

# Queensland Breast Cancer Quality Index

Practice indicators of  
safe, quality cancer care

Public and private hospitals

2007 – 2016



## Acknowledgements

The Queensland Breast Cancer Quality Index: Practice indicators of safe, quality cancer care, Public and private hospitals 2007-2016 has been developed under the auspices of the Queensland Cancer Control Safety and Quality Partnership (The Partnership). The members of The Partnership include: Professor David E Theile AO (Chair), Professor Joanne Aitken, Dr Marie-Frances Burke, Aniko Cooper, Professor Kwun Fong, Adjunct Professor Liz Kenny AO, Shoni Philpot, Professor Mark Smithers, Professor Euan Walpole, Associate Professor David Wyld, Dr Hazel Harden and Professor Keith McNeil.

The Queensland Breast Cancer Sub-committee was established in 2011 as a Sub-committee of The Partnership to examine and improve outcomes for cancer patients who have been diagnosed with breast cancer across Queensland - an approach which has never been adopted for breast cancer in Queensland.

We wish to thank members of the Queensland Breast Cancer Sub-committee: Colin Furnival (Chair), Ben Green, Tony Green, Margot Lehman, Sunil Lakhani, Michelle Morris and Marion Strong for reviewing the data and providing valuable comments.

The report was prepared by Danica Cossio, Gary Francois, Julie Moore, Nathan Dunn, Neal Rawson and the Queensland Cancer Control Analysis Team (QCCAT).

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## Message from the chair

As the Chair of the Breast Cancer Sub-committee of the Queensland Cancer Control and Safety Quality Partnership, I am pleased to introduce the Breast Cancer Quality Index: Practice indicators of safe, quality cancer care. Public and private hospitals 2007-2016 report.

This report provides a population-wide profile of Queensland female invasive breast cancer diagnoses and treatment, containing vital information about breast cancer surgery, radiation therapy and intravenous systemic therapy treatments.

The practice indicators presented in this report have been developed through consultation with breast surgeons and other clinical experts in breast cancer treatment and aim to inform clinicians and hospital administrators of the variation in practice and process that exists among public and private hospitals in Queensland.

I encourage you to discuss the information presented in this report with your colleagues in the context of the services that your hospital delivers. It is intended that these practice indicators will provide useful information to assist with identifying services which are performing well and identifying areas that may benefit from improvement.

On behalf of the Breast Cancer Sub-committee I wish to acknowledge the commitment of the members of the Breast Cancer Sub-committee and the Queensland Cancer Control Analysis Team (QCCAT) in providing the information, analyses, statistics, discussion, and recommendations for this report. I would also like to recognise the commitment of the many clinicians who have been involved in the discussion and development of these breast cancer practice indicators.

A handwritten signature in black ink, appearing to read 'Colin Furnival', with a horizontal line extending to the right.

Colin Furnival  
Chair  
Breast Cancer Sub-committee

## What is the Queensland Breast Cancer Quality Index?

The Queensland Breast Cancer Quality Index is the third report of this kind to be published in Queensland and has been developed for public and private cancer services. It is an initiative of the Queensland Breast Cancer Sub-committee, part of the Cancer Alliance Queensland which brings together the Cancer Control Safety and Quality Partnership (The Partnership), Queensland Cancer Control Analysis Team (QCCAT) and the Queensland Cancer Register (QCR) (<https://cancerallianceqld.health.qld.gov.au>). The report tracks Queensland's progress delivering safe, quality cancer care and will be provided to all relevant public and private hospitals. The Breast Cancer Quality Index highlights areas for improvement and identifies the areas where cancer services are performing well.

The Breast Cancer Quality Index reports on 10 years of data from 2007-2016, and not only includes surgical outcomes but practice quality indicators for radiation therapy (external beam) and intravenous systemic therapy treatment. Whilst there may have been changes more recently that are not captured by the time periods reported the Breast Cancer Quality Index provides an important tool for monitoring current investments in cancer care and changes in clinical practice. It also enables us to reflect on past improvement programs and identify areas where a renewed effort or new approach may be required.

## Why develop the Breast Cancer Quality Index?

Performance indicators linked to clinical outcomes that align with national benchmarking is a key service action in the Cancer Care State-wide Health Service Strategy, 2014. The Breast Cancer Quality Index has been developed by Cancer Alliance Queensland, lead clinicians and relevant persons under the auspices of the Queensland Cancer Control Safety and Quality Partnership (The Partnership). The Cancer Alliance Queensland supports a clinician-led, safety and quality program for cancer across Queensland. The Partnership was gazetted as a quality assurance committee under Part 6, Division 1 of the Hospital and Health Boards Act 2011 in 2004. A key role of the Partnership is to provide cancer clinicians, Hospital and Health Services (HHS), hospitals, treatment facilities and Queensland Health with cancer information and tools to deliver the best patient care.

The Breast Cancer Quality Index is a tool for reviewing and comparing information on the safety and quality of cancer treatment. The Partnership has prepared the Breast Cancer Quality 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 Breast Cancer Quality Index includes public and private cancer care services.

The Breast Cancer Quality Index includes the following quality dimensions, developed by Cancer Alliance Queensland with clinical leadership<sup>1</sup>. (Walpole, Theile, Philpot et al. 2019)

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Quality Dimension	
Effective	Achieving the best outcome for Queensland women with invasive breast cancer and providing cancer services based on recommended guidelines
Accessible	Making health services available to Queensland breast cancer patients

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## Where has the data come from?

Since 2004, QCCAT have compiled and analysed a vast amount of information about cancer incidence, mortality, treatment, and survival. Key to Cancer Alliance Queensland'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 Register, private and public hospital admissions data, death data, treatment systems, public and private pathology, hospital clinical data systems and QOOL. QOR contains approximately 50 million records between 1982–2016. Our matching and linking processes provide the 570,000+ matched and linked records of cancer patients between 1982–2016 which provide the data for the Breast Cancer Quality Index.

The Breast Cancer Quality Index should be interpreted in the context of the previous publications by The Partnership. To access previous publication, go to <https://cancerallianceqld.health.qld.gov.au/reports-publications>.

## Diagnosis year

This report is structured around diagnosis years as reported by the Queensland Cancer Register, the latest incident year being 2016. Female patients diagnosed with invasive breast cancer for two 5-year diagnosis periods are included in this report. Patients that had treatment in 2007 onwards but were diagnosed in an earlier year are excluded from the report.

## Hospital Peer Groups

The Breast Cancer Quality Index uses the Australian hospital peer groups defined by the Australian Institute of Health and Welfare (AIHW).

Hospital peer groupings define groups of similar hospitals based on shared characteristics and allow a better understanding of the organisation and provision of hospital services. For hospitals, a peer grouping supports comparisons that reflect the purpose, resources and role of each hospital. The AIHW peer grouping is assigned on a broad range of factors and is not specific to oncological practice.

Based on clinical feedback, the AIHW hospital peer groups have been further aggregated into a report peer group detailed in the table below.

<b>AIHW peer group</b>	<b>Report peer group</b>
Principal referral hospitals	Principal referral
Public acute group A hospitals	Group A hospitals
Private acute group A hospitals	
Public acute group B hospitals	Group B hospitals
Private acute group B hospitals	
Public acute group C hospitals	Group C hospitals
Private acute group C hospitals	
Public acute group D hospitals	Other hospitals
Private acute group D hospitals	

## Adjusted rates

The indicators have been adjusted to remove the effect of differences in the composition of the various populations.

The indicators have been adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. The displayed confidence intervals are intended to show the level of precision of the adjusted rate estimate and on occasion may not accurately reflect significance due to small numbers.

## Disclosure

This report is confidential and legally protected under section 87 of the *Hospital and Health Boards Act 2011* (the Act). It cannot be accessed under any administrative or judicial order and is not admissible in any proceeding, other than a proceeding for an offence under Part 6, Division 1 of the Act.

## Privacy and confidentiality

Reports generated on behalf of the Cancer Alliance Queensland will contain aggregate and de-identified data and maintain the confidentiality of the person receiving the health service and the individual provider.

## Key findings

In 2021, an estimated 3,802 Queensland women will be diagnosed with invasive breast cancer. Breast cancer accounts for 28% of all reported cancers in females<sup>2</sup>. Incidence of invasive breast cancer continued to increase over the years 2007 to 2016. The age standardised rate of female breast cancer incidence in 2007 was 114.7 (per 100,000 females) compared to 128.2 (per 100,000 females) in 2016. 92% of women who had breast cancer were living 5 years after diagnosis for the 2012-2016<sup>2</sup>.

Surgery is a critical component of treatment for breast cancer. The surgery rate for invasive breast cancer in Queensland is 91%. The two types of surgery performed for breast cancer are breast conservation surgery (BCS) (57%) and mastectomy (43%) for the years 2012-2016. Queensland rates are similar to other countries<sup>3,4,5</sup>. Breast cancer surgery was carried out in over 80 Queensland public and private hospitals. Across Queensland 46 public and private hospitals performed an annual average of <15 definitive breast cancer surgeries. These have been grouped as low volume hospitals.

External beam radiation therapy and intravenous systemic therapy treatments play a key role in the management of breast cancer. The state-wide rate in the 5-year period 2012-2016 for radiation therapy following BCS is 91%. The Queensland radiation therapy utilisation rates have been compared broadly to the CCORE optimal radiotherapy utilisation rate which is 87% for all breast cancer<sup>5</sup>. The Queensland rate is also comparable to reported quality indicator rates in other publications<sup>3,4,7</sup>.

The intravenous systemic therapy utilisation rate is 89% for women aged less than 70 years who had positive axillary lymph nodes in the time period 2012-2016. In Australia, the optimal chemotherapy utilisation rate for breast cancer is 67% and the most common indication for chemotherapy is adjuvant for node-positive breast cancers (younger than 70 years of age)<sup>8</sup>. The recently published IV Systemic Therapy in Queensland report identified utilisation rates are lower than optimal for all breast cancer at 49%<sup>9</sup>.

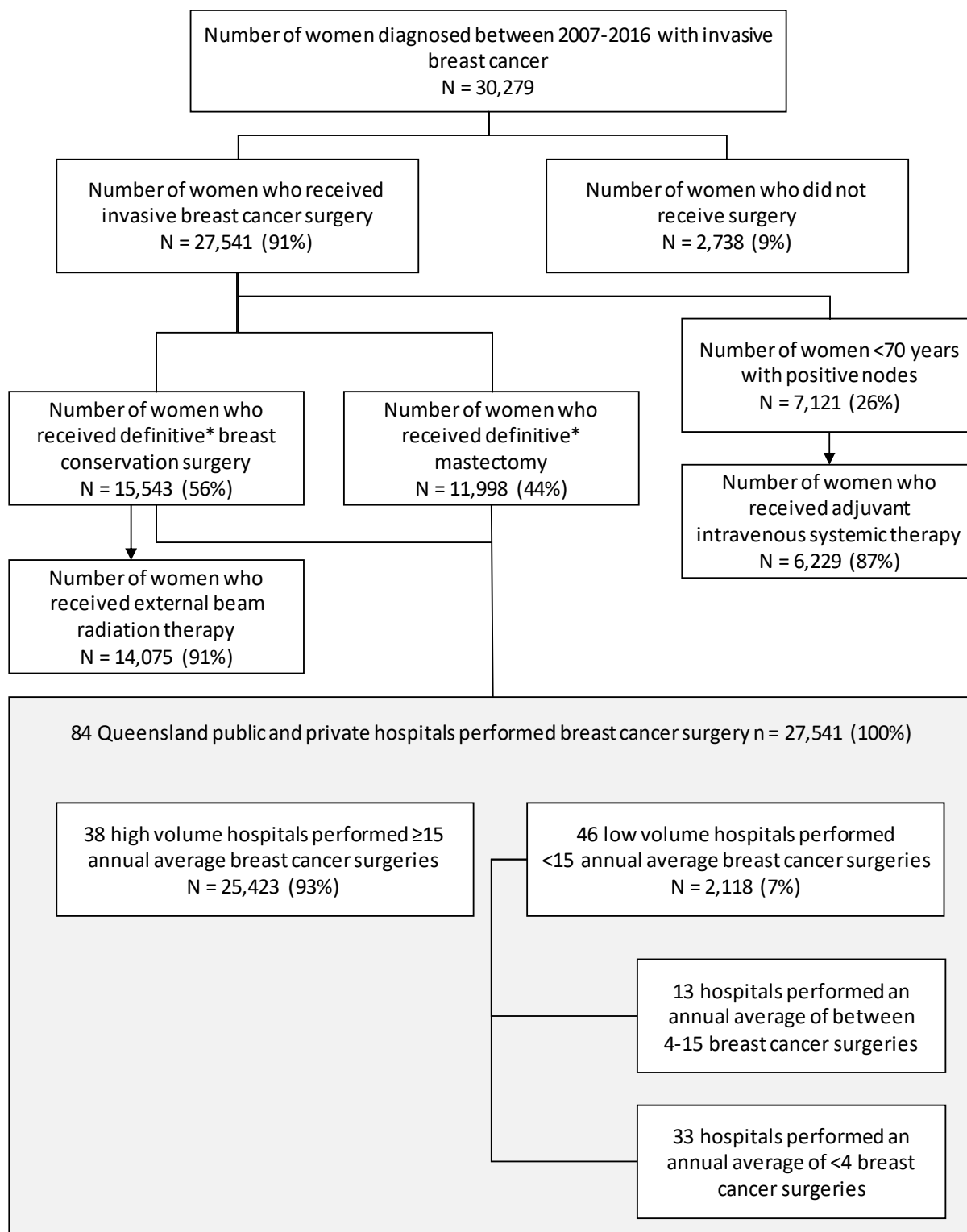
For the first time this report includes QOOL multi-disciplinary review rates (MDT) for breast cancer patients in Queensland. MDT is the gold standard<sup>10</sup>. MDT review in Queensland has doubled from 2007-2011 to the current period 2012-2016.

Similarly, a population-based breast reconstruction surgery rate has been reported for the first time in Queensland. 18% of females diagnosed with invasive breast cancer in Queensland underwent breast reconstruction surgery in the time period 2012-2016 with the majority of breast reconstruction surgery performed in private hospitals. A publication documenting patterns of breast reconstruction in Australia in the year 2013<sup>11</sup> states 6.9% Queensland women underwent breast reconstruction surgery. This publication cohort only included 70-80% of all Queensland breast cancer cases.

The retrospective data used in this index is useful for benchmarking, and baseline breast cancer treatment rates for Queensland. The Sub-committee acknowledges that factors such as patient choice and surgeon choice cannot be accounted for in the analysis, neither are they routinely recorded in electronic data sources.



## What data has been included in the Breast Cancer Quality Index?



*\*Refer to appendix for definition of definitive surgery*

## Report structure overview

Report contents	Description
<b>1   Epidemiological overview</b>	
1.1 Breast cancer incidence and mortality trends	Queensland female invasive breast cancer incidence and mortality age standardised rate 1982-2016
1.2 Understanding the characteristics of breast cancer patients	Queensland female invasive breast cancer by characteristics 2007-2016
1.3 Relative Survival	What is the percentage of females diagnosed with invasive breast cancer are living 5 years after their diagnosis?
<b>2   Effective</b>	
2.1 Breast cancer patients receiving breast cancer surgery	What percentage of female invasive breast cancer patients residing in my HHS received breast cancer surgery?
2.2 Definitive mastectomy	What percentage of female invasive breast cancer patients received a definitive mastectomy?
2.3 Index breast conservation surgery (BCS) for T1 tumours	What percentage of female invasive breast cancer patients who had a T1 tumour and received BCS?
2.4 Re-excision of lesion after index breast conservation surgery (BCS)	What percentage of female invasive breast cancer patients who had a re-excision of lesion after receiving index BCS?
2.5 Conversion of index breast conservation surgery (BCS) to mastectomy	What percentage of female invasive breast cancer patients with an index BCS received a definitive mastectomy?
2.6 Sentinel lymph node biopsy (SLNB) on T1 tumours with index breast conservation surgery (BCS)	What percentage of female invasive breast cancer patients received SLNB on a T1 ( $\leq 20\text{mm}$ ) tumour at the time of index BCS?
2.7 Radiation therapy following definitive breast conservation surgery (BCS)	What percentage of female invasive breast cancer patients received external beam radiation therapy following a definitive BCS within 1 year of diagnosis?
2.8 Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged under 70 years	What percentage of female invasive breast cancer patients aged under 70 years with positive axillary lymph nodes received adjuvant intravenous systemic therapy?
2.9 QOOL Multidisciplinary team (MDT) review	What percentage of female invasive breast cancer patients who received breast cancer surgery were reviewed by a multidisciplinary team during their cancer management in my HHS?
<b>3   Accessible</b>	
3.1 Time from pathological diagnosis to first (index) surgery $\leq 45$ days (excluding women who had neoadjuvant therapy)	What percentage of female invasive breast cancer patients received first (index) surgery within 45 days from pathological diagnosis?
3.2 Time from first (index) surgery to definitive surgery between 1 and 21 days	What percentage of female invasive breast cancer patients received definitive surgery between 1 and 21 days of index BCS surgery?
3.3 Breast reconstruction surgery	What percentage of female invasive breast cancer patients, who received a mastectomy, underwent breast reconstruction surgery?
3.4 Immediate breast reconstruction surgery	What percentage of female invasive breast cancer patients received breast reconstruction surgery at the time of mastectomy?
3.5 Delayed breast reconstruction surgery	What percentage of female invasive breast cancer patients received breast reconstruction surgery any time after mastectomy?
3.6 Patient flows for delayed breast reconstruction surgery	What percentage of female invasive breast cancer patients received breast reconstruction surgery at another facility from their mastectomy?
3.7 Time from mastectomy to breast reconstruction surgery	What cumulative proportion of female invasive breast cancer patients received breast reconstruction surgery after mastectomy?

