

## WHAT ARE THE MAIN GEOGRAPHIC DIFFERENCES IN CANCER ACROSS QUEENSLAND?

*Where you live can influence your risk of being diagnosed with cancer, surviving cancer, or dying from cancer. This fact sheet reports the latest available Queensland cancer data by where people live according to remoteness, area disadvantage and accessibility to radiation treatment facilities. This information covers the years 2011-2015, unless otherwise stated.*

### Terms used in this report:

**Incidence (diagnosis):** number of new cancers diagnosed in Queensland between 2011 and 2015.

**Standardised incidence ratio (SIR):** compares the cancer diagnosis rate between a region and the Queensland average. Values higher than one indicate higher incidence, values lower than one indicate lower incidence.

**Excess death rate:** is a survival-based measure, but refers to the deaths caused by a cancer diagnosis within five years of diagnosis.

**Excess hazard ratio (EHR):** compares the excess death rate between a geographical regions and the Queensland average. An EHR lower than one implies lower excess mortality rates, which is the same as higher survival.

**Mortality (deaths):** number of cancer deaths in Queensland during 2011 and 2015.

**Standardised mortality ratio (SMR):** compares the cancer mortality rate between a region and the Queensland average. Values higher than one indicate higher mortality, values lower than one indicate lower mortality.

### Terms used to describe geographical areas (see page 12 for more details)

**Remoteness:** This is a measure that reflects general services in a specific area, and proximity to other services. Categories are: Major cities (urban), Inner regional, Outer regional, Remote and Very remote combined.

**Area disadvantage:** This is a measure that reflects the level of socioeconomic disadvantage of a specific area, according to the median socioeconomic characteristics of people living in that area. Categories are: Least disadvantaged, Less disadvantaged, Middle, More disadvantaged, Most disadvantaged.

**Accessibility:** This is a measure that reflects the driving time from a specific area to the nearest Queensland public and private radiotherapy facility in 2011. Categories are: <1 hour (reference), 1-<2 hours, 2-<4 hours, 4-<6 hours, 6+ hours

### How to interpret the numbers

A ratio of 1.0 indicates no difference to the Queensland average, while a ratio above 1.0 indicates an increase in incidence (SIR), excess death rate (EHR) and mortality (SMR), compared to the Queensland average. Note that a higher excess death rate (HER) is equivalent to a lower relative survival.

For example:

- An SIR of 0.89 for all cancers among people who live in remote/very remote areas compared to those who live in major cities (see page 4 table) indicates that people living in remote/very remote areas have an 11 per cent lower rate of cancer diagnosis compared to those who live in major cities. The 95 per cent confidence interval for this SIR is 0.85-0.94. Since this does not include 1, this is considered to be significantly lower.
- An EHR of 1.19 for lung cancer among people who live 6+ hours away from the closest radiotherapy facility compared to those who live <1 hour away (see page 9 table) indicates that people who live 6+ hours away have a 19% higher excess death rate (or lower survival) due to lung cancer compared to those who live <1 hour away.
- An SMR of 1.30 for melanoma among people living in the most disadvantaged areas compared to the least disadvantaged areas (see page 6 table) indicates that people living in the most disadvantaged areas have a 30% higher mortality rate due to melanoma compared to those who live in the least disadvantaged areas.

## Is there variation in cancer incidence, survival and mortality by 'Remoteness' between 2011 and 2015?

(All estimates are compared to Major City areas)

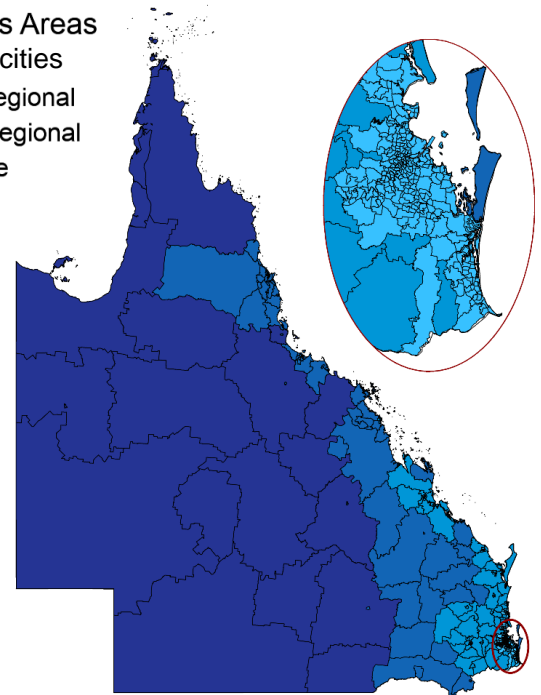
**Cancer diagnosis:** Rate of new cancers diagnosed

