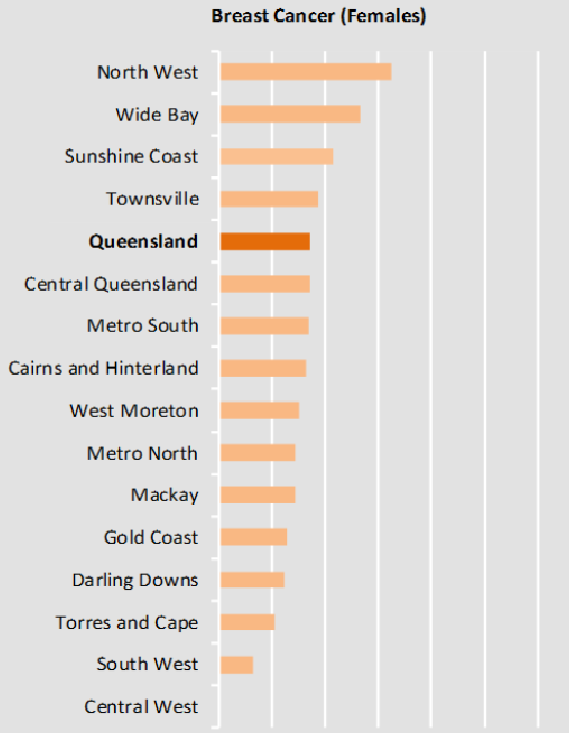
Cancer mortality rates are higher in remote areas for females, but similar to major cities for males.

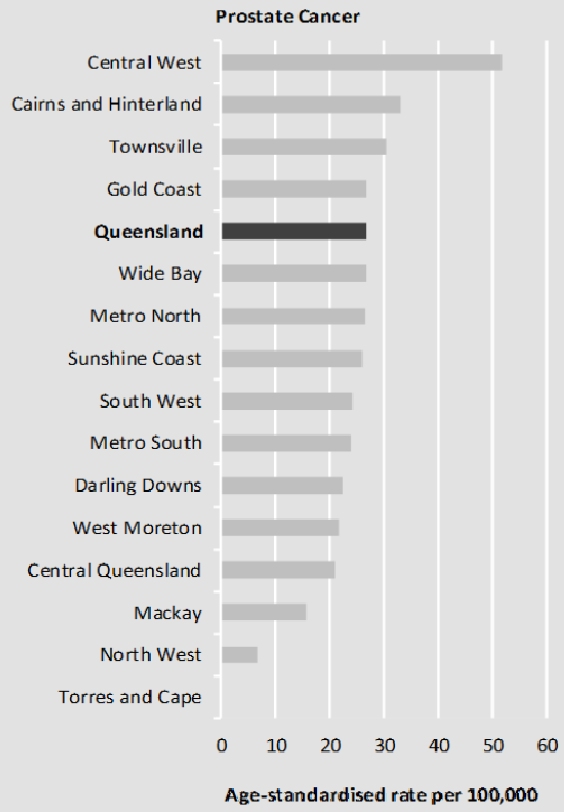
Figure 16: Cancer mortality rates by Hospital and Health Service regions, Queensland, 2014



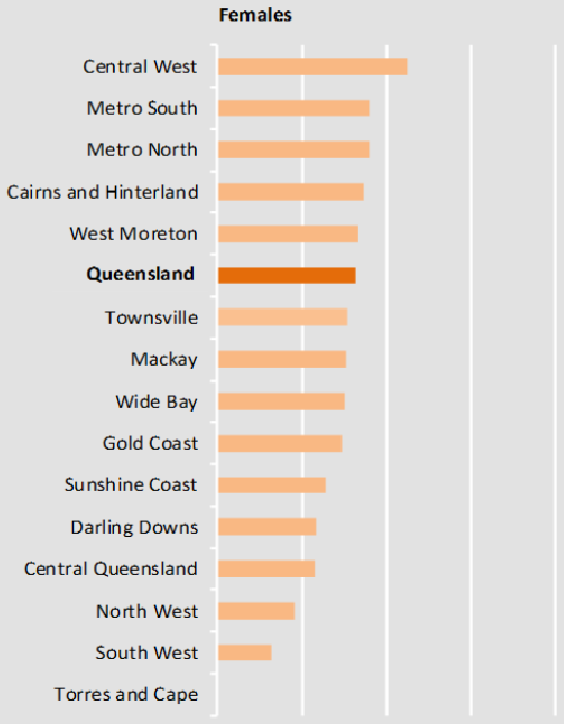
Note: Where no cases were reported during 2014, the graph is intentionally left blank
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

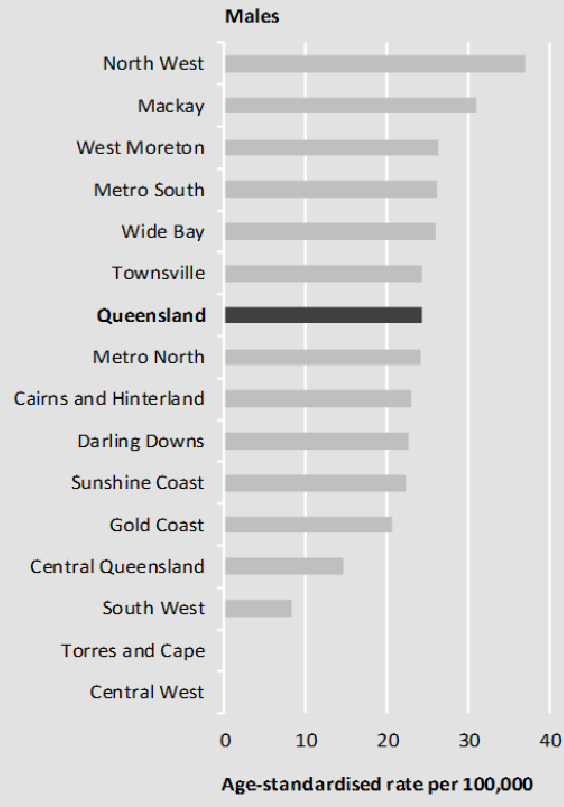
Breast and Prostate Cancers





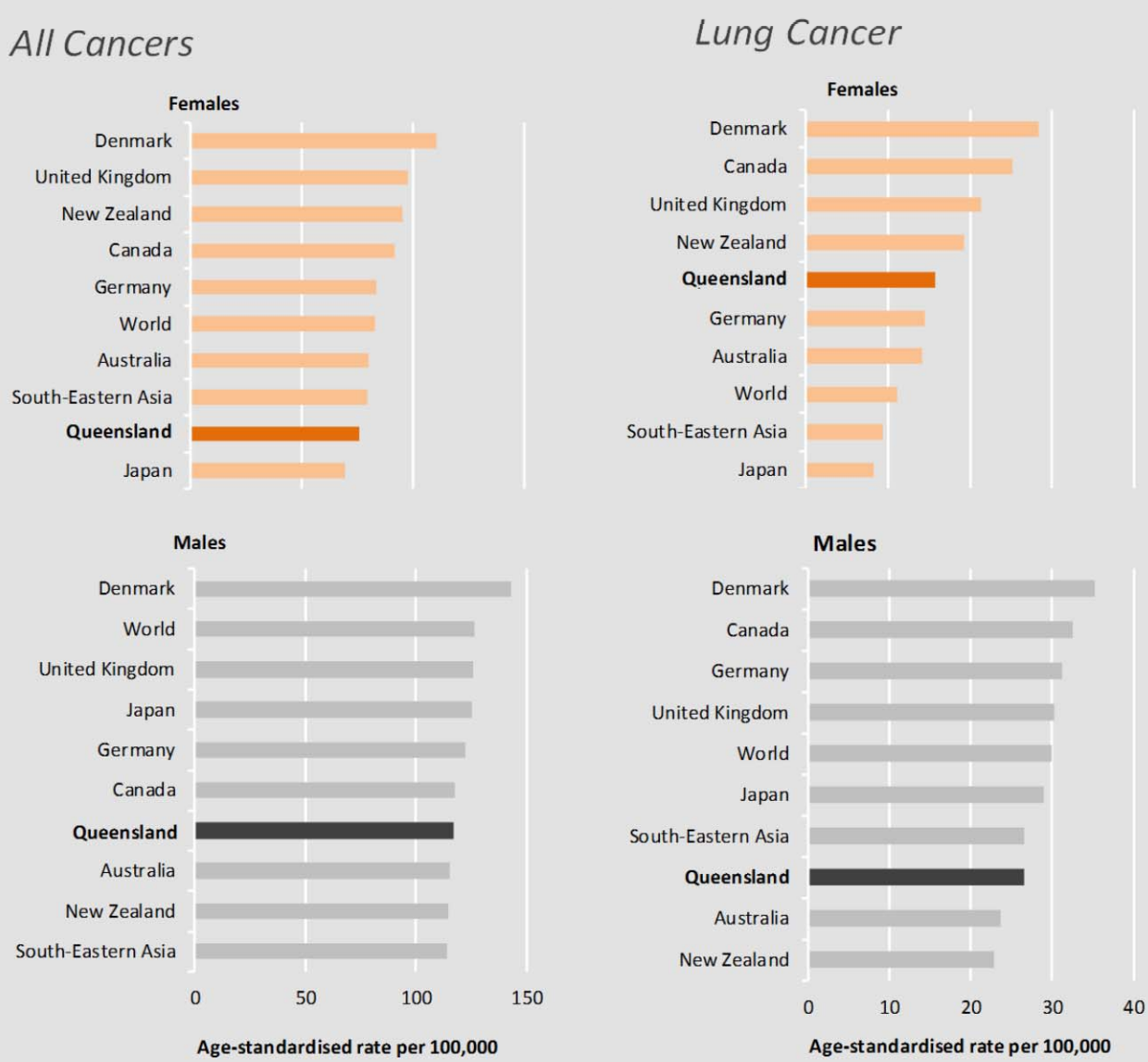
Colorectal Cancer





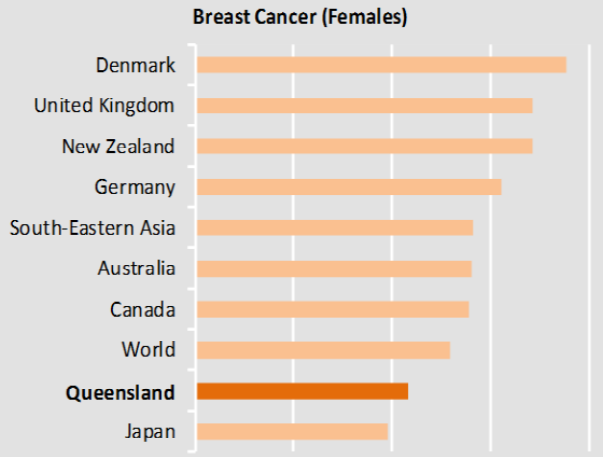
Note: Where no cases were reported during 2014, the graph is intentionally left blank
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

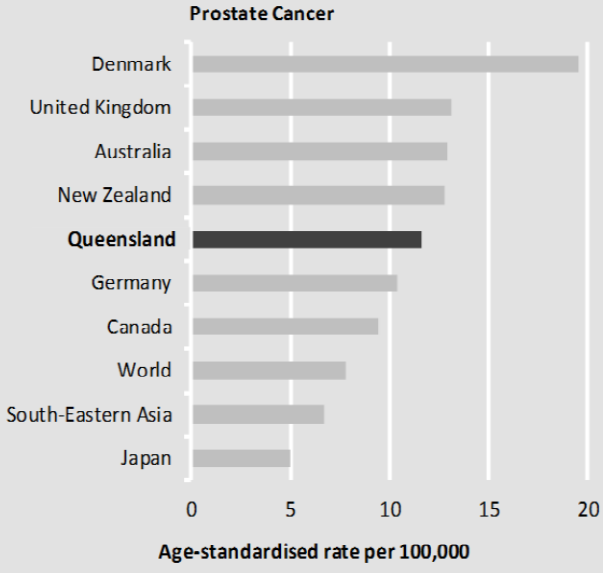
Figure 17: Cancer mortality rates for selected international regions and Queensland, 2014



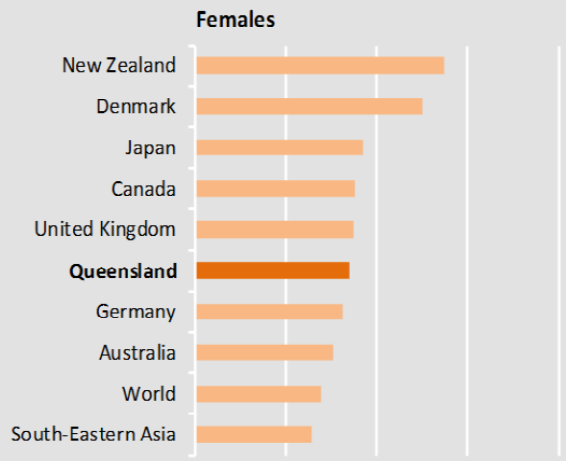
Source: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012)[3] except for Queensland which is based on Queensland Oncology Repository data for 2014. All rates are standardised to World Standard Population.
Source: Oncology Analysis System, Queensland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

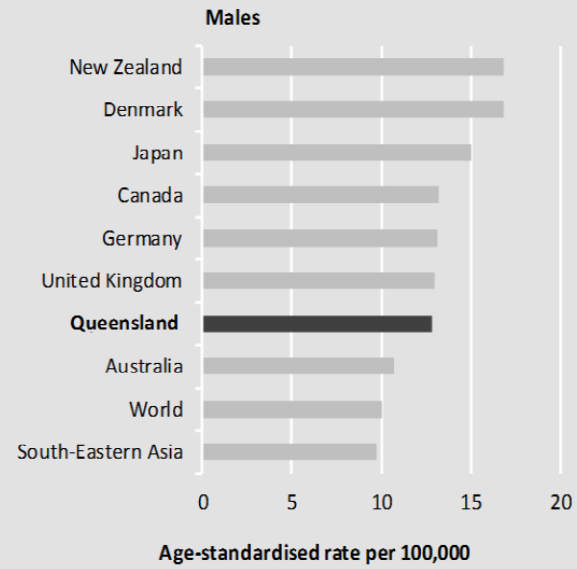
Breast and Prostate Cancers





Colorectal Cancer





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

Overall Queensland cancer mortality rates compare favourably with the rest of Australia and other countries.

Prevalence

Prevalence represents the number of people living with a chronic condition such as cancer and is a measure of the burden of the disease for the individual, families and society. The prevalence of cancer is increasing in Queensland as more people are diagnosed with the disease and survival improves. By the end of 2014, more than 90,000 people were living with a diagnosis of cancer in the previous five years, representing nearly 2% of all Queenslanders. Cancer prevalence is summarised in Table 1.