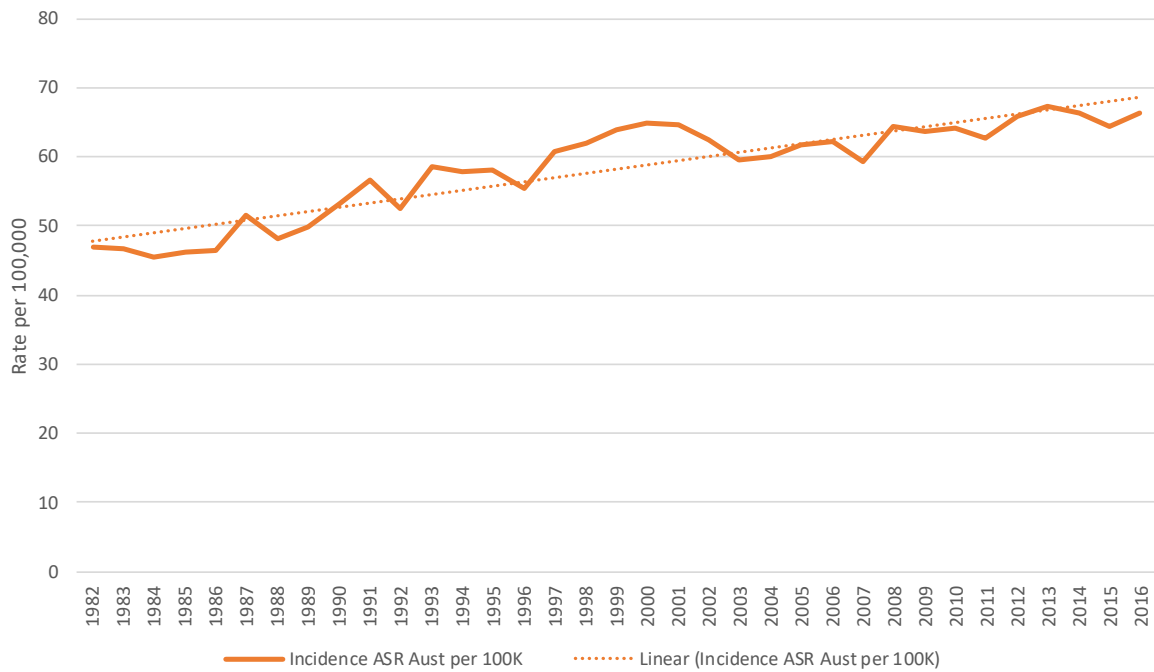
# 1 | Epidemiological overview

Understanding the characteristics of Queensland women diagnosed with invasive breast cancer

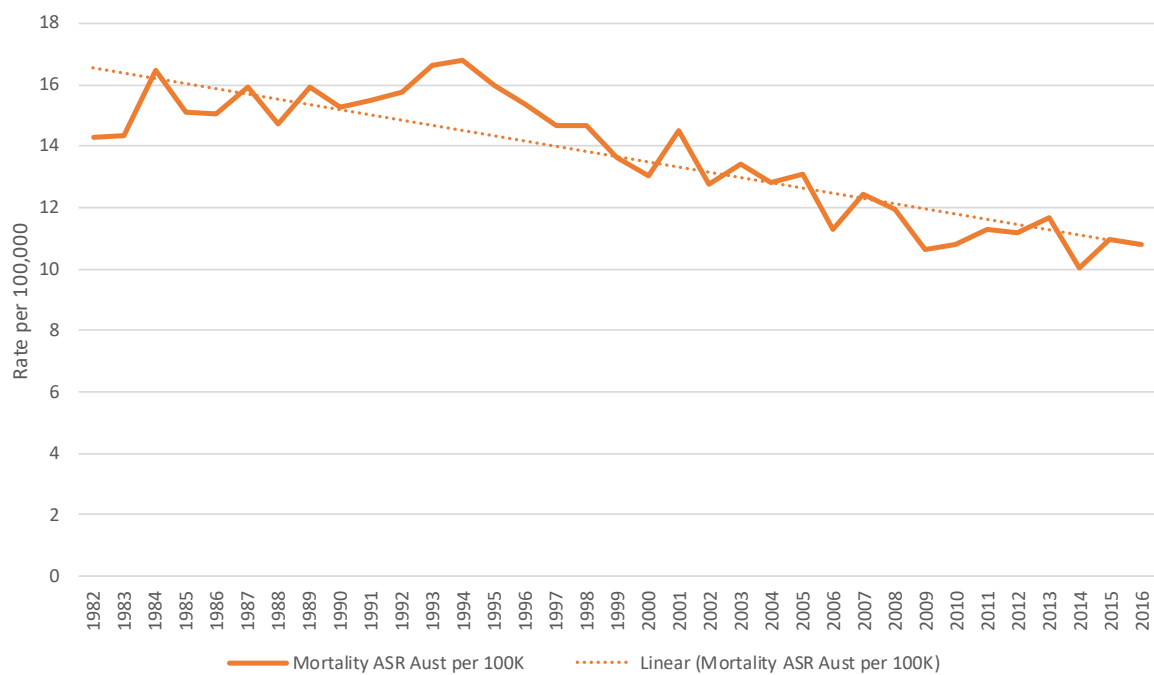


## 1.1 | Breast cancer incidence and mortality trends

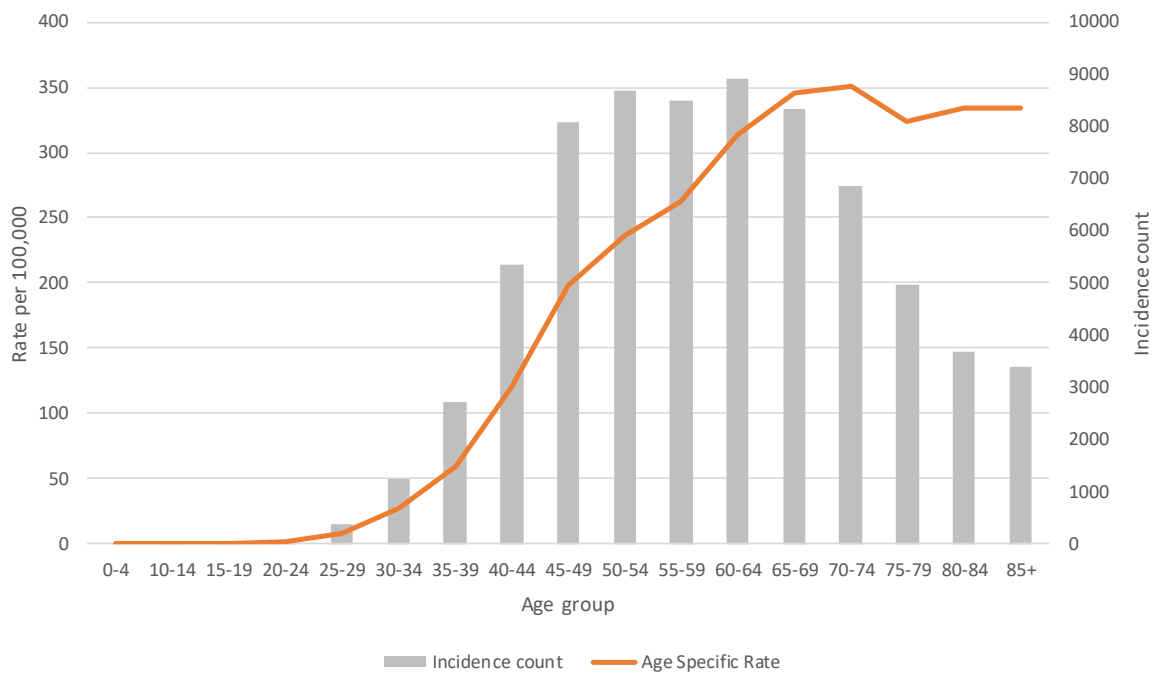
### 1.1.1 | Queensland female invasive breast cancer incidence age standardised rate 1982-2016



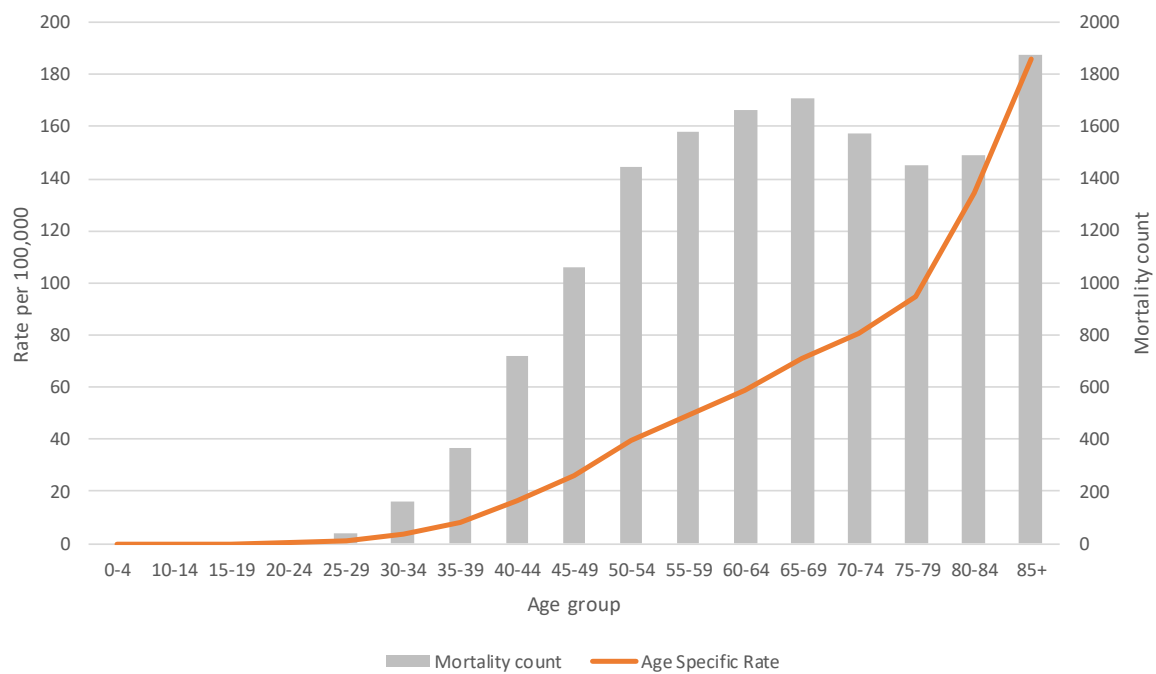
### 1.1.2 | Queensland female invasive breast cancer age standardised mortality rate 1982-2016



1.1.3 | Queensland female invasive breast cancer incidence and age specific incidence rates by five-year age groups 1982-2016



1.1.4 | Queensland female invasive breast cancer mortality and age specific mortality rates by five-year age groups 1982-2016



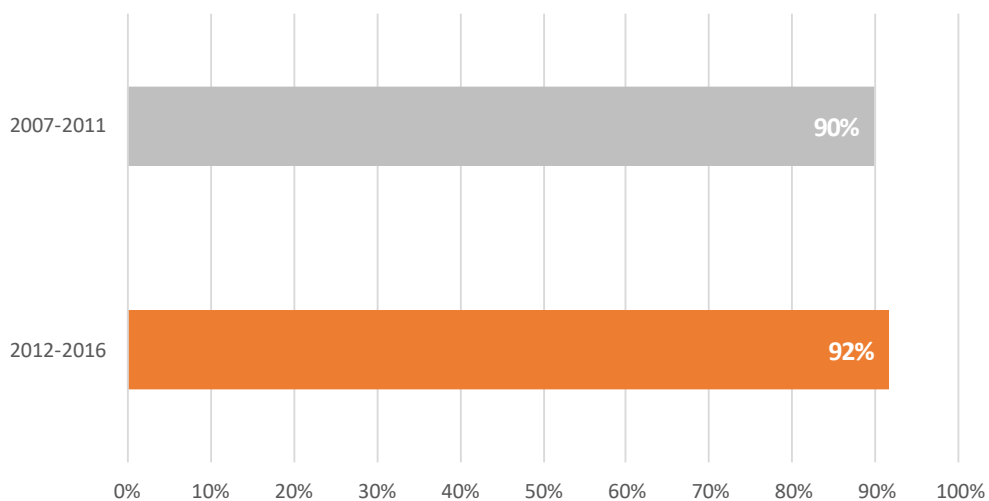
## 1.2 | Understanding the characteristics of breast cancer patients

### 1.2.1 | Queensland female invasive breast cancer by characteristics 2007-2016

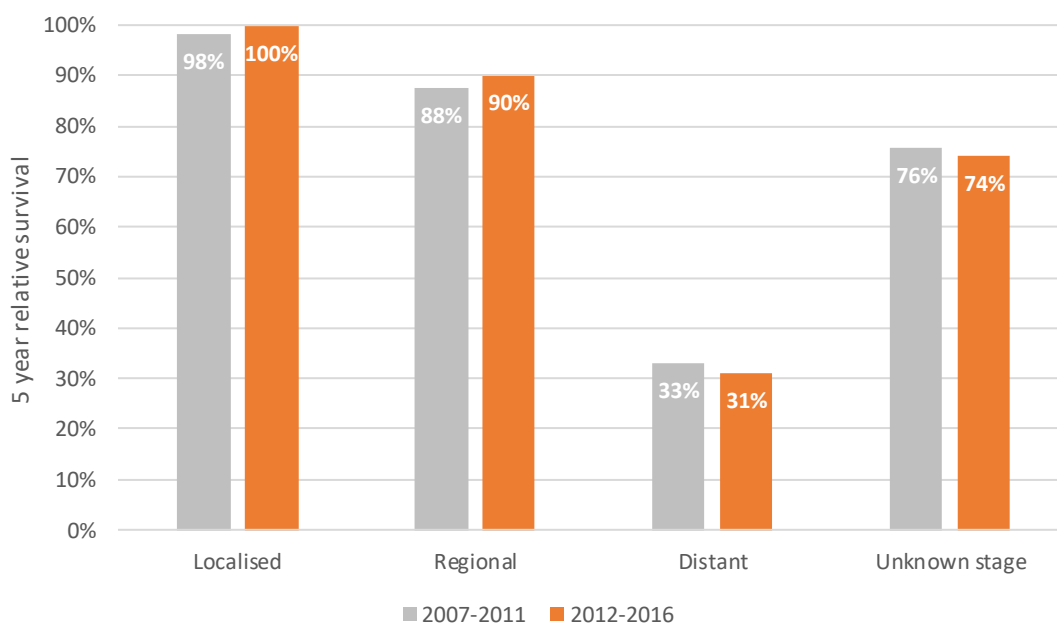
	2007-2011		2012-2016	
	N	Col %	N	Col %
<b>Queensland</b>	<b>13787</b>	<b>100%</b>	<b>16492</b>	<b>100%</b>
<b>Median age at diagnosis</b>				
Median age	60 yrs		62 yrs	
<b>Age group</b>				
0-14	0	0%	0	0%
15-19	0	0%	2	0.01%
20-24	10	0.1%	6	0.04%
25-29	53	0.4%	64	0.4%
30-34	184	1%	206	1%
35-39	439	3%	418	3%
40-44	941	7%	1033	6%
45-49	1487	11%	1726	10%
50-54	1759	13%	1999	12%
55-59	1698	12%	1908	12%
60-64	2004	15%	2148	13%
65-69	1676	12%	2395	15%
70-74	1242	9%	1791	11%
75-79	868	6%	1117	7%
80-84	679	5%	786	5%
85+	747	5%	893	5%
<b>Residence at diagnosis</b>				
Major City	9106	66%	10985	67%
Inner Regional	3027	22%	3574	22%
Outer Regional	1387	10%	1683	10%
Remote & Very Remote	267	2%	250	2%
<b>Socioeconomic status</b>				
Affluent	2258	16%	2784	17%
Middle	9023	65%	10638	65%
Disadvantaged	2506	18%	3070	19%
<b>Indigenous status</b>				
Indigenous	309	2%	378	2%
Non-Indigenous	13458	98%	16040	97%
Unknown	20	0.1%	74	0.4%
<b>Tumour size (mm)</b>				
0-1mm	108	1%	116	1%
2-5mm	2291	17%	2564	16%
6-10mm	4585	33%	5118	31%
11-20mm	757	5%	785	5%
21-50mm	3924	28%	4847	29%
>50mm	773	6%	913	6%
Unknown	1349	10%	2149	13%
<b>Stage at diagnosis</b>				
Localised	7382	54%	9244	56%
Regional	4280	31%	4585	28%
Distant	494	4%	624	4%
Unknown stage	1631	12%	2039	12%
<b>Comorbidities</b>				
0	11975	87%	13554	82%
1	1269	9%	1993	12%
2+	543	4%	945	6%
<b>Axillary lymph nodes</b>				
Positive	4398	32%	4711	29%
Negative (0)	7418	54%	9287	56%
Unknown	1971	14%	2494	15%

## 1.3 | Relative survival

### 1.3.1 | Queensland female invasive breast cancer five-year relative survival for 5-year periods 2007-2011 & 2012-2016



### 1.3.2 | Queensland female invasive breast cancer five-year relative survival by overall stage at diagnosis for 5-year periods 2007-2011 & 2012-2016



## 2 | Effective

Achieving the best outcome for Queensland women with invasive breast cancer and providing cancer services based on recommended guidelines





## Practice indicator summary table

Female invasive breast cancer; year of diagnosis 2007-2011

Indicator results for 2007-2011	Principal referral hospitals	Group A hospitals	Group B hospitals	Group C hospitals	Other hospitals	Public	Private	Queensland
<b>2   Effective</b>								
2.2   Definitive mastectomy	47% (967/2058)	41% (2950/7162)	49% (612/1261)	46% (646/1417)	47% (327/700)	50% (2639/5281)	39% (2863/7317)	44% (5502/12598)
2.3   Index BCS for T1 tumours	77% (884/1154)	79% (3497/4404)	73% (576/786)	74% (655/887)	78% (340/436)	73% (2179/2997)	81% (3773/4670)	78% (5952/7667)
2.4   Re-excision of lesion after index BCS	20% (265/1326)	22% (1068/4955)	20% (157/787)	18% (168/930)	17% (81/472)	24% (793/3258)	18% (946/5212)	21% (1739/8470)
2.5   Conversion of index BCS to mastectomy	17% (221/1326)	14% (697/4955)	16% (123/787)	16% (150/930)	19% (91/472)	18% (586/3258)	13% (696/5212)	15% (1282/8470)
2.6   SLNB on T1 tumours with index BCS*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2.7   Radiation therapy following definitive BCS	91% (989/1091)	91% (3825/4212)	92% (597/649)	86% (661/771)	89% (332/373)	89% (2357/2642)	91% (4047/4454)	90% (6404/7096)
2.8   Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged ≤ 70yrs	80% (509/638)	88% (1761/1994)	81% (251/310)	89% (297/333)	82% (162/198)	80% (1224/1533)	91% (1756/1940)	86% (2980/3473)
<b>3   Accessible</b>								
3.1   Time from pathological diagnosis to first (index) surgery ≤ 45 days	87% (1721/1981)	92% (6360/6904)	94% (1142/1215)	97% (1333/1379)	97% (671/695)	85% (4305/5078)	98% (6922/7096)	92% (11227/12174)
3.2   Time from first (index) surgery to definitive surgery between 1 and 21 days	55% (258/468)	64% (1063/1663)	68% (187/274)	74% (226/304)	64% (103/160)	49% (636/1307)	77% (1201/1562)	64% (1837/2869)
3.3   Breast reconstruction surgery								21% (1145/5502)
3.4   Immediate breast reconstruction surgery	3.3% (32/967)	10% (308/2950)	2.9% (18/612)	9.1% (59/646)	7.3% (24/327)	4.1% (109/2639)	12% (332/2863)	8% (441/5502)
3.5   Delayed breast reconstruction surgery	13% (128/967)	13% (378/2950)	11% (65/612)	14% (93/646)	12% (40/327)	11% (297/2639)	14% (407/2863)	13% (704/5502)

Refer to appendix 1 for hospital grouping definitions.

Crude numbers only.

\*Sentinel lymph node biopsy procedure code was introduced in the ICD-10-AM 6<sup>th</sup> edition July 2008. Due to this SLNB on T1 tumours with index BCS rates could not be calculated for this 5-year period.

\*\*Only Queensland overall breast reconstruction surgery rate has been calculated.

\*\*\*Hospital where mastectomy was performed not where reconstruction surgery occurred.

