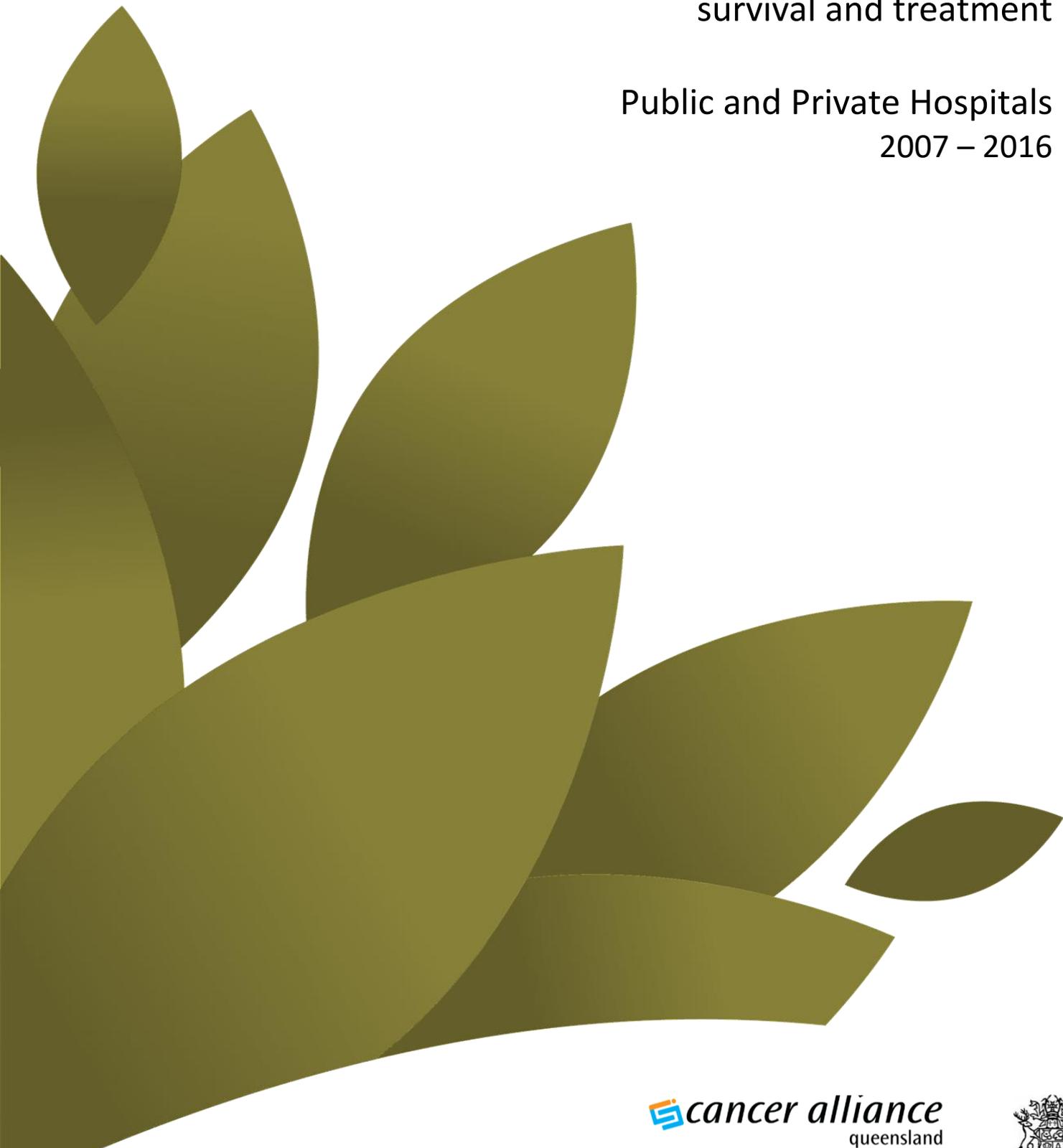


# Cancer in Queensland Seniors

An overview of incidence, mortality,  
survival and treatment

Public and Private Hospitals  
2007 – 2016



## Acknowledgements

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## Message from the chair

In 2018 in Queensland, the 65 and over age group represented 15% of the population<sup>1</sup>, while Queensland's 'aged dependency ratio' (ratio of those aged 65+ years to the working ages of 15-64 years) has increased from 18% in 2008 to 24% in 2018.<sup>2</sup> As cancer incidence increases with increasing age, the rise in the 65+ population has resulted in a dramatic rise in cancer numbers for this age group. Thus, we have an ever increasing cohort of cancer patients aged 65+ years.

Few published studies have examined cancer trends in the 65+ year age cohort at a population-level. Understanding incidence, mortality and survival trends is vital to health service planning and early detection/prevention programmes into the future. Further, there is a lack of information on treatment rates and treatment outcomes in this age cohort. This precludes an understanding of the quality of care this patient group receive.

Here we present a comprehensive report on the epidemiology of cancer in Queensland seniors (aged 65 years and over) from 1982 to 2016. The report also includes an extensive examination of treatment rates and where appropriate, indicators of quality of surgery for colorectal, female breast, lung and oesophagogastric cancers over two time periods, 2007-2011 and 2012-2016.

For each of the four studied diagnoses the case numbers in each of the age groups have risen but incidence rates have been steady or slightly declined. Similarly, for each of the diagnoses among the included age groups the number of patients receiving the full scope of treatment has increased and all measures of immediate outcome and survival have improved.

International comparisons show that older Queensland patients with these cancer diagnoses have survival rates at world best levels.

Patients from rural and remote areas tended to lag in adoption of the full scope of treatment but immediate outcomes and survival at two years was not disadvantaged for patients from those geographic regions.

Queenslanders can be pleased with the state-wide care of older patients with cancer. If improvement is to be maintained and progressed with the expanding aged population, health service resourcing will need to plan and expand.



A handwritten signature in black ink, appearing to read 'David Theile'.

Professor David E Theile AO  
Chair  
Queensland Cancer Control Safety and Quality Partnership  
(The Partnership)

## Key findings

Cancer is primarily a disease of older age with rates increasing significantly from age 50 years onwards. With an ageing population, the number of adults aged 65+ years diagnosed with cancer is expected to increase. In 2031, an estimated 27,114 new cases of invasive cancer will be diagnosed among Queensland seniors. The growing cohort of cancer patients and survivors will place unique challenges on the healthcare system.

## Epidemiology of cancer in Queensland seniors

### Incidence rates are increasing

- From 1982-2016 the annual average number of new cases of invasive cancer among Queensland seniors increased by 287%.
- In males, the age-standardised rate (ASR) for all invasive cancers increased from 2,611 per 100,000 in 1982 to 3,049 per 100,000 in 2016 (17% increase). For females, rates increased from 1,330 to 1,812 per 100,000 over the same two years, representing a 36% increase.
- In 2016, the five most commonly diagnosed cancers in males were prostate, haematological (includes leukaemias, lymphomas and myeloma), melanoma, colorectal and lung cancer, accounting for three-quarters of all cancers.
- The five most common cancers in females in 2016 were breast, colorectal, haematological, lung and melanoma (70% of all cancers).
- Incidence did not vary significantly according to location of residence.

### Mortality rates are decreasing in males and stable in females

- From 1982-2016, mortality rates have remained relatively stable in females and decreased approximately 10% in males. Greatest decreases in mortality rates in males were observed for the age group 65-74 years (34% decrease).
- In 2016 the most common causes of cancer death in males was lung cancer, followed by prostate cancer and haematological malignancies.
- In the same year, the most common causes of cancer death in females were lung cancer, followed by colorectal cancer and haematological malignancies.

### Cancer prevalence is increasing

- The prevalence of cancer in seniors is increasing with just over 53,000 Queenslanders living with a cancer diagnosis within the previous five years.
- Highly prevalent cancers in males included prostate, melanoma and colorectal. For females, cancers with the highest prevalence included breast and colorectal and melanoma.

### Relative survival has improved

- Five-year relative survival increased from 56% in the period 1997-2001 to 63% in the most recent period (2012-2016).
- Improvements in survival were evident for males and females aged 65-74 and 75-84 years, however no improvement in survival for those aged 85+ years was evident.
- Survival was poorest for those diagnosed with cancers of the brain (3%), pancreas (6%) and liver (11%). Whilst high 5-year relative survival was observed for thyroid (94%), prostate (92%), melanoma (91%) and breast (89%).

## Colorectal cancer treatment in Queensland seniors

### Overall treatment for colorectal cancer decreases with increasing age

- Of 18,339 patients diagnosed with colorectal cancer (CRC) from 2007-2016, 88% (n=16,082) received some form of treatment including surgery, radiation therapy or IV systemic therapy.
- As age increased the likelihood of receiving treatment decreased significantly ( $p < 0.001$ ).
- Patients from middle and disadvantaged areas were significantly less likely to have received treatment compared to those from affluent areas (OR=0.77 and OR=0.61, respectively), ( $p < 0.001$ ).
- Compared to major cities, patients living in remote or very remote locations were also less likely to have received treatment (OR=0.61,  $p < 0.001$ ).
- Overall one, two and five-year survival for patients who received treatment was 86%, 77% and 61%, respectively. The corresponding figures for patients who did not receive treatment were 24%, 16% and 9%, respectively.

### 30-day surgical mortality following major resection for colorectal cancer is improving

- Just over three-quarters (78%) of seniors had a major resection for CRC.
- Compared to those aged 65-69 years, patients aged 80-84 and 85+ years were about 40% and 70% less likely to have undergone a major resection, respectively.
- Other factors associated with a decreased likelihood of major resection included living in a remote or very remote location (OR=0.70,  $p < 0.001$ ) and presence of two or more comorbidities (OR=0.79,  $p < 0.001$ ).
- 30-day surgical mortality reduced from 3.6% for the period 2007-2011 to 2.6% from 2012-2016 ( $p < 0.001$ ). A similar magnitude of reduction was observed for 90-day mortality. Reductions in mortality were evident for all age groups with greatest gains observed for patients aged 65-74 years.
- Factors associated with a higher risk of 30-day mortality included: increasing age ( $p < 0.001$ );  $\geq$  two co-morbidities ( $p < 0.001$ ); ASA of  $\geq 3$  ( $p < 0.001$ ) and emergency admission ( $p < 0.001$ ). A similar pattern was observed for 90-day mortality.
- Compared to patients diagnosed from 2007-2011, those diagnosed from 2012-2016 were about 40% less likely to die within 30 days of surgery (OR=0.62, 95%CI=0.50-0.77).

### Intravenous systemic therapy for colorectal cancer is in line with guidelines

- Overall, 27% of seniors received IV systemic therapy for CRC.
- The proportion of stage III CRC patients who received adjuvant IV systemic therapy increased by 10% from 36% for the period 2007-2011 to 46% in 2012-2016 ( $p < 0.001$ ).
- Increasing age and having  $\geq 2$  comorbidities was associated with a reduced likelihood of receiving adjuvant IV systemic therapy ( $p < 0.001$  and  $p < 0.001$ , respectively).
- Compared to those having a major resection at a private hospital, public hospital patients were about 60% less likely to receive adjuvant IV systemic therapy.

### Radiation therapy for colorectal cancer is increasing

- Overall, 15% of seniors received radiation therapy for CRC.
- The use of neoadjuvant radiation therapy prior to major resection for rectal cancer patients increased from 24.8% during 2007-2011 to 29.7% for the period 2012-2016 ( $p < 0.001$ ).
- Rectal cancer patients aged 80-84 and 85+ years were about 50% and 70% less likely to receive neoadjuvant radiation therapy, respectively ( $p < 0.001$ ).
- Indigenous patients were significantly more likely to receive neoadjuvant radiation therapy compared to non-Indigenous patients (OR=1.96, 95%CI=1.10-3.51) ( $p=0.02$ ).

## Breast cancer treatment in Queensland senior females

### Overall treatment rates for breast cancer differ significantly by socioeconomic status

- Of 11,650 females diagnosed between 2007-2016, 91% (n=10,547) received treatment (excluding hormone therapy) with rates decreasing significantly with increasing age ( $p < 0.001$ ).
- Compared to those living in major cities, patients from outer regional or remote/very remote areas were about 40-50% less likely to have received treatment ( $p < 0.001$ ).
- Indigenous patients were also less likely to have received treatment compared to non-Indigenous patients (OR=0.54, 95%CI=0.30-0.97).
- Overall one, two and five-year survival for patients who received treatment was 97%, 93% and 83%, respectively. For patients who did not receive treatment corresponding survival was 63%, 50% and 26%, respectively.

### Mastectomy rates are higher in regional and remote areas

- Overall, 86% (n=10,038) of patients received surgery and of those 45% had a definitive mastectomy.
- Mastectomy rates decreased by about 3% over the two time periods with the largest decrease observed for women aged 70-74 years.
- Compared to those aged 65-69 years, patients aged 70+ years were significantly more likely to have a mastectomy ( $p < 0.001$ ). Patients from outer regional and remote/very remote locations were also more likely to have mastectomy compared to those from major city areas (OR=1.22, and OR=1.75, respectively).
- Patients whose surgery was conducted in a public hospital were about 60% more likely to have mastectomy compared to those in private hospitals ( $p < 0.001$ ).

### Rates of breast conserving surgery (BCS) for T1 ( $\leq 20$ mm) tumours remain stable

- Of the 5,989 patients with a T1 tumour, 74% (n=4,461) had BCS and no significant changes in rates were observed over time.
- The likelihood of having BCS decreased with increasing age ( $p < 0.001$ ).
- Overall, 80% of patients with a T1 tumour received a sentinel lymph node biopsy (SLNB) with their BCS, however this varied according to age with 84% of those aged 65-69 years and 53% of 85+ year olds having SLNB.

### IV systemic therapy for breast cancer increased for node positive cases

- Overall, 28% of patients received IV systemic therapy with rates increasing from 26% during 2007-2011 to 30% during 2012-2016 ( $p < 0.001$ ).
- The use of adjuvant IV systemic therapy for lymph node positive breast cancer increased by 10% from 43% in the period 2007-2011 to 53% from 2012-2016.
- The only factor other than later stage that was associated with less likelihood of receiving adjuvant IV systemic therapy was increasing age ( $p < 0.001$ ).

### Radiation therapy for breast cancer increased over time

- Overall, 55% of patients received radiation therapy with rates increasing from 53% during 2007-2011 to 57% from 2012-2016 ( $p < 0.001$ ).
- For BCS patients, 85% received adjuvant radiation therapy. Patients diagnosed from 2012-2016 were nearly 30% more likely (OR=1.28,  $p=0.005$ ) to have received adjuvant radiation therapy compared to those diagnosed from 2007-2011. It is unknown whether this is due to the availability of data in the earlier period or reduced services.

## Lung cancer treatment in Queensland seniors

### Overall treatment rates for lung cancer increased marginally

- Of 14,817 seniors diagnosed between 2007-2016, 63% (n=9,327) received treatment.
- Treatment rates increased by 5% from the period 2007-2011 to 2012-2016, largely driven by a 7% increase in rates for patients aged 70-74 years ( $p < 0.001$ ) and for those aged 75-79 years ( $p < 0.001$ ).
- A reduced likelihood of receiving treatment was observed for patients living in regional and remote/very remote locations compared to those from major city areas ( $p < 0.001$ ).
- Other factors significantly associated with a reduced likelihood of receiving treatment were socioeconomic disadvantage (OR=72,  $p < 0.001$ ); being Indigenous (OR=0.53,  $p < 0.001$ ); and having  $\geq$ two comorbidities (OR=0.66,  $p < 0.001$ ).
- Patients with small cell lung cancer (SCLC) were about 50% more likely (OR=1.48,  $p < 0.001$ ) to receive some form of treatment compared to those with non-small cell lung cancer (NSCLC).
- One, two and five-year overall survival for patients who received treatment was 54%, 37% and 22%, respectively. The corresponding figures for patients who did not receive treatment was 14%, 8% and 3%, respectively.

### Surgery for Non-small cell lung cancer (NSCLC) decreased with increasing age

- Overall, 18% of NSCLC patients had surgery with rates increasing by about 4% between 2007-2011 and 2012-2016 ( $p < 0.001$ ). Increasing rates of surgery over time were evident across all age groups with the exception of those 85+ years where surgical resection rates fell from 3% to 1% over the two time periods.
- Patients living in a middle or disadvantaged area were between 20% and 40% less likely to have received treatment compared to those living in affluent areas ( $p < 0.001$ ). Those with  $\geq$ two comorbidities were additionally less likely to receive surgery (OR=0.73,  $p < 0.001$ ).
- 30-day surgical mortality was 1.8% in the period 2007-2011 and 1.0% from 2012-2016 with males being significantly more likely to die within 30 days of surgery compared to females (OR=3.11,  $p = 0.02$ ). A similar result was observed for 90-day mortality.
- One-year and two-year surgical survival increased by about 5% and 9%, respectively from the earlier to the later time period.

### IV systemic therapy rates for lung cancer increased over time

- Approximately one-third (34%) of patients received IV systemic therapy with rates increasing by approximately 6% from 2007-2011 to 2012-2016 ( $p < 0.001$ ). Greatest increase was observed in patients aged 70-74 years (10% increase).
- Apart for increasing age, other factors associated with not receiving IV systemic therapy included living in outer regional or remote/very remote locations ( $p < 0.001$ ) or in an area of disadvantage compared to affluent areas ( $p < 0.001$ ).
- Males were about 25% more likely to have received IV systemic therapy compared to females (OR=1.25,  $p < 0.001$ ).

### Radiation therapy rates for lung cancer remain stable

- Overall, 43% received radiation therapy (similar for SCLC and NSCLC) with rates remaining similar over time.
- As with IV systemic therapy, a similar association between increasing age, area-level disadvantage and regional or remote/very remote residence and a reduced likelihood of receiving radiation therapy was observed.

## Oesophagogastric cancer treatment in Queenslanders seniors

### Overall treatment rates for oesophagogastric cancer vary by sex

- Of 4,108 seniors diagnosed between 2007-2016, 63% (n=2,569) received treatment.
- Treatment rates remained relatively stable overall, however rates increased by 7% from 2007-2011 to 2012-2016 for those aged 70-74 years (p=0.02).
- Males were about 35% more likely to receive treatment compared to females (p<0.001). The likelihood of receiving treatment decreased significantly with increasing age (p<0.001).
- One, two and five-year overall survival for patients who received treatment was 58%, 40% and 25%, respectively. The corresponding figures for patients who did not receive treatment was 27%, 21% and 16%, respectively.

### Major resection for oesophagogastric cancer decreases with increasing age

- Oesophagectomies were performed on 13% (n=223) of patients and 33% (n=761) had a gastrectomy.
- The proportion of patients receiving a major resection decreased with increasing age. For example, a major resection was performed on 36% of patients aged 65-69, 16% of 80-84 year olds and 9% for those aged 85+ years.
- Increasing age was significantly associated with a decreased likelihood of having a major resection. Patients diagnosed with stomach cancer were significantly more likely to have received a major resection compared to those with oesophageal cancer (OR=3.92, p<0.001).
- While no significant change in 30-day mortality was observed, 90-day mortality fell by 1.5% (6.0% from 2007-2011 to 4.5% from 2012-2016).
- Indigenous compared to non-Indigenous patients were significantly more likely to die within 90 days of surgery, however the number of cases was extremely small.
- Significant increases in one and two-year surgical survival were observed over time. For example, one-year survival was 76% from 2007-2011 and 83% from 2012-2016 (p=0.007). The increase was mostly driven by survival improvements 65-69 year olds (14% increase).

### IV systemic therapy for oesophagogastric cancer is more common in males

- Overall, 35% of patients received IV systemic therapy with rates increasing by approximately 6% from 2007-2011 to 2012-2016 (p<0.001). Greatest increase was observed in patients aged 70-74 years (18% increase).
- Males were significantly more likely to receive IV systemic therapy compared to females (OR=1.75, p<0.001).
- Aside from increasing age, other factors associated with a reduced likelihood of receiving IV systemic therapy were living in a disadvantaged or middle, compared to an affluent socioeconomic area (OR=0.74 and OR=0.64, respectively) (p=0.001) and having ≥two comorbidities (OR=0.62, p<0.001).

### Radiation therapy for oesophagogastric cancer is less common in females

- Just over one-third of oesophagogastric cancer patients (37%) received radiation therapy (55% for oesophageal and 23% for gastric cancer).
- Males were about 30% more likely to receive radiation therapy (OR=1.29, p<0.001).
- With increasing age, the likelihood of receiving radiation therapy decreased (p<0.001). No other sociodemographic factors were associated with either an increased or decreased likelihood of receiving radiation therapy.

## What is the Cancer in Queensland Seniors report?

The Cancer in Queensland Seniors report has been developed for public and private cancer services. It is an initiative of 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 public and private hospitals. The Cancer in Queensland Seniors highlights areas for improvement and identifies the areas where cancer services are performing well.

The report examines ten years of data from 2007-2016, however there may have been changes more recently that are not captured by the time periods reported. Regardless, the Cancer in Senior Queenslanders 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 a report focusing on cancer in seniors?

The Cancer in Queensland Seniors report is a tool for reviewing, comparing and sharing with the public, information about cancer incidence, mortality, survival and treatment for seniors (aged 65+ years). The Partnership has prepared this report 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. While cancer can occur at any age, incidence increases dramatically after 50 years of age. With a growing and ageing population, understanding trends in incidence, mortality and survival helps to understand the burden of this disease not only on the individual and their family, but also on the wider community, including the health care system.

Where appropriate the report utilises indicators from the Cancer Quality Index developed by Cancer Alliance Queensland with clinical leadership.<sup>3</sup>

## 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 QCCAT's programme 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, 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 this report.

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

The epidemiology section of the report covers the years 1982 to 2016. The sections focusing on treatment for colorectal, breast, lung cancer and oesophagogastric cover the years 2007-2016, but exclude patients whose diagnosis was based on death certificate only or autopsy with histology, which represent on average about 1% of the cohort.

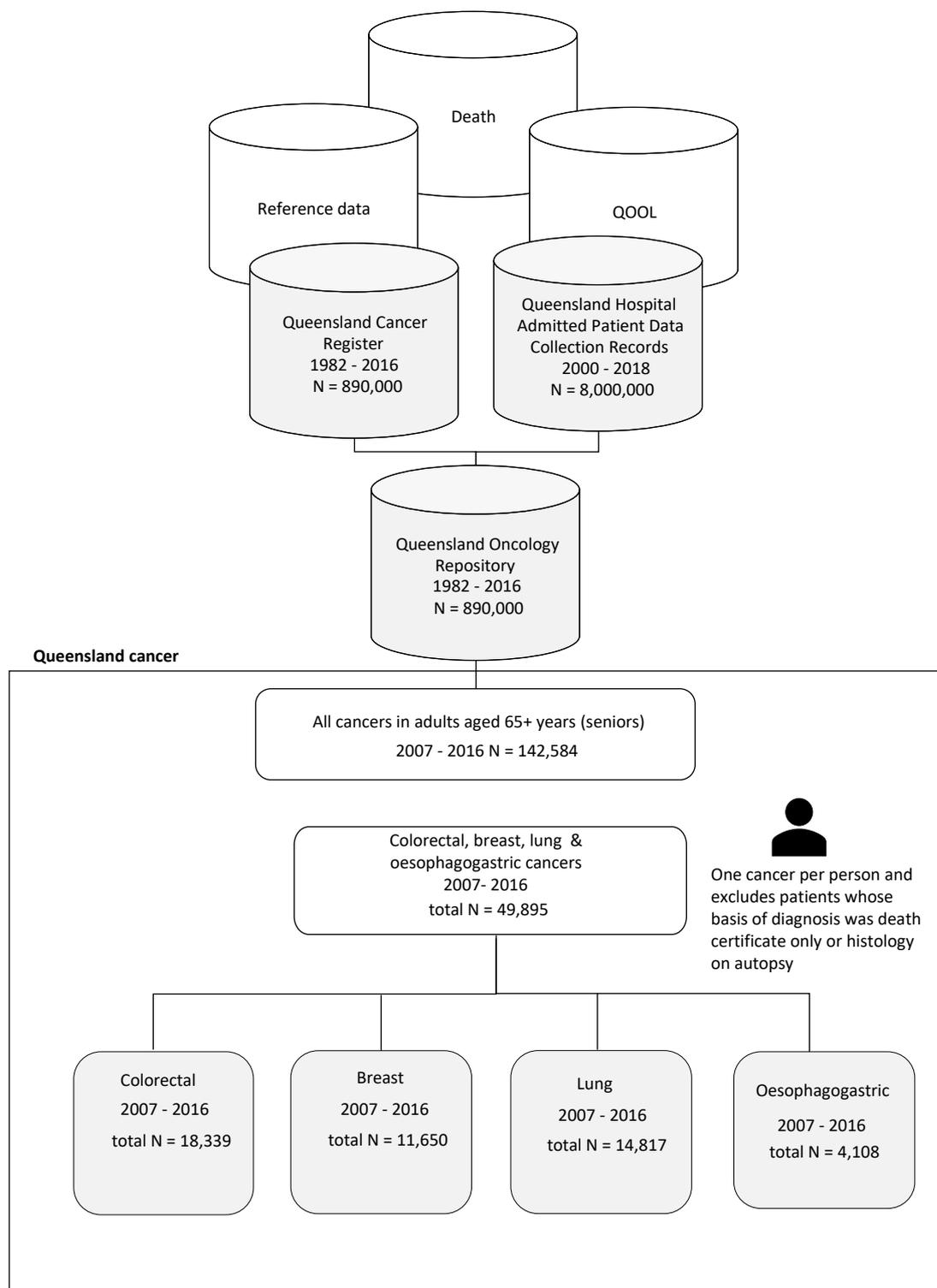
## Hospital Peer Groups

The Cancer in Queensland Seniors 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 Private acute group A hospitals	Group A hospitals
Public acute group B hospitals Private acute group B hospitals	Group B hospitals
Public acute group C hospitals Private acute group C hospitals	Group C hospitals
Public acute group D hospitals Private acute group D hospitals	Other hospitals

## Patient cohort definition



# 1 | Epidemiological overview

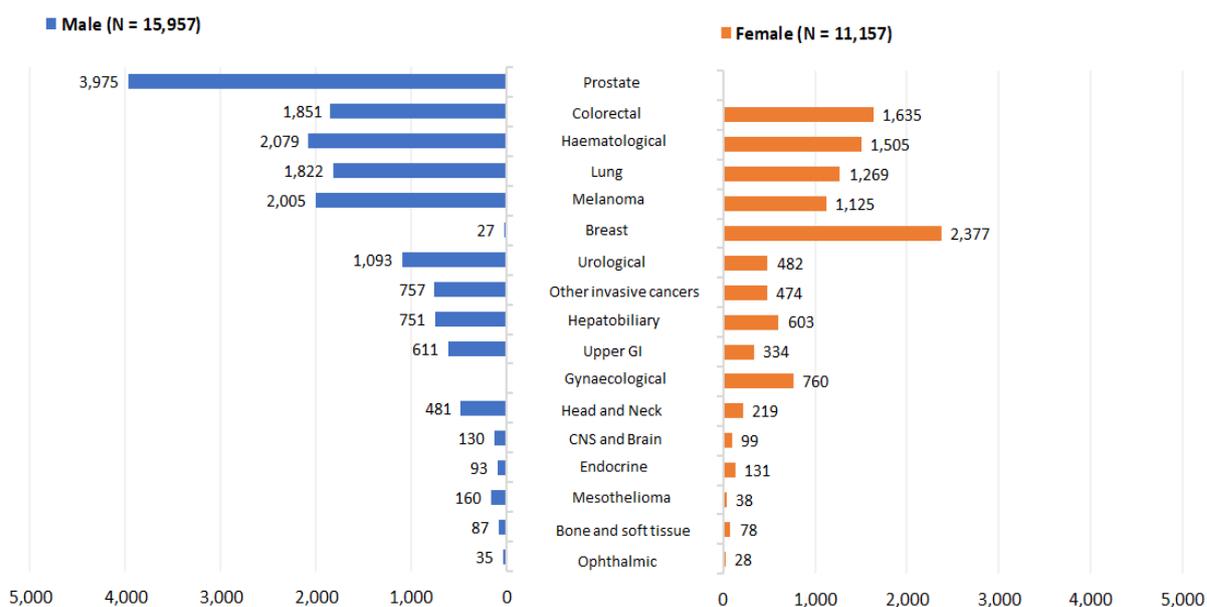
Understanding the characteristics of Queensland seniors diagnosed with invasive cancer: 1982 - 2016



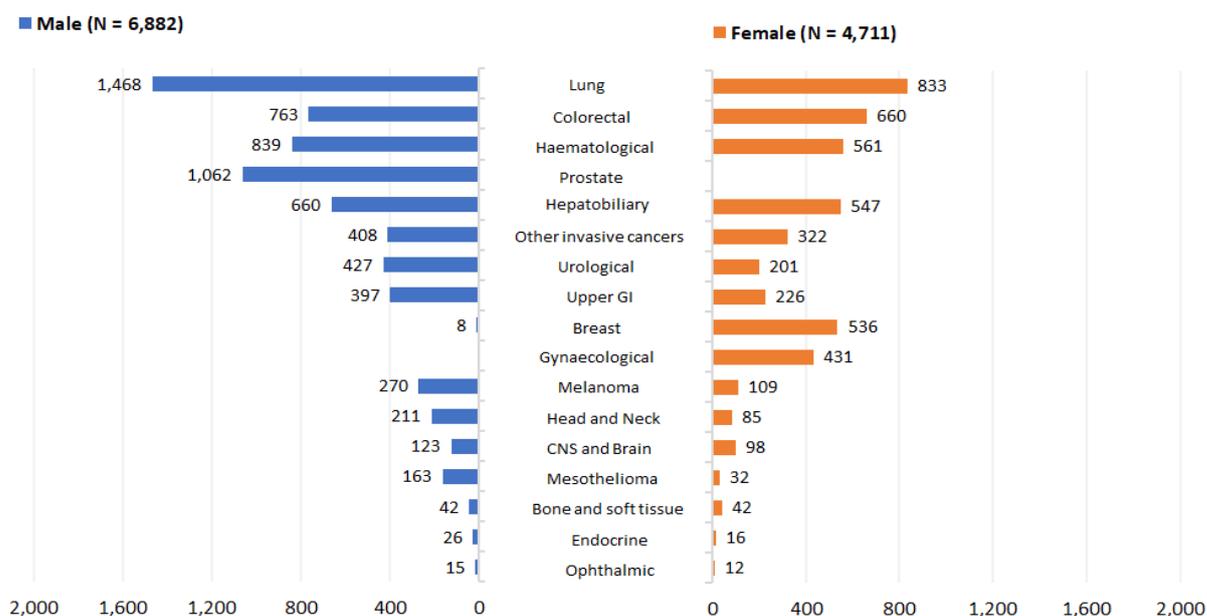
## 1.1 | Cancer projections Queensland, 2031

In 2031, an estimated 27,114 new cases of invasive cancers will be diagnosed among Queensland seniors (Figure 1.1.1), and an estimated 11,593 will die from their disease (Figure 1.1.2). In males, prostate cancer, melanoma and colorectal cancer will remain the most common cancers. In females, the most common cancers in 2031 will be breast, colorectal and haematological malignancies. Lung cancer will continue to be a leading cause of cancer death in senior males and females.

### 1.1.1 | Projected cancer incidence in Queensland senior males and females, 2031



### 1.1.2 | Projected cancer mortality in Queensland senior males and females, 2031

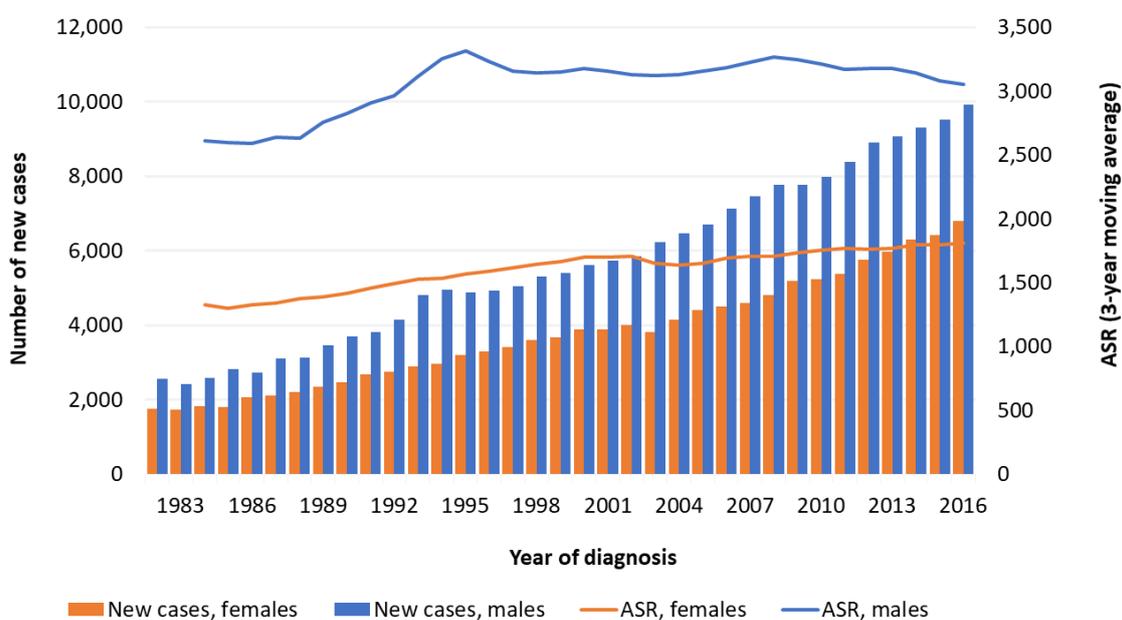


## 1.2 | Incidence and mortality

The annual average number of new cases of cancer among Queensland seniors increased by 287% between 1982 and 2016. This growth in cancer incidence is partly explained by the increase in the proportion of the Queensland population aged 65+ years from 9.7% in 1982 to 14.7% in 2016, and that cancer is more prevalent in older age.

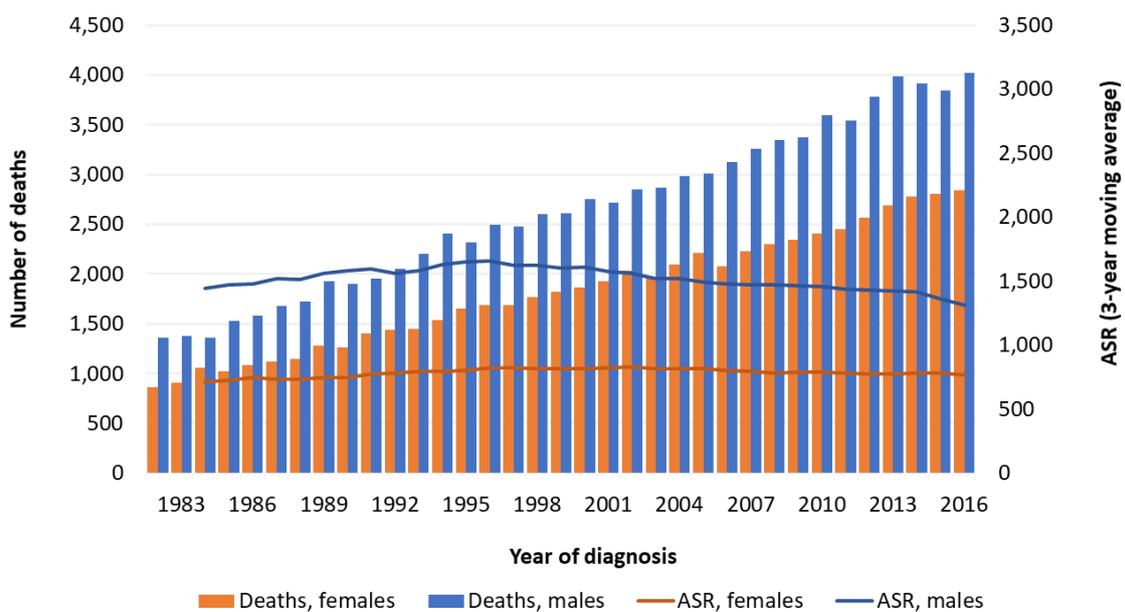
Trends in incidence rates for all invasive cancers combined and the number of new cases diagnosed annually for senior males and females are summarised in Figure 1.2.1. Since 1982, the incidence rate (3-year moving average) for all invasive cancers among senior females increased from 1,330 to 1,812 per 100,000 (36% increase). For males the incidence rates increased from 2,611 to 3,049 per 100,000 (17% increase).

### 1.2.1 | Trends in incidence for all cancers, Queensland senior males and females, 1982-2016



From about 1996, mortality rates began declining steadily in both males and females, likely a result of screening programs and improvements in cancer treatments. While mortality rates have declined, the actual number of people dying from cancer has increased, due to population ageing coupled with increases in annual incidence.

### 1.2.2 | Trends in mortality for all cancers, Queensland senior males and females, 1982-2016

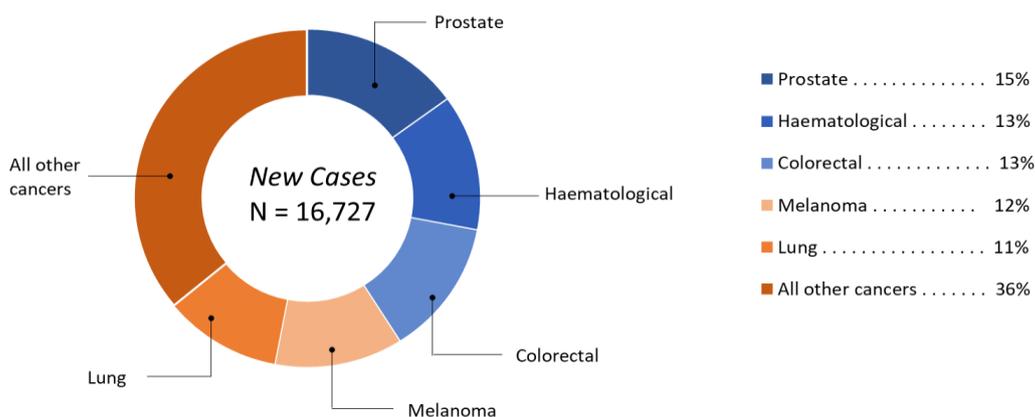


### 1.3 | Most common cancers diagnosed in seniors

#### Five Most Common Cancers

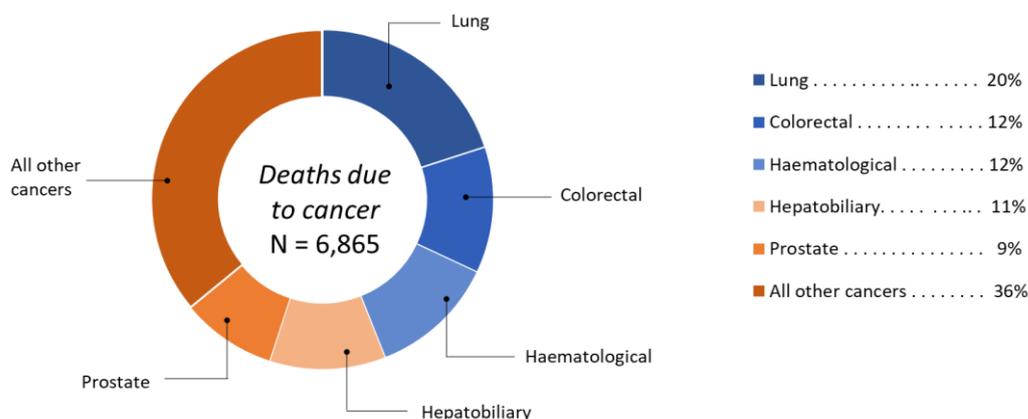
In 2016 there were 16,727 new cases of cancer diagnosed and 6,865 deaths were attributed to cancer in Queensland seniors. The five most commonly diagnosed cancers in 2016 were prostate (2,581 cases), haematological cancers (2,171), colorectal (2,111 cases), melanoma (1,932 cases) and lung (1,881 cases). These cancers combined accounted for 64% of all cancer diagnoses (Figure 1.3.1).

#### 1.3.1 | Most common cancer diagnoses in Queensland seniors, 2016



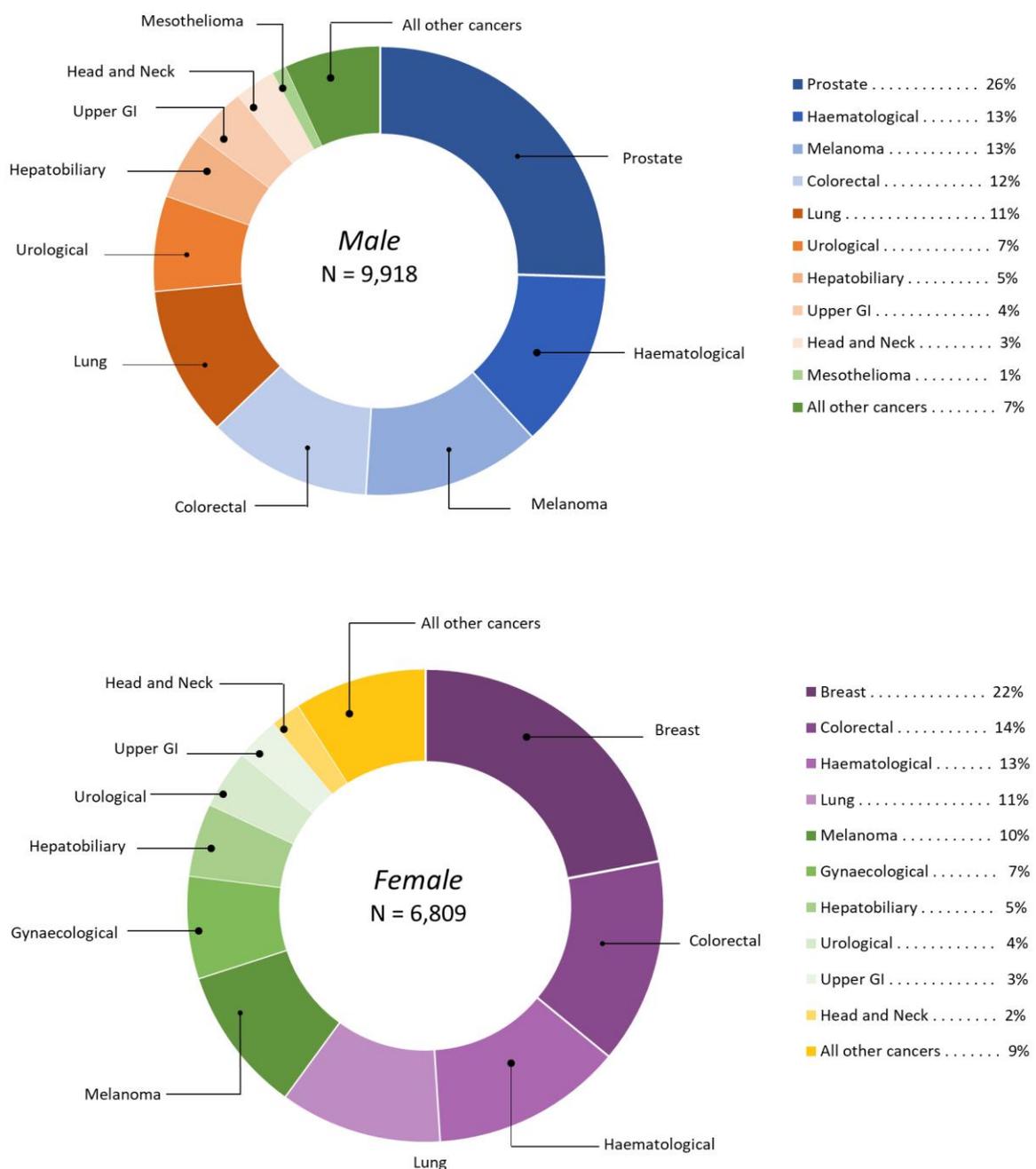
The most common causes of cancer death for Queensland seniors in 2016 was lung cancer (1,385 deaths), colorectal cancer (830 deaths), haematological cancers (809 deaths), hepatobiliary cancers (726 deaths) and prostate cancer (591 deaths). Combined these cancers accounted for 64% of cancer deaths in this age group.

#### 1.3.2 | Most common causes of cancer death in Queensland seniors, 2016



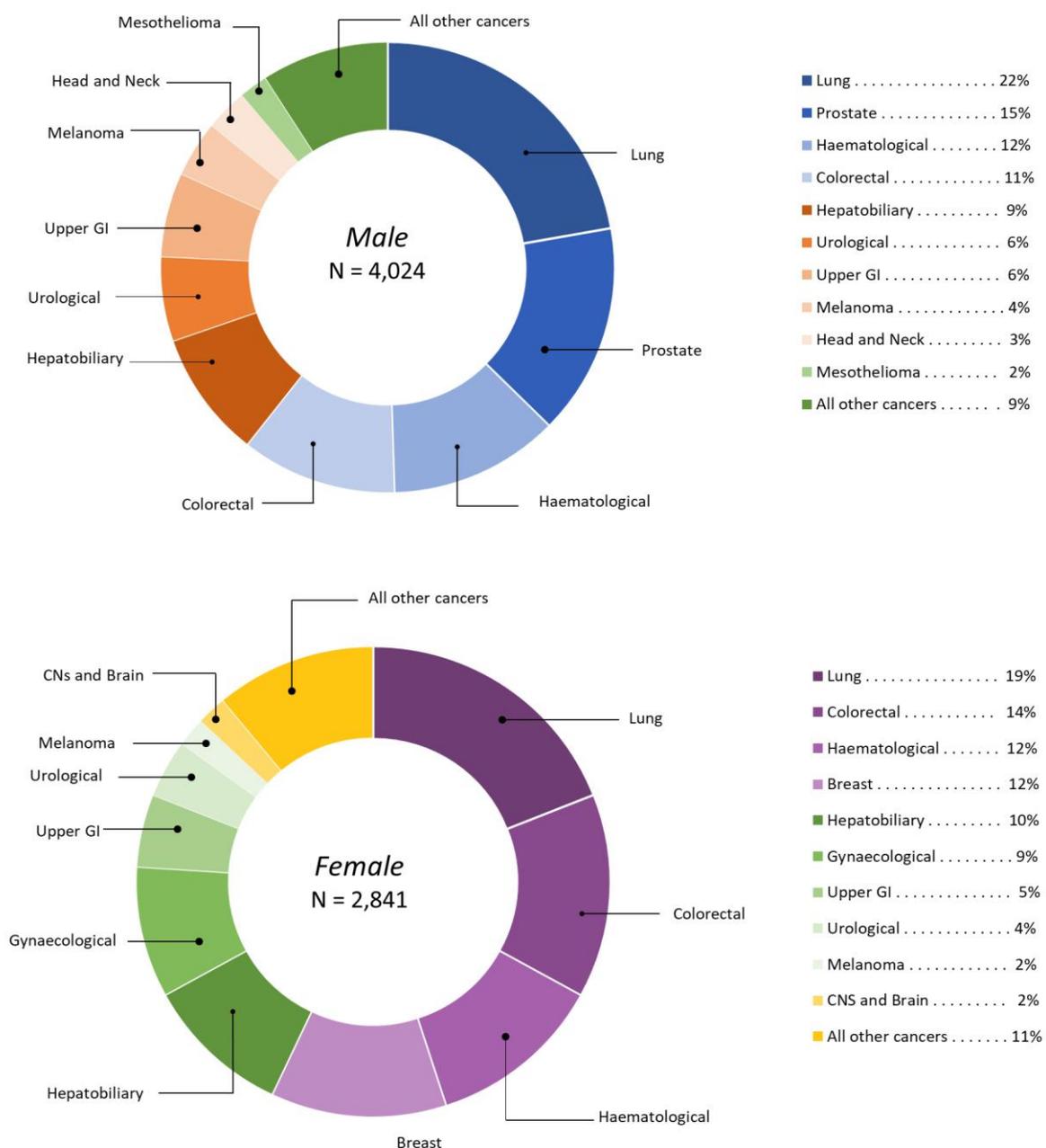
Overall in 2016, cancer was more common in males (9,918 new cases, 3,034 per 100,000) than females (6,809 new cases, 1,829 per 100,000). For males, three cancers accounted for over half of all incidence: prostate cancer represented 26% of cases (2,581 cases), followed by haematological cancers (1,264 cases) and melanoma (1,240 cases). For females, breast cancer was the most common cancer accounting for 22% of cases (1,491), followed by colorectal cancer (973 cases) and haematological cancers (907 cases). Incidence rates of urological cancers were about three times higher in males than females (207 and 77 per 100,000, respectively) (Figure 1.3.3).

### 1.3.3 | Most common cancer diagnoses, Queensland male and female seniors, 2016



During 2016, 6,865 deaths due to cancer occurred in seniors. In males, the most common cancer deaths were lung cancer (22%), prostate cancer (15%) and haematological cancers (12%). Together these cancers accounted for nearly 50% of all cancer deaths in males. In females, lung cancer was the most common cause of cancer death (19%), followed by colorectal cancer (14%) and breast cancer (12%) (Figure 1.3.4).

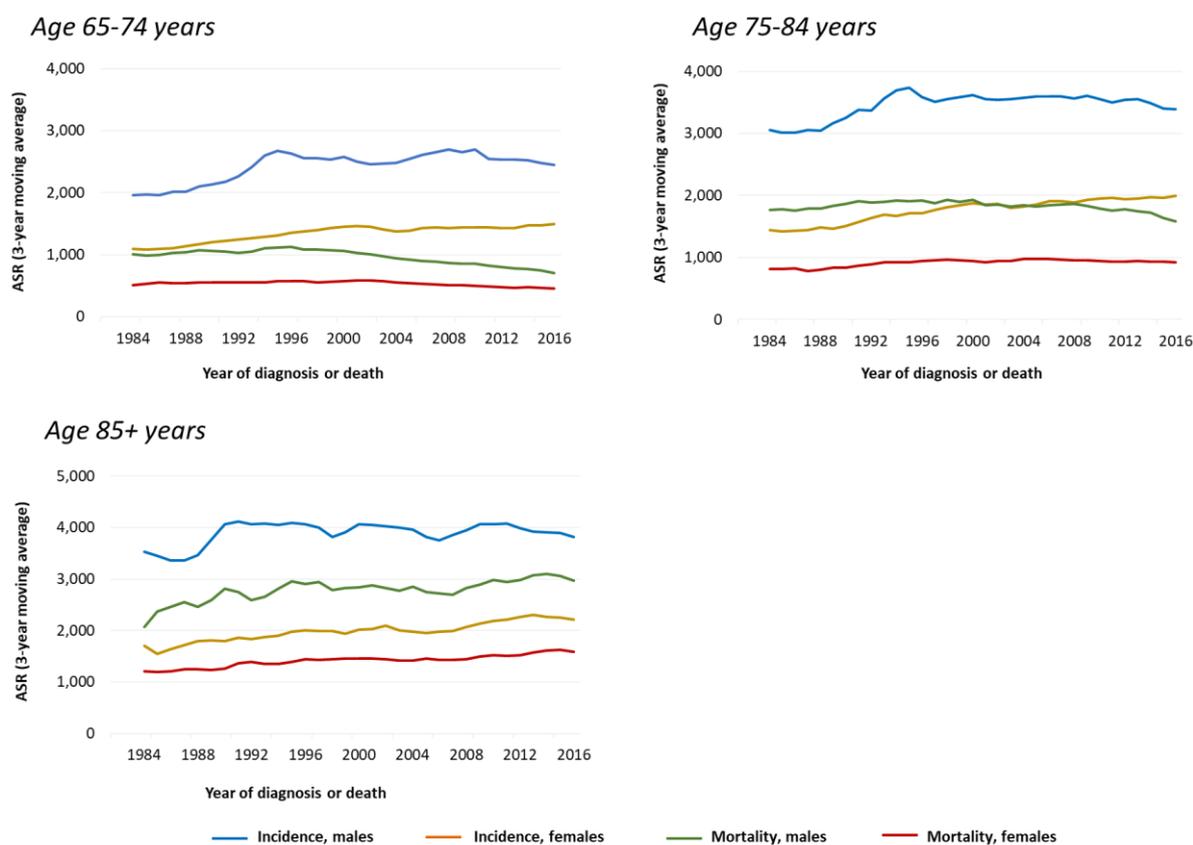
### 1.3.4 | Most common cancer deaths, Queensland male and female seniors, 2016



## 1.4 | Comparative incidence and mortality trends by age groups: 1982-2016

Cancer incidence and mortality rates over time across three senior age groups are presented in Figure 1.4.1. For males, incidence peaked around the mid-1990s across the three age groups, likely coinciding with the introduction of prostate-specific antigen testing. For females aged 65-74 years, 75-84 years and 85+ years, age-standardised incidence rates increased from 1982 to 2016 by 31%, 37% and 28%, respectively. In males over the same time, greatest increases in incidence was observed for men aged 65-74 years (28% increase). Incidence increased by only about 10% for males aged 75-84 and 85+ years. Greatest decreases in mortality rates were observed for males aged 65-74 years where mortality decreased from 1,095 per 100,000 in 1982 to 720 per 100,000 in 2016 (34% decrease).

