

# Queensland Cancer Quality Index

Indicators of safe, quality cancer care

Cancer surgery in public and private hospitals  
2001-2010

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# Table of contents

What is the Queensland Cancer Quality Index (The Cancer Index)? .....	1
Why develop The Cancer Index? .....	2
Where has the data come from? .....	2
Looking to the future .....	3
Cancer surgery highlights .....	4
1. Effective .....	5
1.1   Survival .....	6
1.2   Queenslanders receiving cancer surgery .....	7
2. Efficient .....	8
2.1   Hospital stay .....	9
3. Safe .....	10
3.1   In-Hospital mortality .....	11
3.2   30 day mortality.....	12
3.3   90 day mortality.....	13
3.4   1 year survival .....	14
4. Accessible .....	15
4.1   Timeliness .....	16
4.2   Remoteness .....	17
5. Equitable .....	18
5.1   Over 65 years .....	19
5.2   Indigenous .....	20
5.3   Disadvantaged .....	21
Glossary .....	22

# What is the Queensland Cancer Quality Index (The Cancer Index)?

The Cancer Index has been developed for public and private cancer services. It is an initiative of the Queensland Cancer Control Safety and Quality Partnership (The Partnership) (<https://qccat.health.qld.gov.au>). It tracks Queensland's progress delivering safe, quality cancer care. It is a public report which will be sent to all Queensland Hospital and Health Services (HHS). The Cancer Index highlights areas for improvement and identifies the areas where cancer services are performing well. The Cancer Index has been modelled on the internationally recognised work of the Quality Council of Ontario (<http://www.csqi.on.ca>). At present The Cancer Index has five dimensions and 12 indicators.

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## Quality Dimension

Effective	Achieving the best outcomes for Queenslanders with cancer.
Efficient	Optimally using resources to achieve desired outcomes.
Safe	Avoiding and preventing adverse outcomes or injuries by healthcare management.
Accessible	Making health services available in the most suitable setting in a reasonable time.
Equitable	Providing care and ensuring health status does not vary in quality because of personal characteristics (age, indigenous status or socioeconomic status).

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This first version of The Cancer Index focuses on surgery for breast, biliary tract, colon, rectum, oesophagogastric, lung (specifically non-small cell lung cancer), small intestine and pancreatic cancers. Future versions of The Cancer Index will include radiation therapy, chemotherapy and other dimensions of care. Additional dimensions and indicators will be added in response to clinician, hospital, HHS, Queensland Health and community feedback.

The Cancer Index reports on ten years of data from 2001-2010 however there may have been changes more recently that are not captured by the time periods reported. Regardless, The Cancer Index provides an important baseline for monitoring current investments in cancer care and changes in clinical practice. It also enables us to reflect on past surgery improvement programs and identify areas where a renewed effort or new approach may be required.

# Why develop The Cancer Index?

Performance indicators linked to clinical outcomes that align with national benchmarking is a key service action in the Cancer Care Statewide Health Service Strategy, 2014<sup>1</sup>.

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

The Cancer Index is a tool for reviewing, comparing and sharing with the public, information on the safety and quality of cancer treatments and outcomes. The Partnership has prepared The Cancer Index to assist cancer clinicians and administrators to improve patient care. In some cases it may prompt a change in the delivery and organisation of cancer services to improve health outcomes and performance. The Cancer Index includes public and private cancer care services.

# Where has the data come from?

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

Key to QCCAT's program of work is the ability to match and link population based cancer information on an individual patient basis. This matched and linked data is housed in the Queensland Oncology Repository (QOR), a resource managed by QCCAT. This centralised repository compiles and collates data from a range of source systems including the Queensland Cancer Registry, hospital admissions data, death data, treatment systems, public and private pathology, hospital clinical data systems and Queensland Oncology On-Line (QOOL). QOR contains approximately 32 million records between 1982 – 2013. Our matching and linking processes provide the 308,351 matched and linked records of cancer patients between 2001 – 2010 which provide the data for The Cancer Index.

The Cancer Index should be interpreted in the context of two previous publications by The Partnership: Cancer in Queensland 2012 and Cancer Surgery Infocus – access and flows 2013. These publications provide information on cancer incidence, mortality and survival, surgery rates and patient flows which is important information for understanding the indicators reported in The Cancer Index. Further information is available via Queensland's web-based Oncology Analysis System (OASys) at <https://qccat.health.qld.gov.au>.

For further information on data sources and methods refer to The Cancer Index Technical Appendix.