Table 1: Five-year prevalence, most common cancers, Queensland, 31 December 2014

	Both sexes		Male		Female	
	Count	Percent*	Count	Percent*	Count	Percent*
All cancers	91,020	1.93	49,910	2.11	41,110	1.75
Prostate	18,073	0.38	18,073	0.76		
Melanoma	15,758	0.33	9,108	0.38	6,650	0.28
Breast	14,478	0.31	98	0.00	14,380	0.61
Colorectal	10,812	0.23	5,967	0.25	4,845	0.21
All lymphomas	4,333	0.09	2,437	0.10	1,896	0.08

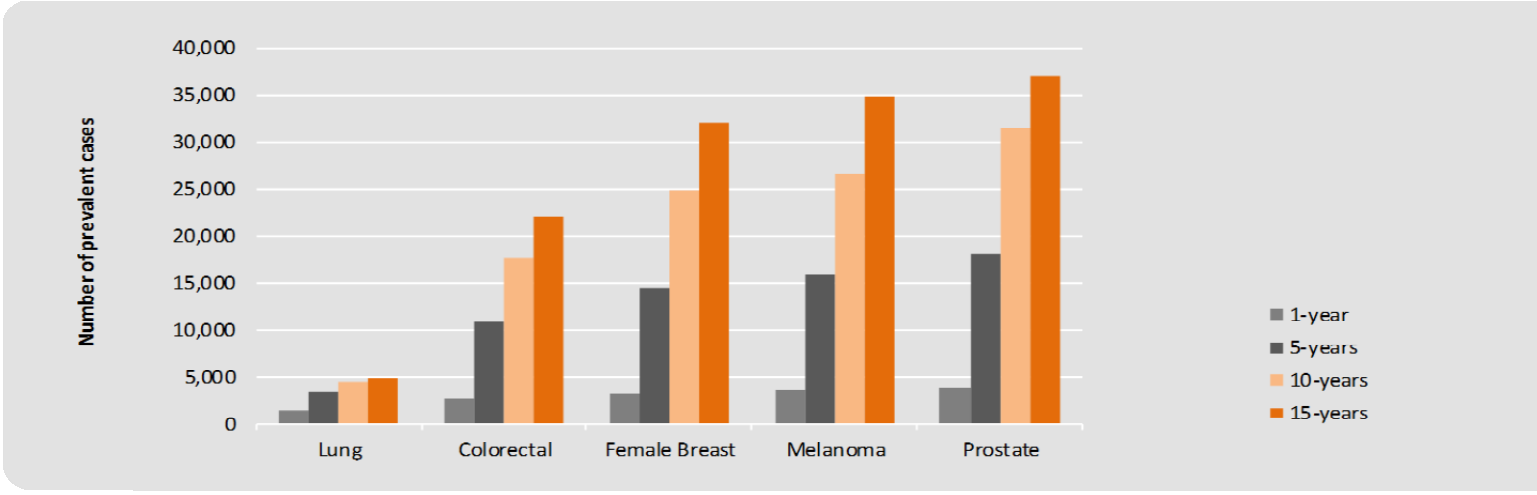
**Percent of Queensland population as at 31 December 2014 (4.72 million) (Australian Bureau of Statistics)*
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Prostate cancer had the highest prevalence, due to high incidence and good survival, followed by melanoma and breast cancer. These three cancers accounted for more than half (53%) of all cancers prevalent in Queenslanders. It is worth noting that lung cancer, representing 9% of all new cancers, has a relatively low prevalence (3,458 cases or 3.8% of all cancers) due to relatively poor survival.[iii]

The prevalence of common cancers by time since diagnosis is shown in Figure 18. For cancers with relatively long survival times such as melanoma and breast cancer, increasing time since diagnosis is associated with increasing prevalence; for cancers with short survival times such as lung cancer, increasing time since diagnosis is associated with smaller proportional increase in prevalence. 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).[5]

Figure 18: Prevalence for the most common cancers, by time since diagnosis, Queensland, 31 December 2014

iii. Note: Prevalence data is for International Classification of Diseases for Oncology, 3rd edition (ICD-03) site C33, C34: Trachea, bronchus and lung.



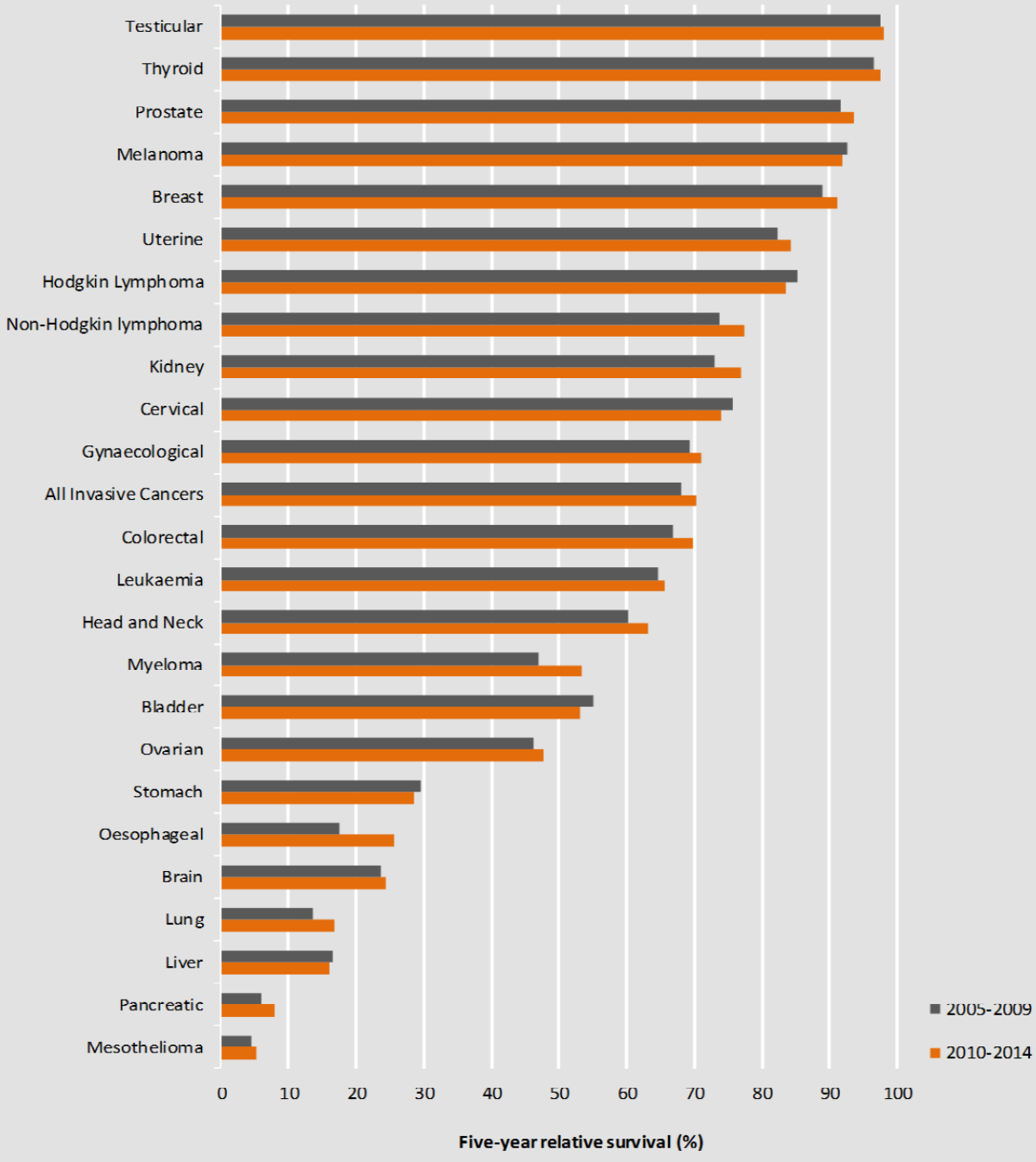
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

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. Five-year survival ratios vary from over 98% for testicular cancer to under 5% for mesothelioma cancer (Figure 19). Considered collectively, five year survival ratio for all invasive cancers from 2010-2014 was 68%.

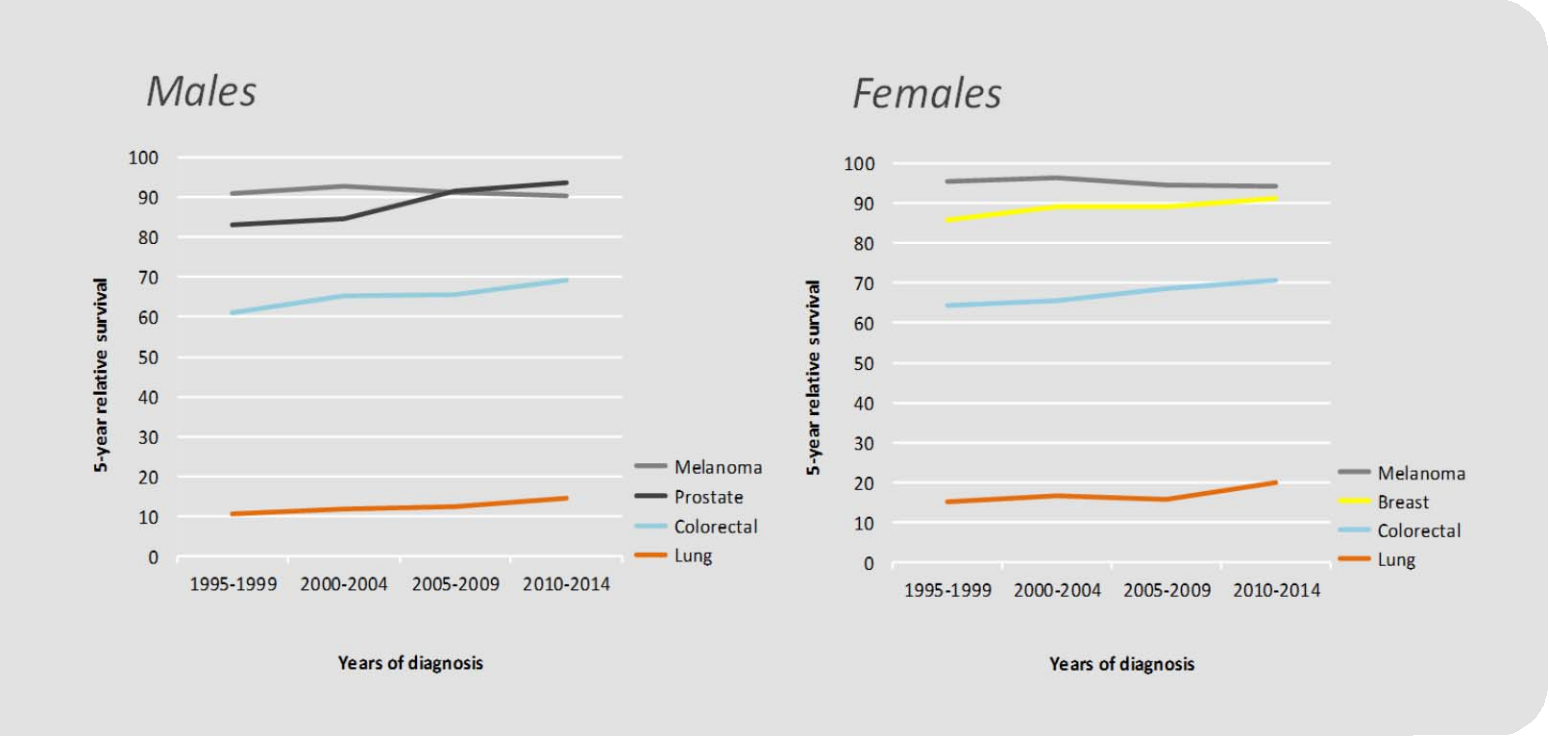
Figure 19: Five year relative survival for the most common cancers diagnosed in Queensland, 2005-2009 vs 2010-2014



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

The relative survival ratios for many common cancers appear to be improving, with greatest gains between 2005-2009 and 2010-2014 observed for non-Hodgkin lymphoma, leukaemia and myeloma, kidney and prostate cancer (Figure 19). Smaller increases in survival are also noted for lung, head and neck, gynaecological and pancreatic cancers. Improvements in survival may be related to earlier detection and improved treatments. Observed decreases in survival for melanoma and cervical cancer have been reported elsewhere[18] and may be associated with changes in patient characteristics. The population-wide mortality burden is impacted more by prevention strategies rather than survival changes among these preventable cancers.

Figure 20: Five-year relative survival for the most common cancers, Queensland, 1995-1999 to 2010-2014



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

Cancer survival rates in Queensland have improved, with the greatest gains observed for breast, prostate and lung cancer.

Incidence and mortality trends: Most common cancers

Trends in incidence or mortality can be characterised by the rate of change and summarised by the annual percentage change (APC) and may be positive (rates increasing) or negative (rates decreasing). Cancer incidence and mortality trends for the most common cancers are summarised in Table 2 and Figures 21 to 24. Rates of change which are statistically significant are highlighted in Table 2.

Table 2: Annual percentage change (APC) in age-standardised incidence and mortality rates, most common cancers, Queensland, 1982-2014

	Incidence				Mortality			
	Males		Females		Males		Females	
Cancer	**Period**	**APC**	**Period**	**APC**	**Period**	**APC**	**Period**	**APC**
All cancers	1982-1986	-0.5	1982-2000	**1.4***	1982-1994	**0.5***	1982-1996	**0.4***
	1986-1994	**2.7***	2000-2003	-1.6	1994-2014	**-1.2***	1996-2014	**-0.9***
	1994-2001	-0.7	2003-2014	**0.6***				
	2001-2008	**1.1***						
	2008-2014	-0.9						
Prostate	1982-1988	0.0			1982-1993	**3.5***		
	1988-1994	**11.1***			1993-2014	**-1.9***		
	1994-1997	-12.1						
	1997-2008	**4.5***						
	2008-2014	**-3.3***						
Female Breast			1982-1998	**2.2***			1982-1993	0.6
			1998-2014	0.4			1993-2014	**-2.1***
Colorectal	1982-2000	**1.2***	1982-1990	-0.7	1982-1991	**1.9***	1982-2014	**-1.4***
	2000-2014	**-1.2***	1990-1993	3.5	1991-2014	**-1.8***		
			1993-2008	-0.2				
			2008-2014	**-1.9***				
Melanoma	1982-1997	**3.1***	1982-1986	**6.3***	1982-2014	**1.5***	1982-2014	**0.4***
	1997-2014	**0.7***	1986-1993	-1.4				
			1993-1997	5.0				
			1997-2007	-0.4				
			2007-2014	**1.9***				
Haematological	1982-1988	0.6	1982-2000	**2.5***	1982-1997	**1.3***	1982-1996	**1.6***
	1988-1998	**3.5***	2000-2014	0.1	1997-2014	**-1.2***	1996-2014	**-1.8***
	1998-2014	**0.5***						
Hepatobiliary	1982-1984	-9.9	1982-2014	**0.8***	1982-2014	**1.1***	1982-2014	**0.7***
	1984-2014	**1.5***						
Gynaecological			1982-2007	**-0.8***			1982-2014	**-1.0***
			2007-2014	1.3				
Lung	1982-2014	**-1.4***	1982-2014	**2.4***	1982-2014	**-1.5***	1982-2005	**2.9***
							2005-2014	0.0
Urological	1982-1998	**0.6***	1982-1994	**1.6***	1982-2014	**-0.6***	1982-1991	**3.3***
	1998-2008	**-2.0***	1994-2014	**-0.9***			1991-2014	**-1.5***
	2008-2014	1.1						
Head and neck	1982-2014	**-0.6***	1982-1993	**1.9***	1982-2014	**-0.9***	1982-2014	**-0.6***
			1993-2001	-2.3				
			2001-2014	1.0				
Endocrine	1982-2014	**4.3***	1982-2014	**5.5***	1982-2014	0.1	1982-2014	0.8
Upper GI	1982-2014	**-0.9***	1982-2014	**-1.0***	1982-2014	**-1.5***	1982-2014	**-2.0***
CNS	1982-2014	0.3	1982-2014	0.0	1982-2014	**0.4***	1982-2014	0.0

** Indicates a significant increase or decrease in annual percentage change (APC).*
Abbreviations: APS: annual percentage change; GI: gastrointestinal; CNS: Central nervous system (including brain).
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Most common cancers

PROSTATE CANCER

Prostate cancer is the most common cancer in males (Figure 7). Incidence rates increased significantly between 1988-1994 (Table 2), coinciding with the increased use of prostate-specific antigen (PSA) testing. The increased identification of prevalent prostate cancers during this period resulted in a decline in incidence over the following years 1994-1997, before increasing significantly again between 1997 and 2008. For the most recent 5 years incidence rates have been decreasing at an annual rate of 3.3%. Mortality rates from prostate cancer peaked in Queensland in 1995 and thereafter have declined at an annual rate of 1.9% (Table 2; Figure 23). The decline in mortality rates is not clearly understood. Increased PSA testing may be a contributing factor, although this is controversial.[6, 7, 8, 9] It is also suggested that improved treatment of early-stage disease with surgery or radiotherapy, or better treatment of advanced cancers with anti-androgenic therapies may be contributing to the lower rates of mortality.[10]

FEMALE BREAST CANCER

Breast cancer is the most common cancer in females (Figure 7). Incidence rates increased significantly between 1982 and 1998 (Table 2), in large part a reflection of increased breast cancer screening during this period. Incidence rates since 1998 have remained fairly constant (slight increase 0.4% per year). Mortality rates peaked in the 1990s and rates have declined by 2.1% per year since 1993 (Figure 23). The decrease, which is significant and has been observed in other countries, is likely due to more effective anticancer treatments[11] along with increased participation in breast screening.[12] Between January 2013 and December 2014, 462,318 women were screened by Breast Screen Queensland; of these 307,932 (66.6%) were in the 50-69 year-old target group.[13]

MELANOMA

Australia has the highest incidence rate of melanoma of any country and Queensland has the highest rate of any Australian state or territory.[10] Melanoma is the second most common cancer in Queensland (Figure 7). Incidence rates for melanoma have continued to rise in both males and females (Table 2), particularly in the 1980s and 1990s. Mortality rates have also risen significantly in both males and females (APC 1.5%, 0.4% respectively; Table 2). Incidence rates for melanoma are susceptible to fluctuations in public awareness.

