Thyroid Cancer in Queensland

An Overview – 2012

Published November 2015

the Partnership
queensland cancer control safety and quality partnership

qccat
queensland cancer control analysis team

Queensland Government

Acknowledgements

This report has been prepared under the auspices of The Queensland Cancer Control Safety and Quality Partnership, a gazetted quality assurance committee under Part 6, Division 1 of the Hospital and Health Boards Act 2011.

The authors acknowledge and appreciate the work of Queensland Health staff who contribute to and participate in the development and maintenance of Queensland Oncology Repository, Queensland Oncology Online and the Oncology Analysis System which supports the collection, analysis and interpretation of cancer information in Queensland.

This report was prepared by Michael Blake, Danica Cossio, Tania Eden, Tracey Guan and Shoni Philpot of the Queensland Cancer Control Analysis Team (QCCAT).

For more information:
Queensland Cancer Control Analysis Team
Queensland Health
GPO Box 48 Brisbane, Queensland, 4001 Australia
Ph: +61 (07) 3840 3200
Fax: +61 (07) 3176 4458
Email: qccat@health.qld.gov.au
https://qccat.health.qld.gov.au

Thyroid Cancer in Queensland: An Overview - 2012

Suggested citation:
Queensland Government. Thyroid Cancer in Queensland: An Overview - 2012. Queensland Health, Brisbane, 2015

ISBN: 978-1-925028-05-8
Published by Queensland Health
November 2015

Table of Contents

Foreword

Thyroid Cancer in Queensland: An Overview - 2012 provides clinicians, cancer patients and their families with up to date and relevant information on thyroid cancer in Queensland.

This report presents cancer data for 2012 and projections for 2021. It is one of a series of cancer specific reports and is part of the Oncology Analysis System (OASys) online library.

The report has three parts. Thyroid cancer projections for 2021 are presented in part one, part two presents Queensland thyroid cancer statistics and part three presents thyroid cancer statistics for Queensland Hospital and Health Services.

Data sources

Key to QCCAT's program of work is our ability to link population based cancer information on an individual patient basis, using a master linkage key specifically developed by our team. This matched and linked data is housed in the Queensland Oncology Repository (QOR), a resource managed by QCCAT. This centralised repository, QOR, compiles and collates data from a range of source systems including Queensland Cancer Registry, hospital admissions data, death data, treatment systems, public and private pathology, hospital clinical data systems and Queensland Oncology On-Line. QOR contains approximately 32 million records between 1982 – 2014. Our matching and linking processes provide the 411,809 matched and linked records of cancer patients between 2000 – 2012, which are the starting point for this analysis.

Highlights

In 2021:

An estimated 585 new cases of thyroid cancer will be diagnosed among Queensland residents, while it is expected that 40 Queenslanders may die of the disease.

The projected incidence for 2021 shows a 22% increase and the projected mortality shows a 43% increase. Female incidence continues to be double that of male incidence.

In 2012:

479 new cases of thyroid cancer were diagnosed in Queensland; of these 124 cases were reported in males and 355 in females. Thyroid cancer demonstrated a peak increase in incidence for the 45-54 age group – particularly for females. There were no deaths recorded for persons under the age of 55. Mortality rates increased overall with age from the 55-64 age group to 85+ age group.

Between 1982 and 2012 the number of new cases of thyroid cancer among Queensland residents has increased by more than ten times with 47 cases per 100,000 in 1982 to 479 cases per 100,000 in 2012. These large increases were mainly due to population growth and the fact thyroid cancer cases have been steadily increasing each year (with only a slight decrease in more recent years). Mortality age-standardised rates have remained fairly constant from 1982-2012.

There were an estimated 2,247 people living with a diagnosis of thyroid cancer in the previous five years.

The average five-year relative survival in 2008 to 2012 for thyroid cancer was 96.4%, an increase of 9% from the 1982 to 1992 5 year relative survival of 87.4%.

Queensland's world age-standardised incidence rate was among the highest in the world with approximately 8 incidences per 100,000. Queensland's world age-standardised mortality rate compares favourably with other regions.

From 2010 to 2012:

Incidence rates for thyroid cancer varied by remoteness for both males and females. The highest rate was seen in females who lived in inner regional Queensland (16.9 per 100,000), for males the rate was 8.1 per 100,000 in the remote & very remote areas of Queensland. Mortality rates were highest in remote & very remote areas than other areas for both males and females.

Age-standardised incidence and mortality rates varied by Hospital and Health Service. Darling Downs had the highest age-standardised incidence rates and the North West had the highest age-standardised mortality rates. The majority of thyroid cancer patients resided in the Metro South and Metro North Hospital and Health Services contributing to 47% of the total thyroid cancer incidence.

Part 1

Thyroid Cancer Projections

The International Classification of Diseases for Oncology (ICD-O) has defined thyroid cancer as those with a primary site of C73 – thyroid gland.[1] Patients with a diagnosis other than thyroid cancer and those patients who reside outside Queensland are not included in this report.

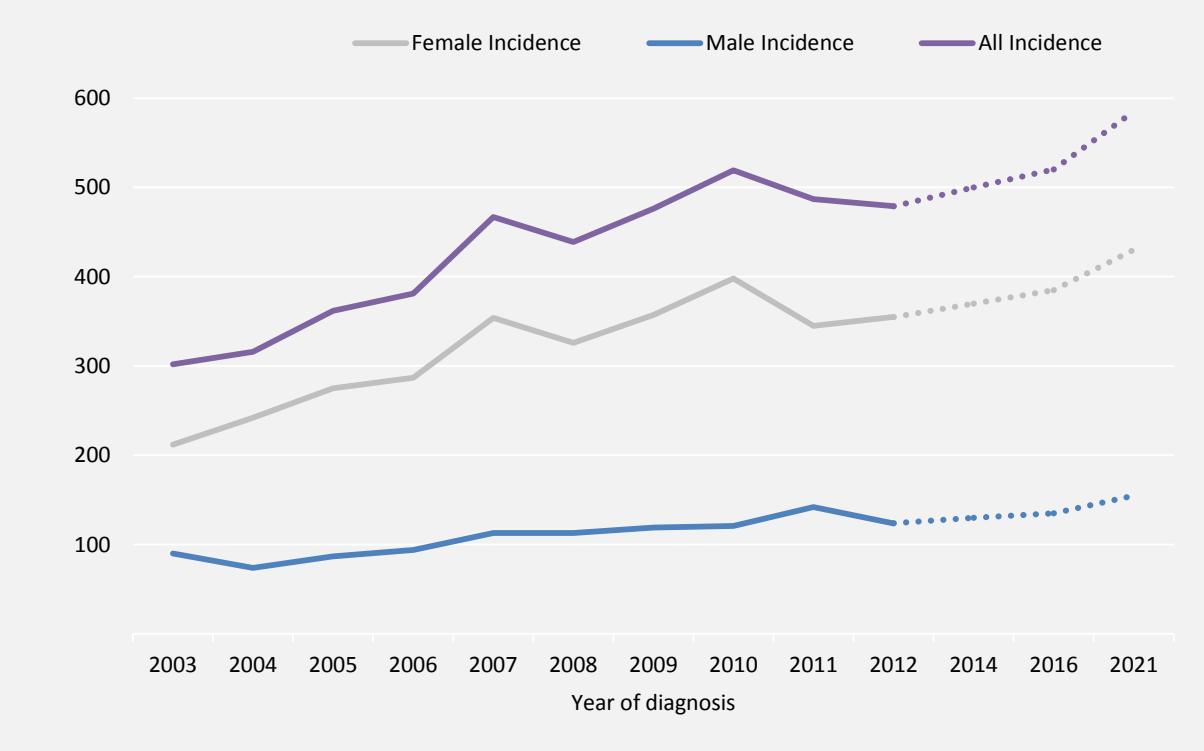
Projections Queensland 2021

It is estimated in 2021 that 585 new cases of thyroid cancer will be diagnosed among Queensland residents and that 40 Queenslanders will die of the disease.

Thyroid cancer incidence is expected to continue to be double in females (430 new cases) compared to males (155 cases). Projected incidence for 2021 shows a 22% increase from the 2012 incidence of 479 cases.

28 thyroid cancer deaths were recorded in 2012 with an expected increase of 43% for thyroid cancer by 2021.