**Cancer survival:** Corresponds to the risk of people diagnosed with cancer dying from the disease within five years of diagnosis

**Cancer deaths:** Rate of deaths due to cancer

The following summary is based on the data tables on pages 6-11 (Note that Cancer survival is the inverse of Excess deaths).

Remoteness Areas



	Cancer diagnoses?	Cancer survival?	Cancer deaths?
All cancers	<b>Yes</b> Lower in remote areas	<b>Yes</b> Lower in regional and remote areas	<b>Yes</b> Higher in regional areas
Prostate cancer	<b>Yes</b> Higher in inner regional areas	<b>No</b>	<b>No</b>
Melanoma	<b>Yes</b> Lower in outer regional and remote areas.	<b>Yes</b> Lower in outer regional areas	<b>Yes</b> Higher in regional areas
Breast cancer	<b>Yes</b> Lower in regional and remote areas	<b>No</b>	<b>No</b>
Bowel cancer	<b>Yes</b> Higher in inner regional areas	<b>No</b>	<b>Yes</b> Higher in inner regional areas
Lung cancer	<b>Yes</b> Higher in outer regional and remote areas	<b>Yes</b> Lower in regional and remote areas	<b>Yes</b> Higher in regional and remote areas

## Is there variation in cancer incidence, survival and mortality by area-level 'Area disadvantage' between 2011 and 2015?

[All estimates are compared to the areas of least disadvantaged (or most affluent areas)]

**Cancer diagnosis:** Rate of new cancers diagnosed

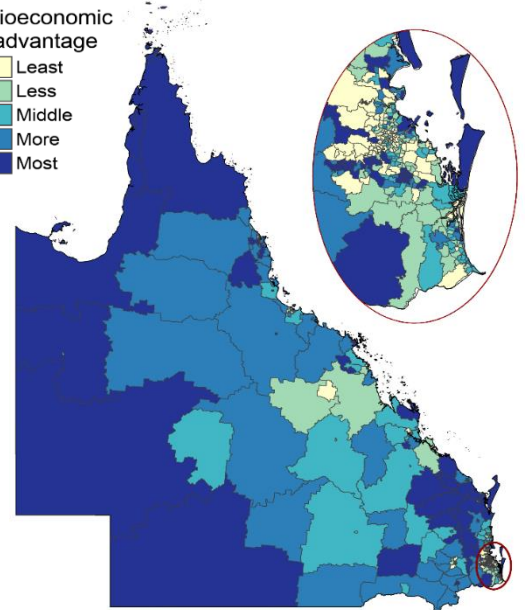
**Cancer survival:** Corresponds to the risk of people diagnosed with cancer dying from the disease within five years of diagnosis

**Cancer deaths:** Rate of deaths due to cancer

The following summary is based on the data tables on pages 6-11  
(Note that cancer survival is the inverse of excess deaths).

Socioeconomic Disadvantage

- Least
- Less
- Middle
- More
- Most



	<b>Cancer diagnoses?</b>	<b>Cancer survival?</b>	<b>Cancer deaths?</b>
All cancers	<b>Yes</b> Lower in areas of less disadvantage but higher in areas of greater disadvantage	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Higher in areas of greater disadvantage
Prostate cancer	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Lower in areas of less disadvantage	<b>Yes</b> Higher in areas of greater disadvantage
Melanoma	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Higher in areas of greater disadvantage
Breast cancer	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Lower in areas of greater disadvantage	<b>No</b>
Bowel cancer	<b>Yes</b> Higher in areas of greater/greatest disadvantage	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Higher in areas of greater disadvantage
Lung cancer	<b>Yes</b> Higher in areas of greater disadvantage	<b>Yes</b> Lower in areas of greater disadvantage	<b>Yes</b> Higher in areas of greater disadvantage