COLORECTAL CANCER

Colorectal cancer is the fourth most common cancer in Queensland (Figure 7). The incidence rate of colorectal cancer in females varied insignificantly over the period 1982 to 2008, before decreasing (APC -1.9%) from 2008-2014. Incidence rates in males increased significantly between 1982 and 2000 (APC 1.2%) before declining significantly thereafter at a rate of 1.2% per year (Table 2). Mortality rates for males decreased significantly after 1994 (APC -1.8%); rates for females have decreased steadily and significantly over the entire period (APC -1.4%).

HAEMATOLOGICAL MALIGNANCIES

The incidence of haematological malignancies increased significantly in both males and females, reaching a peak in the year 2000 and declining slightly or remaining fairly steady thereafter (Table 2, Figure 22). Mortality rates also increased, peaking a few years earlier (1998 for males, 1997 for females) before decreasing significantly thereafter (APC -1.2% for males; -1.8% for females). The decreases in mortality (most likely) reflect the slight decline in incidence combined with improved chemotherapy treatments, particularly for young patients.[14]

LUNG CANCER

Lung cancer incidence rates declined significantly between 1982 and 2014 for males (APC-1.4%). For females rates increased significantly between 1982 and 2009 (APC 2.4%) and only recent years have decreased but not significantly (Table 2). Mortality rates followed similar trends for males with again a significant decrease (APC -1.5%) whereas female mortality rates have continued to increase (significantly between years 1982 and 2005, APC 2.9%; Figure 24). The differences in incidence and mortality rates between males and females have been attributed to past patterns of smoking prevalence.[10] Lung cancer is the leading cause of cancer deaths in females, exceeding those due to breast cancer (Figure 8).

ENDOCRINE CANCERS

Endocrine cancers are increasing in incidence, particularly in females (Figure 22). The annual percentage change (APC) over the period 1982 to 2014 was 4.3% in males, and 5.5% in females, making these cancers among the most rapidly increasing cancer diagnoses in Queensland (Table 2). Mortality rates, however, have remained relatively stable over this period. The increase in incidence is largely due to increases in the incidence of thyroid cancer in females, with three out of four thyroid cancers occurring in females (75%) and thyroid cancer representing 96% of all new endocrine cancers in 2014.

UPPER GASTROINTESTINAL TRACT CANCERS

The incidence of cancers of the upper gastrointestinal tract (stomach, oesophagus and small intestine) declined by around 1% per year since 1982 (Table 2). Mortality rates also decreased significantly since 1982 (APC -1.5% in males, -2.0% in females) (Table 2; Figure 24), mirroring trends in other countries.[15]

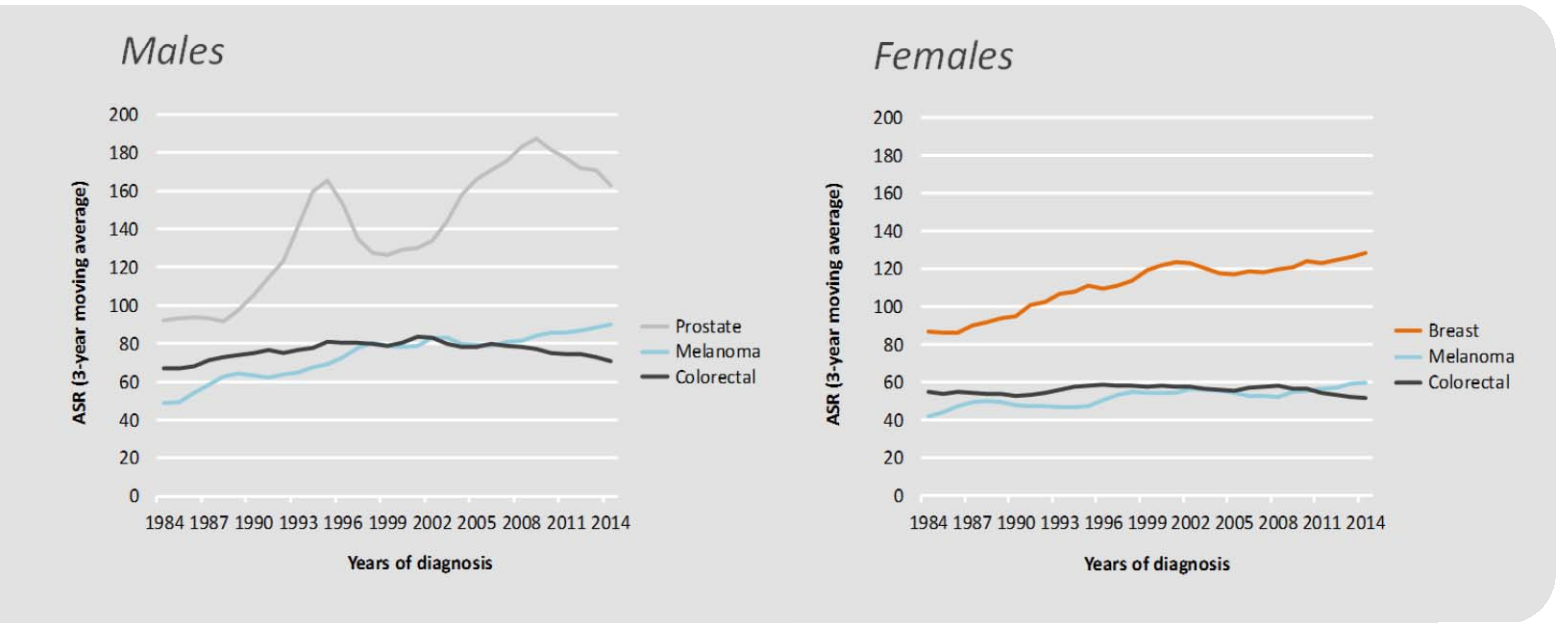
HEPATOBILIARY CANCERS

Incidence rates for hepatobiliary cancers varied in males during the period 1982 to 2014 while incidence rates for females increased significantly (APC 0.8%; Table 2; Figure 22). Mortality rates for both sexes have increased, by 1.1% in males and 0.7% per year in females (both significant).

Endocrine cancers are amongst the most rapidly changing cancers due to a significant increase in thyroid cancer in females.

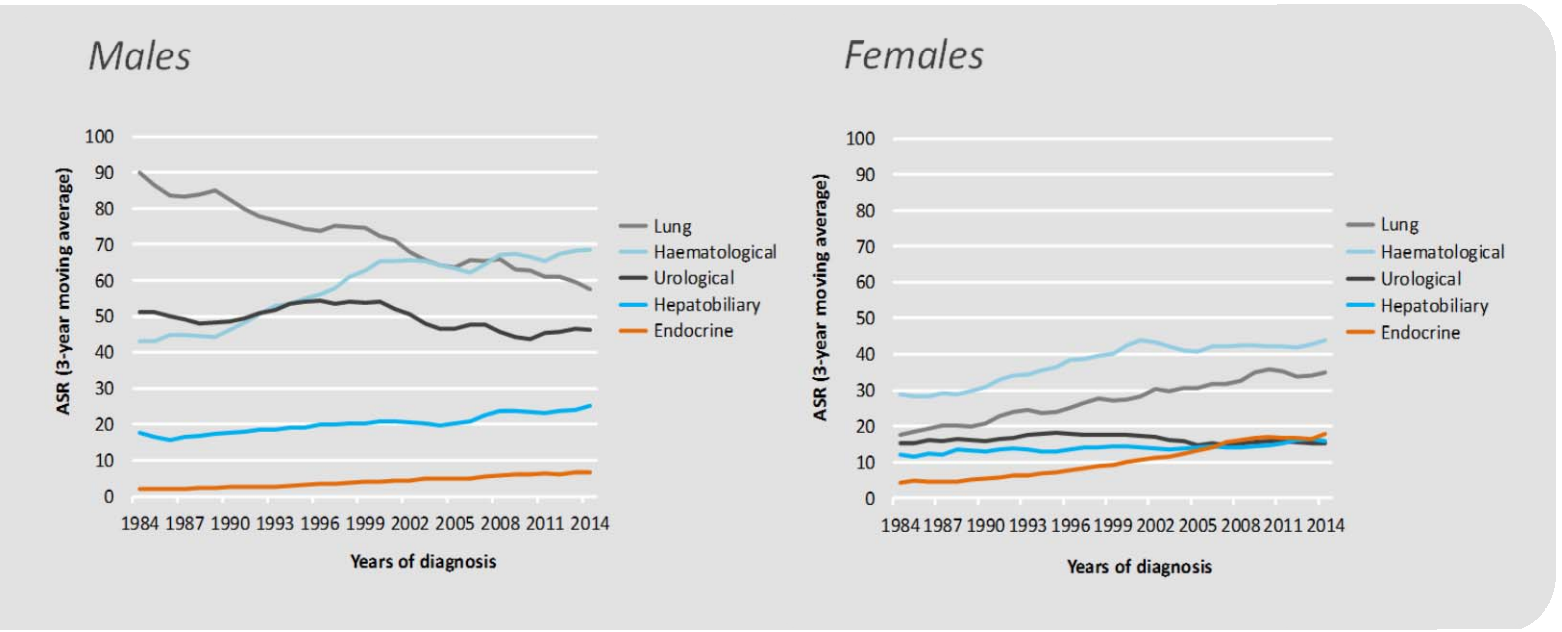
Melanoma incidence rates in Queensland - the highest in the world - have not changed significantly over the past decade.

Figure 21: Incidence trends for the most common cancers, Queensland, 1982-2014



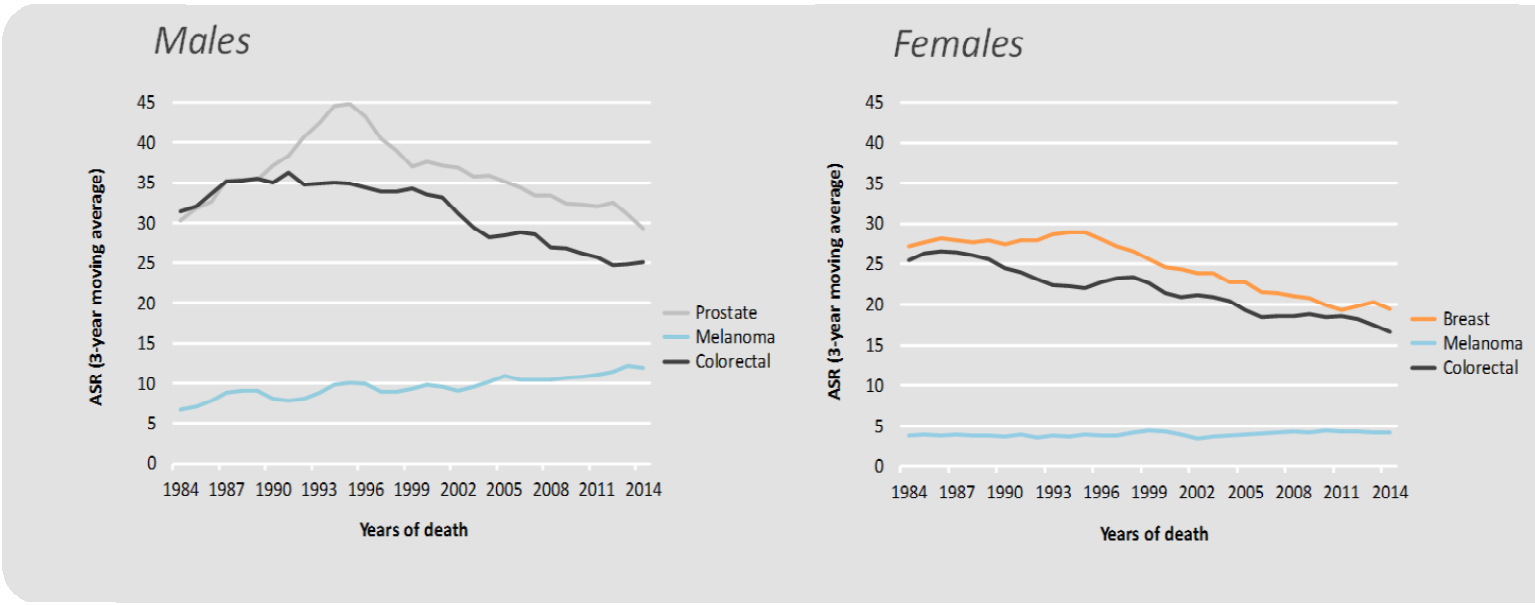
Abbreviation: ASR: Age-standardised rate per 100,000.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 22: Incidence trends for the most rapidly changing cancers, Queensland, 1982-2014



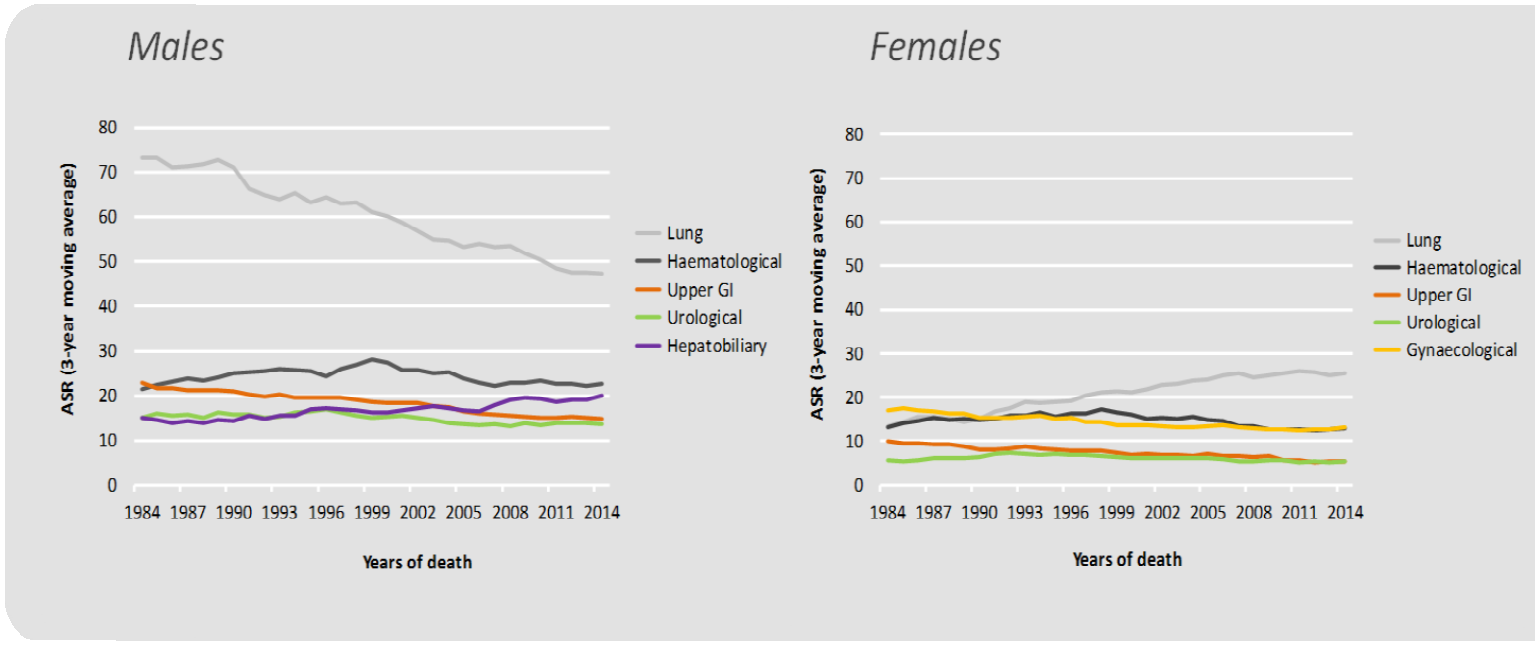
Abbreviation: ASR: Age-standardised rate per 100,000.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 23: Mortality trends for the most common cancers, Queensland, 1982-2014



Abbreviation: ASR: Age-standardised rate per 100,000.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Figure 24: Mortality trends for the most rapidly changing cancers, Queensland, 1982-2014



Abbreviation: ASR: Age-standardised rate per 100,000.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Incidence and mortality trends by age group

Tables 3 and 4 and Figure 25 show incidence and mortality rate trends for the period 1982-2014 for the most common cancers according to age.