### 1.4.1 | Trends in incidence and mortality for all cancers by senior age group, Queensland, 1982-2016

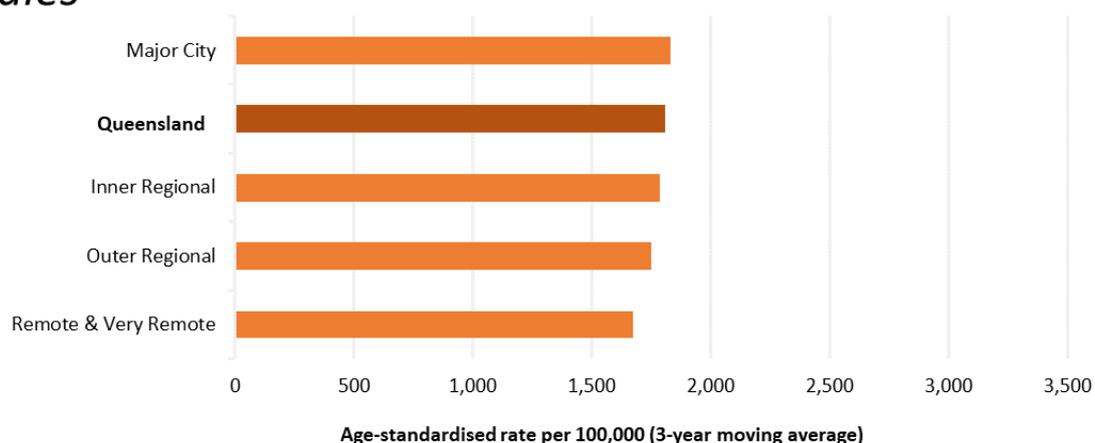


## 1.5 | Regional, national and international variation in incidence

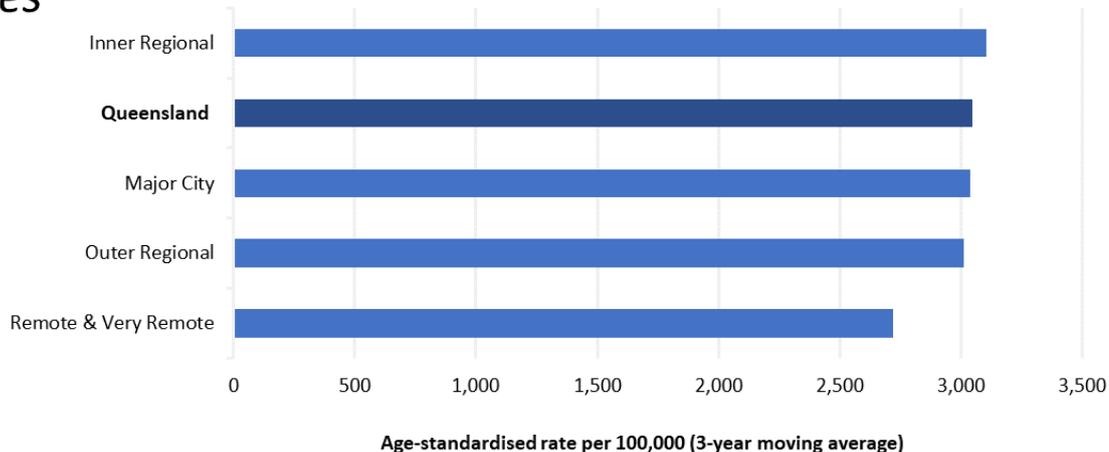
Cancer incidence rates in seniors varied according to place of residence with highest rates observed in major city and inner regional areas for females and males. Lowest incidence was observed in remote and very remote locations (Figure 1.5.1).

### 1.5.1 | Average annual cancer incidence rates by remoteness of residence in Queensland seniors, 2014-2016

#### Females



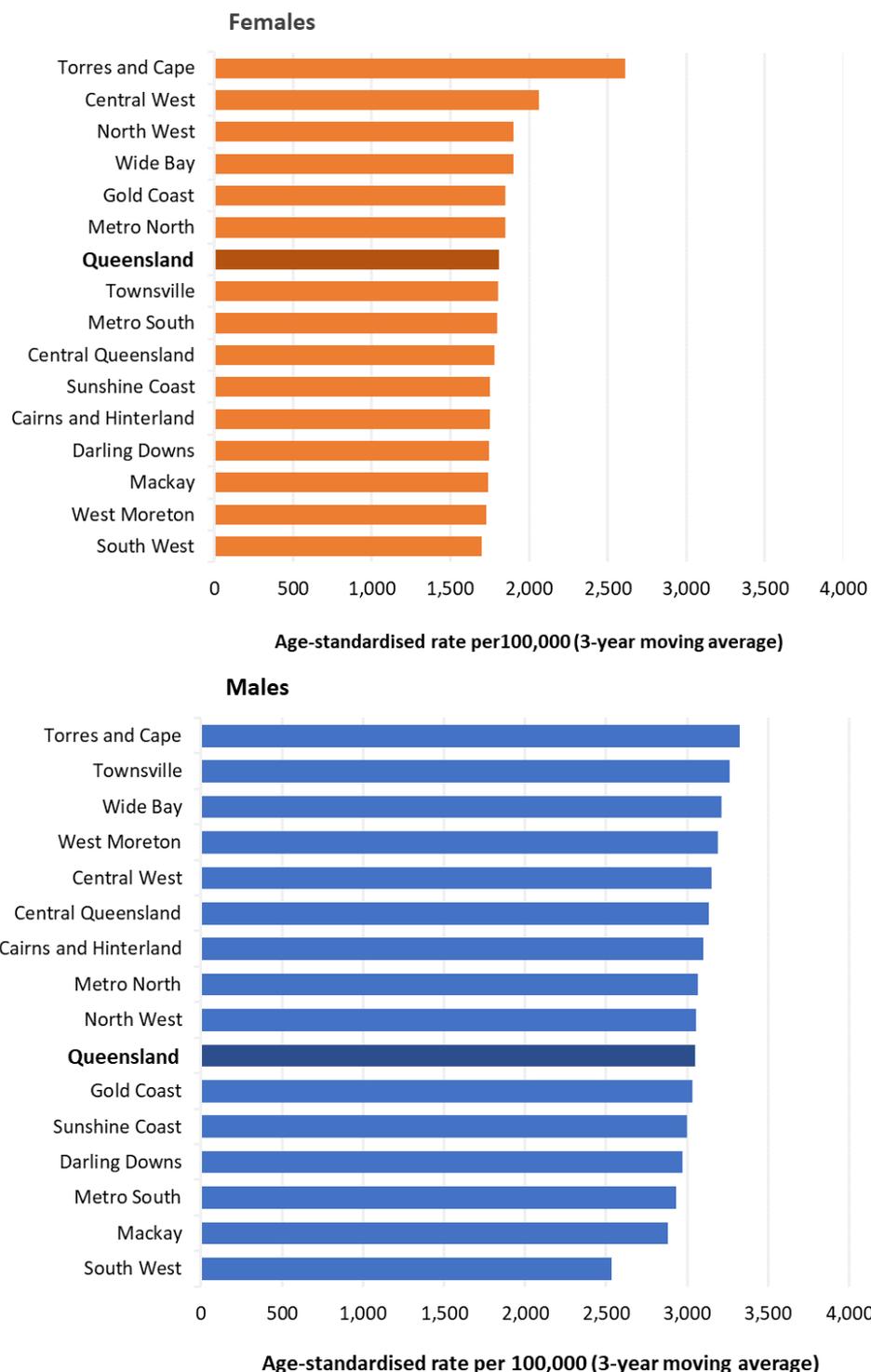
#### Males



At the Hospital and Health Service (HHS) level, age-standardised rates varied across the state for all invasive cancers combined (Figure 1.5.2). For females, highest rates were observed for Torres and Cape and Central West HHS. For males, highest rates were seen in the Torres and Cape and Townsville HHS. However, rates for these areas should be interpreted with caution due to small numbers.

1.5.2 | Average annual cancer incidence rates by Hospital and Health Service regions for Queensland seniors, 2014-2016

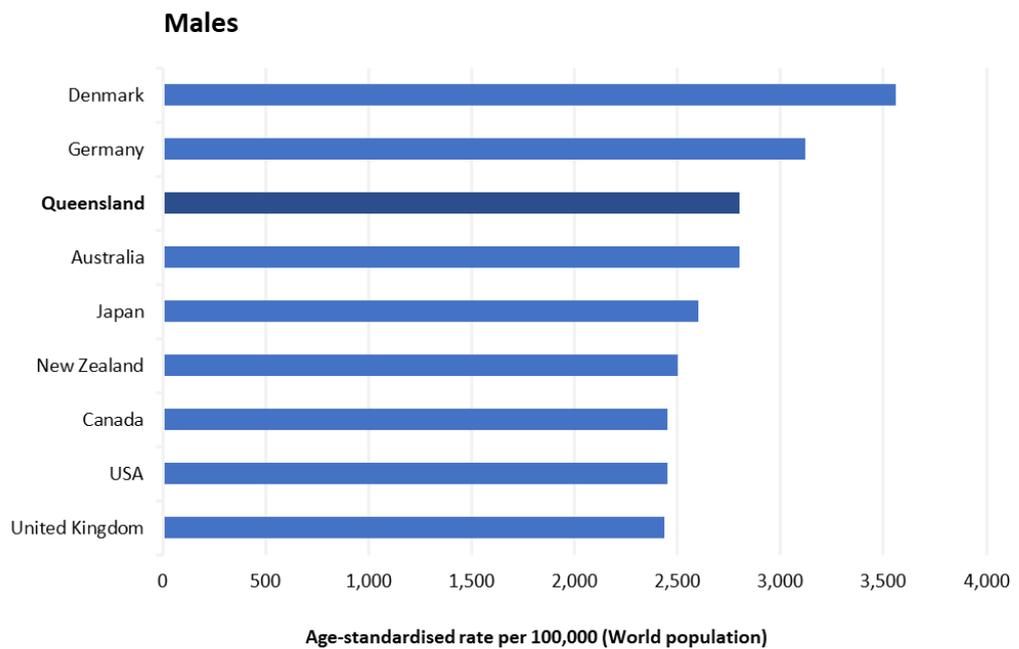
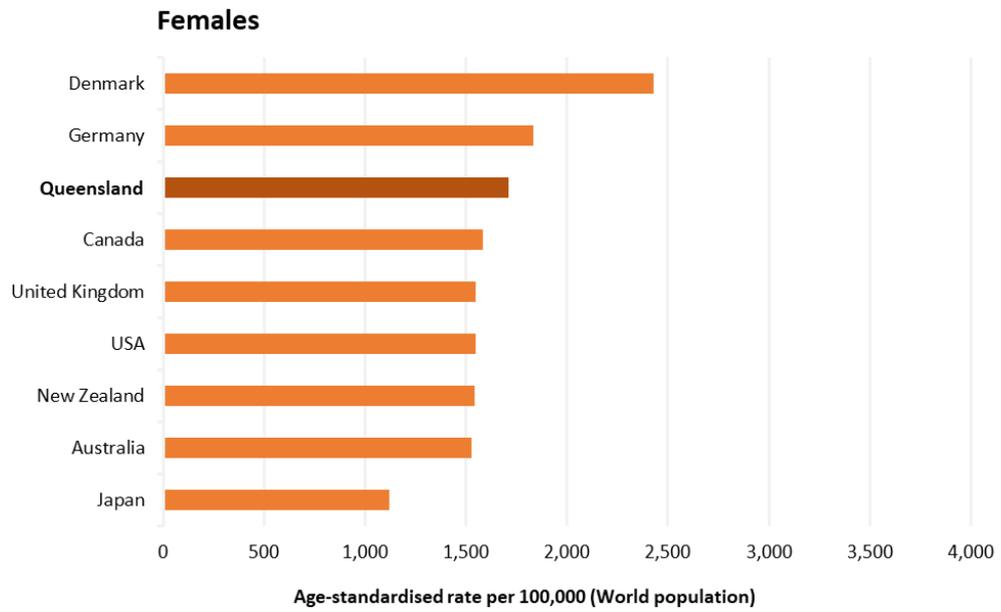
### All Cancers



Cancer incidence rates in Queensland seniors are similar to or somewhat higher, than those observed in Japan, United Kingdom, the USA and Canada (Figure 1.5.3). These higher rates are likely driven to some extent by Queensland’s high rates of melanoma.

1.5.3 | Cancer incidence rates in seniors across selected international regions (2012) and Queensland (2014-2016)

## All Cancers



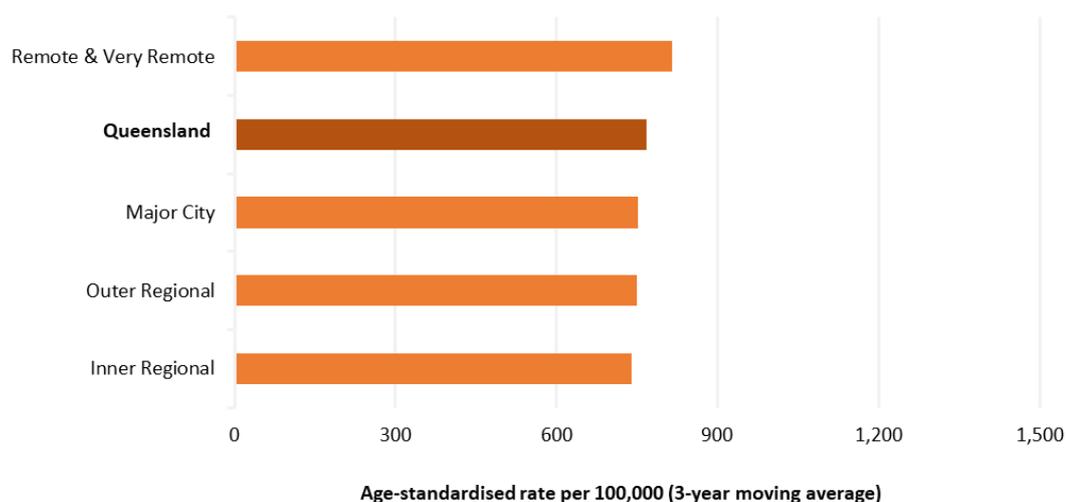
Source: Cancer incidence in five continents 2012

## 1.6 | Regional, national and international variation in mortality

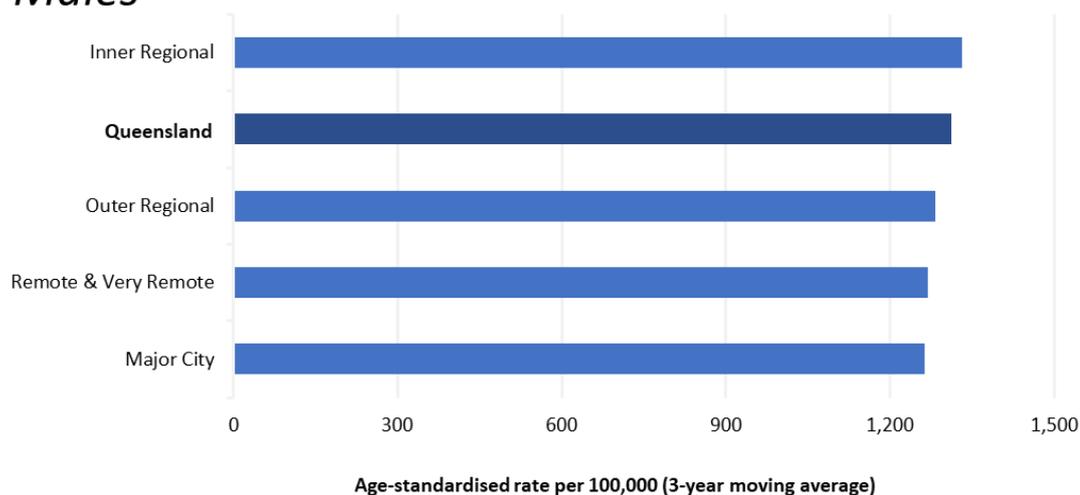
Cancer mortality rates in seniors varied according to place of residence. Highest mortality for females was observed in remote and very remote areas of Queensland and lowest in inner regional locations. For males, highest mortality was observed in inner regional locations and lowest in major cities.

### 1.6.1 | Average annual cancer mortality rates by remoteness of residence in Queensland seniors, 2014-2016

#### Females



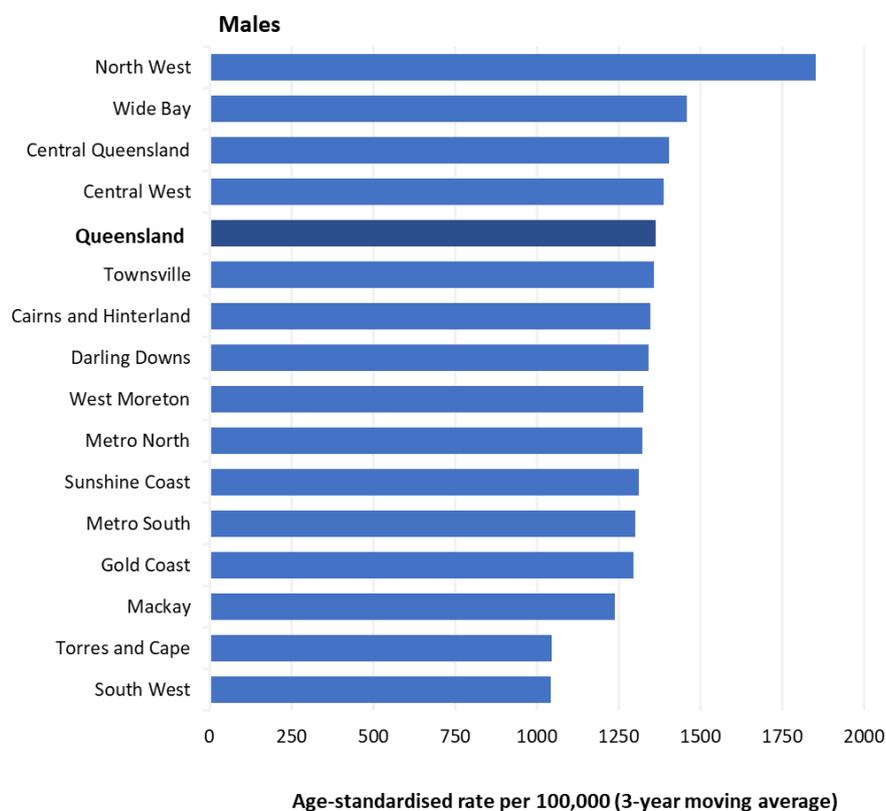
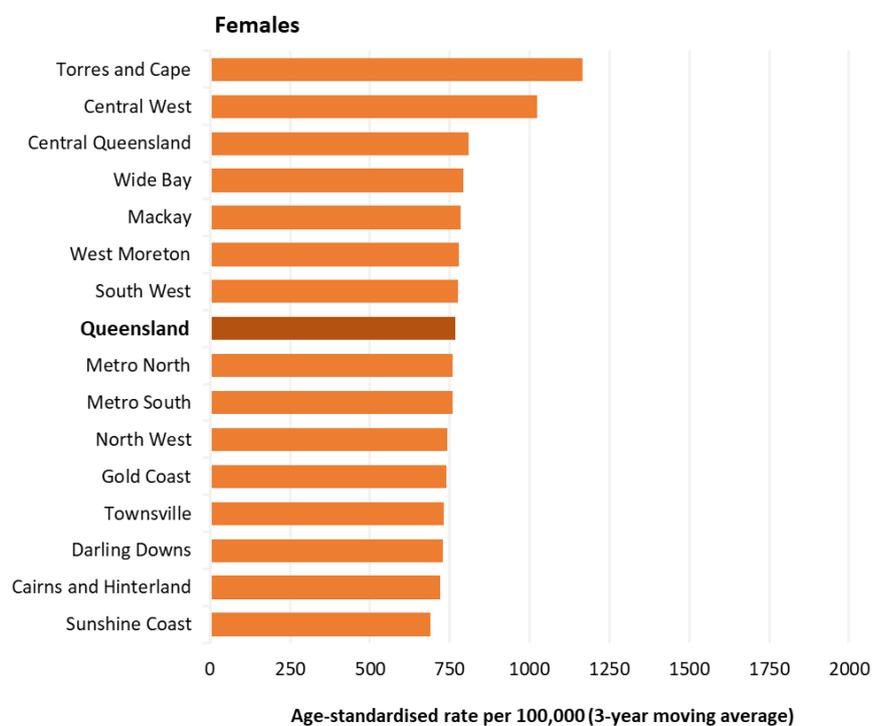
#### Males



For females at the HHS level, (Figure 1.6.2) highest mortality rates were observed for Torres and Cape and Central West HHS. In males, North West and Wide Bay HHS recorded the highest mortality rates. However, number of deaths within these HHSs were relatively few.

1.6.2 | Average annual cancer mortality rates by Hospital and Health Service region in Queensland seniors, 2014-2016

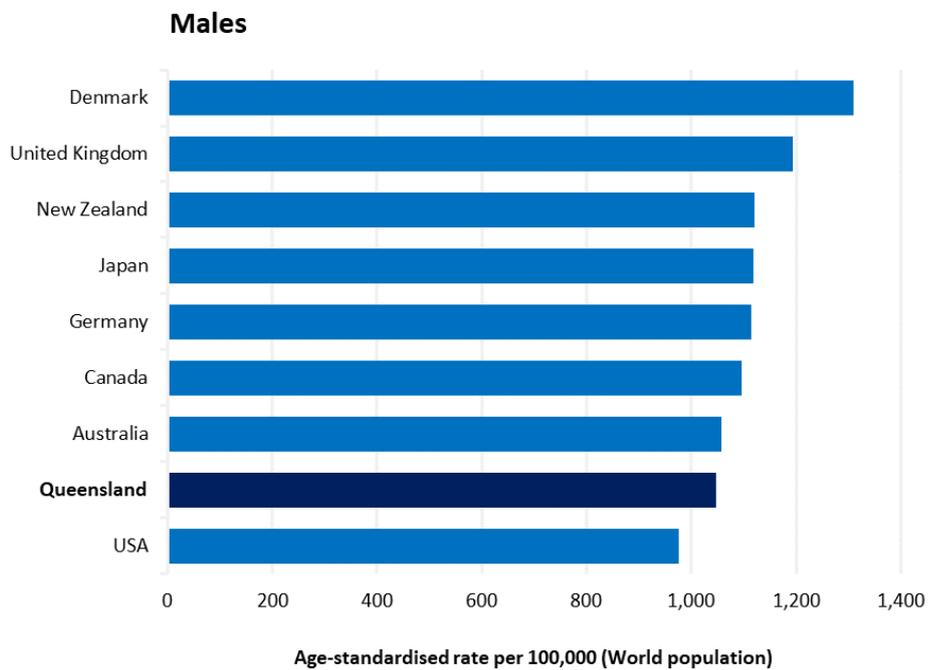
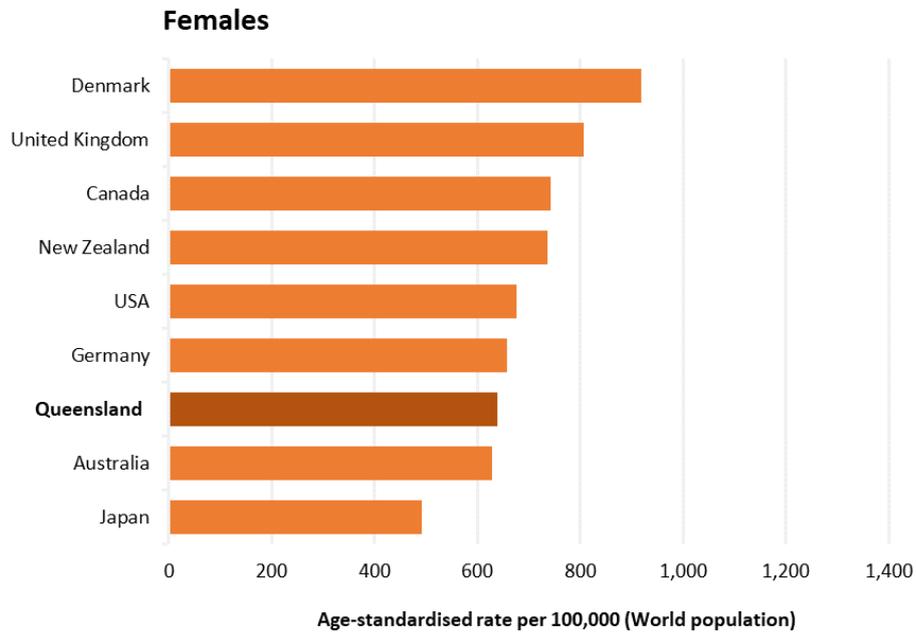
### All Cancers



Mortality rates for Queensland seniors are lower than those observed in some European countries, but higher than Japan (Figure 1.6.3).

1.6.3 | Cancer mortality rates in seniors across selected international regions (2012) and Queensland (2014-2016)

## All Cancers



Source: International Agency for research on Cancer (IARC): WHO Cancer Mortality Database

## 1.7 | Prevalence

Prevalence represents the number of people living with a chronic condition (such as cancer) and is a measure of the burden of the disease for the individual, families, healthcare systems and society. The prevalence of cancer is increasing in Queensland as more people are diagnosed with the disease and survival improves. By the end of 2016, just over 53,000 Queensland seniors were living with a diagnosis of cancer within the previous five years, representing 7.5% of the population aged 65+ years (Figure 1.7.1).

For males, highest prevalence was observed for prostate cancer (12,748 males or 3.76% of the male population 65+ years). Other high prevalent cancers in males included melanoma and colorectal cancer. In females, breast cancer was the most prevalent cancer (6,700 females, or 1.79% of the female population), followed by colorectal cancer. All these cancers have high incidence and good survival.

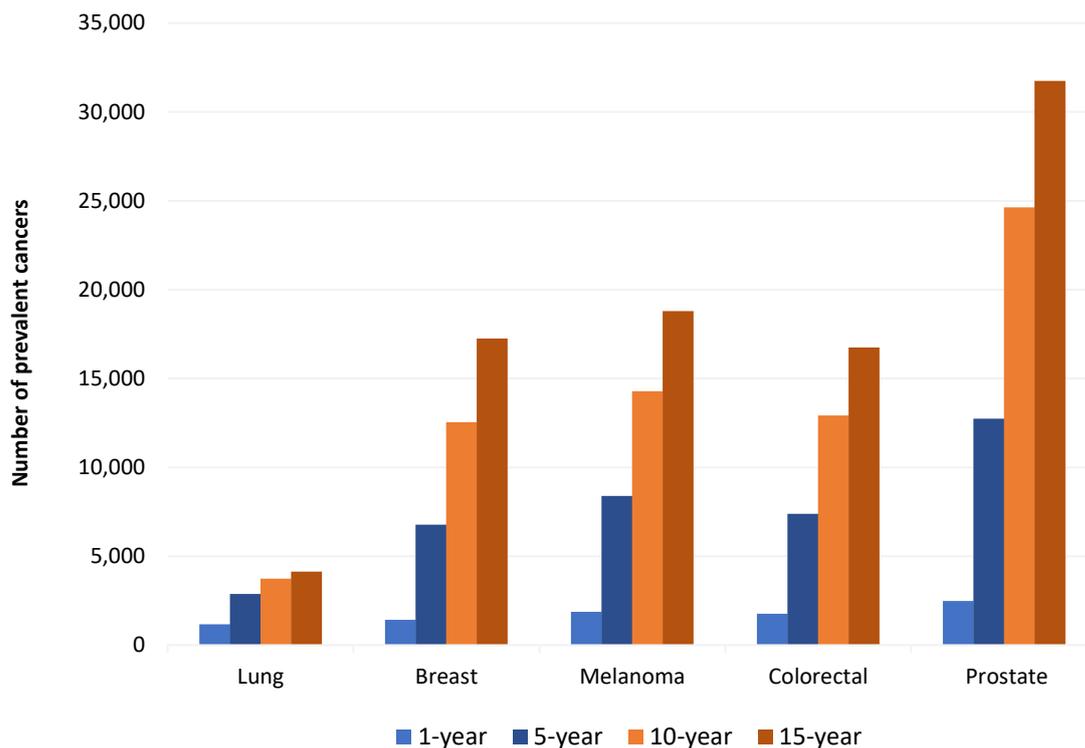
### 1.7.1 | Five-year prevalence, most common cancers, Queensland seniors, 31st December 2016

	Both sexes		Males		Females	
	Count	Percent*	Count	Percent*	Count	Percent*
<b>All cancers</b>	<b>53,348</b>	<b>7.48</b>	<b>31,981</b>	<b>9.44</b>	<b>21,367</b>	<b>5.70</b>
Prostate	12,748	1.79	12,748	3.76		
Melanoma	8,398	1.18	5,353	1.58	3,045	0.81
Colorectal	7,390	1.04	4,060	1.20	3,330	0.89
Breast	6,783	0.95	83	0.02	6,700	1.79
Haematological	6,272	0.88	3,666	1.08	2,606	0.70

\* Percent of the population aged 65+ years as at 31st December 2016 (n=713,653) (Australian Bureau of Statistics).

One, ten and fifteen year prevalence is shown in Figure 1.7.2 below. For cancers such as prostate, melanoma and breast, increasing time since diagnosis is associated with increasing prevalence. However, for cancers with poor survival such as lung cancer, prevalence decreases with increasing time since diagnosis.

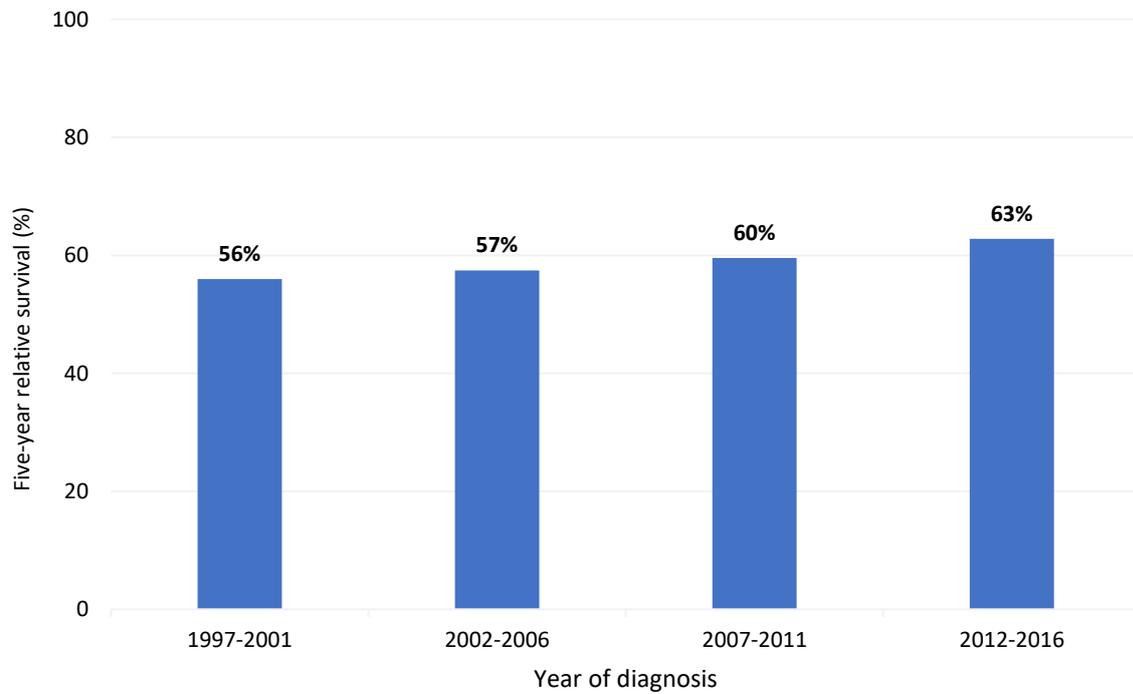
1.7.2 | Prevalence of the most common cancers by time since diagnosis, Queensland seniors, 31st December 2016



## 1.8 | Survival

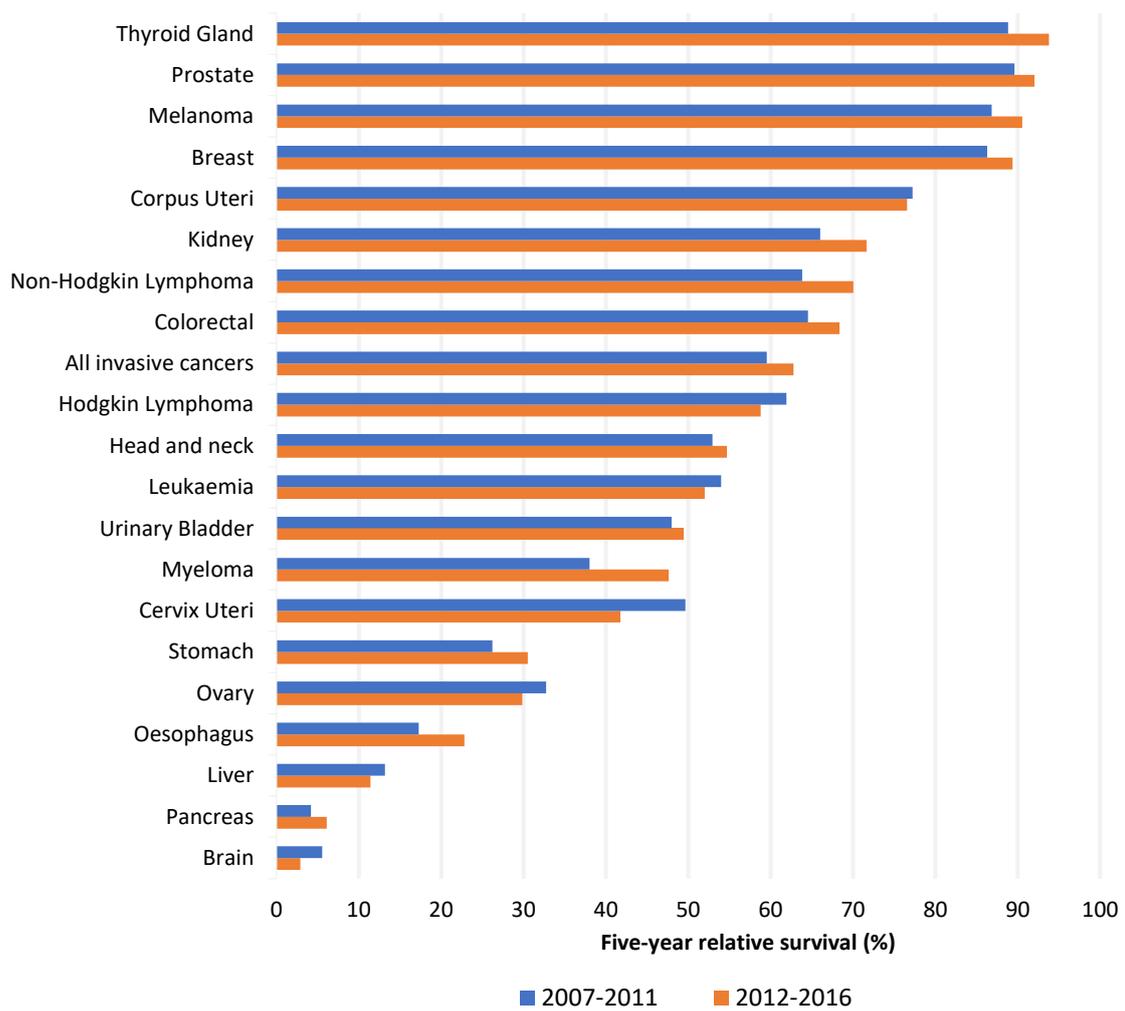
Survival varies widely and depends on type and stage of cancer. In the most recent period (2012-2016) 5-year relative survival was 63%, improving from 56% in the period 1997-2001.

### 1.8.1 | Five-year relative survival in Queensland seniors over time



In seniors, highest five-year survival in the most recent period of 2012-2016 was observed for cancers of the thyroid (94%) and prostate (92%). Those diagnosed with brain, pancreatic and liver cancers had the poorest five-year survival (3%, 6% and 11%, respectively). Compared to the period 2007-2011, improvements in five-year survival were observed across several cancers for the most recent period. For all cancers combined, five-year relative survival improved from 60% for 2007-2011 to 63% from 2012-2016.

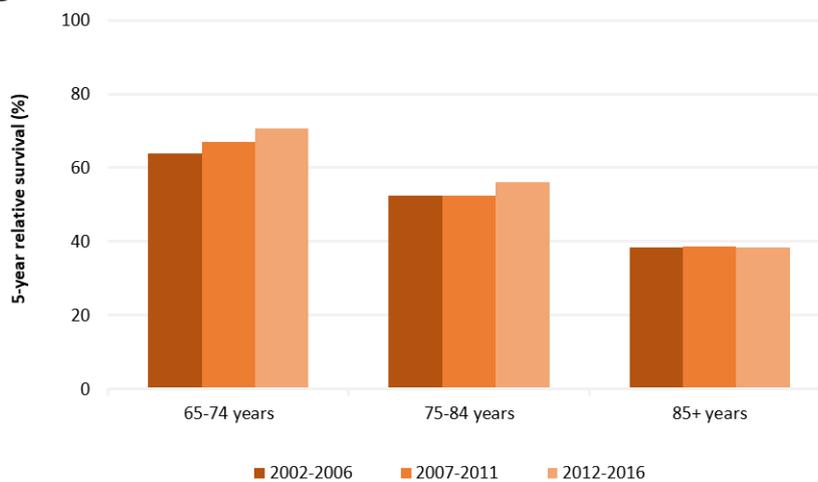
### 1.8.2 | Five-year relative survival for the most common cancer diagnoses in Queensland seniors



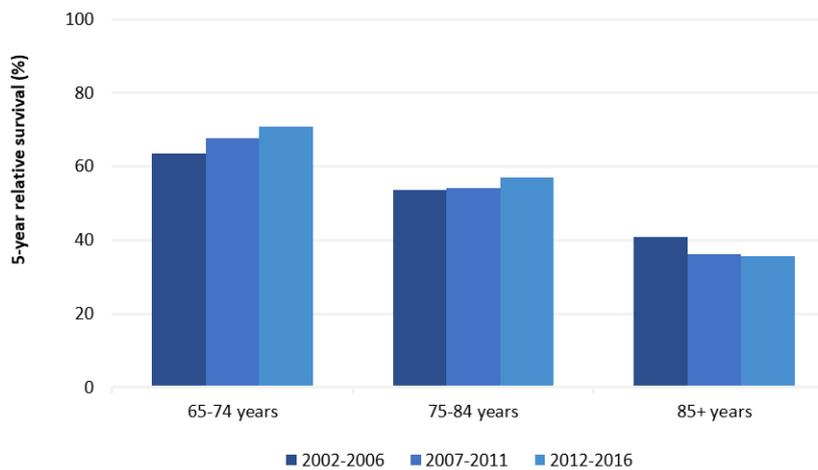
Across age groups and over time, survival improved for both males and females for those aged 65-74 years and 75-84 years. However, little change in survival over time was observed for those aged 85+ years.

### 1.8.3 | Five-year relative survival in Queensland seniors by age group over time

#### Females



#### Males



The remainder of this report will focus on treatment received for seniors diagnosed with colorectal, female breast, lung and oesophagogastric cancers from 2007-2016

## 2 | Colorectal cancer



## 2.1 | Colorectal cancer

### 2.1.1 | What are the characteristics of patients aged 65+ years diagnosed with colorectal cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received any treatment <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>18,339</b>	<b>100%</b>	16,082	88%
<b>Sex</b>				
Male	9,949	54%	8,838	89%
Female	8,390	46%	7,244	86%
<b>Age group</b>				
65-69	4,004	22%	3,811	95%
70-74	4,186	23%	3,885	93%
75-79	3,949	22%	3,587	91%
80-84	3,315	18%	2,795	84%
85+	2,885	16%	2,004	69%
<b>Indigenous status</b>				
Indigenous	160	1%	139	87%
Other than Indigenous <sup>b</sup>	18,179	99%	15,943	88%
<b>Socioeconomic status</b>				
Affluent	2,269	12%	2,039	90%
Middle	11,841	65%	10,410	88%
Disadvantaged	4,229	23%	3,633	86%
<b>Remoteness</b>				
Major city	11,399	62%	10,001	88%
Inner Regional	4,622	25%	4,084	88%
Outer Regional	1,994	11%	1,725	87%
Remote & very remote	272	2%	272	84%
<b>MDT<sup>c</sup></b>				
MDT review	4,135	23%	3,870	94%
No MDT review	14,204	77%	12,212	86%
<b>Comorbidities</b>				
0-1 Comorbidities	14,625	80%	12,995	89%
2+ Comorbidities	3,714	20%	3,087	83%
<b>Primary site</b>				
Colon	13,404	73%	11,763	88%
Rectum	4,935	27%	4,319	88%
<b>Diagnosis years</b>				
2007 - 2011	8,872	48%	7,816	88%
2012 - 2016	9,467	52%	8,266	87%
<b>HHS of residence</b>				
Cairns and Hinterland	979	5%	844	86%
Central Queensland	752	4%	658	88%
Central West	60	0.3%	53	88%
Darling Downs	1,432	8%	1,252	87%
Gold Coast	2,366	13%	2,057	87%
Mackay	556	3%	483	87%
Metro North	3,586	20%	3,169	88%
Metro South	3,475	19%	3,041	88%
North West	58	0.3%	46	79%
South West	103	0.6%	85	83%
Sunshine Coast	1,946	11%	1,755	90%
Torres and Cape	31	0.2%	27	87%
Townsville	779	4%	676	87%
West Moreton	855	5%	751	88%
Wide Bay	1,361	7%	1,185	87%

Notes: <sup>a</sup>Any treatment includes major resection, local excision (excluding biopsies), IV systemic therapy or radiation therapy; <sup>b</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup>MDT rate includes facilities that use QOOL to capture MDT review.

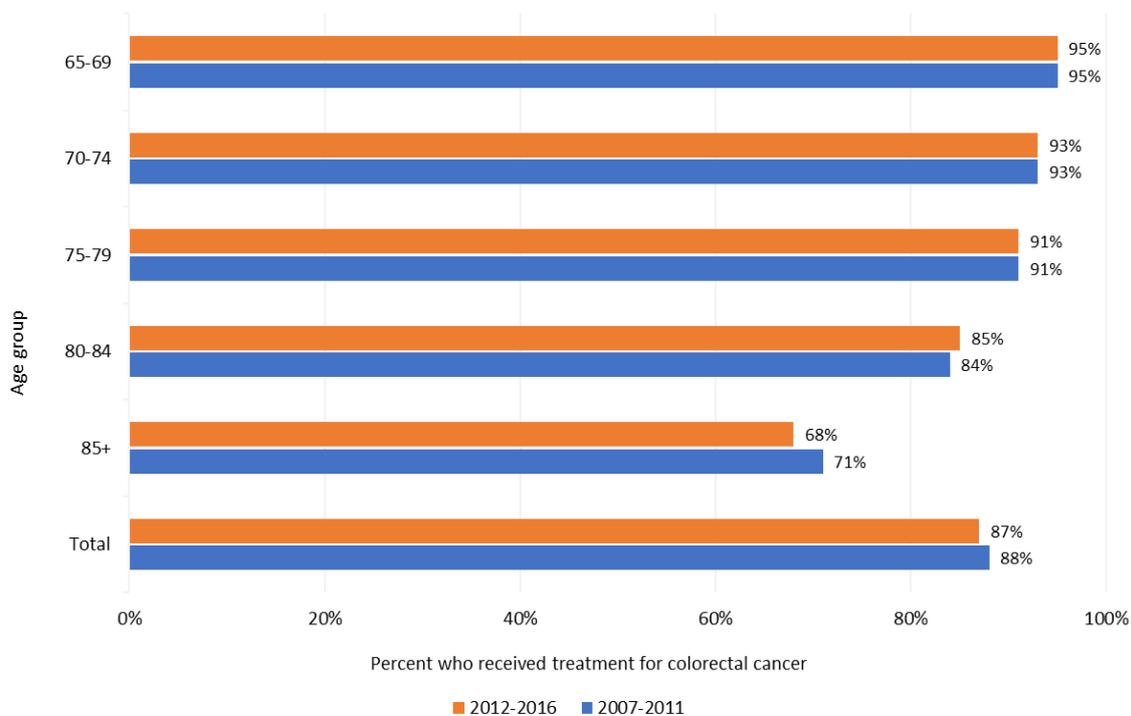
## 2.2 | Treatment for colorectal cancer

### 2.2.1 | What percentage of colorectal cancer senior patients received treatment according to age group?

Year of diagnosis 2007 - 2016

Received treatment <sup>a</sup>	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	95% (1898/1995)	95% (1913/2009)	0% (-1.36-1.36)
70 - 74	93% (1944/2091)	93% (1941/2095)	0% (-1.55-1.55)
75 - 79	91% (1711/1880)	91% (1876/2069)	0% (-1.78-1.80)
80 - 84	84% (1343/1606)	85% (1452/1709)	1.0% (-1.46-3.47)
85+	71% (920/1300)	68% (1084/1585)	3.0% (-0.38-6.35)
<b>Total</b>	<b>88%</b> (7816/8872)	<b>87%</b> (8266/9467)	<b>1.0%</b> (0.04-1.96)

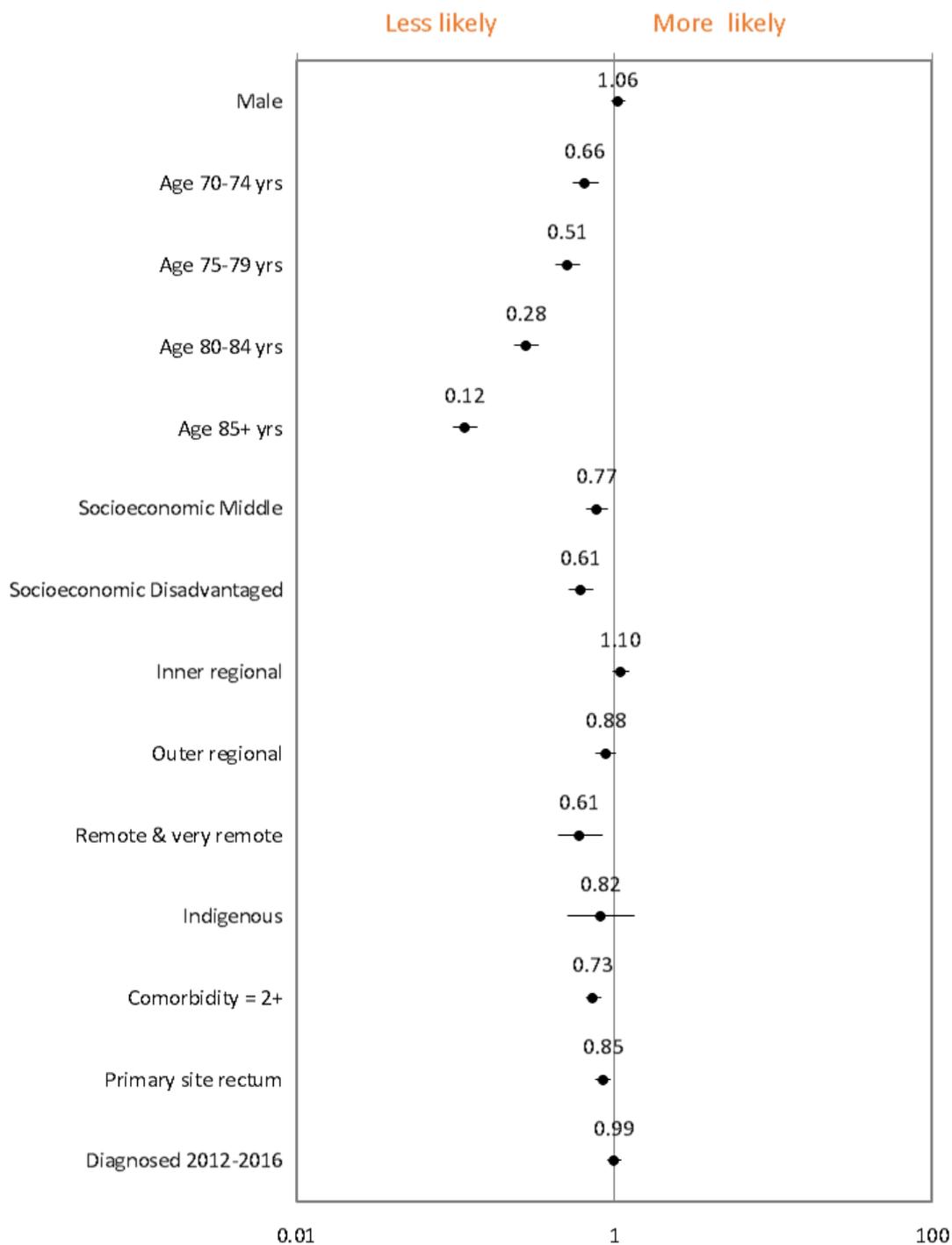
Notes: <sup>a</sup> treatment includes major resection, local excision (excluding biopsies), IV systemic therapy or radiation therapy. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

## 2.2.2 | Factors associated with the likelihood of receiving treatment<sup>a</sup> for colorectal cancer

Year of diagnosis 2007 – 2016



Notes: <sup>a</sup> treatment includes major resection, local excision (excluding biopsies), IV systemic therapy or radiation therapy. The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is considered not to be statistically significant.