## Is there variation in cancer incidence, survival and mortality by ‘Accessibility’ between 2011 and 2015?

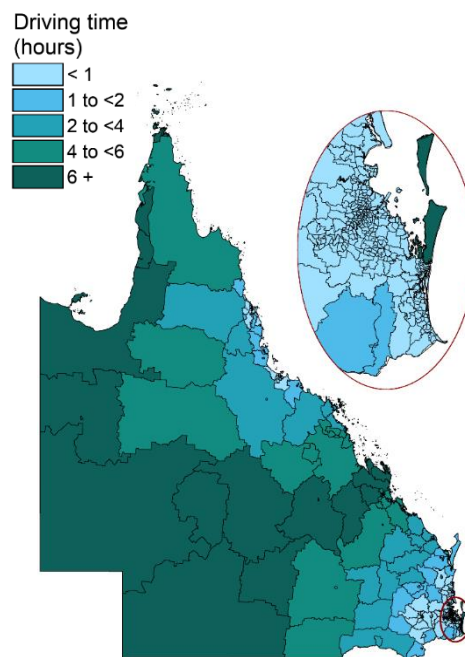
Accessibility is measured by the driving time to the closest radiation facility. All estimates are compared to <1 hour travelling time.

**Cancer diagnosis:** Rate of new cancers diagnosed

**Cancer survival:** Corresponds to the risk of people diagnosed with cancer dying from the disease within five years of diagnosis

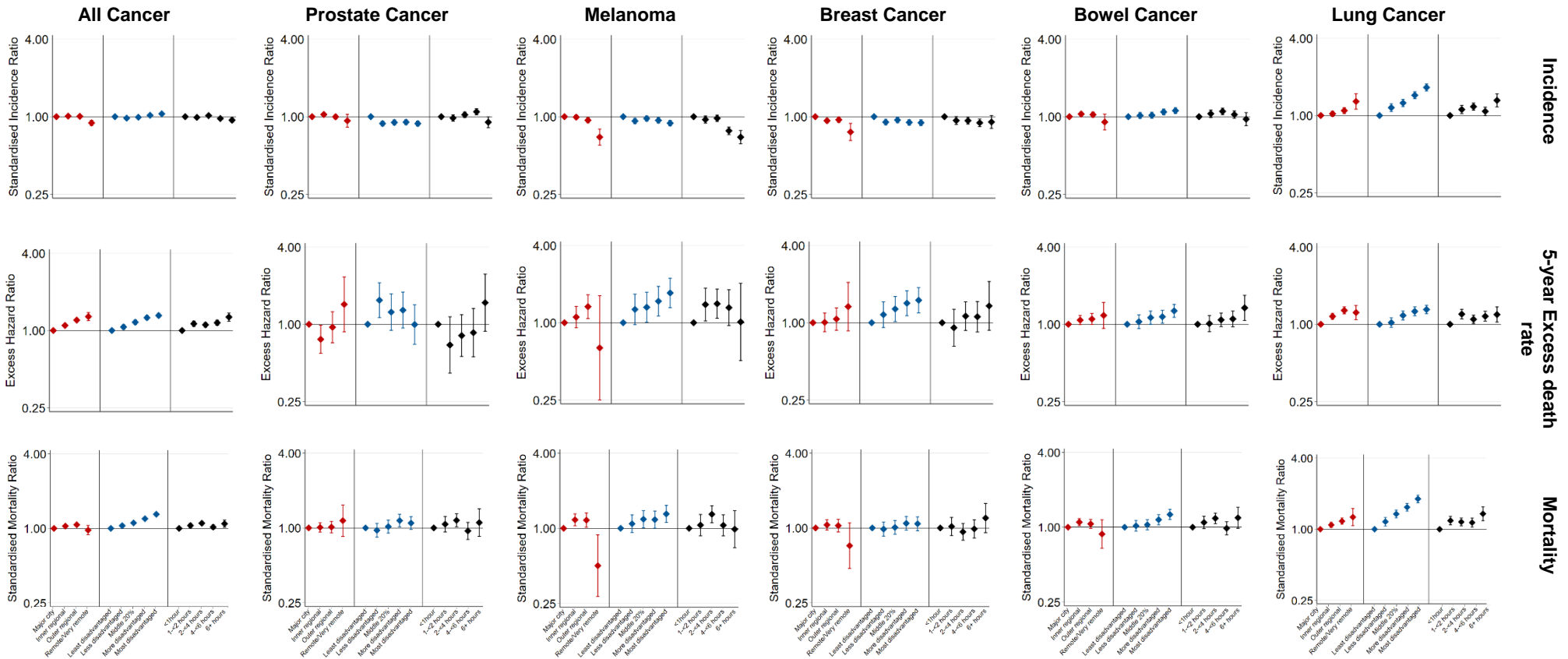
**Cancer deaths:** Rate of deaths due to cancer

The following summary is based on the data tables on pages 6-11  
(Note that Cancer survival is the inverse of Excess deaths).