## Practice indicator summary table

Female invasive breast cancer; year of diagnosis 2012-2016

Indicator results for 2012-2016	Principal referral hospitals	Group A hospitals	Group B hospitals	Group C hospitals	Other hospitals	Public	Private	Queensland
<b>2   Effective</b>								
2.2   Definitive mastectomy	45% (854/1907)	42% (3503/8266)	47% (1286/2748)	42% (613/1464)	43% (240/558)	49% (3164/6482)	39% (3332/8461)	43% (6496/14943)
2.3   Index BCS for T1 tumours	79% (749/954)	79% (3733/4740)	74% (1172/1593)	79% (689/868)	78% (273/348)	73% (2460/3384)	81% (4156/5119)	78% (6616/8503)
2.4   Re-excision of lesion after index BCS	20% (244/1248)	19% (1077/5584)	16% (272/1704)	18% (184/1006)	10% (37/363)	19% (748/3908)	18% (1066/5997)	18% (1814/9905)
2.5   Conversion of index BCS to mastectomy	15% (188/1248)	14% (786/5584)	13% (229/1704)	15% (149/1006)	12% (42/363)	15% (571/3908)	14% (823/5997)	14% (1394/9905)
2.6   SLNB on T1 tumours with index BCS	88% (661/749)	86% (3195/3733)	89% (1041/1172)	83% (573/689)	85% (232/273)	85% (2100/2460)	87% (3602/4156)	86% (5702/6616)
2.7   Radiation therapy following definitive BCS	93% (977/1053)	91% (4347/4763)	91% (1330/1462)	86% (731/851)	90% (286/318)	91% (3018/3318)	91% (4653/5129)	91% (7671/8447)
2.8   Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged ≤ 70yrs	91% (509/562)	89% (1806/2028)	89% (547/615)	89% (300/337)	82% (87/106)	89% (1502/1690)	89% (1747/1958)	89% (3249/3648)
<b>3   Accessible</b>								
3.1   Time from pathological diagnosis to first (index) surgery ≤ 45 days	88% (1571/1792)	90% (6978/7793)	90% (2349/2623)	97% (1359/1399)	96% (533/553)	82% (5028/6096)	96% (7762/8064)	90% (12790/14160)
3.2   Time from first (index) surgery to definitive surgery between 1 and 21 days	53% (216/409)	59% (1031/1754)	53% (259/490)	67% (222/330)	52% (39/75)	45% (568/1269)	67% (1199/1789)	58% (1767/3058)
3.3   Breast reconstruction surgery								18% (1195/6496)
3.4   Immediate breast reconstruction surgery	8.5% (73/854)	12% (413/3503)	5.3% (68/1286)	9.3% (57/613)	2.5% (6/240)	4.3% (136/3164)	14% (481/3332)	9.5% (617/6496)
3.5   Delayed breast reconstruction surgery	6.7% (57/854)	9.5% (332/3503)	8.9% (114/1286)	9.1% (56/613)	7.9% (19/240)	7.7% (243/3164)	10% (335/3332)	8.9% (578/6496)

Refer to appendix 1 for hospital grouping definitions.

Crude numbers only.

\*Only Queensland overall breast reconstruction surgery rate has been calculated.

\*\*Hospital where mastectomy was performed not where reconstruction surgery occurred.

## 2.1 | Breast cancer patients receiving breast cancer surgery

### 2.1.1 | What percentage of female invasive breast cancer patients residing in a Queensland HHS received breast cancer surgery?

*Female invasive breast cancer; year of diagnosis 2007-2011 & 2012-2016*

Breast cancer surgery rate <i>(% of patients receiving surgery)</i>	2007-2011	2012-2016
	Diagnosis year Rate (%) (n/N)	Diagnosis year Rate (%) (n/N)
Cairns and Hinterland	87% (645/740)	87% (751/867)
Central Queensland	92% (558/605)	92% (573/624)
Central West	90% (43/48)	92% (35/38)
Darling Downs	92% (808/874)	90% (872/967)
Gold Coast	90% (1534/1701)	91% (1994/2188)
Mackay	89% (344/388)	91% (520/570)
Metro North	91% (2564/2805)	92% (3110/3393)
Metro South	92% (2763/3008)	91% (3231/3553)
North West	90% (43/48)	87% (41/47)
South West	91% (61/67)	94% (75/80)
Sunshine Coast	91% (1332/1459)	90% (1518/1694)
Torres and Cape	76% (22/29)	74% (29/39)
Townsville	90% (521/580)	89% (658/736)
West Moreton	96% (646/676)	90% (690/770)
Wide Bay	94% (714/759)	91% (846/926)
<b>Queensland</b>	<b>91%</b> <b>(12598/13787)</b>	<b>91%</b> <b>(14943/16492)</b>

Breast cancer surgery is defined as breast conserving surgery or mastectomy.

## 2.1.2 | How many female invasive breast cancer patients received breast cancer surgery by hospital peer group?

*Female invasive breast cancer; year of diagnosis 2007-2011 & 2012-2016*

<b>Breast cancer surgery rate</b>	<b>2007-2011</b>	<b>2012-2016</b>
<i>(Number of patients receiving surgery)</i>	<b>Diagnosis year</b>	<b>Diagnosis year</b>
	Count & rate (%)	Count & rate (%)
Principal referral hospitals	2058 16%	1907 13%
Group A hospitals	7162 57%	8266 55%
Group B hospitals	1261 10%	2748 18%
Group C hospitals	1417 11%	1464 10%
Other hospitals	700 6%	558 4%
<b>Queensland</b>	<b>12598</b>	<b>14943</b>

Refer to appendix 1 for hospital grouping definitions.

Breast cancer surgery is defined as breast conserving surgery or mastectomy.

## 2.2 | Definitive mastectomy

### 2.2.1 | What percentage of female invasive breast cancer patients received a definitive mastectomy?

<b>Definitive mastectomy</b>	<b>2007-2011</b> <b>Diagnosis year</b> Crude rates (n/N)	<b>2012-2016</b> <b>Diagnosis year</b> Crude rates (n/N)
<i>(% of patients having a mastectomy)</i>	[Adjusted rates, CI%, P value]	[Adjusted rates, CI%, P value]
Principal referral hospitals	<b>47% (967/2058)</b> [48%** , 46-50, 0]	<b>45% (854/1907)</b> [43%, 41-45, 0.833]
Group A hospitals	<b>41% (2950/7162)</b> [42%** , 41-43, 0.007]	<b>42% (3503/8266)</b> [43%, 41-44, 0.172]
Group B hospitals	<b>49% (612/1261)</b> [45%, 43-48, 0.176]	<b>47% (1286/2748)</b> [47%** , 45-49, 0]
Group C hospitals	<b>46% (646/1417)</b> [44%, 42-47, 0.616]	<b>42% (613/1464)</b> [42%, 40-45, 0.263]
Other hospitals	<b>47% (327/700)</b> [46%, 43-50, 0.174]	<b>43% (240/558)</b> [44%, 40-48, 0.955]
<b>Queensland</b>	<b>44% (5502/12598)</b>	<b>43% (6496/14943)</b>

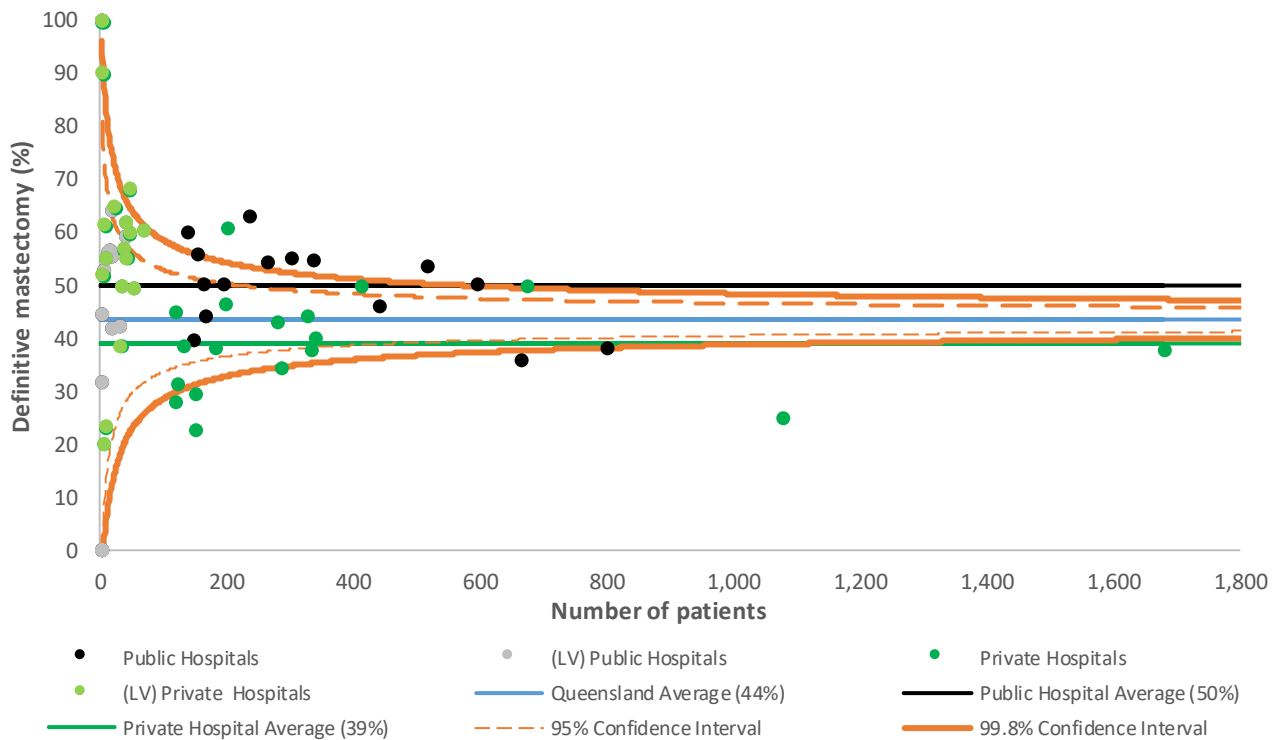
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

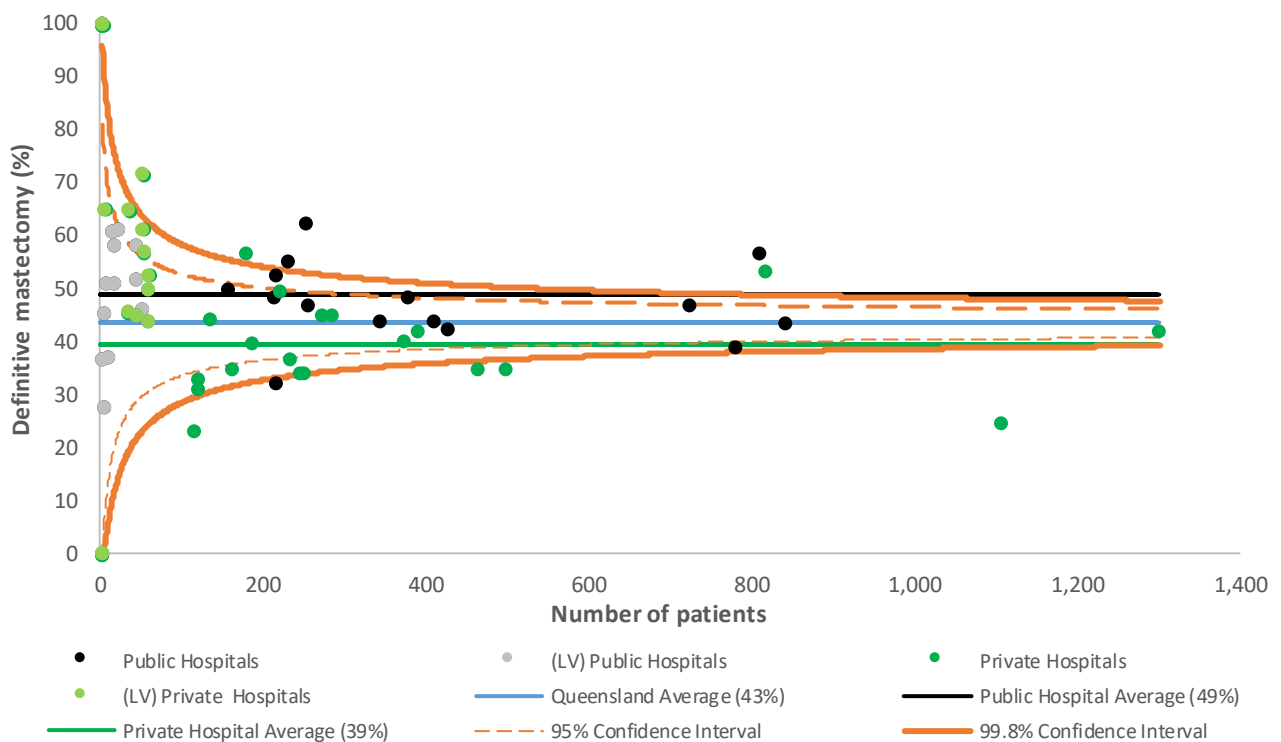
### 2.2.2 | Percentage of female invasive breast cancer patients receiving a definitive mastectomy by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



### 2.2.3 | Percentage of female invasive breast cancer patients receiving a definitive mastectomy by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 2.3 | Index breast conservation surgery (BCS) for T1 tumours

2.3.1 | What percentage of female invasive breast cancer patients who had a T1 tumour ( $\leq 20\text{mm}$ ) received an index BCS?

Index BCS for T1 tumours <i>(% of patients having an index BCS for a T1 tumour (<math>\leq 20\text{ mm}</math>))</i>	2007-2011 Diagnosis year	2012-2016 Diagnosis year
	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	77% (884/1154) [74%** , 72-77, 0.005]	79% (749/954) [78%, 76-81, 0.788]
Group A hospitals	79% (3497/4404) [79%, 77-80, 0.129]	79% (3733/4740) [79%, 77-80, 0.321]
Group B hospitals	73% (576/786) [77%, 74-81, 0.889]	74% (1172/1593) [74%** , 72-76, 0.001]
Group C hospitals	74% (655/887) [76%, 73-80, 0.441]	79% (689/868) [80%, 77-83, 0.1]
Other hospitals	78% (340/436) [79%, 75-83, 0.541]	78% (273/348) [79%, 75-84, 0.54]
<b>Queensland</b>	<b>78% (5952/7667)</b>	<b>78% (6616/8503)</b>

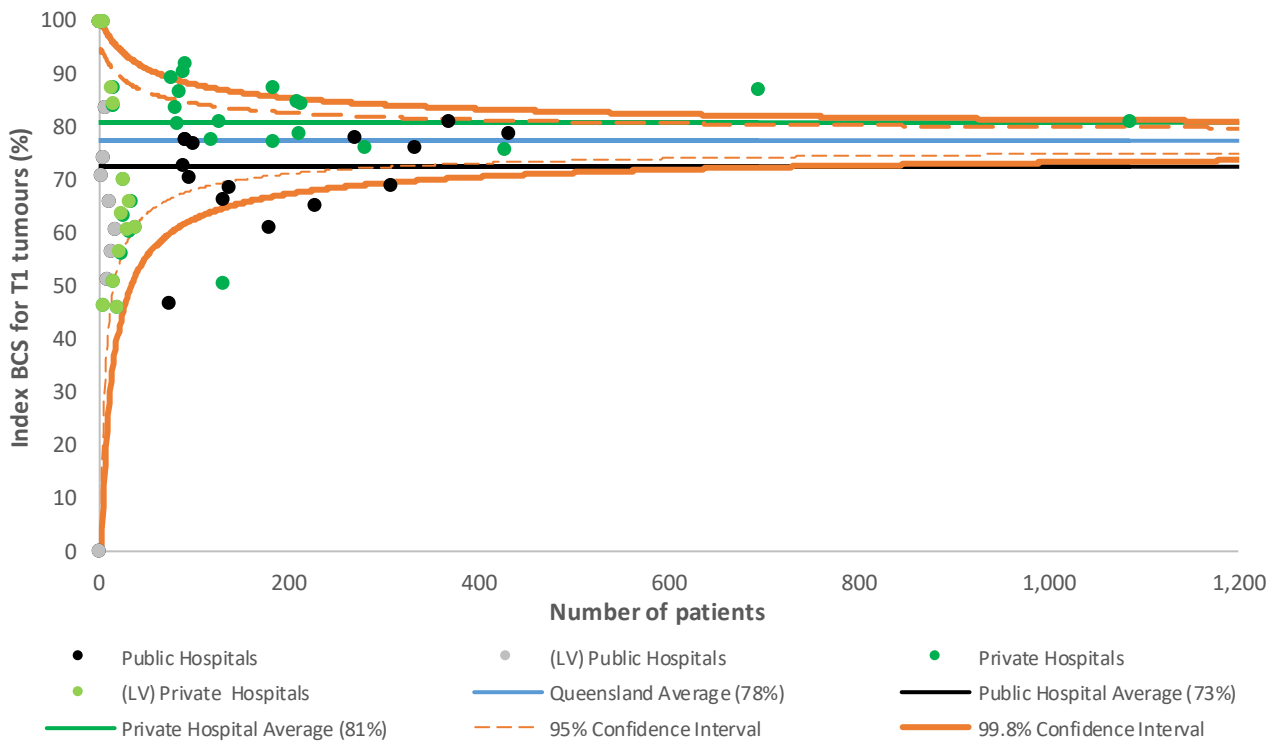
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

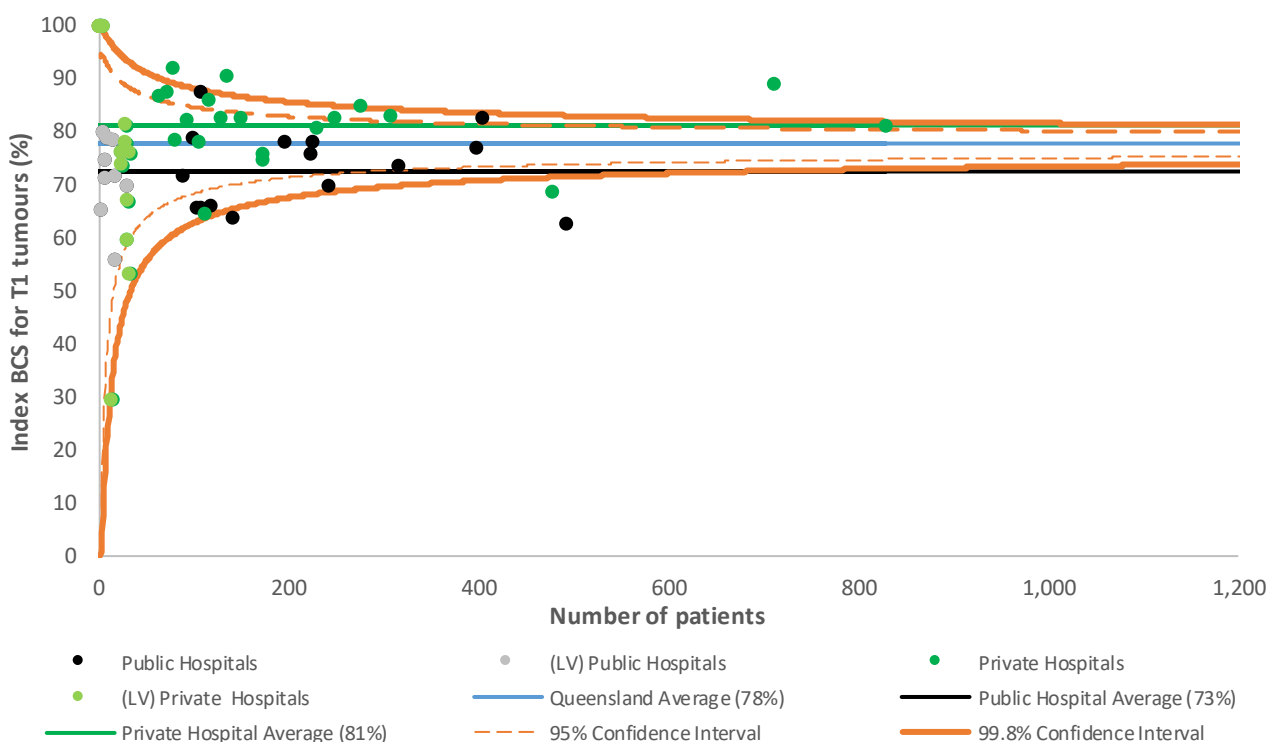
2.3.2 | Percentage of female invasive breast cancer patients who had a T1 tumour ( $\leq 20\text{mm}$ ) receiving an index BCS by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



2.3.3 | Percentage of female invasive breast cancer patients who had a T1 tumour ( $\leq 20\text{mm}$ ) receiving an index BCS by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined





## 2.4 | Re-excision of lesion after index breast conservation surgery (BCS)

### 2.4.1 | What percentage of female invasive breast cancer patients who had a re-excision of lesion after receiving index BCS?