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<sup>1</sup> Service Direction 4, Signs of Success, Cancer Care Statewide Health Service Strategy, 2014

# Looking to the future

The Cancer Index provides baseline measurements for the on-going monitoring of the quality of cancer care in Queensland. The Partnership will report on The Cancer Index every year. Rather than wait for perfect data, The Partnership has chosen to report on a subset of the indicators needed to provide a complete picture of the safety and quality of cancer care in Queensland. This suite of indicators will be expanded as more data becomes available.

A key focus of The Cancer Index is the timeliness of cancer surgery. This is measured by the length of time between the cancer diagnosis date and the cancer surgery date, where surgery is the first treatment. This indicator describes how long a person waits from a confirmed cancer diagnosis to receiving surgery. The indicator, timeliness of cancer surgery reported in The Cancer Index, is a different calculation from the traditional elective surgery waiting times performance indicator. It is a population measure that has been developed to examine potential inequities in waiting times between public and private patients and vulnerable populations with cancer, rather than measure individual hospital performance. However, over time, it will serve as an independent measure of the effectiveness of Queensland Government programs to improve surgery wait times.

The Partnership will now seek feedback from cancer services, Queensland Health and the community on The Cancer Index. They will lead the development and reporting of quality indicators for other cancer treatments and outcomes which will be included in future versions.

# What does The Cancer Index tell us about cancer surgery in Queensland?

The Cancer Index is a first for Queensland. This first release reports on data spanning 10 years of cancer care and highlights where the health system has performed well and where improvements are possible.

1	Effective		Cancer survival compares favourably with the rest of Australia.
2	Efficient		There is little difference in the length of hospital stay between public and private patients receiving cancer surgery.
3	Safe		Compared to other countries, Queensland has low mortality rates after cancer surgery.
4	Accessible		Public patients waited longer for their surgery than private patients. More regional and rural women waited longer for breast cancer surgery than women living in city areas.
5	Equitable		The number of indigenous patients that received timely surgery decreased. The percentage of socio-economically disadvantaged patients with breast and colon cancer waiting longer for surgery has increased.

 Very good
  Good
  Fair
  Poor

# 1 | Effective

Achieving the best outcomes for Queenslanders with cancer.



# 1.1 | Survival

**What percentage of people with cancer are living 5 years after their diagnosis?**

Cancer	Queensland		Australia <sup>1</sup>
	2001-2005 5 year Survival	2006-2010 5 year Survival <sup>~</sup>	2006-2010 5 year survival
Breast	89%	90%	89%
Colon	66%	67%	**
Colorectal	66%	68%	66% <sup>^</sup>
Lung	13%	14%	14%
Oesophagus	19%	19%	16%
Gastric	27%	29%	27%
Pancreatic	6%	6%	5%
Biliary tract	26%	26%	20% <sup>*</sup>
Small intestine (including duodenum)	60%	62%	**
Rectal	67%	69%	**

<sup>~</sup> Censoring will occur for patients diagnosed in later years

<sup>\*</sup> Includes gallbladder cancer (C24)

<sup>^</sup> Includes bowel cancer (C18-C20)

<sup>\*\*</sup> National comparative data not available

<sup>1</sup> Australian Institute of Health and Welfare & Australasian Association of Cancer Registries 2012. *Cancer in Australia: an overview, 2012* (Supplementary tables). Cancer services no. 74. Cat. no. CAN 70. Canberra: AIHW.

*Overall Queensland cancer survival compares favourably with the rest of Australia.*

## 1.2 | Queenslanders receiving cancer surgery

### How many Queenslanders with cancer receive surgery?

Surgery number		Queensland	
<i>(Number of cancer patients receiving surgery)</i>			
Cancer	Surgery type	2001-2005 Surgery number (rate*)	2006-2010 Surgery number (rate*)
Breast	Breast cancer surgery	10,104 (90%)	12,184 (91%)
Colon	Major resections	6,314 (79%)	9,325 (81%)
Non-small cell lung	Major resections	1,201 (21%)	1,373 (19%)
Oesophagogastric	Gastrectomy	547 (21%)	490 (17%)
	Oesophagectomy	402 (15%)	385 (13%)
Pancreatic, biliary tract & duodenum	Pancreaticoduodenectomy	308 (13%)	360 (12%)
Rectal	Major resections	2,954 (73%)	3,203 (72%)
<b>Total</b>		<b>20,730</b>	<b>26,213</b>

*Rates have been adjusted for age and sex.*

*\*Percentage of cancer patients receiving cancer surgery*

*Surgery is a critical component of the curative treatment for breast, colon and rectal cancers.*

*Some patients require treatments other than surgery.*

*A large number of people with cancer get surgery as part of their treatment.*

# 2 | Efficient

Optimally using resources to achieve desired outcomes.