	Cancer diagnoses?	Cancer survival?	Cancer deaths?
All cancers	<b>Yes</b> Lower in less accessible areas	<b>Yes</b> Lower in less accessible areas	<b>Yes</b> Higher in less accessible areas
Prostate cancer	<b>Yes</b> No consistent pattern	<b>No</b>	<b>No</b>
Melanoma	<b>Yes</b> Lower in less accessible areas	<b>Yes</b> Lower in moderately less accessible areas (up to 4 hours travelling)	<b>Yes</b> Higher in moderately less accessible areas (2-<4 hours travelling)
Breast cancer	<b>Yes</b> Lower in less accessible areas	<b>No</b>	<b>No</b>
Bowel cancer	<b>Yes</b> Higher in moderately less accessible areas (2-<4 hours travelling)	<b>No</b>	<b>Yes</b> Higher in moderately less accessible areas (2-<4 hours travelling)
Lung cancer	<b>Yes</b> Higher in moderately less accessible areas	<b>Yes</b> Lower in less accessible areas	<b>Yes</b> Higher in less accessible areas

## Overview of differences in cancer incidence, 5-year excess deaths and mortality by Remoteness, Area disadvantage and accessibility, 2011-2015



Notes: Red markings represent different rural groupings (remoteness) and is in comparison to major city areas (reference). Blue markings represent area disadvantage quintiles and is in comparison to least disadvantaged areas (reference). Black markings represent accessibility (driving distance to radiotherapy facilities) and is in comparison to <1 hours driving time (reference).



## Differences by type of cancer (2011-2015)

### All cancers

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	26,748	537.5			30.4			8,532	171.0		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001			Overall significance <sup>1</sup> , p<0.0001			
Major city	16,062	534.3	1		29.7	1		4,925	162.8	1	
Inner regional	6,275	544.9	1.01	[1.00, 1.02]	31.2	1.10	[1.07, 1.13] *	2,022	171.7	1.04	[1.02, 1.07] *
Outer regional	3,843	544.6	1.01	[0.99, 1.02]	32.1	1.21	[1.17, 1.25] *	1,204	176.3	1.07	[1.04, 1.10] *
Remote/Very remote	564	491.5	0.89	[0.85, 0.94] *	35.6	1.28	[1.19, 1.38] *	182	171.1	0.97	[0.89, 1.06]
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001			Overall significance <sup>1</sup> , p<0.0001			
Least disadvantaged	4,519	533.3	1		24.5	1		1,179	147.7	1	
Less disadvantaged	5,219	518.7	0.97	[0.96, 0.99] *	28.2	1.07	[1.02, 1.11] *	1,493	154.3	1.05	[1.02, 1.09] *
Middle 20%	5,584	527.8	0.99	[0.97, 1.01]	30.2	1.16	[1.12, 1.21] *	1,751	162.2	1.11	[1.07, 1.14] *
More disadvantaged	5,719	547.1	1.03	[1.01, 1.04] *	33.0	1.26	[1.21, 1.31] *	1,891	176.0	1.20	[1.16, 1.24] *
Most disadvantaged	5,695	560.4	1.05	[1.03, 1.07] *	35.3	1.31	[1.26, 1.36] *	2,017	191.6	1.30	[1.26, 1.34] *
<b>By accessibility</b>	Overall significance <sup>1</sup> , p=0.0001				Overall significance <sup>1</sup> , p<0.0001			Overall significance <sup>1</sup> , p<0.0001			
<1 hour	20,938	537.3	1		29.9	1		6,419	164.2	1	
1-<2 hours	1,546	536.2	0.99	[0.97, 1.01]	32.6	1.13	[1.08, 1.18] *	520	175.7	1.05	[1.01, 1.10] *
2-<4 hours	2,119	555.8	1.02	[1.00, 1.04]	32.9	1.11	[1.06, 1.15] *	725	183.9	1.10	[1.06, 1.14] *
4-<6 hours	1,613	523.2	0.97	[0.95, 0.99] *	32.0	1.15	[1.10, 1.20] *	502	169.0	1.02	[0.98, 1.07]
6+ hours	528	512.6	0.94	[0.90, 0.98] *	35.3	1.27	[1.18, 1.37] *	168	182.7	1.09	[1.02, 1.17] *