Table 3: Annual percentage change (APC) in age-specific incidence rates, most common cancers, by age group, Queensland, 1982-2014

		Males				Females			
		2010-2014		Trend §		2010-2014		Trend §	
Age group	Cancer	New cases	Average rate ‡	Period	APC*	New cases	Average rate ‡	Period	APC*
0-14	All cancers	374	16.0	1982-2014	0.0	313	14.1	1982-2014	**1.1***
	Haematological	188	8.0	1982-2014	0.3	137	6.2	1982-2014	**1.5***
	CNS	54	2.3	1982-2014	0.5	41	1.9	1982-2014	4.8
	Bone and soft tissue	50	2.2	1982-2014	0.0	40	1.8	1982-2014	**3.0***
	Urological	23	1.0	1982-2014	8.0	21	0.9	1982-2014	-3.8
	Endocrine	17	0.7	1982-2014	0.2	19	0.9	1982-2014	-1.2
15-24	All cancers	532	33.1	1996-2014	**-1.7***	527	33.8	1995-2014	**-1.3***
	Melanoma	111	6.9	1995-2014	**-5.0***	158	10.2	1995-2014	**-4.8***
	Haematological	148	9.2	1982-2014	**1.3***	121	7.8	1982-2014	**1.8***
	Urological	116	7.2	1982-2014	**1.6***	9	0.6	1982-2014	23.0
	Endocrine	27	1.7	1982-2014	7.9	72	4.6	1982-2014	**4.2***
	Bone and soft tissue	45	2.8	1982-2014	0.7	24	1.5	1982-2014	18.5
25-34	All cancers	1,304	80.7	1996-2014	**-0.8***	1,850	115.2	1982-2014	0.2
	Melanoma	412	25.6	1996-2014	**-2.5***	577	35.9	1982-2014	**-0.5***
	Haematological	172	10.6	1991-2014	-0.5	152	9.4	1982-2014	**1.1***
	Urological	329	20.3	1982-2014	**1.8***	18	1.1	1982-2014	15.9
	Female breast					281	17.5	1982-2014	0.3
	Endocrine	66	4.1	1982-2014	**16.3***	242	15.1	1982-2014	**3.9***
35-44	All cancers	2,690	168.9	1982-2014	**0.6***	4,310	265.8	1982-2014	**0.4***
	Melanoma	809	50.8	1987-2014	-0.4	935	57.7	1982-2014	-0.1
	Female breast					1,507	93.0	1982-2014	**1.0***
	Haematological	362	22.7	1982-2014	**0.9***	283	17.4	1982-2014	**1.5***
	Endocrine	99	6.2	1982-2014	**4.8***	393	24.2	1982-2014	**5.8***
	Colorectal	270	16.9	1982-2014	0.6	223	13.7	1982-2014	-0.1
45-54	All cancers	7,303	482.5	1982-2014	**0.8***	8,944	577.3	1982-2014	**0.6***
	Female breast					3,748	241.9	1993-2014	**0.6***
	Melanoma	1,408	93.0	1998-2014	-0.8	1,322	85.3	1982-2014	**0.8***
	Prostate	1,530	101.2	2009-2014	-6.5				
	Colorectal	792	52.3	1982-2014	**-0.7***	659	42.6	1988-2014	**-0.8***
	Haematological	757	50.0	1982-2014	**1.4***	530	34.2	1982-2014	**1.6***
55-64	All cancers	17,540	1362.8	2009-2014	**-1.6***	11,909	921.9	1998-2014	-0.2
	Prostate	6,126	476.3	2007-2014	**-3.0***				
	Female breast					3,897	301.7	2000-2014	-0.8
	Melanoma	2,346	182.2	1987-2014	**1.5***	1,403	108.6	1982-2014	**1.3***
	Colorectal	1,736	135.0	1995-2014	**-2.5***	1,126	87.2	1995-2014	**-2.5***
	Lung	1,365	106.1	1982-2014	**-2.6***	1,012	78.4	1982-2014	**1.2***
65-74	All cancers	22,786	2595.2	2007-2014	-1.3	13,064	1491.5	1999-2014	0.3
	Prostate	7,813	890.5	2007-2014	-1.6				
	Colorectal	2,599	297.6	2006-2014	**-5.0***	1,673	192.4	2007-2014	**-6.1***
	Lung	2,401	273.5	1982-2014	**-1.6***	1,418	161.5	1982-2014	**2.7***
	Melanoma	2,674	303.3	1997-2014	**1.6***	1,325	151.3	1982-2014	**2.0***
	Female breast					3,631	413.7	1982-2014	**1.9***

		Males				Females			
		2010-2014		Trend §		2010-2014		Trend §	
Age group	Cancer	New cases	Average rate ‡	Period	APC*	New cases	Average rate ‡	Period	APC*
75-84	All cancers	15,035	3552.7	1993-2014	**-0.3***	9,881	1986.8	1998-2014	**0.4***
	Colorectal	2,070	489.2	1982-2014	**0.5***	1,828	367.9	1982-2014	**0.7***
	Prostate	3,476	821.7	2004-2014	**-2.5***				
	Lung	1,835	435.2	2012-2014	-13.4	1,107	222.5	1982-2014	**4.2***
	Haematological	1,727	407.9	2002-2014	0.1	1,237	248.8	2001-2014	0.2
	Melanoma	1,829	431.0	1993-2014	**2.5***	906	181.8	1984-2014	**2.1***
85+	All cancers	5,279	4065.0	1989-2014	**-0.3***	5,398	2303.5	1982-2014	**0.9***
	Colorectal	662	509.7	1988-2014	0.1	982	419.2	1982-2014	0.1
	Haematological	680	522.7	1992-2014	0.8	681	289.9	1997-2014	0.2
	Melanoma	620	474.8	1982-2014	**3.7***	489	208.7	1982-2014	**3.1***
	Prostate	1,005	777.2	1992-2014	**-3.1***				
	Lung	620	477.7	1982-2014	0.2	391	167.4	1982-2014	**4.5***

+ The five most common cancers in each age group are listed.

‡ Average annual age-specific incidence rate per 100,000 for the period 2010-2014. Rates for fewer than 16 cases are presented for completeness but should be treated with caution.

§ Trends were analysed for 1982-2014. If the slope of the trend was not constant over the entire time period, the annual percentage change (APC) in the most recent time period is shown.

** Bold figures with asterisk indicate a significant change (increase or decrease) in APC.*

Abbreviations: APC: annual percentage change; CNS: Central nervous system (including brain).

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

CHILDHOOD CANCERS

In children aged 0-14 years, cancer incidence and mortality rates were higher in boys than girls (Figure 25). Cancer incidence rates for boys were relatively stable over the period 1982-2014, both for all cancers combined and the common cancers of childhood with the exception of urological cancer which demonstrated an increase over this period, although this was not statistically significant. In contrast, incidence rates for all combined increased significantly for girls between 1982 and 2014 (APC 1.1%). The incidence of haematological cancers and cancers of bone and soft tissue in girls increased by 1.5% and 3.0% per year respectively during this period (Table 3).

Considering all cancers together, cancer mortality rates declined significantly in both boys and girls during this period. The decreases in mortality are likely due to improvements in treatment, particularly for the haematological cancers which are the most common cancers in childhood (Table 4).

Table 4: Annual percentage change (APC) in age-specific mortality rates, most common cancers, by age group, Queensland, 1982-2014

		Males				Females			
		2010-2014		Trend		2010-2014		Trend	
Age group	Cancer	New cases	Average rate ‡	Period	APC*	New cases	Average rate ‡	Period	APC*
0-14	All cancers	51	2.2	1982-2014	0.0	42	1.9	1982-2014	**1.1***
15-24	All cancers	56	3.5	1996-2014	**-1.7***	58	3.7	1995-2014	**-1.3***
25-34	All cancers	132	8.2	1996-2014	**-0.8***	147	9.1	1982-2014	0.2
35-44	All cancers	367	23.1	1982-2014	**0.6***	489	30.2	1982-2014	**0.4***
	Melanoma	47	3.0	1987-2014	-0.4	45	2.8	1982-2014	-0.1
	Female breast					118	7.3	1982-2014	**1.0***
	Haematological	35	2.2	1982-2014	**0.9***	36	2.2	1982-2014	**1.5***
	Endocrine	5	0.3	1982-2014	**4.8***	6	0.4	1982-2014	**5.8***
	Colorectal	40	2.5	1982-2014	0.6	59	3.6	1982-2014	-0.1
45-54	All cancers	1,446	95.5	1982-2014	**0.8***	1,326	85.6	1982-2014	**0.6***
	Female breast					356	23.0	1993-2014	**0.6***
	Melanoma	121	8.0	1998-2014	-0.8	71	4.6	1982-2014	**0.8***
	Prostate	28	1.8	2009-2014	-6.5				
	Colorectal	164	10.8	1982-2014	**-0.7***	150	9.7	1988-2014	**-0.8***
	Haematological	116	7.7	1982-2014	**1.4***	51	3.3	1982-2014	**1.6***
55-64	All cancers	3,919	304.4	2009-2014	**-1.6***	2,818	218.3	1998-2014	-0.2
	Prostate	195	15.2	2007-2014	**-3.0***				
	Female breast					546	42.4	2000-2014	-0.8
	Melanoma	221	17.1	1987-2014	**1.5***	107	8.3	1982-2014	**1.3***
	Colorectal	424	33.0	1995-2014	**-2.5***	286	22.2	1995-2014	**-2.5***
	Lung	961	74.7	1982-2014	**-2.6***	665	51.5	1982-2014	**1.2***
65-74	All cancers	6,881	785.5	2007-2014	-1.3	4,132	473.0	1999-2014	0.3
	Prostate	682	78.2	2007-2014	-1.6				
	Colorectal	775	88.5	2006-2014	**-5.0***	429	49.8	2007-2014	**-6.1***
	Lung	1,872	213.3	1982-2014	**-1.6***	1,029	117.6	1982-2014	**2.7***
	Melanoma	316	36.1	1997-2014	**1.6***	96	11.0	1982-2014	**2.0***
	Female breast					586	67.1	1982-2014	**1.9***
75-84	All cancers	7,453	1761.3	1993-2014	**-0.3***	4,684	942.1	1998-2014	**0.4***
	Colorectal	878	207.4	1982-2014	**0.5***	702	141.2	1982-2014	**0.7***
	Prostate	1,259	299.0	2004-2014	**-2.5***				
	Lung	1,589	375.5	2012-2014	-13.4	886	178.1	1982-2014	**4.2***
	Haematological	815	192.4	2002-2014	0.1	562	113.0	2001-2014	0.2
	Melanoma	378	89.0	1993-2014	**2.5***	102	20.5	1984-2014	**2.1***
85+	All cancers	4,040	3104.0	1989-2014	**-0.3***	3,729	1588.0	1982-2014	**0.9***
	Colorectal	423	323.4	1988-2014	0.1	636	271.8	1982-2014	0.1
	Haematological	505	388.8	1992-2014	0.8	478	202.4	1997-2014	0.2
	Melanoma	202	155.4	1982-2014	**3.7***	107	45.8	1982-2014	**3.1***
	Prostate	1,004	773.1	1992-2014	**-3.1***				
	Lung	605	464.2	1982-2014	0.2	410	175.4	1982-2014	**4.5***

+ The five most common cancers in each age group are listed.

‡ Average annual age-specific mortality rate per 100,000 for the period 2010-2014.

§ Trends were analysed for 1982-2014. If the slope of the trend was not constant over the entire time period, the annual percentage change (APC) in the most recent time period is shown.

** Bold figures with asterisk indicate a significant change (increase or decrease) in APC.*

Abbreviations: APC: annual percentage change; CNS: Central nervous system (including brain).

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

CANCERS IN ADOLESCENTS AND YOUNG ADULTS

In males aged 15-24, the incidence rate for all cancers decreased significantly between 1996 and 2014, largely due to a decrease in the incidence of the most common cancer, melanoma (APC –5.0%). The incidence rates of haematological and urological cancers on the other hand increased between 1982 and 2014 (APC 1.3% and 1.6% respectively). In females aged 15-24, the incidence rate for all cancers combined also decreased significantly between 1995 and 2014. The incidence rate for endocrine cancers (mostly thyroid cancer) and haematological cancer increased significantly (APC 4.2% and 1.8% respectively). Incidence rates for melanoma decreased significantly (APC –4.8%). Mortality rates for all cancers combined across males and females decreased significantly (APC –1.7% and –1.3%) (Tables 3 and 4).

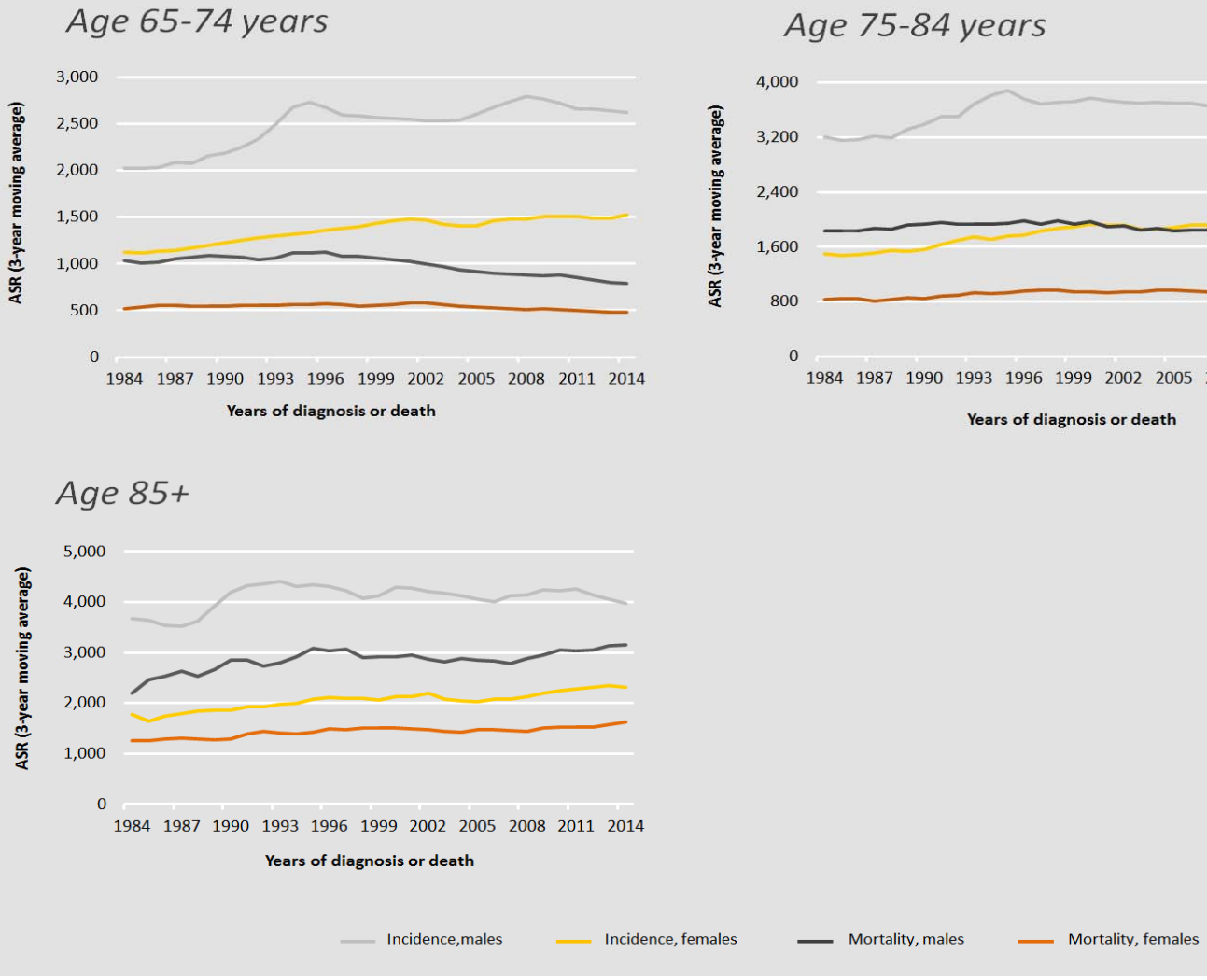
CANCERS IN ADULTS

Incidence and mortality rates for all cancers were higher in females aged 35-44 years than males, but the situation was reversed for persons over 55 years (Figure 25). In the latter age groups, incidence and mortality rates for individual cancers were generally higher in males than females (Tables 3 and 4).

