Colorectal Cancer in Queensland

An Overview 2012

Queensland Government

Acknowledgements

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Foreword

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

Colorectal cancer is one of the most common cancers in Queensland. This report examines the impact of colorectal cancer in Queensland. The report presents cancer data for 2009 and projections for 2013. It is part of a series of cancer specific reports and is part of the Oncology Analysis System (OASys) online library.

The report has four parts. Colorectal cancer projections for 2013 are presented in part one, part two presents Queensland colorectal cancer statistics, part three presents colorectal cancer statistics for Queensland Hospital and Health Services and part four presents a state-wide view of Colorectal multi-disciplinary team data for Queensland public hospitals participating in multi-disciplinary meetings.

We hope that the inclusion of multi-disciplinary data and Hospital and Health Services information provides a new perspective to assist in the planning, management and treatment of colorectal cancer in Queensland.

Highlights

In 2013:

- An estimated 3,325 new cases of invasive colorectal cancer will be diagnosed among Queensland residents, while it is expected that 1,170 Queenslanders may die of the disease.
- Colon cancers are expected to make up 70% of new colorectal cancer cases and 68% of colorectal deaths.

In 2009:

- Between 1982 and 2009 the number of new cases of colorectal cancer among Queensland residents increased 144%. This increase was largely due to population growth and ageing.
- 77% of people were diagnosed with colorectal cancer between the ages of 55 and 84 from 2007 to 2009. The median age at diagnosis was 70 years.
- People who lived in remote and very remote areas had the lowest age-standardised incidence rates (58 new cases per 100,000) and the highest mortality rates (28 deaths per 100,000) from 2007 to 2009.
- Central West Hospital and Health Service had the highest 3 year average age-standardised incidence rate for colorectal cancer in the state with 80 new cases per 100,000 people.
- The latest figures (2005 to 2009) show 5 year relative survival was 66.6%, an increase of 15.2% from the 1982 to 1989 5 year relative survival of 51.4%

In 2008:

- Queensland's world age-standardised incidence rate was estimated to be the second highest in the world (41 new cases per 100,000).
- Queensland's world age-standardised mortality rate of 12 deaths per 100,000 was lower than the estimated Australian world mortality ASR of 13 deaths per 100,000.

Part 1

Colorectal Cancer Projections

The International Classification of Diseases for Oncology (ICD-10-AM) has defined colorectal cancer as those with a primary site of C18 (Colon), C19 (Rectosigmoid Junction), C20 (Rectal) and C218 (Overlapping Lesion of Rectum, Anus and Anal Canal).[1] Where the term colorectal cancer is used it is the combination of all 4 primary sites. Colon cancer is those with a primary site of C18 and Rectal cancer are those with the sites C19, C20 and C218.

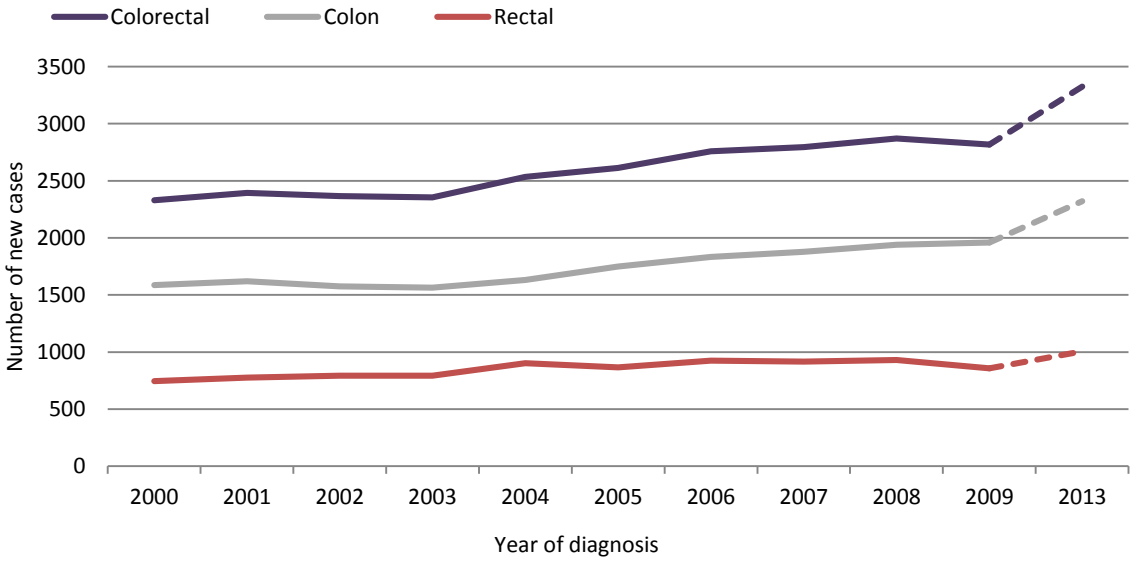
Expected Incidence and Mortality 2013

In 2013, it is estimated that 3,325 new cases of invasive colorectal cancer will be diagnosed among Queensland residents (Figure 1), while it is expected that 1,170 Queenslanders may die of the disease (Figure 2)

Colorectal cancer is expected to continue to be more common in males (1,840 new cases), than in females (1,485 new cases). Projected incidence for 2013 shows an 18% increase from the 2009 incidence of 2,818 new cases (Figure 1).

2,320 new cases of colon cancer and 1,005 new cases of rectal cancer are expected to be diagnosed in 2013.

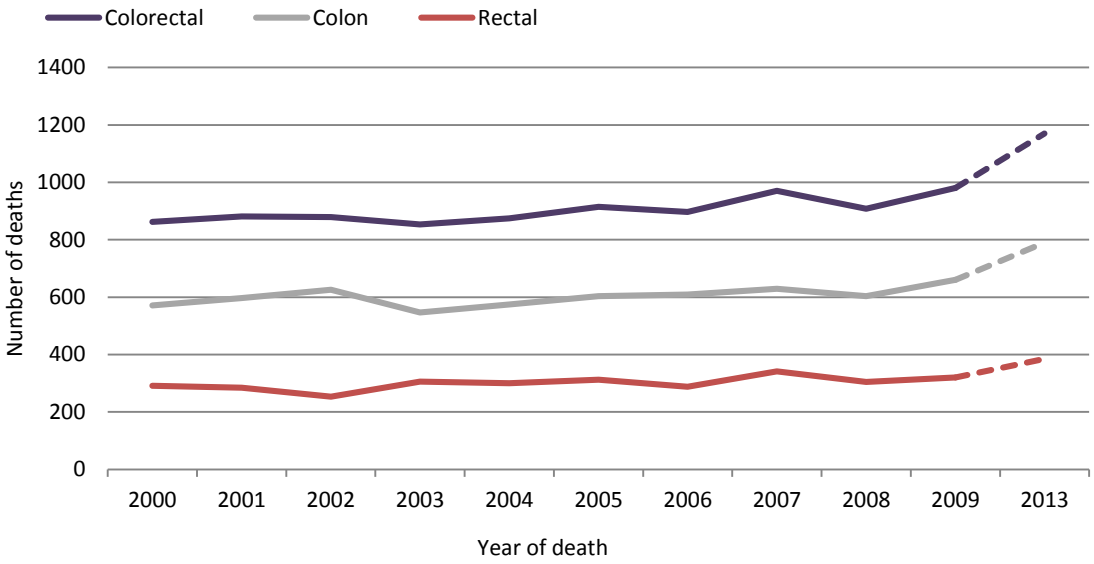
Figure 1: Colorectal actual and expected cancer incidence, Queensland, 2000 to 2013



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

660 colon and 320 rectal cancer deaths were recorded in 2009, with an expected increase of 20% for both cancers by 2013 (Figure 2).