#### Notes:

SIR=Standardised Incidence Ratio, EHR=Excess Hazard Ratio, SMR=Standardised Mortality Ratio

Rates expressed per 100,000 and are age-standardised to the 2001 Australian standard population

Count reported as average number of cases/deaths observed per year aggregated over 2011-2015 period.

Counts do not sum to the Queensland total as some cases could not be assigned to an area.

5-year excess death rate calculated as = 100% - 5-year relative survival calculated using the period method for 'at-risk' cases during 2011-2015 for ages 0-89 years.

SIR and SMR are obtained using Poisson models adjusted for broad age groups and sex.

EHR are additionally adjusted for broad types of cancer.

High EHR equates to low survival

Models are run separately for remoteness, area disadvantage and accessibility

1. Overall significance of geographical variable assessed using the likelihood ratio test
2. \* Statistical differences (p<0.05) for the specific geographical category compared to the reference category. Only relevant when there is a significant overall effect for that variable.

## Differences by type of cancer (2011-2015) (cont.)

### Prostate cancer

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	4,072	78.8			6.5			634	29.4		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p=0.04				Overall significance <sup>1</sup> , p=0.065			Overall significance <sup>1</sup> , p=0.829			
Major city	2,351	76.2	1		7.2	1		363	28.2	1	
Inner regional	1,022	82.8	1.04	[1.01, 1.08] *	5.4	0.76	[0.59, 0.98] *	150	28.6	1.01	[0.93, 1.10]
Outer regional	606	82.8	1.00	[0.96, 1.04]	7.0	0.95	[0.72, 1.25]	85	28.1	1.02	[0.91, 1.13]
Remote/Very remote	93	79.4	0.93	[0.83, 1.04]	9.1	1.43	[0.87, 2.34]	15	34.8	1.14	[0.85, 1.53]
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p=0.019			Overall significance <sup>1</sup> , p=0.012			
Least disadvantaged	737	86.0	1		5.0	1		88	27.6	1	
Less disadvantaged	782	76.2	0.88	[0.85, 0.93] *	8.3	1.54	[1.13, 2.11]*	104	25.5	0.96	[0.84, 1.09]
Middle 20%	855	77.2	0.90	[0.86, 0.94] *	6.6	1.24	[0.90, 1.73]	131	27.6	1.03	[0.91, 1.16]
More disadvantaged	868	78.8	0.91	[0.87, 0.95] *	7.7	1.29	[0.93, 1.78]	149	30.8	1.15	[1.02, 1.29] *
Most disadvantaged	828	76.4	0.88	[0.85, 0.93] *	5.9	1.00	[0.70, 1.42]	141	29.7	1.09	[0.97, 1.23]
<b>By accessibility</b>	Overall significance <sup>1</sup> , p=0.002				Overall significance <sup>1</sup> , p=0.202			Overall significance <sup>1</sup> =0.133			
<1 hour	3,106	77.2	1		7.0	1		468	27.9	1	
1-<2 hours	252	79.6	0.98	[0.92, 1.03]	5.8	0.69	[0.42, 1.14]*	41	29.9	1.07	[0.93, 1.24]
2-<4 hours	350	83.9	1.04	[0.99, 1.09]	5.5	0.82	[0.56, 1.19]	59	32.4	1.15	[1.02, 1.30] *
4-<6 hours	280	89.6	1.09	[1.03, 1.15] *	5.9	0.86	[0.56, 1.33]	33	26.4	0.95	[0.81, 1.11]
6+ hours	83	79.4	0.91	[0.82, 1.00] *	8.3	1.47	[0.88, 2.46]	12	33.7	1.10	[0.85, 1.43]

Notes:

SIR=Standardised Incidence Ratio, EHR=Excess Hazard Ratio, SMR=Standardised Mortality Ratio

Rates expressed per 100,000 and are age-standardised to the 2001 Australian standard population

Count reported as average number of cases/deaths observed per year aggregated over 2011-2015 period.