- **Melanoma** incidence rates decreased in adult males in the 35-44 and 45-54 age groups from 1982, but increased significantly in those 55 years and over. For females rates remained stable for 35-44 year olds and then increased significantly for those aged 45 and older. Although mortality rates decreased in males and females aged 35-44 years, mortality rates have increased in older age groups (males and females over 55 years).
- **Female breast cancer** incidence rates increased significantly in females aged 35-44 and 65-74 years from 1982 (APC 1.0% and 1.9% respectively), but mortality rates for females – including those at high risk for breast cancer (aged 55-64 years) – have decreased from the early 2000s.
- **Prostate cancer** incidence rates have decreased in males over 45 years in the last decade, in particular males aged 85+ in which rates have decreased significantly at a rate of 3.1% per year since 1992. Mortality rates from prostate cancer in males over 55 years have decreased significantly over the last decade.
- **Colorectal cancer** incidence rates have decreased significantly in the 45-54, 55-64 and 65-74 year old age groups in males and females since the early 1990s and 2000s but increased significantly in the 75-84 age group for males and females. Mortality rates have decreased significantly in all age groups in the past 30 years including the largest significant decrease among the common cancers for females (APC –6.1% aged 65-74 years).
- **Lung cancer** incidence rates show a clear gender difference. The incidence rate for males 55-64 and 65-74 years decreased significantly while the rate for females increased. Mortality rates reflect these trends with mortality significantly decreasing for males over 55 years and females with a significant increase in those over 55 years with the exception of the 65-74 age group which remained stable.
- **Haematological cancers** increased in most adult age groups, with the exception of males and females 75-84 years and females aged 85+ years. Apart from males aged 75 years and older, mortality rates from haematological cancers have significantly increased for males and females in the 35-44 and 45-54 year old age groups.

Figure 25: Incidence and mortality trends for all cancers by age group, Queensland, 1982-2014

Abbreviation: ASR: Age-standardised rate per 100,000.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.



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

Cancer in Aboriginal & Torres Strait Islander people of Queensland

Key points

POPULATION DEMOGRAPHICS

There were about 968,000 Aboriginal and Torres Strait Islander people (hereafter respectfully referred to as Indigenous) living in Queensland during 2010-2014, around 4.0% of the total population. Half of all Indigenous Queenslanders lived in remote or very remote areas. The Indigenous population was much younger than the non-Indigenous population with almost 60% of Indigenous Queenslanders aged under 25 (only 33% of non-Indigenous Queenslanders were aged less than 25) and less than 1% aged 75 or more (compared with 3.4% of non-Indigenous Queenslanders).

INCIDENCE AND MORTALITY ANNUAL AVERAGE

In 2010-2014, there was 378 new cases of cancer diagnosed among Indigenous and 22,544 new cases of cancer diagnosed among non-Indigenous Queenslanders. Among the Indigenous population there were more diagnoses in females (195 - 52%) compared to males (183 – 48%). In contrast, among the non-Indigenous population, cancer was more commonly diagnosed in males (12,657 - 56%) compared to females (9,887 - 44%).

Cancer diagnoses among the Indigenous population were made at a younger age (median age 59 years) than in the non-Indigenous population (median age 67 years). The lifetime risk* of a cancer diagnosis was higher among the Indigenous population (1 in 2) than in the non-Indigenous population (1 in 3).

On average each year in 2010-2014, 157 deaths were attributed to cancer in Indigenous Queenslanders and 8,135 in non-Indigenous Queenslanders. More cancer deaths were recorded among males than females for both Indigenous and non-Indigenous (52% and 58% respectively) Queenslanders.

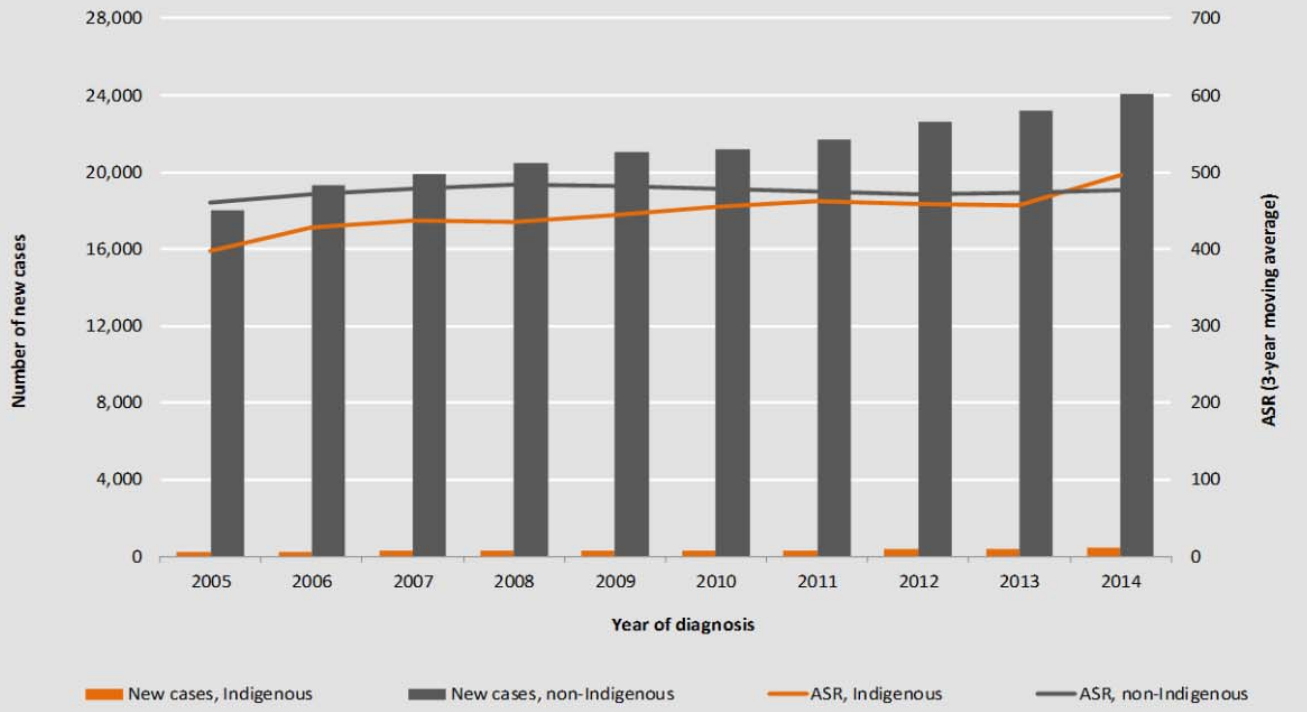
Median age at cancer death was over a decade younger for the Indigenous population (63 years) compared with the non-Indigenous population (74 years). The lifetime risk of cancer death was higher among Indigenous Queenslanders (1 in 4) compared with non-Indigenous Queenslanders (1 in 7).

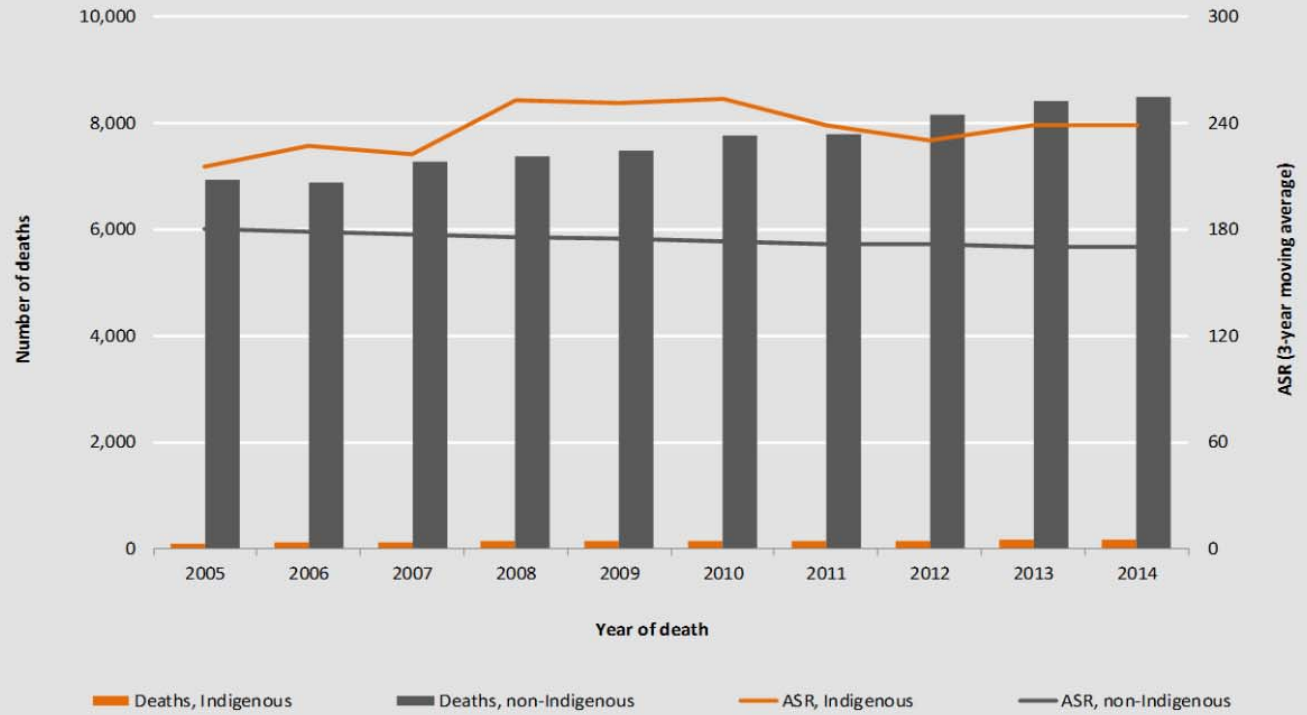
Trends in incidence rates for all invasive cancers and the number of new cases diagnosed annually are summarised in Figure 26. The incidence rate for all invasive cancers among Indigenous Queenslanders has increased from 397 to 496 per 100,000 in 2014, and is at a ten-year high. In contrast, the incidence rate for all invasive cancers among non-Indigenous Queenslanders has decreased slightly over the last ten years.

Over the last ten years, the number of cancer deaths increased among both Indigenous and non-Indigenous Queenslanders. However, the mortality rate among non-Indigenous Queenslanders decreased during the period while the rate for Indigenous Queenslanders did not. The overall mortality rate was higher among Indigenous Queenslanders throughout the ten years and this difference has increased (Figure 26).

** Lifetime risk of developing or dying from cancer refers to the chance a person has, over the course of his or her lifetime (from birth to death), of being diagnosed with or dying from cancer.*

Figure 26: Trends in number and rates for all cancers by Indigenous status, 2005-2014

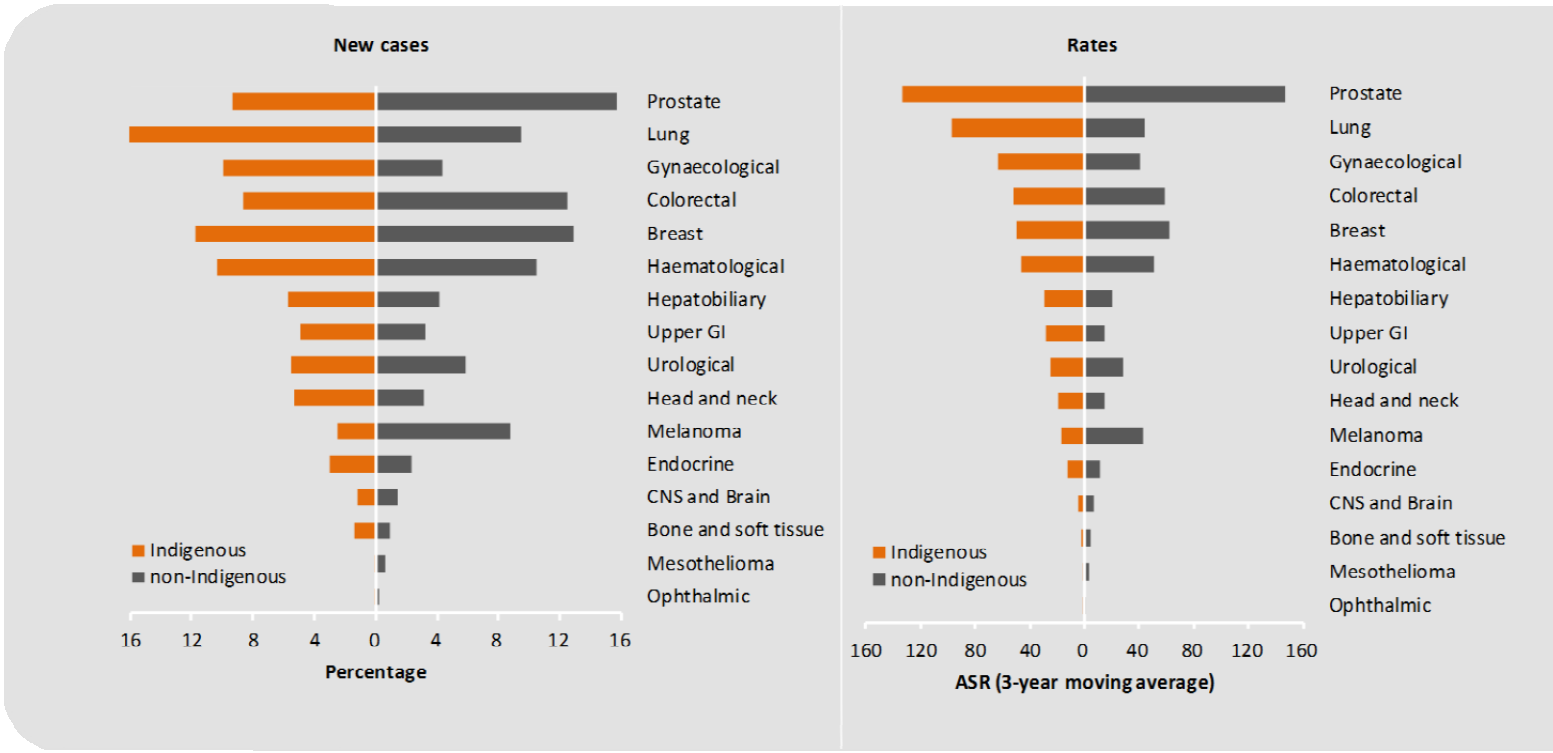




ASR: Age-standardised rate per 100,000, standardised to 2001 Australian population.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Most common cancers and cancer deaths