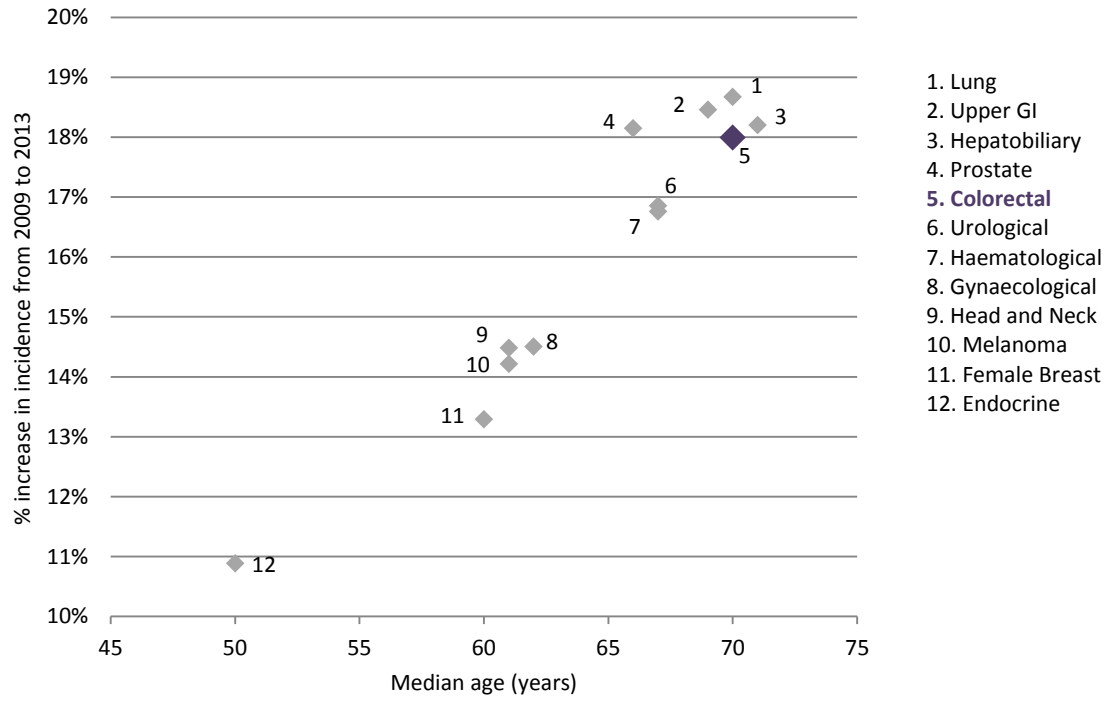
Figure 2: Colorectal actual and expected cancer mortality, Queensland, 2000 to 2013



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Figure 3 shows the expected relative increase in the incidence of common cancers from 2009 to 2013. Assuming no change in incidence rates during this period, colorectal cancer is projected to show an 18% increase in the number of new cases. These projections provide an indication of the likely burden of colorectal cancer and the demand for specialist services in 2013.

Figure 3: Projected percentage change in cancer incidence for common cancers by median age of diagnosis, Queensland, 2009 to 2013



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Part 2

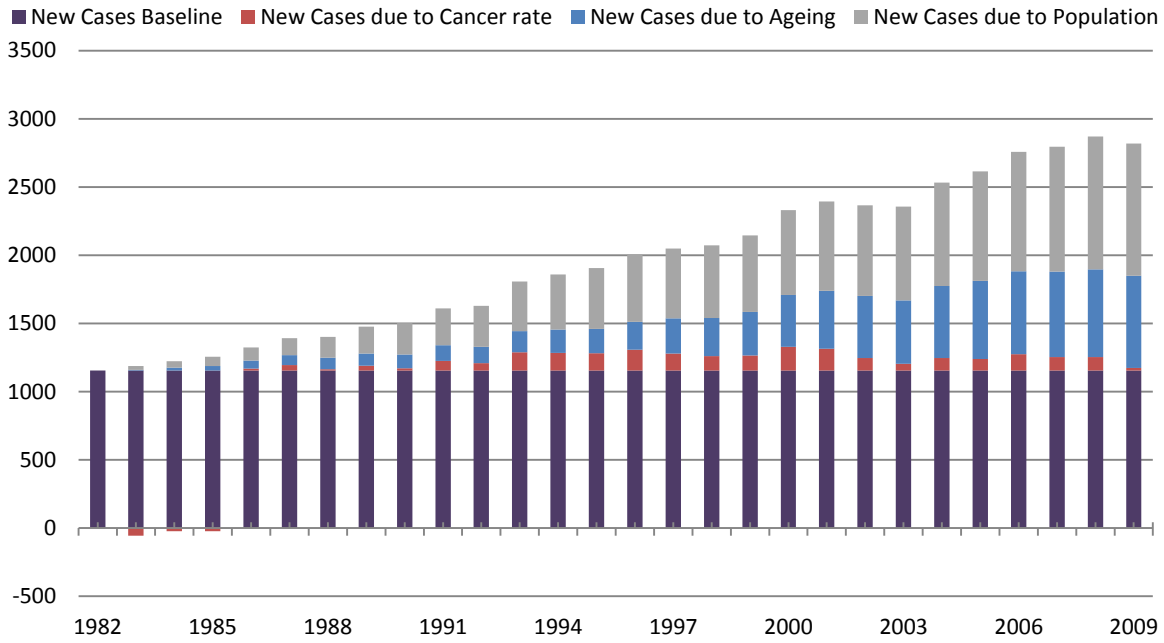
Colorectal Cancer in Queensland

Incidence and Mortality

The total number of new cases of colorectal cancer in Queensland generally increases each year. However when expressed as a proportion of the population and weighted to a fixed age distribution, the incidence, expressed as an *age-standardised rate*, remains relatively stable. This means that despite the annual increase in the number of new cancer cases, colorectal cancer is not necessarily becoming more common or more frequent in the population.