<b>Re-excision of lesion after index BCS</b>	<b>2007-2011 Diagnosis year</b>	<b>2012-2016 Diagnosis year</b>
<i>(% of patients having re-excision of lesion after index BCS)</i>	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	<b>20% (265/1326)</b> [19%, 17-22, 0.281]	<b>20% (244/1248)</b> [19%, 16-21, 0.808]
Group A hospitals	<b>22% (1068/4955)</b> [21%, 20-23, 0.216]	<b>19% (1077/5584)</b> [19%, 18-21, 0.173]
Group B hospitals	<b>20% (157/787)</b> [21%, 18-25, 0.654]	<b>16% (272/1704)</b> [16%, 15-18, 0.06]
Group C hospitals	<b>18% (168/930)</b> [19%, 16-21, 0.174]	<b>18% (184/1006)</b> [19%, 16-22, 0.729]
Other hospitals	<b>17% (81/472)</b> [17%, 14-21, 0.107]	<b>10% (37/363)</b> [11%**, 8-15, 0.001]
<b>Queensland</b>	<b>21% (1739/8470)</b>	<b>18% (1814/9905)</b>

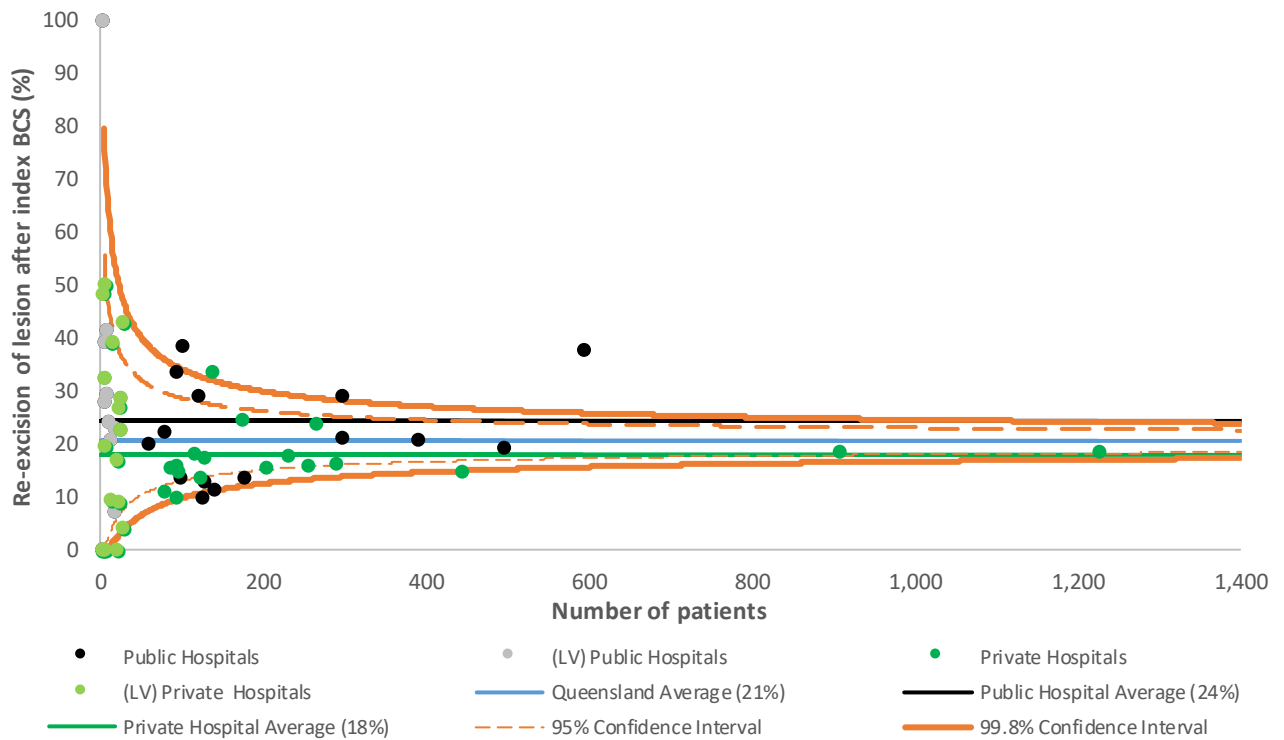
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

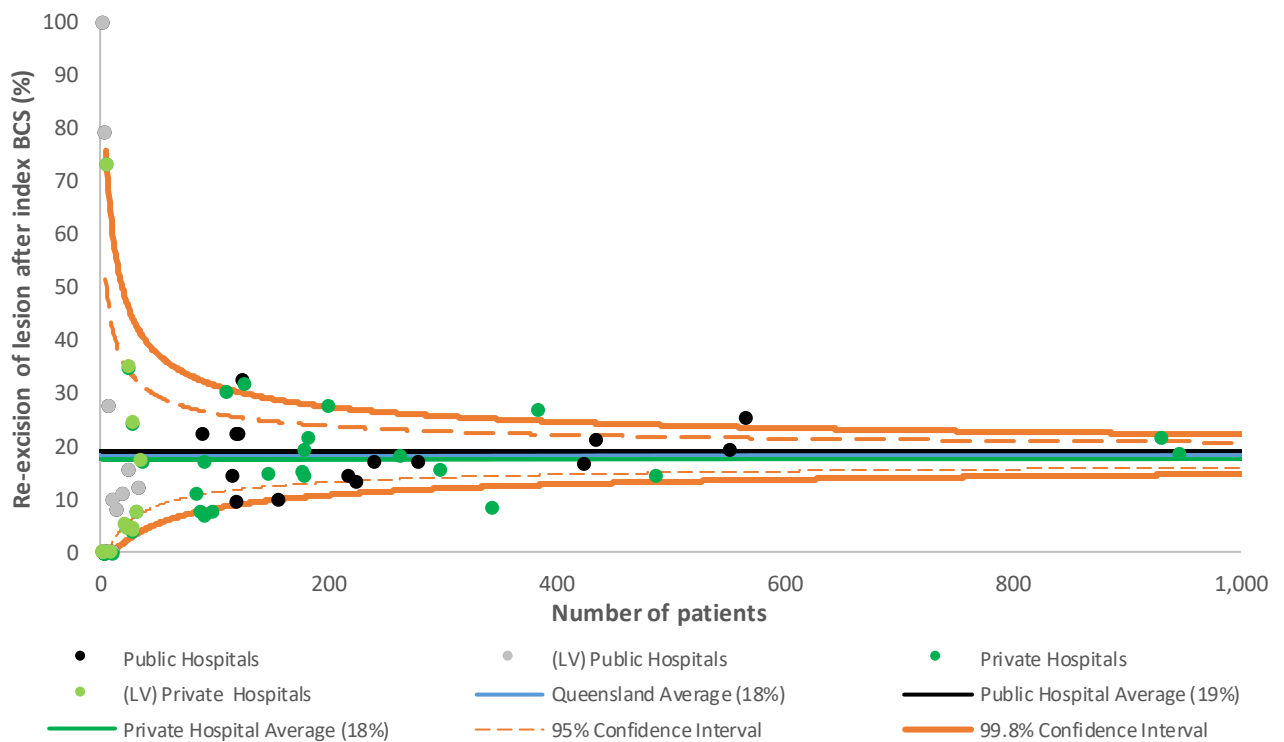
2.4.2 | Percentage of female invasive breast cancer patients who had a re-excision of lesion after receiving index BCS by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



2.4.3 | Percentage of female invasive breast cancer patients who had a re-excision of lesion after receiving index BCS by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 2.5 | Conversion of index breast conservation surgery (BCS) to mastectomy

### 2.5.1 | What percentage of female invasive breast cancer patients with an index BCS received a definitive mastectomy?

<b>Conversion of index BCS to mastectomy</b>	<b>2007-2011 Diagnosis year</b>	<b>2012-2016 Diagnosis year</b>
<i>(% of patients with an index BCS having a definitive mastectomy)</i>	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	<b>17% (221/1326)</b> [16%, 14-19, 0.212]	<b>15% (188/1248)</b> [13%, 12-15, 0.514]
Group A hospitals	<b>14% (697/4955)</b> [14%, 13-15, 0.127]	<b>14% (786/5584)</b> [14%, 13-15, 0.961]
Group B hospitals	<b>16% (123/787)</b> [16%, 13-19, 0.667]	<b>13% (229/1704)</b> [14%, 12-16, 0.994]
Group C hospitals	<b>16% (150/930)</b> [16%, 13-18, 0.654]	<b>15% (149/1006)</b> [15%, 13-18, 0.259]
Other hospitals	<b>19% (91/472)</b> [19%*, 16-23, 0.01]	<b>12% (42/363)</b> [13%, 10-18, 0.705]
<b>Queensland</b>	<b>15% (1282/8470)</b>	<b>14% (1394/9905)</b>

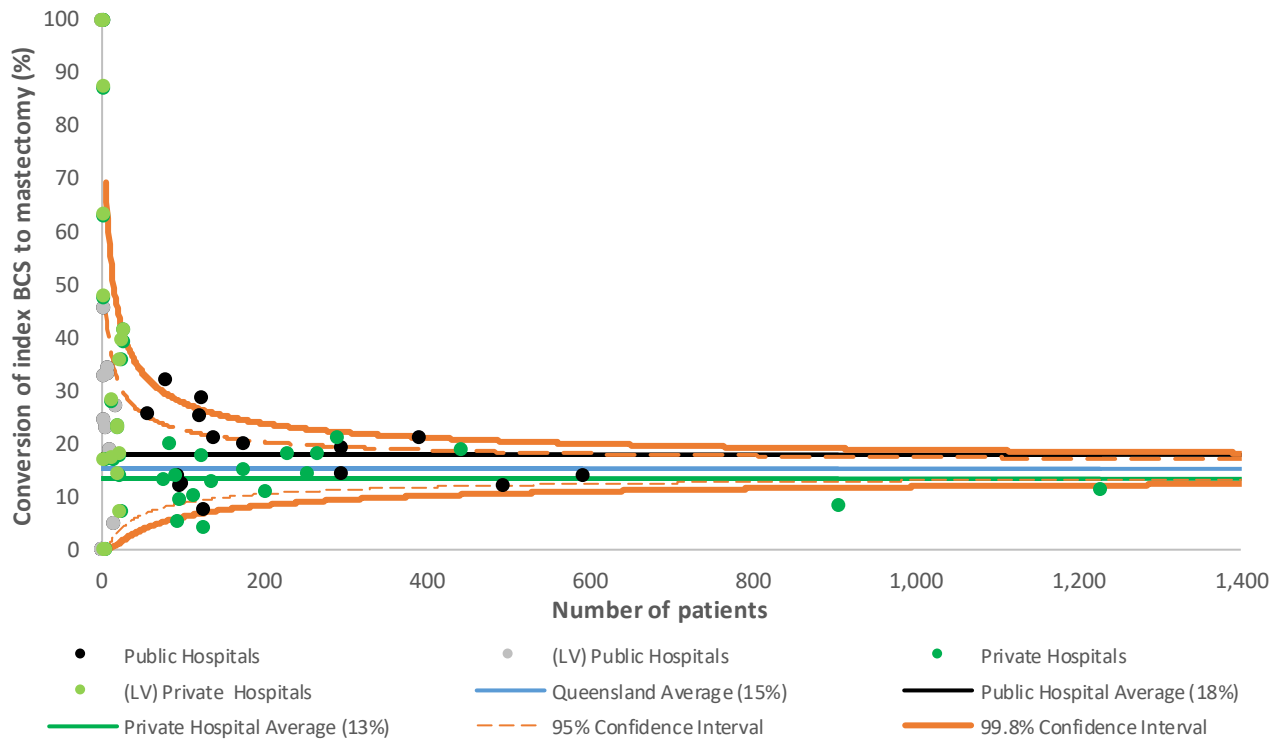
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

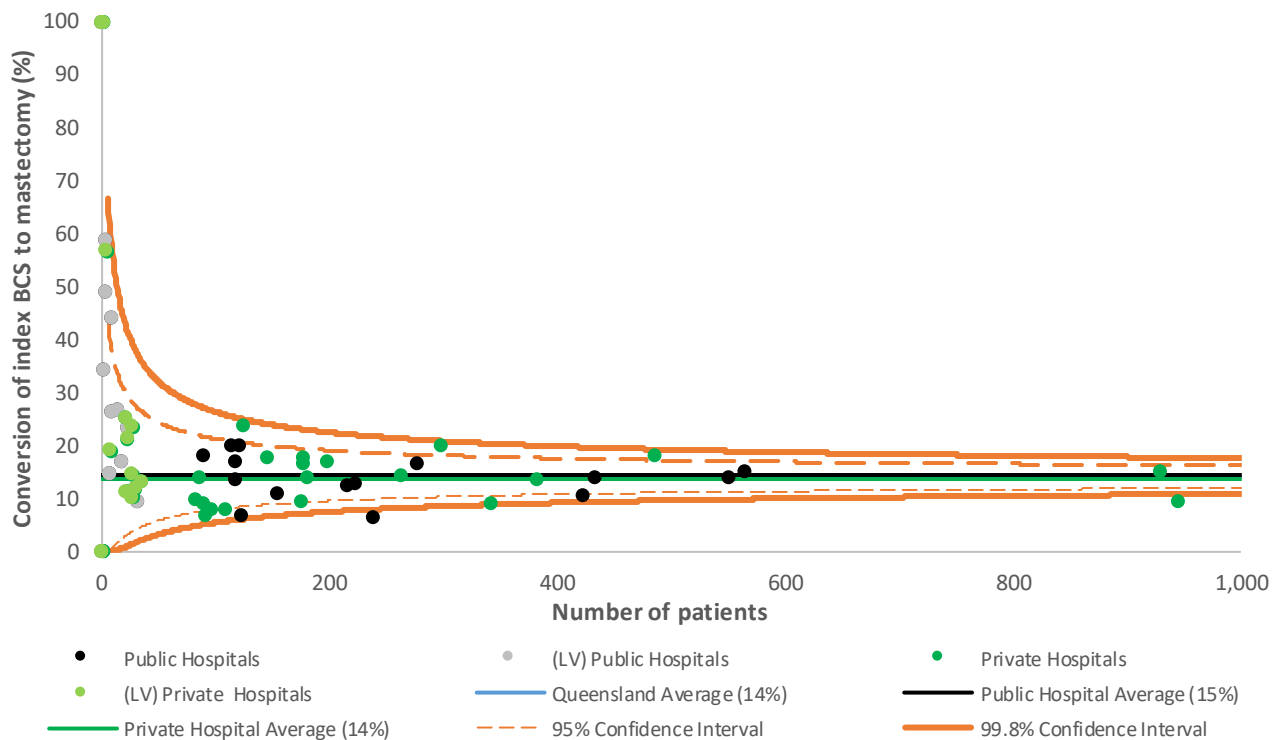
### 2.5.2 | Percentage of female invasive breast cancer patients with an index BCS receiving a definitive mastectomy by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



### 2.5.3 | Percentage of female invasive breast cancer patients with an index BCS receiving a definitive mastectomy by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 2.6 | Sentinel lymph node biopsy (SLNB) on T1 tumours with index breast conservation surgery (BCS)

### 2.6.1 | What percentage of female invasive breast cancer patients received SLNB on a T1 ( $\leq 20$ mm) tumour at the time of index BCS?

<b>SLNB on T1 tumours with index BCS</b>	<b>2007-2011*</b> <b>Diagnosis year</b>	<b>2012-2016</b> <b>Diagnosis year</b>
<i>(% of patients having a SLNB on T1 (<math>\leq 20</math> mm tumour size) tumours with index BCS)</i>	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	N/A	<b>88% (661/749)</b> [87%, 85-90, 0.376]
Group A hospitals	N/A	<b>86% (3195/3733)</b> [85%, 84-87, 0.297]
Group B hospitals	N/A	<b>89% (1041/1172)</b> [89%**, 87-91, 0.007]
Group C hospitals	N/A	<b>83% (573/689)</b> [85%, 82-87, 0.263]
Other hospitals	N/A	<b>85% (232/273)</b> [86%, 82-90, 0.849]
<b>Queensland</b>	<b>N/A</b>	<b>86% (5702/6616)</b>

Refer to appendix 1 for hospital grouping definitions.

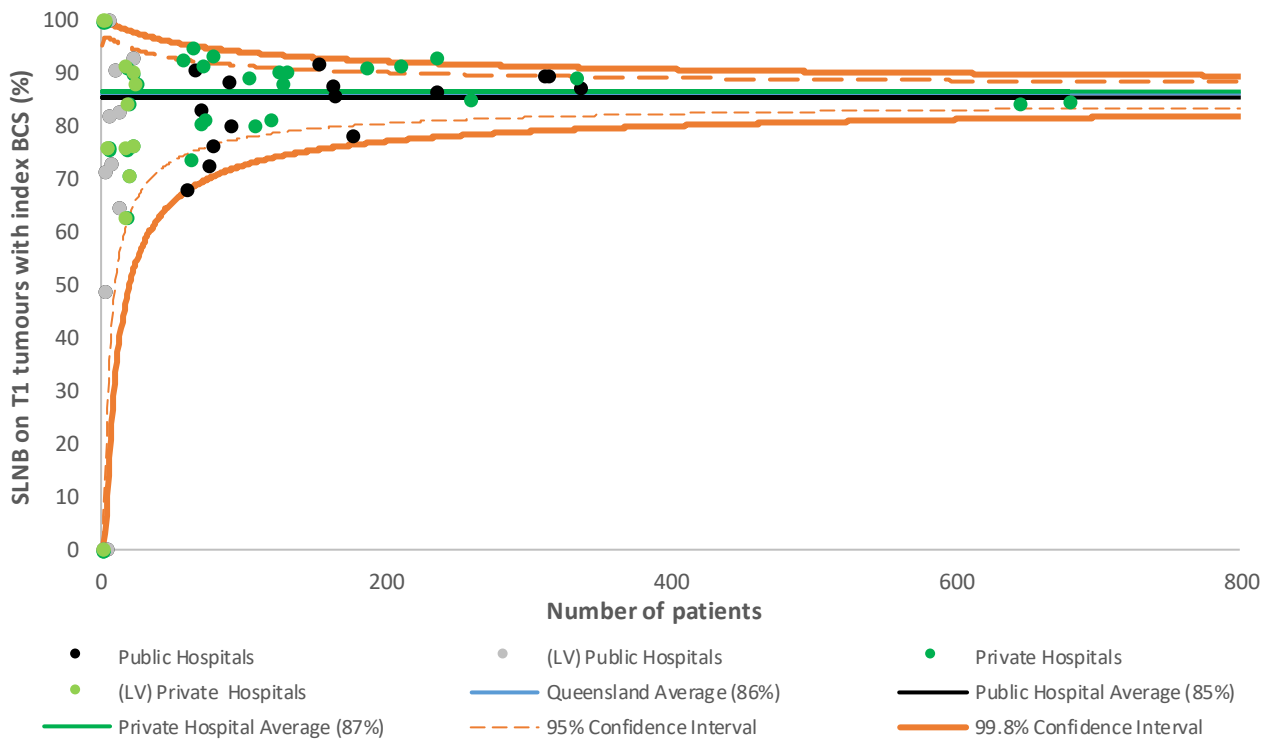
Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

\*Sentinel lymph node biopsy procedure code was introduced in the ICD-10-AM 6<sup>th</sup> edition July 2008. Due to this SLNB on T1 tumours with index BCS rates could not be calculated for this 5-year period.

### 2.6.1 | Percentage of female invasive breast cancer patients receiving SLNB on a T1 ( $\leq 20\text{mm}$ ) tumour at the time of index BCS by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 2.7 | Radiation therapy following definitive breast conservation surgery (BCS)

### 2.7.1 | What percentage of female invasive breast cancer patients received external beam radiation therapy following a definitive BCS within 1 year of diagnosis?