Counts do not sum to the Queensland total as some cases could not be assigned to an area.

5-year excess death rate calculated as = 100% - 5-year relative survival calculated using the period method for 'at-risk' cases during 2011-2015 for ages 0-89 years.

SIR and SMR are obtained using Poisson models adjusted for broad age groups and sex.

EHR are additionally adjusted for broad types of cancer.

High EHR equates to low survival

Models are run separately for remoteness, area disadvantage and accessibility

1. Overall significance of geographical variable assessed using the likelihood ratio test
2. \* Statistical differences (p<0.05) for the specific geographical category compared to the reference category. Only relevant when there is a significant overall effect for that variable.

## Differences by type of cancer (2011-2015) (cont.)

### Melanoma

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]
Total Queensland	3,601	73.5			8.1			367	7.40		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p=0.038			Overall significance <sup>1</sup> , p=0.001			
Major city	2,221	74.5	1		7.8	1		203	6.73	1	
Inner regional	824	75.1	0.99	[0.96, 1.03]	8.9	1.11	[0.91, 1.34]	92	8.07	1.17	[1.05, 1.31] *
Outer regional	498	71.0	0.94	[0.90, 0.98] *	10.1	1.33	[1.08, 1.65] *	55	8.13	1.16	[1.02, 1.33] *
Remote/Very remote	58	50.3	0.69	[0.60, 0.80] *	5.8	0.64	[0.25, 1.62]	4	3.78	0.50	[0.28, 0.89] *
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p=0.002			Overall significance <sup>1</sup> , p=0.012			
Least disadvantaged	674	77.6	1		5.7	1		51	6.22	1	
Less disadvantaged	733	72.1	0.93	[0.88, 0.97] *	8.1	1.27	[0.97, 1.67]	66	6.76	1.09	[0.92, 1.28]
Middle 20%	778	75.4	0.97	[0.92, 1.01]	8.3	1.32	[1.01, 1.73] *	78	7.37	1.18	[1.01, 1.39] *
More disadvantaged	740	73.5	0.94	[0.89, 0.98] *	9.5	1.47	[1.13, 1.92] *	77	7.36	1.17	[1.00, 1.38] *
Most disadvantaged	674	69.1	0.89	[0.85, 0.93] *	10.1	1.71	[1.31, 2.22] *	83	8.09	1.30	[1.12, 1.52] *
<b>By accessibility</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p=0.019			Overall significance <sup>1</sup> , p=0.030			
<1 hour	2,897	75.2	1		8.0	1		269	6.91	1	
1-<2 hours	196	72.8	0.95	[0.89, 1.01]	9.6	1.39	[1.03, 1.86] *	22	7.42	1.06	[0.87, 1.29]
2-<4 hours	268	75.1	0.97	[0.92, 1.03]	10.4	1.41	[1.08, 1.83] *	35	9.19	1.30	[1.11, 1.52] *
4-<6 hours	183	58.8	0.78	[0.73, 0.83] *	9.4	1.31	[0.95, 1.81]	22	7.37	1.06	[0.87, 1.28]
6+ hours	56	55.1	0.69	[0.62, 0.78] *	8.3	1.01	[0.51, 2.03]	7	7.37	0.98	[0.70, 1.38]

Notes:

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Counts do not sum to the Queensland total as some cases could not be assigned to an area.

5-year excess death rate calculated as = 100% - 5-year relative survival calculated using the period method for 'at-risk' cases during 2011-2015 for ages 0-89 years.

SIR and SMR are obtained using Poisson models adjusted for broad age groups and sex.

EHR are additionally adjusted for broad types of cancer.

High EHR equates to low survival

Models are run separately for remoteness, area disadvantage and accessibility

1. Overall significance of geographical variable assessed using the likelihood ratio test
2. \* Statistical differences (p<0.05) for the specific geographical category compared to the reference category. Only relevant when there is a significant overall effect for that variable.