## 2.1 | Hospital stay

### How long do people having cancer surgery stay in hospital?

Length of stay		Queensland					
<i>(Median time between the admission and discharge date of cancer surgery)</i>							
Cancer	Surgery type	2001-2005 Length of stay			2006-2010 Length of stay		
		All	Public	Private	All	Public	Private
Breast	Breast cancer surgery	2	2	3	2	1	2
Colon	Major resections	10	10	10	8	8	8
Non-small cell lung	Major resections	8	8	9	8	7	8
Oesophagogastric	Gastrectomy	12	13	12	13	13	12
	Oesophagectomy	15	15	15	16	17	15
Pancreatic, biliary tract & duodenum	Pancreatico-duodenectomy	18	19	18	16	15	17
Rectal	Major resections	10	10	11	9	9	8

*Patients receiving cancer surgery have different lengths of hospital stay.*

*There is little variation in the length of stay between public and private hospitals.*

# 3 | Safe

Avoiding and preventing adverse outcomes or injuries caused by healthcare management.



## 3.1 | In-Hospital mortality

What percentage of patients die in-hospital after cancer surgery?

In-Hospital mortality		Queensland	
<i>(% of patients who die in hospital following cancer surgery)</i>			
Cancer	Surgery type	2001-2005 In-Hospital mortality	2006-2010 In-Hospital mortality
Breast	Breast cancer surgery	<0.1%	<0.1%
Colon	Major resections	3.4%	2.8%
Non-small cell lung	Major resections	2.0%	1.3%
Oesophagogastric	Gastrectomy	5.2%	3.7%
	Oesophagectomy	1.9%	0.8%
Pancreatic, biliary tract & duodenum	Pancreaticoduodenectomy	3.5%	1.7%
Rectal	Major resections	2.4%	1.8%

*Rates have been adjusted for age and sex.*

*Mortality is an important measure of safe surgery.*

*Queensland has low mortality rates after cancer surgery.*

*In-hospital mortality after cancer surgery is decreasing.*

## 3.2 | 30 day mortality

What percentage of patients die within 30 days of their cancer surgery?

30 day mortality				
(% of patients who die $\leq$ 30 days following cancer surgery)				
		Queensland		Other Countries
Cancer	Surgery type	2001-2005 30 day mortality	2006-2010 30 day mortality	30 day mortality
Breast	Breast cancer surgery	<0.1%	<0.1%	US 0 - 0.24% <sup>1</sup>
Colon	Major resections	4.0%	3.0%	UK 2.9% <sup>2</sup>
Non-small cell lung	Major resections	2.5%	1.2%	US 2.8% <sup>3</sup>
Oesophagogastric	Gastrectomy	4.5%	3.5%	UK 2.3% <sup>4</sup>
	Oesophagectomy	1.5%	0.3%	UK 2.4% <sup>4</sup>
Pancreatic, biliary tract & duodenum	Pancreatico-duodenectomy	3.9%	1.7%	US 3.0% <sup>5</sup>
Rectal	Major resections	2.8%	2.0%	UK 2.9% <sup>2</sup>

Rates have been adjusted for age and sex.

<sup>1</sup> El-Tamer M, Ward M, Schiffner T, Neumayer L, Khuri S, Henderson W. Morbidity and Mortality Following Breast Cancer Surgery in Women. *National Benchmarks for Standards of Care. Annals of Surgery* 2007 May 245:5. Covers breast cancer surgery from 2001 to 2004.

<sup>2</sup> Health and Social Care Information Centre, *National Bowel Cancer Audit Annual Report 2013. United Kingdom. Rates are for colon and rectal cancer and covers patients diagnosed between 1 April 2011 to 31 March 2012.*

<sup>3</sup> Pezzi CM, Mallin K, Mendez AS, Greer Gay E, Putnam JB. Ninety-day mortality after resection for lung cancer is nearly double 30-day mortality. *J Thorac Cardiovasc Surg.* 2014; Aug 4. Covers major resections from 2007 to 2011

<sup>4</sup> Health and Social Care Information Centre, *National Oesophago-Gastric Cancer Audit Annual Report 2014. United Kingdom. Covers patients diagnosed between 1 April 2011 to 31 March 2013.*

<sup>5</sup> Annamalaj A, Kakarla VR, Nandipati K. Predictors of mortality following pancreaticoduodenectomy for periampullary cancer. *OA Surgery* 2014 Jan 18;2(1):2. Covers pancreaticoduodenectomies from 2005 to 2008.