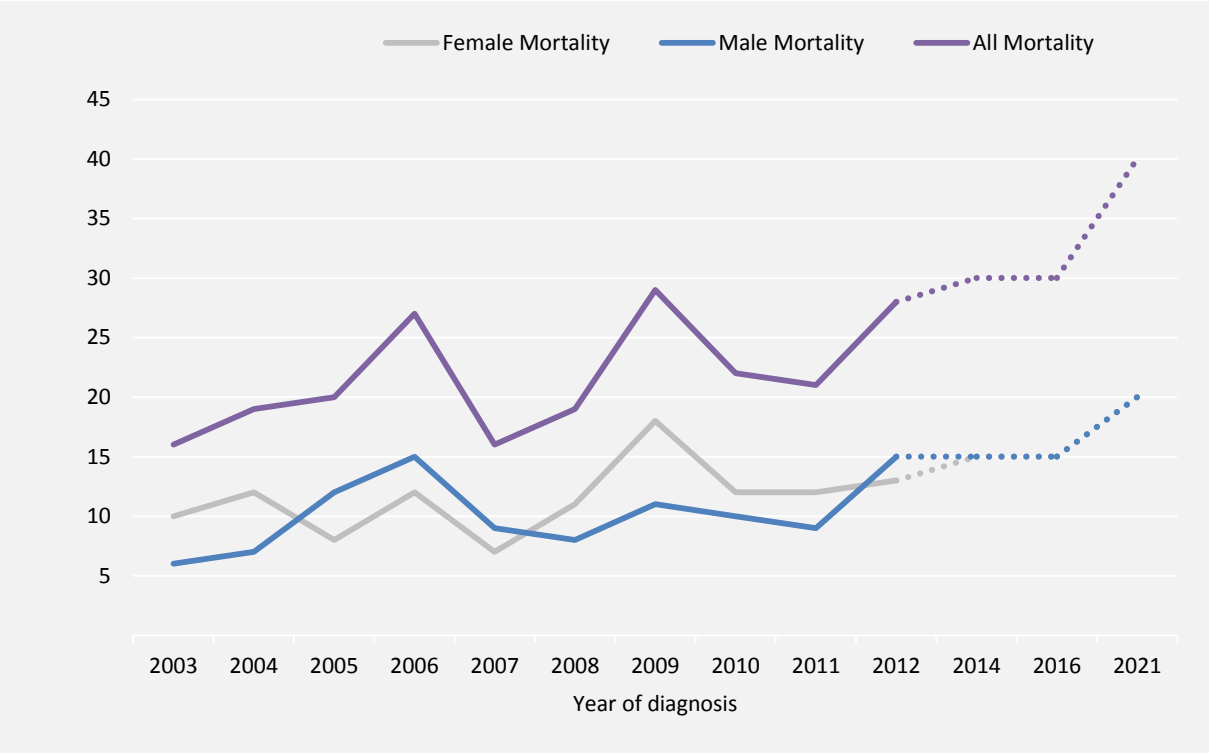
Thyroid actual and projected cancer incidence
Year of diagnosis 2003-2012, Projected years 2014, 2016, 2021



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

[1] *Fritz A, Percy C, Jack A, Shanmugaratham K, Sobin L, Parkin D, Whelan S (ed.). 2000, International Classification of Diseases for Oncology, 3rd edition, World Health Organisation*

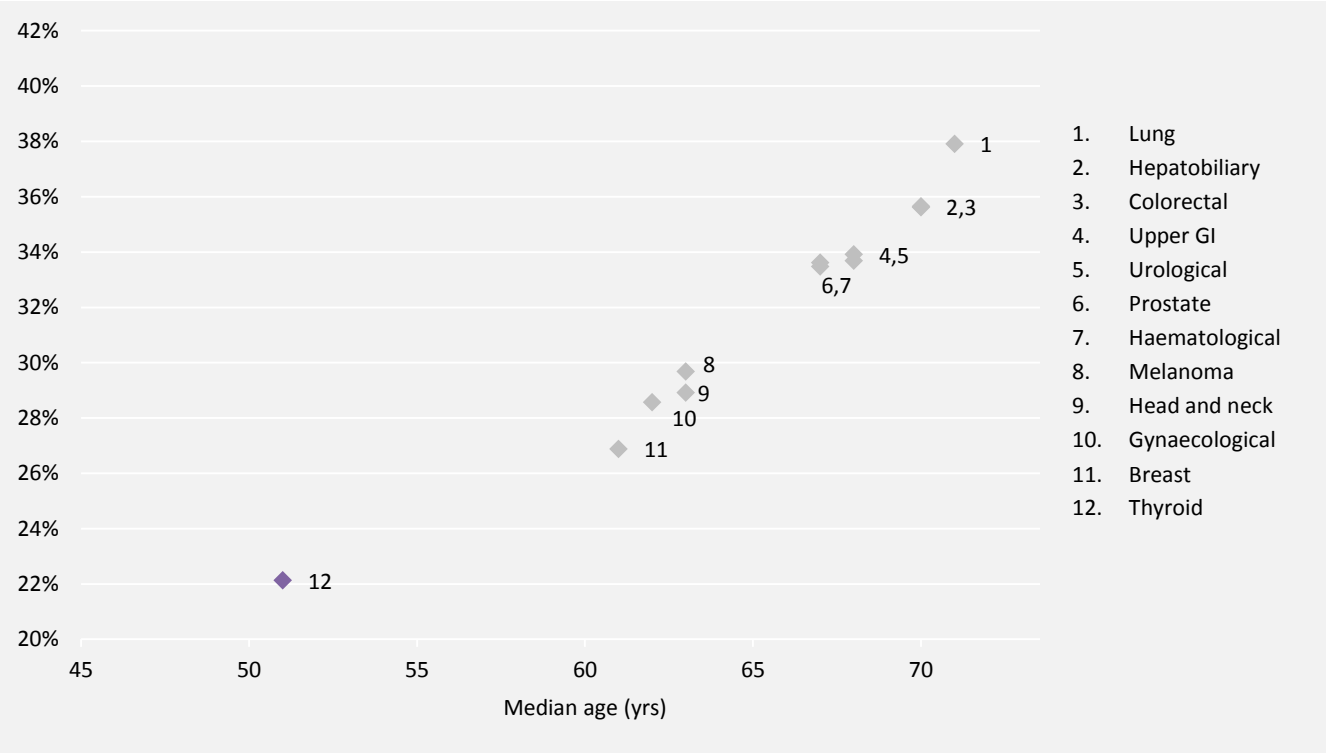
Thyroid actual and projected cancer mortality
Year of diagnosis 2003-2012, Projected years 2014, 2016, 2021



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

The percentage change in cancer incidence between 2012 and 2021 is shown below. Assuming no change in incidence rates during this period thyroid cancer, more common in younger people with a median age of 51 years, is projected to show a relatively smaller increase of 22% in the number of new cases compared to other cancers common in older people such as Upper Gastrointestinal, hepatobiliary, colorectal and lung cancers.

Projected percentage change in cancer incidence from 2012 to 2021 for common cancers by median age at diagnosis