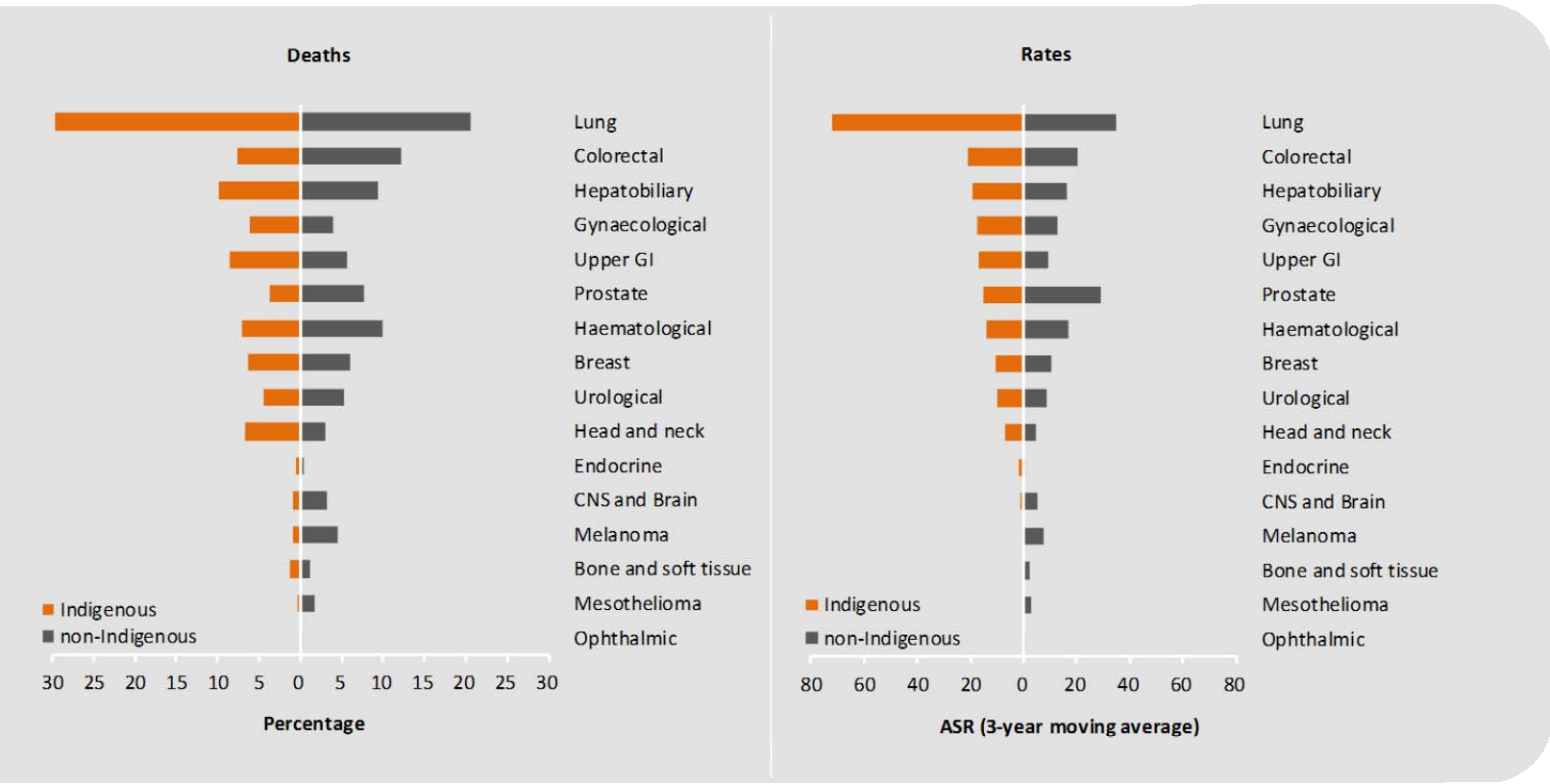
Figure 27: Annual average proportion and rates of new cases for selected cancers by Indigenous status, 2010-2014



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

The most commonly diagnosed cancers in the Indigenous population were lung (16%, 97 per 100,000), breast (12%, 50 per 100,000), haematological (10%, 46 per 100,000), gynaecological (10%, 63 per 100,000) and prostate (9%, 134 per 100,000) (Figure 27).

Figure 28 Annual average proportion and rates of deaths for selected cancers by indigenous status, 2010-2014

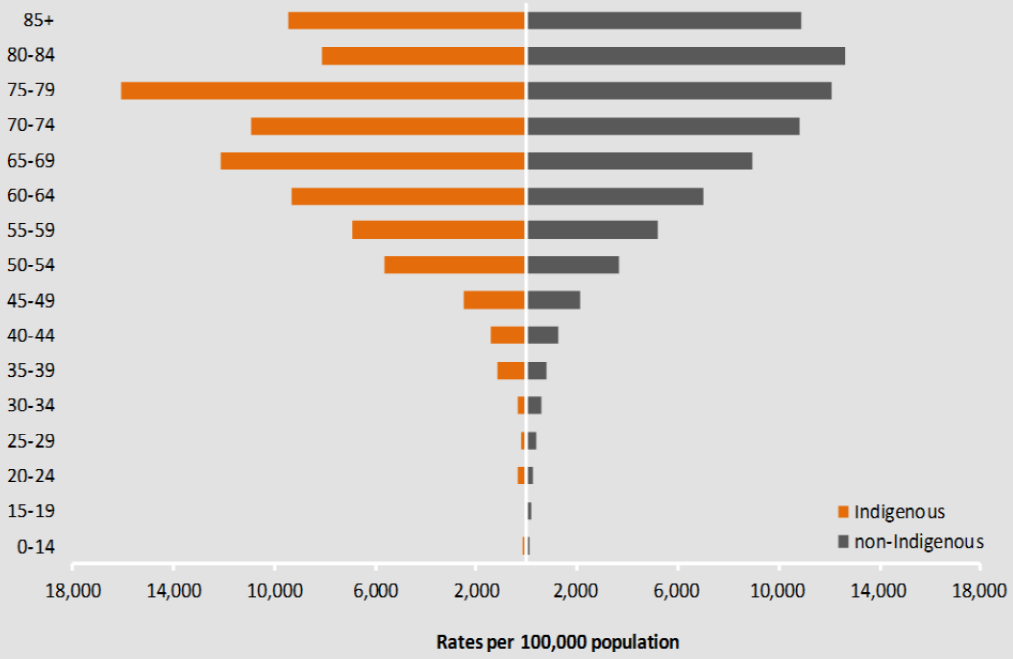


ASR: Age-standardised rate per 100,000, standardised to 2001 Australian population.
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

During 2010-2014, lung cancer was the leading cause of cancer death for both Indigenous people with 47 deaths (30%, 72 per 100,000) and non-Indigenous people with 1,671 deaths (21%, 35 per 100,000) on average each year. Colorectal cancer was one of the most common causes of cancer death with 12 deaths (8%, 21 per 100,000) for Indigenous people and 988 deaths (12%, 20 per 100,000) for non-Indigenous people on average each year. Hepatobiliary cancer was also a common cause of cancer death with 17 deaths (10%, 19 per 100,000) for Indigenous people and 794 deaths (10%, 16 per 100,000) for non-Indigenous people on average each year (Figure 28).

Potential years of life lost (PYLL)

Figure 29: Potential years of life lost (PYLL) annual average rates due to cancer, by age and Indigenous status, Queensland, 2010-2014

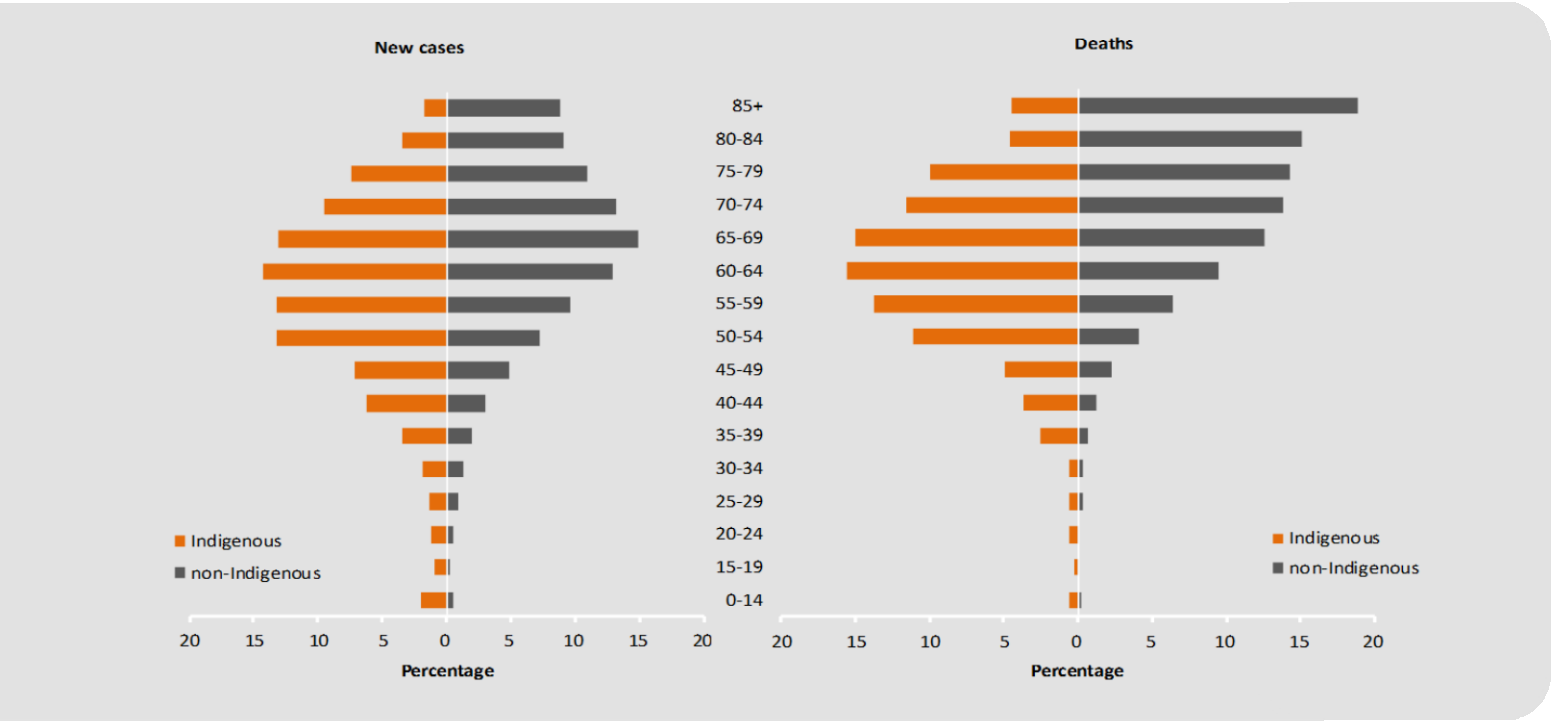


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.
Notes: Experimental Life Tables by Remoteness, Queensland, 2005-07 from Health Statistics Centre, Queensland Health[4] has been used to calculate for PYLL.

The Indigenous population experienced a higher rate of potential years of life lost (PYLL) than the non-Indigenous population across all age groups with the exception of people aged 0-19, 25-29 and 80+. The rate peaks among those aged 75-79 within the Indigenous population and for those aged 80-84 in the non-Indigenous population (Figure 29).

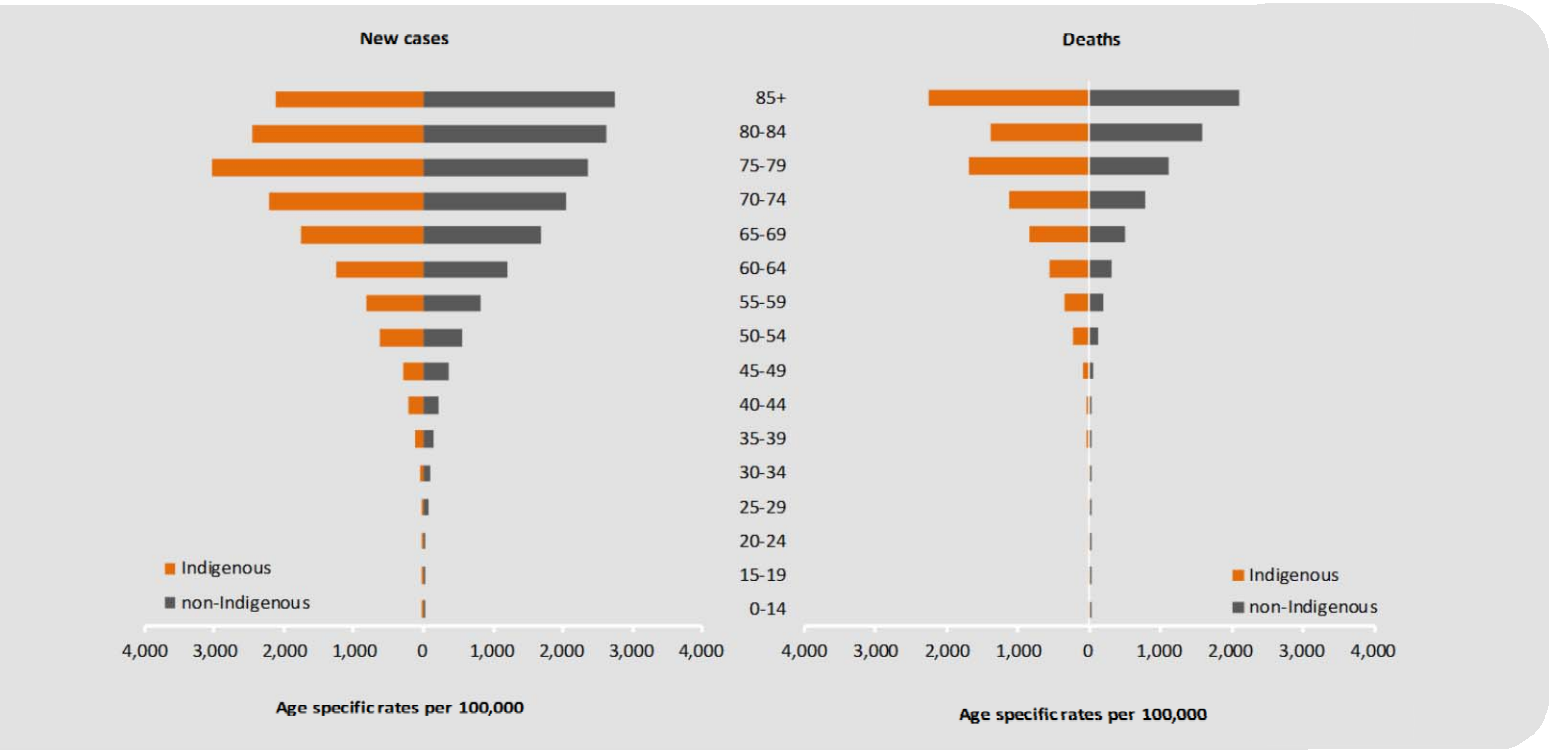
Incidence and mortality by age group

Figure 30: Incidence and mortality proportions for all cancers, by age and Indigenous status, Queensland, 2010-2014



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

Figure 31: Incidence and mortality age specific rates for all cancers, by age and Indigenous status, Queensland, 2010-2014