## 3.3 | 90 day mortality

What percentage of patients die within 90 days of their cancer surgery?

90 day mortality (% of patients who die $\leq$ 90 days following cancer surgery)		Queensland	
		2001-2005 90 day mortality	2006-2010 90 day mortality
Cancer	Surgery type		
Breast	Breast cancer surgery	0.4%	0.2%
Colon	Major resections	6.9%	5.4%
Non-small cell lung	Major resections	4.9%	2.8%
Oesophagogastric	Gastrectomy	8.9%	5.8%
	Oesophagectomy	3.4%	1.8%
Pancreatic, biliary tract & duodenum	Pancreaticoduodenectomy	8.1%	3.1%
Rectal	Major resections	4.5%	3.5%

*Rates have been adjusted for age and sex.*

*Queensland mortality rates after surgery are among the best in the world.*

*Overall there has been a decrease in mortality after cancer surgery.*

## 3.4 | 1 year survival

What percentage of patients are alive one year after cancer surgery?

1 year survival		Queensland	
(% of patients still alive 1 year after cancer surgery)		2001-2005	2006-2010
Cancer	Surgery type	1 yr survival	1 yr survival
Breast	Breast cancer surgery	98%	99%
Colon	Major resections	83%	87%
Non-small cell lung	Major resections	82%	89%
Oesophagogastric	Gastrectomy	73%	76%
	Oesophagectomy	76%	83%
Pancreatic, biliary tract & duodenum	Pancreaticoduodenectomy	71%	80%
Rectal	Major resections	88%	90%

*One-year survival in patients receiving cancer surgery has improved.*

*Improvements in one-year survival for gastric, oesophageal, pancreatic and lung cancer surgery reflect the skilful selection of the right patients for complex, high risk surgeries by cancer teams.*

*Mortality rates and survival will continue to be monitored to keep surgery safe for Queenslanders.*

# 4 | Accessible

Making health services available in the most suitable setting in a reasonable time.



## 4.1 | Timeliness

### What percentage of public compared to private patients received cancer surgery within 30 days of diagnosis?

Many cancers require other treatment prior to surgery and are not reported for this dimension.

#### Received surgery within 30 days

(% patients whose time from diagnosis to cancer surgery is ≤ 30 days)

Queensland

Cancer	Surgery type	2001-2005 Time to surgery			2006-2010 Time to surgery		
		All	Public	Private	All	Public	Private
Breast	Breast cancer surgery	87%	77%	94%	79%	62%	91%
Colon	Major resections	89%	83%	93%	81%	71%	90%

Rates have been adjusted for age and sex.

*Finding out you have cancer is a stressful time.*

*Cancer surgery requires careful planning.*

*Hospitals are responsive to patients needs and most patients receive surgery within 30 days. However, more public patients than private patients waited longer for cancer surgery and this difference has widened.*



## 4.2 | Remoteness

### What percentage of patients living outside a major city received cancer surgery within 30 days of diagnosis?

Many cancers require other treatment prior to surgery and are not reported for this dimension.

Rural time to surgery		Queensland					
<i>(% patients whose time from diagnosis to cancer surgery is ≤ 30 days)</i>		2001-2005			2006-2010		
Cancer	Surgery type	Time to surgery			Time to surgery		
		Rural	Regional	Metro-politan	Rural	Regional	Metro-politan
Breast	Breast cancer surgery	83%	89%	87%	72%	78%	81%
Colon	Major resections	89%	89%	88%	82%	81%	81%

*Rates have been adjusted for age and sex.*

*Most regional and rural patients with breast or colon cancer can receive their surgery in a regional hospital.*

*There is little difference in the timeliness of colon cancer surgery for patients living in rural, regional and metropolitan areas.*

*However, more rural women with breast cancer waited over 30 days compared to women from regional and metropolitan areas. This difference needs to be explored further.*

# 5 | Equitable

Providing care and ensuring health status does not vary in quality because of personal characteristics (age, indigenous status or socioeconomic status).



## 5.1 | Over 65 years

### What percentage of patients aged >65 years received cancer surgery within 30 days of diagnosis?

Many cancers require other treatment prior to surgery and are not reported for this dimension.

#### Time to surgery

(% patients whose time from diagnosis to cancer surgery is ≤ 30 days)

Queensland

Cancer	Surgery type	2001-2005 Time to surgery		2006-2010 Time to surgery	
		Aged < 65	Aged 65 and above	Aged < 65	Aged 65 and above
Breast	Breast cancer surgery	88%	86%	80%	79%
Colon	Major resections	89%	88%	81%	81%

*Rates have been adjusted for age and sex.*

*Generally people over 65 years with cancer do not wait longer for surgery.*

## 5.2 | Indigenous

### What percentage of indigenous patients received cancer surgery within 30 days of diagnosis?

Many cancers require other treatment prior to surgery and are not reported for this dimension.