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

Part 2

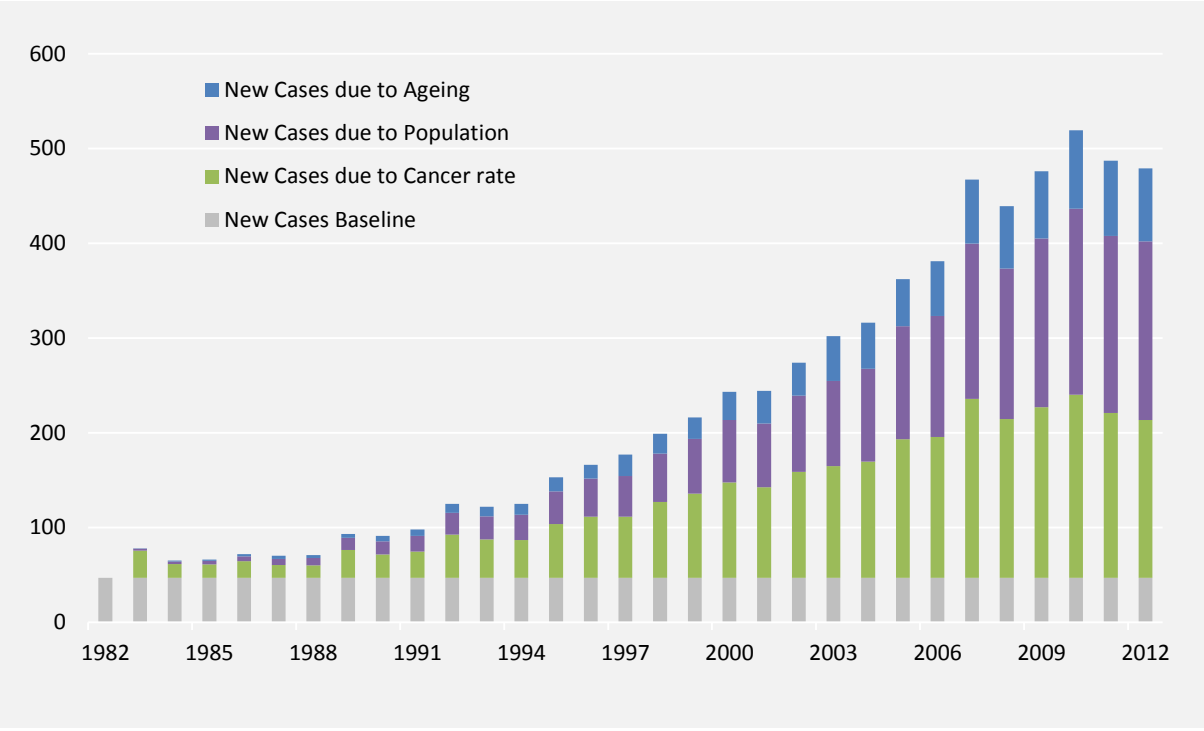
Thyroid Cancer in Queensland

Incidence and mortality

The number of new cases of thyroid cancer among Queensland residents has increased more than ten times between 1982 to 2012 with 47 cases in 1982 to 479 in 2012. For males, the number of new cases has increased nearly 7 times from 18 in 1982 to 124 in 2012; for females, the number of new cases increased more than 12 times from 29 to 355.

These large increases were mainly due to population growth and the fact thyroid cancer since 1982 have become more frequent each year. Queensland's population increased from 2.4 million in 1982 to 4.6 million in 2012, an increase of 88%, making Queensland the fastest growing state in Australia and one of the fastest among developed countries. The number of new thyroid cancer cases has steadily increased from 1982 to 2007 with only a slight decrease in recent years. Changes in ageing accounted for only a small proportion of the total increase in the number of cancers, with thyroid cancer being relatively more common in younger age groups.

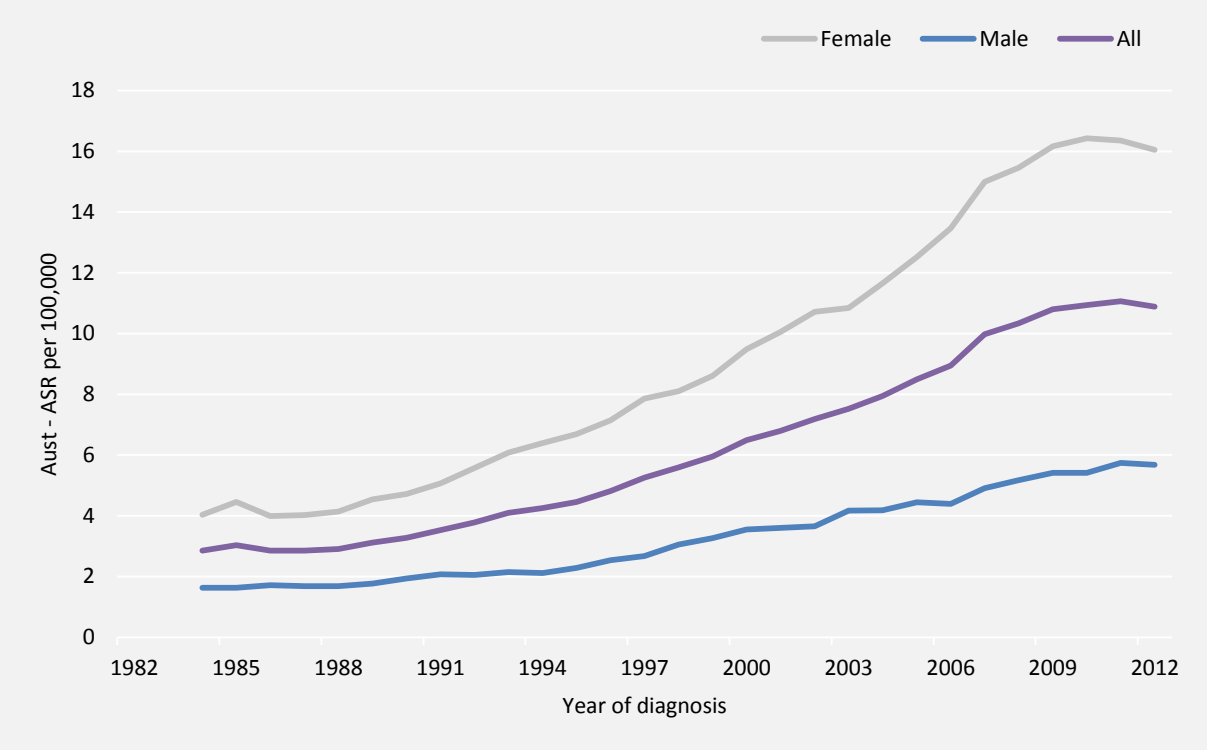
Growth in thyroid cancer
Year of diagnosis 1982-2012



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

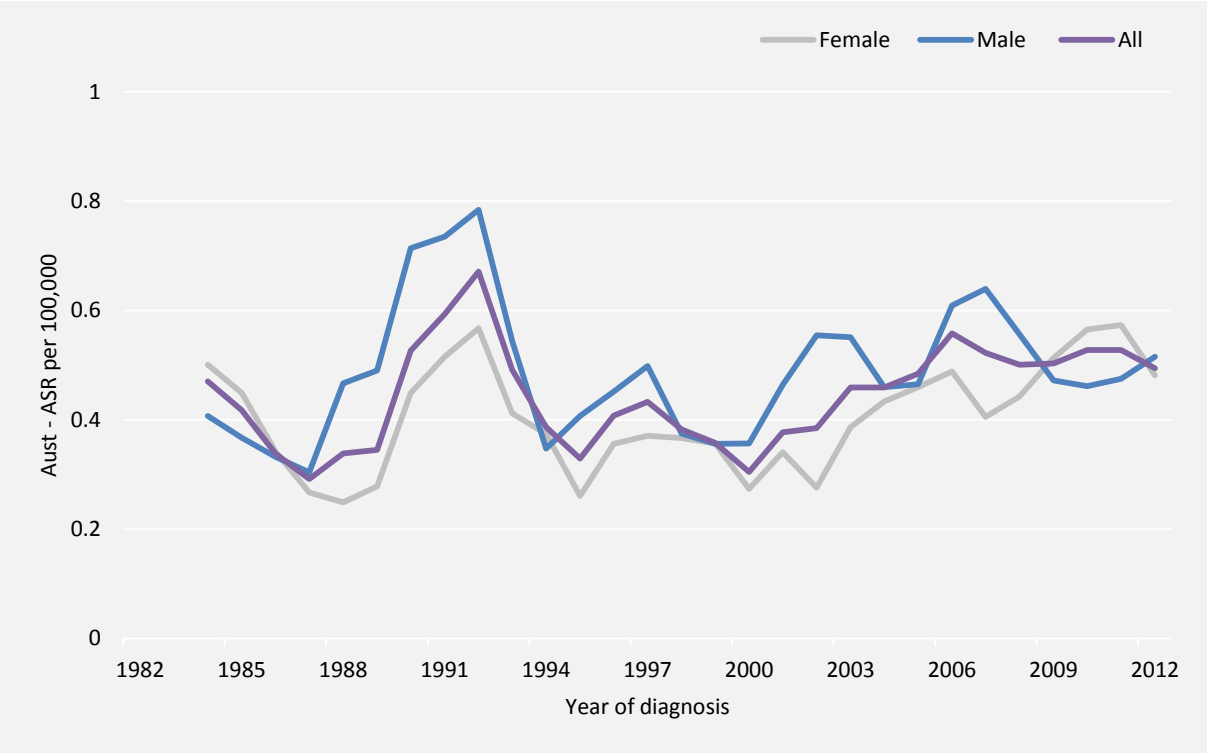
The age-standardised incidence rate of thyroid cancer increased more than 3 times from 2.9 per 100,000 in 1984 to 10.9 per 100,000 in 2012. Mortality rates have remained fairly stable over time with all rates less than 1 per 100,000 from 1982 to 2012.