## 2.3 | Major resection for colorectal cancer

### 2.3.1 | What are the characteristics of patients who had a major resection for colorectal cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received major resection	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>18,339</b>	<b>100%</b>	<b>14,274</b>	<b>78%</b>
<b>Sex</b>				
Male	9,949	54%	7,683	77%
Female	8,390	46%	6,591	79%
<b>Age group</b>				
65-69	4,004	22%	3,325	83%
70-74	4,186	23%	3,452	83%
75-79	3,949	22%	3,239	82%
80-84	3,315	18%	2,508	76%
85+	2,885	16%	1,750	61%
<b>Indigenous status</b>				
Indigenous	160	1%	121	76%
Other than Indigenous <sup>a</sup>	18,179	99%	14,153	78%
<b>Socioeconomic status</b>				
Affluent	2,269	12%	1,808	80%
Middle	11,841	65%	9,232	78%
Disadvantaged	4,229	23%	3,234	76%
<b>Remoteness</b>				
Major city	11,399	62%	8,870	78%
Inner Regional	4,622	25%	3,639	79%
Outer Regional	1,994	11%	1,530	77%
Remote & very remote	272	2%	235	73%
<b>MDT<sup>b</sup></b>				
MDT review	4,135	23%	3,470	84%
No MDT review	14,204	77%	10,804	76%
<b>Comorbidities</b>				
0-1 Comorbidities	14,625	80%	11,573	79%
2+ Comorbidities	3,714	20%	2,701	73%
<b>Primary site</b>				
Colon	13,404	73%	10,731	80%
Rectum	4,935	27%	3,543	72%
<b>Diagnosis years</b>				
2007 - 2011	8,872	48%	7,020	79%
2012 - 2016	9,467	52%	7,254	77%
<b>HHS of residence</b>				
Cairns and Hinterland	979	5%	742	76%
Central Queensland	752	4%	571	76%
Central West	60	0.3%	45	75%
Darling Downs	1,432	8%	1,107	77%
Gold Coast	2,366	13%	1,801	76%
Mackay	556	3%	435	78%
Metro North	3,586	20%	2,850	79%
Metro South	3,475	19%	2,690	77%
North West	58	0.3%	37	64%
South West	103	0.6%	80	78%
Sunshine Coast	1,946	11%	1,569	81%
Torres and Cape	31	0.2%	24	77%
Townsville	779	4%	609	78%
West Moreton	855	5%	657	77%
Wide Bay	1,361	7%	1,057	78%

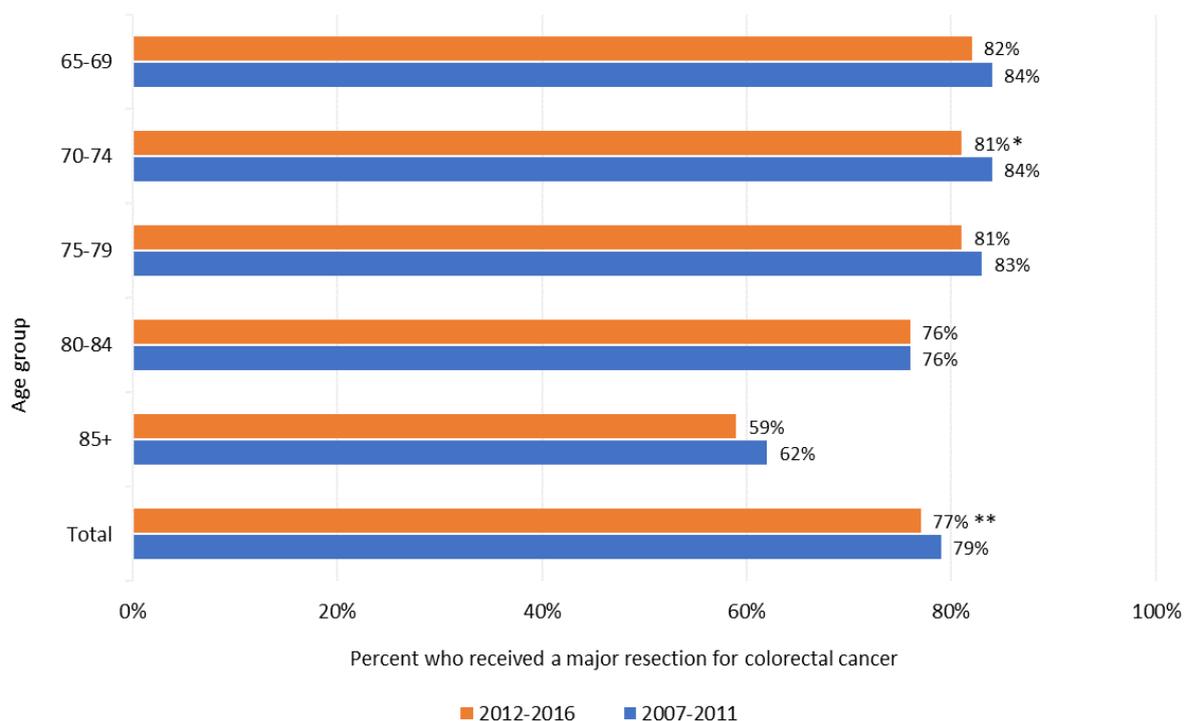
Notes: <sup>a</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

### 2.3.2 | What percentage of patients received a major resection for colorectal cancer according to age group?

Year of diagnosis 2007 - 2016

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	84% (1681/1995)	82% (1644/2009)	2% (-0.33-4.33)
70 - 74	84% (1748/2091)	81% (1704/2095)	3%* (0.70-5.30)
75 - 79	83% (1567/1880)	81% (1672/2069)	2% (-0.40-4.39)
80 - 84	76% (1214/1606)	76% (1294/1709)	0% (-2.90-2.91)
85+	62% (810/1300)	59% (940/1585)	3% (-0.59-6.57)
<b>Total</b>	<b>79%</b> (7020/8872)	<b>77%</b> (7254/9467)	<b>2%**</b> (0.80-3.20)

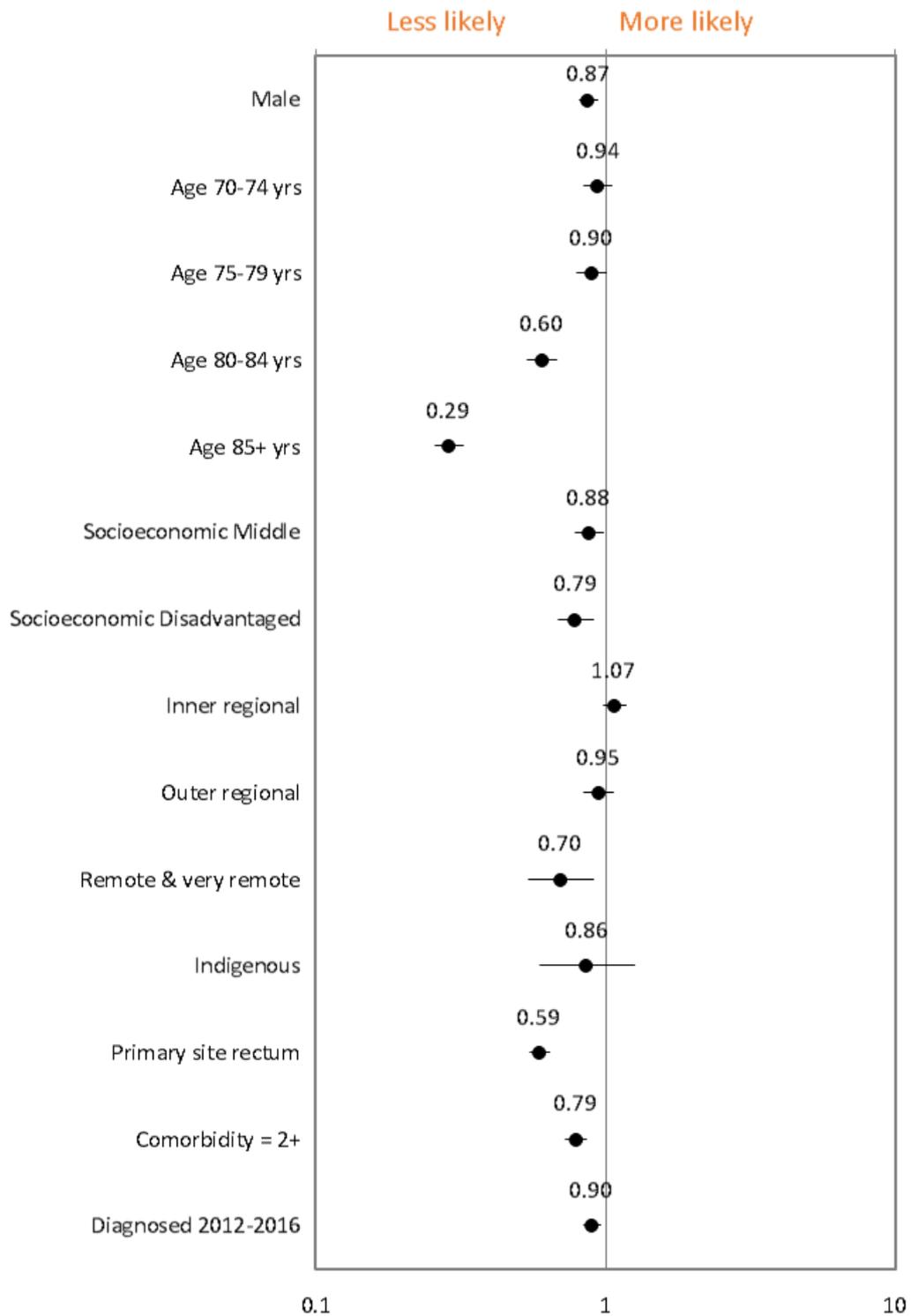
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.3.3 | Factors associated with likelihood of having a major resection for colorectal cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.4 | 30-day mortality following major resection for colorectal cancer

### 2.4.1 | What percentage of patients die within 30 days of major resection for colorectal cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

30-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	4.6% (65/1401) [4.3%, 3.0-6.3, 0.144]	2.2% (31/1437) [2.2%, 1.3-3.7, 0.457]
Group A hospitals	3.4% (135/4004) [3.3%, 2.4-4.5, 0.414]	3.0% (130/4283) [2.8%, 2.0-4.0, 0.423]
Group B hospitals	4.0% (35/876) [4.2%, 2.6-6.7, 0.339]	2.3% (24/1054) [2.5%, 1.5-4.4, 0.924]
Other hospitals	2.0% (15/739) [2.7%, 1.4-5.0, 0.258]	0.4% (2/480) [0.7%, 0.1-3.1, 0.056]
<b>Hospital Type</b>		
Public hospitals	4.8% (157/3272) [4.2%, 3.1-5.6, 0.069]	3.2% (115/3599) [2.9%, 2.1-4.1, 0.218]
Private hospitals	2.5% (93/3748) [2.9%*, 2.0-4.0, 0.045]	2.0% (72/3655) [2.2%, 1.5-3.2, 0.164]
<b>Queensland</b>	<b>3.6% (250/7020)</b>	<b>2.6% (187/7254)</b>

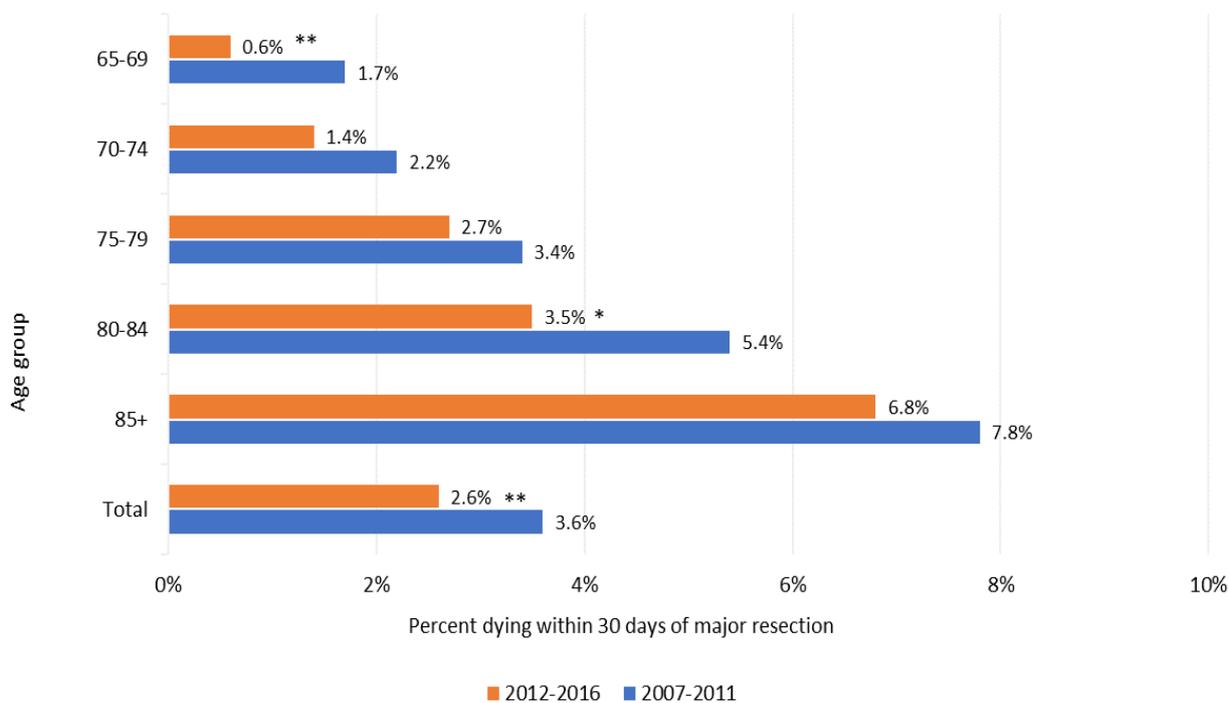
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 2.4.2 | What percentage of patients die within 30 days of major resection for colorectal cancer according to age group?

Year of diagnosis 2007 - 2016

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	1.7% (28/1681)	0.6% (10/1644)	1.1%** (0.38-1.89)
70 - 74	2.2% (39/1748)	1.4% (23/1704)	0.8% (-0.98-1.72)
75 - 79	3.4% (54/1567)	2.7% (45/1672)	0.7% (-0.49-1.92)
80 - 84	5.4% (66/1214)	3.5% (45/1294)	1.9%* (0.29-3.56)
85+	7.8% (63/810)	6.8% (64/940)	1.0% (-1.44-3.51)
<b>Total</b>	<b>3.6%</b> (250/7020)	<b>2.6%</b> (187/7254)	<b>1.0%**</b> (0.43-1.57)

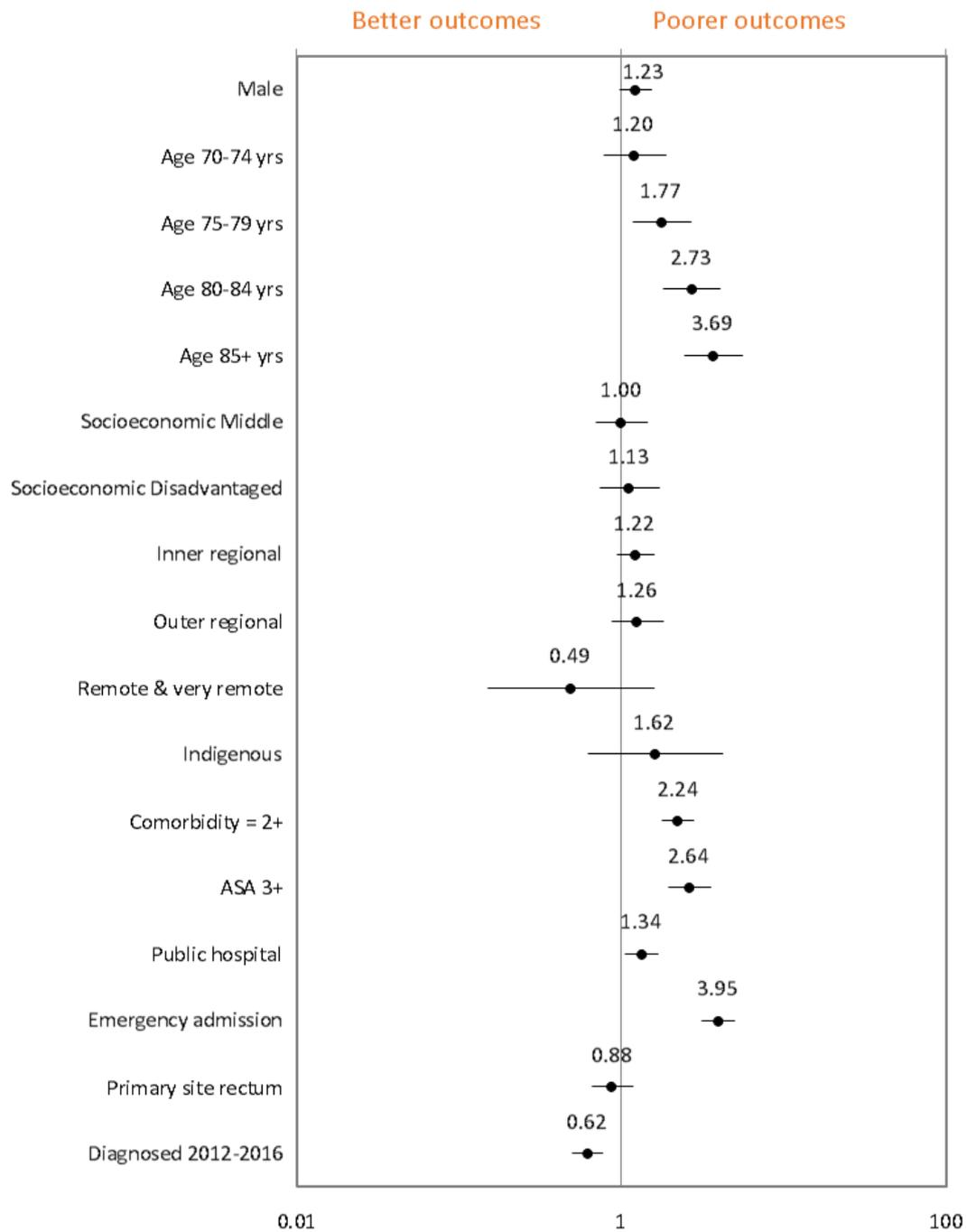
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.4.3 | Factors associated with 30-day surgical mortality following major resection for colorectal cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.5 | 90-day mortality following major resection for colorectal cancer

### 2.5.1 | What percentage of patients die within 90 days of major resection for colorectal cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

90-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	7.1% (100/1401) [6.6%, 4.9-8.9, 0.523]	4.4% (64/1437) [4.5%, 3.1-6.5, 0.828]
Group A hospitals	6.2% (248/4004) [6.0%, 4.7-7.6, 0.684]	5.1% (220/4283) [4.8%, 3.7-6.3, 0.592]
Group B hospitals	6.2% (54/876) [6.7%, 4.7-9.6, 0.569]	4.6% (48/1054) [5.0%, 3.3-7.3, 0.64]
Other hospitals	4.5% (33/739) [5.7%, 3.7-8.8, 0.64]	0.8% (4/480) [1.2%** , 0.4-3.7, 0.009]
<b>Hospital Type</b>		
Public hospitals	7.5% (246/3272) [6.7%, 5.3-8.5, 0.287]	5.8% (207/3599) [5.2, 4.0-6.9, 0.14]
Private hospitals	5.0% (189/3748) [5.6%, 4.4-7.3, 0.253]	3.5% (129/3655) [3.9%, 2.9-5.3, 0.083]
<b>Queensland</b>	<b>6.2% (435/7020)</b>	<b>4.6% (336/7254)</b>

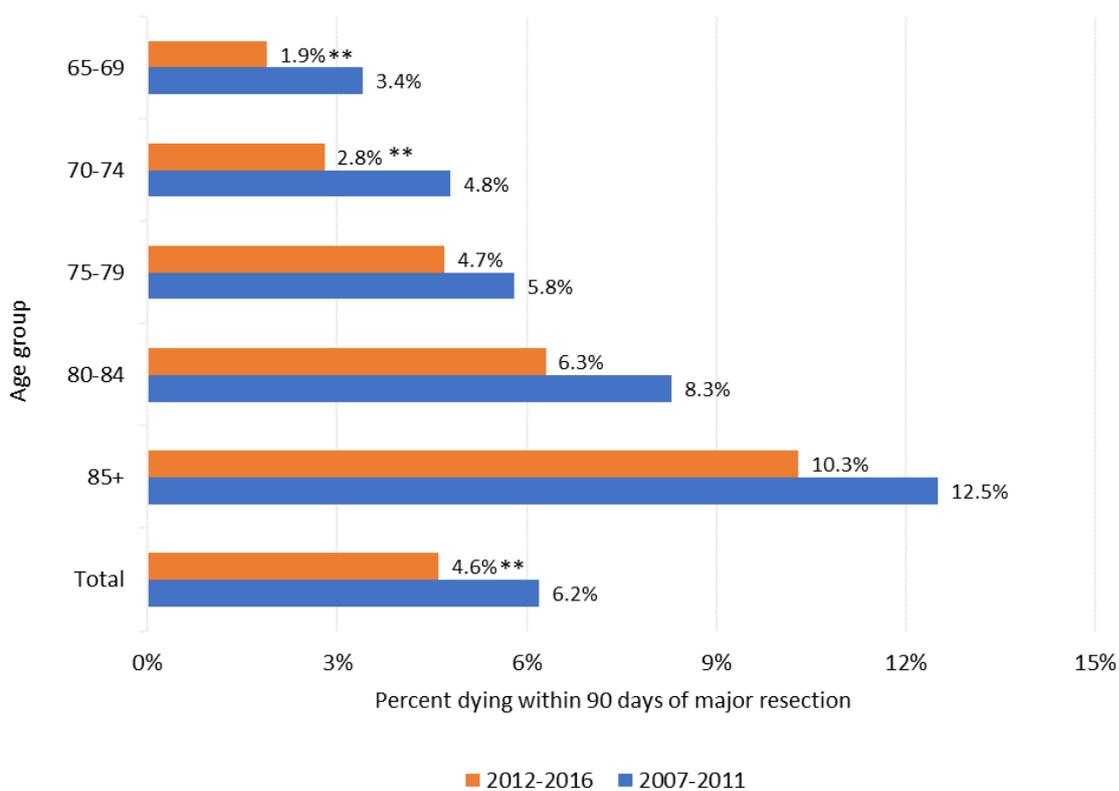
Notes: <sup>a</sup> Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to appendix A for hospital grouping definitions.

## 2.5.2 | What percentage of patients die within 90 days of major resection for colorectal cancer according to age group?

Year of diagnosis 2007 - 2016

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	3.4% (58/1681)	1.9% (31/1644)	1.5%** (0.41-2.63)
70 - 74	4.8% (84/1748)	2.8% (48/1704)	2.0%** (0.73-3.30)
75 - 79	5.8% (91/1567)	4.7% (79/1672)	1.1% (-0.44-2.66)
80 - 84	8.3% (101/1214)	6.3% (81/1294)	2.0% (-0.04-4.07)
85+	12.5% (101/810)	10.3% (97/940)	2.2% (-0.78-5.24)
<b>Total</b>	<b>6.2%</b> (435/7020)	<b>4.6%</b> (336/7254)	<b>1.6%**</b> (0.85-2.35)

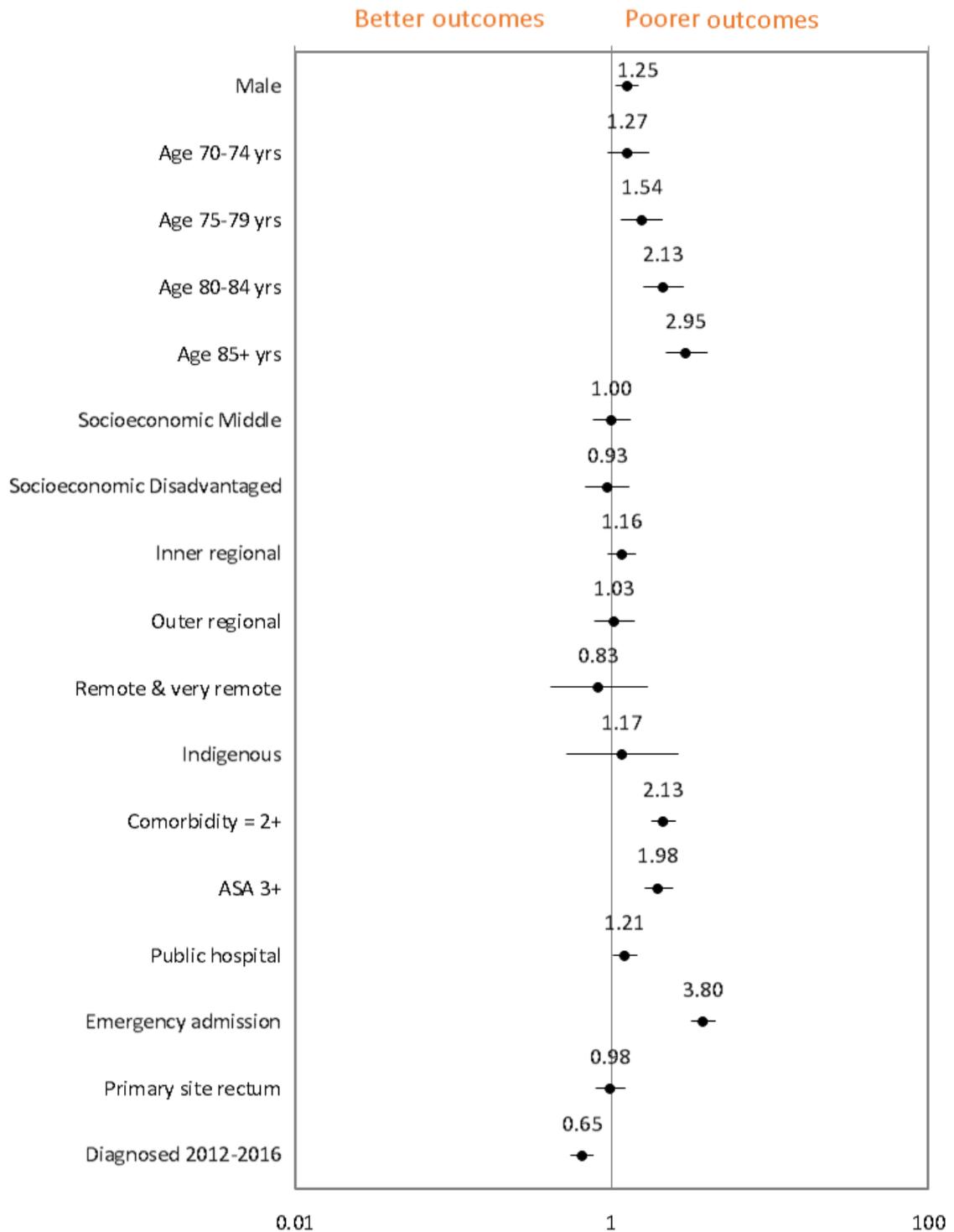
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.5.3 | Factors associated with 90-day surgical mortality following major resection for colorectal cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.6 | 1-year surgical survival

### 2.6.1 | What percentage of patients are alive one year after major resection for colorectal cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

1-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year	Diagnosis year
	Crude rates (n/N)	Crude rates (n/N)
	[Adjusted <sup>a</sup> rates, CI%, P value]	[Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	84% (1181/1401) [85%, 83-88, 0.441]	88% (1265/1437) [89%, 86-91, 0.985]
Group A hospitals	86% (3460/4004) [87%, 85-89, 0.452]	88% (3767/4283) [88%, 86-90, 0.831]
Group B hospitals	86% (753/876) [85%, 82-89, 0.574]	89% (935/1054) [88%, 86-91, 0.789]
Other hospitals	88% (651/739) [86%, 83-89, 0.766]	94% (450/480) [90%, 87-93, 0.155]
<b>Hospital Type</b>		
Public hospitals	84% (2738/3272) [85%, 83-87, 0.161]	86% (3102/3599) [88%, 86-90, 0.177]
Private hospitals	88% (3307/3748) [87%, 85-89, 0.168]	91% (3315/3655) [89%, 87-91, 0.14]
<b>Queensland</b>	<b>86% (6045/7020)</b>	<b>88% (6417/7254)</b>

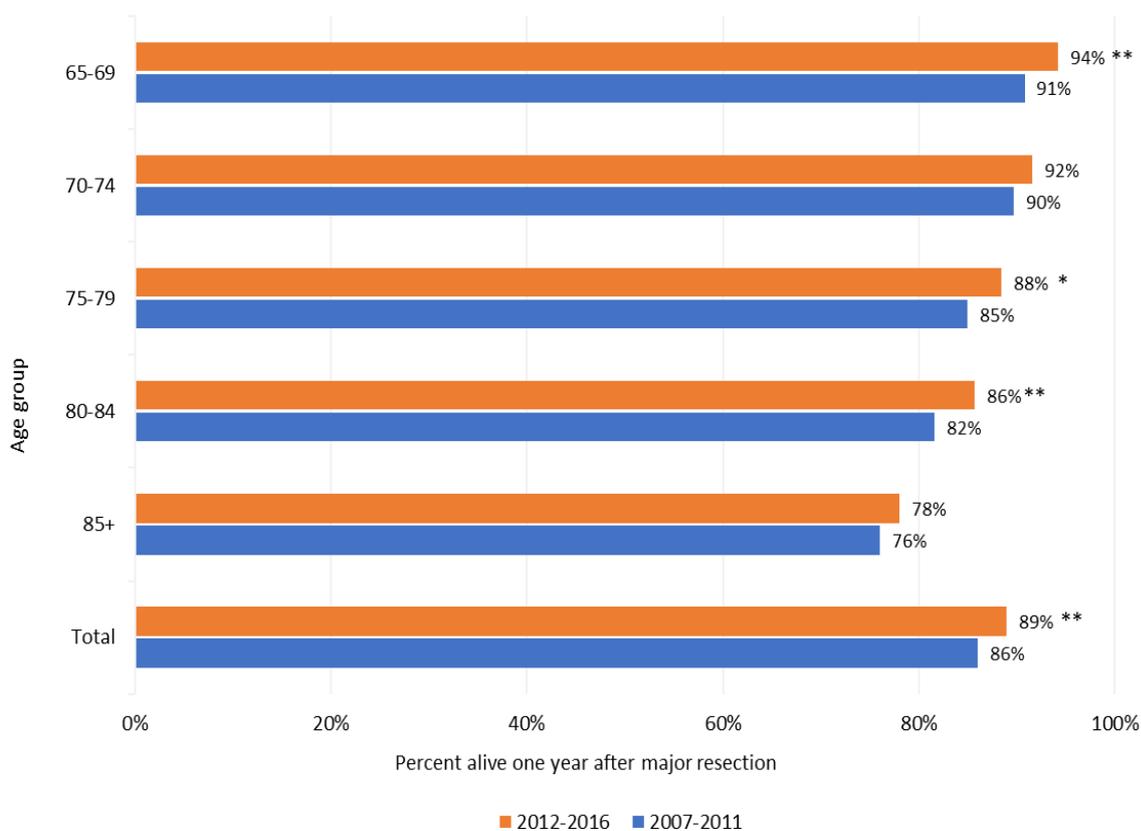
Notes: <sup>a</sup> Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to appendix A for hospital grouping definitions.

## 2.6.2 | What percentage of patients are alive one year after major resection for colorectal cancer according age group?

Year of diagnosis 2007 - 2016

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	90.8% (1527/1681)	94.0% (1546/1644)	3.2%** (1.40-5.01)
70 - 74	89.8% (1569/1748)	91.5% (1559/1704)	1.7% (-0.25-3.65)
75 - 79	85.4% (1339/1567)	88.2% (1474/1672)	2.8%* (0.47-5.14)
80 - 84	81.6% (991/1214)	85.6% (1108/1294)	4.0%** (1.10-6.91)
85+	76.4% (619/810)	77.7% (730/940)	1.3% (-2.64-5.27)
<b>Total</b>	<b>86.1%</b> (6045/7020)	<b>88.5%</b> (6417/7254)	<b>2.4%**</b> (1.31-3.49)

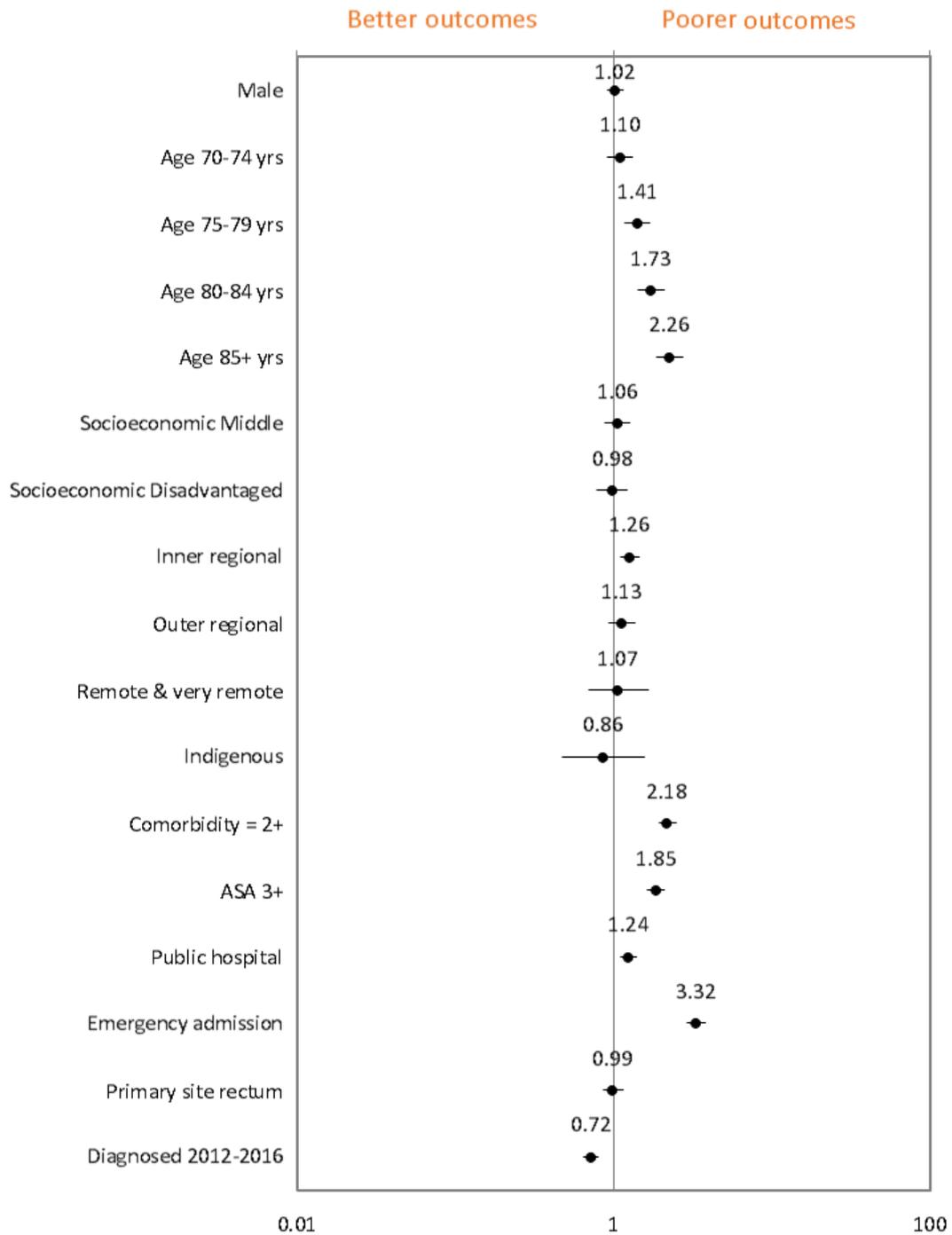
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.6.3 | Factors associated with 1-year surgical survival following major resection for colorectal cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.7 | 2-year surgical survival

### 2.7.1 | What percentage of patients are alive two years after major resection for colorectal cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

2-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	74% (1040/1401) [76%, 72-79, 0.209]	80% (1145/1437) [80%, 77-83, 0.887]
Group A hospitals	77% (3089/4004) [77%, 75-80, 0.65]	79% (3402/4283) [80%, 78-82, 0.521]
Group B hospitals	77% (676/876) [77%, 73-80, 0.733]	82% (862/1054) [81%, 78-85, 0.499]
Other hospitals	81% (602/739) [79%, 75-82, 0.306]	88% (421/480) [83%, 79-87, 0.063]
<b>Hospital Type</b>		
Public hospitals	73% (2396/3273) [75%*, 72-78, 0.02]	77% (2782/3599) [79%, 77-82, 0.074]
Private hospitals	80% (3011/3748) [79%*, 76-81, 0.025]	83% (3048/3655) [82%, 79-84, 0.06]
<b>Queensland</b>	<b>77% (5407/7020)</b>	<b>80% (5830/7254)</b>

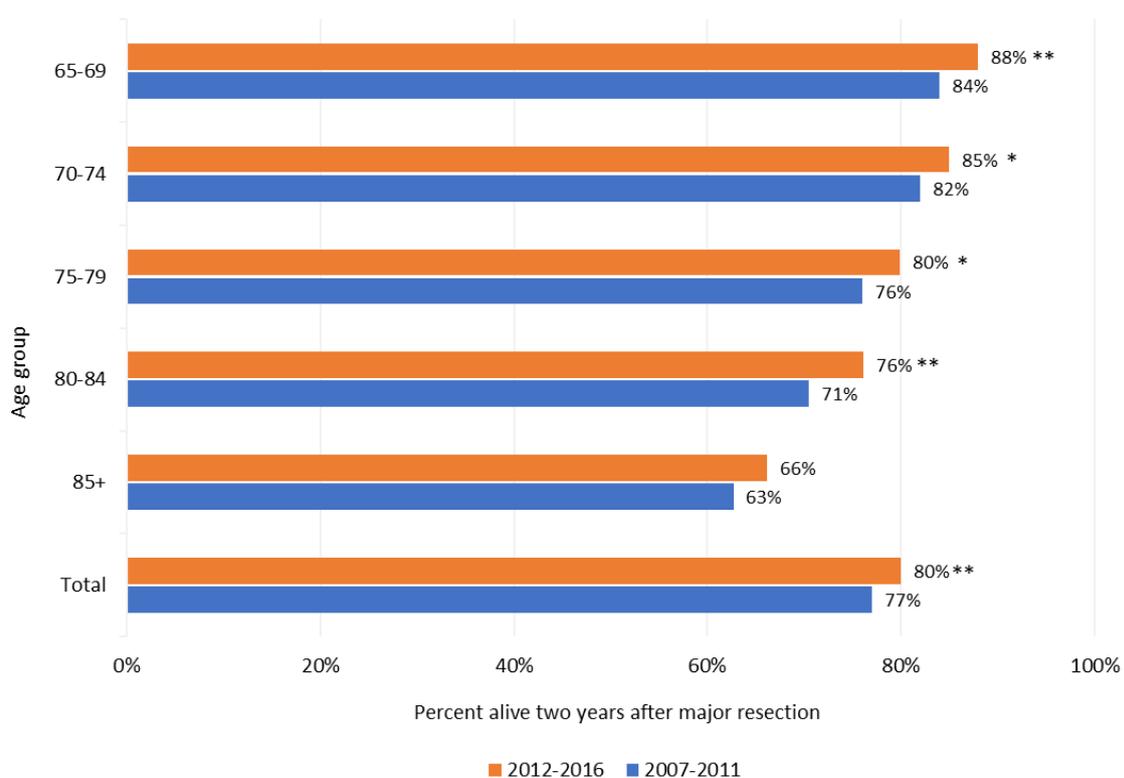
Notes: <sup>a</sup> Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 2.7.2 | What percentage of patients are alive two years after major resection for colorectal cancer according to age group?

Year of diagnosis 2007 - 2016

2-year surgical survival	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	84.4% (1420/1681)	88.3% (1452/1644)	3.9%** (1.57-6.23)
70 - 74	82.0% (1433/1748)	84.8% (1445/1704)	2.8%* (0.32-5.28)
75 - 79	76.0% (1190/1567)	79.6% (1330/1672)	3.6%* (0.74-6.46)
80 - 84	70.5% (856/1214)	76.0% (983/1294)	5.5%** (2.04-8.96)
85+	62.7% (508/810)	66.0% (620/940)	3.3% (-1.19-7.79)
<b>Total</b>	<b>77.0%</b> (5407/7020)	<b>80.4%</b> (5830/7254)	<b>3.4%**</b> (2.06-4.74)

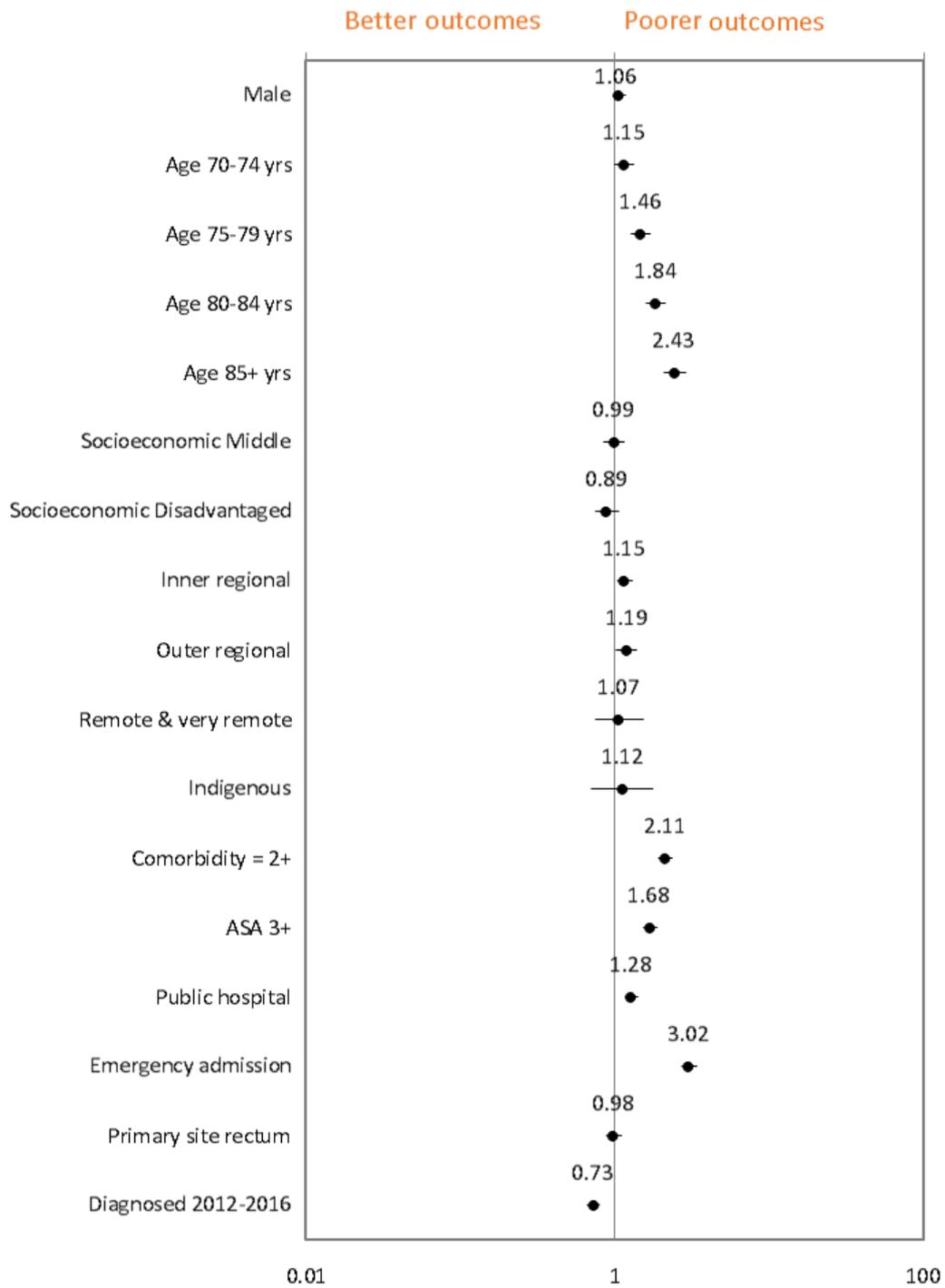
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.7.3 | Factors associated with 2-year surgical survival following major resection for colorectal cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.8 | IV systemic therapy for colorectal cancer

### 2.8.1 | What are the characteristics of colorectal cancer patients who received IV systemic therapy?

Year of diagnosis 2007 - 2016

	Diagnosis		Received IV systemic therapy	
	N	(Col %)	n	(Row %)
<b>Queensland</b>	<b>18,339</b>	<b>100%</b>	5,036	27%
<b>Sex</b>				
Male	9,949	54%	3,098	31%
Female	8,390	46%	1,938	23%
<b>Age Group</b>				
65-69	4,004	22%	1,796	45%
70 - 74	4,186	23%	1,556	37%
75 - 79	3,949	22%	1,085	27%
80 - 84	3,315	18%	452	14%
85 +	2,885	16%	147	5%
<b>Indigenous status</b>				
Indigenous	160	1%	40	25%
Other than Indigenous <sup>a</sup>	18,179	99%	4,996	27%
<b>Socioeconomic status</b>				
Affluent	2,269	12%	692	31%
Middle	11,841	65%	3,300	28%
Disadvantaged	4,229	23%	1,044	25%
<b>Remoteness</b>				
Major City	11,399	62%	3,170	28%
Inner Regional	4,622	25%	1,287	28%
Outer Regional	1,994	11%	493	25%
Remote & very remote	272	2%	86	27%
<b>MDT<sup>b</sup></b>				
MDT Review	4,135	23%	1,396	34%
No MDT Review	14,204	77%	3,640	26%
<b>Comorbidities</b>				
0-1 Comorbidities	14,625	80%	4,256	29%
2+ Comorbidities	3,714	20%	780	21%
<b>Diagnosis years</b>				
2007 - 2011	8,872	48%	2,363	27%
2012 - 2016	9,467	52%	2,673	28%
<b>Primary site</b>				
Colon	13,404	73%	3,341	25%
Rectum	4,935	27%	1,695	34%
<b>HHS of residence</b>				
Cairns and Hinterland	979	5%	254	26%
Central Queensland	752	4%	236	31%
Central West	60	0.3%	10	17%
Darling Downs	1,432	8%	367	26%
Gold Coast	2,366	13%	738	31%
Mackay	556	3%	123	22%
Metro North	3,586	20%	915	26%
Metro South	3,475	19%	970	28%
North West	58	0.3%	17	29%
South West	103	0.6%	27	26%
Sunshine Coast	1,946	11%	549	28%
Torres and Cape	31	0.2%	15	48%
Townsville	779	4%	164	21%
West Moreton	855	5%	292	34%
Wide Bay	1,361	7%	359	26%

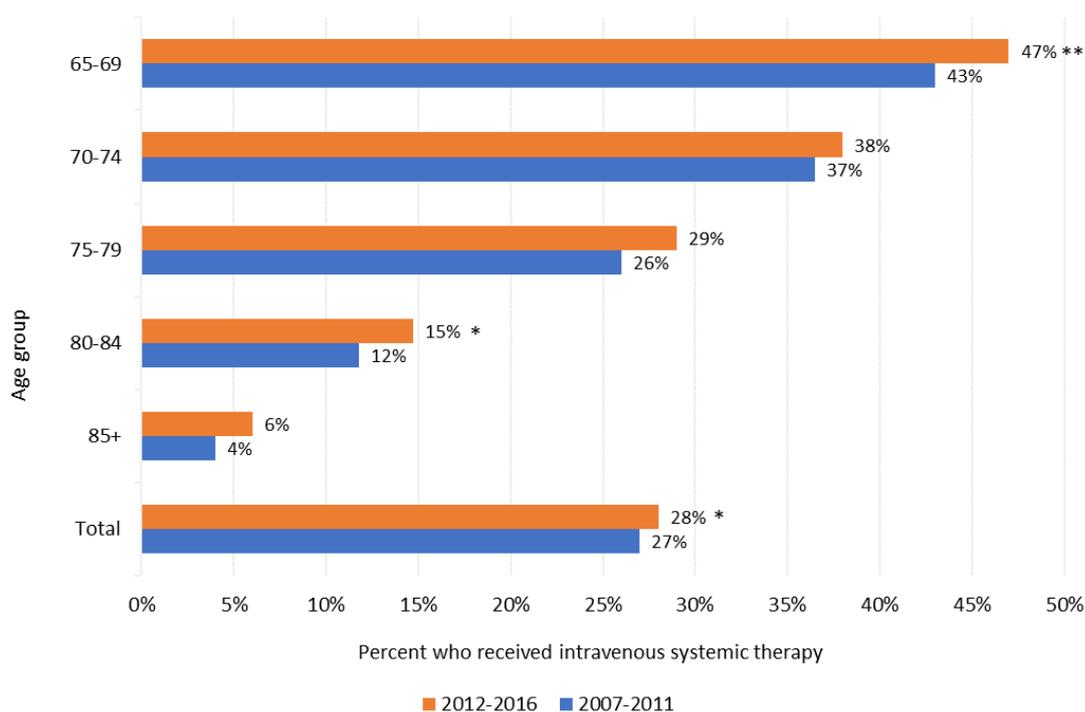
Notes: <sup>a</sup> Other than Indigenous includes non-Indigenous and not stated; <sup>b</sup> MDT rate includes facilities that use QOOL to capture MDT review.

## 2.8.2 | What percentage of colorectal cancer patients received IV systemic therapy according to age group?

Year of diagnosis 2007 - 2016

Received IV systemic therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	42.7% (851/1995)	47.0% (945/2009)	4.3%** (1.22-7.37)
70 - 74	36.9% (771/2091)	37.5% (785/2095)	0.6% (-2.33-3.53)
75 - 79	26.3% (494/1880)	28.6% (591/2084)	2.3% (-0.49-5.07)
80 - 84	12.1% (194/1606)	15.1% (258/1709)	3.0%* (0.66-5.33)
85+	4.1% (53/1300)	5.9% (95/1683)	1.8%* (0.20-3.35)
<b>Total</b>	<b>26.6%</b> (2363/8872)	<b>28.2%</b> (2673/9467)	<b>1.6%*</b> (0.31-2.89)

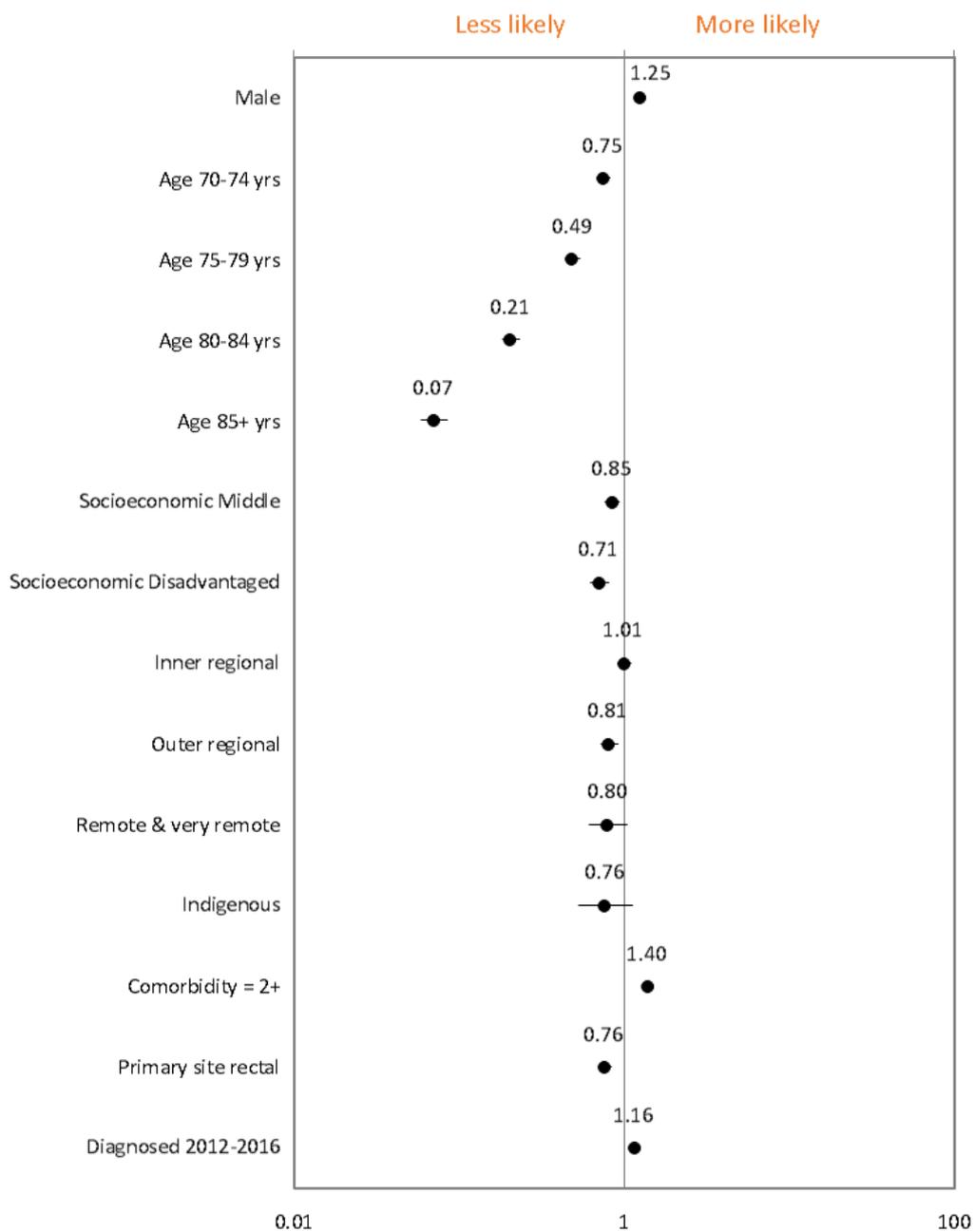
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.8.3 | Factors associated with likelihood of receiving IV systemic therapy for colorectal cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.9 | Stage III colorectal cancer patients and adjuvant IV systemic therapy

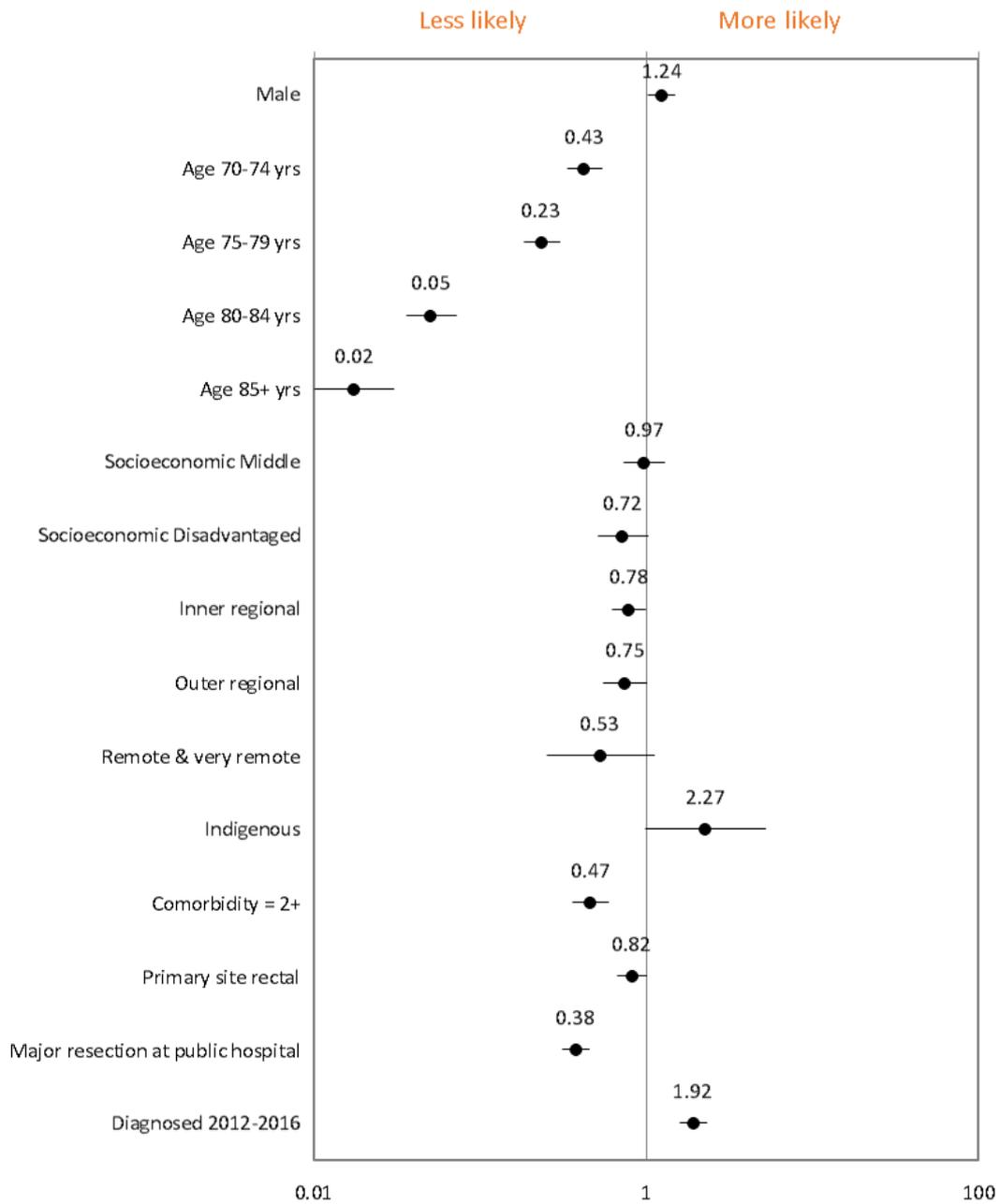
### 2.9.1 | What percentage of patients with stage III colorectal cancer received adjuvant IV systemic therapy within three months of major resection?