Between 1982 and 2009 the number of new cases of colorectal cancer among Queensland residents increased 144%. In 1982, 1,154 new cases of colorectal cancer were identified, increasing to 2,818 in 2009. This increase was largely due to population growth and ageing (Figure 4).

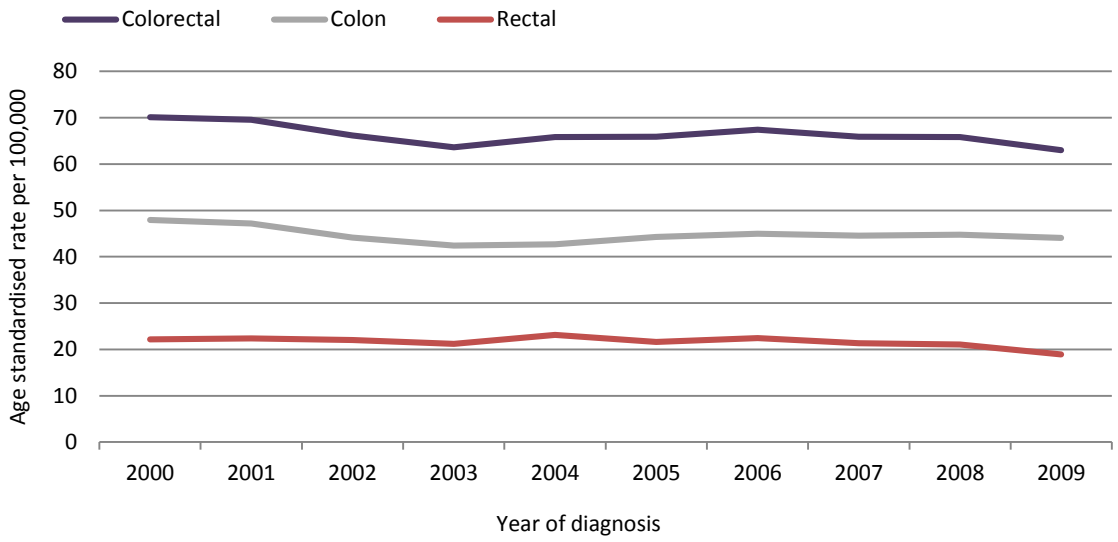
Figure 4: Growth in Colorectal new cases, Queensland, 1982 to 2009



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

The age-standardised rate (ASR) for colorectal cancer incidence between 2000 and 2009 has decreased by 11%. The rectal cancer incidence rate from 2000 to 2009 showed the largest decrease of 17%. Colon cancer incidence rates decreased 9% from 2000 to 2009 (Figure 5).

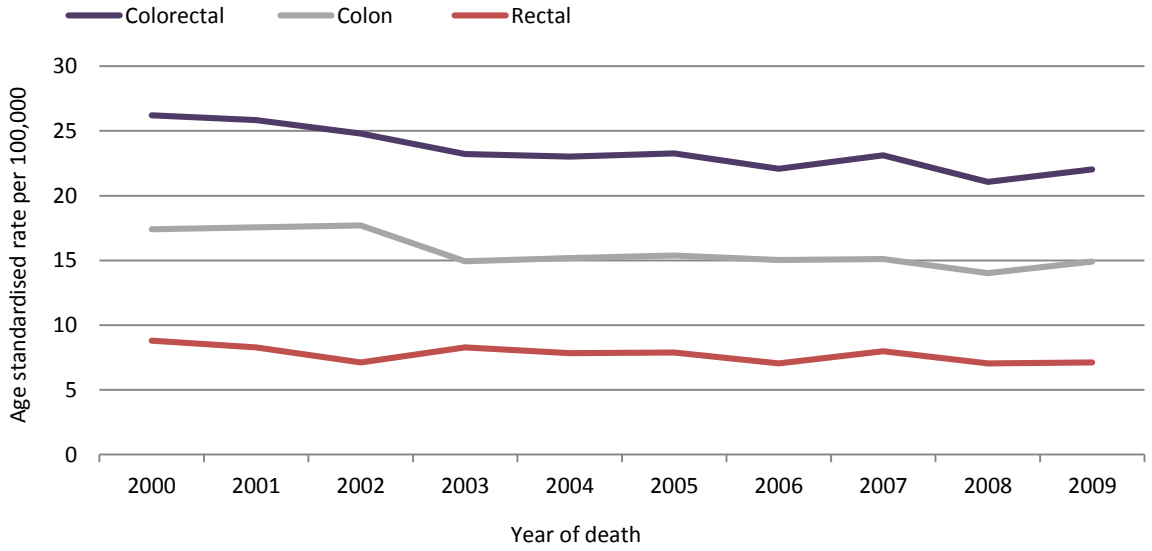
Figure 5: Colorectal cancer age-standardised incidence rates per 100,000, Queensland, 2000 to 2009



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

The age-standardised mortality rate for colorectal cancer has decreased from 26 to 22 deaths per 100,000 from 2000 to 2009 (Figure 6).

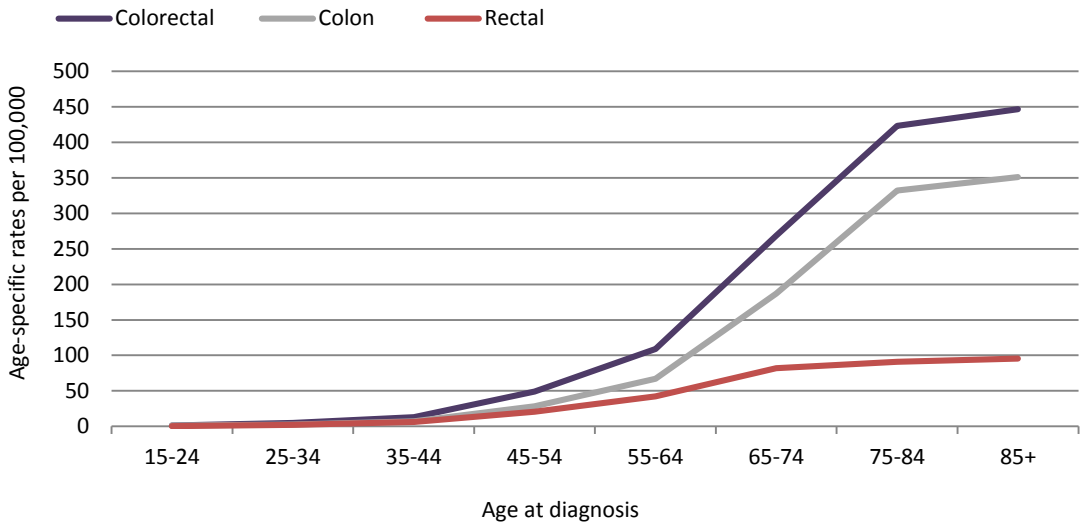
Figure 6: Colorectal cancer age-standardised mortality rates per 100,000, Queensland, 2000 to 2009



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Colorectal cancer age-specific incidence rates increased with age. For every 100,000 people aged 75 and older 870 were diagnosed with colorectal cancer. Very few cases are recorded for persons under the age of 54 (Figure 7). The median age at diagnosis was 70 years.