Thyroid cancer age-standardised incidence rates per 100,000
Year of diagnosis 2003-2012



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

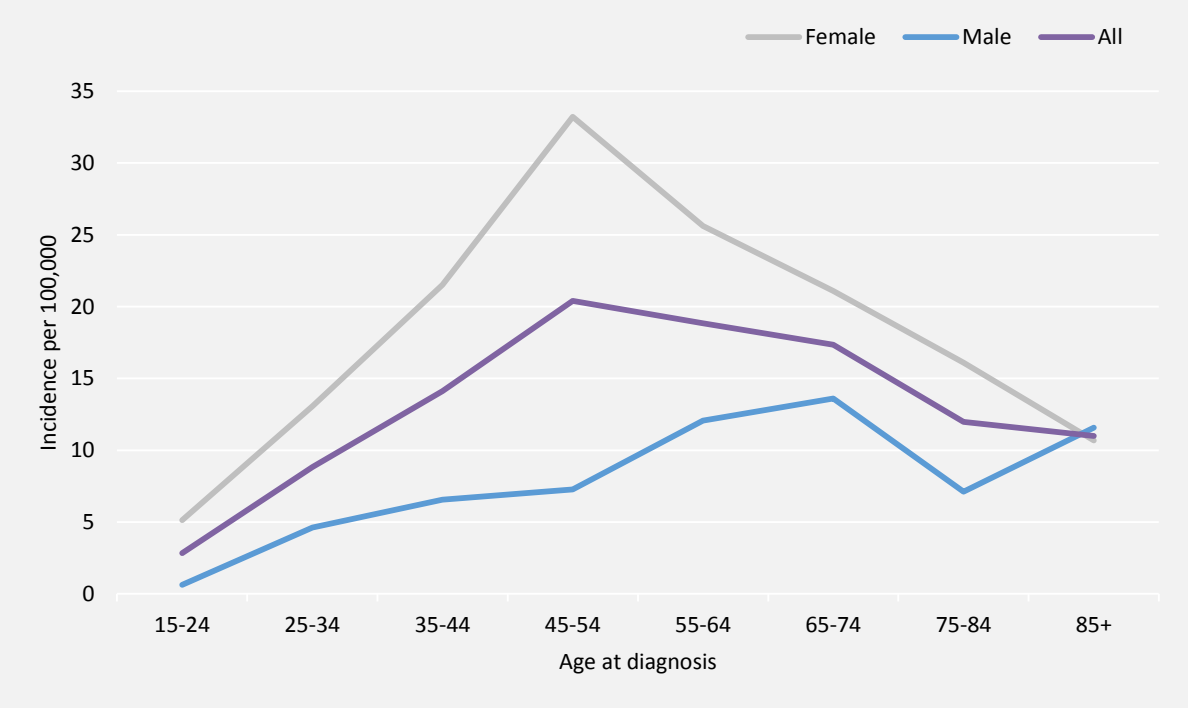
Thyroid cancer age-standardised mortality rates per 100,000
Year of diagnosis 2003-2012



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

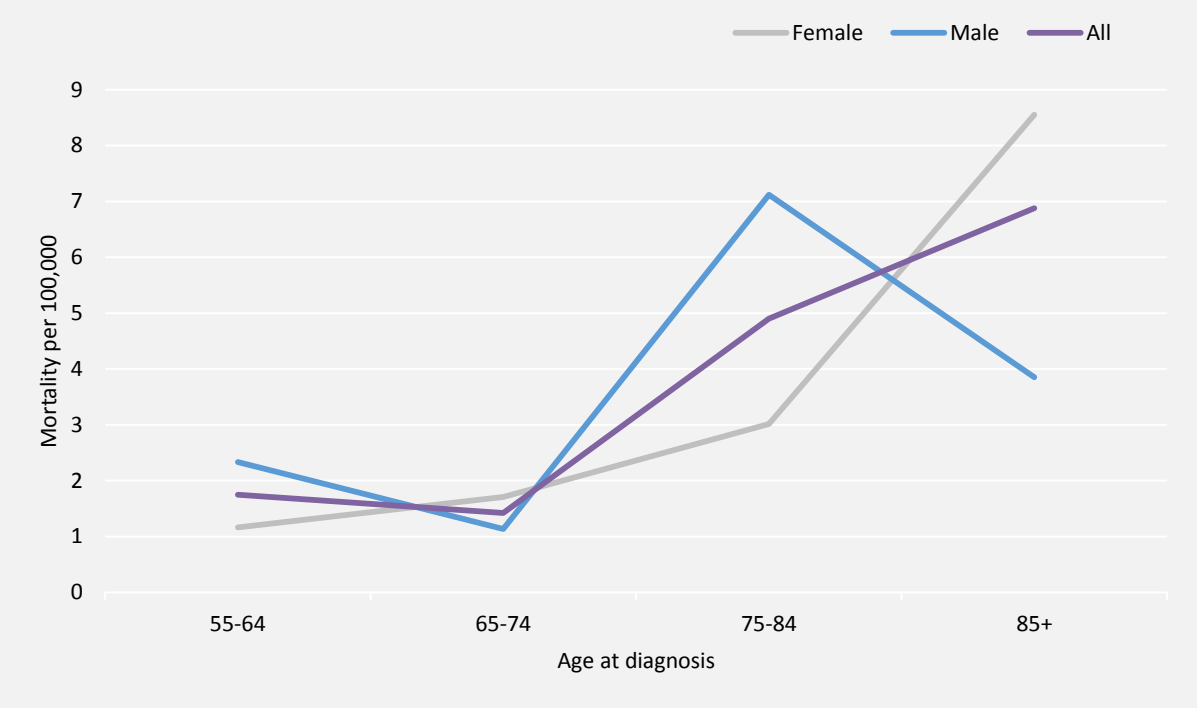
Thyroid cancer demonstrated a peak increase in incidence for the 45-54 age group – particularly for females. Thyroid cancer incidence decreased after the peak 45-54 age group. People aged 45-54 accounted for 19% and people aged 55-64 were 18% of the total incidence rate per 100,000. There were no deaths recorded for persons under the age of 55. Mortality rates increased overall from the 55-64 age group to 85+ age group with the sharpest increase occurring in males aged 75-84.

Thyroid cancer incidence per 100,000, by age at diagnosis
Year of diagnosis 2012



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

Thyroid cancer mortality per 100,000, by age at diagnosis
Year of diagnosis 2012



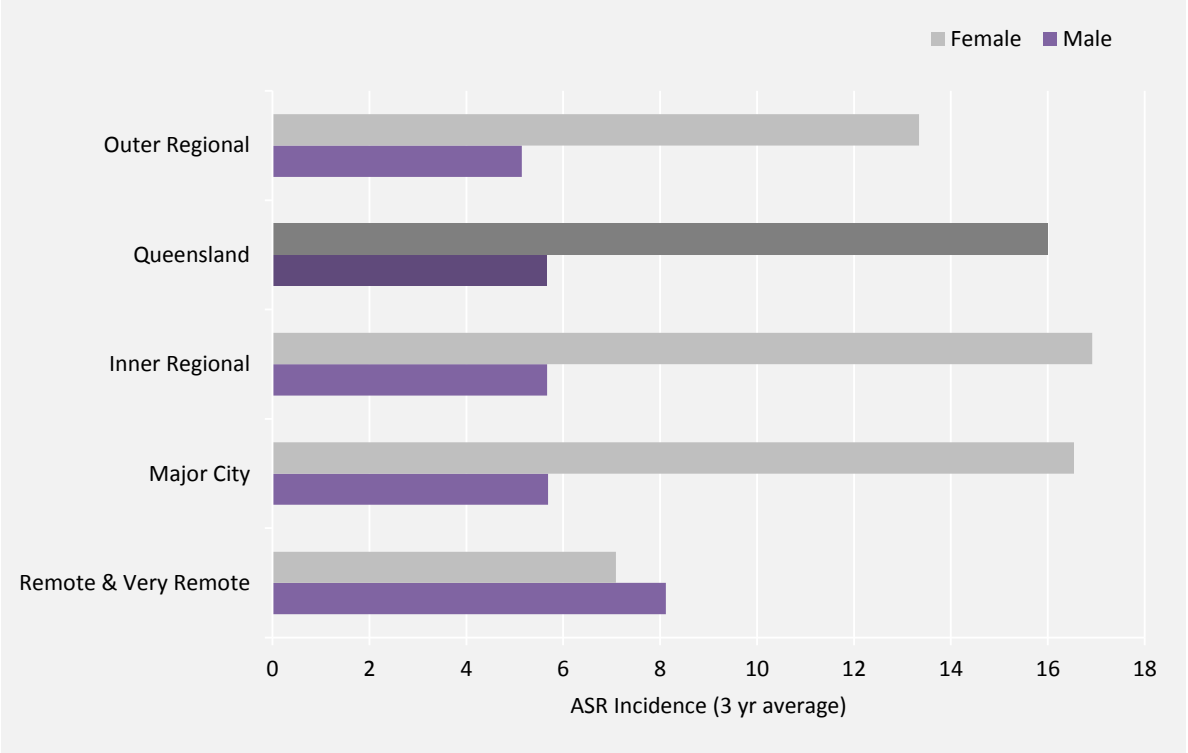
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team.