Year of diagnosis 2007 – 2016

		Year of diagnosis		
		Total	2007-2011	2012-2016
<b>Colon</b>	Number of stage III colon cancer patients	1940	937	1003
	Number of stage III colon cancer patients receiving adjuvant IV systemic therapy	786	335	451
	% of stage III colon cancer patients receiving adjuvant IV systemic therapy	41%	36%	45%
<b>Rectal</b>	Number of stage III rectal cancer patients	699	317	382
	Number of stage III rectal cancer patients receiving adjuvant IV systemic therapy	306	119	187
	% of stage III rectal cancer patients receiving adjuvant IV systemic therapy	44%	38%	49%

## 2.9.2 | Factors associated with likelihood of receiving adjuvant systemic IV therapy following major resection in stage III colorectal cancer patients

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.10 | Radiation therapy for colorectal cancer

### 2.10.1 | What are the characteristics of colorectal cancer patients who received radiation<sup>a</sup> therapy?

Year of diagnosis 2007 – 2016

	Diagnosis		Received radiation therapy	
	N	(Col %)	n	(Row %)
<b>Queensland</b>	<b>18,339</b>	<b>100%</b>	2,830	15%
<b>Sex</b>				
Male	9,949	54%	1,888	19%
Female	8,390	46%	942	11%
<b>Age Group</b>				
65-69	4,004	22%	856	21%
70 - 74	4,186	23%	774	18%
75 - 79	3,949	22%	602	15%
80 - 84	3,315	18%	362	11%
85 +	2,885	16%	236	8%
<b>Indigenous status</b>				
Indigenous	160	1%	33	21%
Other than Indigenous <sup>b</sup>	18,179	99%	2,797	15%
<b>Socioeconomic status</b>				
Affluent	2,269	12%	331	15%
Middle	11,841	65%	1,837	16%
Disadvantaged	4,229	23%	662	16%
<b>Remoteness</b>				
Major City	11,399	62%	1,736	15%
Inner Regional	4,622	25%	699	15%
Outer Regional	1,994	11%	338	17%
Remote & very remote	272	2%	57	18%
<b>MDT<sup>c</sup></b>				
MDT Review	4,135	23%	988	24%
No MDT Review	14,204	77%	1,842	13%
<b>Comorbidities</b>				
0-1 Comorbidities	14,625	80%	2,273	16%
2+ Comorbidities	3,714	20%	557	15%
<b>Diagnosis years</b>				
2007 - 2011	8,872	48%	1,420	16%
2012 - 2016	9,467	52%	1,410	15%
<b>Primary site</b>				
Colon	13,404	73%	1,049	8%
Rectum	4,935	27%	1,781	36%
<b>HHS of residence</b>				
Cairns and Hinterland	979	5%	177	18%
Central Queensland	752	4%	107	14%
Central West	60	0.3%	7	12%
Darling Downs	1,432	8%	223	16%
Gold Coast	2,366	13%	351	15%
Mackay	556	3%	81	15%
Metro North	3,586	20%	535	15%
Metro South	3,475	19%	539	16%
North West	58	0.3%	15	26%
South West	103	0.6%	13	13%
Sunshine Coast	1,946	11%	317	16%
Torres and Cape	31	0.2%	10	33%
Townsville	779	4%	128	16%
West Moreton	855	5%	140	16%
Wide Bay	1,361	7%	187	14%

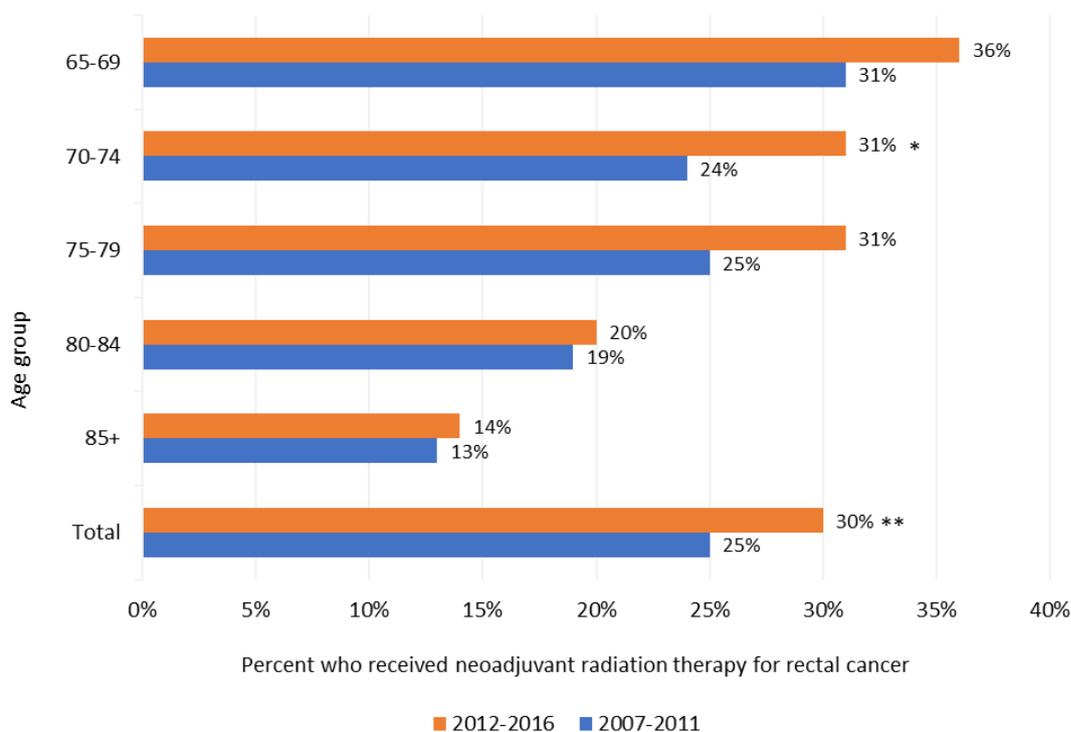
Notes: <sup>a</sup>Radiation therapy includes external beam therapy only; <sup>b</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup> MDT rate includes facilities that use QOOL to capture MDT review

## 2.10.2| What percentage of patients received neoadjuvant radiation therapy prior to major resection for rectal cancer?

Year of diagnosis 2007 - 2016

Neoadjuvant radiation therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	31.0% (164/529)	36.4% (197/541)	5.4% (-0.27-11.01)
70 - 74	24.3% (117/482)	30.7% (139/453)	6.4%* (0.68-12.09)
75 - 79	25.3% (86/340)	30.9% (125/404)	5.6% (-0.91-11.97)
80 - 84	18.7% (45/241)	20.4% (56/274)	1.7% (-5.23-8.50)
85+	12.9% (18/140)	14.4% (20/139)	1.5% (-6.67-9.69)
<b>Total</b>	<b>24.8%</b> (430/1732)	<b>29.7%</b> (537/1811)	<b>4.9%**</b> (1.97-7.82)

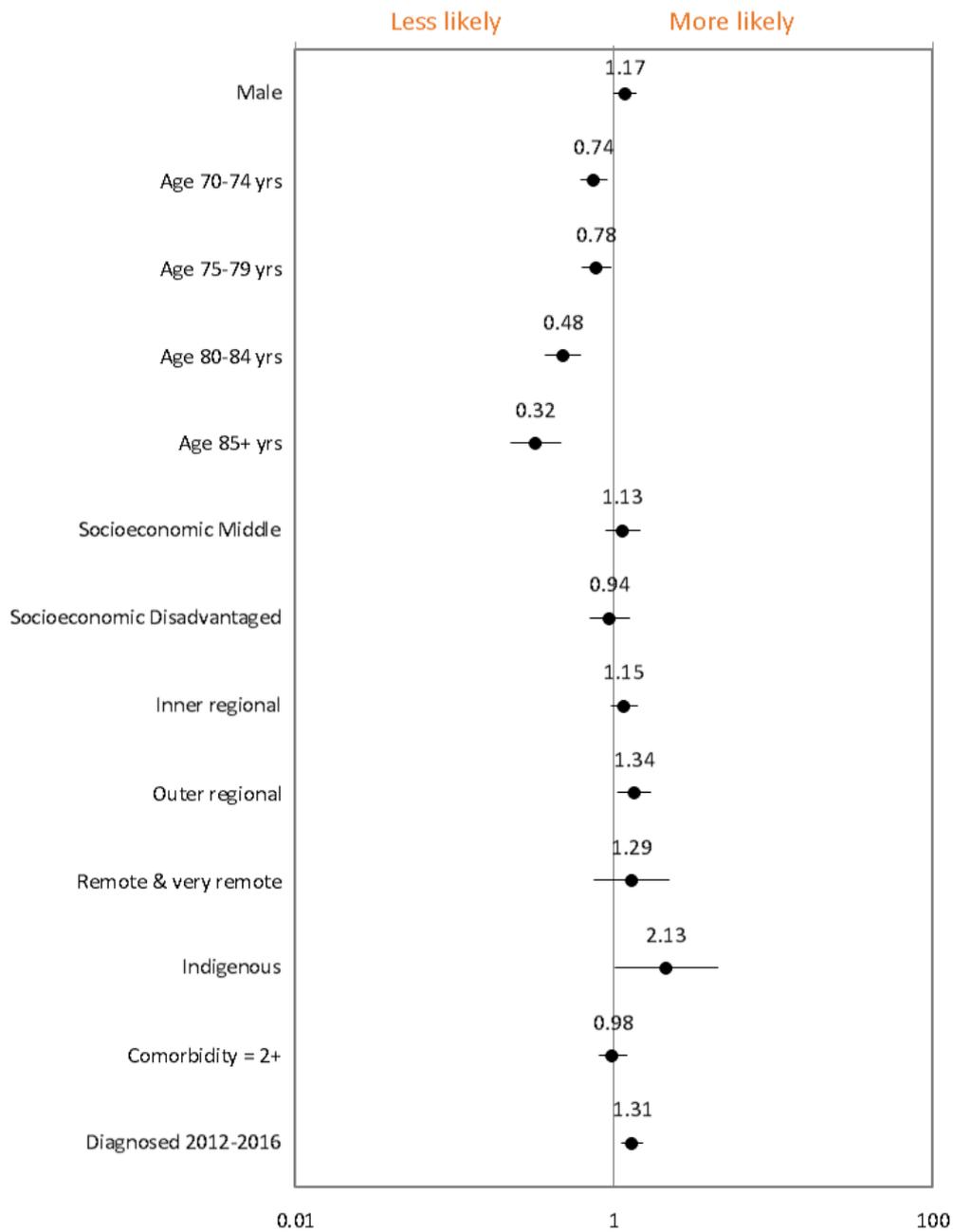
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\*and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 2.10.3 | Factors associated with likelihood of receiving neoadjuvant radiation therapy for rectal cancer

Year of diagnosis 2007 – 2016



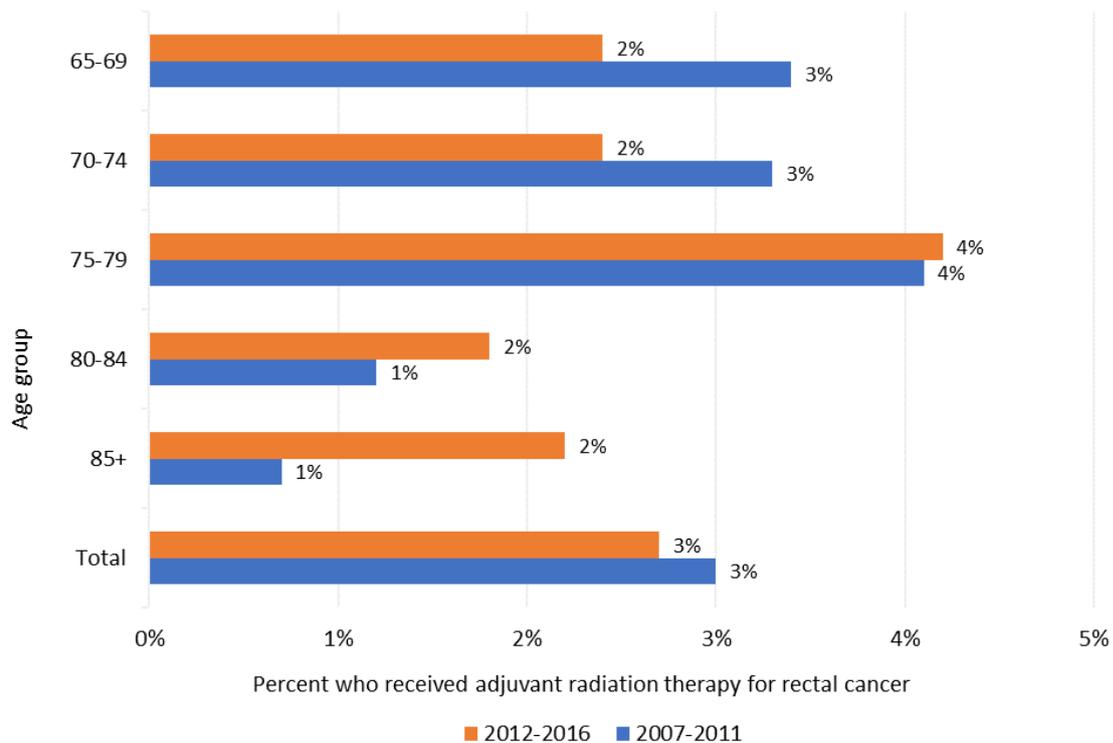
The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 2.10.4| What percentage of patients with rectal cancer received adjuvant radiation therapy within 3 months of their first major resection?

Year of diagnosis 2007 - 2016

Received adjuvant radiation therapy for rectal cancer	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	3.4% (18/529)	2.4% (13/541)	1.0% (-1.07-3.15)
70 - 74	3.3% (16/482)	2.4% (11/453)	0.9% (-1.35-3.16)
75 - 79	4.1% (14/340)	4.2% (17/404)	0.1% (-2.99-3.03)
80 - 84	1.2% (3/241)	1.8% (5/274)	0.6% (-1.95-3.10)
85+	0.7% (1/140)	2.2% (3/139)	1.5% (-2.02-5.55)
<b>Total</b>	<b>3.0%</b> (52/1732)	<b>2.7%</b> (49/1811)	<b>0.3%</b> (-0.81-1.42)

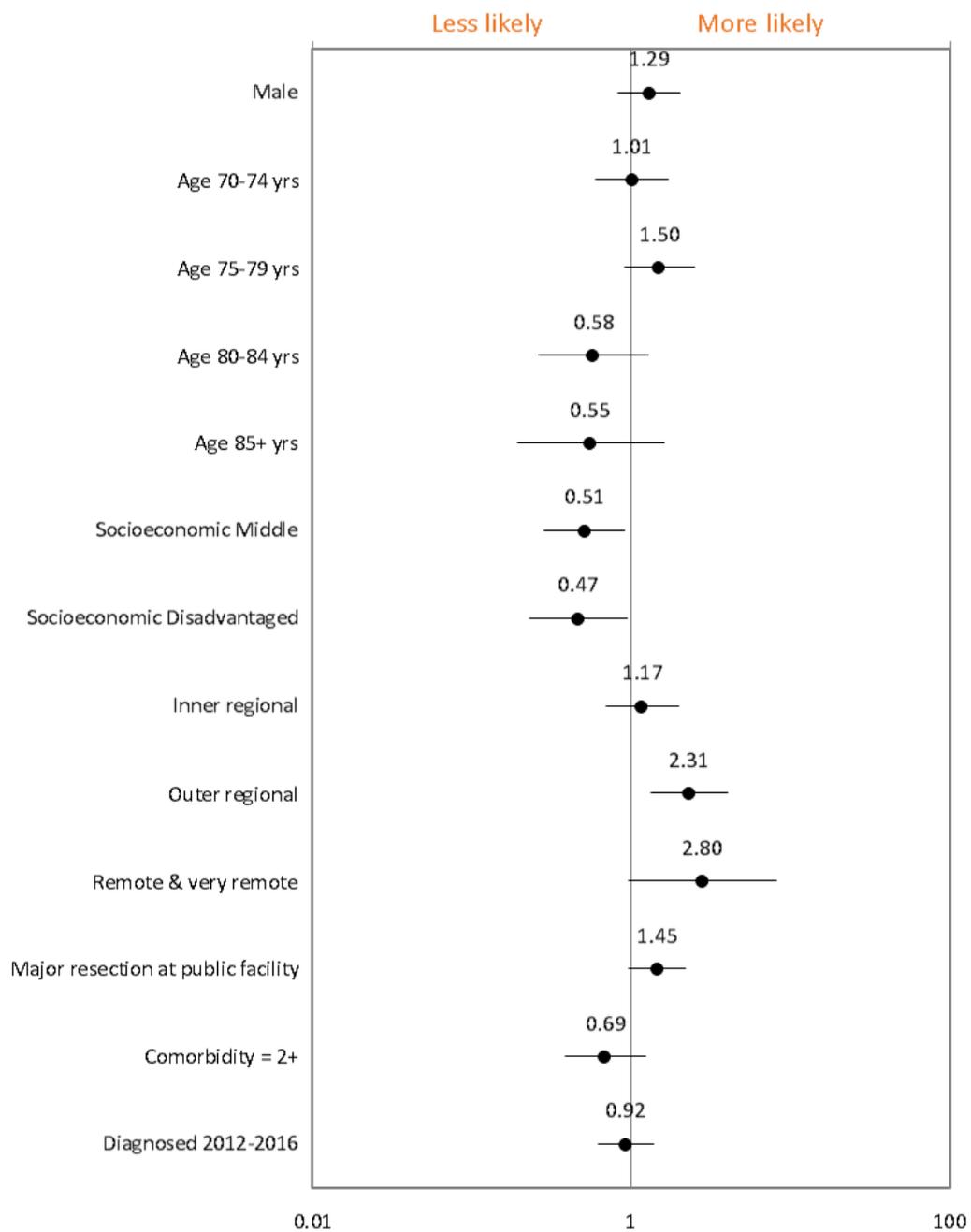
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

## 2.10.5 | Factors associated with likelihood of receiving adjuvant radiation therapy for rectal cancer

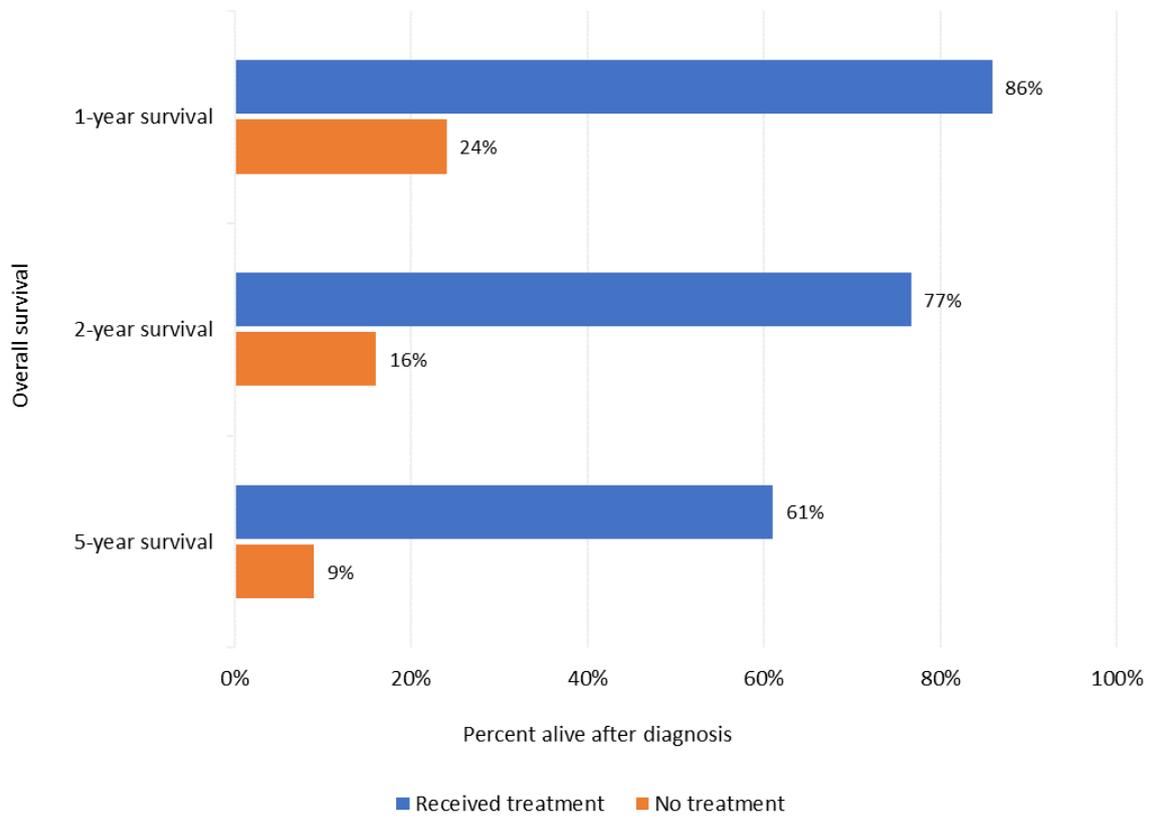
Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Indigenous status not included in model due to very small numbers.

## 2.11 | One, two and five-year overall survival for colorectal cancer patients

### 2.11.1 | What percentage of colorectal cancer patients are alive after diagnosis according to treatment status?



# 3 | Breast cancer



## 3.1 | Breast cancer

### 3.1.1 | What are the characteristics of females aged 65+ years diagnosed with breast cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received treatment <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>11,650</b>	<b>100%</b>	10,547	91%
<b>Age group</b>				
65-69	4,006	34%	3,911	98%
70-74	2,922	25%	2,820	97%
75-79	1,904	16%	1,770	93%
80-84	1,402	12%	1,178	84%
85+	1,416	12%	868	61%
<b>Indigenous status</b>				
Indigenous	121	1%	105	87%
Other than Indigenous <sup>b</sup>	11,529	99%	10,442	91%
<b>Socioeconomic status</b>				
Affluent	1,615	14%	1,475	91%
Middle	7,615	65%	6,881	90%
Disadvantaged	2,420	21%	2,191	90%
<b>Remoteness</b>				
Major city	7,686	66%	6,939	90%
Inner Regional	2,714	23%	2,520	93%
Outer Regional	1,097	9%	960	88%
Remote & very remote	153	1%	128	84%
<b>MDT<sup>c</sup></b>				
MDT review	3,346	29%	3,194	95%
No MDT review	8,304	71%	7,353	89%
<b>Comorbidities</b>				
0-1 Comorbidities	10,594	91%	9,731	92%
2+ Comorbidities	1,056	9%	816	77%
<b>Overall stage at diagnosis</b>				
Early	6,286	54%	6,262	99%
Locally advanced	2,794	24%	2,773	99%
Metastatic	561	5%	357	64%
Unknown	2,009	17%	1,155	57%
<b>Diagnosis years</b>				
2007 - 2011	4,973	43%	4,481	90%
2012 - 2016	6,677	57%	6,066	91%
<b>HHS of residence</b>				
Cairns and Hinterland	558	5%	483	87%
Central Queensland	424	4%	391	92%
Central West	25	0.2%	21	84%
Darling Downs	787	7%	728	93%
Gold Coast	1,542	13%	1,428	93%
Mackay	315	3%	279	89%
Metro North	2,385	20%	2,091	89%
Metro South	2,340	20%	2,090	88%
North West	22	0.2%	18	82%
South West	53	0.5%	50	94%
Sunshine Coast	1,363	12%	1,238	91%
Torres and Cape	16	0.1%	13	82%
Townsville	489	4%	422	86%
West Moreton	566	5%	530	94%
Wide Bay	765	7%	717	94%

Notes: <sup>a</sup> Treatment includes surgery, IV systemic therapy or radiation therapy, but does not include hormone therapy; <sup>b</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup>MDT rate includes facilities that use QOOL to capture MDT review.

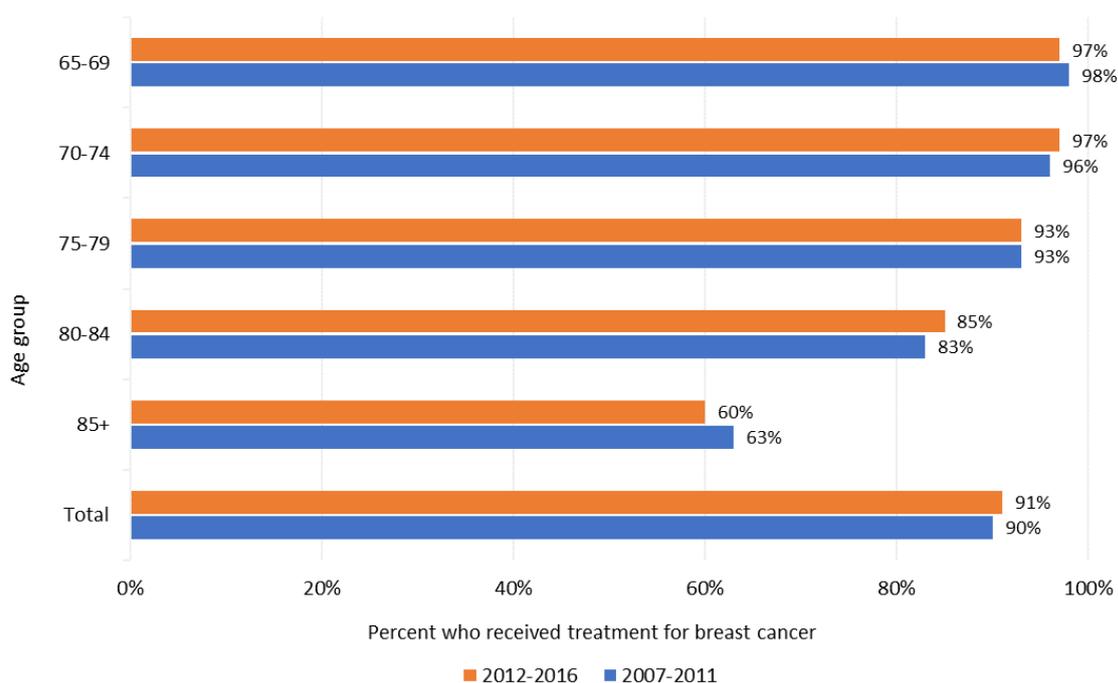
## 3.2 | Treatment for breast cancer

### 3.2.1 | What percentage of female patients received treatment for breast cancer according to age group?

Year of diagnosis 2007 - 2016

Received treatment	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	98% (1597/1631)	97% (2314/2375)	1% (-0.01-1.96)
70 - 74	96% (1159/1206)	97% (1661/1716)	1% (-0.33-2.44)
75 - 79	93% (784/847)	93% (986/1057)	0% (-2.29-2.37)
80 - 84	83% (527/636)	85% (651/766)	2% (-1.83-5.90)
85+	63% (414/653)	60% (454/763)	3% (-2.09-8.04)
<b>Total</b>	<b>90%</b> (4481/4973)	<b>91%</b> (6066/6677)	<b>1%</b> (-0.07-2.09)

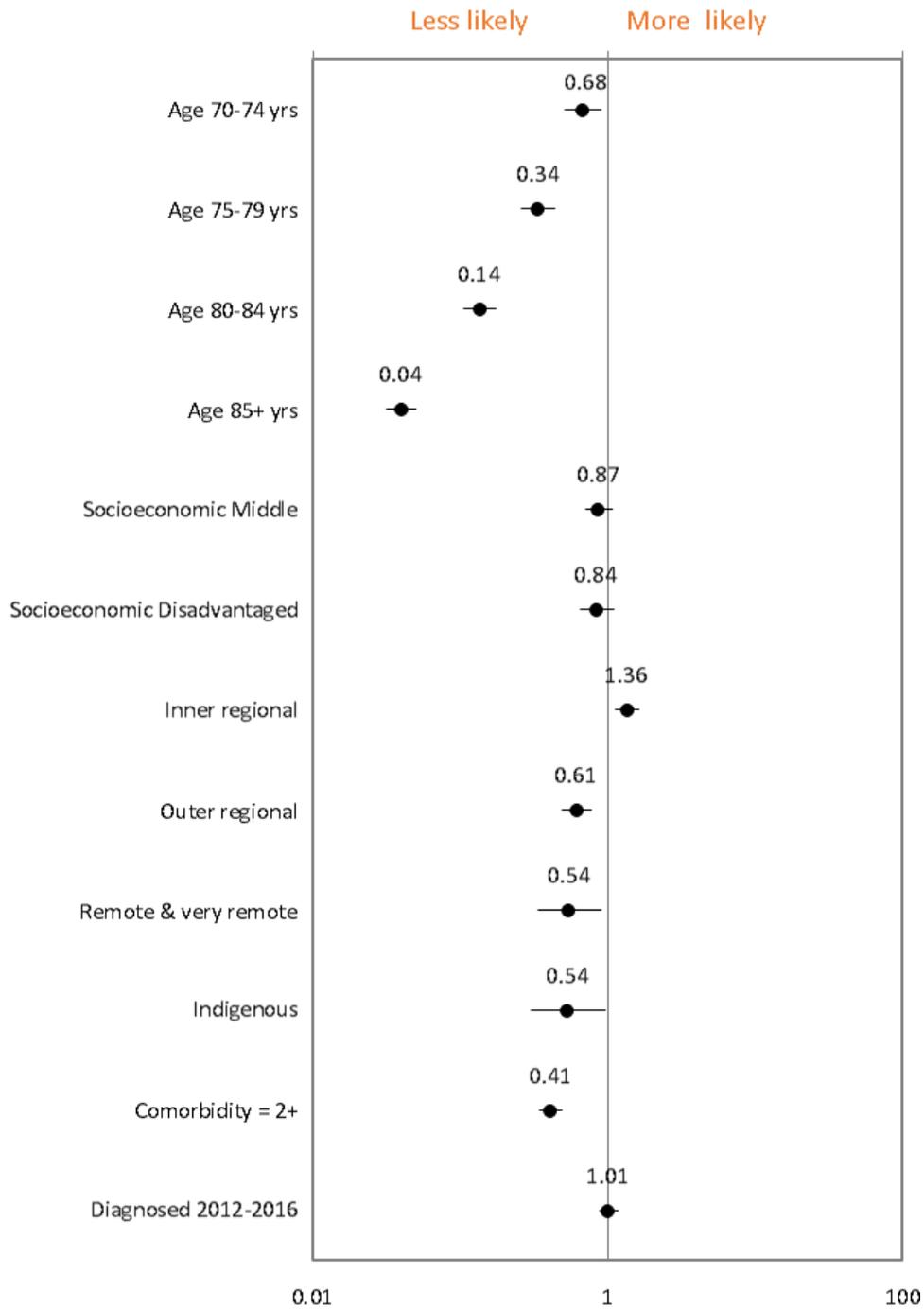
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.2.2 | Factors associated with the likelihood of receiving treatment for breast cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

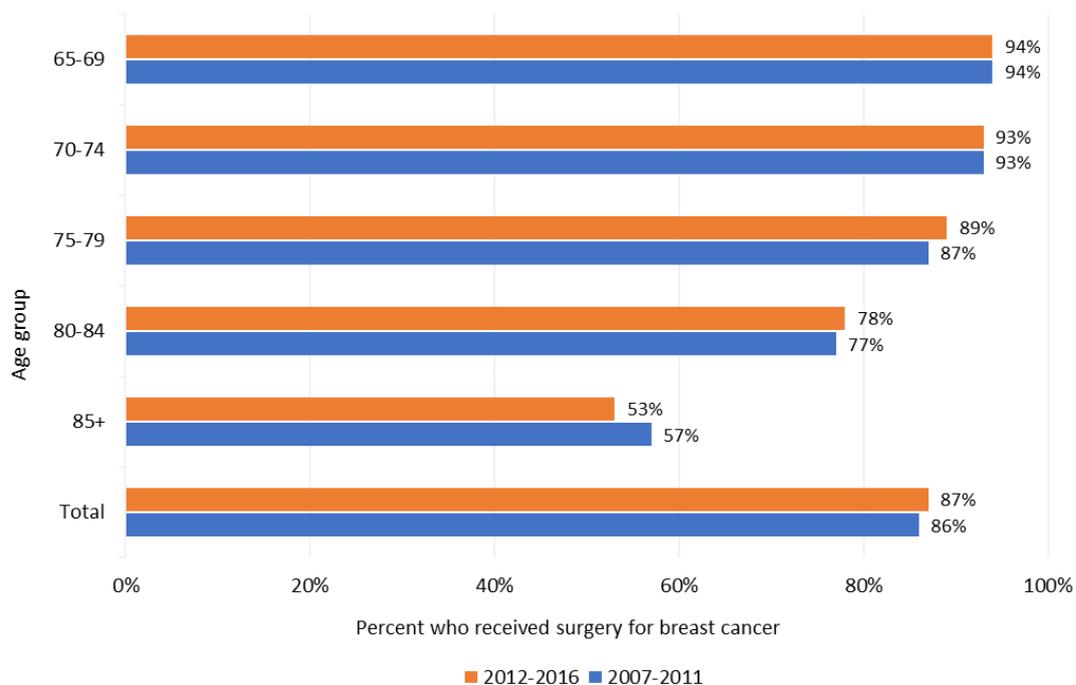
### 3.3 | Surgery for breast cancer

#### 3.3.1 | What percentage of female patients received surgery for breast cancer?

Year of diagnosis 2007 - 2016

Received surgery	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	94% (1542/1631)	94% (2236/2375)	0% (-1.47-1.54)
70 - 74	93% (1116/1206)	93% (1592/1716)	0% (-1.85-1.93)
75 - 79	87% (740/847)	89% (945/1057)	2% (-0.92-4.99)
80 - 84	77% (490/636)	78% (598/766)	1% (-3.36-5.42)
85+	57% (374/653)	53% (405/763)	4% (-1.20-9.16)
<b>Total</b>	<b>86%</b> (4262/4973)	<b>87%</b> (5776/6677)	<b>1%</b> (-0.25-2.27)

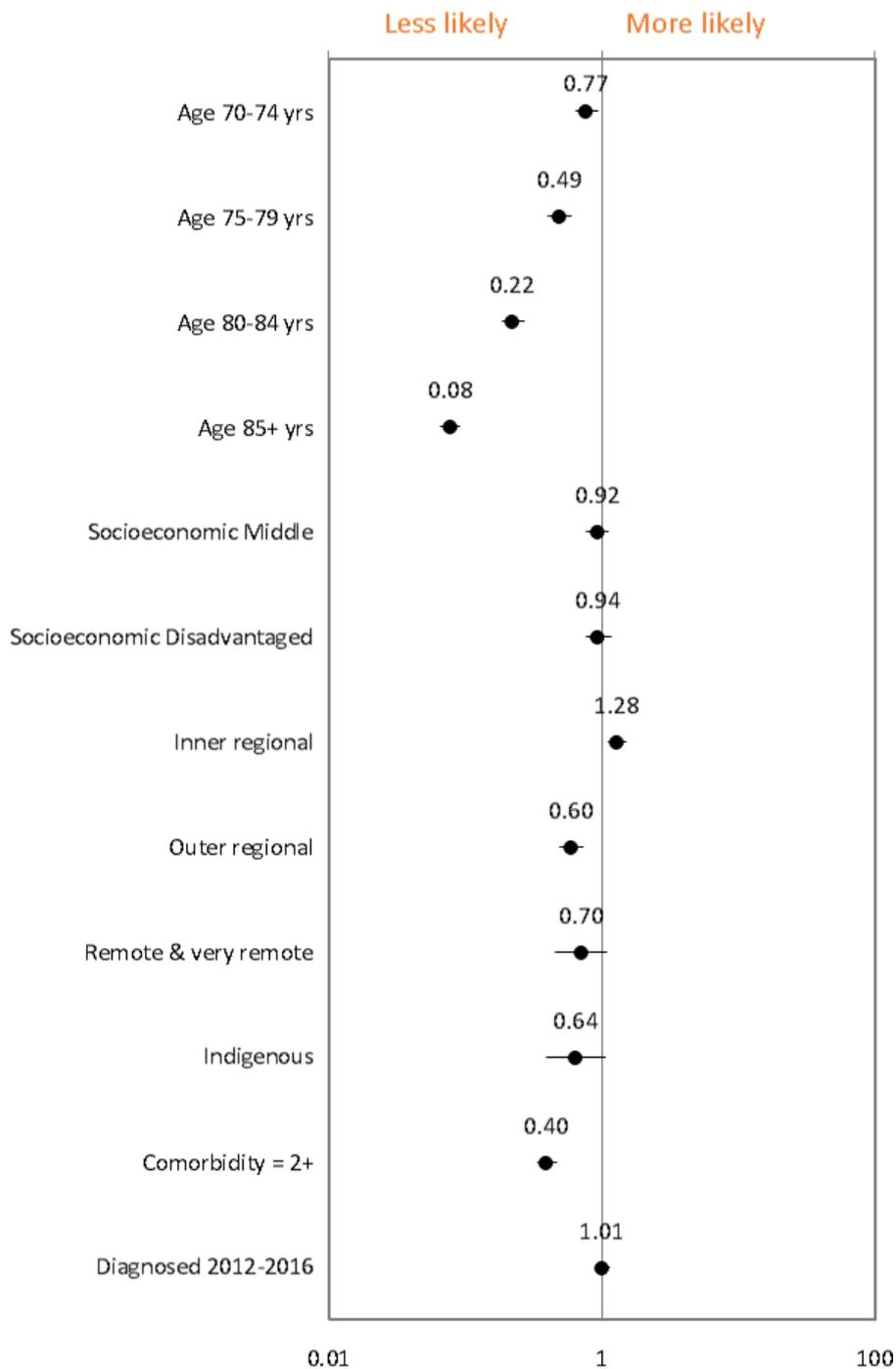
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.3.2 | Factors associated with the likelihood of receiving surgery for breast cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 3.4 | Definitive mastectomy

### 3.4.1 | What are the characteristics of female breast cancer patients who had a mastectomy?

Year of diagnosis 2007 – 2016

	Had surgery		Definitive mastectomy <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>10,038</b>	<b>100%</b>	4,545	45%
<b>Age group</b>				
65-69	3,778	38%	1,427	38%
70-74	2,708	27%	1,113	41%
75-79	1,685	17%	871	52%
80-84	1,088	11%	667	61%
85+	779	8%	467	60%
<b>Indigenous status</b>				
Indigenous	99	1%	55	56%
Other than Indigenous <sup>b</sup>	9,939	99%	4,490	45%
<b>Socioeconomic status</b>				
Affluent	1,403	14%	536	38%
Middle	6,544	65%	2,905	44%
Disadvantaged	2,091	21%	1,104	53%
<b>Remoteness</b>				
Major city	6,605	66%	2,726	41%
Inner Regional	2,417	24%	1,336	55%
Outer Regional	893	9%	414	46%
Remote & very remote	123	1%	69	56%
<b>MDT<sup>c</sup></b>				
MDT review	3,059	30%	1,530	50%
No MDT review	6,979	70%	3,015	43%
<b>Comorbidities</b>				
0-1 Comorbidities	9,307	93%	4,135	44%
2+ Comorbidities	731	7%	410	56%
<b>Tumour size</b>				
T1 (1-20mm)	5,989	60%	1,921	32%
T2 (21-50mm)	3,159	31%	1,918	61%
T3 (>50mm)	579	6%	524	91%
T Unknown	311	3%	182	56%
<b>Diagnosis years</b>				
2007 - 2011	4,262	42%	1,992	47%
2012 - 2016	5,776	58%	2,553	44%
<b>HHS of residence</b>				
Cairns and Hinterland	443	4%	181	41%
Central Queensland	375	4%	247	66%
Central West	21	0.2%	14	67%
Darling Downs	697	7%	391	56%
Gold Coast	1,370	14%	639	47%
Mackay	264	3%	135	51%
Metro North	2,016	20%	945	47%
Metro South	1,982	20%	652	33%
North West	17	0.2%	9	53%
South West	49	0.5%	32	65%
Sunshine Coast	1,186	12%	467	39%
Torres and Cape	12	0.1%	6	50%
Townsville	400	4%	161	40%
West Moreton	511	5%	256	50%
Wide Bay	695	7%	410	59%

Notes: <sup>a</sup> includes only patients who had surgery; <sup>b</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup> MDT rate includes facilities that use QOOL to capture MDT review.

### 3.4.2 | What percentage of female breast cancer patients who received surgery had a definitive mastectomy?

Year of diagnosis 2007 – 2016

Definitive mastectomy	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	49% (321/661) [51%*, 45-57, 0.05]	48% (299/626) [48%, 42-53, 0.089]
Group A hospitals	44% (1032/2354) [45%, 41-48, 0.068]	43% (1345/3135) [43%, 40-47, 0.346]
Group B hospitals	53% (271/513) [49%, 43-55, 0.407]	45% (521/1152) [45%, 40-49, 0.785]
Other hospitals	50% (368/734) [49%, 44-54, 0.206]	45% (388/863) [45%, 40-50, 0.713]
<b>Hospital Type</b>		
Public hospitals	54% (945/1759) [52%** , 48-56, 0.00]	52% (1232/2383) [51%** , 47-55, 0.00]
Private hospitals	42% (1047/2503) [43%** , 40-47, 0.002]	39% (1321/3393) [40%** , 37-43, 0.00]
<b>Queensland</b>	<b>47% (1992/4262)</b>	<b>44% (2553/5776)</b>

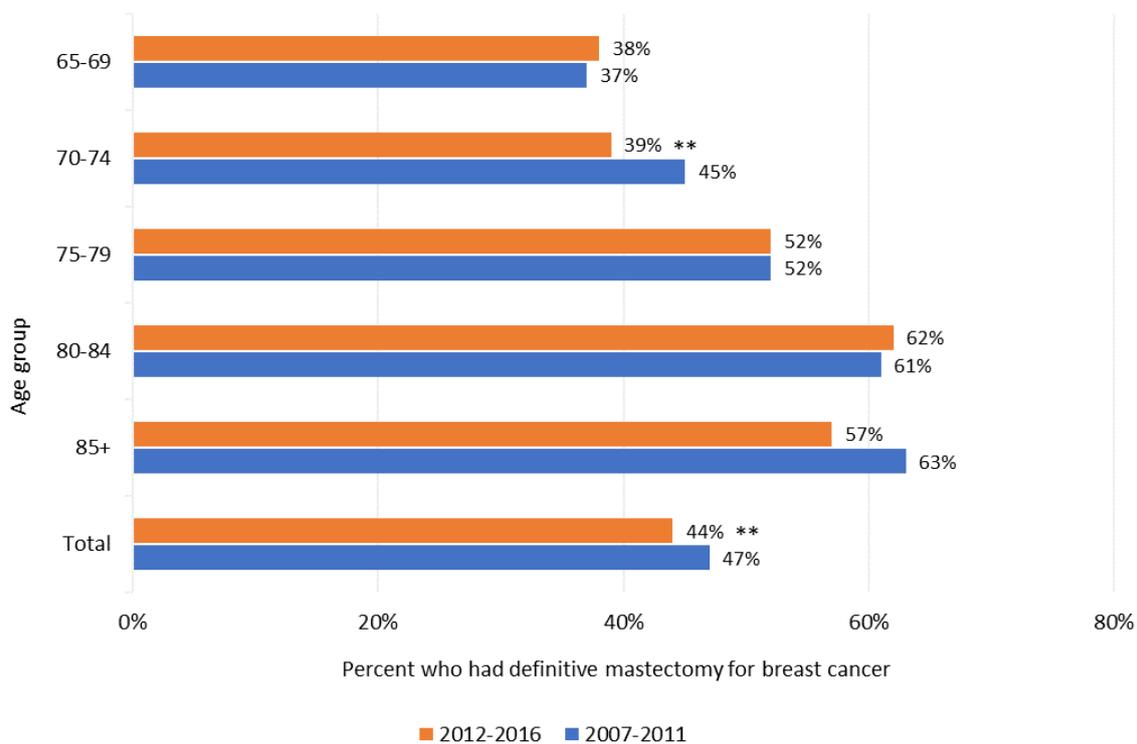
Notes: <sup>a</sup>Adjusted by age, tumour size, year of surgery, socioeconomic status, rurality, comorbidities and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions

### 3.4.3 | What percentage of female breast cancer patients who had surgery received a mastectomy according to age group?

Year of diagnosis 2007 - 2016

Definitive mastectomy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	37% (578/1542)	38% (849/2236)	1% (-2.15-4.12)
70 - 74	45% (498/1116)	39% (615/1592)	6%** (2.22-9.77)
75 - 79	52% (383/740)	52% (488/945)	0% (-4.79-4.80)
80 - 84	61% (298/490)	62% (369/598)	1% (-4.78-6.80)
85+	63% (235/374)	57% (232/405)	6% (-0.89-12.79)
<b>Total</b>	<b>47%</b> (1992/4262)	<b>44%</b> (2553/5776)	<b>3%**</b> (1.03-4.97)

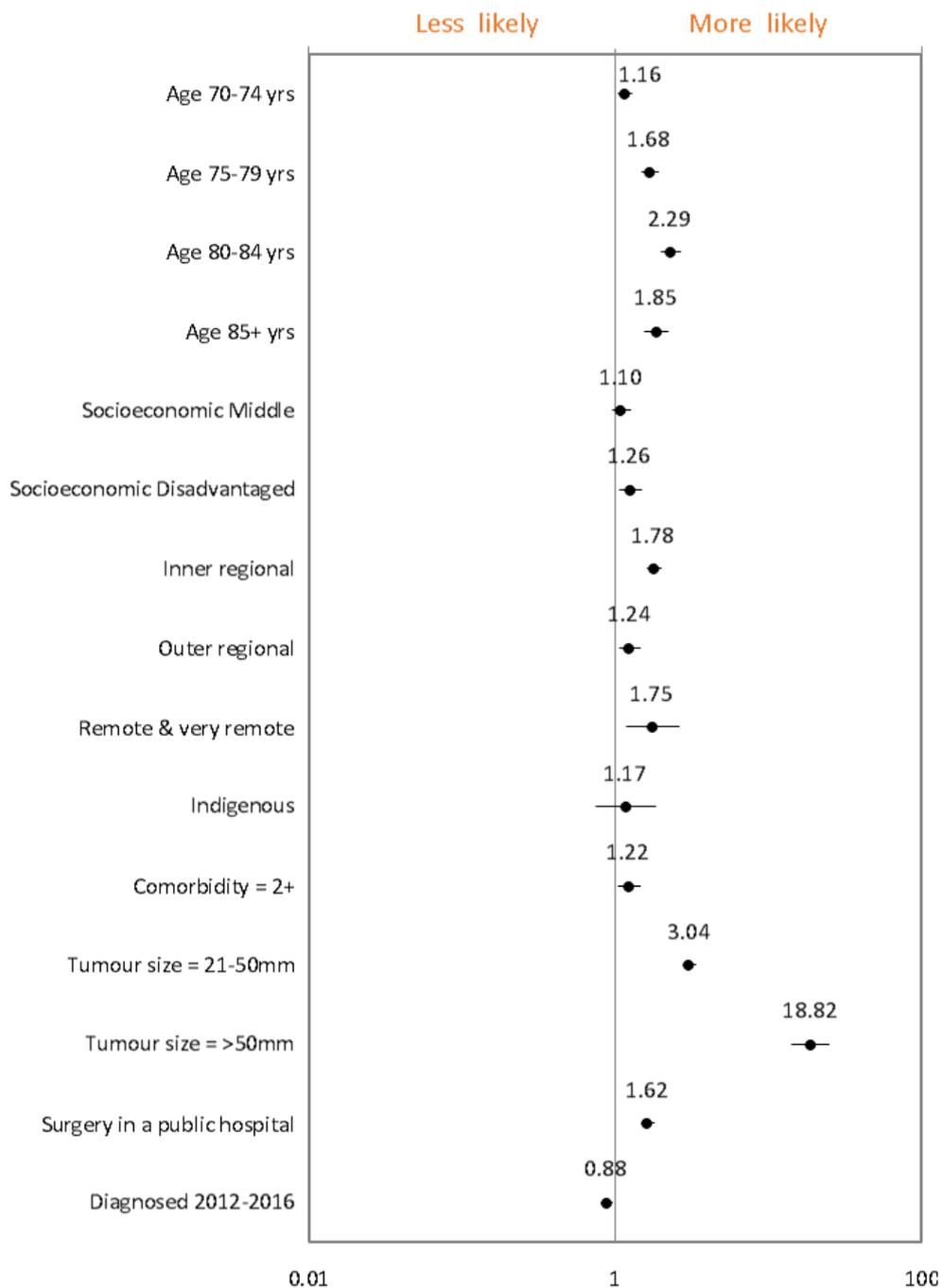
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.4.4 | Factors associated with the likelihood of receiving a mastectomy for patients who had surgery for breast cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

### 3.5 | Index breast conservation surgery (BCS) for T1 tumours (≤20mm)

#### 3.5.1| What are the characteristics of female breast cancer patients who received BCS for a T1 tumour?

Year of diagnosis 2007 – 2016

	Had surgery for T1 tumour (≤20mm)		BCS for T1 tumour <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>5,989</b>	<b>100%</b>	4,461	74%
<b>Age group</b>				
65-69	2,518	42%	1,993	79%
70-74	1,751	29%	1,355	77%
75-79	968	16%	664	69%
80-84	482	8%	287	60%
85+	270	5%	162	60%
<b>Indigenous status</b>				
Indigenous	56	1%	37	66%
Other than Indigenous <sup>b</sup>	5,933	99%	4,424	75%
<b>Socioeconomic status</b>				
Affluent	859	14%	712	83%
Middle	3,914	65%	2,920	75%
Disadvantaged	1,216	20%	829	68%
<b>Remoteness</b>				
Major city	3,945	66%	3,101	79%
Inner Regional	1,410	24%	925	66%
Outer Regional	562	9%	383	68%
Remote & very remote	72	1%	52	72%
<b>MDT<sup>c</sup></b>				
MDT review	1,777	30%	1,241	70%
No MDT review	4,212	70%	3,220	76%
<b>Comorbidities</b>				
0-1 Comorbidities	5,625	94%	4,241	75%
2+ Comorbidities	364	6%	220	60%
<b>Diagnosis years</b>				
2007 - 2011	2,599	43%	1,911	74%
2012 - 2016	3,390	57%	2,550	75%
<b>HHS of residence</b>				
Cairns and Hinterland	286	5%	216	76%
Central Queensland	224	4%	120	54%
Central West	14	0.2%	7	50%
Darling Downs	415	7%	253	61%
Gold Coast	816	14%	610	75%
Mackay	153	3%	99	65%
Metro North	1,225	20%	924	75%
Metro South	1,161	19%	963	83%
North West	11	0.2%	9	82%
South West	32	0.5%	16	50%
Sunshine Coast	706	12%	572	81%
Torres and Cape	4	0.1%	4	100%
Townsville	269	5%	202	75%
West Moreton	287	5%	216	75%
Wide Bay	386	6%	250	65%

Notes: <sup>a</sup> includes only patients who had surgery; <sup>b</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup> MDT rate includes facilities that use QOOL to capture MDT review.

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

Year of diagnosis 2007 – 2016

Index BCS for T1 tumours	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	72% (284/394) [69%*, 63-75, 0.034]	73% (259/354) [74%, 68-80, 0.515]
Group A hospitals	76% (1080/1417) [75%, 71-80, 0.24]	76% (1397/1829) [76%, 72-80, 0.561]
Group B hospitals	70% (224/320) [75%, 68-82, 0.642]	74% (511/691) [74%, 70-80, 0.641]
Other hospitals	69% (323/468) [72%, 66-78, 0.539]	74% (383/516) [75%, 70-80, 0.875]
<b>Hospital Type</b>		
Public hospitals	67% (684/1019) [68%***, 63-72, 0.00]	69% (923/1347) [69%***, 65-74, 0.00]
Private hospitals	78% (1227/1580) [77%***, 73-82, 0.003]	80% (1627/2043) [79%***, 75-83, 0.001]
<b>Queensland</b>	<b>74% (1911/2599)</b>	<b>75% (2550/3390)</b>

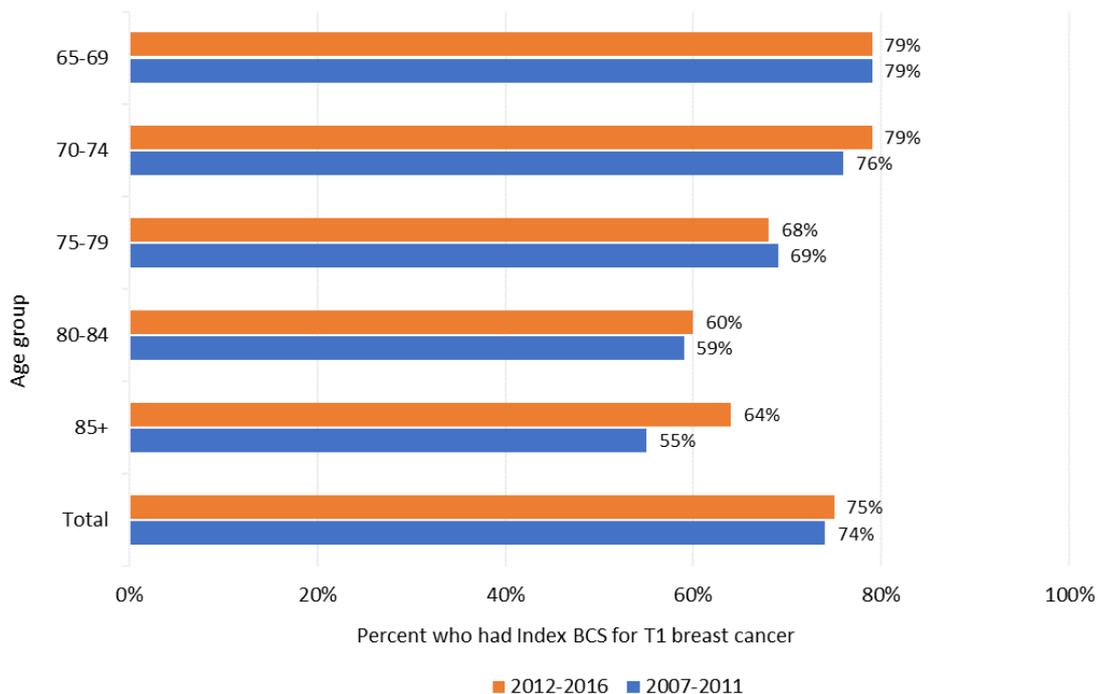
Notes: <sup>a</sup>Adjusted by age, tumour size, year of surgery, socioeconomic status, rurality, comorbidities and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

### 3.5.3 | What percentage of female breast cancer patients with T1 tumours ( $\leq 20\text{mm}$ ) received an index BCS according to age group?