Radiation therapy following definitive BCS <i>(% of BCS patients having radiation therapy)</i>	2007-2011 Diagnosis year	2012-2016 Diagnosis year
	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	91% (989/1091) [90%, 89-92, 0.906]	93% (977/1053) [91%, 90-93, 0.56]
Group A hospitals	91% (3825/4212) [90%, 89-92, 0.691]	91% (4347/4763) [91%, 90-92, 0.482]
Group B hospitals	92% (597/649) [94%**, 92-96, 0.002]	91% (1330/1462) [91%, 90-93, 0.403]
Group C hospitals	86% (661/771) [87%** , 84-89, 0.004]	86% (731/851) [87%** , 85-89, 0.001]
Other hospitals	89% (332/373) [89%, 86-92, 0.482]	90% (286/318) [91%, 88-95, 0.787]
<b>Queensland</b>	<b>90% (6404/7096)</b>	<b>91% (7671/8447)</b>

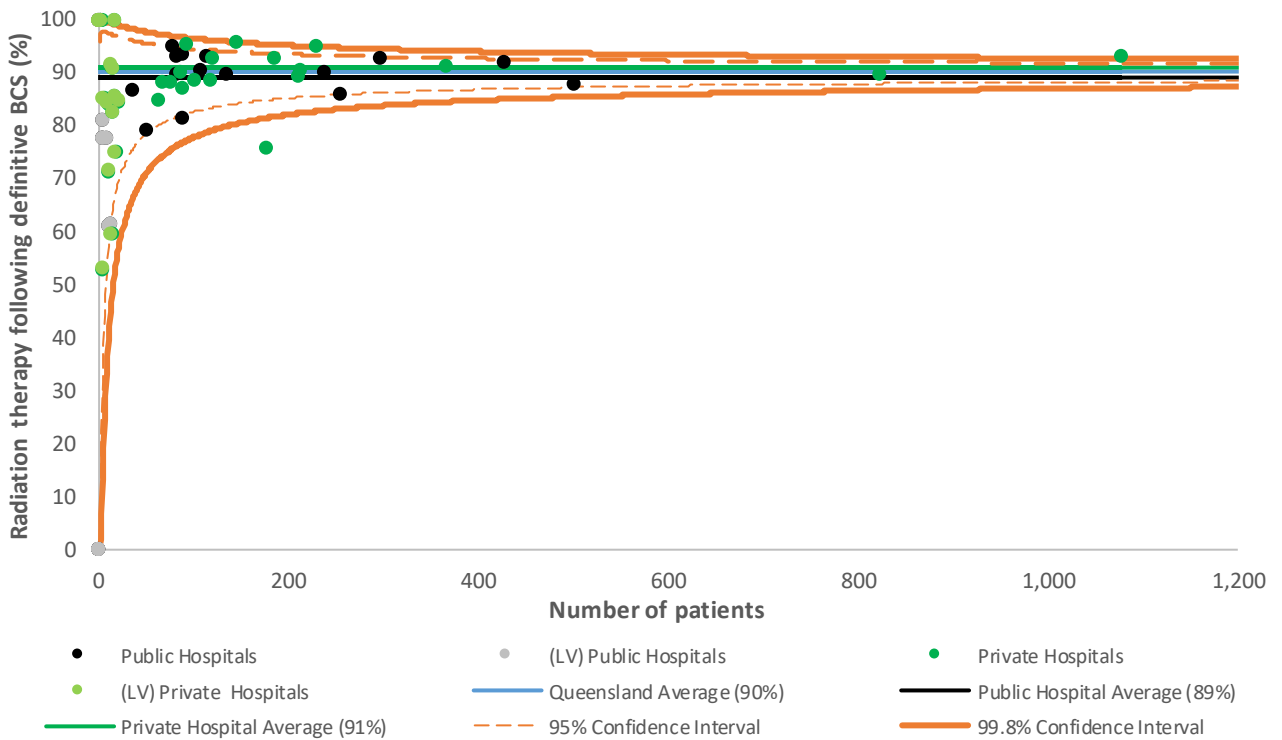
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

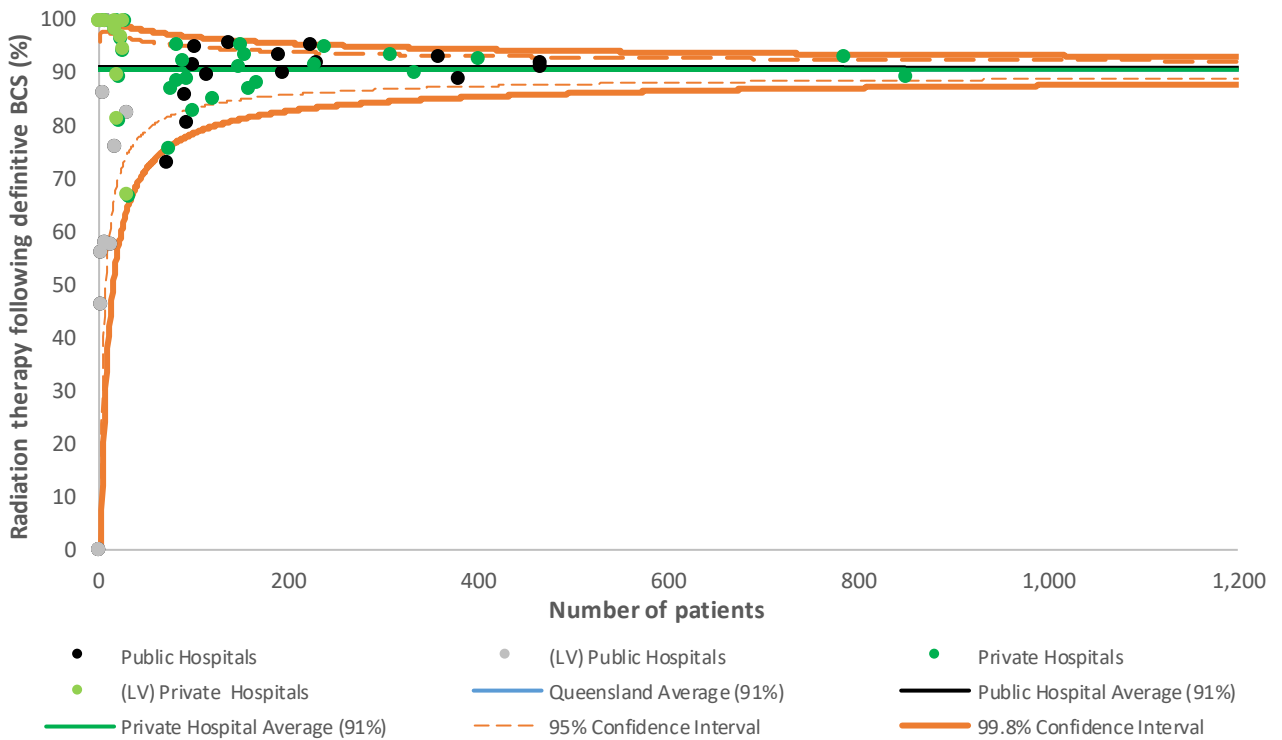
2.7.2 | Percentage of female invasive breast cancer patients receiving external beam radiation therapy following definitive BCS within 1 year of diagnosis by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



2.7.3 | Percentage of female invasive breast cancer patients receiving external beam radiation therapy following definitive BCS within 1 year of diagnosis by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined





## 2.8 | Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged under 70 years

### 2.8.1 | What percentage of female invasive breast cancer patients aged under 70 years with positive axillary lymph node received adjuvant intravenous systemic therapy?

<b>Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged ≤ 70yrs</b> <i>(% of lymph node positive patients aged &lt; 70yrs having adjuvant intravenous systemic therapy)</i>	<b>2007-2011 Diagnosis year</b> Crude rates (n/N) [Adjusted rates, CI%, P value]	<b>2012-2016 Diagnosis year</b> Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	<b>80% (509/638)</b> [79%**, 76-82, 0]	<b>91% (509/562)</b> [89%, 86-91, 0.823]
Group A hospitals	<b>88% (1761/1994)</b> [88%**, 87-90, 0.005]	<b>89% (1806/2028)</b> [89%, 88-91, 0.892]
Group B hospitals	<b>81% (251/310)</b> [82%, 78-87, 0.113]	<b>89% (547/615)</b> [90%, 87-92, 0.725]
Group C hospitals	<b>89% (297/333)</b> [89%, 86-93, 0.058]	<b>89% (300/337)</b> [90%, 86-93, 0.678]
Other hospitals	<b>82% (162/198)</b> [82%, 77-87, 0.161]	<b>82% (87/106)</b> [83%, 76-91, 0.144]
<b>Queensland</b>	<b>86% (2980/3473)</b>	<b>89% (3249/3648)</b>

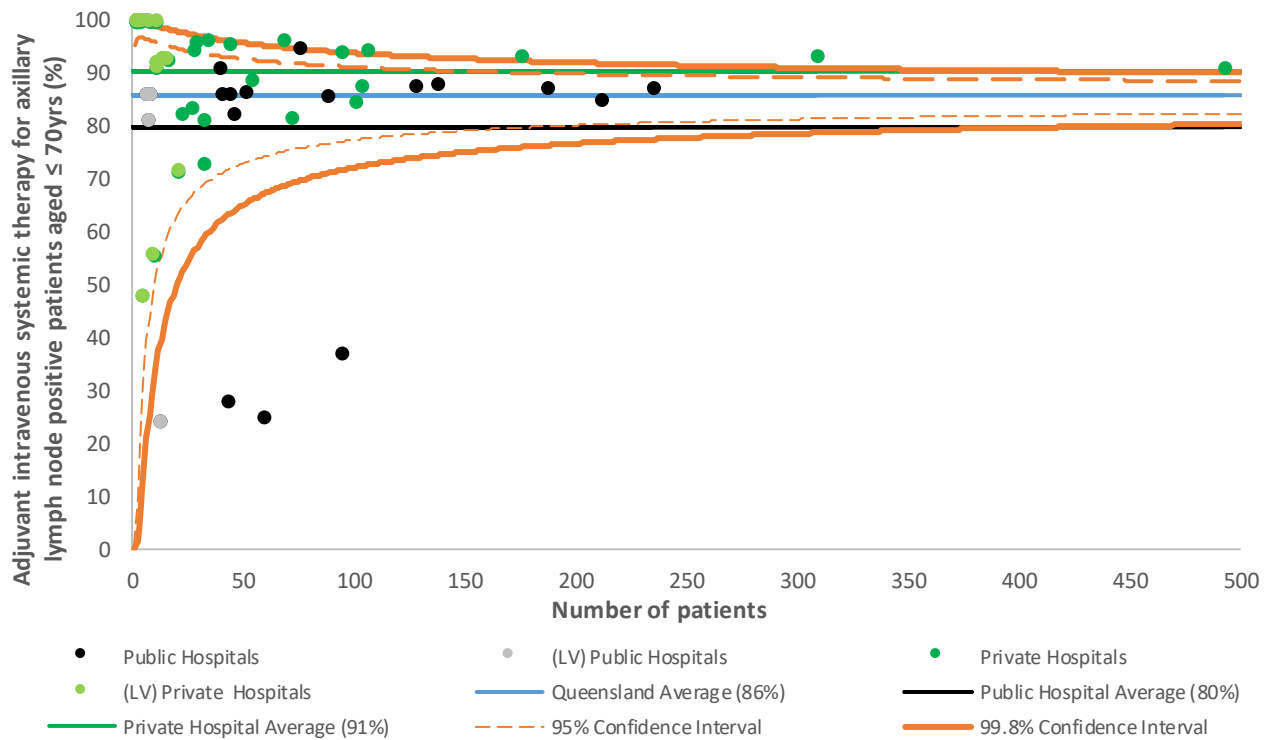
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

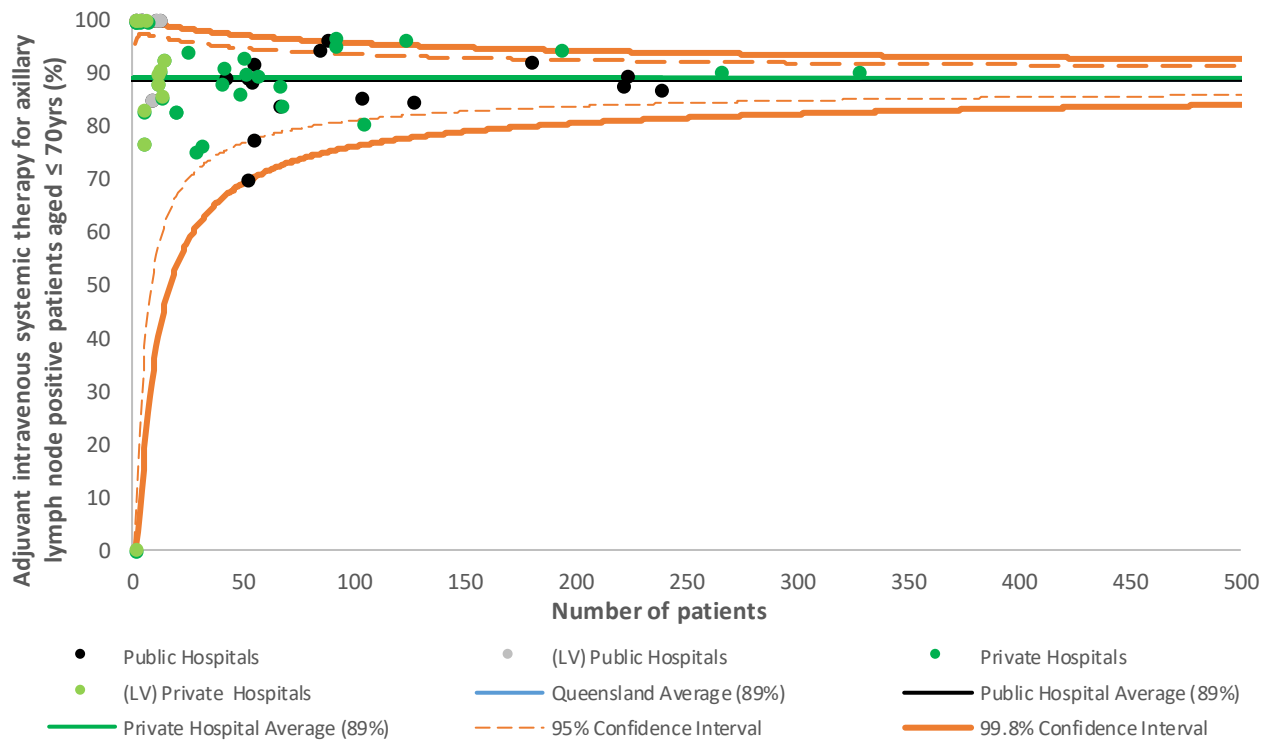
2.8.2 | Percentage of female invasive breast cancer patients aged under 70yrs with positive axillary lymph nodes receiving adjuvant intravenous therapy by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



2.8.3 | Percentage of female invasive breast cancer patients aged under 70yrs with positive axillary lymph nodes receiving adjuvant intravenous therapy by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 2.9 | QOOL multidisciplinary team (MDT) review

### 2.9.1 | What percentage of female invasive breast cancer patients who received breast cancer surgery were reviewed by a multidisciplinary team during their cancer management in my HHS?

<b>QOOL MDT* review rate</b>	<b>2007-2011 Diagnosis year</b>	<b>2012-2016 Diagnosis year</b>
<i>(% of patients having MDT review)</i>	Crude rates (n/N)	Crude rates (n/N)
	[Adjusted rates, CI%, P value]	[Adjusted rates, CI%, P value]
Cairns and Hinterland	38% (242/645) [23%** , 21-26, 0]	86% (644/751) [23%** , 22-24, 0]
Central Queensland	13% (72/558) [13%** , 11-16, 0]	11% (63/573) [11%** , 8-13, 0]
Central West	14% (6/43) [14%, 7-29, 0.223]	23% (8/35) [22%, 12-41, 0.059]
Darling Downs	17% (134/808) [17%** , 15-20, 0.008]	40% (353/872) [40%, 36-43, 0.725]
Gold Coast	18% (271/1534) [18%** , 16-20, 0]	44% (877/1994) [45%** , 43-48, 0]
Mackay	1.7% (6/344) [1.8%** , 1-4, 0]	3.7% (19/520) [3.5%** , 2-5, 0]
Metro North	23% (582/2564) [22%, 21-24, 0.438]	39% (1223/3110) [40%, 38-42, 0.585]
Metro South	29% (811/2763) [29%** , 27-31, 0]	46% (1488/3231) [46%** , 44-48, 0]
North West	4.7% (2/43) [4.9%* , 1-19, 0.031]	12% (5/41) [11%** , 5-25, 0.002]
South West	15% (9/61) [15%, 8-29, 0.281]	33% (25/75) [32%, 23-44, 0.155]
Sunshine Coast	25% (327/1332) [25%** , 22-27, 0.007]	44% (668/1518) [45%** , 42-48, 0]
Torres and Cape	36% (8/22) [34%, 20-59, 0.099]	86% (25/29) [76%** , 65-89, 0]
Townsville	1.2% (6/521) [1.1%** , 1-3, 0]	2.4% (16/658) [2.4%** , 1-4, 0]
West Moreton	17% (108/646) [17%** , 14-20, 0.003]	44% (307/690) [44%* , 40-48, 0.047]
Wide Bay	20% (146/714) [21%, 18-25, 0.786]	35% (295/846) [34%** , 31-38, 0.002]
<b>Queensland</b>	<b>22%</b> <b>(2730/12598)</b>	<b>40%</b> <b>(6016/14943)</b>

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

\*MDT rate is calculated from hospitals that use QOOL to capture MDT review.

# 3 | Accessible

Making health services available to Queensland breast cancer patients



## 3.1 | Time from pathological diagnosis to first (index) surgery ≤ 45 days (excluding women who had neoadjuvant therapy)

### 3.1.1 | What percentage of female invasive breast cancer patients received first (index) surgery within 45 days from pathological diagnosis?