Regional, national and international variation in incidence and mortality

On average, incidence for thyroid cancer varied by remoteness of residence for both males and females from 2010-2012. The highest average rate was seen in females who lived in the inner regional areas of Queensland (16.9 per 100,000), for males the rate was 8.1 per 100,000 in the remote & very remote areas of Queensland.

Age-standardised mortality rates for thyroid cancers were highest in remote and very remote areas than other areas for both males and females.

Thyroid cancer age-standardised incidence rates by remoteness of residence
Year of diagnosis 2010-2012



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

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/suppression.htm

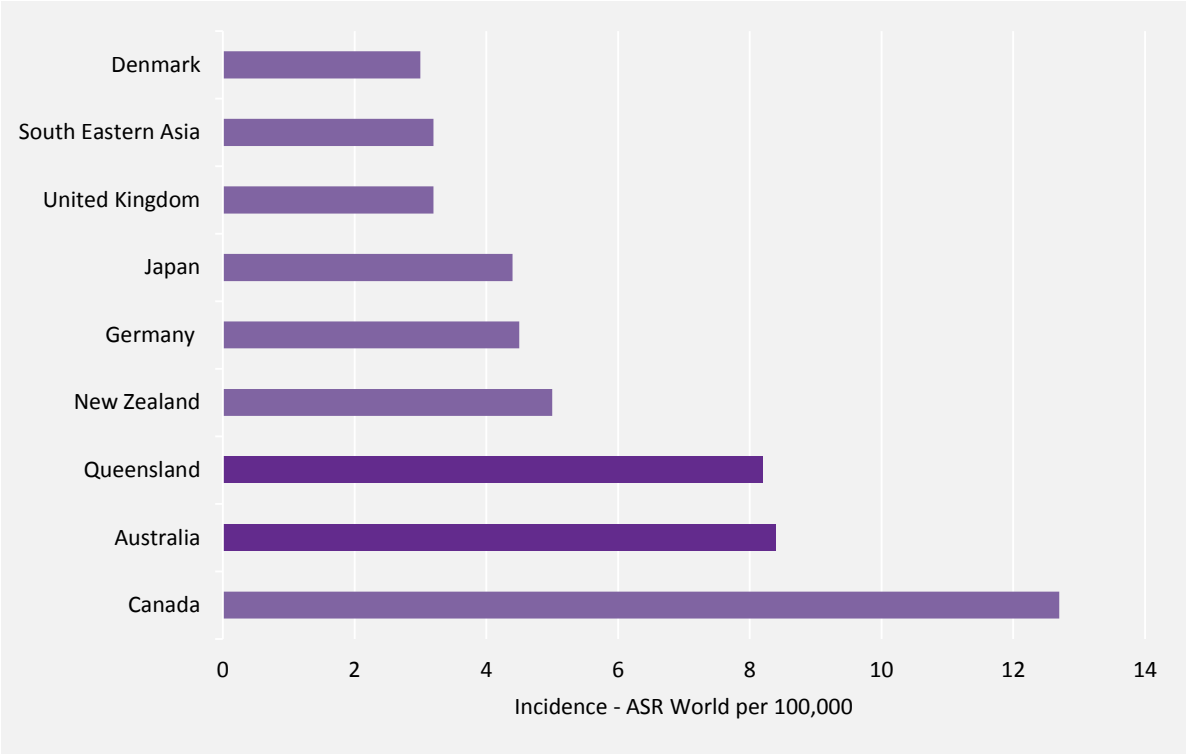
Thyroid cancer age-standardised mortality rates by remoteness of residence
Year of diagnosis 2010-2012

Source: Oncology Analysis System, Queensland Cancer Control Analysis Team
Note: Mortality rates with fewer than 16 cases should be treated with caution

Large differences in thyroid incidence existed internationally based on the most recent data available at the International Agency for Research on Cancer (IARC).[2] Canada recorded the highest incidence (12.7 cases per 100,000) and Australia and Queensland following with approximately 8 cases per 100,000. The lowest incidence regions included Denmark, South Eastern Asia and the United Kingdom with approximately 3 cases per 100,000.

Mortality rates were similar internationally with slightly higher rates in South Eastern Asia (1.2 cases per 100,000). Australian age standardised mortality rates for thyroid cancer were low (0.3 cases per 100,000) and were in line with rates in Canada, New Zealand, Germany and Denmark.

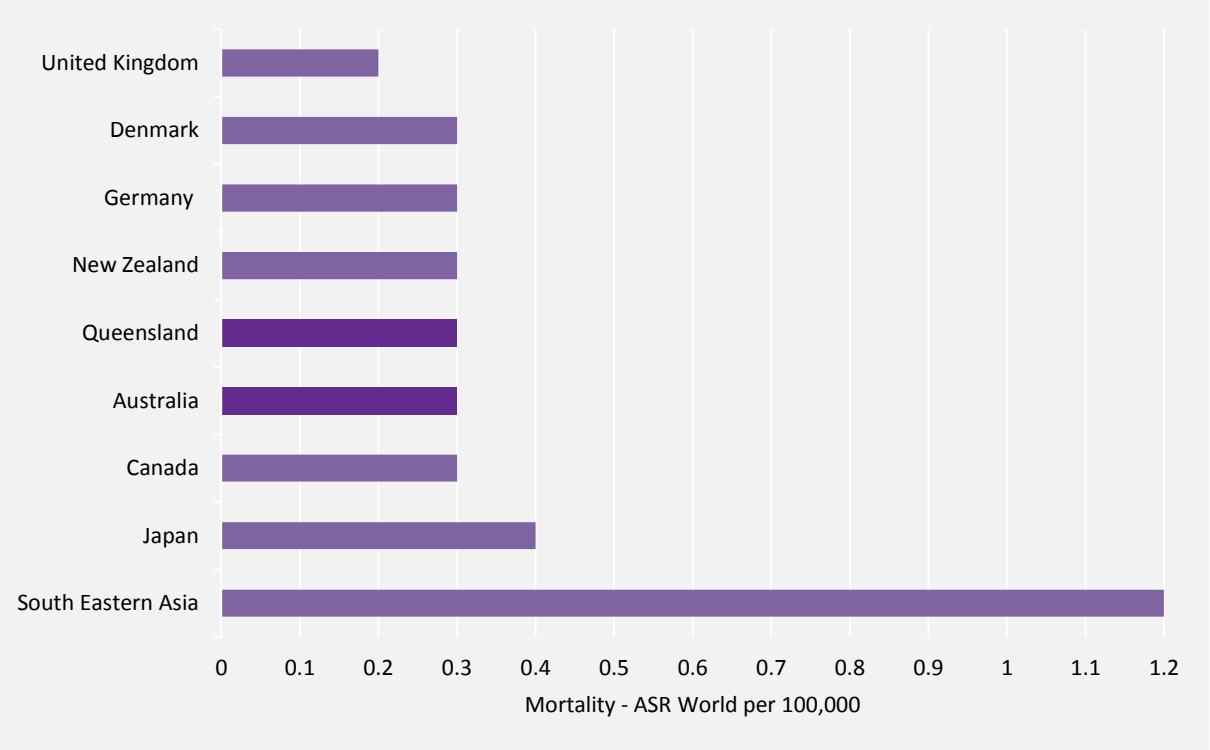
Thyroid incidence age-standardised rates for selected international regions and Queensland
Year of diagnosis 2012



Note: Cancer incidence estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012) except for Queensland which is sourced from Oncology Analysis System, Queensland Cancer Control Analysis Team.