Year of diagnosis 2007 - 2016

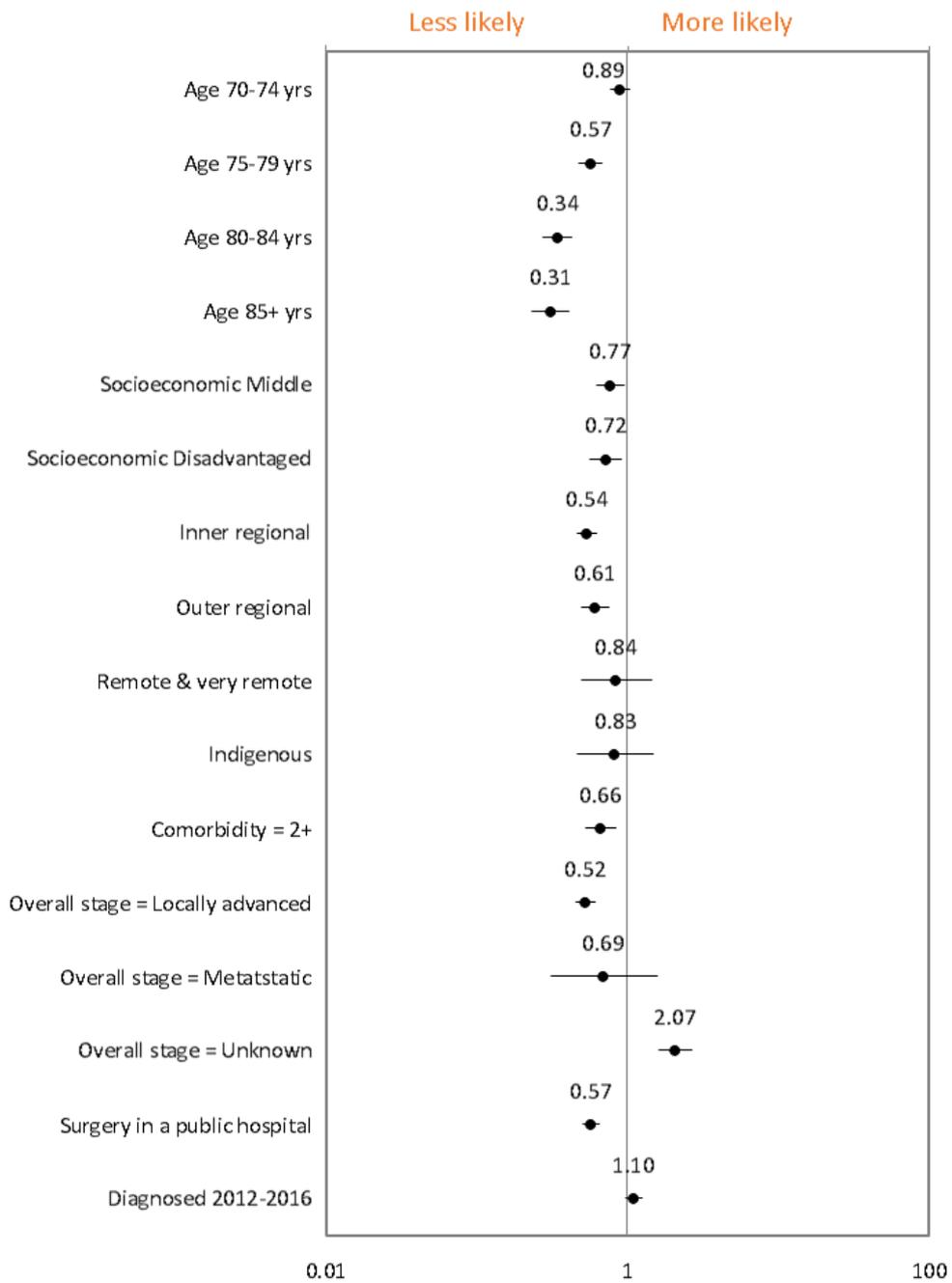
Index BCS for T1 tumours	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	79% (856/1085)	79% (1137/1433)	0% (-3.19-3.24)
70 - 74	76% (551/729)	79% (804/1022)	3% (-0.94-7.02)
75 - 79	69% (304/438)	68% (360/530)	1% (-4.90-6.83)
80 - 84	59% (134/227)	60% (153/255)	1% (-7.71-9.72)
85+	55% (66/120)	64% (96/150)	9% (-2.71-20.49)
<b>Total</b>	<b>74%</b> (1911/2599)	<b>75%</b> (2550/3390)	<b>1%</b> (-1.22-3.24)

Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.5.4| Factors associated with the likelihood of receiving index BCS for T1 ( $\leq 20\text{mm}$ ) breast cancer tumours



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

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

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

Year of diagnosis 2012 – 2016

Index BCS & SLNB for T1 tumours	2007 – 2011 <sup>a</sup>	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>b</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>b</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	N/A	80% (206/259) [79%, 73-86, 0.824]
Group A hospitals	N/A	80% (1111/1397) [80%, 76-84, 0.811]
Group B hospitals	N/A	85% (432/511) [84%*, 79-89, 0.026]
Other hospitals	N/A	76% (290/383) [76%, 71-82, 0.086]
<b>Hospital Type</b>		
Public hospitals	N/A	80% (742/922) [81%, 76-85, 0.635]
Private hospitals	N/A	80% (1296/1627) [80%, 76-83, 0.747]
<b>Queensland</b>	<b>N/A</b>	<b>80% (2039/2550)</b>

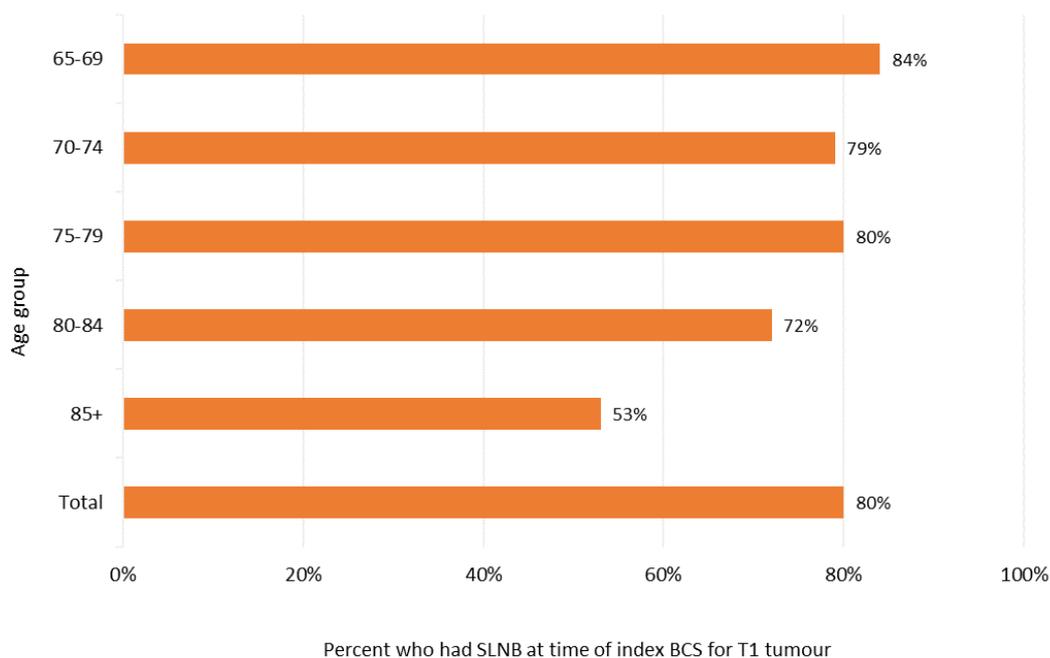
Notes: <sup>a</sup>Sentinel lymph node biopsy procedure code was introduced in the ICD-10-Am 6<sup>th</sup> edition July 2008. Due to this SLNB on T1 tumours with index BCS rates could not be calculated for this 5-year period; <sup>b</sup> Adjusted by age, tumour size, year of surgery, socioeconomic status, rurality, comorbidities and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically 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 \*. Refer to Appendix A for hospital grouping definitions

### 3.6.2 | What percentage of female breast cancer patients received SLNB on a T1 ( $\leq 20\text{mm}$ ) tumour at the time of their index BCS according to age group?

Year of diagnosis 2012 - 2016

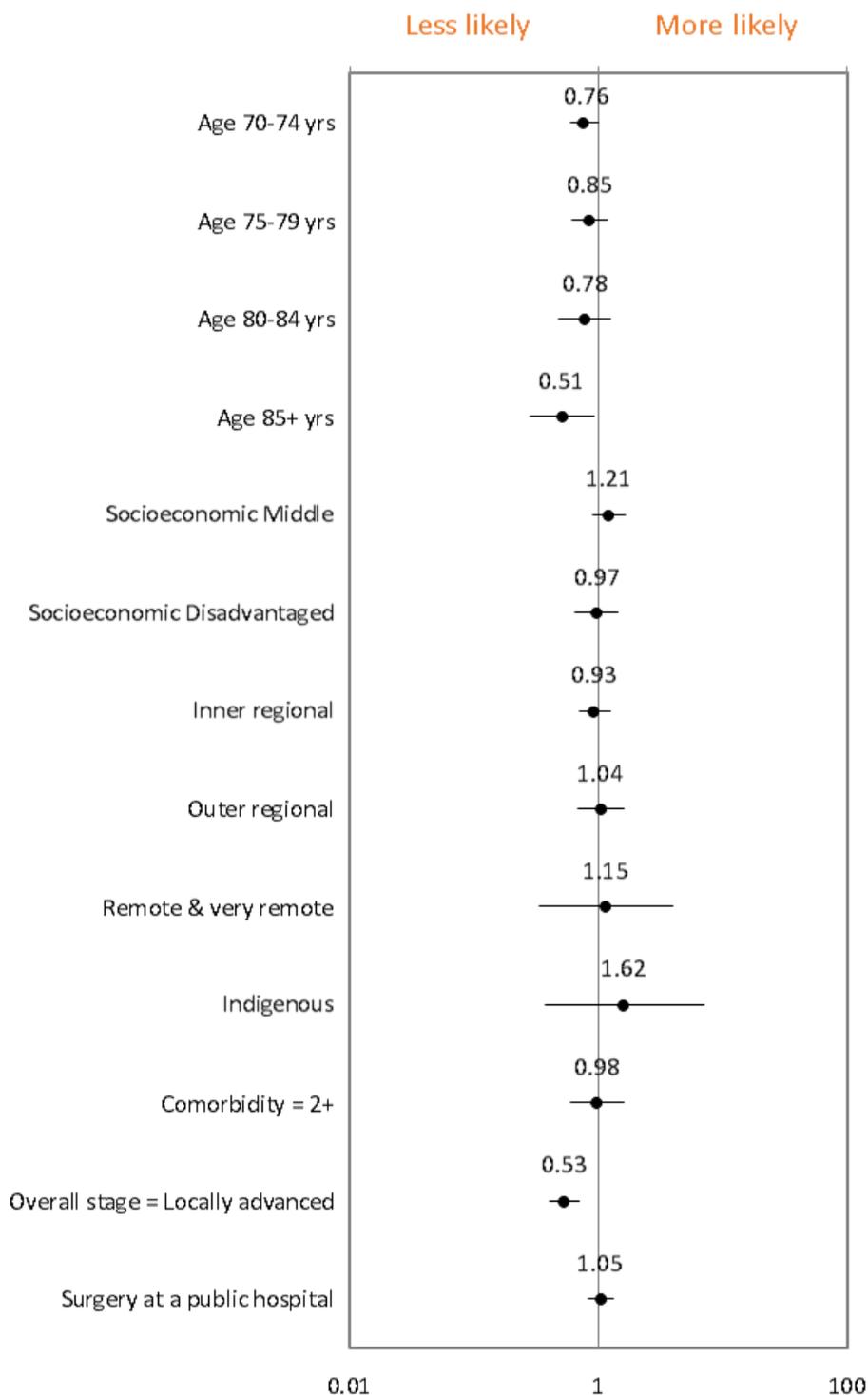
Index BCS & SLNB for T1 tumours	Diagnosis Year	
	2007-2011 <sup>a</sup> Crude rates (n/N)	2012-2016 Crude rates (n/N)
<b>Age at diagnosis</b>		
65 - 69	N/A	84% (950/1137)
70 - 74	N/A	79% (638/804)
75 - 79	N/A	80% (289/360)
80 - 84	N/A	72% (111/153)
85+	N/A	53% (51/96)
<b>Total</b>	<b>N/A</b>	<b>80%</b> (2039/2550)

Notes: <sup>a</sup> 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.



### 3.6.3 | Factors associated with the likelihood of having SLNB at time of index BCS for a T1 breast cancer tumour ( $\leq 20\text{mm}$ )

Year of diagnosis 2012 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 3.7 | IV systemic therapy for breast cancer

### 3.7.1 | What are the characteristics of female breast cancer patients who received IV systemic therapy?

Year of diagnosis 2007 - 2016

	Diagnosis		Received IV systemic therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>11,650</b>	<b>100%</b>	3,279	28%
<b>Age group</b>				
65-69	4,006	34%	1,682	42%
70-74	2,922	25%	919	31%
75-79	1,904	16%	409	21%
80-84	1,402	12%	184	13%
85+	1,416	12%	85	6%
<b>Indigenous status</b>				
Indigenous	121	1%	39	32%
Other than Indigenous <sup>a</sup>	11,529	99%	3,240	28%
<b>Socioeconomic status</b>				
Affluent	1,615	14%	446	28%
Middle	7,615	65%	2,126	28%
Disadvantaged	2,420	21%	707	29%
<b>Remoteness</b>				
Major city	7,686	66%	2,159	28%
Inner Regional	2,714	23%	769	28%
Outer Regional	1,097	9%	308	28%
Remote & very remote	153	1%	43	28%
<b>MDT<sup>b</sup></b>				
MDT review	3,346	29%	1,103	33%
No MDT review	8,304	71%	2,176	26%
<b>Comorbidities</b>				
0-1 Comorbidities	10,594	91%	3,012	28%
2+ Comorbidities	1,056	9%	267	25%
<b>Tumour size</b>				
T1 (1-20mm)	6,286	54%	1,342	41%
T2 (21-50mm)	2,794	24%	1,425	51%
T3 (> 50mm)	561	5%	239	43%
Unknown	2,009	17%	273	14%
<b>Diagnosis years</b>				
2007 - 2011	4,973	43%	1,286	26%
2012 - 2016	6,677	57%	1,993	30%
<b>HHS of residence</b>				
Cairns and Hinterland	558	5%	134	24%
Central Queensland	424	4%	111	26%
Central West	25	0.2%	6	24%
Darling Downs	787	7%	251	32%
Gold Coast	1,542	13%	530	34%
Mackay	315	3%	74	23%
Metro North	2,385	20%	631	26%
Metro South	2,340	20%	633	27%
North West	22	0.2%	4	18%
South West	53	0.5%	19	36%
Sunshine Coast	1,363	12%	326	24%
Torres and Cape	16	0.1%	7	44%
Townsville	489	4%	155	32%
West Moreton	566	5%	166	29%
Wide Bay	765	7%	232	30%

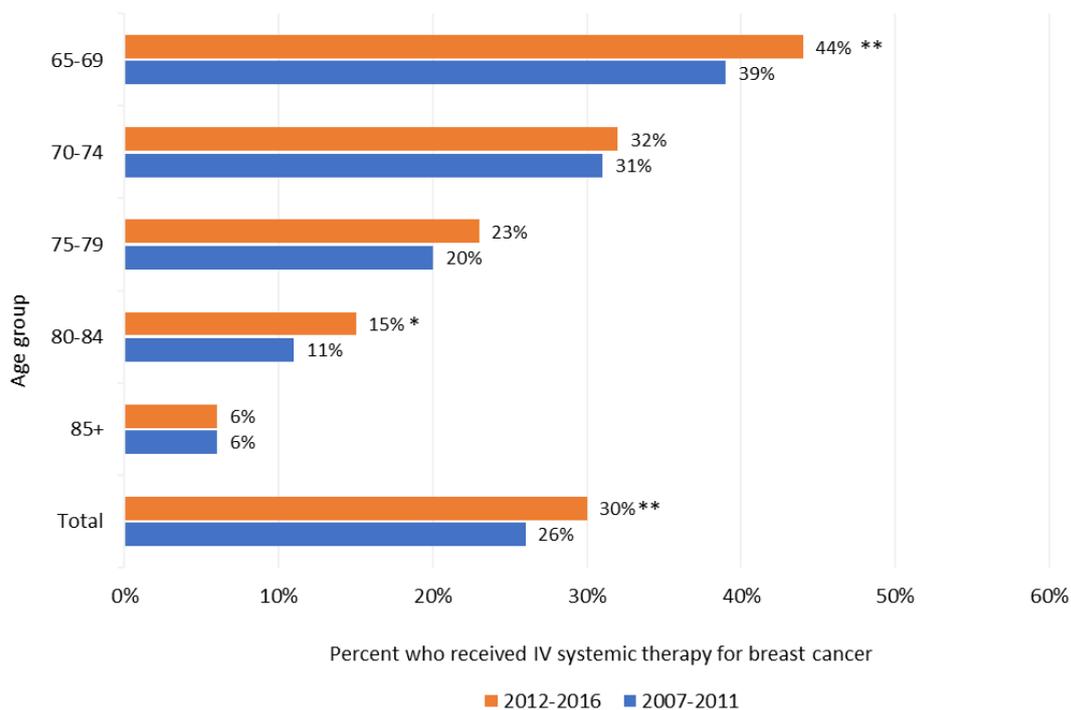
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup> MDT rate includes facilities that use QOOL to capture MDT review.

### 3.7.2 | What percentage of female patients received IV systemic therapy for breast cancer?

Year of diagnosis 2007 - 2016

Received IV systemic therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	39% (636/1631)	44% (1046/2375)	5%** (1.89-8.08)
70 - 74	31% (373/1206)	32% (546/1716)	1% (-2.44-4.39)
75 - 79	20% (167/847)	23% (242/1057)	3% (-0.73-6.67)
80 - 84	11% (68/636)	15% (116/766)	4%* (0.44-7.49)
85+	6% (42/653)	6% (43/763)	0% (-2.56-2.48)
<b>Total</b>	<b>26%</b> (1286/4973)	<b>30%</b> (1993/6677)	<b>4%**</b> (2.35-5.64)

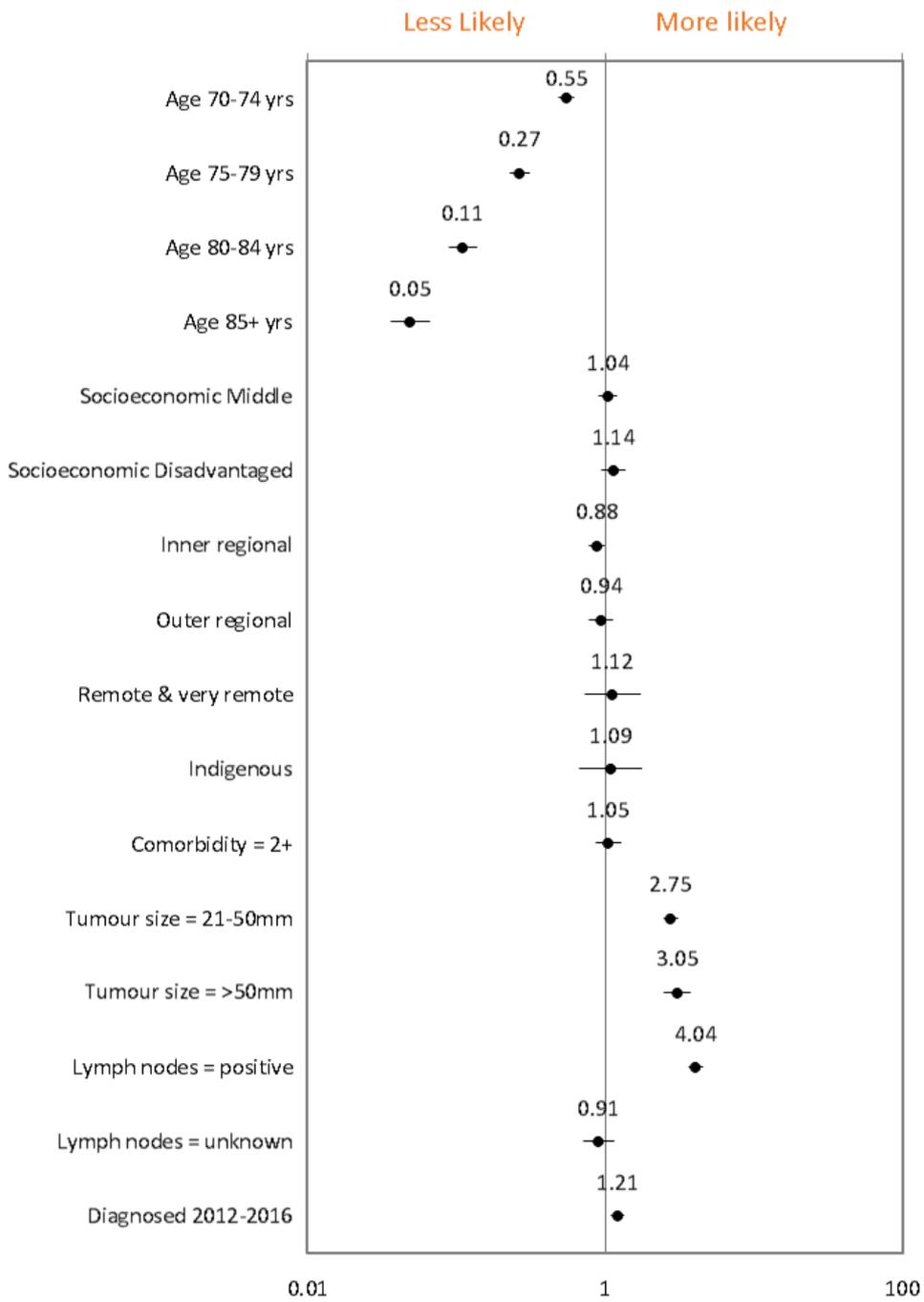
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.7.3 | Factors associated with likelihood of receiving IV systemic therapy for breast cancer

Year of diagnosis 2007 – 2016



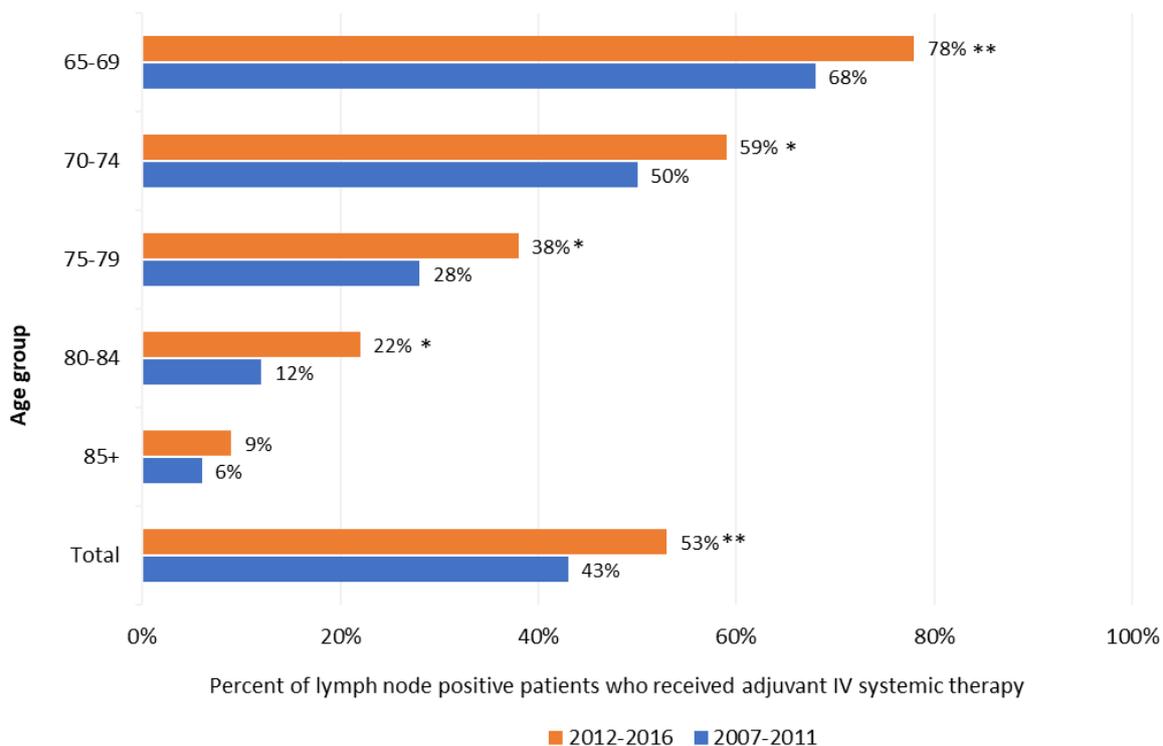
The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

### 3.7.4 | What percentage of female breast cancer patients with positive axillary node received adjuvant IV systemic therapy?

Year of diagnosis 2007 – 2016

Received adjuvant IV systemic therapy for node positive	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	68% (294/431)	78% (430/553)	10%** (4.42-15.59)
70 - 74	50% (158/317)	59% (230/391)	9%* (1.63-16.25)
75 - 79	28% (62/224)	38% (102/269)	10%* (1.64-18.07)
80 - 84	12% (20/172)	22% (47/211)	10%* (2.37-17.29)
85+	6% (8/127)	9% (11/128)	3% (-3.75-9.90)
<b>Total</b>	<b>43%</b> (543/1271)	<b>53%</b> (820/1552)	<b>10%**</b> (6.30-13.66)

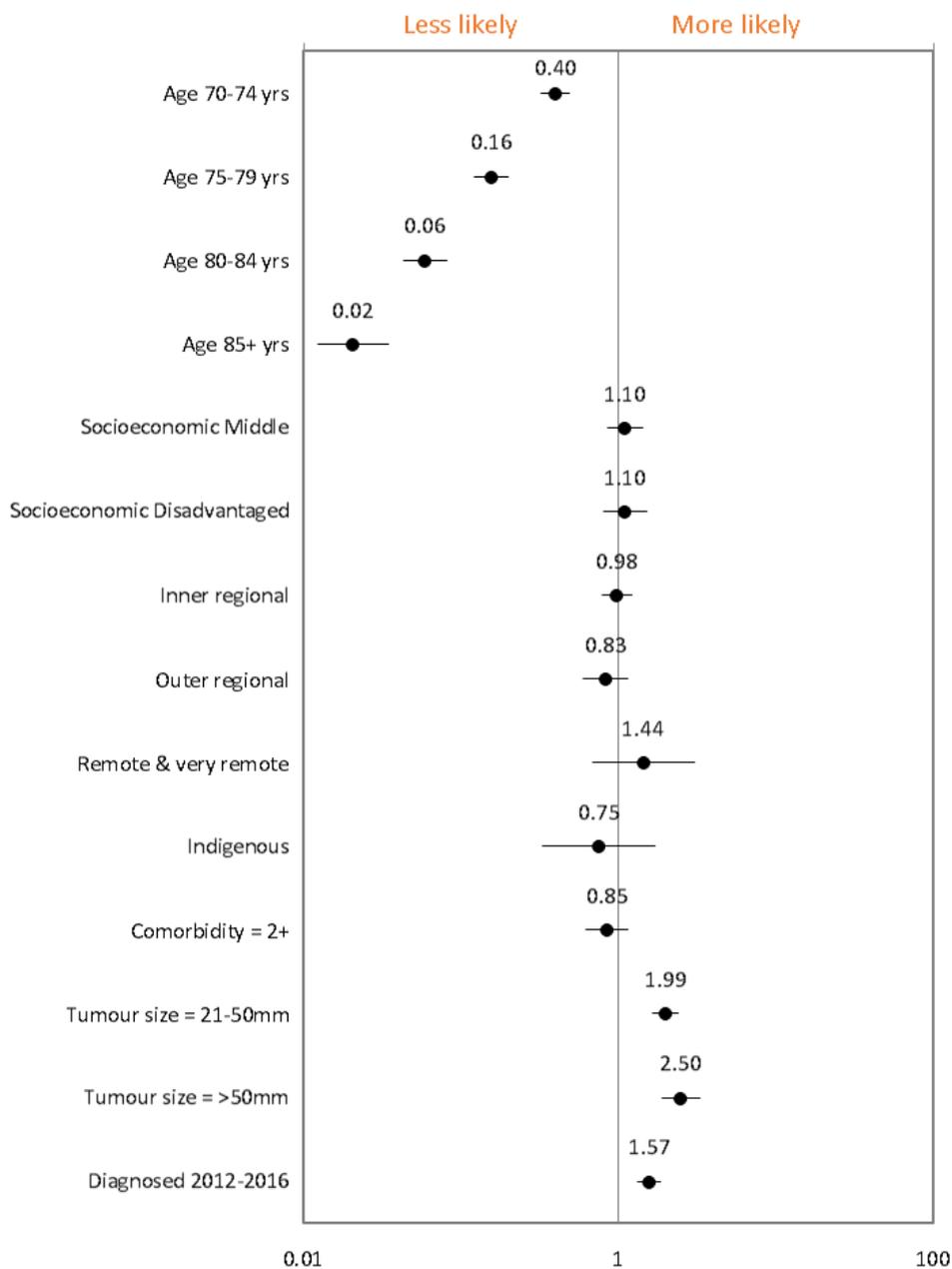
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.7.5 | Factors associated with receipt of adjuvant IV systemic therapy for axillary lymph node positive breast cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 3.8 | Radiation therapy for breast cancer

### 3.8.1 | What are the characteristics of female breast cancer patients who received radiation therapy?

Year of diagnosis 2007 - 2016

	Diagnosis		Received radiation therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>11,650</b>	<b>100%</b>	6,416	55%
<b>Age group</b>				
65-69	4,006	34%	2,784	70%
70-74	2,922	25%	1,865	64%
75-79	1,904	16%	986	52%
80-84	1,402	12%	515	37%
85+	1,416	12%	266	19%
<b>Indigenous status</b>				
Indigenous	121	1%	65	54%
Other than Indigenous <sup>a</sup>	11,529	99%	6,351	55%
<b>Socioeconomic status</b>				
Affluent	1,615	14%	1,000	62%
Middle	7,615	65%	4,185	55%
Disadvantaged	2,420	21%	1,231	51%
<b>Remoteness</b>				
Major city	7,686	66%	4,465	58%
Inner Regional	2,714	23%	1,332	49%
Outer Regional	1,097	9%	552	50%
Remote & very remote	153	1%	67	44%
<b>MDT<sup>b</sup></b>				
MDT review	3,346	29%	1,957	58%
No MDT review	8,304	71%	4,459	54%
<b>Comorbidities</b>				
0-1 Comorbidities	10,594	91%	6,011	57%
2+ Comorbidities	1,056	9%	405	38%
<b>Diagnosis years</b>				
2007 - 2011	4,973	43%	2,613	53%
2012 - 2016	6,677	57%	3,803	57%
<b>HHS of residence</b>				
Cairns and Hinterland	558	5%	305	55%
Central Queensland	424	4%	149	35%
Central West	25	0.2%	12	48%
Darling Downs	787	7%	398	51%
Gold Coast	1,542	13%	853	55%
Mackay	315	3%	140	44%
Metro North	2,385	20%	1,346	56%
Metro South	2,340	20%	1,412	60%
North West	22	0.2%	6	27%
South West	53	0.5%	22	42%
Sunshine Coast	1,363	12%	841	62%
Torres and Cape	16	0.1%	8	50%
Townsville	489	4%	260	53%
West Moreton	566	5%	304	54%
Wide Bay	765	7%	360	47%

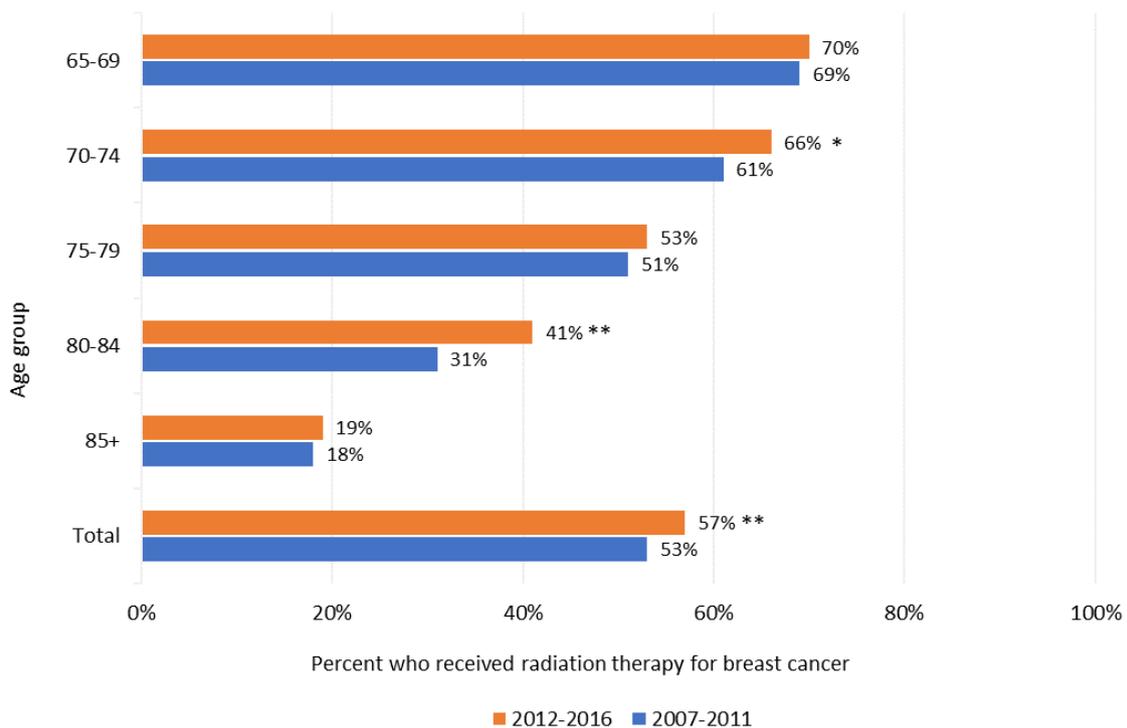
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

### 3.8.2 | What percentage of female patients received radiation therapy for breast cancer?

Year of diagnosis 2007 - 2016

Received radiation therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	69% (1131/1631)	70% (1653/2375)	1% (-1.89-3.92)
70 - 74	61% (734/1206)	66% (1131/1716)	5%* (1.46-8.55)
75 - 79	51% (431/847)	53% (555/1057)	2% (-2.51-6.50)
80 - 84	31% (198/636)	41% (317/766)	10%** (4.96-14.94)
85+	18% (119/653)	19% (147/763)	1% (-3.09-5.03)
<b>Total</b>	<b>53%</b> (2613/4973)	<b>57%</b> (3803/6677)	<b>4%**</b> (2.17-5.82)

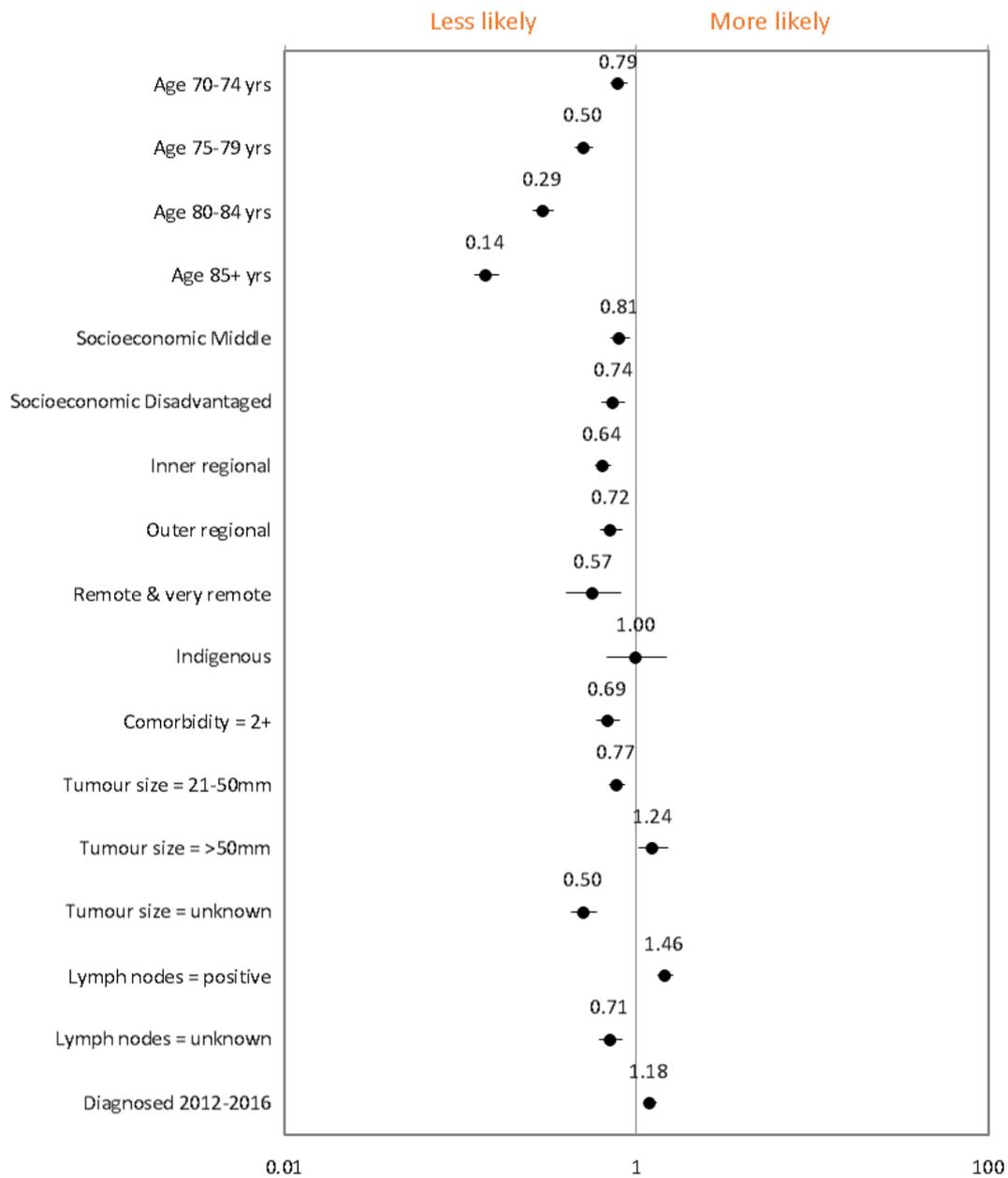
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.8.3 | Factors associated with likelihood of receiving radiation therapy for breast cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

### 3.8.4 | What percentage of female breast cancer patients received radiation therapy following BCS?

Year of diagnosis 2007 – 2016

Received radiation therapy following BCS	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	84% (285/340) [83%, 77-88, 0.879]	87% (285/327) [86%, 81-90, 0.60]
Group A hospitals	83% (1098/1322) [83%, 79-87, 0.719]	87% (1563/1789) [87%, 85-90, 0.29]
Group B hospitals	84% (204/242) [86%, 80-92, 0.086]	88% (552/630) [88%, 84-91, 0.403]
Other hospitals	77% (280/366) [78%*, 73-84, 0.05]	81% (383/473) [82%**, 78-87, 0.012]
<b>Hospital Type</b>		
Public hospitals	80% (654/814) [79%*, 75-84, 0.047]	87% (1001/1151) [87%, 84-90, 0.774]
Private hospitals	83% (1213/1456) [84%, 80-88, 0.14]	85% (1782/2068) [86%, 84-89, 0.841]
<b>Queensland</b>	<b>82% (1867/2270)</b>	<b>86% (2783/3219)</b>

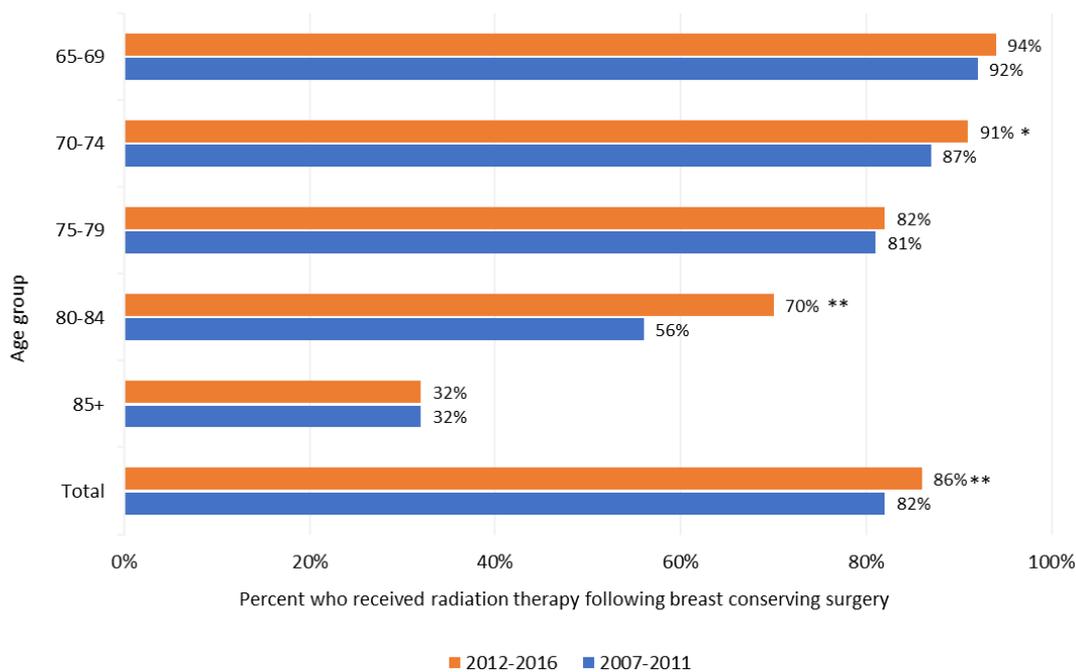
Notes: <sup>a</sup>Adjusted by age, tumour size, year of surgery, socioeconomic status, rurality, comorbidities and overall stage. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

### 3.8.5 | What percentage of female breast cancer patients received radiation therapy following definitive breast conserving surgery (BCS) within 1 year of diagnosis according to age group?

Year of diagnosis 2007 - 2016

Received radiation therapy following BCS	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	92% (890/964)	94% (1299/1385)	2% (-0.07-4.20)
70 - 74	87% (535/618)	91% (892/976)	4%* (0.88-7.31)
75 - 79	81% (290/357)	82% (377/457)	1% (-4.31-6.46)
80 - 84	56% (107/192)	70% (160/229)	14%** (4.75-23.00)
85+	32% (45/139)	32% (55/172)	0% (-10.43-10.24)
<b>Total</b>	<b>82%</b> (1867/2270)	<b>86%</b> (2783/3219)	<b>4%**</b> (2.03-6.0)

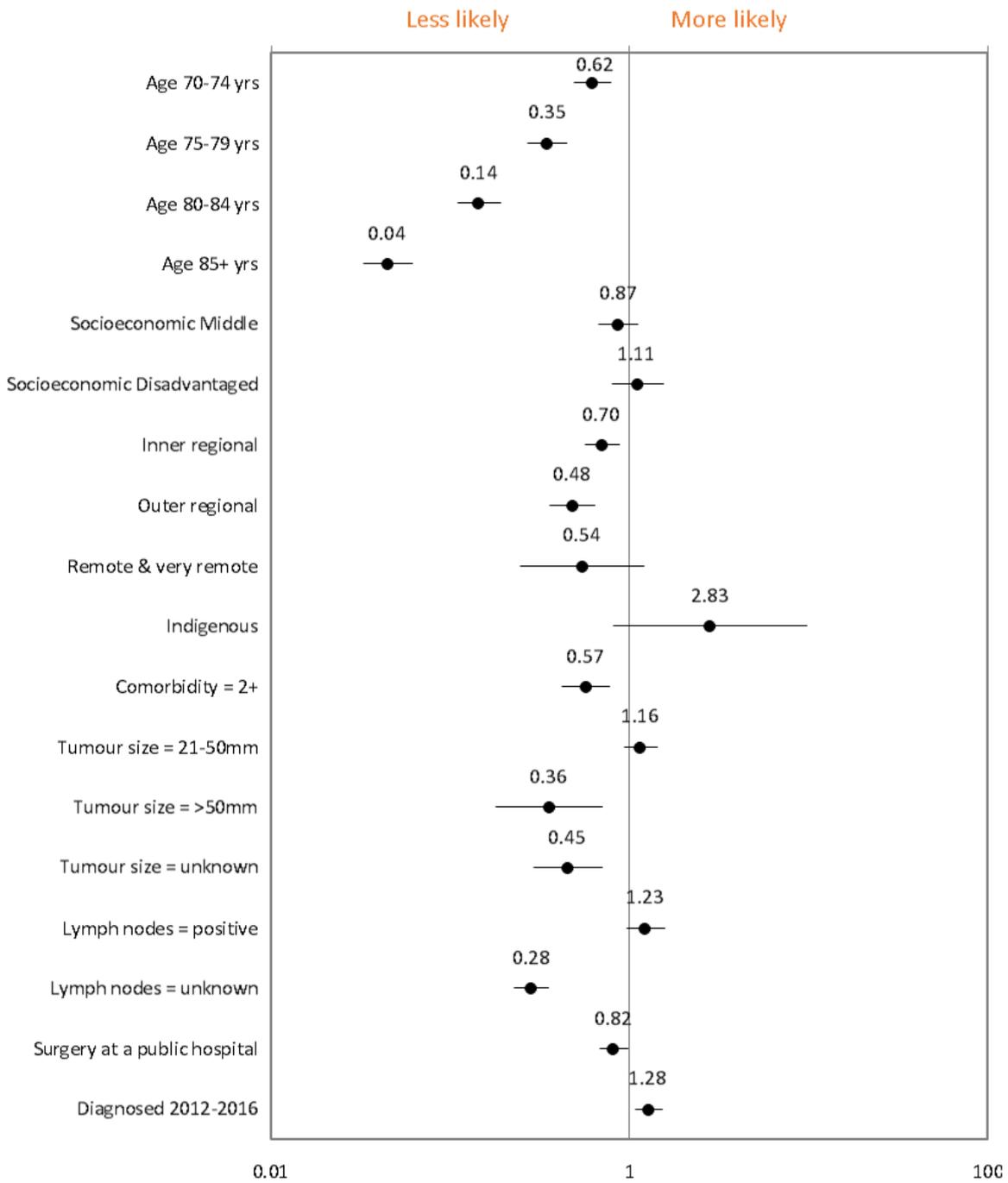
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 3.8.6 | Factors associated with likelihood of receiving radiation therapy following BCS within one year of diagnosis

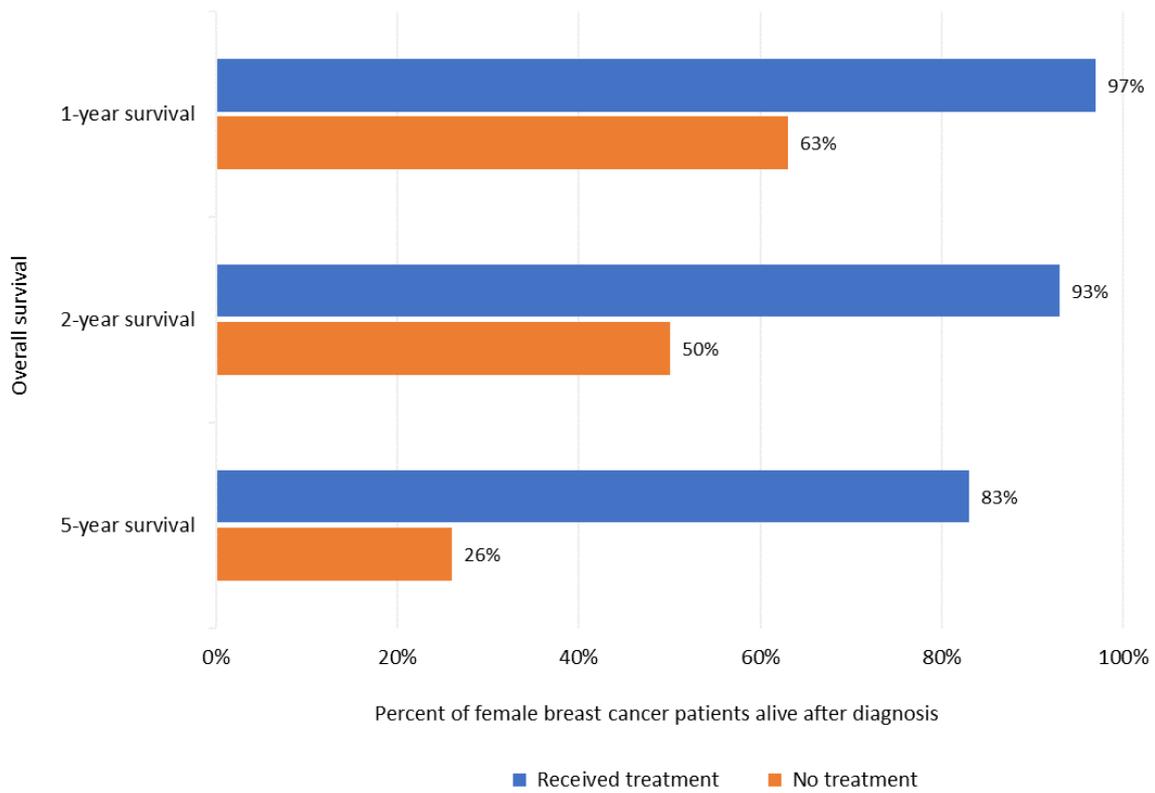
Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

### 3.9 | One, two and five-year overall survival for female breast cancer patients

#### 3.9.1 | What percentage of female breast cancer patients are alive after diagnosis by treatment status?



# 4 | Lung cancer



## 4.1 | Lung cancer

### 4.1.1 | What are the characteristics of patients aged 65+ years diagnosed with lung cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received treatment <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>14,817</b>	<b>100%</b>	<b>9,327</b>	<b>63%</b>
<b>Sex</b>				
Male	9,236	62%	5,813	63%
Female	5,581	38%	3,499	63%
<b>Age group</b>				
65-69	3,684	25%	2,949	80%
70-74	3,672	25%	2,689	73%
75-79	3,172	21%	2,052	65%
80-84	2,511	17%	1,182	47%
85+	1,778	12%	455	26%
<b>Indigenous status</b>				
Indigenous	259	2%	130	50%
Other than Indigenous <sup>b</sup>	14,558	98%	9,197	63%
<b>Socioeconomic status</b>				
Affluent	1,541	10%	1,021	66%
Middle	9,382	63%	5,988	64%
Disadvantaged	3,894	26%	2,318	60%
<b>Remoteness</b>				
Major city	9,342	63%	6,074	65%
Inner Regional	3,565	24%	2,227	62%
Outer Regional	1,523	10%	833	55%
Remote & very remote	387	3%	193	50%
<b>MDT<sup>c</sup></b>				
MDT review	6,846	46%	5,184	76%
No MDT review	7,971	54%	4,143	52%
<b>Comorbidities</b>				
0-1 Comorbidities	10,734	72%	7,083	66%
2+ Comorbidities	4,083	28%	2,244	55%
<b>Morphology</b>				
Non-small cell cancer	12,006	81%	7,943	66%
Small cell cancer	1,498	10%	1,131	76%
Other lung cancer	1,313	9%	253	19%
<b>Diagnosis years</b>				
2007 - 2011	6,679	45%	4,013	60%
2012 - 2016	8,138	55%	5,314	65%
<b>HHS of residence</b>				
Cairns and Hinterland	738	5%	392	53%
Central Queensland	672	5%	392	58%
Central West	70	0.5%	38	54%
Darling Downs	867	6%	503	58%
Gold Coast	1,900	13%	1,237	65%
Mackay	394	3%	209	53%
Metro North	2,849	19%	1,883	66%
Metro South	2,972	20%	1,927	65%
North West	77	0.5%	48	62%
South West	101	0.7%	45	45%
Sunshine Coast	1,528	10%	1,011	66%
Torres and Cape	49	0.3%	18	37%
Townsville	678	5%	401	59%
West Moreton	724	5%	461	64%
Wide Bay	1,198	8%	762	64%

Notes: <sup>a</sup>Treatment includes lobectomy, partial resection, pneumonectomy, IV systemic therapy or radiation therapy; <sup>b</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup>MDT rate includes facilities that use QOOL to capture MDT review.