<b>Time from pathological diagnosis to first (index) surgery ≤ 45 days</b>	<b>2007-2011 Diagnosis year</b>	<b>2012-2016 Diagnosis year</b>
<i>(% of patients having surgery 45 days or less from time of pathological diagnosis to index surgery)</i>	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	<b>87% (1721/1981)</b> [86%** , 85-88, 0]	<b>88% (1571/1792)</b> [86%** , 85-88, 0]
Group A hospitals	<b>92% (6360/6904)</b> [92% , 91-93, 0.348]	<b>90% (6978/7793)</b> [89%* , 89-90, 0.031]
Group B hospitals	<b>94% (1142/1215)</b> [96%** , 94-97, 0]	<b>90% (2349/2623)</b> [90% , 89-91, 0.543]
Group C hospitals	<b>97% (1333/1379)</b> [98%** , 97-99, 0]	<b>97% (1359/1399)</b> [98%** , 97-99, 0]
Other hospitals	<b>97% (671/695)</b> [97%** , 95-98, 0]	<b>96% (533/553)</b> [98%** , 96-100, 0]
<b>Queensland</b>	<b>92% (11227/12174)</b>	<b>90% (12790/14160)</b>

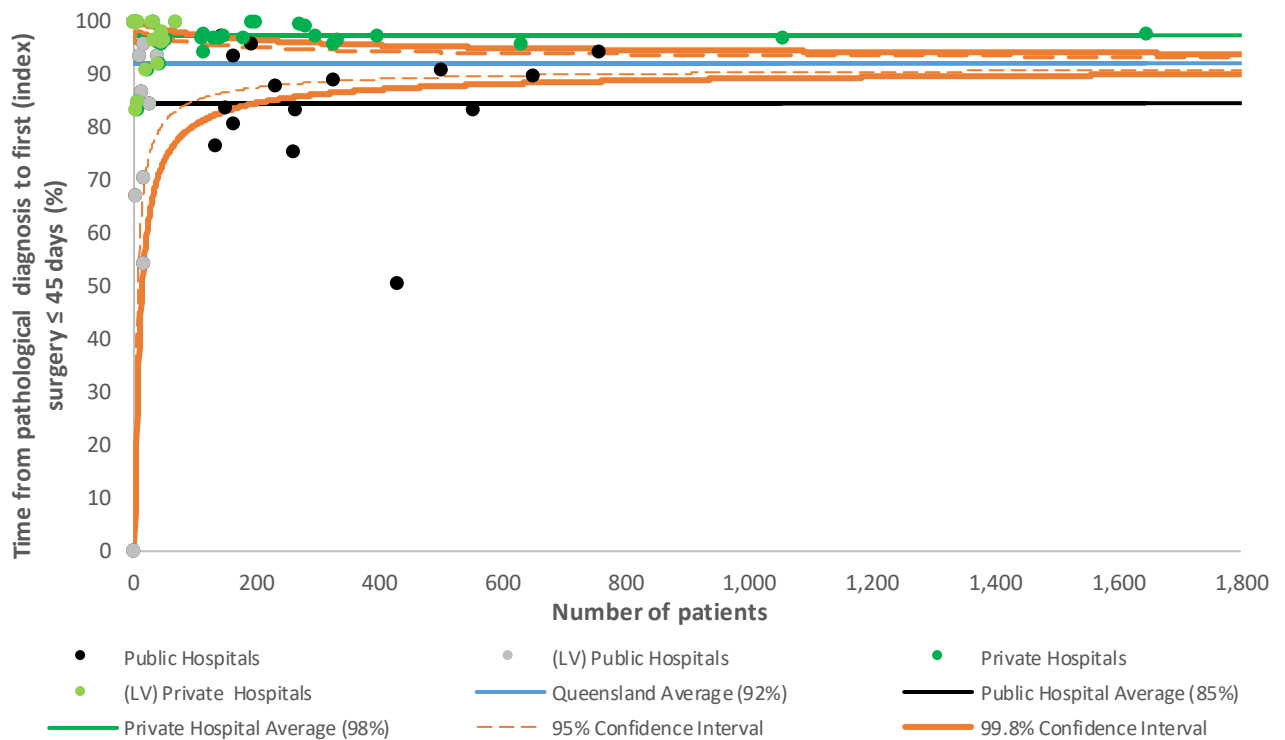
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

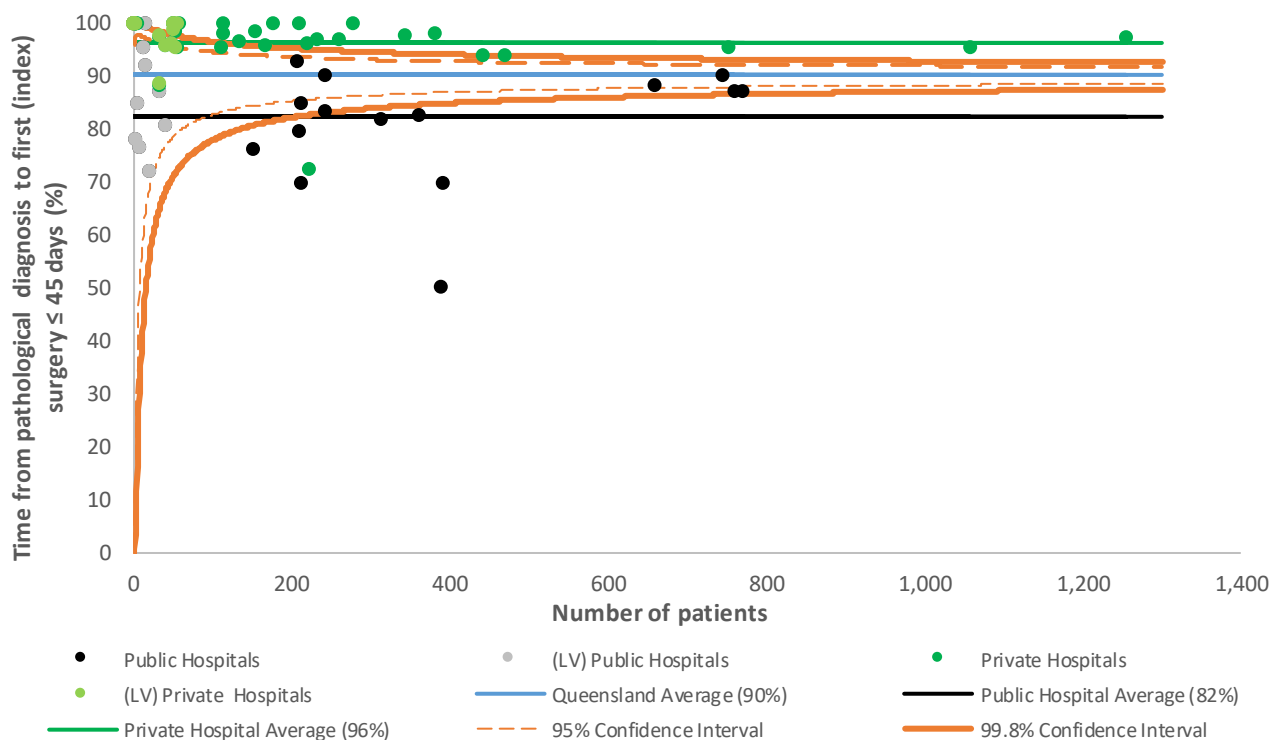
### 3.1.2 | Percentage of female invasive breast cancer patients receiving first (index) surgery within 45 days from pathological diagnosis by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



### 3.1.3 | Percentage of female invasive breast cancer patients receiving first (index) surgery within 45 days from pathological diagnosis by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 3.2 | Time from first (index) surgery to definitive surgery between 1 and 21 days

### 3.2.1 | What percentage of female invasive breast cancer patients received definitive surgery between 1 and 21 days of index BCS surgery?

<b>Time from first (index) surgery to definitive surgery between 1 and 21 days</b> <i>(% of patients receiving definitive surgery between 1 and 21 days from index BCS surgery)</i>	<b>2007-2011</b> <b>Diagnosis year</b> Crude rates (n/N) [Adjusted rates, CI%, P value]	<b>2012-2016</b> <b>Diagnosis year</b> Crude rates (n/N) [Adjusted rates, CI%, P value]
Principal referral hospitals	55% (258/468) [53%**, 49-58, 0]	53% (216/409) [51%*, 46-56, 0.011]
Group A hospitals	64% (1063/1663) [63%, 61-66, 0.626]	59% (1031/1754) [59%, 56-62, 0.535]
Group B hospitals	68% (187/274) [74%**, 67-81, 0.002]	53% (259/490) [54%, 49-59, 0.145]
Group C hospitals	74% (226/304) [78%**, 73-84, 0]	67% (222/330) [69%**, 63-74, 0]
Other hospitals	64% (103/160) [65%, 58-73, 0.822]	52% (39/75) [53%, 42-66, 0.429]
<b>Queensland</b>	<b>64% (1837/2869)</b>	<b>58% (1767/3058)</b>

Refer to appendix 1 for hospital grouping definitions.

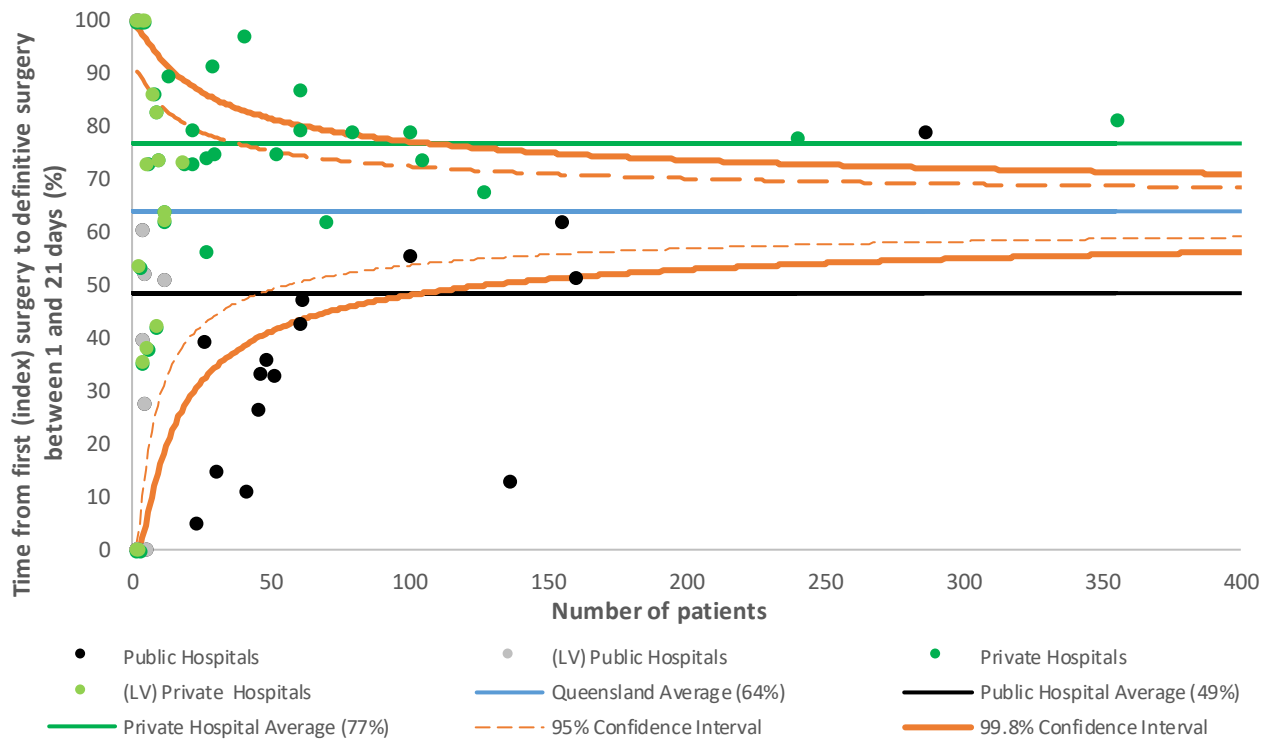
Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

Some patients may have multiple re-excisions prior to definitive surgery.

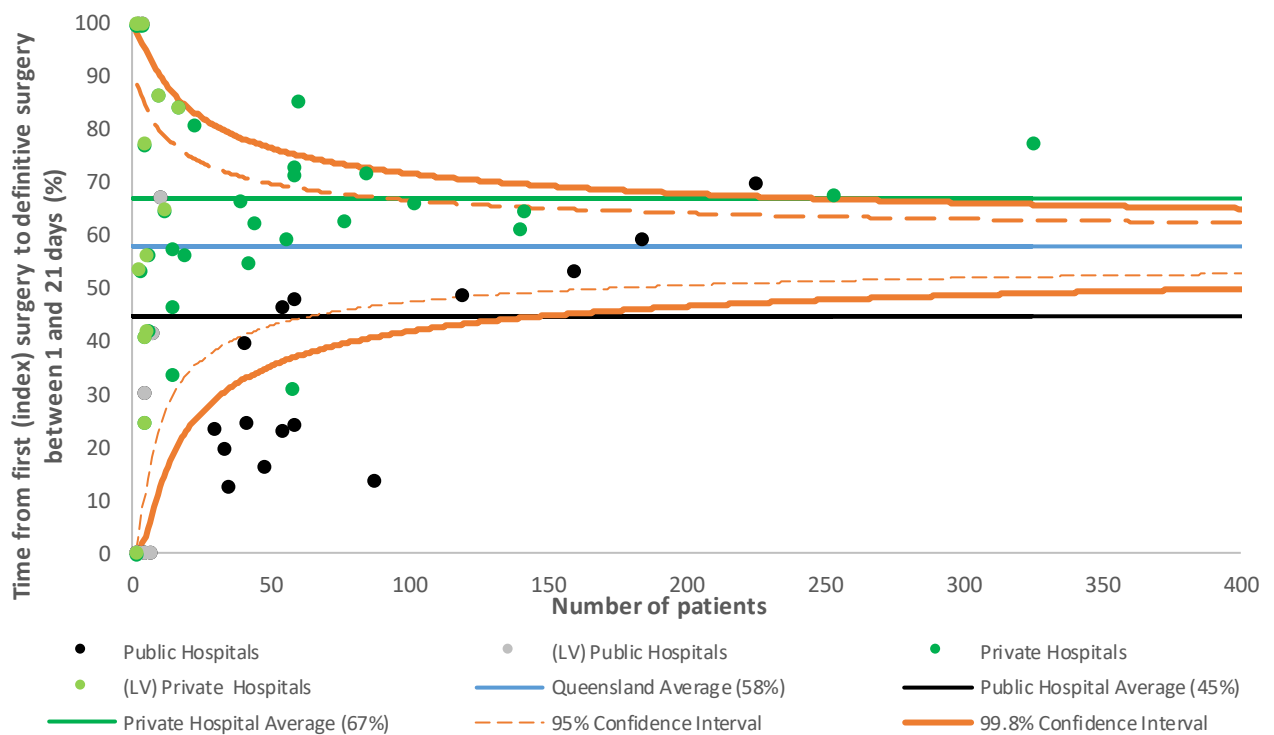
### 3.2.2 | Percentage of female invasive breast cancer patients receiving definitive surgery between 1 and 21 days of index BCS surgery by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



### 3.2.3 | Percentage of female invasive breast cancer patients receiving definitive surgery between 1 and 21 days of index BCS surgery by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined





### 3.3 | Breast reconstruction surgery

#### 3.3.1 | What percentage of female invasive breast cancer patients received a mastectomy and underwent breast reconstruction surgery?

<b>Breast reconstruction surgery following mastectomy</b> <i>(% of patients having breast reconstruction surgery)</i>	<b>2007-2011</b> <b>Diagnosis year</b> Crude rate	<b>2012-2016</b> <b>Diagnosis year</b> Crude rate
Breast reconstruction surgery	21% (1145/5502)	18% (1195/6496)

#### 3.3.2 | What are the characteristics of female invasive breast cancer patients who received mastectomy and underwent breast reconstruction surgery Diagnosis year 2007-2016

	Definitive mastectomy		Breast reconstruction surgery	
	N	Col %	N	Row %
<b>Queensland Total</b>	<b>11998</b>	<b>100%</b>	<b>2340</b>	<b>20%</b>
<b>Age group</b>				
0-9	0	0%	0	0%
10-19	0	0%	0	0%
20-29	77	0.6%	33	43%
30-39	672	5.6%	333	50%
40-49	2377	20%	904	38%
50-59	2742	23%	689	25%
60-69	2890	24%	323	11%
70-79	2018	17%	55	3%
80+	0	0%	0	0%
<b>Residence at diagnosis</b>				
Major City	7428	62%	1688	23%
Inner Regional	3053	25%	403	13%
Outer Regional	1267	11%	225	18%
Remote & Very Remote	250	2.1%	24	10%
<b>Socioeconomic status</b>				
Affluent	1774	15%	514	29%
Middle	7758	65%	1545	20%
Disadvantaged	2466	21%	281	11%
<b>Stage at diagnosis</b>				
Localised	5698	47%	1260	22%
Regional	5321	44%	934	18%
Distant	244	2%	24	10%
Unknown stage	735	6%	122	17%
<b>Comorbidities</b>				
0	9986	83%	2214	22%
1	1413	12%	110	8%
2+	599	5.0%	16	3%

## 3.4 | Immediate breast reconstruction surgery

### 3.4.1 | What percentage of female invasive breast cancer patients received breast reconstruction surgery at the time of mastectomy?

<b>Immediate breast reconstruction surgery</b>	<b>2007-2011 Diagnosis year</b>	<b>2012-2016 Diagnosis year</b>
<i>(% of patients having breast reconstruction surgery at the time of mastectomy)</i>	Crude rates (n/N) [Adjusted rates, CI%, P value]	Crude rates (n/N) [Adjusted rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	3.3% (32/967) [3%** , 2-4, 0]	8.5% (73/854) [7.5%* , 6-9, 0.046]
Group A public hospitals	4.8% (72/1508) [5%** , 4-6, 0]	1.8% (30/1697) [2.2%** , 2-3, 0]
Group A private hospitals	16% (236/1442) [14%** , 12-17, 0]	21% (383/1806) [17%** , 15-19, 0]
Group B hospitals	2.9% (18/612) [3.9%** , 3-6, 0.002]	5.3% (68/1286) [5.6%** , 4-7, 0]
Group C hospitals	9.1% (59/646) [10% , 8-13, 0.081]	9.3% (57/613) [11% , 9-14, 0.271]
Other hospitals	7.3% (24/327) [7.8% , 5-11, 0.892]	2.5% (6/240) [3.6%* , 2-8, 0.016]
<b>Facility Type</b>		
Public hospital	4.1% (109/2639) [4.2%** , 3-5, 0]	4.3% (136/3164) [4.5%** , 4-5, 0]
Private hospital	12% (332/2863) [11%** , 10-13, 0]	14% (481/3332) [14%** , 12-15, 0]
<b>Queensland</b>	<b>8% (441/5502)</b>	<b>9.5% (617/6496)</b>

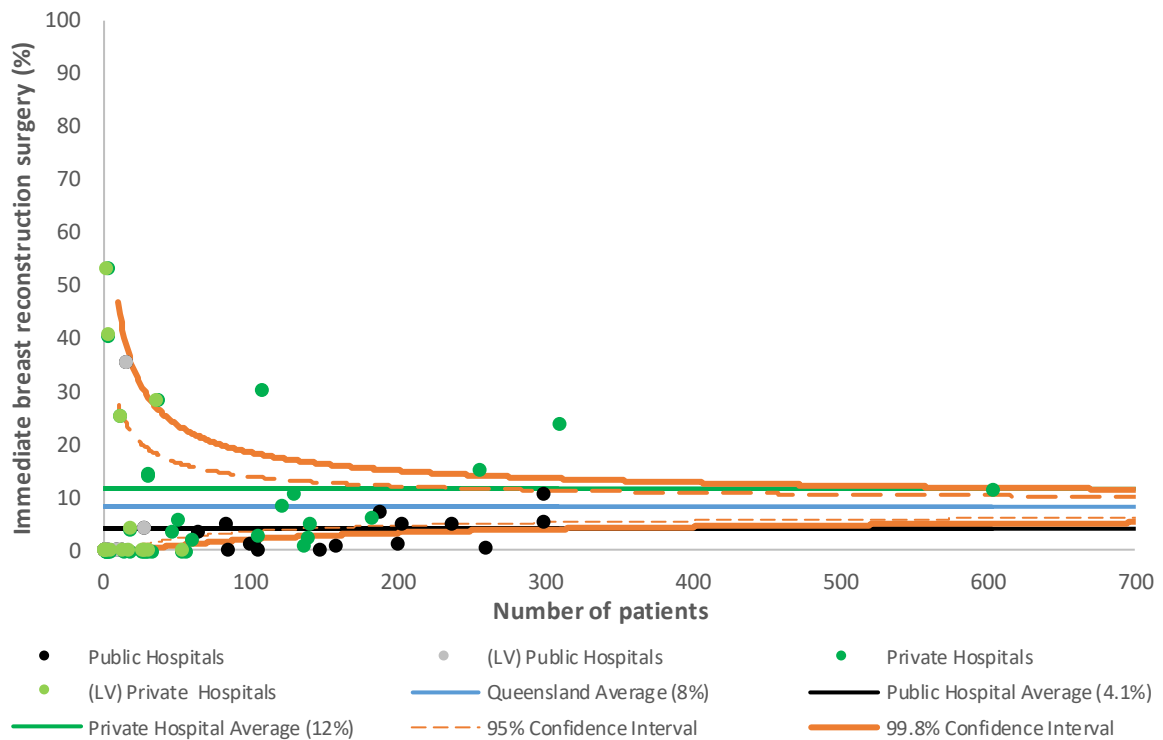
Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Low volume (LV) hospitals perform <15 annual average surgeries.