[2] *Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D and Bray F, GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr, accessed 29 June 2015*

Thyroid mortality age-standardised rates for selected international regions and Queensland
Year of diagnosis 2012



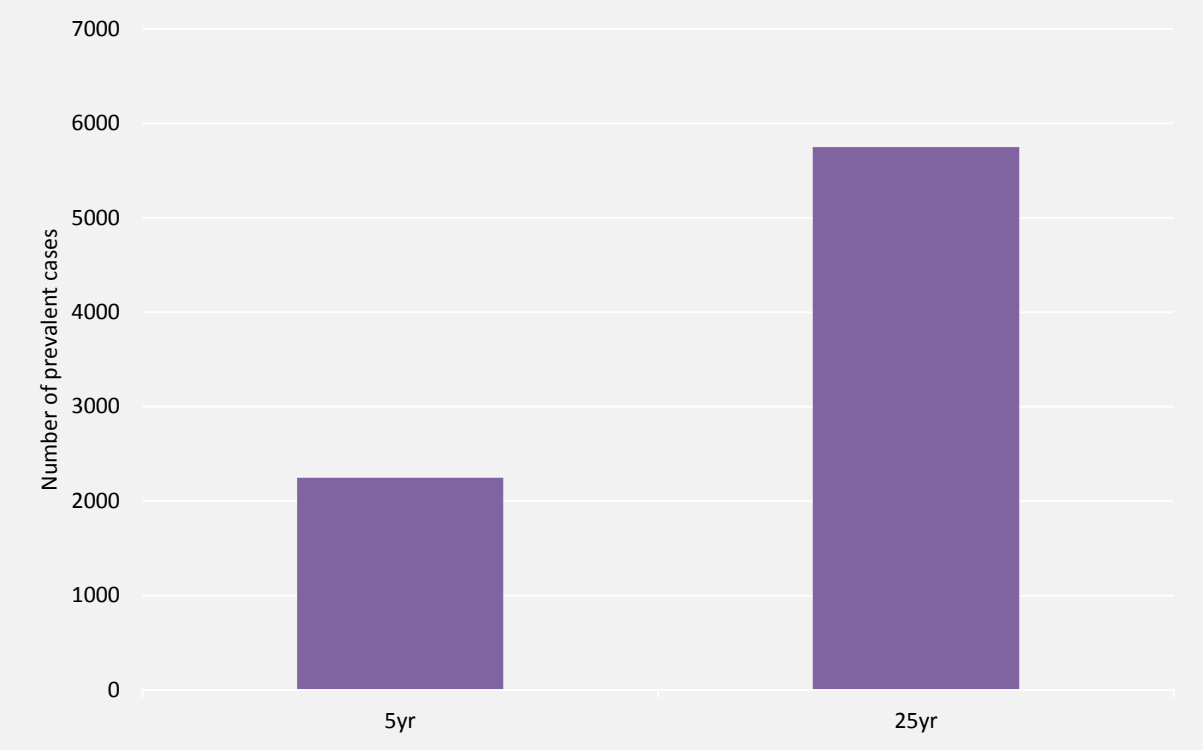
Note: Cancer mortality estimated by the International Agency for Research on Cancer (IARC) for 2012 (GLOBOCAN 2012) except for Queensland which is sourced from Oncology Analysis System, Queensland Cancer Control Analysis Team.

Prevalence

Prevalence represents the number of people living with a cancer and is a measure of the burden of the disease for the individual, families and society. Thyroid cancer prevalence is increasing as more people are diagnosed and survival improves.

At the end of 2012, 2,247 people were living with a diagnosis of thyroid cancer in the previous five years and 5,746 people were living with a diagnosis of thyroid cancer in the last 25 years.

Prevalence of thyroid cancer, by time since diagnosis, as at 31st December, 2012



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Prevalence of thyroid cancer, by time since diagnosis, as at 31st December, 2012		
	Male	**Female**
5 year	568	1,679
25 year	1,299	4,447

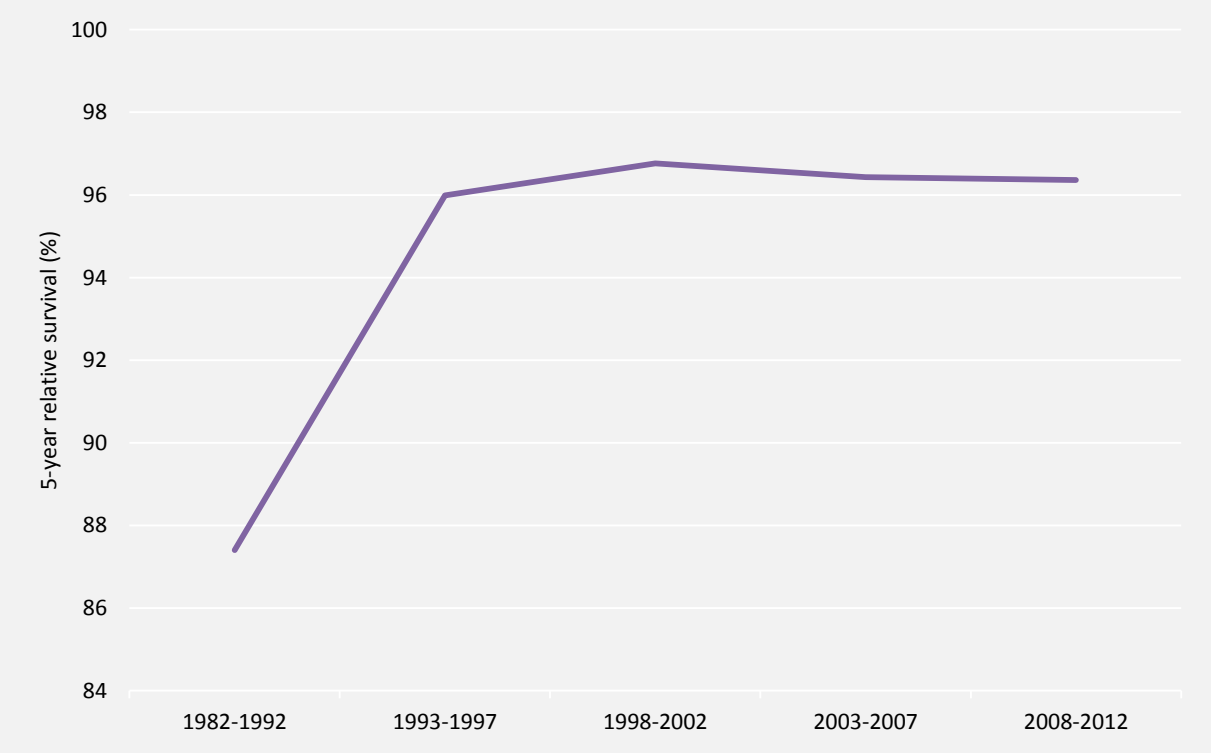
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

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.

The average 5-year survival in 2008 to 2012 for thyroid cancer was 96.4%, an increase of 9% from the 1982 to 1992 5 year relative survival of 87.4%.

5 year relative survival trend of thyroid cancer
Year of diagnosis 1982-2012



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Part 3

Thyroid Cancer by Hospital and Health Service

Patient Characteristics

In this section an overview of incidence and mortality is presented for the fifteen Hospital and Health Services (HHS) in Queensland for the time period 2010-2012.

The median age for thyroid cancer patients in Queensland was 51 with a range of 33-63 years across HHS. Thyroid cancer was generally more common in females representing between 63-78% of incidence across the state except in the Central West and Torres & Cape HHS (where males represented 75% and 100% respectively). The majority of thyroid cancer patients resided in Metro South and Metro North. These two HHS contributed 47% of the total incidence.

Socioeconomic status varied across Queensland with 64% of cases falling within the middle status group. Approximately 2% of all people diagnosed with thyroid cancer are indigenous.