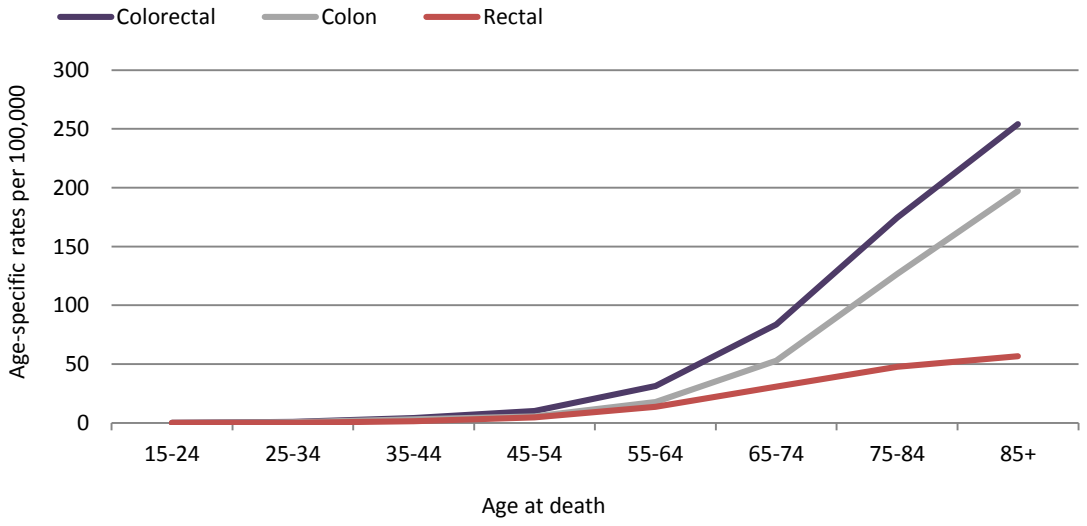
Figure 7: Colorectal cancer age specific incidence rate per 100,000, by age at diagnosis, Queensland, 2009



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Colorectal cancer age-specific mortality rates increased with age. Very few deaths were recorded for persons under the age of 64 (Figure 8).

Figure 8: Colorectal cancer age specific mortality rate per 100,000, by age at diagnosis, Queensland, 2009



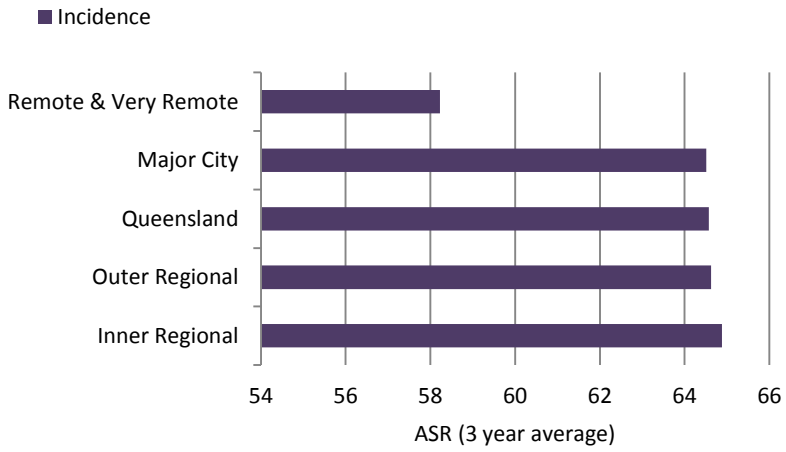
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Regional, national and international variation in incidence and mortality

Age-standardised incidence rates for colorectal cancer varied by remoteness of residence from 2007 to 2009 (Figure 9). Major city, outer regional and inner regional areas all had a similar rate to the Queensland average of 65 new cases per 100,000. Remote and very remote areas had the lowest incidence rate of 58 new cases per 100,000.

On average, 2,814 people were diagnosed with colorectal cancer each year between 2007 and 2009. The median age at diagnosis was 69 and 55% of new cases were male.

Figure 9: Colorectal cancer incidence by remoteness of residence, Queensland, 2007 to 2009

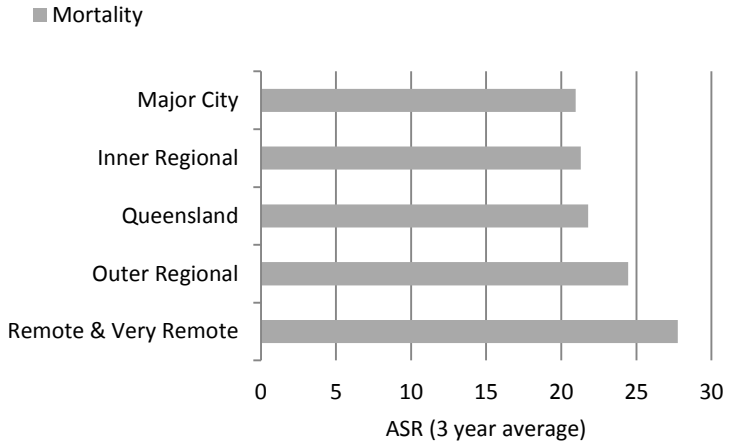


	Incidence ASR (3 year average)	Incidence Annual Average (2007-2009)	Median Age	% Male
Remote & Very Remote	58	50	66	58
Major City	65	1,410	70	53
Queensland	65	2,814	69	55
Outer Regional	65	464	68	57
Inner Regional	65	890	70	57

Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Age-standardised mortality rates for colorectal cancer varied by remoteness of residence between 2007 and 2009. Remote and very remote areas had higher mortality rates than other areas. The Queensland average mortality rate was 22 deaths per 100,000 from 2007 and 2009 (Figure 10).