#### Time to surgery

(% patients whose time from diagnosis to cancer surgery is ≤ 30 days)

Queensland

Cancer	Surgery type	2001-2005 Time to surgery		2006-2010 Time to surgery	
		Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Breast	Breast cancer surgery	71% (84)*	87% (8,676)*	57% (77)*	80% (9,581)*
Colon	Major resections	85% (39)*	89% (5,540)*	70% (43)*	81% (6,075)*

Rates have been adjusted for age and sex.

\*Total patients in this category.

*The number of indigenous patients that received timely surgery decreased.*

*More needs to be done to ensure indigenous patients receive cancer surgery in a timely manner.*



# 5.3 | Socio-economically disadvantaged

## What percentage of socioeconomically disadvantaged patients received cancer surgery within 30 days of diagnosis?

Many cancers require other treatment prior to surgery and are not reported for this dimension.

### Time to surgery

(% patients whose time from diagnosis to cancer surgery is ≤ 30 days)

Queensland

Cancer	Surgery type	2001-2005 Time to surgery			2006-2010 Time to surgery		
		Disadv- antaged	Middle	Affluent	Disadv- antaged	Middle	Affluent
Breast	Breast cancer surgery	85%	86%	93%	72%	79%	88%
Colon	Major resections	88%	89%	88%	78%	81%	85%

Rates have been adjusted for age and sex.

*The percentage of socio-economically disadvantaged people with breast and colon cancer waiting longer for surgery has increased.*

*We need a better understanding of why more socio-economically disadvantaged patients are waiting for surgery.*

# Glossary

## **1 year survival**

All-cause crude survival: the percentage of patients still alive after 1 year from their last cancer surgery.

## **30 day mortality**

The percentage of patients that die  $\leq$  30 days following their last cancer surgery.

## **90 day mortality**

The percentage of patients that die  $\leq$  90 days following their last cancer surgery.

## **Age and sex adjusted figures**

Rates have been adjusted by age and sex to account for any differences in cancer populations across the two periods of interest.

## **First cancer surgery**

The first cancer surgery the patient ever had to treat their cancer.

## **Hospital and Health Service (HHS)**

For residence considerations, the Hospital and Health Service is a geographic area defined by a collection of Statistical Local Areas (SLA). For public hospitals and health service facilities, the term Hospital and Health Service is synonymous with a group of Queensland Health facilities and staff responsible for providing and delivering health resources and services to an area which may consist of one or more residential areas. Queensland unknown residence includes addresses reported as overseas, unknown, or not fixed.

## **Hospital Stay**

The median time between the admission and discharge date of a patient's first cancer surgery

## **Indigenous status**

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

## **In-Hospital mortality**

The percentage of patients that die in hospital following their last cancer surgery.

## **Last cancer surgery**

The last cancer surgery that a patient ever had to treat their cancer.

## **Non-Indigenous**

A measure of whether a person doesn't identify themselves as Indigenous.

## **Number of surgeries**

Includes Queensland residents of all ages diagnosed with invasive cancer in the surgical cohort time period who underwent cancer surgery.

## **Over 65 years**

The age that divides this population into over 65 years and under 65 years, it describes Queensland's ageing population.

**Private hospital**

All other hospitals that are not Queensland Health hospitals.

**Public hospital**

Queensland Health hospitals.

**Relative Survival (RS)**

Relative survival is the net survival from cancer or the proportion (%) who would have survived if cancer was the only cause of death.

$$RS = \frac{\text{(Observed survival proportion in cancer cohort)}}{\text{(Expected survival in whole population)}}$$

Therefore, 56% of five-year survival does not mean that 56/100 cancer patients are alive 5 years later but 56% (about half) as many of this group would survive compared with a group the same age and sex without cancer. Thus the actual proportion surviving would differ between age groups even if relative survival were the same.

**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 three groups: Metropolitan, Regional and Rural.

**Sex**

Refers to the biological and physiological characteristics that define men and women.

**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 Local Areas (SLA).

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.

**Surgery/Major Resection**

Refer to Cancer Surgery in Qld: Infocus Access and Flows for full definitions. Available at <https://qccat.health.qld.gov.au>.

**Time to Surgery**

Time between the patient's histological diagnosis and their first cancer surgery.

**Timeliness**

A patients time to surgery.

## FOR MORE INFORMATION

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