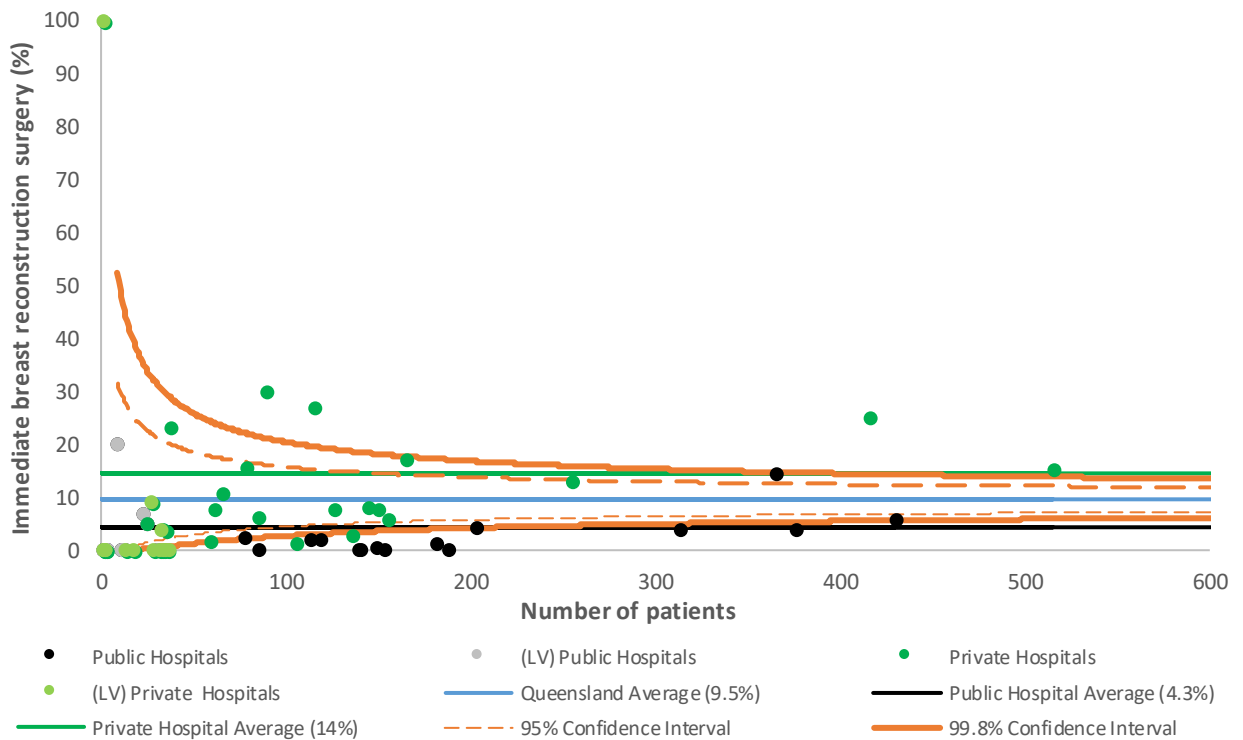
### 3.4.2 | Percentage of female invasive breast cancer patients receiving breast reconstruction surgery at the time of mastectomy by hospital.

Diagnosis year 2007-2011 | Adjusted rates, 5 years combined



### 3.4.3 | Percentage of female invasive breast cancer patients receiving breast reconstruction surgery at the time of mastectomy by hospital.

Diagnosis year 2012-2016 | Adjusted rates, 5 years combined



## 3.5 | Delayed breast reconstruction surgery

### 3.5.1 | What percentage of female invasive breast cancer patients received breast reconstruction surgery any time after mastectomy?

Delayed breast reconstruction surgery	2007-2011 Diagnosis year		2012-2016 Diagnosis year	
	Delayed reconstruction Crude rates (n/N) [Adjusted rates, CI%, P value]	Received adjuvant treatment Crude rates (n/N)	Delayed reconstruction Crude rates (n/N) [Adjusted rates, CI%, P value]	Received adjuvant treatment Crude rates (n/N)
<b>AIHW Peer Group</b>				
Principal referral hospitals	13% (128/967) [12%, 10-14, 0.337]	76% (97/128)	6.7% (57/854) [5.9%** , 5-8, 0.002]	84% (48/57)
Group A public hospitals	9.8% (148/1508) [10%** , 9-12, 0.005]	65% (96/148)	7.2% (123/1697) [7.8%, 7-9, 0.163]	76% (93/123)
Group A private hospitals	16% (230/1442) [14%, 13-16, 0.076]	80% (184/230)	12% (209/1806) [10%, 9-12, 0.057]	82% (172/209)
Group B hospitals	11% (65/612) [13%, 11-17, 0.672]	62% (40/65)	8.9% (114/1286) [9.7%, 8-12, 0.346]	80% (91/114)
Group C hospitals	14% (93/646) [16%* , 13-19, 0.033]	74% (69/93)	9.1% (56/613) [9.6%, 7-12, 0.55]	68% (38/56)
Other hospitals	12% (40/327) [14%, 10-18, 0.614]	70% (28/40)	7.9% (19/240) [11%, 7-17, 0.286]	63% (12/19)
<b>Queensland</b>	<b>13% (704/5502)</b>	<b>73% (514/704)</b>	<b>8.9% (578/6496)</b>	<b>79% (454/578)</b>

Refer to appendix 1 for hospital grouping definitions.

Adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically significantly different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*.

Hospital where mastectomy was performed. Breast reconstruction surgery and adjuvant treatment could have occurred at a different hospital.

### 3.6 | Patient flows for delayed breast reconstruction surgery

#### 3.6.1 | What percentage of female invasive breast cancer patients received breast reconstruction surgery at another facility from their mastectomy?

Diagnosis year 2007-2016

Peer group hospitals where mastectomy performed	Peer group hospitals where breast reconstruction surgery performed						Queensland
	Principal referral hospitals	Group A public hospitals	Group A private hospitals	Group B hospitals	Group C hospitals	Other hospitals	
Principal referral hospitals	86 (46% 64%)	38 (21% 14%)	22 (12% 4%)	18 (10% 12%)	19 (10% 18%)	2 (1% 3%)	185 14%
Group A public hospitals	27 (10% 20%)	173 (64% 64%)	27 (10% 5%)	12 (4% 8%)	10 (4% 9%)	22 (8% 30%)	271 21%
Group A private hospitals	6 (1% 4%)	26 (6% 10%)	361 (82% 66%)	14 (3% 9%)	18 (4% 17%)	14 (3% 19%)	439 34%
Group B hospitals	16 (9% 12%)	18 (10% 7%)	46 (26% 8%)	77 (43% 51%)	14 (8% 13%)	8 (4% 11%)	179 14%
Group C hospitals		15 (10% 6%)	79 (53% 14%)	8 (5% 5%)	44 (30% 41%)	3 (2% 4%)	149 12%
Other hospitals		1 (2% 0%)	10 (17% 2%)	21 (36% 14%)	3 (5% 3%)	24 (41% 33%)	59 5%
<b>Queensland</b>	<b>135</b> <b>11%</b>	<b>271</b> <b>21%</b>	<b>545</b> <b>43%</b>	<b>150</b> <b>12%</b>	<b>108</b> <b>8%</b>	<b>73</b> <b>6%</b>	<b>1282</b>

**Guide to interpretation:**

86  
(46% 64%)

→ There are 86 patients that received breast reconstruction surgery within the same hospital peer group that they received their mastectomy.

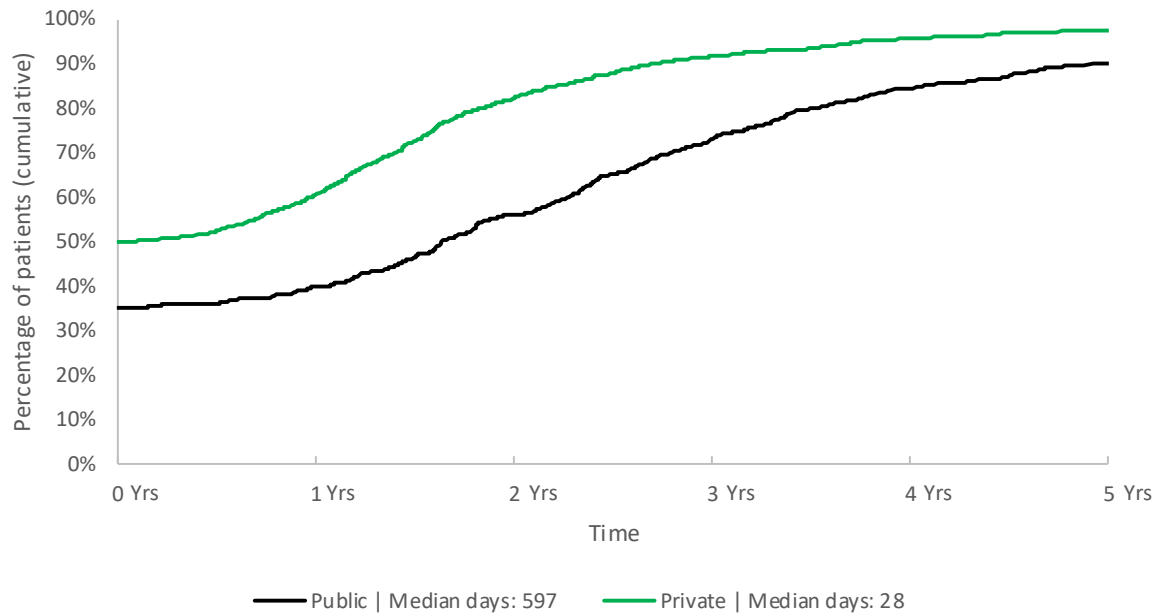


↓ In total, there were 134 patients who received breast reconstruction in a principal referral hospital, meaning that 64% of all patients received mastectomy at a principal referral hospital.

↓ There were 185 patients who received a mastectomy and subsequently received breast reconstruction in a principal referral hospital, meaning that 46% received breast reconstruction in a principal referral hospital.

### 3.7 | Time from mastectomy to breast reconstruction surgery

#### 3.7.1 | What cumulative proportion of female invasive breast cancer patients received breast reconstruction surgery after mastectomy?



x-axis has been capped at 5 years (1825 days). Maximum days from mastectomy to reconstruction is 10.7 years (3937 days).

# Appendix



## Appendix 1: AIHW hospital peer group definitions

### **Principal referral hospitals**

*Principal referral hospitals* are public acute hospitals that provide a very broad range of services, have a range of highly specialised service units, and have very large patient volumes. The term 'referral' recognises that these hospitals have specialist facilities not typically found in smaller hospitals.

### **Public acute group A hospitals (Group A hospitals)**

*Public acute group A hospitals* are public acute hospitals that provide a wide range of services typically including a 24-hour emergency department, intensive care unit, coronary care unit and oncology unit, but do not provide the breadth of services provided by *Principal referral hospitals*.

### **Private acute group A hospitals (Group A hospitals)**

*Private acute group A hospitals* are private acute hospitals that have a 24-hour emergency department and an intensive care unit, and provide a number of other specialised services such as coronary care, special care nursery, cardiac surgery and neurosurgery.

### **Public acute group B hospitals (Group B hospitals)**

*Public acute group B hospitals* are those public acute hospitals that do not have the service profile of the *Principal referral hospitals* and *Group A hospitals*, but do have 24-hour emergency department; they typically provide elective surgery and have specialised service units such as obstetric, paediatric and psychiatric units.

### **Private acute group B hospitals (Group B hospitals)**

*Private acute group B hospitals* are private acute hospitals that do not have a 24-hour emergency department, but do have an intensive care unit and a number of other specialised services including coronary care, special care nursery, cardiac surgery and neurosurgery.

### **Public acute group C hospitals (Group C hospitals)**

*Public acute group C hospitals* include those public acute hospitals that provide a more limited range of services than *Principal referral hospitals* or *Public acute group A* and *B hospitals*, but do have an obstetric unit, provide surgical services and/or some form of emergency facility (emergency department, or accident and emergency service).

### **Private acute group C hospitals (Group C hospitals)**

*Private acute group C hospitals* are those private acute hospitals that do not provide emergency department services or have an intensive care unit, but do provide specialised services in a range of clinical specialities.

### **Public acute group D hospitals (Other hospitals)**

*Public acute group D hospitals* are acute public hospitals that offer a smaller range of services relative to other public acute hospitals and provide 200 or more separations per year. They are mostly situated in regional and remote areas.

### **Private acute group D hospitals (Other hospitals)**

*Private acute group D hospitals* are those private acute hospitals that do not provide emergency department services or have an intensive care unit, do not provide specialised services in a range of clinical specialities, but had 200 or more separations.



Parent Peer Group	AIHW Peer Group	Hospital Name
Principal referral hospitals	Principal referral hospitals	Gold Coast University Hospital
		Princess Alexandra Hospital
		Royal Brisbane & Women's Hospital
		The Prince Charles Hospital
		The Townsville Hospital
Group A hospitals	Public acute group A hospitals	Bundaberg Base Hospital
		Cairns Hospital
		Hervey Bay Hospital
		Ipswich Hospital
		Logan Hospital
	Private acute group A hospitals	Mackay Base Hospital
		Mater Hospital Brisbane
		Nambour General Hospital
		Queen Elizabeth II Jubilee Hospital
		Redcliffe Hospital
		Rockhampton Hospital
		Toowoomba Hospital
		Gold Coast Private Hospital
		Greenslopes Private Hospital
		Holy Spirit Northside
John Flynn Private Hospital		
Mater Private Hospital Brisbane		
Noosa Hospital		
Pindara Private Hospital		
St Andrew's War Memorial Hospital		
The Wesley Hospital		
Group B hospitals	Public acute group B hospitals	Caboolture Hospital
		Caloundra Hospital
		Gladstone Hospital
		Gympie Hospital
		Maryborough Hospital
	Private acute group B hospitals	Mount Isa Base Hospital
		Redland Hospital
		Robina Hospital
		Buderim Private Hospital
		Friendly Society Private Hospital
		Mater Hospital Pimlico
		St Andrew's Toowoomba Hospital
		St Vincent's Hospital Toowoomba
		Sunshine Coast University Private Hospital
		Atherton Hospital
Group C hospitals	Public acute group C hospitals	Ayr Hospital
		Charleville Hospital
		Chinchilla Hospital
		Dalby Hospital
		Emerald Hospital
	Private acute group C hospitals	Goondiwindi Hospital
		Innisfail Hospital
		Kingaroy Hospital
		Longreach Hospital
		Roma Hospital
		Warwick Hospital
		Brisbane Private Hospital
		Cairns Private Hospital
		Hillcrest - Rockhampton Private Hospital
		Mater Misericordiae Hospital Gladstone
Mater Misericordiae Hospital Mackay		

<b>Parent Peer Group</b>	<b>AIHW Peer Group</b>	<b>Hospital Name</b>	
Other hospitals		Mater Misericordiae Hospital Rockhampton	
		Mater Private Hospital Redland	
		Mater Women's and Children's Hospital Hyde Park	
		North West Private Hospital	
		St Andrew's - Ipswich Private Hospital	
		Sunnybank Private Hospital	
		Public acute group D hospitals	Ingham Hospital
			Caboolture Private Hospital
			Caloundra Private Clinic
			Gympie Private Hospital
			Hervey Bay Surgical Hospital
			Kawana Private Hospital
		Private acute group D hospitals	Lady Bjelke-Petersen Community Hospital
			Mater Misericordiae Hospital Bundaberg
			Nambour Selangor Private Hospital
			Peninsula Private Hospital
			Pioneer Valley Hospital
			St Stephen's Private Hospital Maryborough
			Cairns Central Day Hospital
			Pacific Private Day Hospital
	Mixed day procedure hospitals	Pindara Day Procedure Centre	
		St Stephen's Hospital Hervey Bay	
		Townsville Day Surgery	
	Plastic & reconstructive surgery centres	Pacific Day Surgery Centre	
	Women's hospitals	Mater Mothers' Hospital	

## Appendix 2: Practice indicator calculations

	Practice indicator	Calculation
<b>2   Effective</b>		
2.2	Definitive mastectomy	Definitive mastectomy ÷ Number of patients who had breast cancer surgery
2.3	Index breast conservation surgery (BCS) for T1 tumours	Index BCS for T1 tumours (≤ 20 mm tumour size) ÷ T1 tumours
2.4	Re-excision of lesion after index breast conservation surgery (BCS)	Re-excision of lesion after index BCS ÷ Index BCS
2.5	Conversion of index breast conservation surgery (BCS) to mastectomy	Definitive mastectomy - index mastectomy ÷ Index BCS
2.6	Sentinel lymph node biopsy (SLNB) on T1 tumours with index breast conservation surgery (BCS)	SLNB on T1 (≤ 20 mm tumour size) tumours with index BCS ÷ Index BCS with T1 tumours
2.7	Radiation therapy following definitive breast conservation surgery (BCS)	Number of patients who had external beam radiation therapy ÷ definitive BCS within 1 year of diagnosis
2.8	Adjuvant intravenous systemic therapy for axillary lymph node positive patients aged under 70 years	Number of patients who had adjuvant intravenous systemic therapy ÷ Number of patients aged under 70yrs and have positive axillary lymph nodes
<b>3   Accessible</b>		
3.1	Time from pathological diagnosis to first (index) surgery ≤ 45 days (excluding women who had neoadjuvant therapy)	Number of patients who had surgery 45 days or less from time of pathological diagnosis to index surgery ÷ Number of patients who had breast cancer surgery (excluding women who received neoadjuvant therapy)
3.2	Time from first (index) surgery to definitive surgery between 1 and 21 days	Number of patients who had surgery between 1 and 21 days or less from BCS index surgery to definitive surgery ÷ Number patients who had a subsequent breast cancer surgery following BCS
3.3	Breast reconstruction surgery	Number of patients who had breast reconstruction surgery and had a definitive mastectomy ÷ Number of patients who had definitive mastectomy
3.4	Immediate breast reconstruction surgery	Number of patients who had breast reconstruction surgery at the time of definitive mastectomy ÷ Number of patients who had definitive mastectomy
3.5	Delayed reconstruction surgery	Number of patients who had breast reconstruction surgery any time after definitive mastectomy ÷ Number of patients who had definitive mastectomy