Figure 10: Colorectal cancer mortality by remoteness of residence, Queensland, 2007 to 2009



	Mortality ASR (3 year average)	Mortality Annual Average (2007-2009)
Major City	21	460
Inner Regional	21	289
Queensland	22	941
Outer Regional	24	169
Remote & Very Remote	27	23

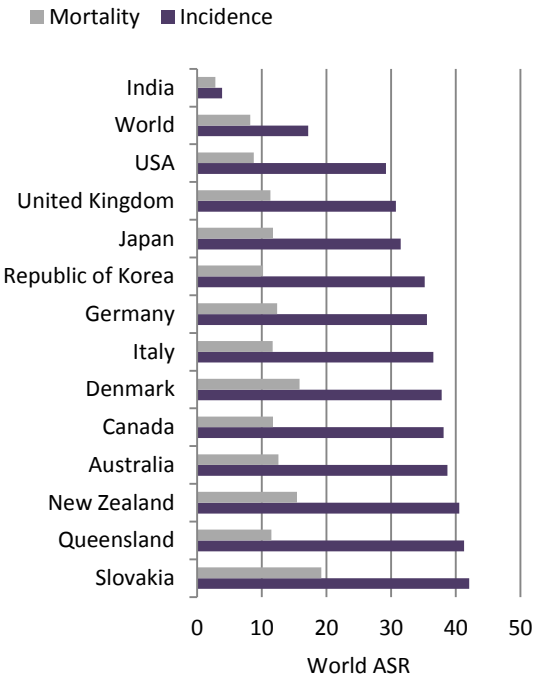
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

In 2008, it was estimated that 1,235,108 people were diagnosed with colorectal cancer.[2] These estimations are based on the most recent data available at the International Agency for Research on Cancer (IARC). Large differences in world age-standardised incidence rates exist internationally. Queensland's world age-standardised incidence rate was estimated to be the second highest in the world (41 new cases per 100,000) in 2008.

Queensland's mortality rate for colorectal cancer was 12 and was lower than the estimated Australian mortality ASR of 13 deaths per 100,000.

An international and national comparison by world age-standardised rates is displayed in figure 11.

Figure 11: Estimated international colorectal incidence & mortality by world ASR, selected countries, 2008



	ASR (W) Incidence	ASR (W) Mortality
Slovakia	42	19
Queensland	41	12
New Zealand	41	15
Australia	39	13
Canada	38	12
Denmark	38	16
Italy	37	12
Germany	36	12
Rep. of Korea	35	10
Japan	31	12
USA	29	9
World	17	8
India	4	3

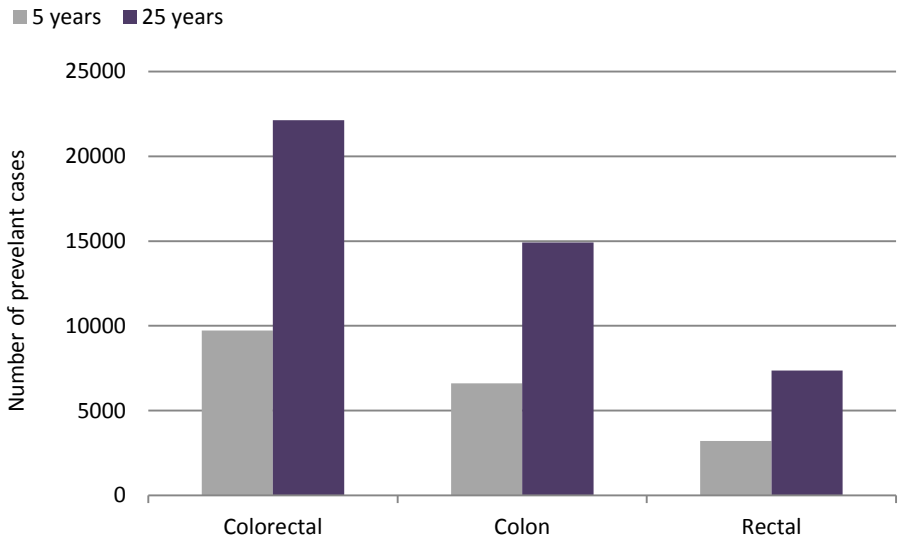
Source: Ferlay J, Shin HR, Bray F, Forman D, Mathers C and Parkin DM, GLOBOCAN 2008 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10[Internet]. Lyon, France: International Agency for Research on Cancer; 2010. Available from http://globocan.iarc.fr, accessed on 3/10/2012
Queensland ASR (W) 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.

It was estimated by the end of 2009, 9,721 people were living with a diagnosis of colorectal cancer in the last five years and 22,118 people were living with a diagnosis of colorectal cancer in the last 25 years (Figure 12).[3]

Figure 12: Prevalence of colorectal cancer, by time since diagnosis, by age group, Queensland 2009



	Colon		Rectal	
	Male	Female	Male	Female
5 year	3,384	3,223	7,391	7,519
25 year	2,028	1,176	4,494	2,871

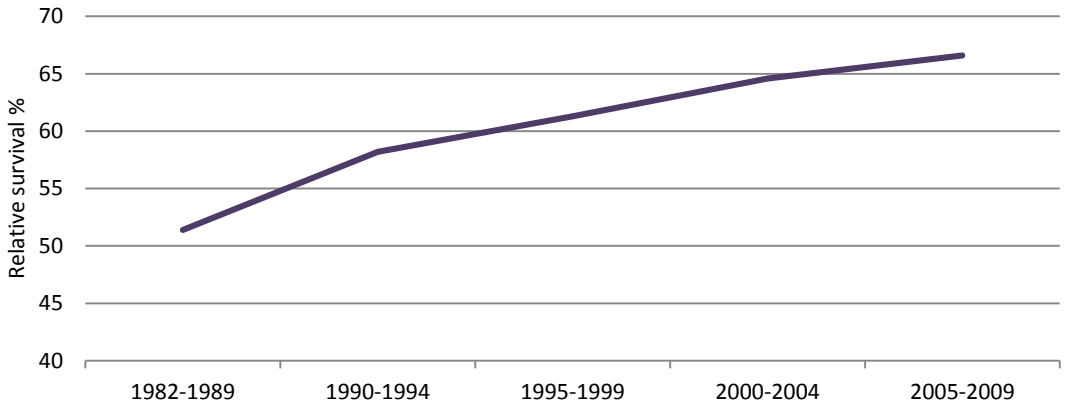
Source: Cancer in Queensland 1982-2009. Incidence, mortality, survival and prevalence. Queensland Cancer Registry, Cancer Council Queensland: Brisbane.

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 latest figures (2005 to 2009) show 5 year relative survival was 66.6%, an increase of 15.2% from the 1982 to 1989 5 year relative survival 51.4% (Figure 13).[3]

Figure 13: 5 year relative survival trend of colorectal cancer, Queensland, 1982 to 2009



Source: Cancer in Queensland 1982-2009. Incidence, mortality, survival and prevalence. Queensland Cancer Registry, Cancer Council Queensland: Brisbane.

Part 3

Colorectal Cancer by Hospital and Health Service

Colorectal Population Characteristics

From 2007 to 2009 colorectal cancer in Queensland was more common in males with an average of 55% of all new cases being male. The median age at diagnosis was 69. The majority (39%) of all colorectal cancers diagnosed in Queensland come from Metro South and Metro North areas (Table 1).

A number of studies have shown that socioeconomically groups experience significantly higher mortality and morbidity rates. At least 20% of people who were diagnosed with colorectal cancer and living in Darling Downs, Wide Bay, South West or Torres Strait-Northern Peninsula Hospital and Health Services were disadvantaged.