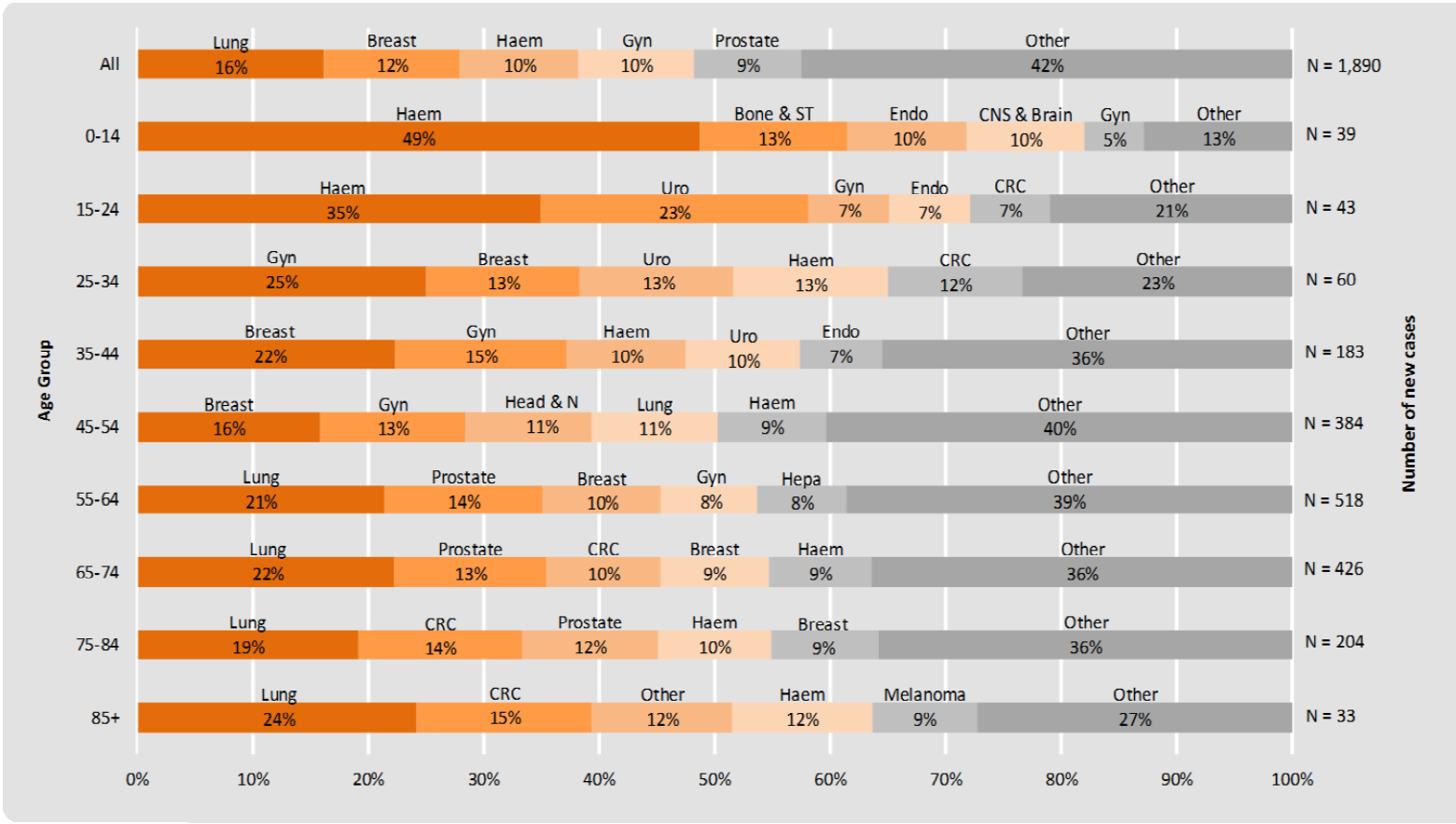


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

In 2010-2014, the proportion of new cases and number of deaths occurring among Indigenous people in older age groups (75+) is low when compared to the non-Indigenous population despite similar rates of incidence and mortality in these age groups. This is due to lower overall life expectancy among the Indigenous population and reflects the smaller proportion of older persons within this population. Age-specific incidence rates from cancer were higher for Indigenous Queenslanders for age groups 0-14 to 20-24 and 75-79. The age-specific mortality rate was generally higher in Indigenous Queenslanders than non-Indigenous Queenslanders throughout all age groups except for age group 80-84.(Figure 31).

MOST COMMON CANCERS BY AGE GROUP

Figure 32: The top 5 most common cancer diagnoses by age group and Indigenous Queenslanders, 2010-2014

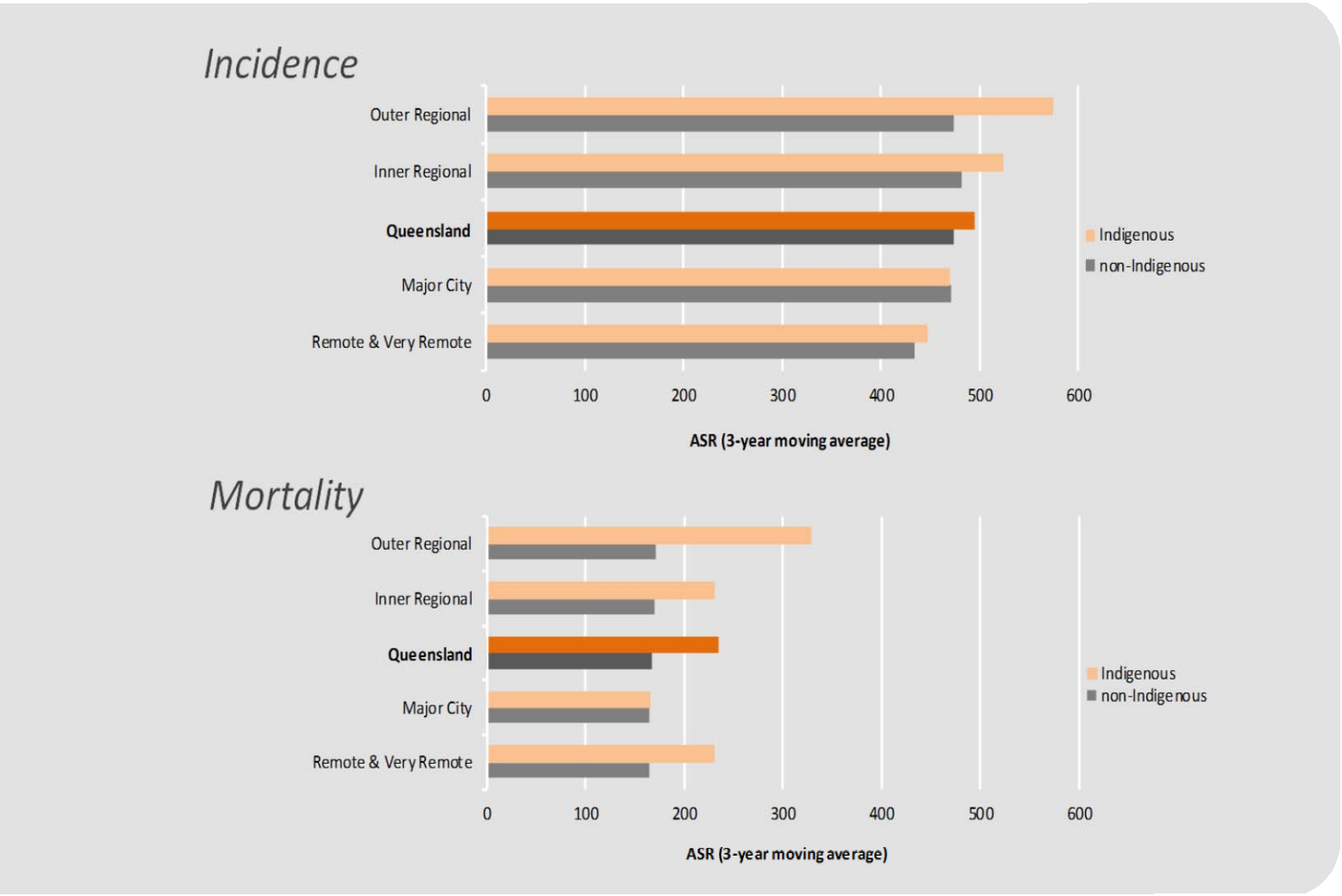


Abbreviations: Bone & ST: Bone and soft tissue / CNS & brain: Central nervous system and brain / CRC: Colorectal / Endo: Endocrine / Gyn: Gynaecological / Haem: Haematological / Head & N: Head and neck/ Uro: Urological

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

Incidence and mortality by remoteness

Figure 33: Cancer incidence and mortality rates by remoteness of residence and Indigenous status, Queensland, 2014

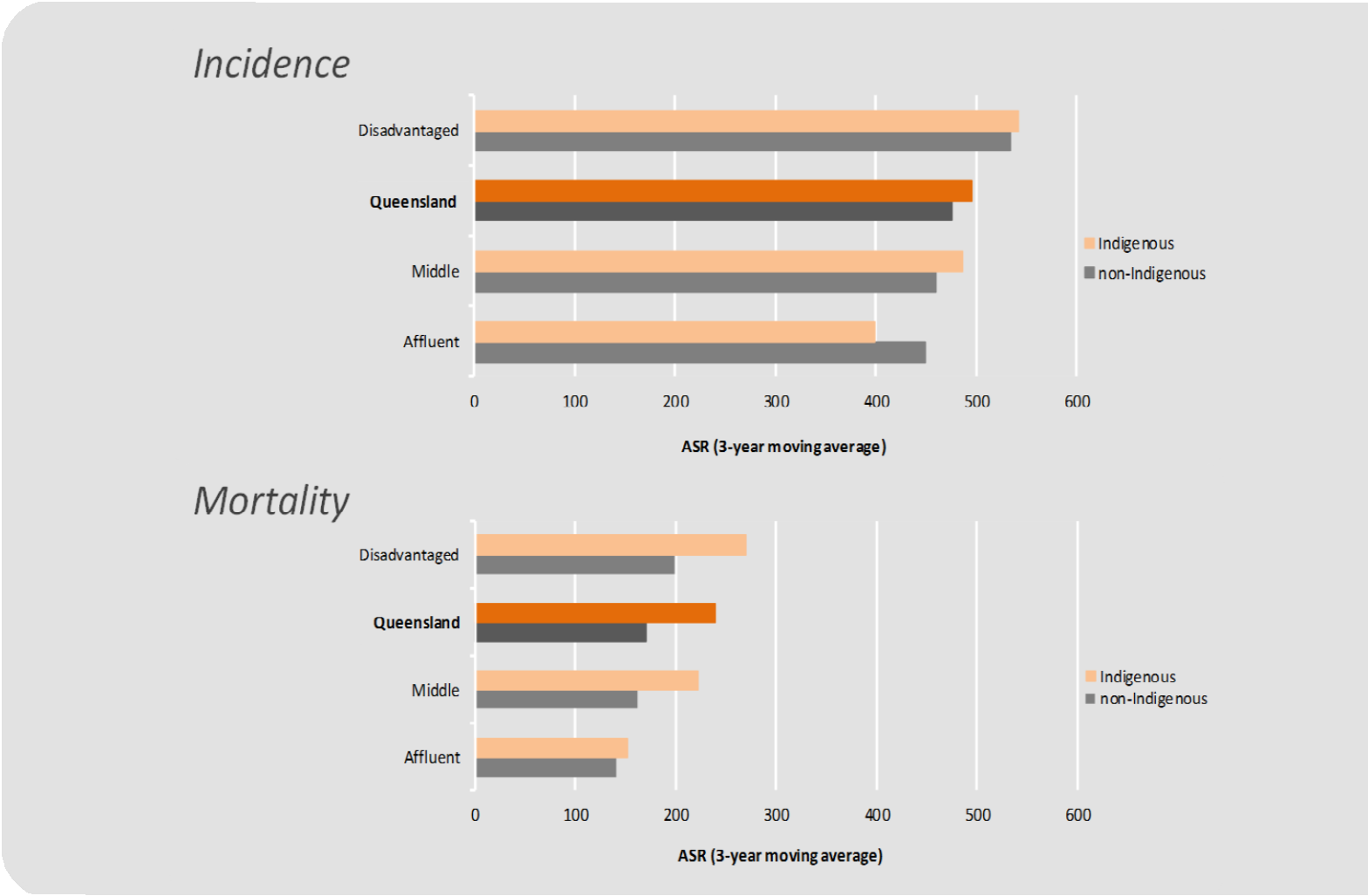


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

The incidence and mortality rates for all invasive cancers varied by remoteness and were highest in outer regional for Indigenous Queenslanders (Figure 33; see the Glossary for a definition of remoteness). Incidence and mortality rates for all invasive cancers varied only slightly by remoteness for non-Indigenous Queenslanders.

Incidence and mortality by socio-economic status

Figure 34: Cancer incidence and mortality rates by socio-economic status and Indigenous status, Queensland, 2014



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

The incidence and mortality rates for all invasive cancers were high for both Indigenous and non-Indigenous Queenslanders in areas of socio-economic disadvantage (Figure 34 see the Glossary for a definition of socio-economic disadvantage).

Prevalence

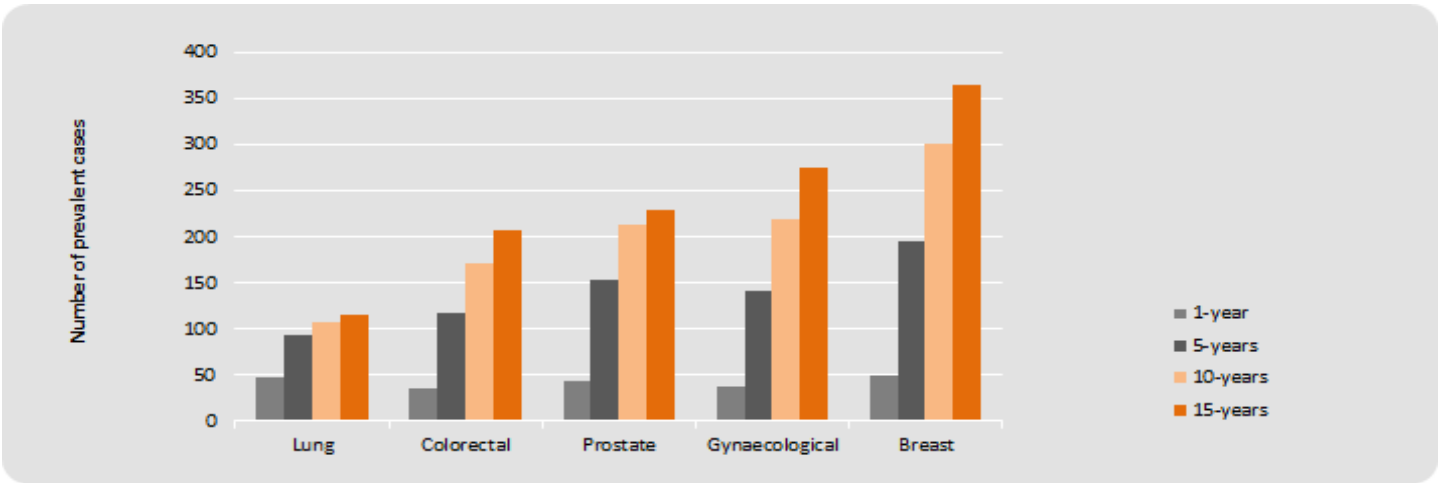
Table 5: Five-year prevalence, most common cancers, Indigenous status, Queensland, 31 December 2014

	Indigenous & non-Indigenous		Indigenous		non-Indigenous	
	Count	Percent*	Count	Percent*	Count	Percent*
All cancers	91,020	1.93	1,175	0.58	75,686	1.67
Prostate	18,073	0.38	154	0.08	15,742	0.35
Breast	14,478	0.31	196	0.10	13,298	0.29
Colorectal	10,812	0.23	117	0.06	10,066	0.22
Gynaecological	4,003	0.08	141	0.07	3,676	0.08
Lung	3,458	0.07	93	0.05	3,239	0.07

**Percent of Queensland population as at 31 December 2014 (4.72 million) (Australian Bureau of Statistics)*
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

By the end of 2014, more than 1,100 Indigenous Queenslanders and more than 75,000 non-Indigenous Queenslanders were living with a diagnosis of cancer in the previous five years (Table 5). Breast and prostate cancer had the highest prevalence for both Indigenous and non-Indigenous Queenslanders. Due to relatively poor survival, lung cancer has a relatively low prevalence in both Indigenous and non-Indigenous Queenslanders.