Thyroid cancer patient characteristics, by Hospital and Health Service
Year of diagnosis annual average 2010-2012

					Socioeconomic Status		
	Incidence annual average 2010-2012	**Median age**	**% Male**	**% Indigenous**	**% Affluent**	**% Middle**	**% Disadvantaged**
Metro South	118	50 yrs	26%	1%	30%	60%	10%
Metro North	109	50 yrs	26%	1%	51%	41%	8%
Gold Coast	45	54 yrs	22%		4%	95%	1%
Darling Downs	42	52 yrs	24%		4%	63%	33%
Sunshine Coast	41	50 yrs	25%	2%		91%	9%
Wide Bay	27	54 yrs	33%			19%	81%
West Moreton	23	51 yrs	25%	1%	10%	81%	9%
Cairns and Hinterland	21	50 yrs	32%	5%		71%	29%
Townsville	20	53 yrs	23%	7%	3%	87%	10%
Mackay	16	51 yrs	30%	6%		87%	13%
Central Queensland	15	47 yrs	27%	2%	2%	95%	2%
South West	3	58 yrs	38%	13%		100%	
North West	2	33 yrs	33%			100%	
Central West	1	54 yrs	75%			50%	50%
Torres & Cape	1	63 yrs	100%			100%	
Queensland	**481**	**51 yrs**	**26%**	**2%**	**20%**	**64%**	**15%**

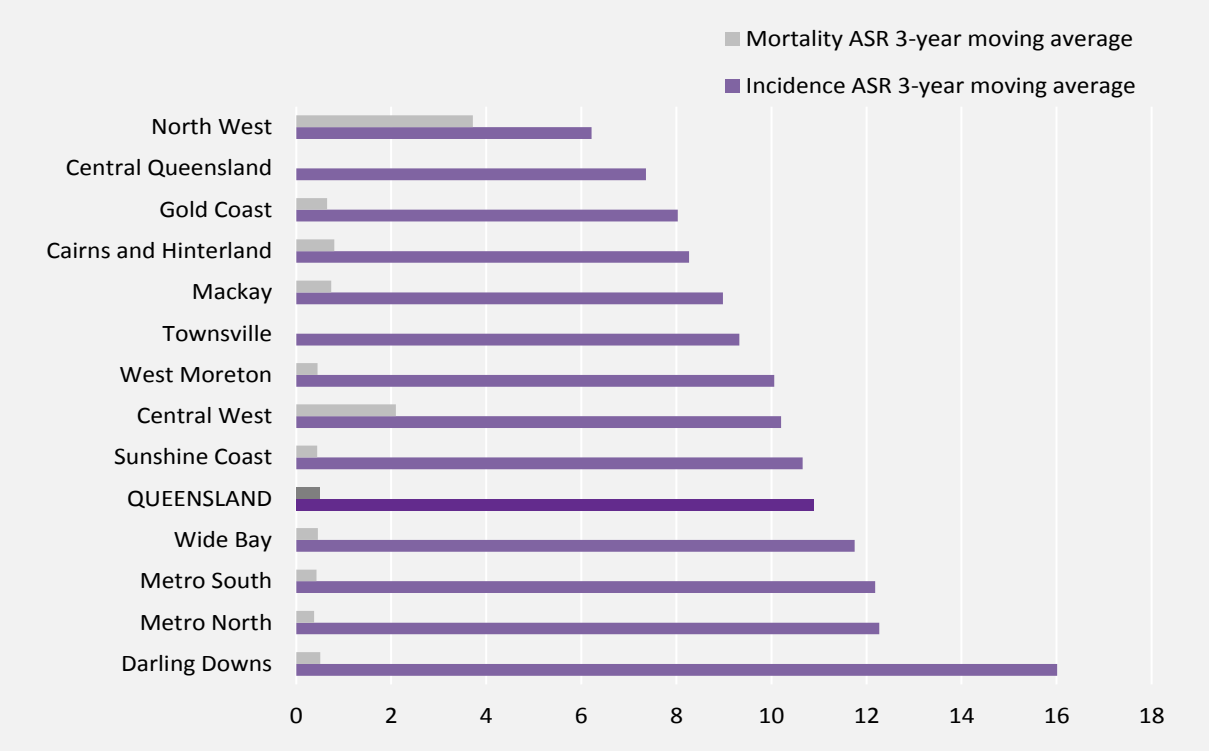
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Incidence and Mortality

At the Hospital and Health Service level age-standardised incidence and mortality rates vary across the state. 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 Hospital and Health Services have small populations and estimates of mortality rates based on such small numbers may not be as accurate as those for areas with larger populations.

Thyroid cancer age-standardised incidence rates are highest in the Darling Downs Hospital and Health Services with 16 per 100,000 diagnosed, while mortality rates are highest in North West with approximately 4 per 100,000 deaths. The North West Hospital and Health Services experienced the lowest age-standardised incidence rates in the state while Metro South, Metro North and the Sunshine Coast experienced the lowest mortality rates (Townsville and Central Queensland have no mortality).

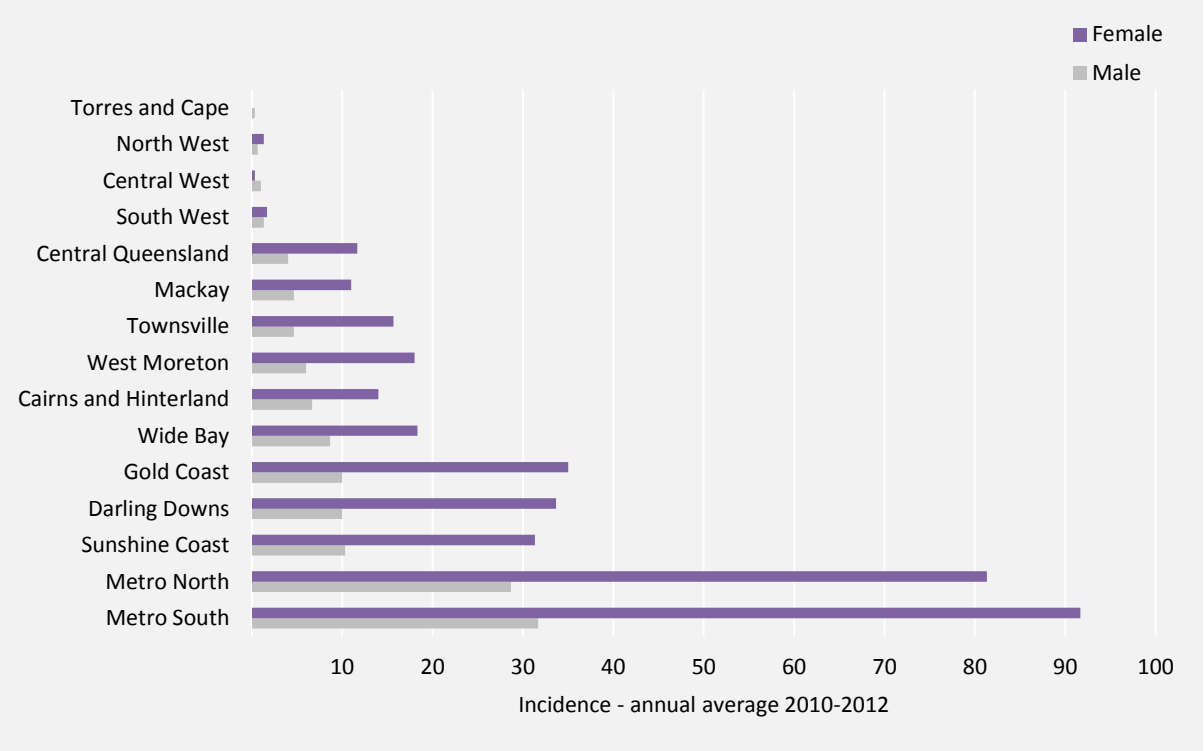
Thyroid cancer age standardised rate 3-year moving average by HHS
Year of diagnosis 2010-2012



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Thyroid cancer annual incidence (2010-2012) is highest in Metro South and Metro North Hospital and Health Services accounting for 25% and 22% for the state's incidence respectively.