Table 1: Colorectal population characteristics by Hospital & Health Services, Queensland, 2007 to 2009

	Incidence Annual Avg.	Median Age	% Male	Socioeconomic Status		
				% Affluent	% Middle	% Disadvantaged
Metro South	565	68	53	27	62	10
Metro North	548	71	52	37	57	6
Gold Coast	351	70	55	11	89	
Sunshine Coast	280	70	58		93	8
Darling Downs	213	71	55	4	71	25
Wide Bay	183	70	56		40	60
Cairns & Hinterland	153	67	60		85	15
West Moreton	137	69	60	3	90	6
Townsville	136	67	55	8	76	16
Central Queensland	112	67	60		95	5
Mackay	90	68	54		89	11
South West	16	69	50		77	23
North West	11	61	67		97	3
Cape York	<10	63	65		94	6
Torres Strait-Northern Peninsula	<10	61	43			100
Queensland	2814	69	55	15	73	13

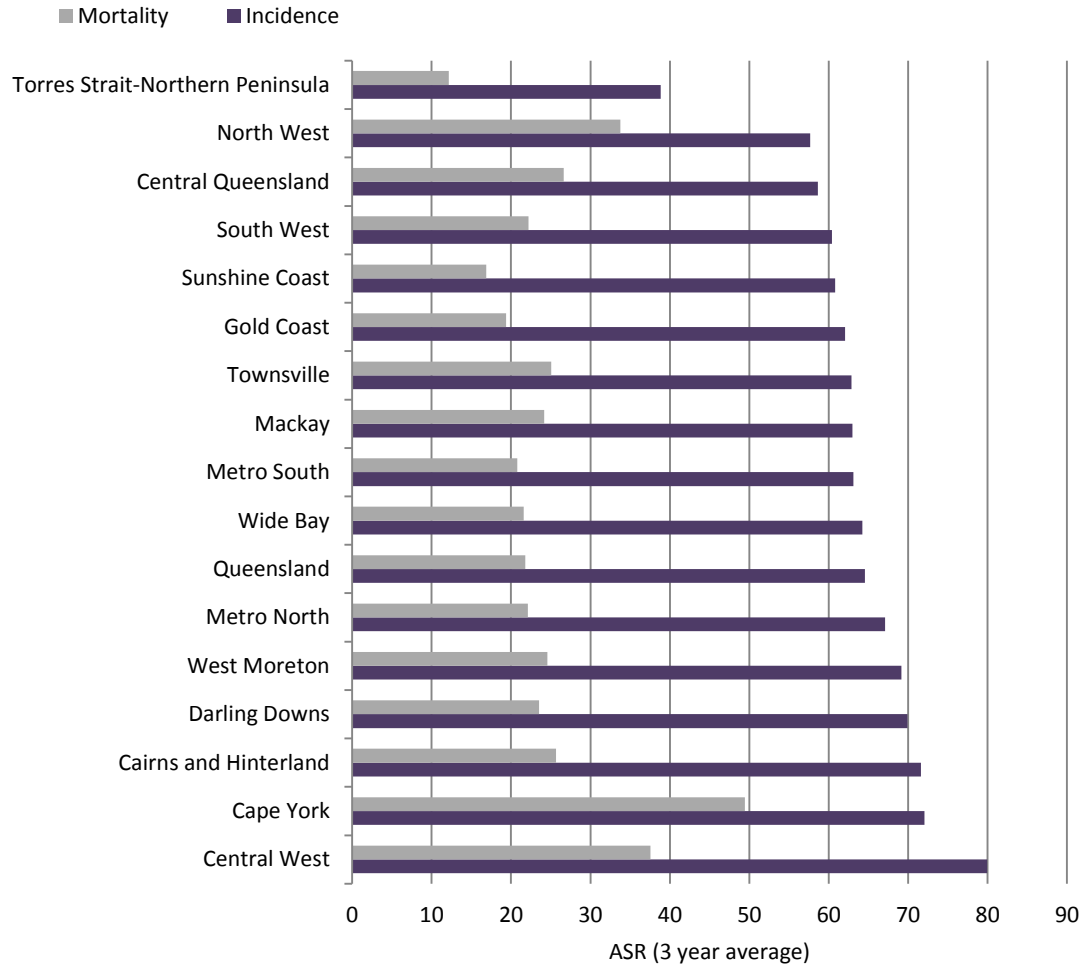
Shading represents those who have more than 20% disadvantaged (Australian standard)
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Incidence and Mortality

Incidence and mortality age-standardised rates varied by Hospital and Health Service from 2007 to 2009 (Figure 14). The colorectal cancer incidence rate in Queensland was 65 new cases per 100,000. Metro North, West Moreton, Darling Downs, Cairns and Hinterland, Cape York and Central West all had higher incidence rates than the Queensland average. Central West had the highest incidence rates of colorectal cancer with the average being 80 new cases per 100,000.

The average Queensland age-standardised mortality rate for colorectal cancer was 22 deaths per 100,000. The highest colorectal cancer mortality rate was seen in Cape York with 49 deaths per 100,000.

Figure 14: Colorectal cancer age-standardised rate 3 year average, incidence and mortality, by Hospital and Health Services, Queensland, 2007 to 2009