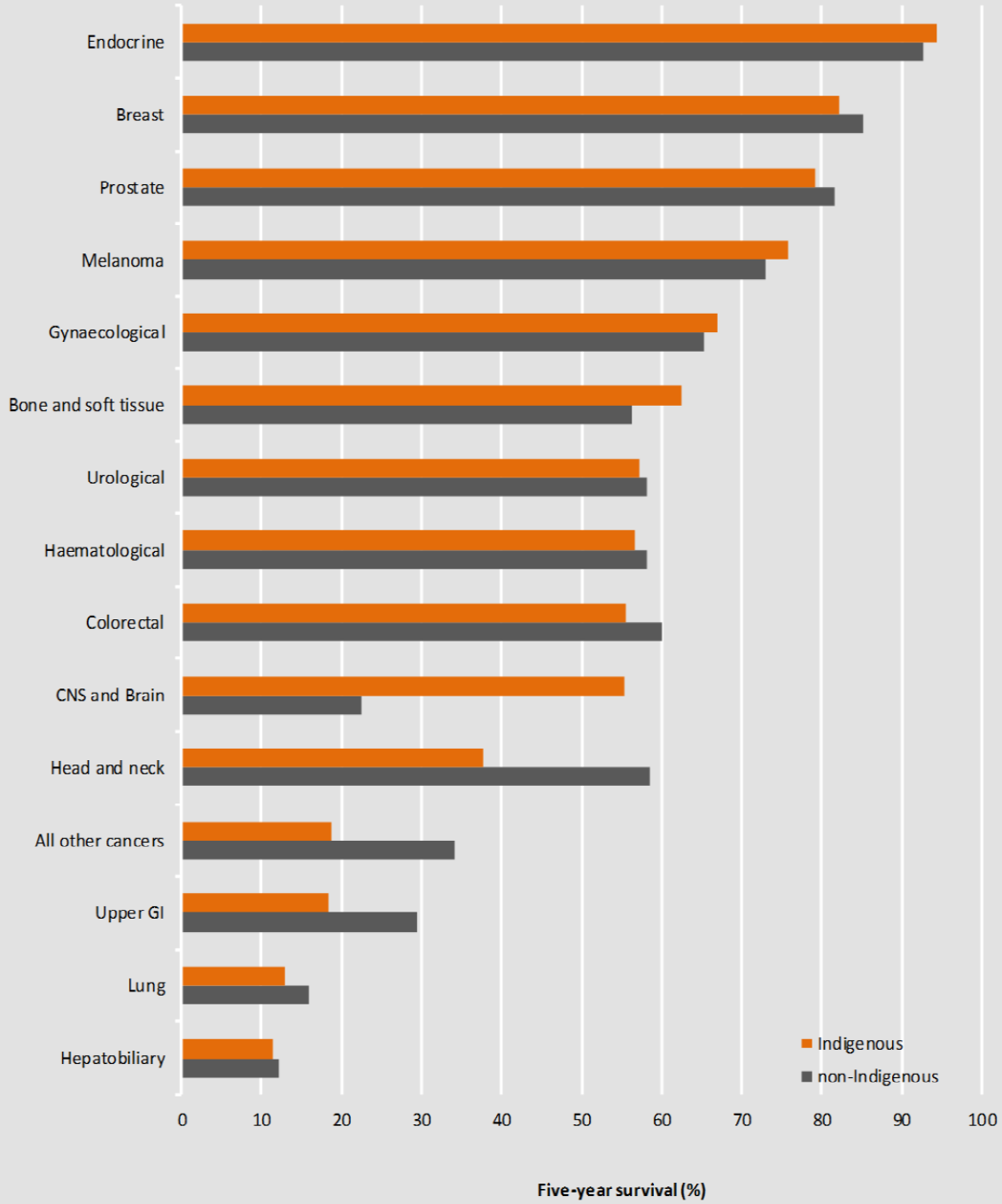
Figure 35: Prevalence for the most common cancers for Indigenous Queenslanders, by time since diagnosis, Queensland, 31 December 2014



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

Survival

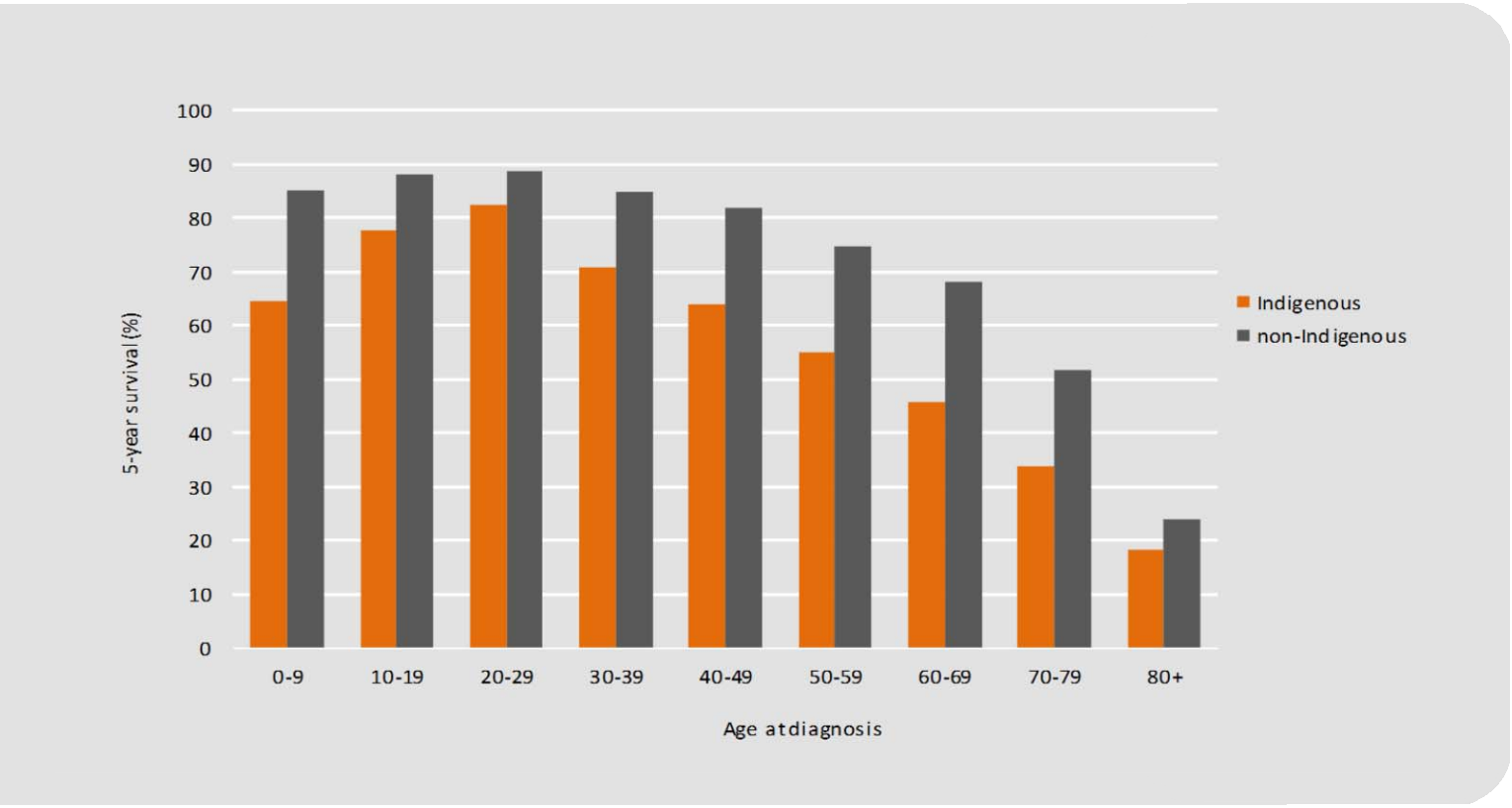
Figure 36: Five year survival for selected cancers and Indigenous status, Queensland, 2010-2014



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

Survival rates for Indigenous and non-Indigenous Queenslanders are similar for many selected cancers. However, these rates differ for CNS and brain, and bone and soft tissue cancers where Indigenous Queenslanders experience higher survival, while among head and neck, upper GI and colorectal cancers non-Indigenous Queenslanders experience higher survival rates (Figure 36).

Figure 37: Five year survival by age at diagnosis and Indigenous status, Queensland, 2010-2014



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

Five year survival rates for the Indigenous population are lower than for their non-Indigenous counterparts in each ten-year age group. Survival rates are highest in both groups for those aged 20-29 and the survival differential is also smallest within this age group. Decreases in survival are observed from age 30-39 onwards with sharper declines occurring among the Indigenous population. The widening gap with increasing age reflects the overall lower life expectancy experienced by Indigenous Queenslanders in general (Figure 37).

Data for today:

Our aim is to provide data which can inform our decision making as we move through the process of health reform. The challenge now faced by us all is to incorporate this knowledge into our day to day decision making.

Glossary and common abbreviations

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

Age-standardised incidence/mortality (ASR)
The number of new cases or deaths per 100,000 that would have occurred in a given population if the age distribution of that population was the same as that of the Australian population in 2001 and if the age-specific rates observed in the population of interest had prevailed. In international comparisons, the World Standard Population was used as the reference population. Age-standardised rates are independent of the age-structure of the population of interest and are therefore useful in making comparisons between different populations and time periods.

Annual percentage change (APC)
The annual rate of increase or decrease in cancer incidence or mortality. The APC is calculated by fitting a linear model to the annual rates after logarithmic transformation; the slope represents the APC for the time period. The APCs were calculated using Joinpoint Software Version 3.5.2 from the Surveillance Research Program, National Cancer Institute (US). The software identifies significant changes in rates over time and estimates the periods characterised by different rates.[16]

Five-year survival
All-cause crude survival: the percentage of cases still alive five year after diagnosis.

Five-year 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.

HHS
See Queensland Hospital and Health Service (HHS) of residence.

Incidence (new cases)
The number of new cases of cancer diagnosed in a defined population during a specified time period. For example, 2014 incidence is the number of cancers which were first diagnosed between 1 January 2014 and 31 December 2014.

Indigenous
A measure of whether a person identifies as being of Aboriginal or Torres Strait Islander origin. The term 'Indigenous' is used interchangeably with 'Aboriginal or Torres Strait Islander' in order to assist readability.

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.

non-Indigenous
A measure of whether a person does not identify themselves as Indigenous.

Potential Years of Life Lost (PYLL)
Potential Years of Life Lost (PYLL) estimates the total number of years of life lost due to a premature death from cancer. The PYLL measure used in this report relates to a reference age from Experimental Life Tables by Remoteness, Queensland, 2005-07 from Health Statistics Centre, Queensland Health[4]. This measure reports the number of years of life lost due to cancer deaths occurring prior to this reference age. For example, a cancer death at age 60 would contribute 25 years to the total PYLL. A cancer death occurring at an age of 85 or more would not contribute any years to the total PYLL being reported.

Prevalence
The number of Queenslanders with a diagnosis of cancer who were alive on 31 December 2014.

Projections
Projections are calculated using the most recent age-specific incidence and mortality rates (2014) and applying these to the population projections produced by the Australian Bureau of Statistics (ABS).

Proportions
A proportion refers to the number representing a part of a population.

Appendix

Queensland Hospital and Health Service (HHS) of residence
Hospital and Health Service of residence is a geographic area defined by a collection of Statistical Areas Level 2 (SA2) where the patient resides at time of diagnosis.

Remoteness
The relative remoteness of residence at time of diagnosis, based on the Australian Standard Geographical Classification (ASGC)[17]. In this report, remoteness is classified into four groups: Major City, Inner Regional, Outer Regional, and Remote & Very Remote.

Socioeconomic status
Socioeconomic status is based on the Socio-Economic Indexes for Areas (SEIFA), a census-based measure of social and economic well-being developed by the Australian Bureau of Statistics (ABS) and aggregated at the level of Statistical Areas (SA).

The ABS uses SEIFA scores to rank regions into ten groups or deciles numbered one to ten, with one being the most disadvantaged and ten being the most affluent group. This ranking is useful at the national level, but the number of people in each decile often becomes too small for meaningful comparisons when applied to a subset of the population. For this reason, this document further aggregates SEIFA deciles into 3 socioeconomic groups.

SEIFA Group	Decile	Percentage of population (approximate)
Affluent	1-2	20%
Middle	3-8	60%
Disadvantaged	9-10	20%

The proportion of cases in each group will vary depending on the subset of the population being examined. For example, the proportion in the Disadvantaged group may be higher than 20% when the data is limited to cancers that are more common in poor compared to rich people.

Affluent - the group of patients whose socioeconomic status is affluent.

Disadvantaged - the group of patients whose socioeconomic status is disadvantaged.

Middle - the group of patients whose socioeconomic status is middle.

Australian Bureau of Statistics, 2013, Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), cat. No. 2033.0.55.001. http://www.abs.gov.au/websitedbs/censushome.nsf/home/seifa

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.

Statistical significant
Results from the Joinpoint regression are presented as annual percentage changes (APC). Those highlighted with * (pp 30, 35 & 37) are deemed to be statistically significant changes, where the likelihood that the observed result is due to chance alone is less than 5% ($p<0.05$).

Cancer groups

Cancer	Description	ICD-10 AM code 9th edition
Bone and soft tissue	Bone / Soft tissue	C38, C40-C41, C46-C49
Breast	Invasive breast	C50
CNS and Brain	Brain / Central nervous system	C70-C72
Colorectal	Colon / Rectal	C18, C19-C20,C218
Endocrine	Adrenal gland / pituitary gland / thymus gland / thyroid gland	C37, C73-C75
Gynaecological	Cervix uteri / Corpus uteri / Gestational trophoblastic / Ovary / Vagina / Vulva	C51-C58
Haematological	Hodgkin Lymphoma / Leukaemia / Myeloma / Non-Hodgkin Lymphoma	M965-M966, M980-M994, M973, M967-M972
Head and neck	Larynx / Nasal cavity and paranasal sinuses / Nasopharynx / Oral Cavity / Oropharynx and Hypopharynx / Pharynx / Salivary Glands	C01-C14, C30-C32
Hepatobiliary	Biliary tract (not incl bile ducts and vater) / Gallbladder / Liver / Pancreas	C22-C25
Lung	NSCLC / SCLC	C33-C34
Melanoma	Melanoma	C43
Mesothelioma	Mesothelioma	C45
Ophthalmic	Ophthalmic	C69
Prostate	Prostate	C61
Upper GI	Oesophagus / Small intestine / Stomach	C15-C17
Urological	Kidney / Penis / Renal pelvis and ureter / Testis / Urinary bladder	C60, C62-C68
Other	Ill-Defined and Unknown Sites	C76, C80

Methods

The incidence and mortality data in this report are based on cancer registrations for 2014 and for 1982-2014 for trend analysis. Rates for common cancer and Indigenous status are aggregated over five years (2010-2014). Incidence and mortality counts for common cancers by Hospital and Health Service are averaged over three years (2012-2014). Unless otherwise stated, information presented in this report is sourced from the database of the Queensland Oncology Repository as of 31 December 2014. Except where noted, incidence and mortality rates are standardised to the Australian age-specific population in 2001.

Projections are calculated using the most recent age-specific incidence and mortality rates (2014) and applying these to the population projections produced by the Australian Bureau of Statistics (ABS).

Data sources

QUEENSLAND ONCOLOGY REPOSITORY

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 and deaths, surgery, chemotherapy, and radiotherapy. QOR also includes data collected by clinicians at multidisciplinary team (MDT) meetings across the state. For more information, visit https://qccat.health.qld.gov.au/QueenslandOncology Repository.

QUEENSLAND CANCER REGISTRY

The Queensland Cancer Registry (QCR) operates under the Public Health Act 2005 to receive information on cancer in Queensland. The QCR is a population-based registry and maintains a register of all cases of cancer diagnosed in Queensland since 1982 (excluding basal and squamous cell carcinomas). The QCR codes the site and the histology of the cancers to the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3).

Notification of cancer is a statutory requirement for all public and private hospitals, nursing homes and pathology services. Notifications are received for all persons with cancer separated from public and private hospitals and nursing homes. Cancer-related pathology reports are received from Queensland pathology laboratories. Mortality data with cancer identified as the underlying cause of death as well as cancer-related deaths are abstracted from the mortality files of the Registry of Births, Deaths and Marriages.

Oncology Analysis System (OASys)

Oncology Analysis System (OASys) is a web based state-wide cancer analysis system with diagnostic, treatment and outcome data on registry-notifiable invasive cancers diagnosed among Queensland residents of all ages (including children) from 1982 to 2014.

The Partnership was gazetted as a quality assurance committee under Part 6, Division 1 of the Hospital and Health Boards Act 2011 in 2004

More on the QCCAT website

For more details on our program of work, go to https://qccat.health.qld.gov.au

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Notes

FOR MORE INFORMATION

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