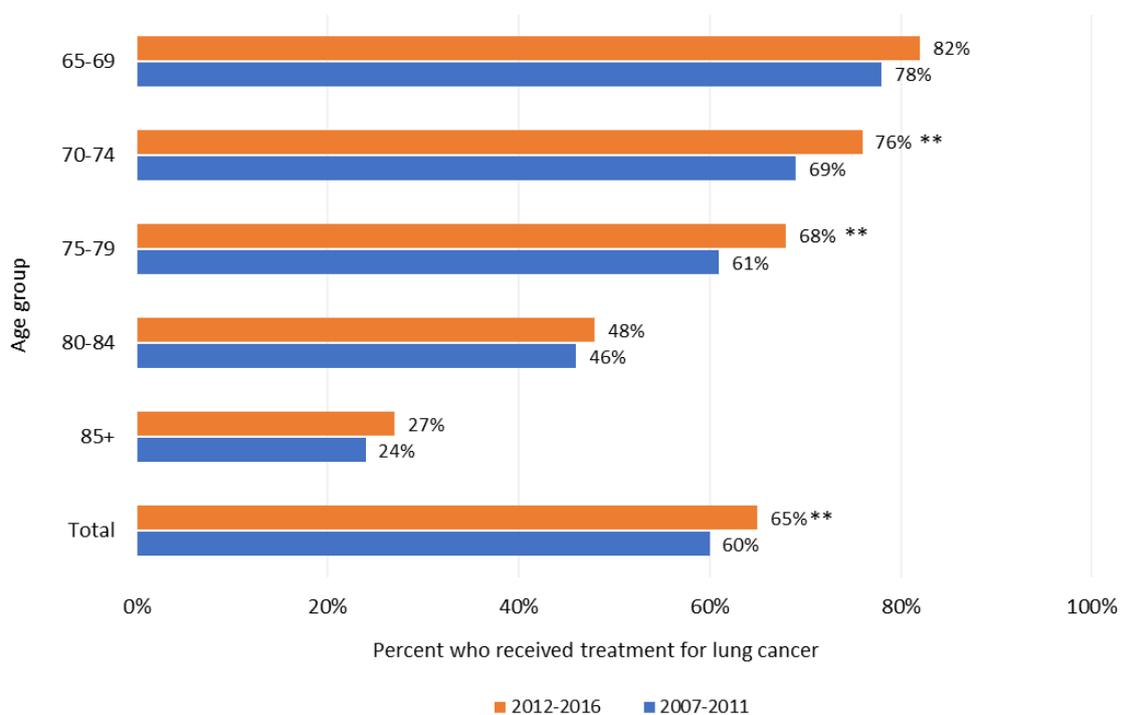
## 4.2 | Treatment for lung cancer

### 4.2.1 | What percentage of lung cancer patients received treatment<sup>a</sup> according to age group?

Year of diagnosis 2007 - 2016

Received treatment*	Diagnosis Year		% difference <sup>b</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	78% (1271/1639)	82% (1678/2045)	4%** (1.41-6.62)
70 - 74	69% (1111/1608)	76% (1578/2064)	7%** (4.09-9.92)
75 - 79	61% (886/1451)	68% (1166/1721)	7%** (3.66-10.33)
80 - 84	46% (560/1222)	48% (622/1289)	2% (-1.90-5.89)
85+	24% (185/759)	27% (270/1019)	3% (-1.12-7.04)
<b>Total</b>	<b>60%</b> (4013/6679)	<b>65%</b> (5314/8138)	<b>5%**</b> (3.43-6.57)

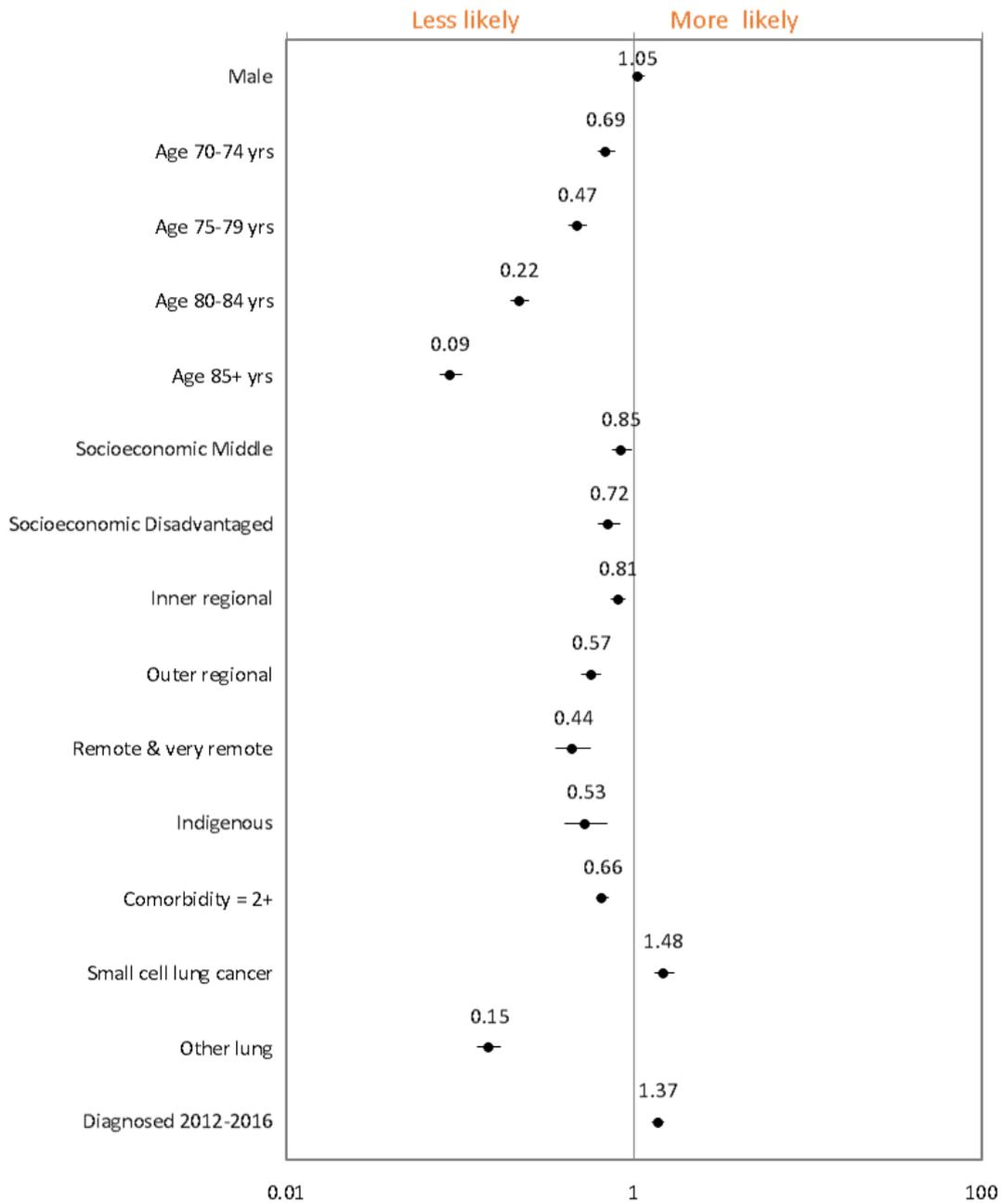
Notes: <sup>a</sup>Treatment includes lobectomy, partial resection, pneumonectomy, IV systemic therapy or radiation therapy; <sup>b</sup> the likelihood the observed difference is due to chance alone is less than 1% for those marked \*\*and less than 5% for those marked \*.



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

#### 4.2.2| Factors associated with the likelihood of receiving treatment for lung cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 4.3 | Major resection for non-small cell lung cancer

### 4.3.1 | What are the characteristics of patients who had a major resection for non-small cell lung cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received major resection <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>12,006</b>	<b>100%</b>	<b>2,178</b>	<b>18%</b>
<b>Sex</b>				
Male	7,528	63%	1,272	17%
Female	4,478	37%	904	20%
<b>Age group</b>				
65-69	3,064	26%	742	24%
70-74	3,058	25%	685	22%
75-79	2,564	21%	491	19%
80-84	2,031	17%	229	11%
85+	1,289	11%	29	2%
<b>Indigenous status</b>				
Indigenous	269	2%	39	15%
Other than Indigenous <sup>b</sup>	11,941	98%	2,139	18%
<b>Socioeconomic status</b>				
Affluent	1,277	11%	268	21%
Middle	7,629	64%	1,414	19%
Disadvantaged	3,100	26%	494	16%
<b>Remoteness</b>				
Major city	7,581	63%	1,424	19%
Inner Regional	2,915	24%	501	17%
Outer Regional	1,215	10%	209	17%
Remote & very remote	295	2%	42	14%
<b>MDT<sup>c</sup></b>				
MDT review	5,849	49%	1,190	20%
No MDT review	6,157	51%	986	16%
<b>Comorbidities</b>				
0-1 Comorbidities	8,787	73%	1,716	20%
2+ Comorbidities	3,219	27%	460	14%
<b>Diagnosis years</b>				
2007 - 2011	5,458	46%	876	16%
2012 - 2016	6,548	54%	1,300	20%
<b>HHS of residence</b>				
Cairns and Hinterland	588	5%	111	19%
Central Queensland	560	5%	68	12%
Central West	52	0.4%	14	26%
Darling Downs	691	6%	101	15%
Gold Coast	1,531	13%	269	18%
Mackay	307	3%	57	19%
Metro North	2,326	19%	498	21%
Metro South	2,428	20%	436	18%
North West	62	0.5%	9	15%
South West	80	0.7%	8	10%
Sunshine Coast	1,249	10%	223	18%
Torres and Cape	33	0.3%	2	6%
Townsville	526	4%	103	20%
West Moreton	584	5%	95	16%
Wide Bay	989	8%	182	18%

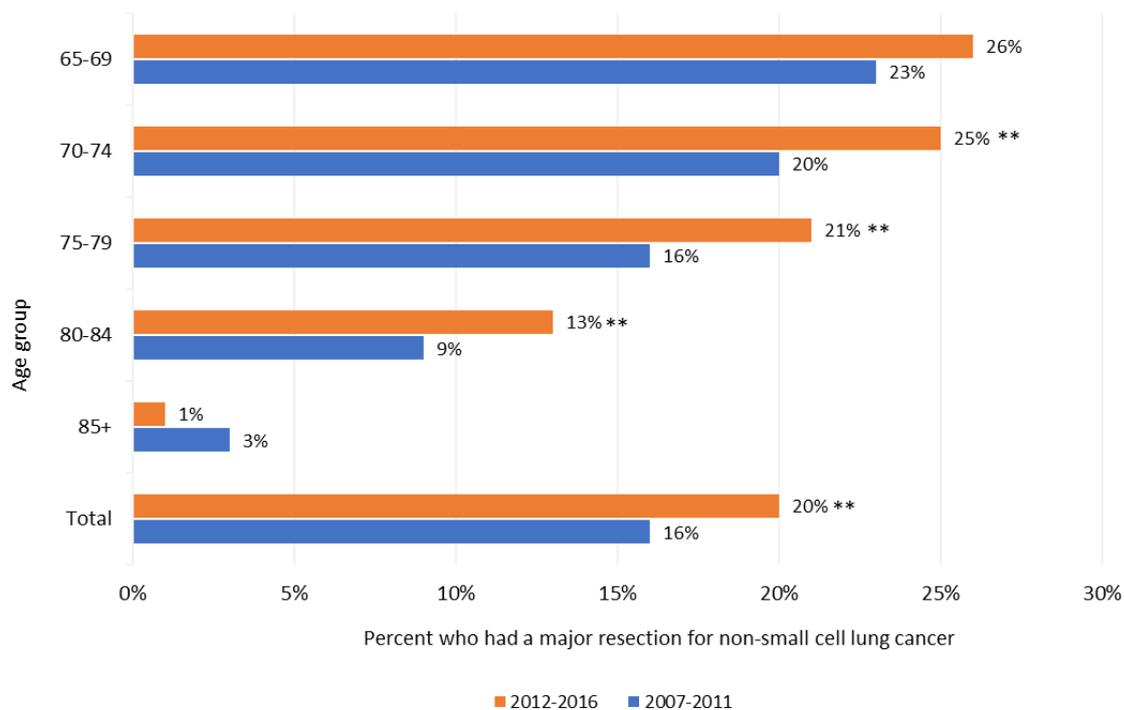
Notes: <sup>a</sup> Major resection includes lobectomy, partial resection, pneumonectomy; <sup>b</sup> Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup> MDT rate includes facilities that use QOOL to capture MDT review.

### 4.3.2 | What percentage of non-small cell lung cancer patients had a major resection according to age group?

Year of diagnosis 2007 - 2016

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	23% (308/1364)	26% (434/1700)	3% (-0.07-6.04)
70 - 74	20% (260/1325)	25% (425/1733)	5%** (2.01-7.94)
75 - 79	16% (194/1177)	21% (297/1387)	5%** (1.98-7.98)
80 - 84	9% (95/1009)	13% (134/1022)	4%** (1.28-6.73)
85+	3% (19/583)	1% (10/706)	2%** (0.47-3.80)
<b>Total</b>	<b>16%</b> (876/5458)	<b>20%</b> (1300/6548)	<b>4%**</b> (2.62-5.37)

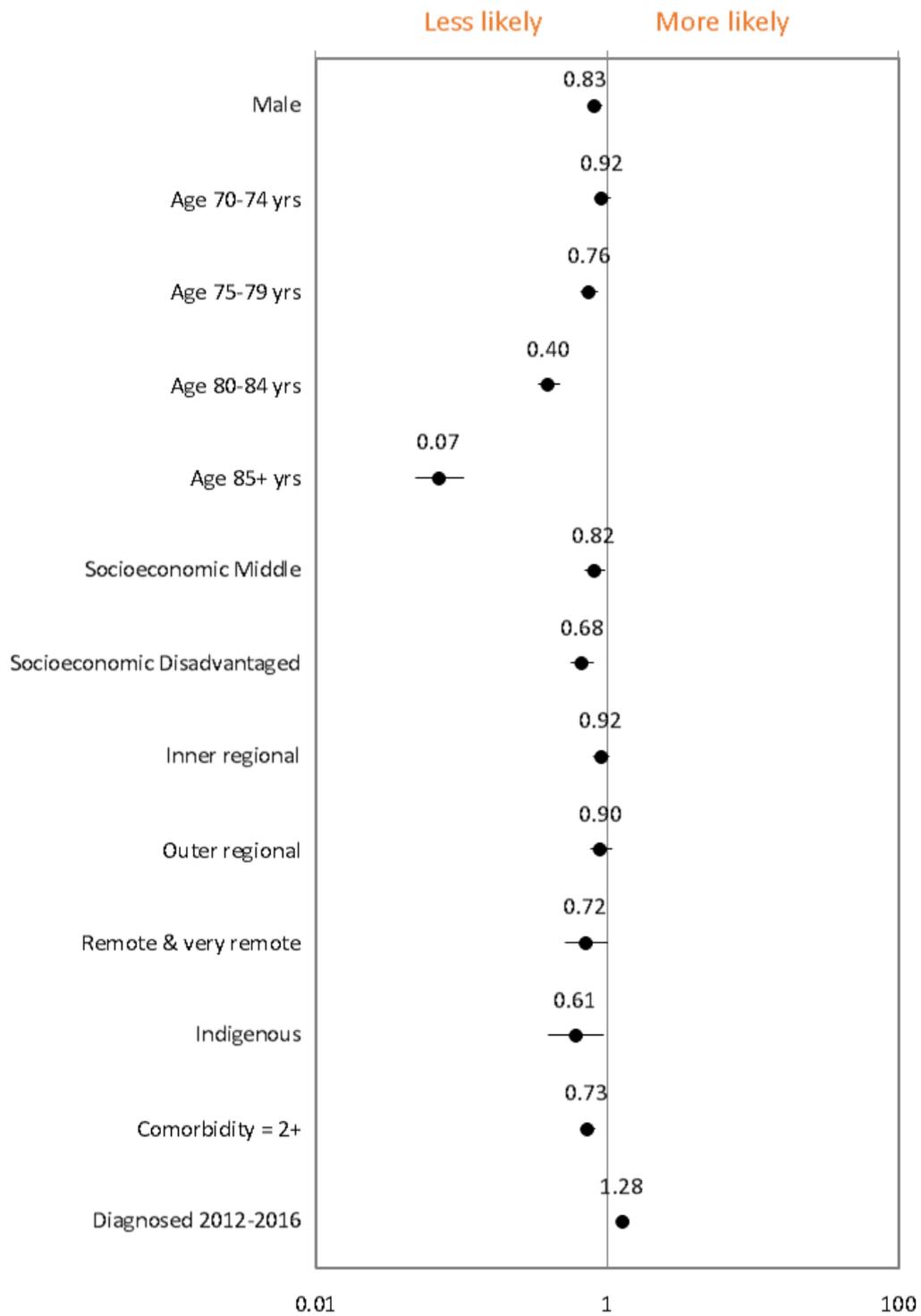
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.3.3 | Factors associated with the likelihood of having a major resection for lung cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 4.4 | 30-day mortality following major resection for non-small cell lung cancer

### 4.4.1 | What percentage of patients die within 30 days of major resection for non-small cell lung cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

30-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	<b>1.1% (5/444)</b> [1.1%, 0.3-4.8, 0.32]	<b>0.8% (5/622)</b> [0.8%, 0.2-3.8, 0.636]
Group A hospitals	<b>2.6% (10/389)</b> [2.5%, 0.7-9.0, 0.412]	<b>1.2% (7/605)</b> [1.2, 0.3-5.2, 0.686]
Group B hospitals	<b>2.3% (1/43)</b> [3.4%, 0.4-31.1, 0.47]	<b>1.4% (1/73)</b> [1.3%, 0.1-14.7, 0.803]
Other hospitals	N/A	N/A
<b>Hospital Type</b>		
Public hospitals	<b>1.1% (5/444)</b> [1.1%, 0.3-4.8, 0.319]	<b>0.9% (6/649)</b> [0.9%, 0.2-4.1, 0.822]
Private hospitals	<b>2.6% (11/432)</b> [2.6%, 0.7-9.0, 0.36]	<b>1.0% (7/651)</b> [1.1%, 0.3-4.8, 0.821]
<b>Queensland</b>	<b>1.8% (16/876)</b>	<b>1.0% (13/1300)</b>

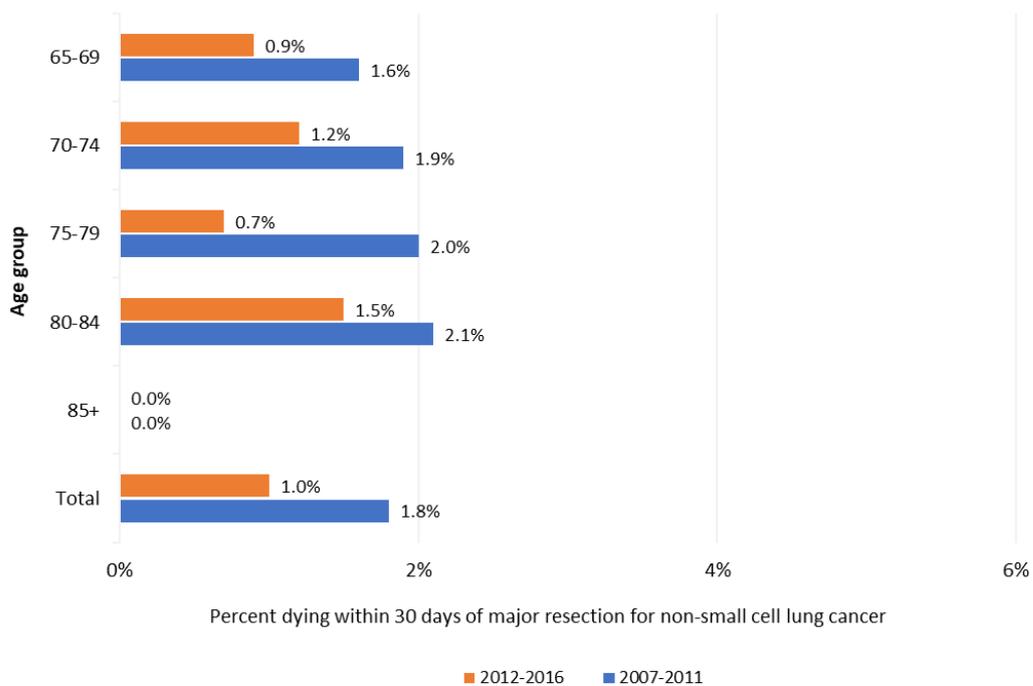
Notes: <sup>a</sup> Adjusted by age, sex, socioeconomic status, rurality, comorbidity and ASA. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

#### 4.4.2 | What percentage of non-small cell lung cancer patients die within 30 days of major resection according to age group?

Year of diagnosis 2007 - 2016

30-day mortality	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	1.6% (5/308)	0.9% (4/434)	0.7% (-0.98-2.88)
70 - 74	1.9% (5/260)	1.2% (5/425)	0.7% (-1.20-3.28)
75 - 79	2.0% (4/194)	0.7% (2/297)	1.3% (-0.85-4.43)
80 - 84	2.1% (2/95)	1.5% (2/134)	0.6% (-3.48-5.96)
85+	0% (0/19)	0% (0/10)	0% (-)
<b>Total</b>	<b>1.8%</b> (16/876)	<b>1.0%</b> (13/1300)	<b>0.8%</b> (-0.19-1.99)

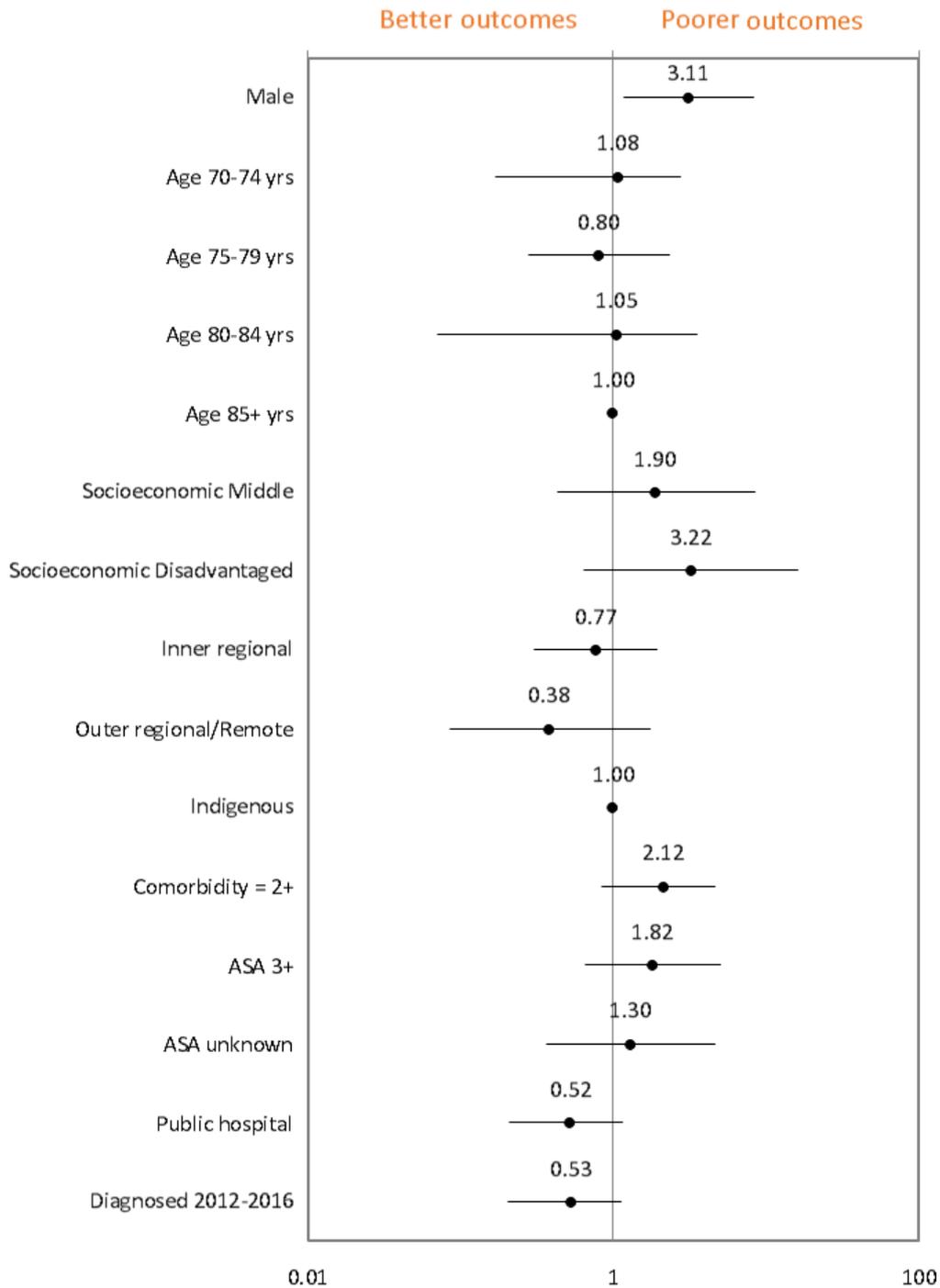
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.4.3 | Factors associated with 30-day surgical mortality following major resection for non-small cell lung cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional remote and very remote combined due to small numbers.

## 4.5 | 90-day mortality following major resection for non-small cell lung cancer

### 4.5.1 | What percentage of patients die within 90 days of major resection for non-small cell lung cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

90-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	1.8% (8/444) [1.8%, 0.6-5.3, 0.050]	1.9% (12/622) [1.9%, 0.7-5.2, 0.417]
Group A hospitals	5.7% (22/389) [5.7%, 2.4-13.4, 0.128]	3.0% (18/605) [3.0, 1.2-7.4, 0.558]
Group B hospitals	7.0% (3/43) [8.4%, 1.9-35.9, 0.162]	4.1% (3/73) [3.7%, 0.8-16.7, 0.525]
Other hospitals	N/A	N/A
<b>Hospital Type</b>		
Public hospitals	1.8% (8/444) [1.8%*, 0.6-5.3, 0.05]	2.2% (14/649) [2.2%, 0.8-5.6, 0.61]
Private hospitals	5.8% (25/432) [5.9%, 2.5-13.7, 0.082]	2.9% (19/651) [2.9%, 1.2-7.0, 0.627]
<b>Queensland</b>	<b>3.8% (33/876)</b>	<b>2.5% (33/1300)</b>

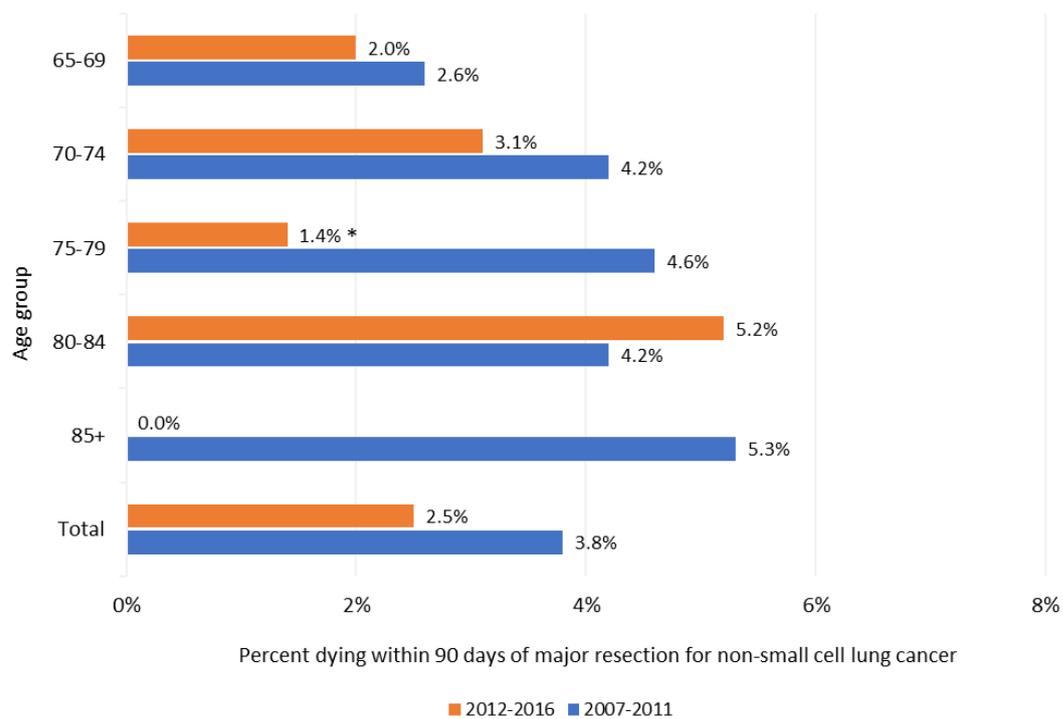
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity and ASA. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

#### 4.5.2 | What percentage of non-small cell lung cancer patients die within 90 days of major resection according to age group?

Year of diagnosis 2007 - 2016

90-day mortality	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	2.6% (8/308)	2.0% (9/434)	0.6% (-1.60-3.22)
70 - 74	4.2% (11/260)	3.1% (13/425)	1.1% (-1.70-4.52)
75 - 79	4.6% (9/194)	1.4% (4/297)	3.2%* (0.19-7.22)
80 - 84	4.2% (4/95)	5.2% (7/134)	1.0% (-5.67-6.76)
85+	5.3% (1/19)	0% (0/10)	5.3% (-22.80-24.69)
<b>Total</b>	<b>3.8%</b> (33/876)	<b>2.5%</b> (33/1300)	<b>1.3%</b> (-0.17-2.95)

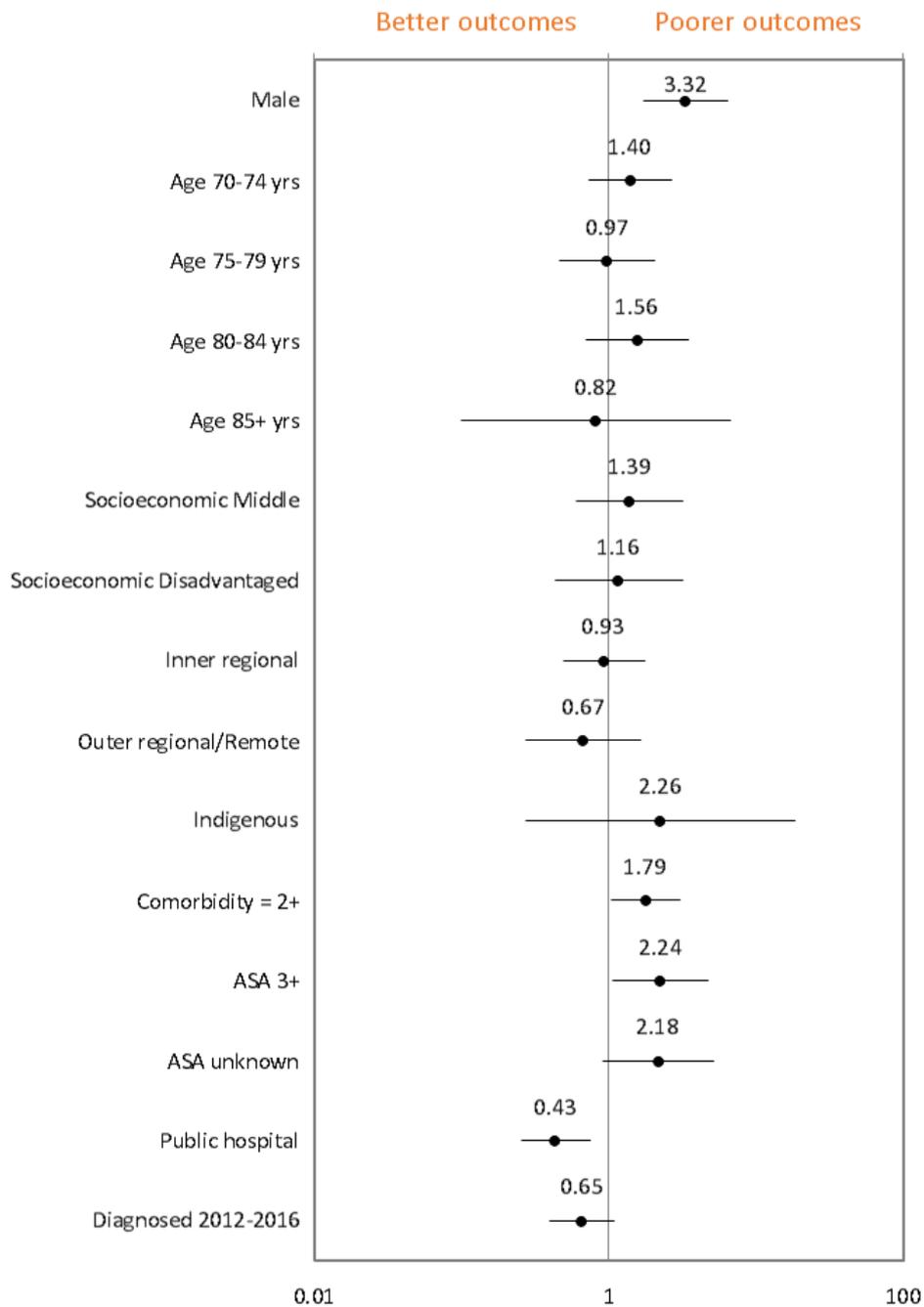
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.5.3 | Factors associated with 90-day surgical mortality following major resection for non-small cell lung cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional remote and very remote combined due to small numbers.

## 4.6 | One-year surgical survival

### 4.6.1 | What percentage of patients are alive one year after major resection for non-small cell lung cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

1-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year	Diagnosis year
	Crude rates (n/N)	Crude rates (n/N)
	[Adjusted <sup>a</sup> rates, CI%, P value]	[Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	<b>89% (395/444)</b> [89%, 83-95, 0.148]	<b>92% (570/622)</b> [92%, 88-96, 0.723]
Group A hospitals	<b>84% (325/389)</b> [84%, 77-90, 0.249]	<b>92% (559/605)</b> [92%, 88-96, 0.70]
Group B hospitals	<b>81% (35/43)</b> [82%, 68-96, 0.423]	<b>81% (59/73)</b> [83%, 73-94, 0.09]
Other hospitals	N/A	N/A
<b>Hospital Type</b>		
Public hospitals	<b>89% (395/444)</b> [89%, 83-95, 0.148]	<b>92% (594/649)</b> [92%, 87-95, 0.815]
Private hospitals	<b>83% (360/432)</b> [83%, 77-90, 0.192]	<b>91% (594/651)</b> [91%, 87-95, 0.815]
<b>Queensland</b>	<b>86% (755/876)</b>	<b>91% (1188/1300)</b>

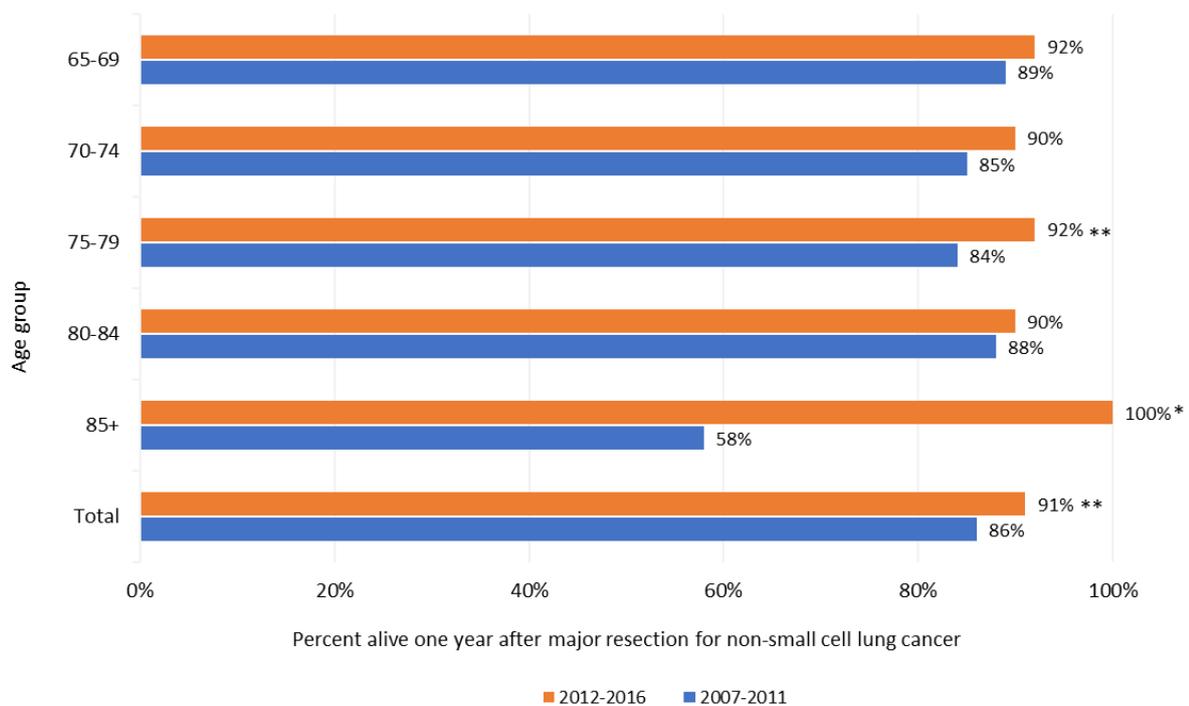
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

#### 4.6.2 | What percentage of non-small cell lung cancer patients are alive one year after major resection according to age group?

Year of diagnosis 2007 - 2016

1-year survival	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	89% (275/308)	92% (401/434)	3% (-1.22-7.55)
70 - 74	85% (222/260)	90% (384/425)	5% (-0.03-10.46)
75 - 79	84% (163/194)	92% (273/297)	8%** (2.21-14.36)
80 - 84	88% (84/95)	90% (120/134)	2% (-6.06-11.00)
85+	58% (11/19)	100% (0/10)	42%* (8.40-63.63)
<b>Total</b>	<b>86%</b> (755/876)	<b>91%</b> (1188/1300)	<b>5%**</b> (2.28-7.84)

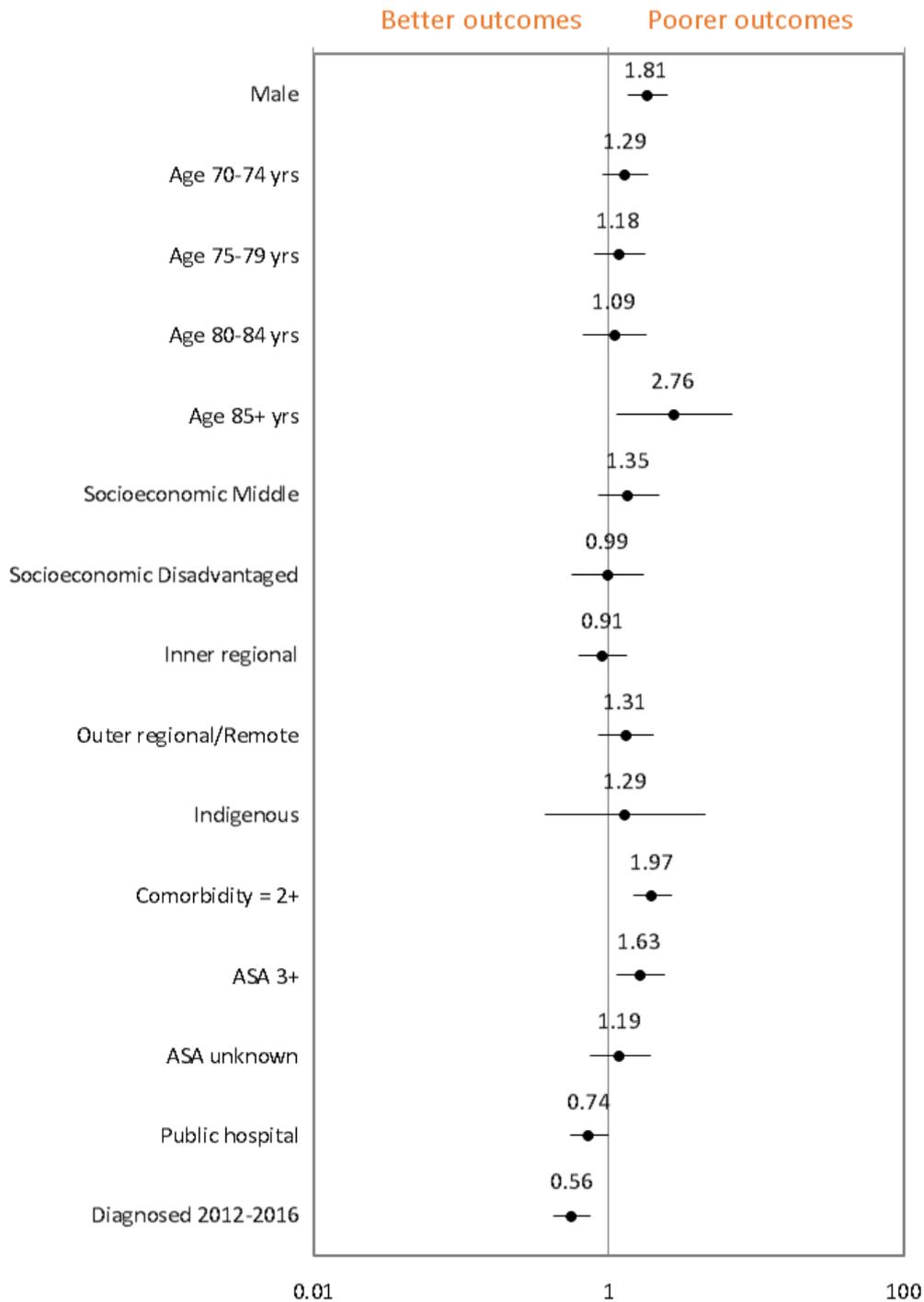
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.6.3 | Factors associated with one-year survival following major resection for non-small cell lung cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional remote and very remote combined due to small numbers.

## 4.7 | Two-year surgical survival

### 4.7.1 | What percentage of patients are alive two years after major resection for non-small cell lung cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

2-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	<b>77% (341/444)</b> [77%, 69-85, 0.158]	<b>85% (528/622)</b> [85%, 80-91, 0.248]
Group A hospitals	<b>71% (276/389)</b> [71%, 63-79, 0.248]	<b>83% (503/605)</b> [83%, 77-88, 0.715]
Group B hospitals	<b>65% (28/43)</b> [66%, 51-86, 0.357]	<b>68% (50/73)</b> [71%, 59-85, 0.056]
Other hospitals	N/A	N/A
<b>Hospital Type</b>		
Public hospitals	<b>77% (341/444)</b> [77%, 69-85, 0.158]	<b>85% (551/650)</b> [85%, 80-91, 0.282]
Private hospitals	<b>70% (304/432)</b> [70%, 63-78, 0.177]	<b>82% (532/652)</b> [81%, 76-87, 0.315]
<b>Queensland</b>	<b>74% (645/876)</b>	<b>83% (1081/1300)</b>

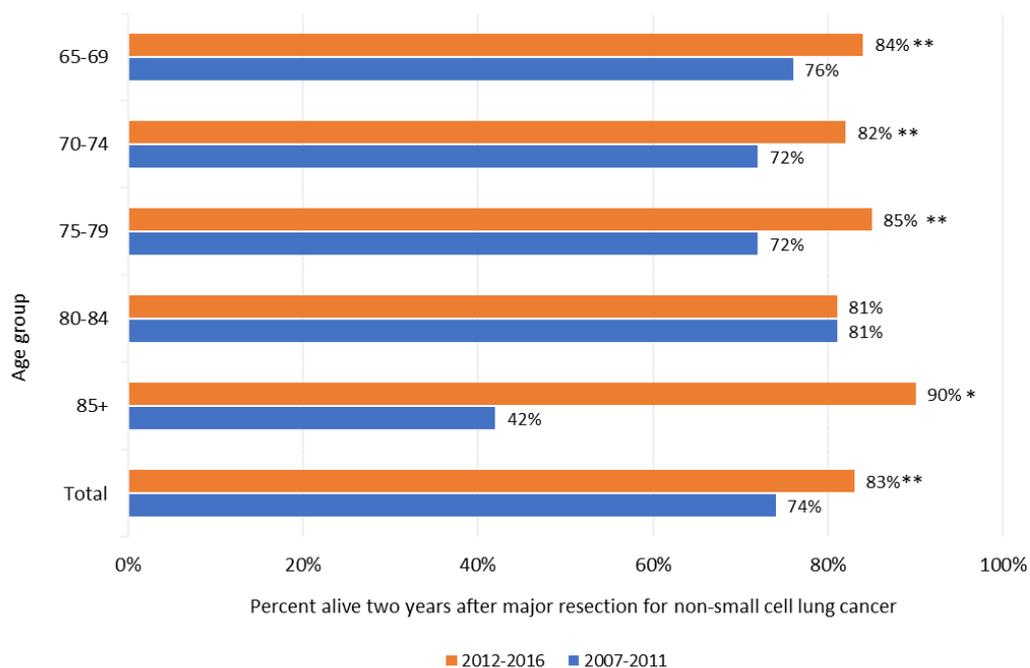
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to appendix A for hospital grouping definitions.

#### 4.7.2 | What percentage of non-small cell lung cancer patients are alive two years after major resection according to age group?

Year of diagnosis 2007 - 2016

2-year survival	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	76% (233/308)	84% (363/434)	8%** (2.20-13.97)
70 - 74	72% (187/260)	82% (348/425)	10%** (3.55-16.66)
75 - 79	72% (140/194)	85% (252/297)	13%** (5.62-20.61)
80 - 84	81% (77/95)	81% (109/134)	0% (-9.98-10.70)
85+	42% (8/19)	90% (9/10)	48%* (10.68-68.64)
<b>Total</b>	<b>74%</b> (645/876)	<b>83%</b> (1081/1300)	<b>9%**</b> (5.48-12.58)

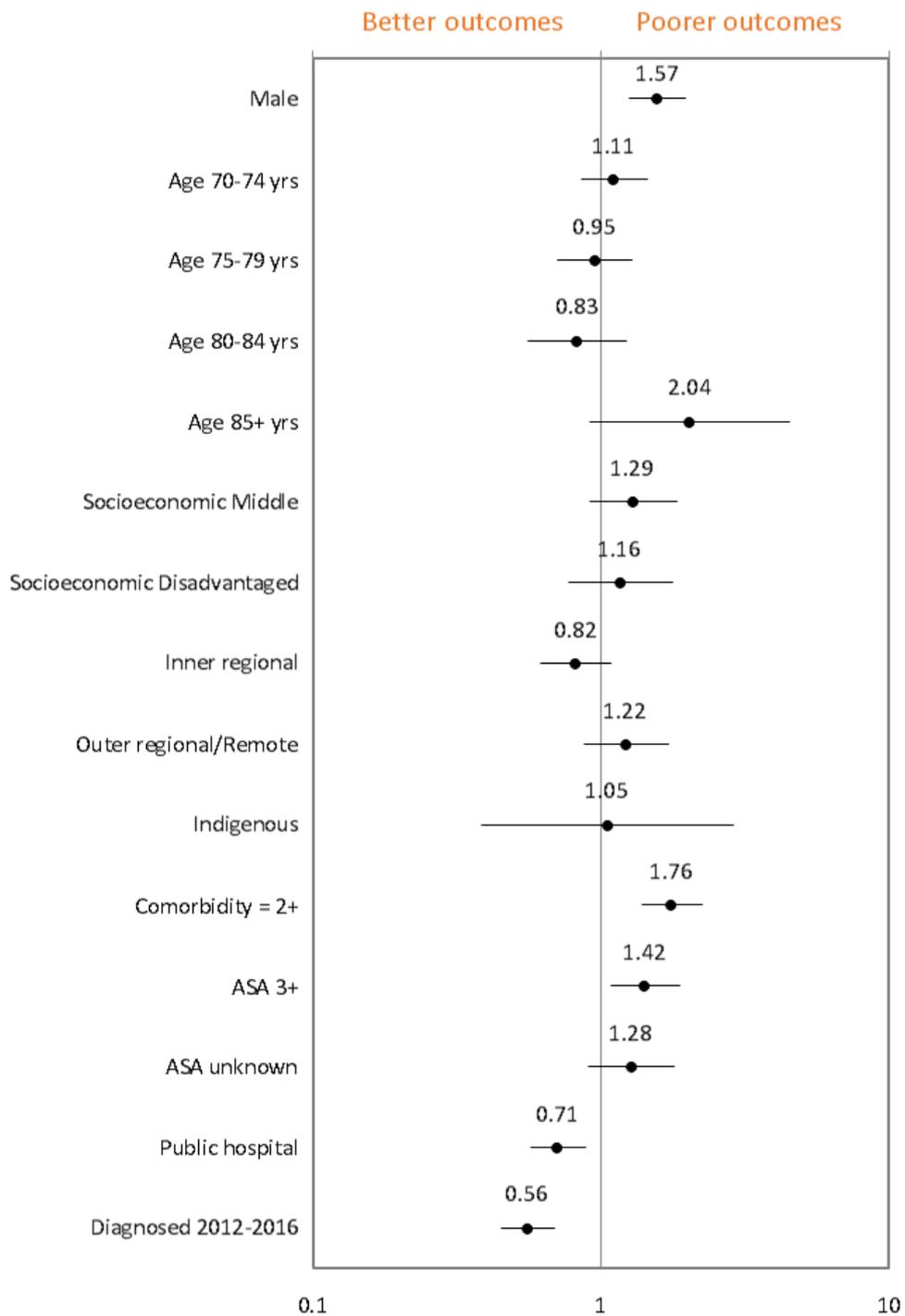
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.7.3 | Factors associated with two-year survival following major resection for non-small cell lung cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional remote and very remote combined due to small numbers.