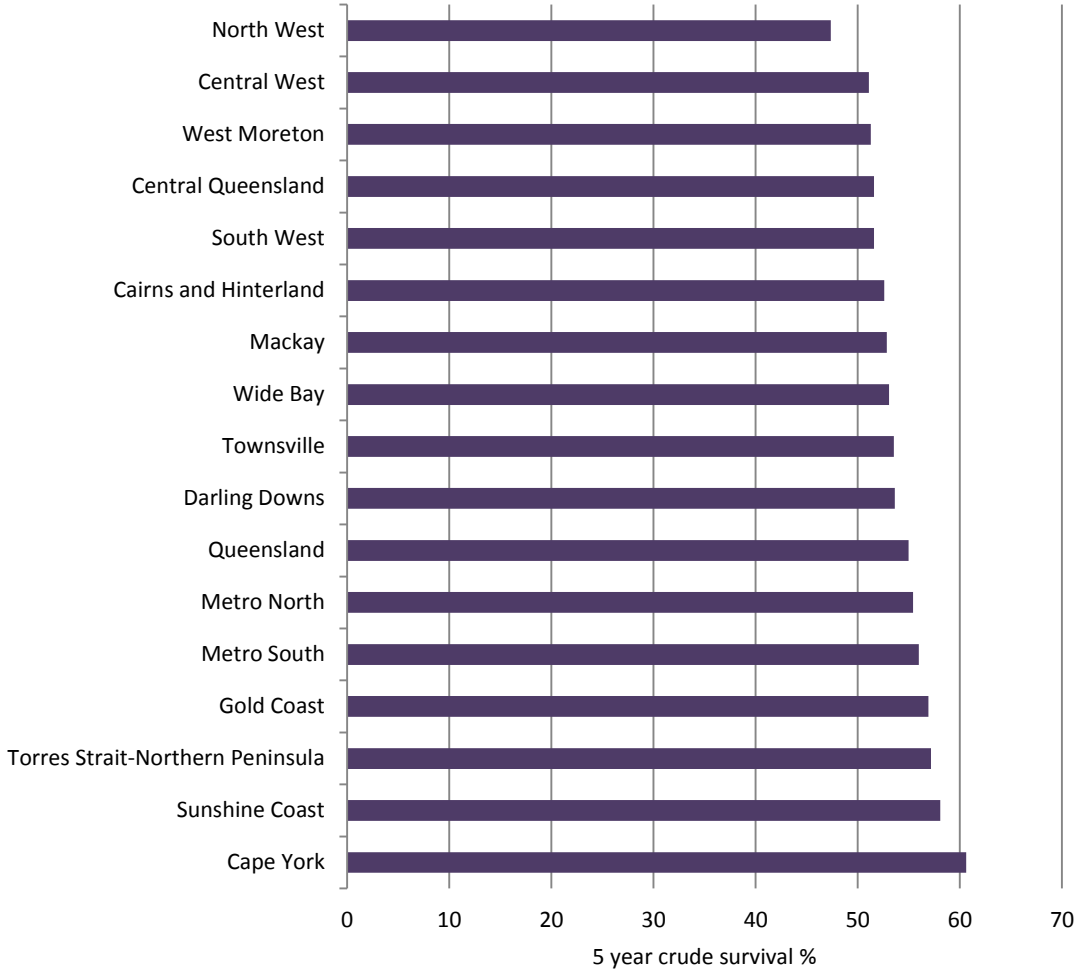
Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Survival

All cause crude survival is the percentage of cancer cases still alive after a specified period of time from diagnosis.

5 year survival for colorectal cancer in Queensland was 55% from 1982 to 2009. Cape York Hospital and Health Service had the highest 5 year survival (61%). North West had the lowest 5 year survival (47%) (Figure 15).

Figure 15: Colorectal cancer 5 year crude survival by Hospital and Health Services, Queensland, 1982 to 2009



Source: Oncology Analysis System, Queensland Cancer Control Analysis Team

Part 4

Multi-disciplinary Colorectal Cancer Care in Queensland

Multi-disciplinary Meetings

Review by a multi-disciplinary team (MDT) is an important part of multi-disciplinary care for people with colorectal cancer. In Queensland public hospitals multi-disciplinary review takes place in regular multi-disciplinary meetings (MDM). At a MDM clinicians come together to diagnose, stage and plan their patient's treatment.

Clinicians can use Queensland Oncology Online (QOOL) to electronically capture and communicate important clinical information such as diagnosis, cancer stage and recommended treatment. QOOL enables clinicians from across Queensland to participate in local and state-wide audit and peer review activities.

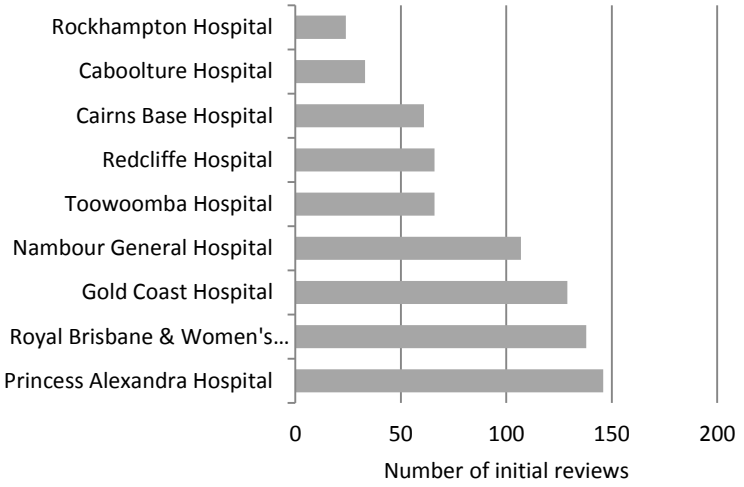
In 2011, 23 hospitals across Queensland utilised QOOL to support 51 individual MDMs. There were 9 public hospitals in Queensland using QOOL who reviewed colorectal cancer patients. These hospitals reviewed 770 patients diagnosed in 2011 with a primary site of colon, rectum or anus.

Number of colorectal patients reviewed at a MDM, by Hospital, 2011

At least 770 unique patients were reviewed at a MDM in 2011.

Every colorectal patient should be given the opportunity of having their case reviewed by a MDM.

34% of patients had their case reviewed more than once at a MDM.



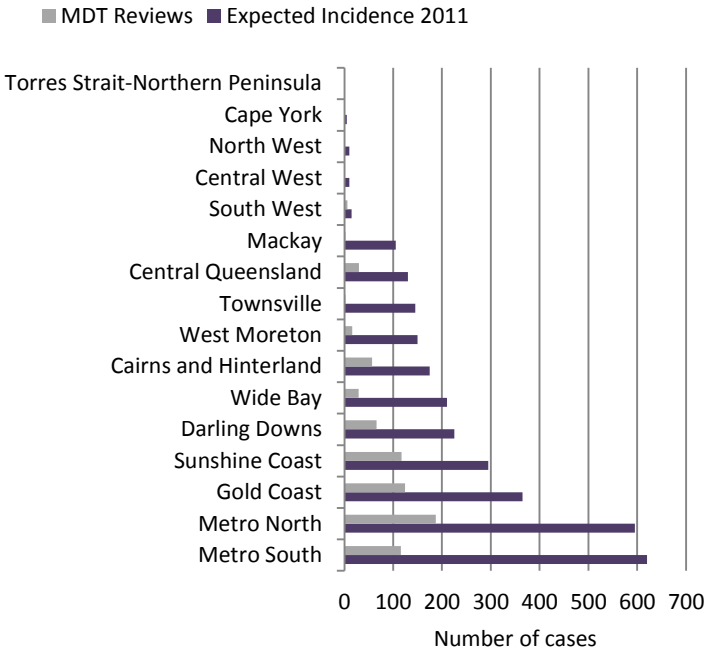
Hospital	Initial Review	Subsequent Review	Total Reviews
Rockhampton	24	1	25
Caboolture	33	16	49
Cairns	61	12	73
Redcliffe	66	8	74
Toowoomba	66	6	72
Nambour	107	37	144
Gold Coast	129	73	202
Royal Brisbane & Women's	138	60	198
Princess Alexandra	146	49	195
Total	770	262	1032

Source: Queensland Oncology Online, Queensland Cancer Control Analysis Team

Number of colorectal patients reviewed at a MDM and expected incidence, Queensland, 2011

3,080 new cases of colorectal cancer are expected to occur in Queensland in 2011.