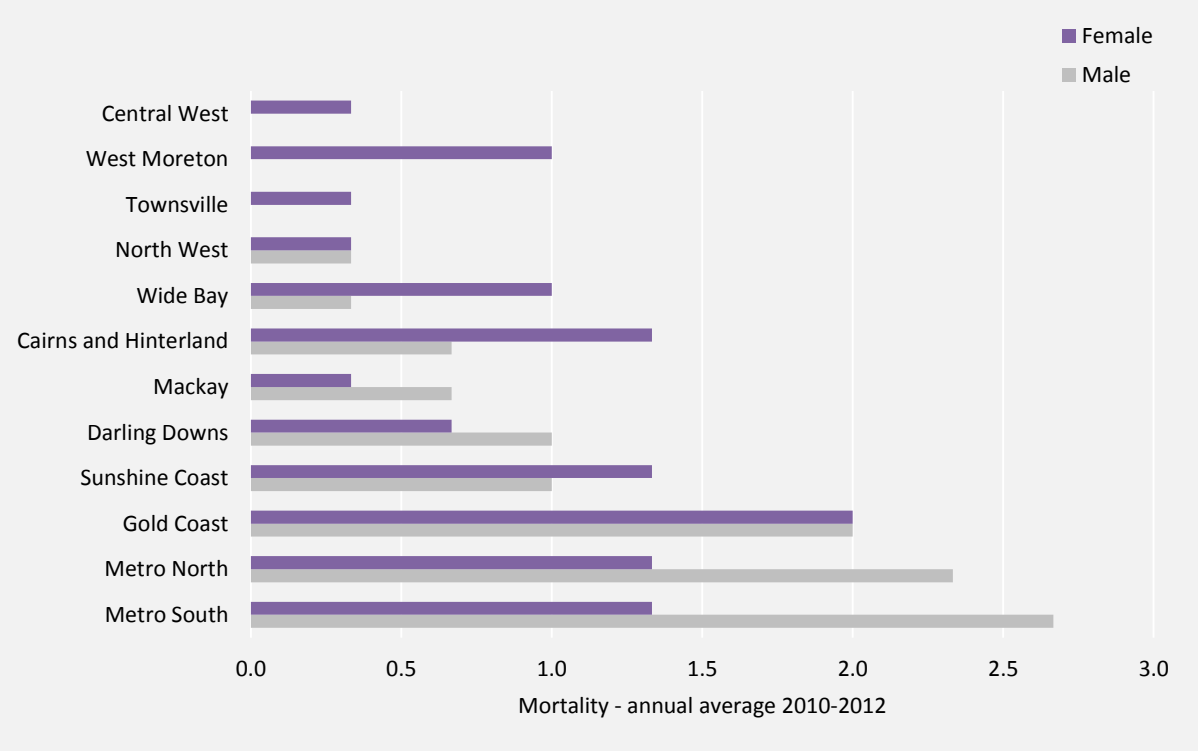
Thyroid cancer annual average incidence by HHS
Year of diagnosis 2010-2012



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

The average annual mortality (2010-2012) is highest in Metro South and Gold Coast Hospital and Health Services both accounting for 18% of the state's mortality.

Thyroid cancer annual average mortality by HHS
Year of diagnosis 2010-2012

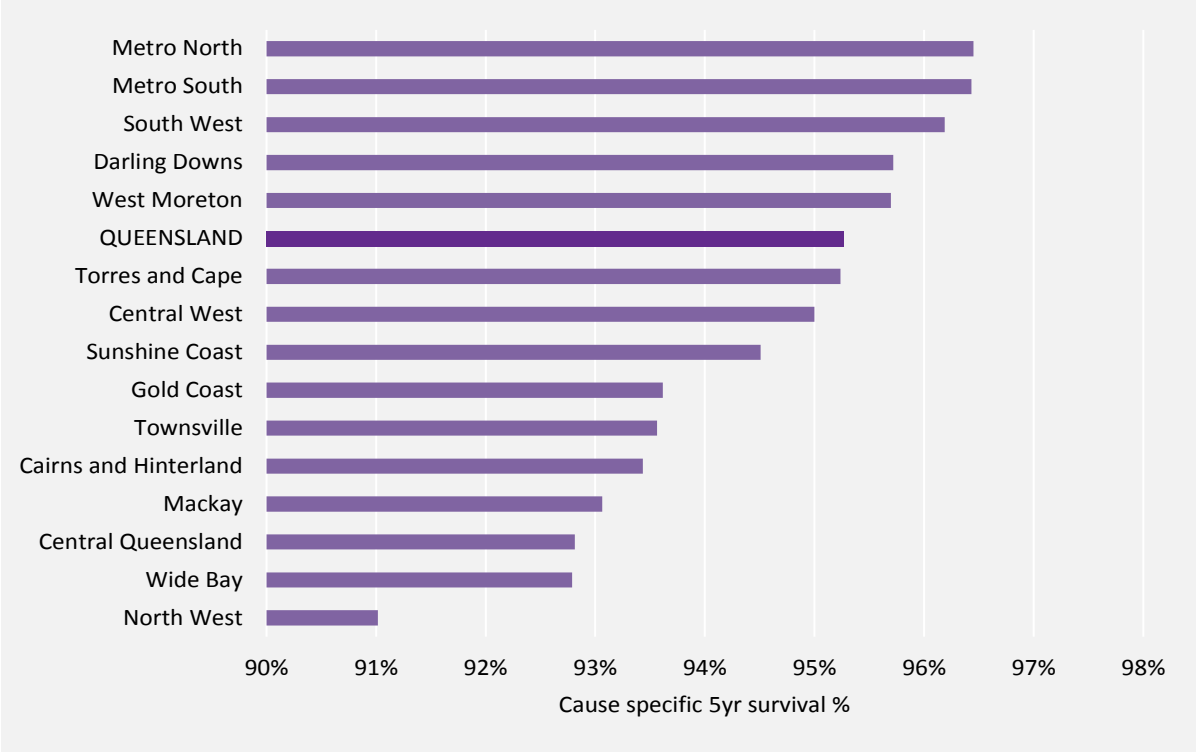


Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Survival

There is little regional variation in cause specific 5-yr survival of Queensland thyroid cancer across the state. The North West Hospital and Health Service represented the lowest 5 year survival percentage of 91% and the Metro North had the highest at just over 96%.

Thyroid cancer cause specific survival by HHS
Year of diagnosis 1982-2012



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Appendix

Data Sources

Oncology Analysis System

Oncology Analysis System (OASys) is a state-wide clinical cancer database with diagnostic, treatment, and outcome data on registry-notifiable invasive cancers diagnosed among Queensland residents of all ages (including children) from 1982 to 2012. The database includes inpatient data for public and private admissions and information systems for radiation oncology, pharmacy and pathology. Benign (non-invasive) cancers are excluded. New cancer cases are counted following the rules for counting multiple primary cancers as defined by the International Association for Research on Cancer (IARC).

The data collection, linking and reporting of OASys data is performed under the auspices of Queensland Cancer Control Safety and Quality Partnership, a Quality Assurance Committee gazetted under Section 31, The Health Services Act 1991.

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/QOR

Appendix 2 - Glossary and Common Abbreviations

Age-standardised incidence/mortality rate (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.

Except where noted, incidence and mortality rates are standardised to the Australian age-specific population in 2001.

Annual average

Annual average refers to the sum of numbers divided by the number of years being reported. In this report annual average numbers have been rounded up to the nearest whole number for those with less than 1.

Cause specific survival

Cause specific survival: the percentage of cancer cases attributed to a specific cancer still alive after a specified period of time from diagnosis.

Hospital and Health Services (HHS)

For residence considerations, a 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.

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.

Indigenous Status

A measure of whether a person identifies as being of Aboriginal or Torres Strait Islander origin.

Median age

The age that divides a population into halves: one older than the median, the other younger than the median.

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.

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

Sex

Refers to the biological and physiological characteristics that define males and females.

Socioeconomic status

Socioeconomic classification 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 Local Areas (SLA).

The ABS uses SEIFA scores to rank regions into ten groups or deciles numbered 1 to 10, with 1 being the most disadvantaged group and 10 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.

For more information:

Queensland Cancer Control Analysis Team
Queensland Health
GPO Box 48 Brisbane, Queensland, 4001 Australia
Ph: +61 (07) 3840 3200
Fax: +61 (07) 3176 4458
Email: qccat@health.qld.gov.au
https://qccat.health.qld.gov.au