## 4.8 | IV systemic therapy for lung cancer

### 4.8.1 | What are the characteristics of lung cancer patients who received IV systemic therapy?

Year of diagnosis 2007 – 2016

	Diagnosis		Received IV systemic therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>14,817</b>	<b>100%</b>	<b>5,082</b>	<b>34%</b>
<b>Sex</b>				
Male	9,236	62%	3,273	35%
Female	5,581	38%	1,809	32%
<b>Age group</b>				
65-69	3,684	25%	1,961	53%
70-74	3,672	25%	1,596	43%
75-79	3,172	21%	1,012	32%
80-84	2,511	17%	415	17%
85+	1,778	12%	98	6%
<b>Indigenous status</b>				
Indigenous	259	2%	75	29%
Other than Indigenous <sup>a</sup>	14,558	98%	5,007	34%
<b>Socioeconomic status</b>				
Affluent	1,541	10%	556	36%
Middle	9,382	63%	3,258	35%
Disadvantaged	3,894	26%	1,268	33%
<b>Remoteness</b>				
Major city	9,342	63%	3,263	35%
Inner Regional	3,565	24%	1,297	37%
Outer Regional	1,523	10%	428	28%
Remote & very remote	387	3%	94	24%
<b>MDT<sup>b</sup></b>				
MDT review	6,846	46%	2,762	40%
No MDT review	7,971	54%	2,320	29%
<b>Comorbidities</b>				
0-1 Comorbidities	10,734	72%	3,908	36%
2+ Comorbidities	4,083	28%	1,174	29%
<b>Morphology</b>				
Non-small cell	12,006	81%	3,999	33%
Small cell	1,498	10%	1,026	68%
Other lung	1,313	9%	57	4%
<b>Diagnosis years</b>				
2007 - 2011	6,679	45%	2,093	31%
2012 - 2016	8,138	55%	2,989	37%
<b>HHS of residence</b>				
Cairns and Hinterland	738	5%	187	25%
Central Queensland	672	5%	223	33%
Central West	70	0.5%	11	16%
Darling Downs	867	6%	297	34%
Gold Coast	1,900	13%	758	40%
Mackay	394	3%	110	28%
Metro North	2,849	19%	969	34%
Metro South	2,972	20%	1,020	34%
North West	77	0.5%	26	34%
South West	101	0.7%	23	23%
Sunshine Coast	1,528	10%	535	35%
Torres and Cape	49	0.3%	10	20%
Townsville	678	5%	184	27%
West Moreton	724	5%	263	36%
Wide Bay	1,198	8%	466	39%

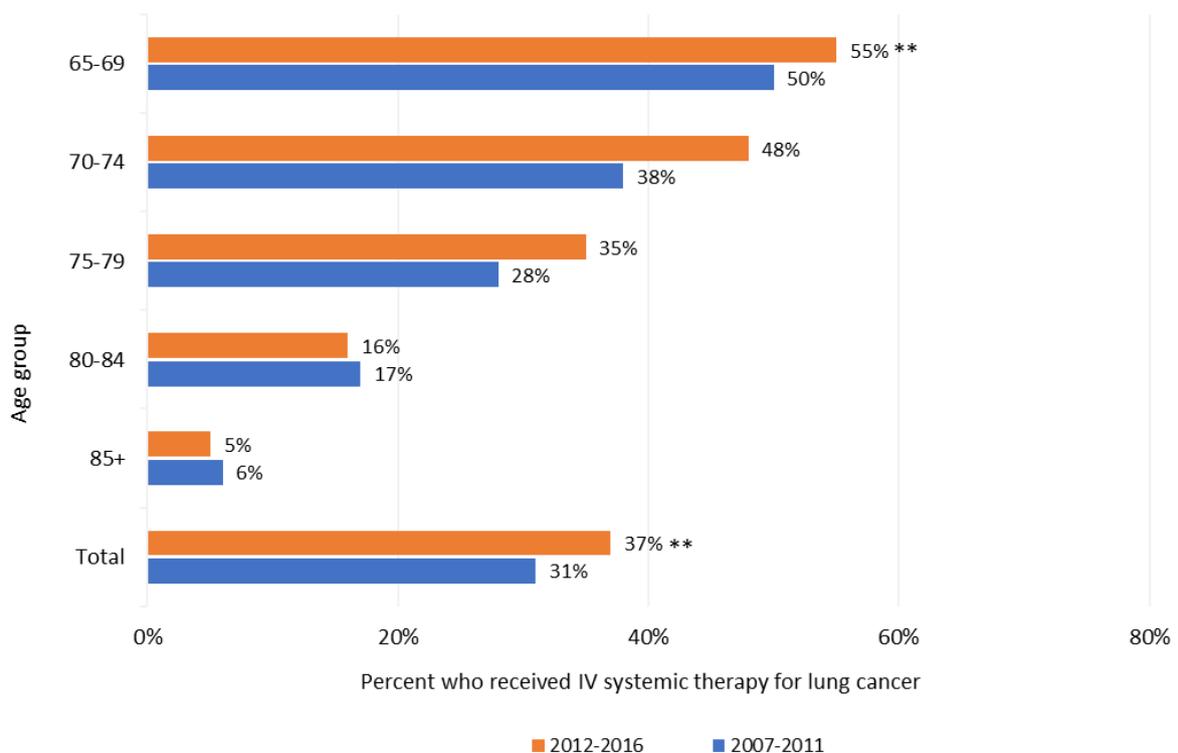
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

## 4.8.2 | What percentage of lung cancer patients received IV systemic therapy according to age group?

Year of diagnosis 2007 - 2016

Received IV systemic therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	50% (827/1639)	55% (1134/2045)	5%** (1.76-8.23)
70 - 74	38% (613/1608)	48% (983/2064)	10%** (6.78-13.18)
75 - 79	28% (403/1451)	35% (609/1721)	7%** (3.76-10.21)
80 - 84	17% (207/1222)	16% (208/1289)	1% (-1.90-3.91)
85+	6% (43/759)	5% (55/1019)	1% (-1.12-3.25)
<b>Total</b>	<b>31%</b> (2093/6679)	<b>37%</b> (2989/8138)	<b>6%**</b> (4.47-7.52)

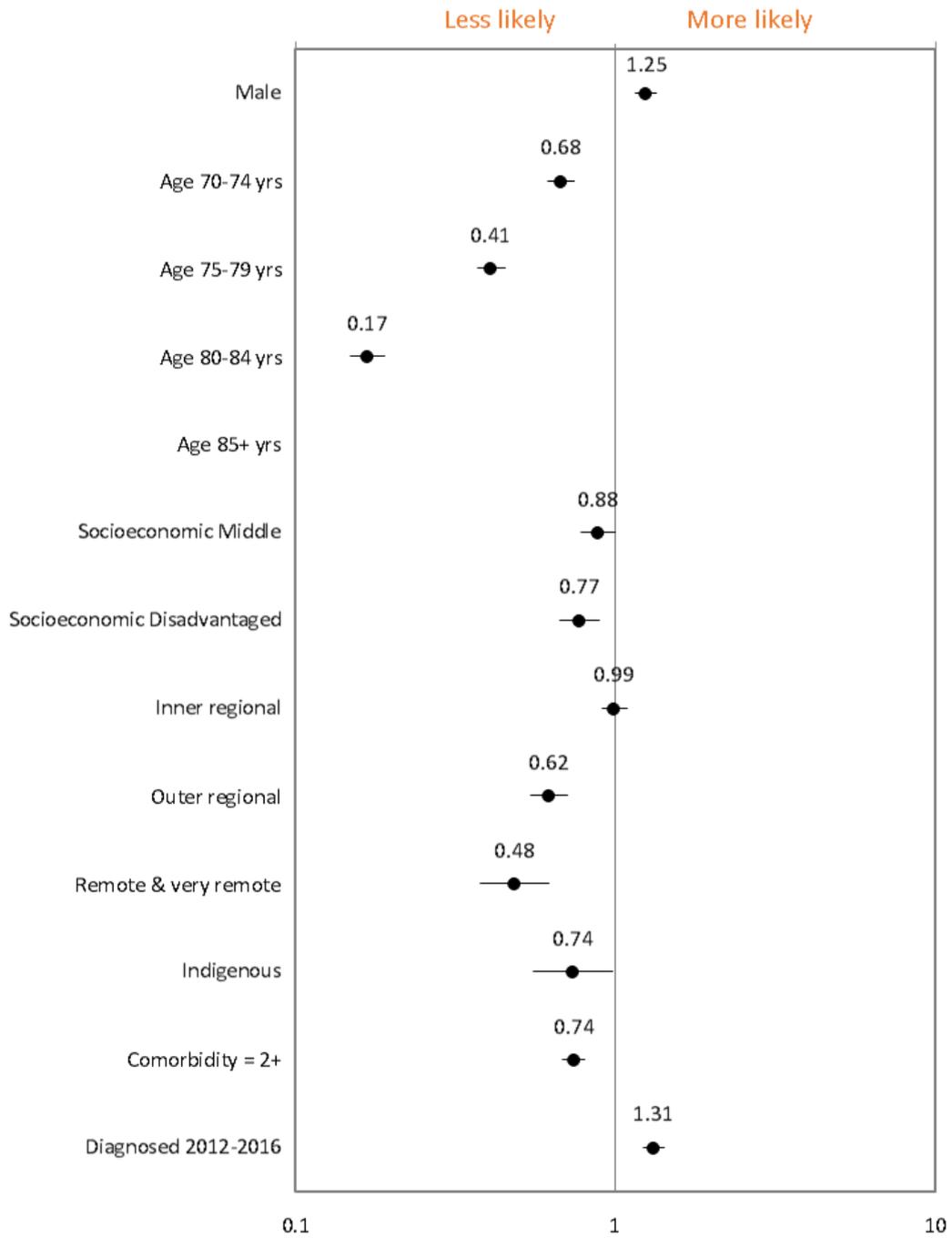
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.8.3 | Factors associated likelihood of receiving IV systemic therapy for lung cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 4.9 | Radiation therapy for lung cancer

### 4.9.1 | What are the characteristics of lung cancer patients who received external beam radiation therapy?

Year of diagnosis 2007 – 2016

	Diagnosis		Received radiation therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>14,817</b>	<b>100%</b>	<b>6,437</b>	<b>43%</b>
<b>Sex</b>				
Male	9,236	62%	4,095	44%
Female	5,581	38%	2,342	42%
<b>Age group</b>				
65-69	3,684	25%	2,044	55%
70-74	3,672	25%	1,781	49%
75-79	3,172	21%	1,374	43%
80-84	2,511	17%	859	34%
85+	1,778	12%	379	21%
<b>Indigenous status</b>				
Indigenous	259	2%	92	36%
Other than Indigenous <sup>a</sup>	14,558	98%	6,345	44%
<b>Socioeconomic status</b>				
Affluent	1,541	10%	703	46%
Middle	9,382	63%	4,096	44%
Disadvantaged	3,894	26%	1,638	42%
<b>Remoteness</b>				
Major city	9,342	63%	4,264	46%
Inner Regional	3,565	24%	1,477	41%
Outer Regional	1,523	10%	573	38%
Remote & very remote	387	3%	123	32%
<b>MDT<sup>b</sup></b>				
MDT review	6,846	46%	3705	54%
No MDT review	7,971	54%	2,732	34%
<b>Comorbidities</b>				
0-1 Comorbidities	10,734	72%	4,861	45%
2+ Comorbidities	4,083	28%	1,576	39%
<b>Morphology</b>				
Non-small cell	12,006	81%	5,563	46%
Small cell	1,498	10%	744	50%
Other lung	1,313	9%	130	10%
<b>Diagnosis years</b>				
2007 - 2011	6,679	45%	2,850	43%
2012 - 2016	8,138	55%	3,587	44%
<b>HHS of residence</b>				
Cairns and Hinterland	738	5%	272	37%
Central Queensland	672	5%	265	39%
Central West	70	0.5%	23	33%
Darling Downs	867	6%	350	40%
Gold Coast	1,900	13%	835	44%
Mackay	394	3%	127	32%
Metro North	2,849	19%	1,324	46%
Metro South	2,972	20%	1,380	46%
North West	77	0.5%	30	39%
South West	101	0.7%	34	34%
Sunshine Coast	1,528	10%	686	45%
Torres and Cape	49	0.3%	14	29%
Townsville	678	5%	273	40%
West Moreton	724	5%	333	50%
Wide Bay	1,198	8%	491	41%

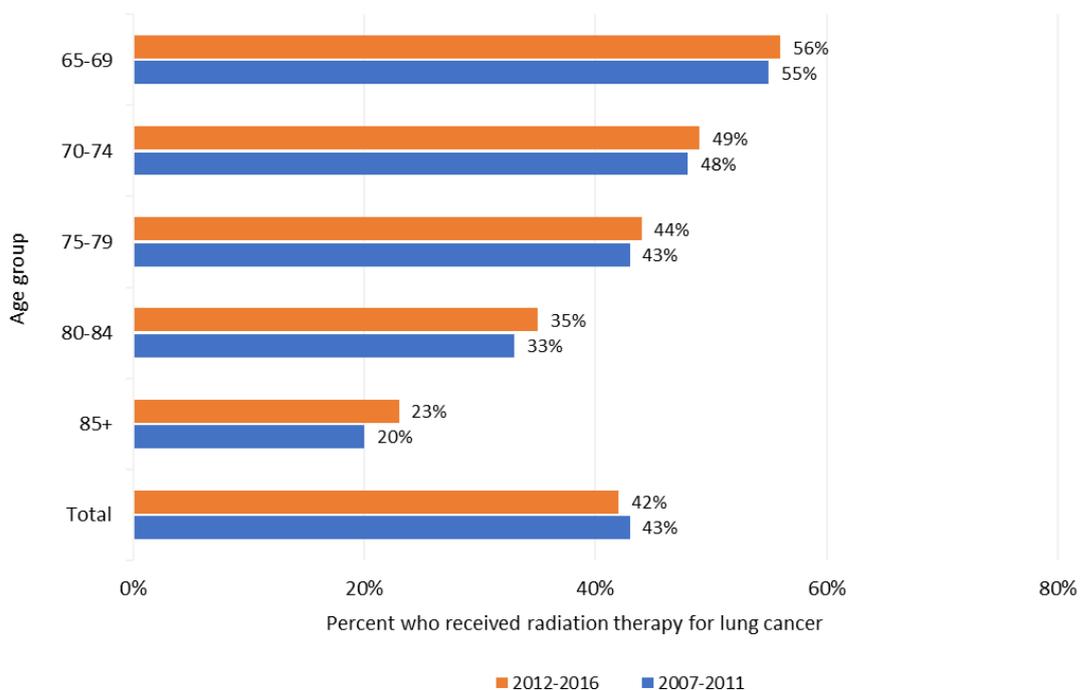
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

## 4.9.2 | What percentage of lung cancer patients received radiation therapy according to age group?

Year of diagnosis 2007 - 2016

Received radiation therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	55% (906/1639)	56% (1138/2045)	1% (-2.22-4.23)
70 - 74	48% (769/1608)	49% (1012/2064)	1% (-2.26-4.25)
75 - 79	43% (617/1451)	44% (757/1721)	1% (-2.46-4.45)
80 - 84	33% (409/1222)	35% (450/1289)	2% (-1.71-5.69)
85+	20% (149/759)	23% (230/1019)	3% (-0.89-6.80)
<b>Total</b>	<b>43%</b> (2850/6679)	<b>42%</b> (3587/8138)	<b>1%</b> (-0.60-2.60)

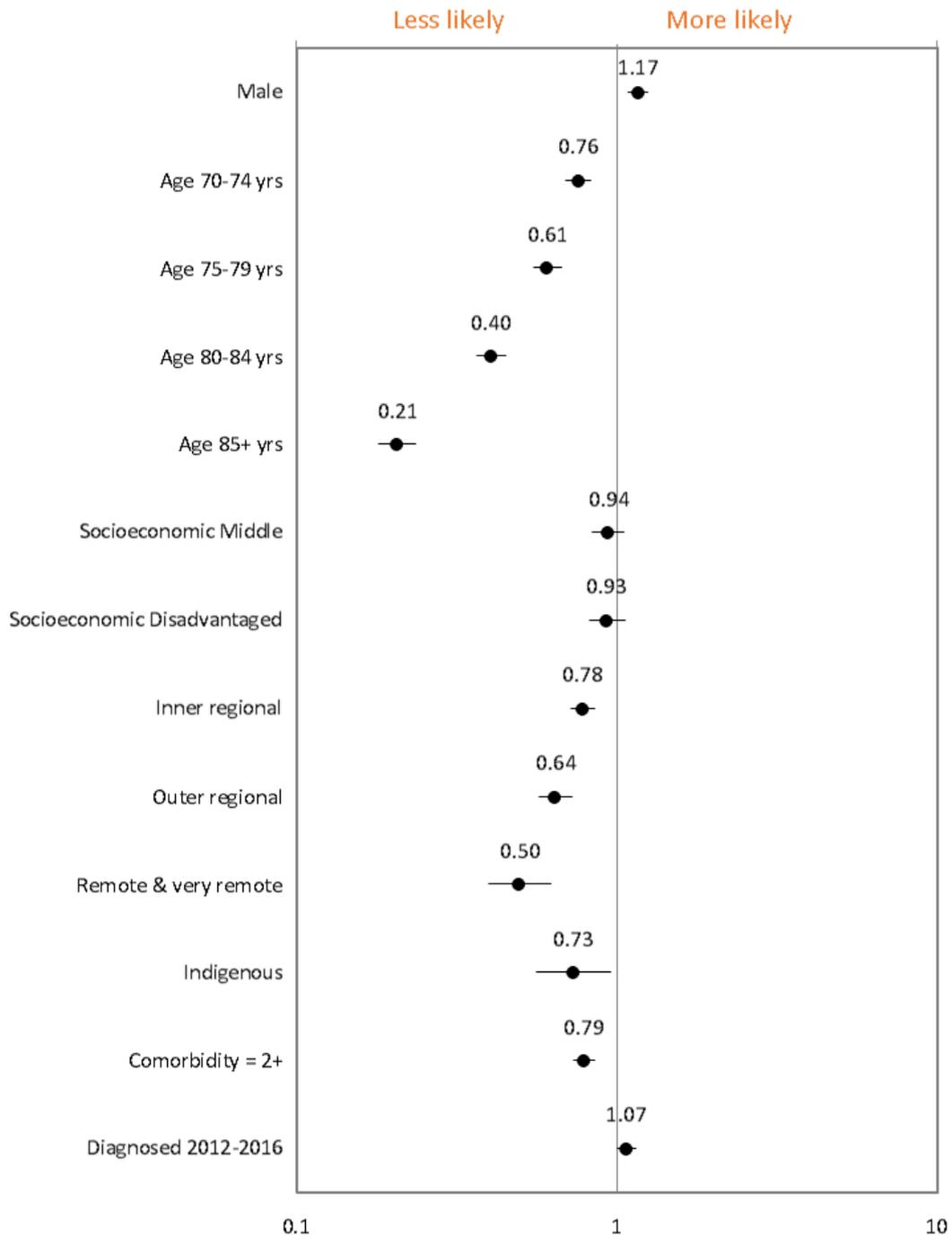
Notes: <sup>a</sup> The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 4.9.3 | Factors associated likelihood of receiving external beam radiation therapy for lung cancer

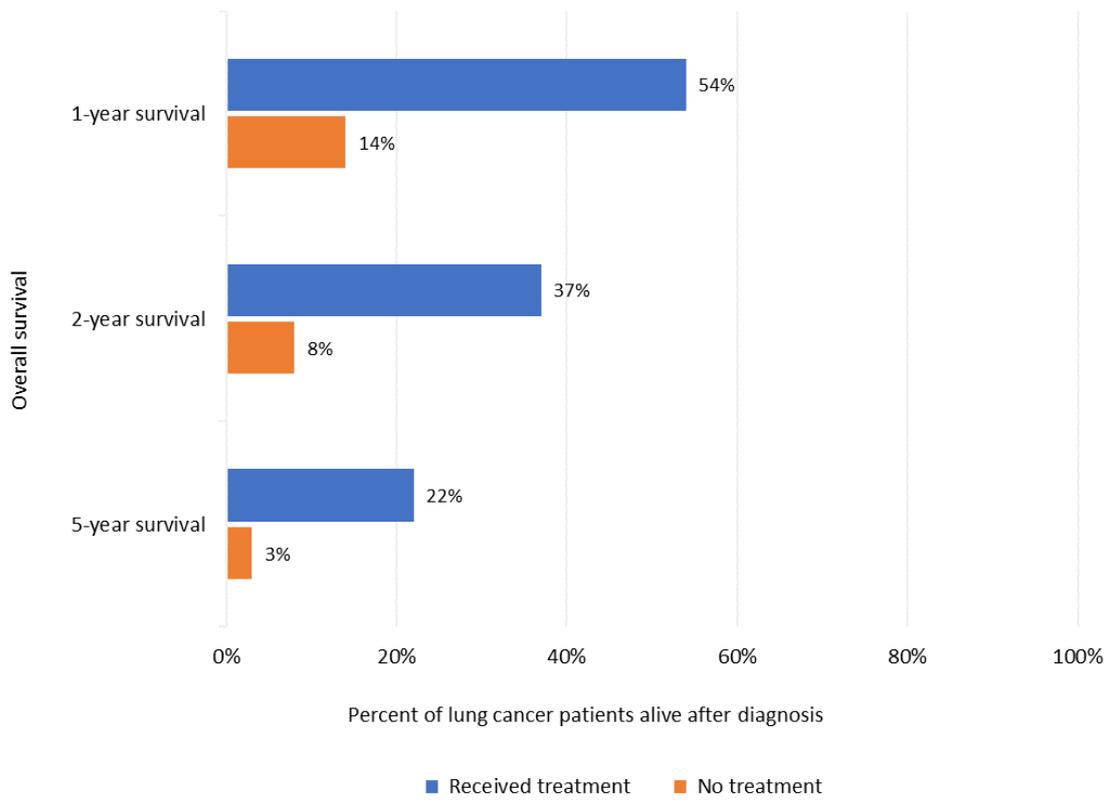
Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 4.10 | One, two and five-year overall survival for lung cancer patients

### 4.10.1 | What percentage of lung cancer patients are alive after diagnosis by treatment status?



# 5 | Oesophagogastric cancer



## 5.1 | Oesophagogastric cancer

### 5.1.1 | What are the characteristics of patients aged 65+ years diagnosed with oesophagogastric cancer?

Year of diagnosis 2007 – 2016

	Diagnosis		Received treatment <sup>a</sup>	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>4,108</b>	<b>100%</b>	<b>2,569</b>	<b>63%</b>
<b>Sex</b>				
Male	2,749	67%	1,820	66%
Female	1,359	33%	749	55%
<b>Age group</b>				
65-69	969	24%	768	79%
70-74	874	21%	626	72%
75-79	855	21%	550	64%
80-84	689	17%	363	53%
85+	721	18%	262	36%
<b>Indigenous status</b>				
Indigenous	69	2%	36	52%
Other than Indigenous <sup>b</sup>	4,039	98%	2,533	63%
<b>Socioeconomic status</b>				
Affluent	491	12%	326	66%
Middle	2,623	64%	1,659	63%
Disadvantaged	994	24%	584	59%
<b>Remoteness</b>				
Major city	2,591	63%	1,639	63%
Inner Regional	1,023	25%	644	63%
Outer Regional	415	10%	243	59%
Remote & very remote	79	2%	43	54%
<b>MDT<sup>c</sup></b>				
MDT review	1,314	32%	1,008	77%
No MDT review	2,794	68%	1,561	56%
<b>Comorbidities</b>				
0-1 Comorbidities	3,118	76%	1,982	64%
2+ Comorbidities	990	24%	587	59%
<b>Primary site</b>				
Oesophagus	1,773	43%	1,164	66%
Stomach	2,335	57%	1,405	60%
<b>Diagnosis years</b>				
2007 - 2011	1,882	46%	1,170	62%
2012 - 2016	2,226	54%	1,399	63%
<b>HHS of residence</b>				
Cairns and Hinterland	193	5%	111	58%
Central Queensland	164	4%	96	59%
Central West	6	0.1%	4	67%
Darling Downs	296	7%	178	60%
Gold Coast	506	12%	337	67%
Mackay	108	3%	64	59%
Metro North	763	19%	495	65%
Metro South	854	21%	517	61%
North West	13	0.3%	9	69%
South West	20	0.5%	8	40%
Sunshine Coast	453	11%	308	68%
Torres and Cape	18	0.4%	6	33%
Townsville	204	5%	118	58%
West Moreton	198	5%	124	63%
Wide Bay	312	8%	194	62%

Notes: <sup>a</sup>Treatment includes oesophagectomy, gastrectomy, IV systemic therapy or radiation therapy; <sup>b</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>c</sup>MDT rate includes facilities that use QOOL to capture MDT review.

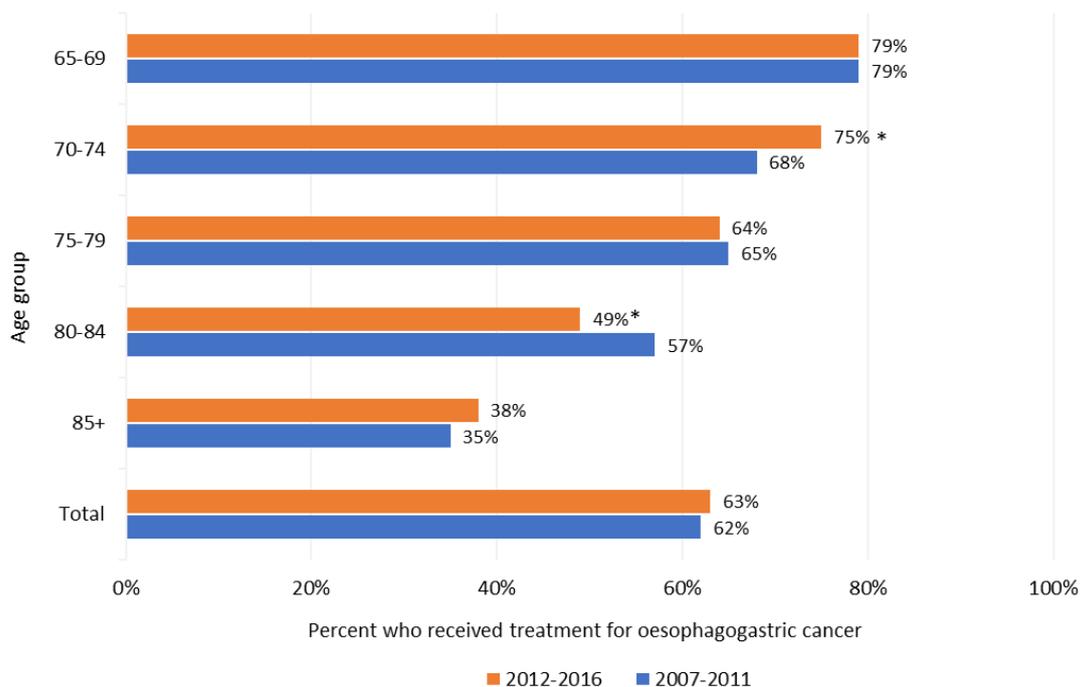
## 5.2 | Treatment for oesophagogastric cancer

### 5.2.1 | What percentage of oesophagogastric cancer patients received treatment according to age group?

Year of diagnosis 2007 - 2016

Received treatment*	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	79% (336/424)	79% (432/545)	0% (-5.11-5.23)
70 - 74	68% (275/404)	75% (351/470)	7%* (1.01-12.98)
75 - 79	65% (252/386)	64% (298/469)	1% (-5.45-7.39)
80 - 84	57% (192/337)	49% (171/352)	8%* (0.55-15.33)
85+	35% (115/331)	38% (147/390)	3% (-1.96-8.17)
<b>Total</b>	<b>62%</b> (1170/1882)	<b>63%</b> (1399/2226)	<b>1%*</b> (-1.97-3.97)

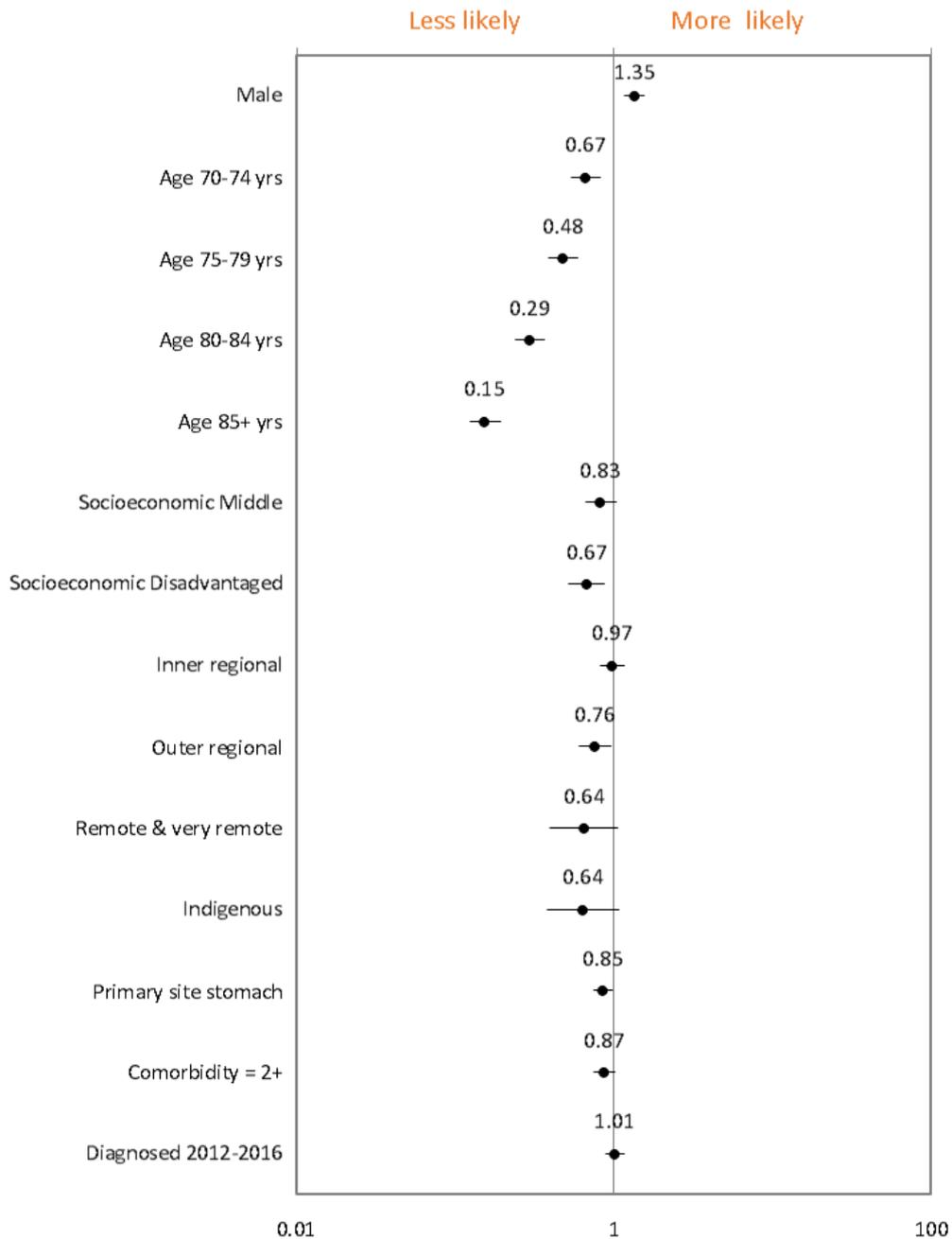
Notes: <sup>a</sup>treatment includes oesophagectomy, gastrectomy, IV systemic therapy or radiation therapy. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

## 5.2.2 | Factors associated with the likelihood of receiving treatment for oesophagogastric cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 5.3 | Major resection for oesophagogastric cancer

### 5.3.1 | What are the characteristics of patients who had a major resection for oesophagogastric cancer?

Year of diagnosis 2007 – 2016

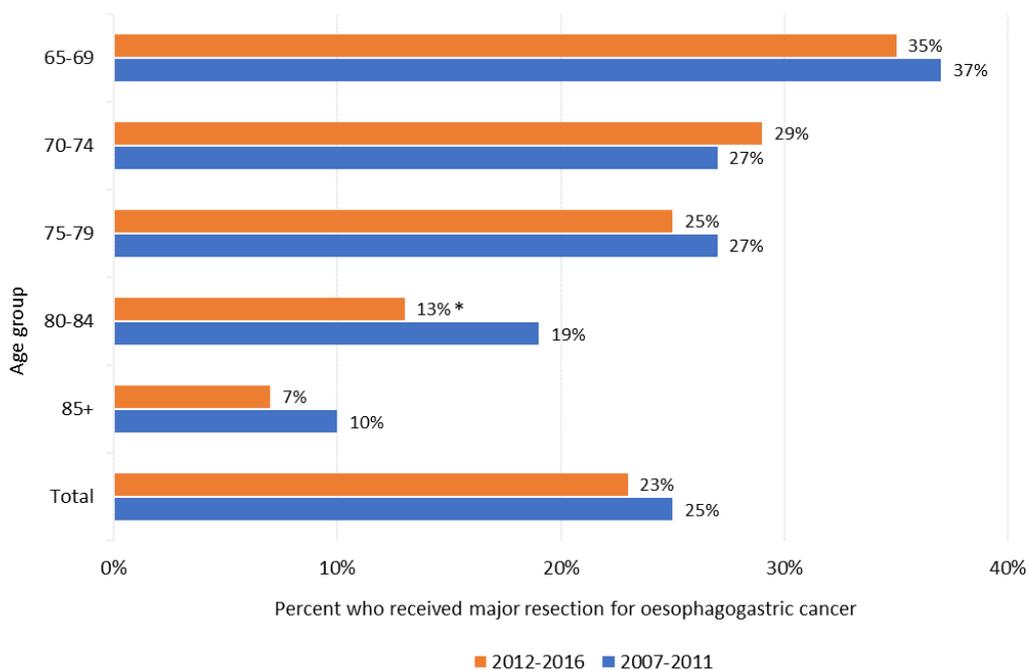
	Diagnosis		Received major resection	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>4,108</b>	<b>100%</b>	<b>984</b>	<b>24%</b>
<b>Sex</b>				
Male	2,749	67%	701	26%
Female	1,359	33%	283	21%
<b>Age group</b>				
65-69	969	24%	347	36%
70-74	874	21%	242	28%
75-79	855	21%	220	26%
80-84	689	17%	112	16%
85+	721	18%	63	9%
<b>Indigenous status</b>				
Indigenous	69	2%	13	19%
Other than Indigenous <sup>a</sup>	4,039	98%	971	24%
<b>Socioeconomic status</b>				
Affluent	491	12%	134	27%
Middle	2,623	64%	628	24%
Disadvantaged	994	24%	222	22%
<b>Remoteness</b>				
Major city	2,591	63%	637	25%
Inner Regional	1,023	25%	239	23%
Outer Regional	415	10%	93	22%
Remote & very remote	79	2%	15	19%
<b>MDT<sup>b</sup></b>				
MDT review	1,314	32%	375	29%
No MDT review	2,794	68%	609	22%
<b>Comorbidities</b>				
0-1 Comorbidities	3,118	76%	747	24%
2+ Comorbidities	990	24%	237	24%
<b>Primary site</b>				
Oesophagus	1,773	43%	223	13%
Stomach	2,335	57%	761	33%
<b>Diagnosis years</b>				
2007 - 2011	1,882	46%	468	25%
2012 - 2016	2,226	54%	516	23%
<b>HHS of residence</b>				
Cairns and Hinterland	193	5%	47	24%
Central Queensland	164	4%	32	20%
Central West	6	0.1%	1	17%
Darling Downs	296	7%	61	21%
Gold Coast	506	12%	120	24%
Mackay	108	3%	20	19%
Metro North	763	19%	200	26%
Metro South	854	21%	217	25%
North West	13	0.3%	2	15%
South West	20	0.5%	2	10%
Sunshine Coast	453	11%	110	24%
Torres and Cape	18	0.4%	0	0%
Townsville	204	5%	48	24%
West Moreton	198	5%	43	22%
Wide Bay	312	8%	81	26%

Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and "not stated"; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

### 5.3.2 | What percentage of oesophagogastric cancer patients had a major resection according to age group?

Received major resection	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	37% (155/424)	35% (192/545)	2% (-4.06-8.09)
70 - 74	27% (108/404)	29% (134/470)	2% (-3.99-7.91)
75 - 79	27% (104/386)	25% (116/469)	2% (-3.87-7.94)
80 - 84	19% (65/337)	13% (47/352)	6%* (0.52-11.50)
85+	11% (36/331)	7% (27/390)	4% (-0.18-8.38)
<b>Total</b>	<b>25%</b> (468/1882)	<b>23%</b> (516/2226)	<b>2%</b> (-0.62-4.63)

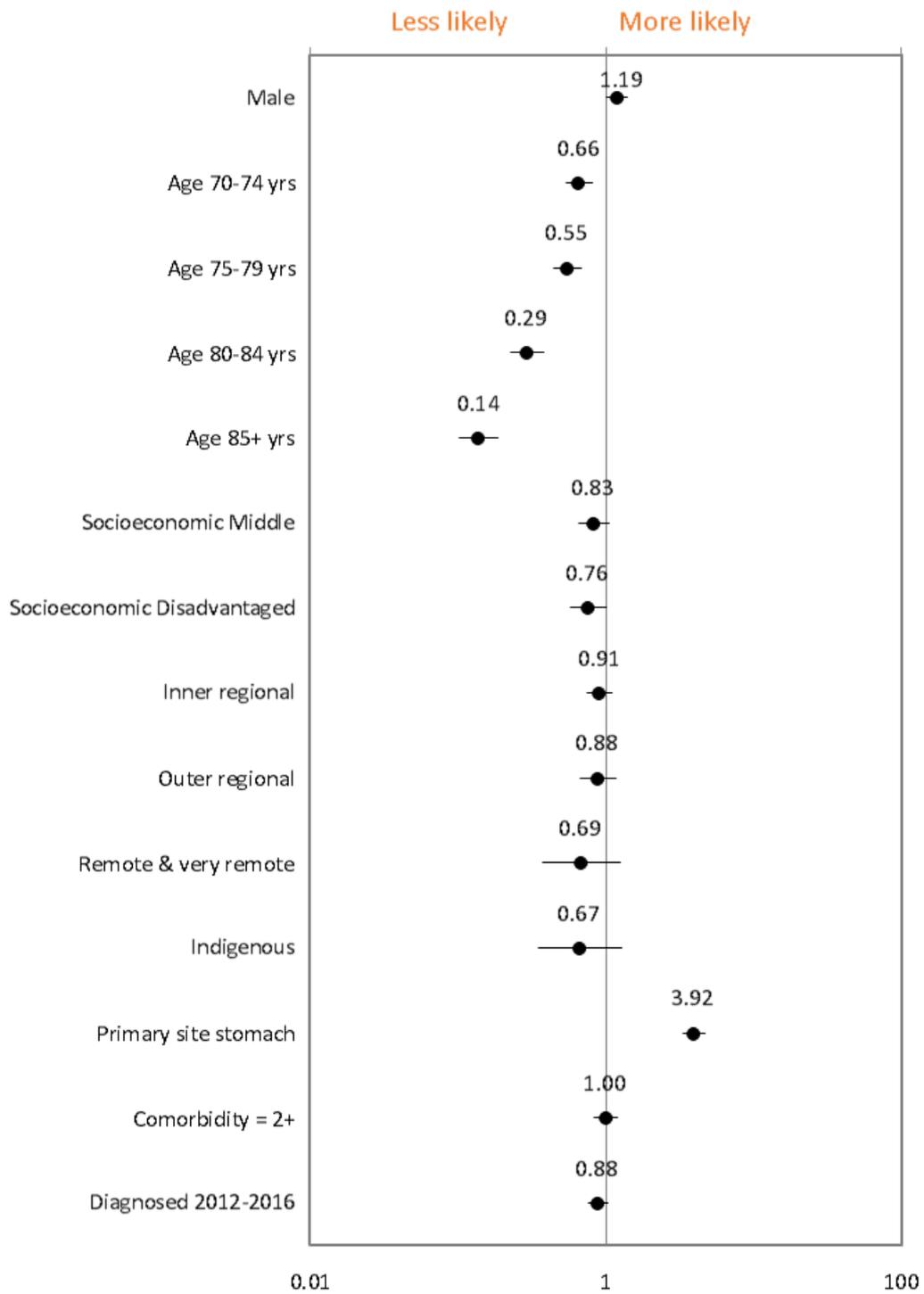
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.3.3 | Factors associated with the likelihood of receiving a major resection for oesophagogastric cancer

Year of diagnosis 2007 – 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant.

## 5.4 | 30-day mortality following major resection for oesophagogastric cancer

### 5.4.1 | What percentage of patients die within 30 days of major resection for oesophagogastric cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

30-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	3.0% (5/169) [3.7%, 0.8-17.7, 0.481]	3.6% (8/222) [3.6%, 1.1-11.0, 0.813]
Group A hospitals	2.3% (6/260) [1.9%, 0.4-8.5, 0.548]	3.3% (9/270) [3.4, 1.0-10.8, 0.954]
Group B hospitals	3.6% (1/28) [8.2%, 0.6-110.0, 0.264]	0% (0/21) [0%***, 0-0, 0.000]
Other hospitals	0% (0/11) [0%***, 0-0, 0.000]	0% (0/3) [0%***, 0-0, 0.000]
<b>Hospital Type</b>		
Public hospitals	3.4% (7/208) [3.6%, 0.9-14.9, 0.447]	3.2% (8/254) [2.9%, 0.8-10.3, 0.766]
Private hospitals	1.9% (5/260) [1.8%, 0.4-8.8, 0.516]	3.4% (9/262) [3.7%, 1.1-13.0, 0.764]
<b>Queensland</b>	<b>2.6% (12/468)</b>	<b>3.3% (17/516)</b>

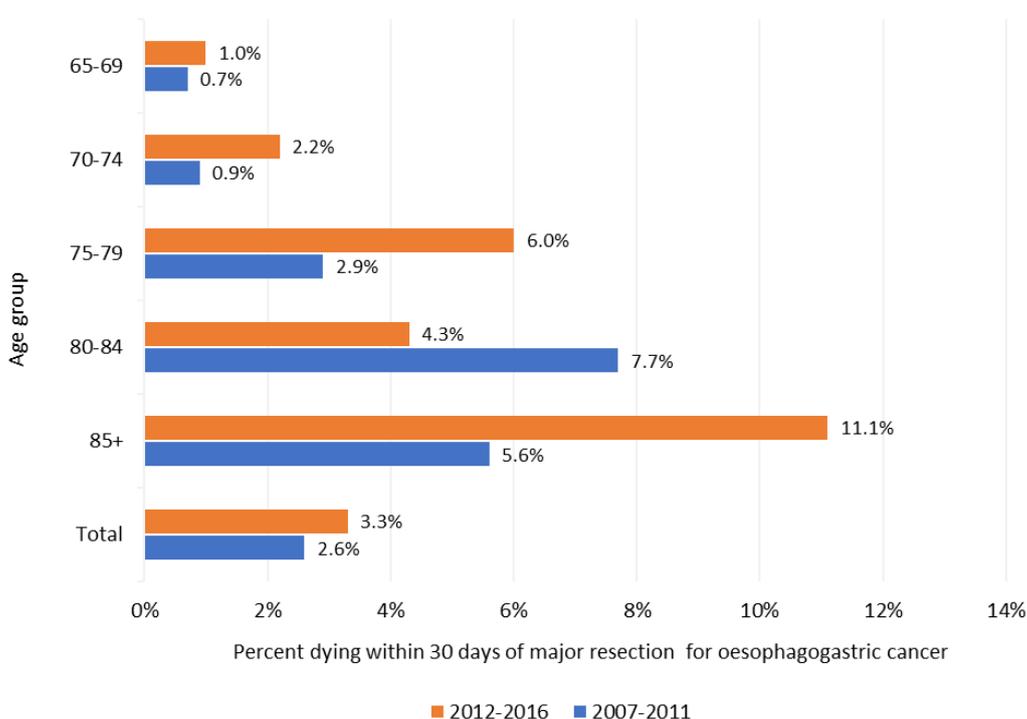
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 5.4.2 | What percentage of oesophagogastric cancer patients die within 30 days of major resection according to age group?

Year of diagnosis 2007 - 2016

30-day mortality	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	0.7% (1/155)	1.0% (2/192)	0.3% (-2.74-3.01)
70 - 74	0.9% (1/108)	2.2% (3/134)	1.3% (-3.07-5.49)
75 - 79	2.9% (3/104)	6.0% (7/116)	3.1% (-2.99-9.29)
80 - 84	7.7% (5/65)	4.3% (2/47)	3.4% (-7.52-13.00)
85+	5.6% (2/36)	11.1% (3/27)	5.5% (-9.04-22.92)
<b>Total</b>	<b>2.6%</b> (12/468)	<b>3.3%</b> (17/516)	<b>0.7%</b> (-1.54-2.91)

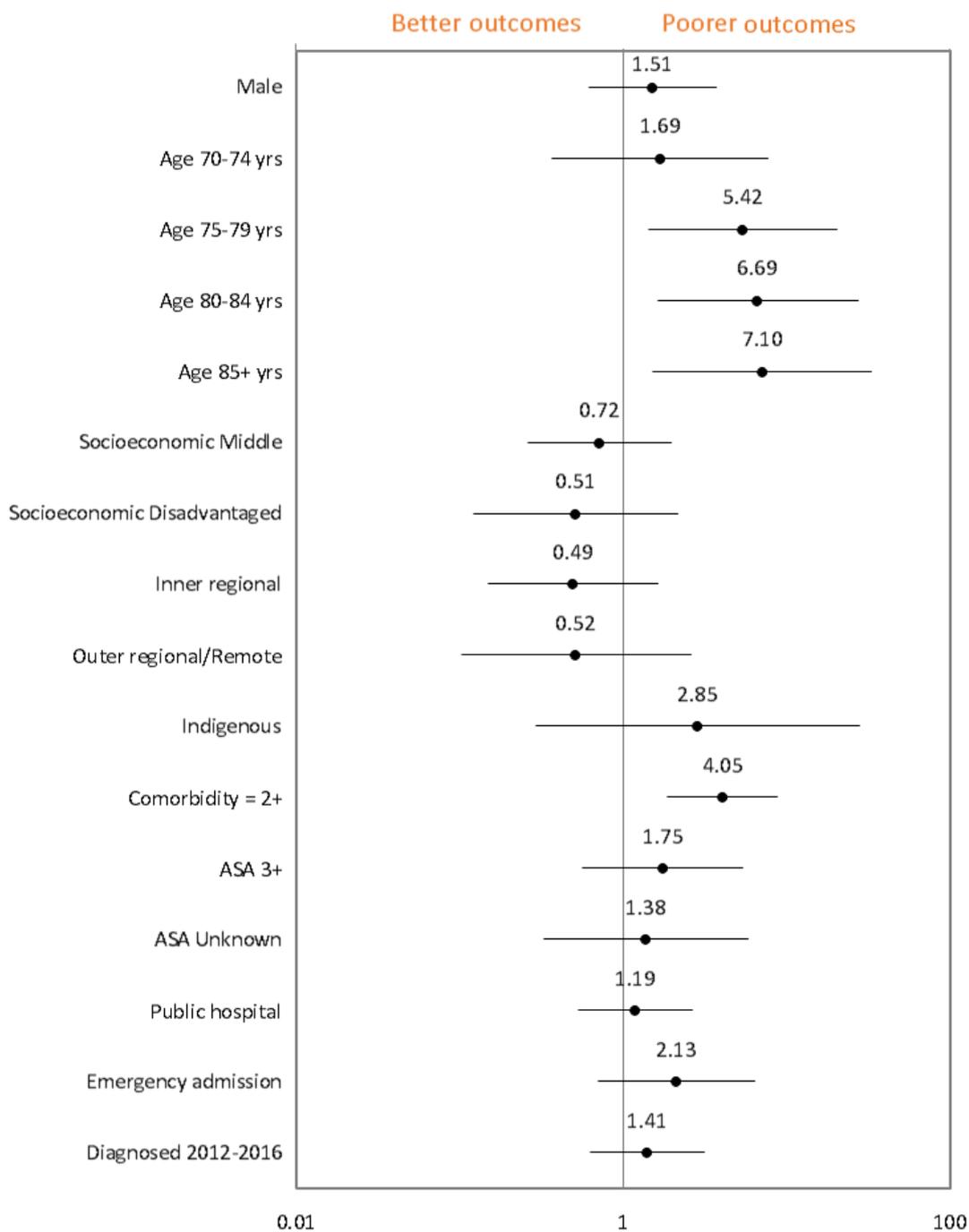
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.4.3 | Factors associated with 30-day surgical mortality following major resection for oesophagogastric cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.5 | 90-day mortality following major resection for oesophagogastric cancer

### 5.5.1 | What percentage of patients die within 90 days of major resection for oesophagogastric cancer?

Year of diagnosis 2007 – 2016

Mortality rate is calculated from facility of last major resection

90-day mortality	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	8.2% (14/169) [8.8%, 3.3-22.8, 0.212]	5.4% (12/222) [5.5%, 1.9-16.0, 0.524]
Group A hospitals	5.0% (13/260) [4.7%, 1.7-12.4, 0.434]	4.1% (11/270) [4.3%, 1.4-12.8, 0.899]
Group B hospitals	3.6% (1/28) [6.7%, 0.6-72.1, 0.918]	0% (0/21) [0%** , 0-0, 0.000]
Other hospitals	0% (0/11) [0%**0,0-, 0.000]	0% (0/3) [0%** , 0-0, 0.000]
<b>Hospital Type</b>		
Public hospitals	8.2% (17/208) [7.9%, 3.1-19.7, 0.337]	4.8% (12/252) [4.5%, 1.5-13.3, 0.998]
Private hospitals	4.2% (11/260) [4.4%, 1.5-12.2, 0.358]	4.2% (11/262) [4.5%,1.5-13.2, 0.999]
<b>Queensland</b>	<b>6.0% (28/468)</b>	<b>4.5% (23/516)</b>

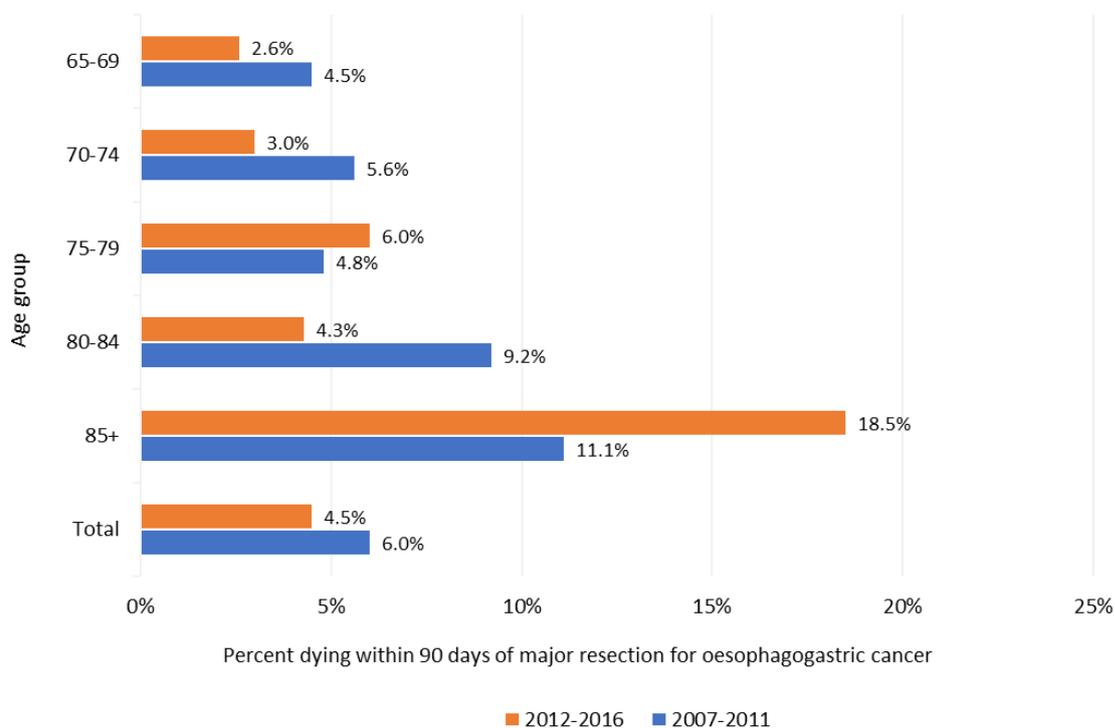
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 5.5.2 | What percentage of oesophagogastric cancer patients die within 90 days of major resection according to age group?

Year of diagnosis 2007 - 2016

90-day mortality	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	4.5% (7/155)	2.6% (5/192)	1.9% (-2.16-6.65)
70 - 74	5.6% (6/108)	3.0% (4/134)	2.6% (-2.78-8.92)
75 - 79	4.8% (5/104)	6.0% (7/116)	1.2% (-5.50-7.69)
80 - 84	9.2% (6/65)	4.3% (2/47)	4.9% (-6.26-14.87)
85+	11.1% (4/36)	18.5% (5/27)	7.4% (-10.16-26.77)
<b>Total</b>	<b>6.0%</b> (28/468)	<b>4.5%</b> (23/516)	<b>1.5%</b> (-1.31-4.43)

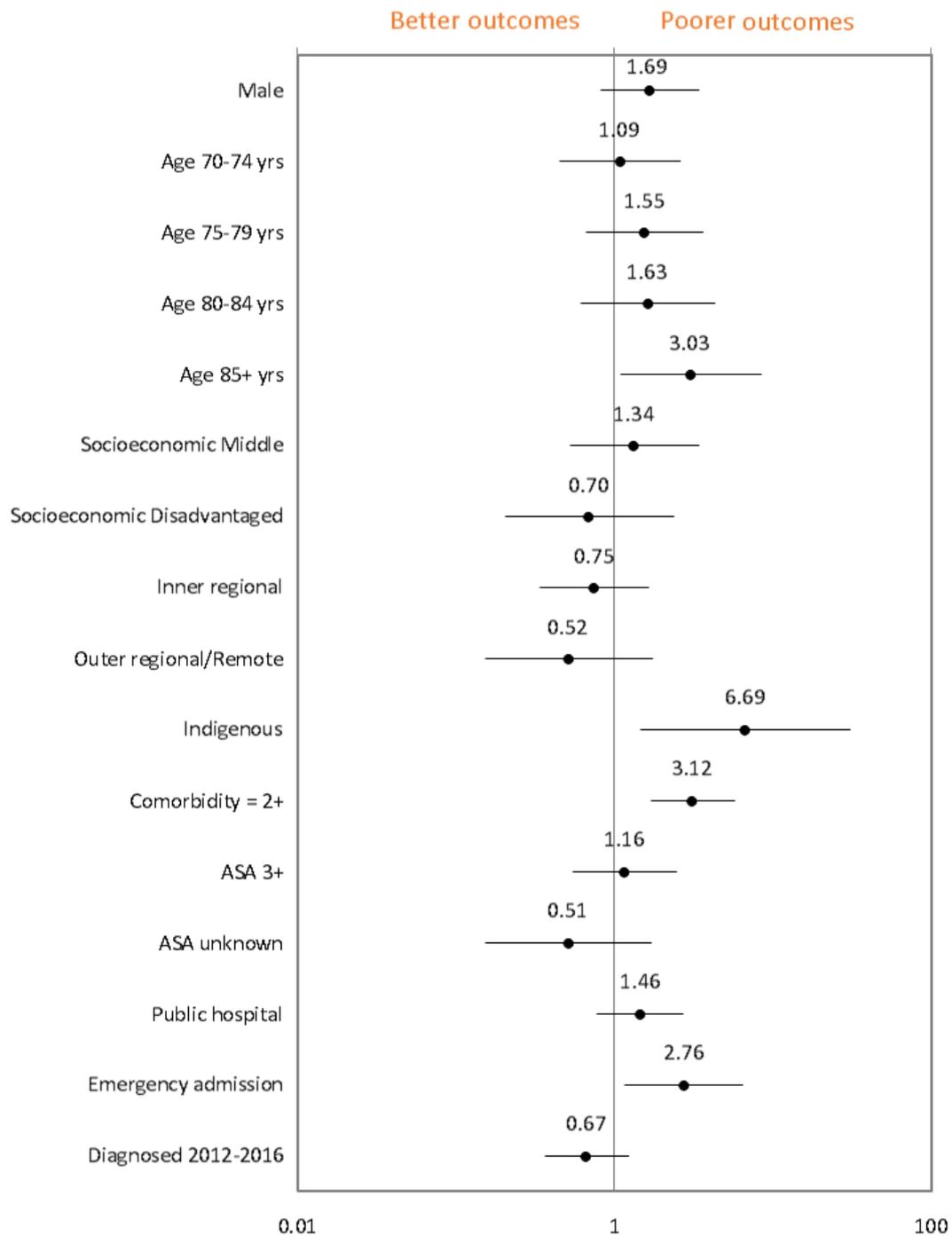
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.5.3 | Factors associated with 90-day surgical mortality following major resection for oesophagogastric cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.6 | One-year surgical survival

### 5.6.1 | What percentage of patients are alive one year after major resection for oesophagogastric cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

1-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Diagnosis year Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	71% (120/169) [72%, 61-83, 0.255]	78% (173/222) [78%, 70-88, 0.168]
Group A hospitals	77% (201/260) [77%, 68-88, 0.706]	86% (233/270) [86%, 77-94, 0.245]
Group B hospitals	89% (25/28) [84%, 67-103, 0.25]	86% (18/21) [85%, 68-106, 0.759]
Other hospitals	91% (10/11) [95%*, 74-122, 0.029]	100% (3/3) [123%*, 83-181, 0.028]
<b>Hospital Type</b>		
Public hospitals	71% (147/208) [72%, 62-83, 0.268]	81% (205/254) [81%, 73-90, 0.618]
Private hospitals	80% (209/260) [79%, 69-90, 0.32]	85% (222/262) [84%, 76-93, 0.607]
<b>Queensland</b>	<b>76% (356/468)</b>	<b>83% (425/516)</b>

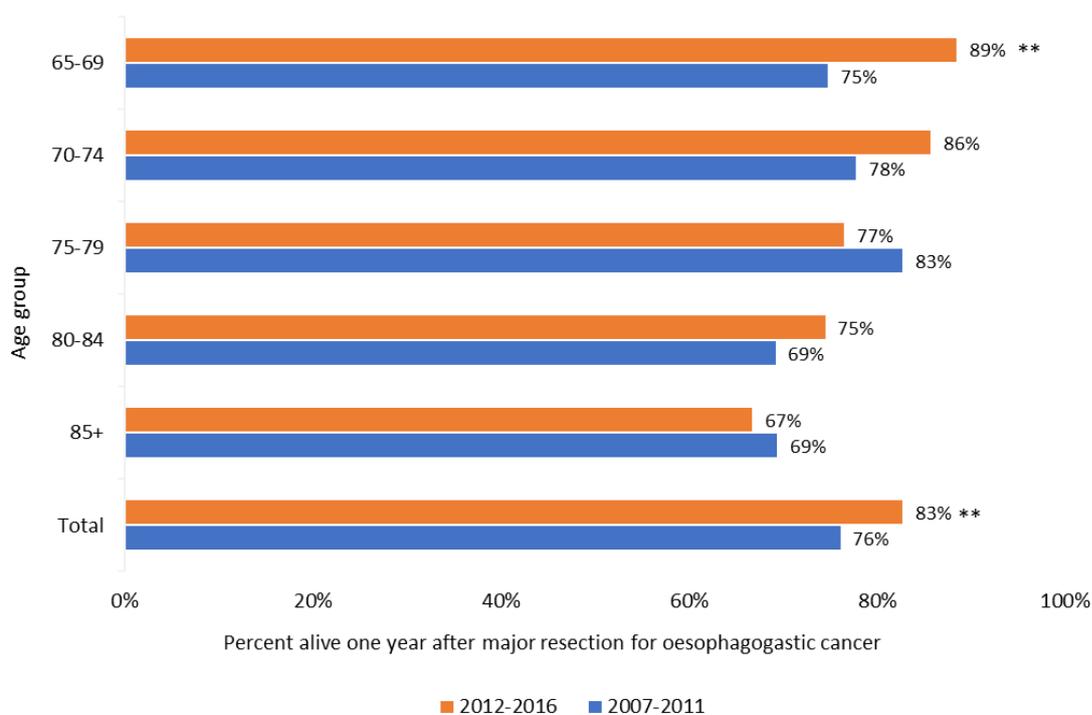
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 5.6.2 | What percentage of oesophagogastric cancer patients are alive one year after major resection according to age group?