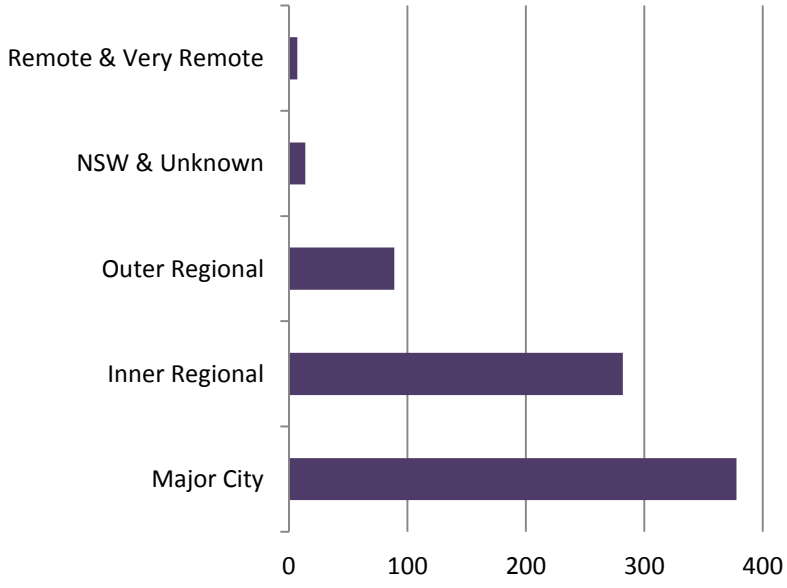
It can be estimated that approximately 25% of these patients will have their case reviewed by a MDM.



Source: Queensland Oncology Online, Queensland Cancer Control Analysis Team

Colorectal patients reviewed at a MDM, by remoteness of residence, Queensland 2011

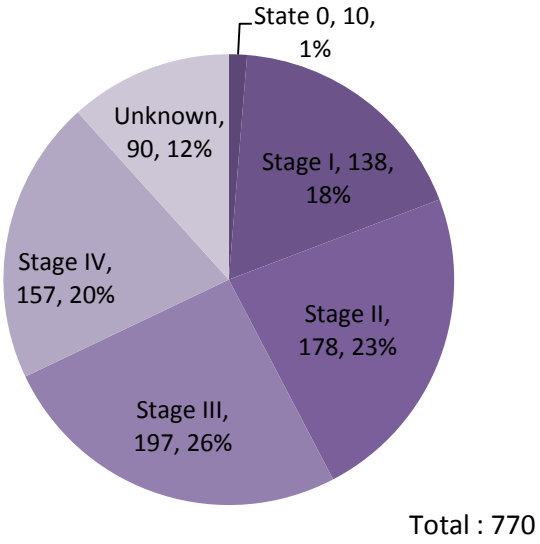
86% of colorectal patients who were reviewed at a MDM reside in a Major City or Inner Regional area.



Source: Queensland Oncology Online, Queensland Cancer Control Analysis Team

TNM Stage Distribution of colorectal patients reviewed at a MDM, Queensland, 2011

In 2011, 88% of patients had a TNM stage recorded.



	Stage 0 Count (%)	Stage I Count (%)	Stage II Count (%)	Stage III Count (%)	Stage IV Count (%)	Unknown Count (%)
Princess Alexandra	2 (1)	31 (21)	42 (29)	35 (24)	35 (24)	1 (1)
Royal Brisbane & Women's	1 (1)	28 (20)	31 (22)	43 (31)	25 (18)	10 (7)
Gold Coast	3 (2)	25 (19)	27 (21)	25 (19)	28 (22)	21 (16)
Nambour General	4 (4)	10 (9)	30 (28)	22 (21)	27 (25)	14 (13)
Toowoomba		15 (23)	13 (20)	20 (30)	15 (23)	3 (5)
Redcliffe		8 (12)	11 (17)	16 (24)	8 (12)	23 (35)
Cairns		13 (21)	14 (23)	19 (31)	11 (18)	4 (7)
Caboolture		7 (21)	5 (15)	9 (27)	4 (12)	8 (24)
Rockhampton		1 (4)	5 (21)	8 (33)	4 (17)	6 (25)
Total	10 (1)	138 (18)	178 (23)	197 (26)	157 (20)	90 (12)

Source: Queensland Oncology Online, Queensland Cancer Control Analysis Team

Appendix

Sources of Data

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 2009. 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). All data are de-identified and aggregated.

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

Queensland Oncology Online

Queensland Oncology Online (QOOL) is an innovative web based system that integrates existing "data silos" and makes available just in time clinical information for multidisciplinary case conferencing, service improvement, monitoring safety and quality, and research.

QOOL has been developed to support clinicians to participate in multidisciplinary care and support the information needs of clinical networks and cancer services. This state-wide clinical registry aims to link patient information from multiple systems and facilitates the sharing of information between clinicians and facilities, producing a single patient summary view across the state.

QOOL provides the following functionality to cancer providers:

- Auto-population of demographic, pathology and death data from routine electronic sources, combined with additional clinical data, to provide an online clinical summary.
- Secure web access to the clinical summary for online scheduling, case conferencing, cancer care coordination and updating of clinical summary.
- Auto-generated GP/Specialist letter and case notes summary.
- Enables clinicians to record the critical information for each cancer episode, building a profile of the patient's journey, which is accessible by the multidisciplinary clinical team, independent of location of care.

As a result of collecting this information, clinicians are able to more effectively participate in audit and peer review activities as part of routine clinical practice. QCCAT in collaboration with partners and teams will apply a strong multidisciplinary approach to cancer service activities that includes primary care, community, allied health, clinicians and consumers. There is further hope that a strong partnership between public and private providers of oncology services will allow a greater focus on service improvement and safety.

In 2012 QOOL is being utilised by 23 hospitals across Queensland supporting 51 individual multidisciplinary meetings.

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.

Crude Survival

All-cause crude survival: the percentage of cancer cases still alive after a specified period of time from diagnosis. Survival curves use the Kaplan-Meier estimator of the probability of surviving beyond a specific time from diagnosis, with failure or event defined as death from any cause.

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 districts.

Incidence (new cases)

The number of new cases of cancer diagnosed in a defined population during a specified time period. For example, 2009 incidence is the number of cancers which were first diagnosed between 1 January 2009 and 31 December 2009.

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 2009.

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

Methods

The Incidence and mortality data in this report are based on cancer registrations for 2009 and for 1982-2009 for trend analysis. Except where noted, incidence and mortality rates are standardised to the Australian age-specific population in 2001.

The International Classification of Diseases for Oncology (ICD-10-AM) has defined colorectal cancer as those with a primary site of C18-C20, C218.[2]

More on the QCCAT website

Go to https://qccat.health.qld.gov.au

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