## Appendix 3: Patient Characteristics | 2007-2016

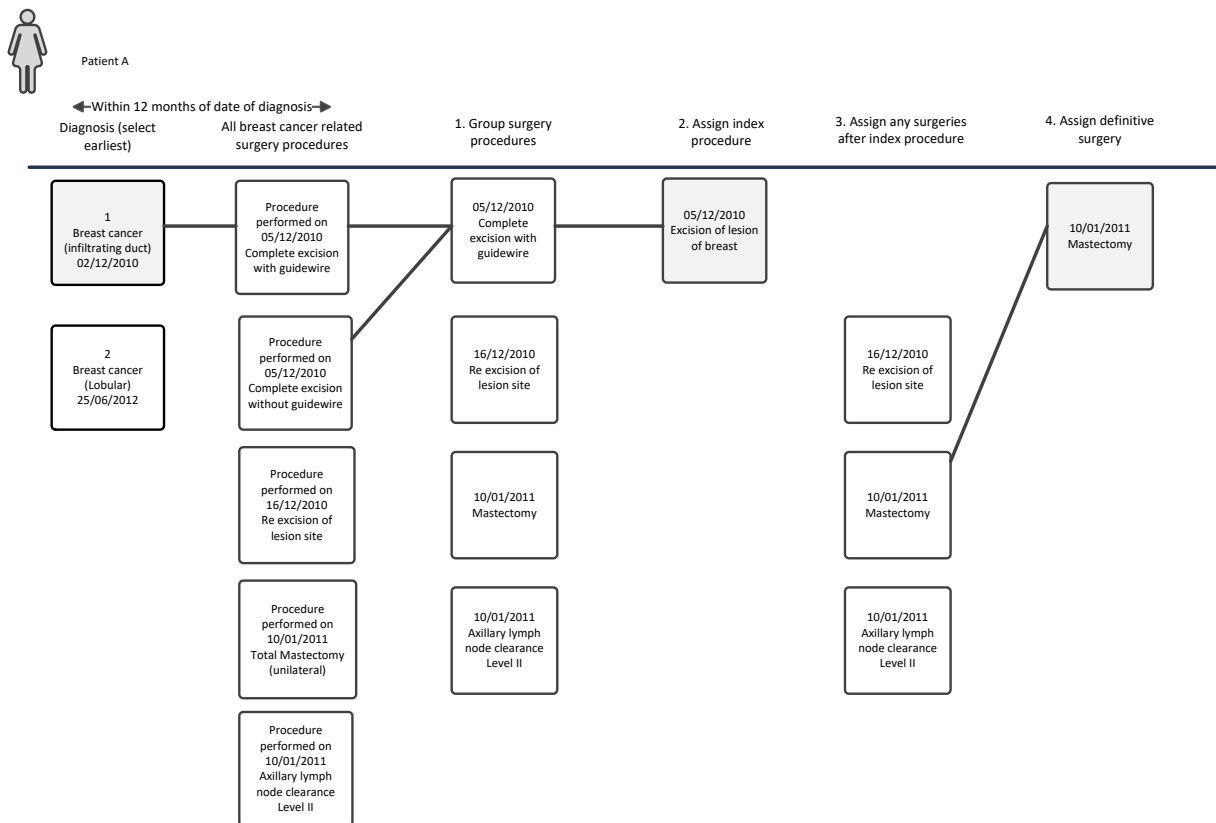
	Breast cancer surgery	Indicator 2.2	Indicator 2.3	Indicator 2.4	Indicator 2.5	Indicator 2.6	Indicator 2.7	Indicator 2.8	Indicator 3.1	Indicator 3.2	Indicator 3.3	Indicator 3.4	Indicator 3.5
	N	N	N	N	N	N	N	N	N	N	N	N	N
<b>Queensland</b>	<b>27541</b>	<b>11998</b>	<b>12568</b>	<b>3553</b>	<b>2676</b>	<b>5702</b>	<b>14075</b>	<b>6229</b>	<b>24017</b>	<b>3604</b>	<b>2340</b>	<b>1058</b>	<b>1282</b>
<b>Age group</b>													
0-9	0	0	0	0	0	0	0	0	0	0	0	0	0
10-19	2	0	0	2	0	0	1	0	2	0	0	0	0
20-29	112	77	33	11	27	7	27	45	96	14	33	13	20
30-39	1167	672	366	169	195	134	450	532	981	182	333	126	207
40-49	4937	2377	2024	739	668	868	2426	1806	4260	761	904	397	507
50-59	6961	2742	3395	1007	712	1502	3975	2063	6091	1015	689	321	368
60-69	7777	2890	4117	1079	625	1949	4556	1726	6876	1021	323	164	159
70-79	4573	2018	2140	459	359	1055	2232	57	4022	509	55	34	21
80+	2012	1222	493	87	90	187	408	0	1689	102	3	3	0
<b>Residence at diagnosis</b>													
Major City	18325	7428	8753	2571	1806	4008	9951	4133	16201	2668	1688	820	868
Inner Regional	6055	3053	2499	654	600	1101	2683	1360	5202	619	403	111	292
Outer Regional	2708	1267	1126	288	213	523	1258	611	2241	261	225	119	106
Remote & Very Remote	453	250	190	40	57	70	183	125	373	56	24	8	16
<b>Socioeconomic status</b>													
Affluent	4682	1774	2354	713	494	1103	2705	1123	4306	785	514	270	244
Middle	17838	7758	8130	2272	1697	3646	9084	4029	15436	2288	1545	700	845
Disadvantaged	5021	2466	2084	568	485	953	2286	1077	4275	531	281	88	193
<b>Tumour size (mm)</b>													
0-1mm	217	95	153	55	29	58	104	9	182	39	37	28	9
2-5mm	4810	1221	3999	678	395	1843	3279	383	4368	613	345	219	126
6-10mm	9622	3155	7203	1238	692	3303	5958	1775	8687	1142	673	335	338
11-20mm	1521	541	1213	333	227	498	865	87	1351	302	171	97	74
21-50mm	8681	4874	0	1080	936	0	3425	3014	7689	1209	794	267	527
>50mm	1657	1488	0	79	301	0	134	873	1318	214	206	46	160
Unknown	1033	624	0	90	96	0	310	88	422	85	114	66	48
<b>Stage at diagnosis</b>													
Localised	16500	5698	9512	2341	1442	4704	10017	0	14918	2119	1260	679	581
Regional	8737	5321	2177	927	1032	837	3163	6058	7507	1204	934	311	623
Distant	370	244	62	21	25	18	95	171	248	29	24	6	18
Unknown stage	1934	735	817	264	177	143	800	0	1344	252	122	62	60
<b>Comorbidities</b>													
0	23656	9986	11179	3188	2372	5015	12490	5489	20829	3232	2214	1005	1209
1	2788	1413	1063	276	241	534	1197	559	2327	293	110	48	62
2+	1097	599	326	89	63	153	388	181	861	79	16	5	11
<b>Axillary lymph nodes</b>													
Positive	8962	5483	2212	943	1051	846	3211	6229	7676	1227	955	315	640
Negative (0)	16576	5735	9531	2344	1445	4712	10048	0	14975	2122	1262	680	582
Unknown	2003	780	825	266	180	144	816	0	1366	255	123	63	60

## Appendix 4: Methods

To assign a surgery record to a person with breast cancer the earliest diagnosis in the cancer group is used. For example, a person was diagnosed with invasive breast cancer in 2010 and again in 2012 then the surgery record that is linked to the cancer diagnosed in 2010 will be reported.

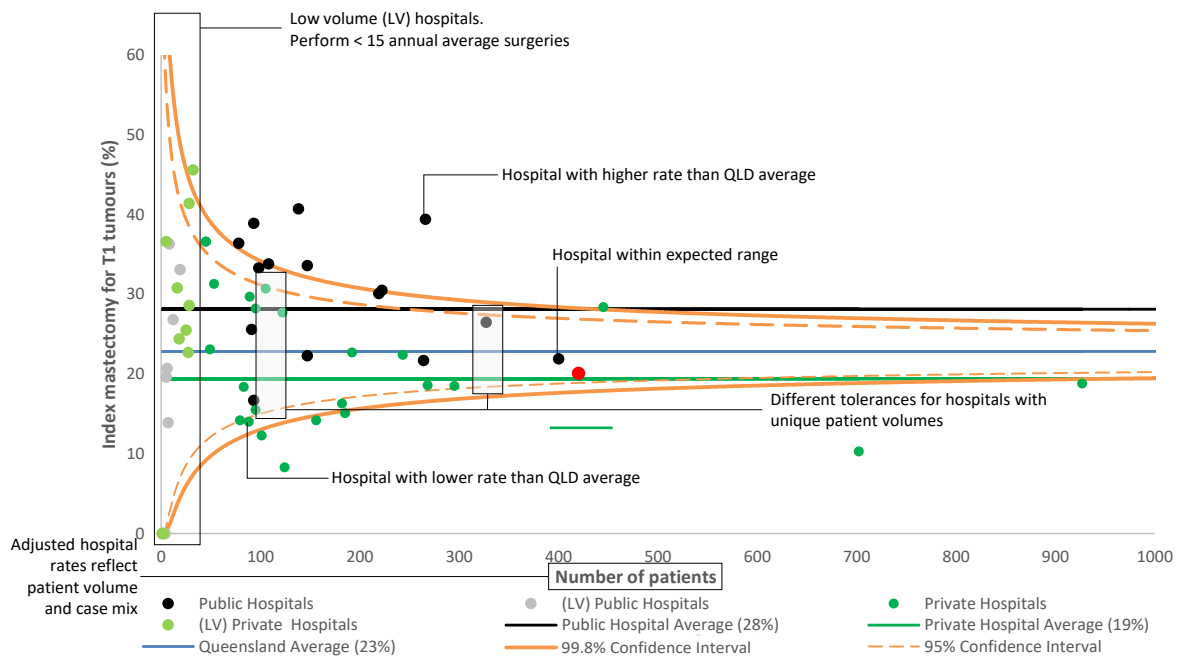
Each cancer diagnosis in a calendar year was matched and linked to one or many surgery records. This produces a list of all the surgeries performed for the earliest breast cancer diagnosis. The surgeries are then categorised according to clinically developed rules which are specific to each indicator and measure. The surgery procedures identified as breast cancer surgeries are:

- Breast conservation surgery (BCS)
- Mastectomy (unilateral or bilateral)
- Re-excision of lesion
- Sentinel lymph node biopsy (SLNB)
- Axillary lymph node dissection (ALND)
- Breast reconstruction surgery



## Appendix 5: How to interpret a funnel plot

Funnel plots help to identify where variation in hospital performance lies outside the range of results we would expect to see through natural variation. Hospital results are plotted against the y-axis while the x-axis provides context regarding the number of patients being treated at the hospital. Hospital results sitting outside the funnel are considered to be significantly different to the state wide average. This state wide average and public and private hospital averages are also displayed on the graph as lines.



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## Definitions

### Adjusted rates

The indicators have been adjusted to remove the effect of differences in composition of the various populations. The indicators have been adjusted by age, tumour size, year of surgery, comorbidities, rurality and overall stage.

### Age-Standardised Rate (ASR)

The hypothetical rate, expressed as the number of cases per 100,000 persons, of cancer incidence or mortality in a group of people if their age distribution is the same as that in a standard or reference population.

ASR is used to compare cancer incidence or mortality between populations with different sizes and age structures. The different populations can represent different states or countries, as well as different time periods for the same geographic region.

ASR allows tracking of incidence and mortality trends that are not due to changes or differences in population size or age. Cancer incidence and mortality generally increases over time as a result of population growth and ageing. Similarly, cancer incidence will usually differ between two populations of similar sizes if one population is older than the other.

The standard populations used in calculation of ASR are listed below.

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Age Group	Australia 2001	Australia 2001 (per 100,000)
0-4	1,282,357	6,600
5-9	1,351,664	7,000
10-14	1,353,177	7,000
15-19	1,352,745	7,000
20-24	1,302,412	6,700
25-29	1,407,081	7,200
30-34	1,466,615	7,500
35-39	1,492,204	7,700
40-44	1,479,257	7,600
45-49	1,358,594	7,000
50-54	1,300,777	6,700
55-59	1,008,799	5,200
60-64	822,024	4,200
65-69	682,513	3,500
70-74	638,380	3,300
75-79	519,356	2,700
80-84	330,050	1,700
85+	265,235	1,400
<b>Total</b>	<b>19,413,240</b>	<b>100,000</b>

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### Adjuvant intravenous systemic therapy

Systemic therapy agents that are administered intravenously after breast cancer surgery and within 12 months of breast cancer surgery.

### Axillary lymph node dissection

Excision and removal of axillary lymph nodes (the nodes in the underarm or "axilla" area).

### Breast cancer T stage

Breast tumour size in millimetres classified according to 'TNM Classification of Malignant Tumours' 7th edition, UICC International Union Against Cancer.

### Breast conservation surgery (BCS)

Queensland female residents of all ages diagnosed with invasive breast cancer in the surgical cohort time period who underwent one of the following procedures: excision of lesion of breast and/or re-excision of lesion.

### Cohort

#### *Breast cancer cohort*

Queensland female residents who were diagnosed with breast cancer between 1 January 2007 and 31 December 2016.

Site and morphology of the breast cancers have been coded according to the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3).

Site	ICD-O-3	Morphology
Breast	C50	All (invasive only)

#### *Breast cancer surgery cohort*

Anyone in the breast cancer cohort who had any of the identified cancer related procedures one month before or 12 months after their diagnosis.

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### ICD-11-AM (11<sup>th</sup> edition) breast cancer surgery procedure and groupings

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#### EXCISION OF LESION

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3153600	Localisation of lesion of breast
3150000	Excision of lesion of breast

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#### MASTECTOMY

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3151800	Total mastectomy (unilateral)
3151801	Total mastectomy (bilateral)
3152400	Subcutaneous mastectomy (unilateral)
3152401	Subcutaneous mastectomy (bilateral)

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#### RE-EXCISION OF LESION

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3151500	Re-excision of lesion of breast
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#### SENTINEL LYMPH NODE BIOPSY

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9624302	Sentinel lymph node biopsy, axillary
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#### LYMPH NODE SURGERY

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	9624402	Excision of lymphatic structure axillary
	9624502	Radical excision of lymphatic structure axillary
<b>BREAST RECONSTRUCTION SURGERY</b>		
Immediate breast reconstruction	4553900	Reconstruction of breast with insertion of tissue expander
	4553002	Reconstruction of breast using flap
Delayed breast reconstruction	4553300	Reconstruction of breast using breast sharing technique, 1 <sup>st</sup> stage
	4553600	Reconstruction of breast using breast sharing technique, 2 <sup>nd</sup> stage

### Comorbidity

A clinical condition that has the potential to significantly affect a cancer patient's prognosis.

Comorbidity is derived from hospital admissions data following the Quan algorithm for classifying ICD-11 coded conditions, modified to exclude metastasis, which is represented by a separate and distinct metastasis dimension.

Comorbidity is limited to conditions coded in any admission episode between 12 months before and 12 months after the date of cancer diagnosis.

For any given cancer diagnosis, comorbidity is restricted to conditions other than the primary cancer. E.g. A rectum cancer can be a comorbidity to a colon cancer diagnosis and vice versa, if they are diagnosed within 12 months of each other.

Benign tumours are not considered comorbidities.

### Co-morbidity list:

AIDS	Acute myocardial infarction	Cancer
Cerebrovascular disease	Congestive heart failure	Chronic obstructive pulmonary disease
Dementia	Diabetes	Diabetes + complications
Hemiplegia or Paraplegia	Mild liver disease	Moderate/severe liver disease
Peptic ulcer	Peripheral vascular disease	Renal disease
Rheumatoid disease		

### Confidence interval

The 95% confidence intervals for the adjusted rates are displayed on the graph as bars attached to the rate for each hospital. Where the bars do not cross the line showing the state average for that indicator, it means the result for this hospital is statistically significantly different from the state average.

### Crude rate (not adjusted)

The observed rate within the population/facility. Does not take into account differences in the demographics of the populations being compared (eg. age, gender differences).

### Definitive surgery

Mastectomy within 12 months of the first procedure. If mastectomy was not recorded, then the last record of either excision of lesion of breast or re-excision of lesion site within 12 months of the first procedure was selected.

### **Breast cancer procedure hierarchy**

1. Mastectomy
2. Excision of lesion of breast (BCS)

### **HHS of Residence**

Hospital and Health Service of residence is a geographic area defined by a collection of Statistical Areas Level 2 (SA2s) where the patient resides at time of diagnosis. Queensland unknown residence includes addresses reported as unknown or no fixed address.

### **Immediate breast reconstruction**

Breast reconstruction surgery at the time of mastectomy. (See breast reconstruction surgery ICD-10-AM 11<sup>th</sup> edition procedure codes)

### **Index surgery**

The first breast cancer surgery procedure performed closest to diagnosis date within 12 months of diagnosis.

### **Indigenous status**

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

### **Invasive breast cancer**

Breast cancer is the abnormal growth of cells lining the breast lobules (milk-producing glands) and breast ducts (passages that drain milk from the lobules towards the nipple). (*ref Breast Cancer Network Australia*)

### **Lymph node positive**

If invasive cancer is found on pathological examination in 1 or more axillary lymph node/s (the nodes in the underarm or "axilla" area).

### **Mastectomy**

Queensland female residents of all ages diagnosed with invasive breast cancer in the surgical cohort time period who underwent one of the following procedures: total mastectomy (unilateral), total mastectomy (bilateral), subcutaneous mastectomy (unilateral), subcutaneous mastectomy (bilateral).

### **Micro-invasion (T1mi)**

Tumour size is  $\leq 1$  mm classified according to 'TNM Classification of Malignant Tumours' 7th edition, UICC International Union Against Cancer.

### **Multidisciplinary team (MDT) review**

Provides a forum for clinicians working within cancer care to discuss cancer patient's diagnosis and treatment planning.

### **Neoadjuvant treatment**

In select cases, treatment with intravenous systemic therapy may be given before breast surgery. Women who had intravenous systemic therapy between date of diagnosis and before date of index surgery were identified as receiving neoadjuvant treatment.

### **Number of surgeries**

Queensland female residents of all ages diagnosed with invasive breast cancer in the surgical cohort time period who underwent a definitive breast cancer surgery.

### **Overall stage at diagnosis**

Cancer stage at diagnosis is not routinely collected in Queensland. For the purposes of this report overall stage has been derived by linking and integrating multiple sources of information to provide the best quality determination of stage. Overall stage has been derived by using tumour size (mm), number of positive axillary lymph nodes recorded in the Queensland Cancer Register and distant metastatic diagnosis codes recorded in hospital admissions data:

Localised = no nodes positive at diagnosis

Regional = any axillary lymph node/s positive at diagnosis

Distant = distant metastatic diagnosis ICD-10-AM diagnosis codes (C78, C79) recorded in hospital admissions data and within 6 months of diagnosis

### **Pathological diagnosis**

Confirmation of a breast cancer diagnosis based on the pathologist's examination of a sample of tissue taken from the tumour.

### **Peer group hospital**

The Australian Institute of Health and Welfare (AIHW) grouping of Queensland public and private hospitals into peer groups for reporting hospital data.

### **Private Hospital**

All other hospitals that are not Queensland Health hospitals.

### **Public Hospital**

Queensland Health hospitals.

### **QOOL**

QOOL supports cancer multidisciplinary teams by assisting meeting preparation, communication and documentation of essential clinical information such as diagnosis, cancer stage and recommended treatment plans. QOOL provides continuity of care and state-wide multidisciplinary team linkage and provides access to clinical outcomes and system performance data for quality improvement. The system provides a central view of patient data for multiple users, accessible at multiple locations.

### **Radiation therapy (external beam)**

Female breast cancer patients who received external beam radiation therapy after definitive BCS breast surgery within 365 days of diagnosis. For further information on radiation therapy

<https://www.targetingcancer.com.au>

### **Relative survival (5 year)**

Relative survival is a net survival measure representing cancer survival in the absence of other causes of death. Relative survival is defined as the ratio of the proportion of observed survivors in a cohort of cancer patients to the proportion of expected survivors in a comparable set of cancer free individuals.

Relative survival is calculated by dividing observed survival by expected survival, where the numerator and denominator have been matched for age, sex and calendar year.

Observed survival refers to the proportion of people alive for a given amount of time after a diagnosis of cancer; it is calculated from population-based cancer data. Expected survival refers to the proportion of people in the general population alive for a given amount of time and is calculated from life tables of the entire Australian population, assumed to be cancer free.

Changes to cancer incidence rates and the underlying life tables to may lead to fluctuations in relative survival estimates. Accordingly, caution should be used when making comparisons to historically reported rates of relative survival.

### **Re-excision of breast lesion**

Female breast cancer patients who received re-excision of breast lesion surgery after index breast cancer surgery.

### **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 & Remote.

<b>ASGC classifications</b>	<b>Modified ASGC classification</b>
Major City	Metropolitan
Inner Regional	Regional
Outer Regional	
Remote	Rural and Remote
Very Remote	

An exception to this grouping is the metropolitan area of Townsville (originally classified as Rural). Townsville has been classified as Metropolitan because of the availability of tertiary level cancer services.

### **Sentinel lymph node biopsy (SLNB)**

Sentinel lymph node biopsy is a surgical technique in which the first lymph node (or nodes) that cancer may spread to is removed. (*ref Breast Cancer Network Australia*)

### **Socioeconomic status (SES)**

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 Areas Level 2 (SA2s).

ABS use 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%

### **Time from pathological diagnosis to first (index) surgery ≤ 45 days**

% of female breast cancer patients who received first (index) surgery within 45 days from pathological diagnosis.

### **Time from index surgery to definitive surgery ≤ 21 days**

% of female breast cancer patients who received definitive surgery within 21 days of index BCS surgery. Some patients may have multiple re-excisions prior definitive surgery

## FOR MORE INFORMATION

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