Year of diagnosis 2007 - 2016

1-year surgical survival	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	75% (116/155)	89% (170/192)	14%** (5.93-22.24)
70 - 74	78% (84/108)	86% (115/134)	8% (-1.66-17.97)
75 - 79	83% (86/104)	77% (89/116)	6% (-4.73-16.37)
80 - 84	69% (45/65)	75% (35/47)	6% (-11.11-21.75)
85+	69% (25/36)	67% (18/27)	2% (-19.90-24.70)
<b>Total</b>	<b>76%</b> (356/468)	<b>83%</b> (427/516)	<b>7%**</b> (1.96-12.05)

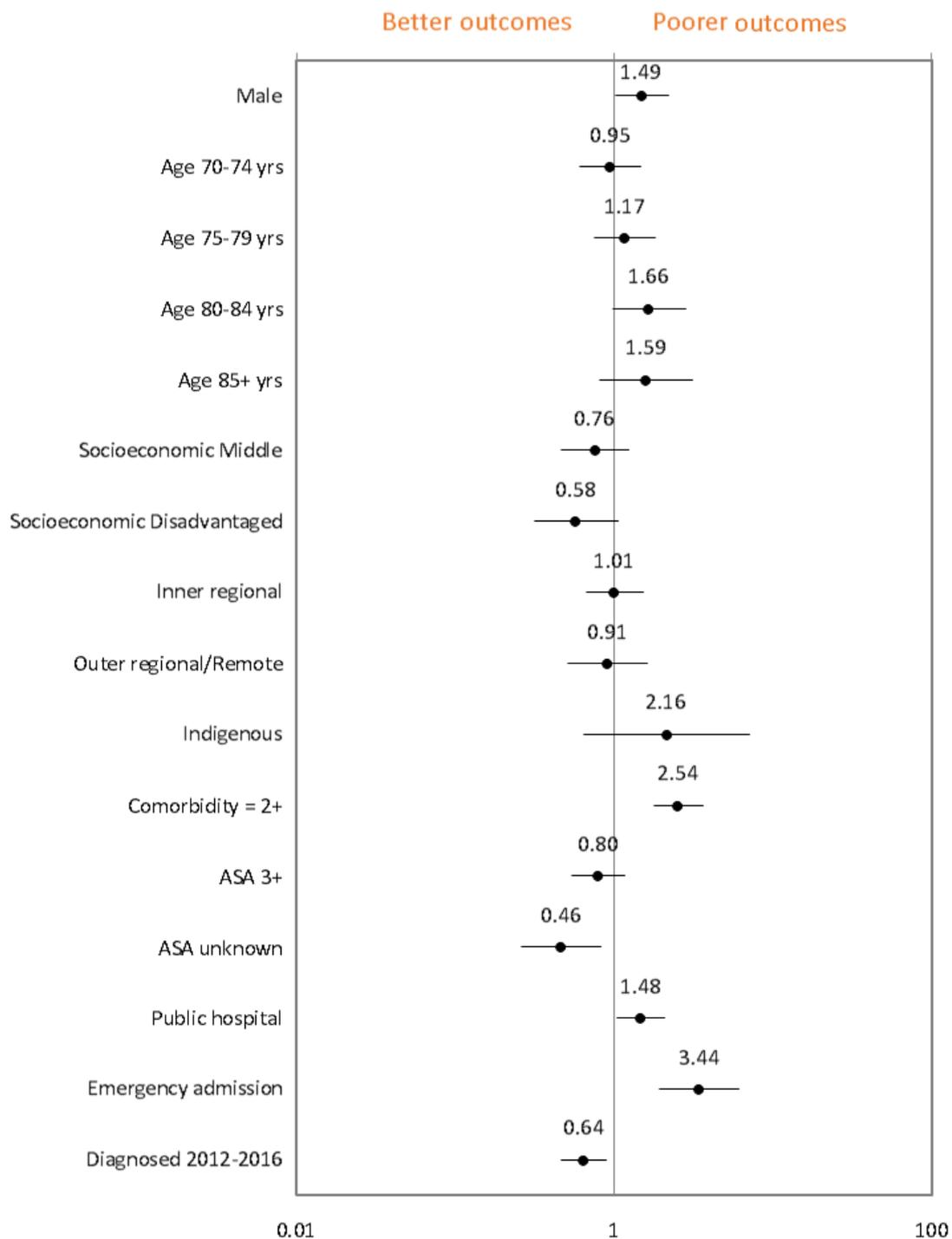
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.6.3 | Factors associated with one-year surgical survival following major resection for oesophagogastric cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.7 | Two-year surgical survival

### 5.7.1 | What percentage of patients are alive two years after major resection for oesophagogastric cancer?

Year of diagnosis 2007 – 2016

Survival rate is calculated from facility of last major resection

2-year surgical survival	2007 - 2011	2012 - 2016
	Diagnosis year	Diagnosis year
	Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]	Crude rates (n/N) [Adjusted <sup>a</sup> rates, CI%, P value]
<b>AIHW Peer Group</b>		
Principal referral hospitals	57% (97/169) [57%, 46-71, 0.282]	65% (144/222) [65%, 55-76, 0.072]
Group A hospitals	62% (160/260) [62%, 51-74, 0.925]	76% (205/270) [76%, 66-87, 0.132]
Group B hospitals	86% (24/28) [83%**, 64-107, 0.002]	76% (16/21) [78%, 57-106, 0.447]
Other hospitals	82% (9/11) [88%*, 60-129, 0.028]	67% (2/3) [93%, 33-263, 0.593]
<b>Hospital Type</b>		
Public hospitals	57% (119/208) [58%, 47-71, 0.348]	68% (173/254) [68%, 58-78, 0.31]
Private hospitals	66% (171/260) [65%, 54-78, 0.421]	74% (194/262) [75%, 64-86, 0.303]
<b>Queensland</b>	<b>62% (290/468)</b>	<b>71% (367/516)</b>

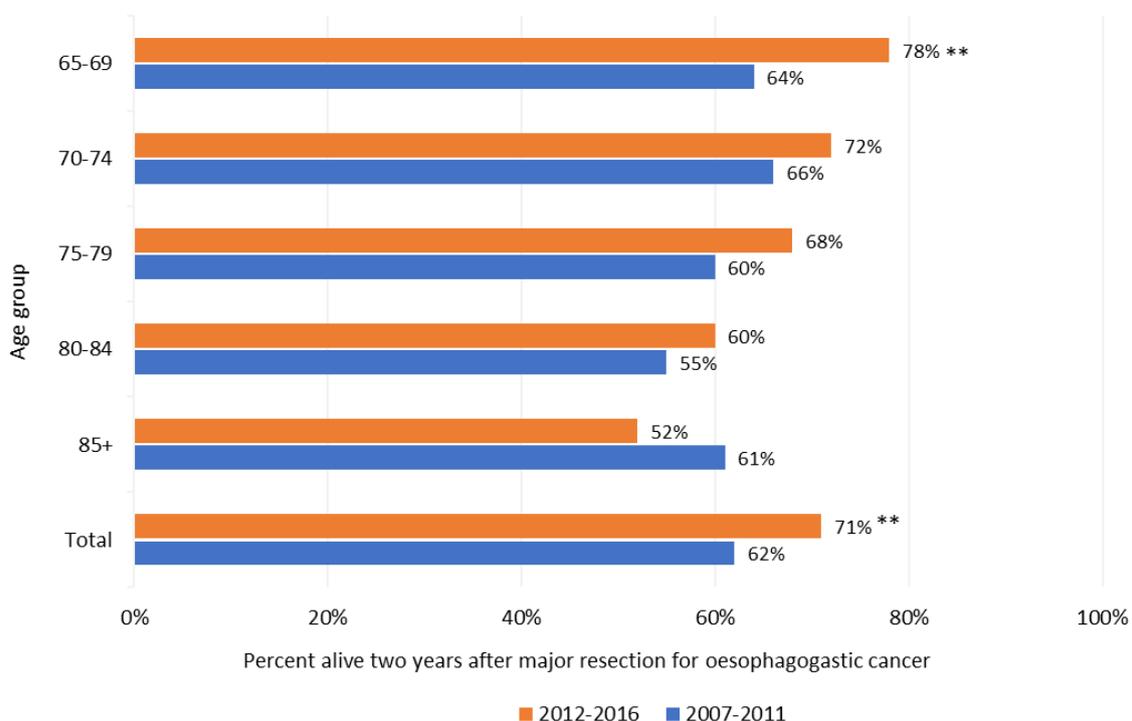
Notes: <sup>a</sup>Adjusted by age, sex, socioeconomic status, rurality, comorbidity, ASA and emergency admission. Adjusted results highlighted with \* and \*\* are deemed to be statistically different to the whole of Queensland result. The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*. Refer to Appendix A for hospital grouping definitions.

## 5.7.2 | What percentage of oesophagogastric cancer patients are alive two years after major resection according to age group?

Year of diagnosis 2007 - 2016

2-year surgical survival	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	64% (99/155)	78% (149/192)	14%** (4.43-23.43)
70 - 74	66% (71/108)	72% (97/134)	6% (-5.58-17.62)
75 - 79	60% (62/104)	68% (79/116)	8% (-4.62-20.37)
80 - 84	55% (36/65)	60% (28/47)	5% (-13.29-22.52)
85+	61% (22/36)	52% (14/27)	9% (-14.79-31.79)
<b>Total</b>	<b>62%</b> (290/468)	<b>71%</b> (367/516)	<b>9%**</b> (3.10-14.84)

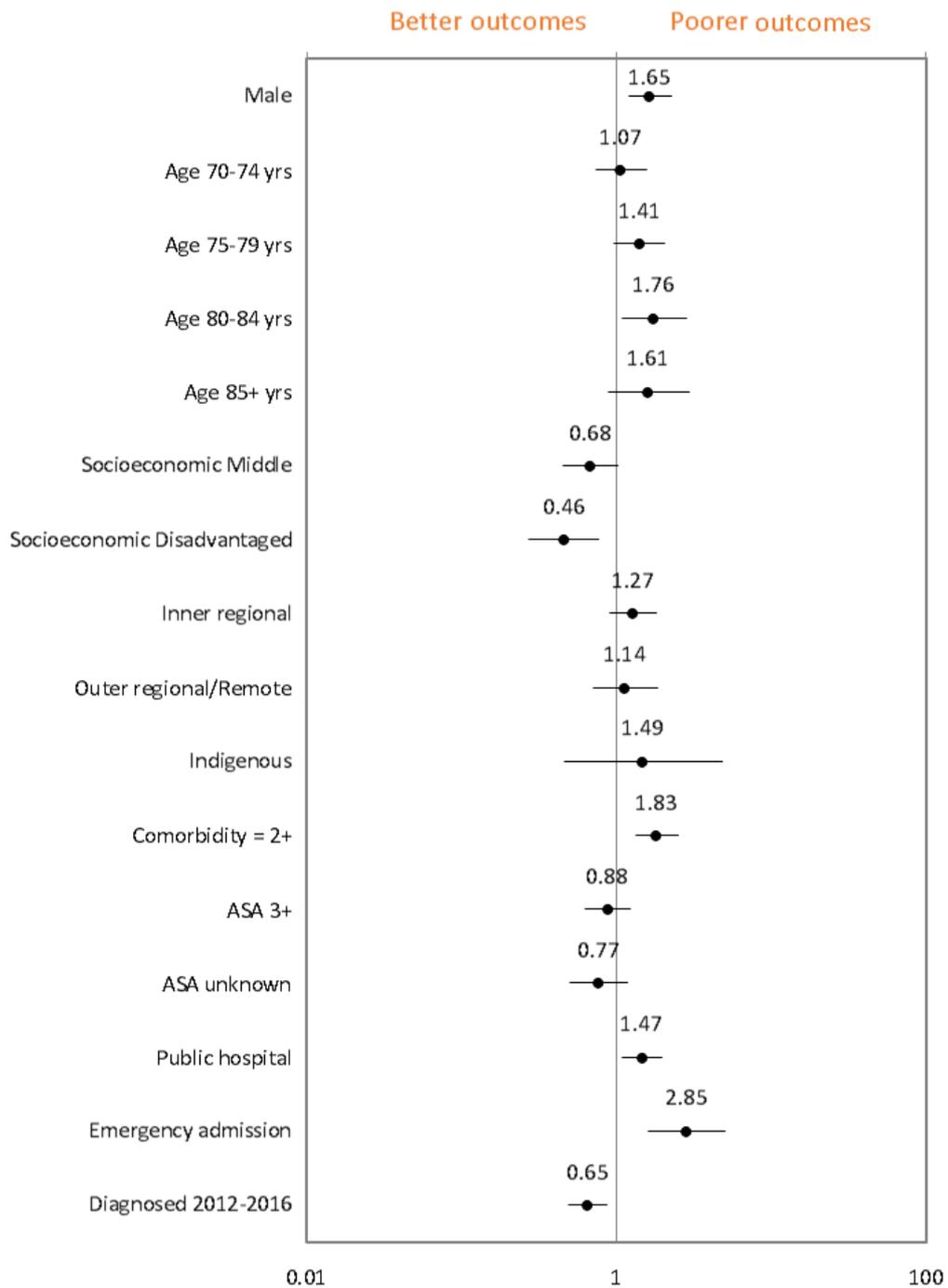
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.7.3 | Factors associated with two-year surgical survival following major resection for oesophagogastric cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.8 | IV systemic therapy for oesophagogastric cancer

### 5.8.1 | What are the characteristics of oesophagogastric cancer patients who received IV systemic therapy?

Year of diagnosis 2007 - 2016

	Diagnosis		Received IV systemic therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>4,108</b>	<b>100%</b>	<b>1,440</b>	<b>35%</b>
<b>Sex</b>				
Male	2,749	67%	1,104	40%
Female	1,359	33%	336	25%
<b>Age group</b>				
65-69	969	24%	596	62%
70-74	874	21%	416	48%
75-79	855	21%	262	31%
80-84	689	17%	122	18%
85+	721	18%	44	6%
<b>Indigenous status</b>				
Indigenous	69	2%	18	26%
Other than Indigenous <sup>a</sup>	4,039	98%	1,422	35%
<b>Socioeconomic status</b>				
Affluent	491	12%	196	40%
Middle	2,623	64%	917	35%
Disadvantaged	994	24%	327	33%
<b>Remoteness</b>				
Major city	2,591	63%	909	35%
Inner Regional	1,023	25%	364	36%
Outer Regional	415	10%	141	34%
Remote & very remote	79	2%	26	33%
<b>MDT<sup>b</sup></b>				
MDT review	1,314	32%	576	44%
No MDT review	2,794	68%	864	31%
<b>Comorbidities</b>				
0-1 Comorbidities	3,118	76%	1,167	37%
2+ Comorbidities	990	24%	273	28%
<b>Primary site</b>				
Oesophagus	1,773	43%	684	39%
Stomach	2,335	57%	756	32%
<b>Diagnosis years</b>				
2007 - 2011	1,882	46%	597	32%
2012 - 2016	2,226	54%	843	38%
<b>HHS of residence</b>				
Cairns and Hinterland	193	5%	69	36%
Central Queensland	164	4%	67	41%
Central West	6	0.1%	4	67%
Darling Downs	296	7%	90	30%
Gold Coast	506	12%	211	42%
Mackay	108	3%	31	29%
Metro North	763	19%	296	39%
Metro South	854	21%	254	30%
North West	13	0.3%	7	54%
South West	20	0.5%	4	20%
Sunshine Coast	453	11%	153	34%
Torres and Cape	18	0.4%	3	17%
Townsville	204	5%	59	29%
West Moreton	198	5%	67	34%
Wide Bay	312	8%	125	40%

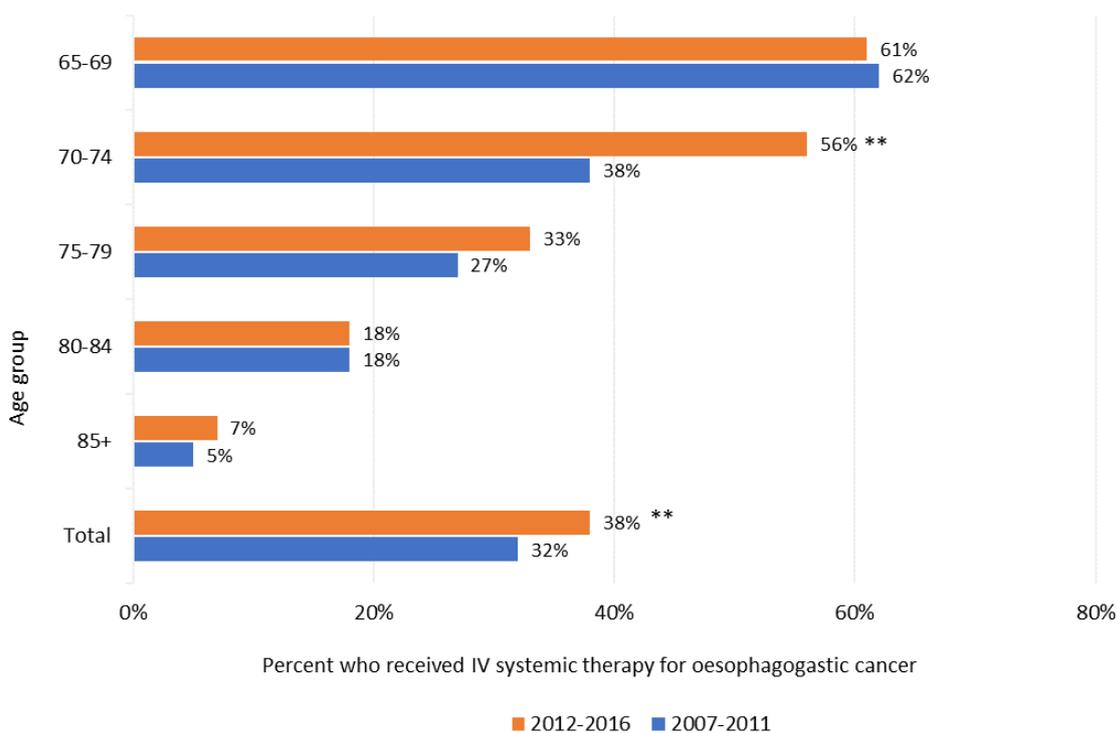
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and not stated; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

## 5.8.2 | What percentage of oesophagogastric cancer patients received IV systemic therapy according to age group?

Year of diagnosis 2007 - 2016

Received IV systemic therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	62% (261/424)	61% (335/545)	1% (-5.18-7.12)
70 - 74	38% (154/404)	56% (262/470)	18%** (11.39-24.38)
75 - 79	27% (105/386)	33% (157/469)	6% (-0.19-12.06)
80 - 84	18% (59/337)	18% (63/352)	0% (-5.77-5.73)
85+	5% (18/331)	7% (26/390)	2% (-1.61-5.52)
<b>Total</b>	<b>32%</b> (597/1882)	<b>38%</b> (843/2226)	<b>6%**</b> (3.07-8.90)

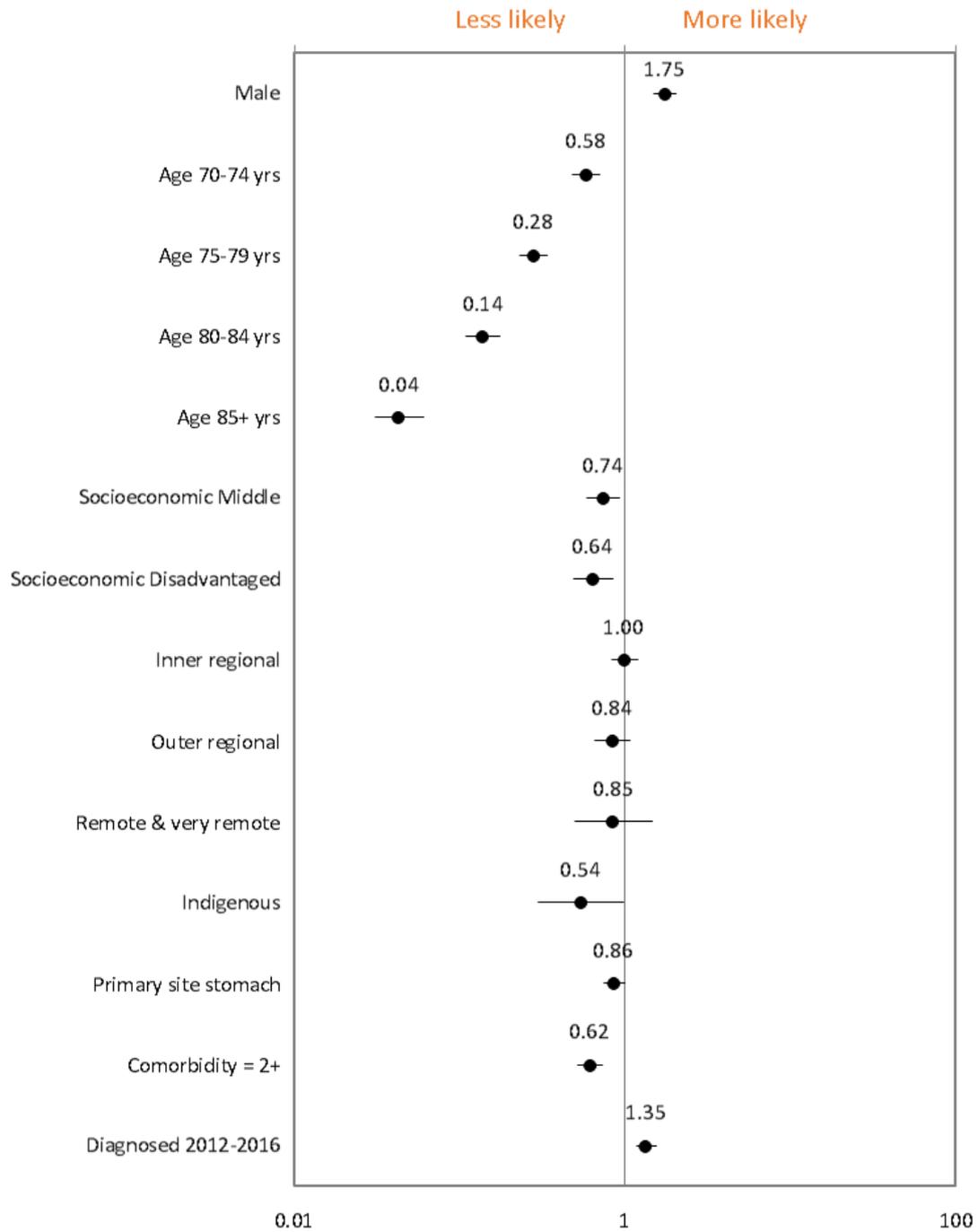
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.8.3 | Factors associated likelihood of receiving IV systemic therapy for oesophagogastric cancer

Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.9 | Radiation therapy for oesophagogastric cancer

### 5.9.1 | What are the characteristics of oesophagogastric cancer patients who received radiation therapy?

Year of diagnosis 2007 - 2016

	Diagnosis		Received radiation therapy	
	N	(Col %)	N	(Row %)
<b>Queensland</b>	<b>4,108</b>	<b>100%</b>	<b>1,515</b>	<b>37%</b>
<b>Sex</b>				
Male	2,749	67%	1,085	39%
Female	1,359	33%	430	32%
<b>Age group</b>				
65-69	969	24%	424	44%
70-74	874	21%	358	41%
75-79	855	21%	303	35%
80-84	689	17%	234	34%
85+	721	18%	196	27%
<b>Indigenous status</b>				
Indigenous	69	2%	22	32%
Other than Indigenous <sup>a</sup>	4,039	98%	1,493	37%
<b>Socioeconomic status</b>				
Affluent	491	12%	175	36%
Middle	2,623	64%	995	38%
Disadvantaged	994	24%	345	35%
<b>Remoteness</b>				
Major city	2,591	63%	966	37%
Inner Regional	1,023	25%	378	37%
Outer Regional	415	10%	140	34%
Remote & very remote	79	2%	31	39%
<b>MDT<sup>b</sup></b>				
MDT review	1,314	32%	648	49%
No MDT review	2,794	68%	867	31%
<b>Comorbidities</b>				
0-1 Comorbidities	3,118	76%	1,182	38%
2+ Comorbidities	990	24%	333	34%
<b>Primary site</b>				
Oesophagus	1,773	43%	967	55%
Stomach	2,335	57%	548	23%
<b>Diagnosis years</b>				
2007 - 2011	1,882	46%	680	36%
2012 - 2016	2,226	54%	835	38%
<b>HHS of residence</b>				
Cairns and Hinterland	193	5%	67	35%
Central Queensland	164	4%	60	37%
Central West	6	0.1%	3	50%
Darling Downs	296	7%	106	36%
Gold Coast	506	12%	218	43%
Mackay	108	3%	37	34%
Metro North	763	19%	262	34%
Metro South	854	21%	300	35%
North West	13	0.3%	6	46%
South West	20	0.5%	6	29%
Sunshine Coast	453	11%	193	43%
Torres and Cape	18	0.4%	6	33%
Townsville	204	5%	67	33%
West Moreton	198	5%	81	41%
Wide Bay	312	8%	103	33%

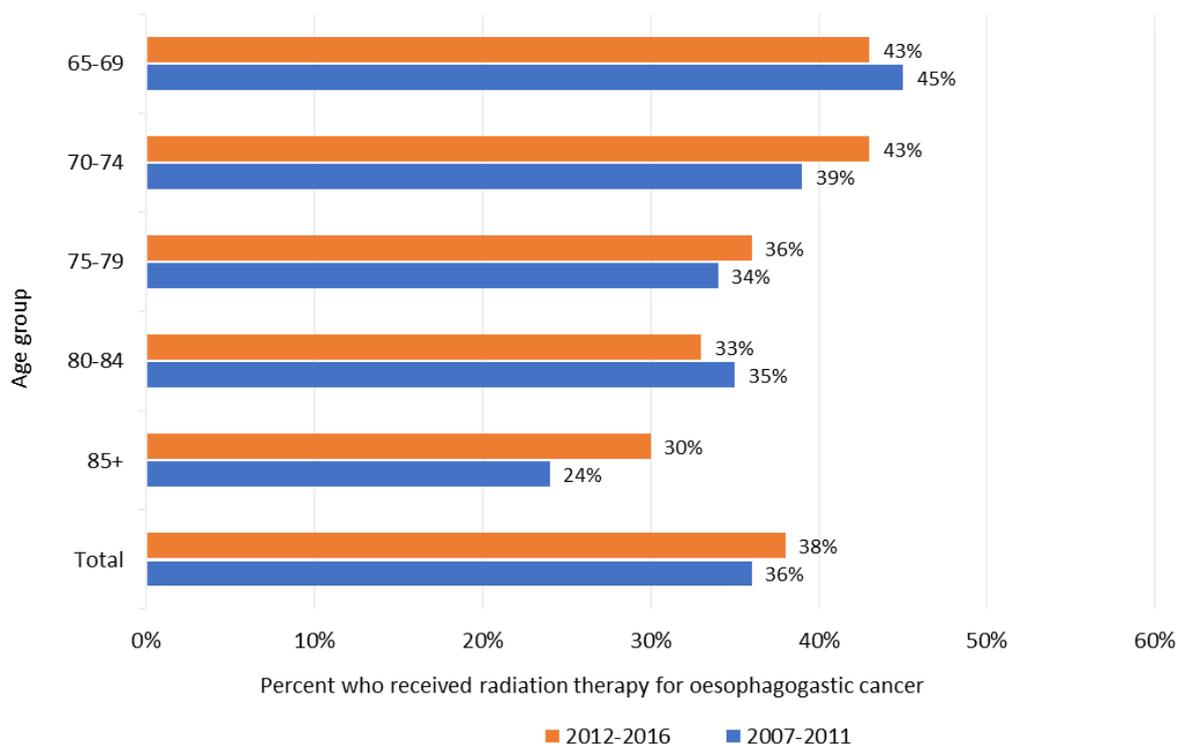
Notes: <sup>a</sup>Other than Indigenous includes non-Indigenous and not stated; <sup>b</sup>MDT rate includes facilities that use QOOL to capture MDT review.

## 5.9.2 | What percentage of oesophagogastric cancer patients received radiation therapy according to age group?

Year of diagnosis 2007 - 2016

Received radiation therapy	Diagnosis Year		% difference <sup>a</sup> (95%CI)
	2007-2011 Crude rates (n/N)	2012-2016 Crude rates (n/N)	
<b>Age at diagnosis</b>			
65 - 69	45% (190/424)	43% (234/545)	2% (-4.27-8.28)
70 - 74	39% (158/404)	43% (200/470)	4% (-2.54-10.47)
75 - 79	34% (133/386)	36% (170/469)	2% (-4.43-8.36)
80 - 84	35% (119/337)	33% (115/352)	2% (-4.93-8.92)
85+	24% (80/331)	30% (116/390)	6% (-0.53-12.38)
<b>Total</b>	<b>36%</b> (680/1882)	<b>38%</b> (835/2226)	<b>2%</b> (-0.97-4.95)

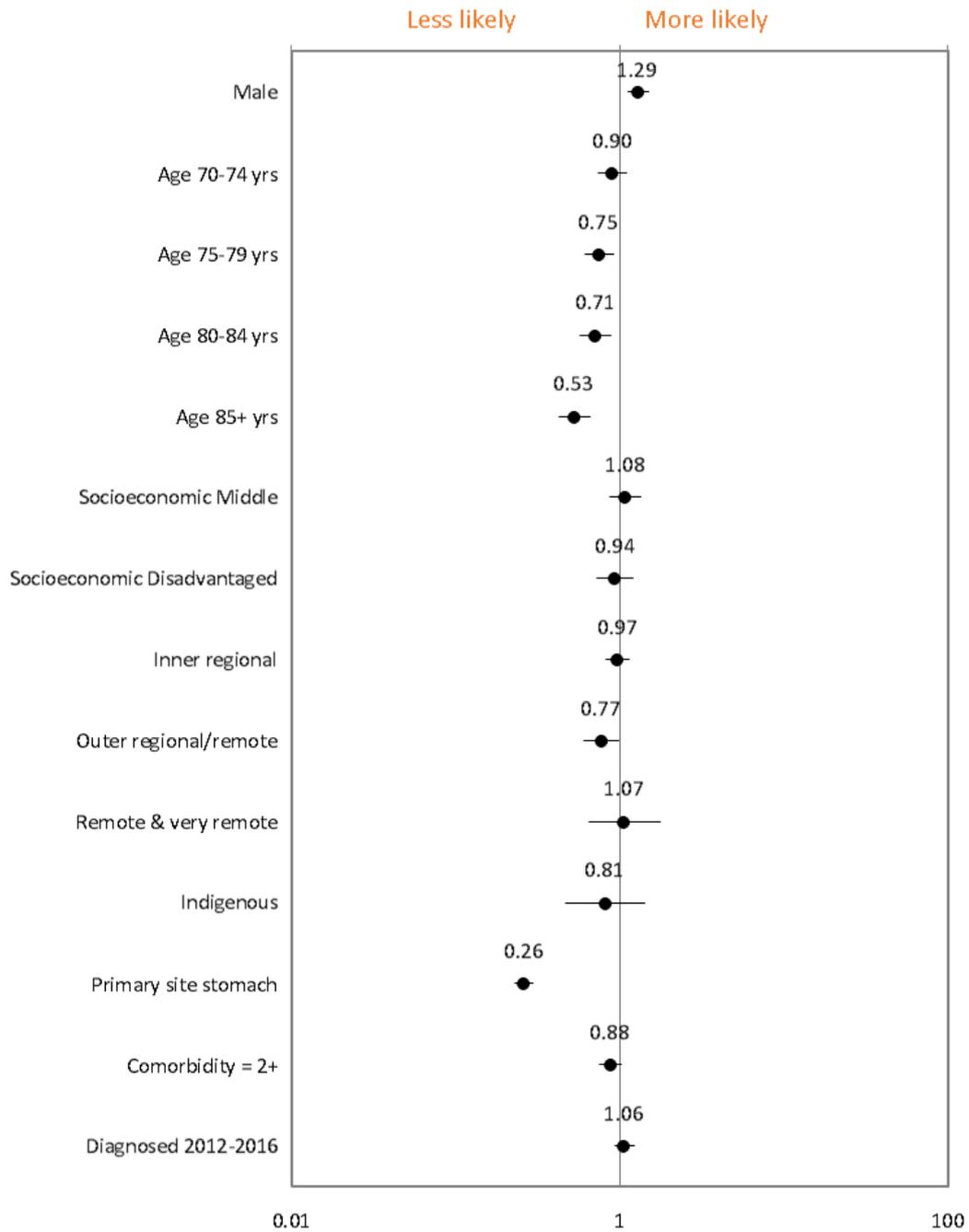
Notes: <sup>a</sup>The likelihood the observed difference is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*



The likelihood the observed difference over the two time periods is due to chance alone is less than 1% for those marked \*\* and less than 5% for those marked \*

### 5.9.3 | Factors associated likelihood of receiving radiation therapy for oesophagogastric cancer

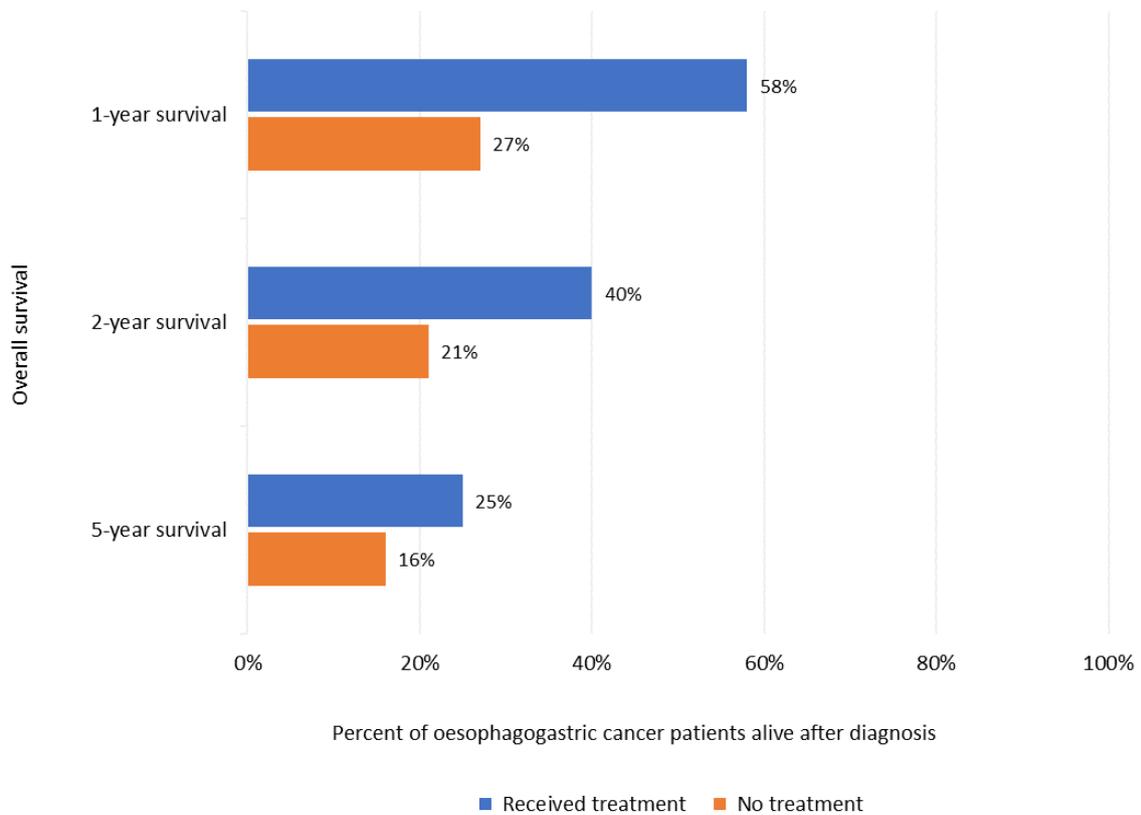
Year of diagnosis 2007 - 2016



The above graph (forest plot) is a graphical display of the relative risk for each covariate in the analysis. The dot represents the estimate of the relative risk with confidence intervals of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central line then the effect is not considered to be statistically significant. Outer regional, remote and very remote locations combined due to small numbers.

## 5.10 | One, two and five-year overall survival for oesophagogastric cancer patients

### 5.10.1 | What percentage of oesophagogastric cancer patients are alive after diagnosis by treatment status?



# Appendix



## Appendix A: 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.

<b>Parent Peer Group</b>	<b>AIHW Peer Group</b>	<b>Hospital Name</b>
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
		Mackay Base Hospital
		Mater Hospital Brisbane
		Nambour General Hospital
		Queen Elizabeth II Jubilee Hospital
		Redcliffe Hospital
	Rockhampton Hospital	
	Toowoomba Hospital	
	Private acute group A hospitals	Gold Coast Private Hospital
		Greenslopes Private Hospital
		Holy Spirit Northside
John Flynn Private Hospital		
Mater Private Hospital Brisbane		
Group B hospitals	Public acute group B hospitals	Noosa Hospital
		Pindara Private Hospital
		St Andrew's War Memorial Hospital
		The Wesley Hospital
		Caboolture Hospital
	Caloundra Hospital	
	Gladstone Hospital	
	Gympie Hospital	
	Maryborough Hospital	
	Mount Isa Base Hospital	
Redland Hospital		
Robina Hospital		
Private acute group B hospitals	Buderim Private Hospital	
	Friendly Society Private Hospital	
	Mater Hospital Pimlico	
	St Andrew's Toowoomba Hospital	
	St Vincent's Hospital Toowoomba	
Group C hospitals	Public acute group C hospitals	Sunshine Coast University Private Hospital
		Atherton Hospital
		Ayr Hospital
		Charleville Hospital
		Chinchilla Hospital
		Dalby Hospital
		Emerald Hospital
		Goondiwindi Hospital
		Innisfail Hospital
		Kingaroy Hospital
	Longreach Hospital	
	Roma Hospital	
	Warwick Hospital	
	Private acute group C hospitals	Brisbane Private Hospital
		Cairns Private Hospital
Hillcrest - Rockhampton Private Hospital		
Mater Misericordiae Hospital Gladstone		
Mater Misericordiae Hospital Mackay		
Mater Misericordiae Hospital Rockhampton		
Mater Private Hospital Redland		
Mater Women's and Children's Hospital Hyde Park		

<b>Parent Peer Group</b>	<b>AIHW Peer Group</b>	<b>Hospital Name</b>
Other hospitals		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
	Private acute group D hospitals	Kawana Private Hospital
		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
	Mixed day procedure hospitals	Cairns Central Day Hospital
		Pacific Private Day Hospital
		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 B: Indicator calculations for people aged 65+ years

Indicator		Calculation
<b>2   Colorectal</b>		
2.1	Any treatment	Received treatment ÷ Number of patients diagnosed with colorectal cancer
2.3	Major resection	Received major resection ÷ Number of patients diagnosed with colorectal cancer
2.4	30-day mortality	Died within 30 days of major resection ÷ Number of patients having a major resection
2.5	90-day mortality	Died within 90 days of major resection ÷ Number of patients having a major resection
2.6	1-year surgical survival	Alive one year following major resection ÷ Number of patients having a major resection
2.7	2-year surgical survival	Alive two years following major resection ÷ Number of patients having a major resection
2.8	IV systemic therapy	Received IV systemic therapy ÷ Number of patients diagnosed with colorectal cancer
2.9	Adjuvant IV systemic therapy	Stage III colorectal cancer patients who received IV systemic therapy within three months of major resection ÷ Number of stage III colorectal cancer patients who had a major resection
2.10	Radiation therapy	Received radiation therapy ÷ Number of patients diagnosed with colorectal cancer
2.10.2	Neoadjuvant radiation therapy	Rectal cancer patients who had radiation therapy prior to major resection ÷ Number of rectal cancer patients who had major resection
2.10.4	Adjuvant radiation therapy	Rectal cancer patients who received radiation therapy within 3 months of their major resection ÷ Number of patients who had radiation therapy ÷ Number of patients diagnosed with colorectal cancer ÷ Number of rectal cancer patients who had a major resection
<b>3   Breast</b>		
3.1	Any treatment	Received treatment (excluding hormone therapy) ÷ Number of patients diagnosed with breast cancer
3.3	Surgery	Received surgery ÷ Number of patients diagnosed with invasive breast cancer
3.4	Definitive mastectomy	Definitive mastectomy ÷ Number of patients who had breast cancer surgery
3.5	Index breast conservation surgery (BCS) for T1 tumours	Index BCS for T1 tumours (≤20mm tumour size) ÷ Number of patients with T1 tumours who had surgery
3.6	Sentinel lymph node biopsy (SLNB) on T1 tumours with index breast conservation surgery (BCS)	SLNB on T1 (≤20mm tumour size) with index BCS ÷ Index BCS with T1 tumours
3.7	IV systemic therapy	Received IV systemic therapy ÷ Number of patients diagnosed with breast cancer
3.7.4	Adjuvant IV systemic therapy for axillary lymph node positive patients	Number of patients who had adjuvant IV systemic therapy ÷ Number of patients with positive lymph nodes
3.8	Radiation therapy	Received radiation therapy ÷ Number of patients diagnosed with breast cancer
3.8.4	Radiation therapy following definitive breast conservation therapy (BC)	Number of patients who received external beam radiation therapy ÷ definitive BCS within 1 year of diagnosis
<b>4   Lung</b>		
4.1	Any treatment	Received any treatment ÷ Number of patients diagnosed with lung cancer
4.3	Major resection	Received major resection (lobectomy, partial resection or pneumonectomy) within 1 year from diagnosis ÷ Number of patients diagnosed with non-small cell lung cancer
4.4	30-day mortality	Died within 30 days of major resection ÷ Number of patients with non-small cell lung cancer who received major resection

4.5	90-day mortality	Died within 90 days of major resection ÷ Number of patients with non-small cell lung cancer who received major resection
4.6	One-year surgical survival	Alive one year following major resection ÷ Number of patients with non-small cell lung cancer who received major resection
4.7	Two-year surgical survival	Alive two years following major resection ÷ Number of patients with non-small cell lung cancer who received major resection
4.8	IV systemic therapy	Received IV systemic therapy ÷ Number of patients diagnosed with lung cancer (NSCLC, SCLC and other)
4.9	Radiation therapy	Received radiation therapy ÷ Number of patients diagnosed with lung cancer (NSCL, SCLC and other)

## 5 | Oesophagogastric

5.1	Any treatment	Received treatment ÷ Number of patients diagnosed with oesophageal or gastric cancer
5.3	Major resection	Received either oesophagectomy or gastrectomy ÷ Number of patients diagnosed with oesophageal or gastric cancer
5.4	30-day mortality	Died within 30 days of major resection ÷ Number of patients having major resection
5.5	90-day mortality	Died within 90 days of major resection ÷ Number of patients having major resection
5.6	One-year surgical survival	Alive one year following major resection ÷ Number of patients having major resection
5.7	Two-year surgical survival	Alive two years following major resection ÷ Number of patients having major resection
5.8	IV systemic therapy	Received IV systemic therapy ÷ Number of patients diagnosed with oesophageal or gastric cancer
5.9	Radiation therapy	Received radiation therapy ÷ Number of patients diagnosed with oesophageal or gastric cancer

## Appendix C: Patient cohorts ICD-10-AM procedure codes

### ICD-10-AM procedure codes

#### Colorectal major resection procedures

ICD Code	ICD Name
3200501	Extended right hemicolectomy with anastomosis
3200401	Extended right hemicolectomy with formation of stoma
3051503	Ileocolic resection with anastomosis
3051505	Ileocolic resection with formation of stoma
3200503	Laparoscopic extended right hemicolectomy with anastomosis
3200403	Laparoscopic extended right hemicolectomy with formation of stoma
3051504	Laparoscopic ileocolic resection with anastomosis
3051506	Laparoscopic ileocolic resection with formation of stoma
3200602	Laparoscopic left hemicolectomy with anastomosis
3200603	Laparoscopic left hemicolectomy with formation of stoma
3200302	Laparoscopic limited excision of large intestine with anastomosis
3200002	Laparoscopic limited excision of large intestine with formation of stoma
3200303	Laparoscopic right hemicolectomy with anastomosis
3200003	Laparoscopic right hemicolectomy with formation of stoma
3200502	Laparoscopic subtotal colectomy with anastomosis
3200402	Laparoscopic subtotal colectomy with formation of stoma
3201201	Laparoscopic total colectomy with ileorectal anastomosis
3200901	Laparoscopic total colectomy with ileostomy
3200600	Left hemicolectomy with anastomosis
3200601	Left hemicolectomy with formation of stoma
3200300	Limited excision of large intestine with anastomosis
3200000	Limited excision of large intestine with formation of stoma
3056600	Resection of small intestine with anastomosis
3056500	Resection of small intestine with formation of stoma
3200301	Right hemicolectomy with anastomosis
3200001	Right hemicolectomy with formation of stoma
3200500	Subtotal colectomy with anastomosis
3200400	Subtotal colectomy with formation of stoma
3201200	Total colectomy with ileorectal anastomosis
3200900	Total colectomy with ileostomy
3203900	Abdominoperineal proctectomy
3205100	Total proctocolectomy with ileo-anal anastomosis
3205101	Total proctocolectomy with ileo-anal anastomosis and formation of temp ileostomy
3201500	Total proctocolectomy with ileostomy
9220800	Anterior resection of rectum, level unspecified
3202400	High anterior resection of rectum
3202500	Low anterior resection of rectum
3202600	Ultra low anterior resection of rectum
3202800	Ultra low anterior resection of rectum with hand sutured coloanal anastomosis
3203001	Laparoscopic rectosigmoidectomy with formation of stoma (Hartmanns)
3203000	Rectosigmoidectomy with formation of stoma (Hartmanns)
9029702	Endoscopic mucosal resection of large intestine
9095900	Excision of other lesion of large intestine
3209300	Fibreoptic colonoscopy to caecum, with polypectomy
3208700	Fibreoptic colonoscopy to hepatic flexure, with polypectomy
9034100	Other excision of lesion of rectum
3210500	Per anal full thickness excision of anorectal lesion or tissue
3209900	Per anal submucosal excision of lesion of tissue of rectum
3207800	Rigid sigmoidoscopy with polypectomy involving removal of <= 9 polyps

## Breast surgery procedures

ICD Code	ICD Name
3153600	Localisation of lesion of breast
3150000	Excision of lesion of breast
3151800	Total mastectomy (unilateral)
3151801	Total mastectomy (bilateral)
3152400	Subcutaneous mastectomy (unilateral)
3152401	Subcutaneous mastectomy (bilateral)
3151500	Re-excision of lesion of breast
9624302	Sentinel lymph node biopsy, axillary
9624402	Radical excision of lymphatic structure, axillary
9624502	Re-excision of lymphatic structure, axillary

## Lung major resection procedures

ICD Code	ICD Name
9016900	Endoscopic wedge resection of lung
3844001	Radical wedge resection of lung
3843800	Segmental wedge resection of lung
3844000	Wedge resection of lung
3843801	Lobectomy of lung
3844100	Radical lobectomy
3843802	Pneumonectomy
3844101	Radical pneumonectomy

## Oesophagogastric major resection procedures

Procedure group	Procedure code	Procedure name	
Oesophagectomy	3029400	Cervical oesophagectomy	
	3053500	Oesophagectomy by abdominal and transthoracic mobilisation with thoracic oesophagogastric anastomosis	
	3053600	Oesophagectomy by abdominal and transthoracic mobilisation with cervical oesophagogastric anastomosis	
	3053601	Oesophagectomy by abdominal and transthoracic mobilisation with cervical oesophagostomy	
	3054100	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation with oesophagogastric anastomosis	
	3054101	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation with oesophagojejunal anastomosis	
	3054500	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis large intestine interposition and anastomosis	
	3054501	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis using Roux-en-Y reconstruction	
	3055000	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis large intestine interposition and anastomosis	
	3055001	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis using Roux-en-Y reconstruction	
	3055400	Oesophagectomy with reconstruction by free jejunal flap	
	3055401	Oesophagectomy with reconstruction by other free flap	
	Gastrectomy	3051800	Partial distal gastrectomy with gastroduodenal anastomosis
		3051801	Partial distal gastrectomy with gastrojejunal anastomosis
3051802		Partial proximal gastrectomy with oesophagogastric anastomosis	
3052100		Total gastrectomy	
3052300		Subtotal gastrectomy	
3052400		Radical gastrectomy	

## References

1. Australian Bureau of Statistics (ABS). Estimated Resident Population Queensland 2018. ABS, customised report, 2019.
2. Queensland Government Statistician's Office. Population by age and sex, regional of Queensland, 2018.
3. Euan T. Walpole, David E. Theile, Shoni Philpot, Philippa H. Youl for Cancer Alliance Queensland. Development and Implementation of a Cancer Quality Index in Queensland, Australia: A Tool for Monitoring Cancer Care. *Journal of Oncology Practice* 2019 15:7, e636-e643.
4. Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017). *Cancer Incidence in Five Continents, Vol. XI* (electronic version). Lyon: International Agency for Research on Cancer. Available from: <http://ci5.iarc.fr>.

# Methods

## Adjusted rates

The indicators report both crude and adjusted rates. Adjusting is used to account for the effect of differences in composition of the various populations. Where appropriate indicators have been adjusted by the combination of age, sex, socioeconomic status, rurality, comorbidity, ASA, emergency admission status.

Results highlighted with an \* and \*\* are deemed to be statistically 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 \*.

Statistical significance is determined from the results of Poisson regression. 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.

## 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.

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>

# Glossary

## **Adjuvant intravenous systemic therapy**

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

## **ASA score**

American Society of Anaesthetic (ASA) physical status classification system for assessing the fitness of a patient prior to surgery.

Hierarchies by ASA Group

Normal/Mild Disease: ASA 1-2

Severe Disease: ASA 3-6

When two or more different ASA scores are coded on the same date in the admissions data, only one ASA score is chosen. The choice of the ASA score is based on the type of anaesthesia in the following order of selection: General > Sedation > Neuraxial > Regional > Intravenous Regional > Infiltration > Local. For example, if General Anaesthesia ASA 2 and Sedation ASA 3, are coded on the same date, the General Anaesthesia score of 2 is chosen.

## **Axillary lymph node dissection**

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

## **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.

## **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.

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### **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		

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**Confidence interval**

The confidence interval represents the probability that a population parameter will fall between two set values. A very wide interval may indicate that more data should be collected before anything definite can be said about the parameter.

**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 (e.g. age, gender differences).

**Definitive surgery (Breast)**

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.

**Diagnosis year**

This report is structured around diagnosis years as recorded in the Queensland Cancer Register, the latest incident year being 2016. Only patients diagnosed between 2007 and 2016 are included in this report. Patients that had surgery in 2007 but were diagnosed in an earlier year are excluded.

**Forest plots**

A forest plot is a graphical display of the results from a regression model, illustrating the hazard ratios (or odds ratios) for each covariate included in the regression model. The dot represents the estimate of the hazard ratio (or odds ratio) with the confidence interval of the estimated represented by a horizontal line. A central vertical line representing no effect is also plotted, and if the confidence intervals for an estimate cross this line then the effect is considered not to be statistically significant.

**Hospital peer groups**

The Australian Institute of Health and Welfare (AIHW) have published *The Australian Hospital Peer Groups* report that groups public and private hospitals that share similar characteristics, providing a basis for meaningful comparisons. There are thirty peer groups, six of which are relevant to this report.

**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.

**Intravenous systemic therapy (IVST)**

Systemic therapy is the use of anti-cancer drugs to destroy cancer cells. A patient is counted as having IVST as treatment if they receive intravenous systemic therapy within 365 days of diagnosis. Note this report does not include oral chemotherapy.

**Index surgery (Breast)**

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.

**Lymph node positive (Breast)**

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

**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 surgery. In this report patients diagnosed with rectal cancer who had intravenous systemic therapy between date of diagnosis and before date of index surgery were identified as receiving neoadjuvant treatment.

**MDT Review**

Cancer patients are discussed by a Multidisciplinary Team (MDT) to ensure all available treatment options are considered. Note that in this report, the MDT rate includes hospitals that use QOOL to capture MDT review data or provide MDT data to The Partnership.

**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, statewide 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 any location.

**Radiation therapy (external beam)**

Radiation therapy (RT) uses X-rays to destroy or injure cancer cells so they cannot multiply. RT can be used to treat the primary cancer or advanced cancer. It can also be used to reduce the size of the cancer and relieve pain, discomfort or other symptoms. A patient is counted as having radiation therapy as treatment if they received radiation therapy within 365 days of diagnosis.

**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 may lead to fluctuations in relative survival estimates. Accordingly, caution should be used when making comparisons to historically reported rates of relative survival.

## 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.

ASGC classifications	Modified ASGC classification
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.

## Seniors

Queenslanders aged 65 years or more at time of invasive cancer diagnosis.

## 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*)

## Sex

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

## 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%

## Stage

Cancer stage at diagnosis is not routinely collected in Queensland with the exception of breast cancer. For colorectal, lung and oesophagogastric cancers, overall stage (where appropriate) 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

### **Surgery**

Refer to the Methods section: *Method for assigning a surgery record to a patient.*

### **Surgical survival**

One Year Surgical Survival: All-cause crude survival: the percentage of cases still alive one year after surgery.

Two Year Surgical Survival: All-cause crude survival: the percentage of cases still alive two years after surgery.

### **Treatment**

Any anti-cancer treatment including surgery, intravenous systemic therapy or radiation therapy either alone or in combination within 365 days of histological diagnosis. Excludes oral chemotherapy and hormone therapy.

**FOR MORE INFORMATION**

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