## Differences by type of cancer (2011-2015) (cont.)

### Breast cancer (females only)

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	3,218	126.9			10.1			521	19.7		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p =0.569			Overall significance <sup>1</sup> , p =0.233			
Major city	2,034	130.6	1		10.1	1		308	18.8	1	
Inner regional	693	121.5	0.93	[0.90, 0.97] *	9.9	1.01	[0.85, 1.19]	120	20.1	1.06	[0.96, 1.16]
Outer regional	435	123.0	0.95	[0.90, 0.99] *	10.6	1.07	[0.87, 1.31]	69	19.7	1.04	[0.93, 1.17]
Remote/Very remote	56	103.2	0.76	[0.65, 0.89] *	14.6	1.34	[0.86, 2.06]	9	17.1	0.72	[0.47, 1.10]
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p =0.003			Overall significance <sup>1</sup> , p =0.312			
Least disadvantaged	621	136.7	1		7.9	1		83	18.4	1	
Less disadvantaged	655	123.7	0.91	[0.86, 0.95] *	9.9	1.16	[0.92, 1.46]	96	18.1	0.98	[0.86, 1.12]
Middle 20%	692	129.4	0.94	[0.90, 0.99] *	10.1	1.28	[1.02, 1.60] *	107	18.7	1.01	[0.89, 1.15]
More disadvantaged	639	123.3	0.90	[0.86, 0.95] *	11.0	1.42	[1.13, 1.78] *	112	20.4	1.09	[0.96, 1.24]
Most disadvantaged	609	121.2	0.90	[0.85, 0.94] *	12.0	1.50	[1.19, 1.88] *	108	20.0	1.08	[0.95, 1.23]
<b>By accessibility</b>	Overall significance <sup>1</sup> , p=0.001				Overall significance <sup>1</sup> , p =0.490			Overall significance <sup>1</sup> , p=0.574			
<1 hour	2,594	129.0	1		10.0	1		403	19.2	1	
1-<2 hours	166	119.9	0.93	[0.87, 1.00]	10.4	0.91	[0.66, 1.27]	29	19.8	1.03	[0.87, 1.22]
2-<4 hours	220	119.8	0.93	[0.88, 0.99] *	11.4	1.13	[0.87, 1.46]	35	17.6	0.93	[0.80, 1.09]
4-<6 hours	178	116.0	0.90	[0.84, 0.96] *	10.3	1.11	[0.85, 1.46]	29	18.8	0.98	[0.83, 1.16]
6+ hours	59	120.0	0.91	[0.81, 1.02]	13.5	1.35	[0.87, 2.09]	11	24.6	1.20	[0.92, 1.58]

Notes:

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SIR and SMR are obtained using Poisson models adjusted for broad age groups and sex.

EHR are additionally adjusted for broad types of cancer.

High EHR equates to low survival

Models are run separately for remoteness, area disadvantage and accessibility

1. Overall significance of geographical variable assessed using the likelihood ratio test
2. \* Statistical differences (p<0.05) for the specific geographical category compared to the reference category. Only relevant when there is a significant overall effect for that variable.

## Differences by type of cancer (2011-2015) (cont.)

### Bowel cancer

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	3,077	62.2			30.8			1,025	20.6		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p=0.020				Overall significance <sup>1</sup> , p=0.095			Overall significance <sup>1</sup> , p=0.021			
Major city	1,825	61.0	1		30.3	1		588	19.5	1	
Inner regional	748	64.7	1.05 [1.01, 1.09] *		31.9	1.08 [0.99, 1.17]		251	21.5	1.10 [1.03, 1.17] *	
Outer regional	441	64.3	1.04 [0.99, 1.09]		32.1	1.10 [0.99, 1.21]		140	21.1	1.06 [0.98, 1.15]	
Remote/Very remote	63	56.0	0.91 [0.79, 1.05]		30.8	1.17 [0.93, 1.48]		19	18.7	0.88 [0.68, 1.15]	
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p=0.0003			Overall significance <sup>1</sup> , p<0.0001			
Least disadvantaged	484	59.6	1		28.3	1		145	18.3	1	
Less disadvantaged	591	60.3	1.02 [0.97, 1.08]		28.7	1.05 [0.93, 1.18]		180	18.7	1.03 [0.93, 1.13]	
Middle 20%	643	60.6	1.03 [0.97, 1.08]		30.5	1.13 [1.00, 1.27] *		205	19.1	1.05 [0.95, 1.15]	
More disadvantaged	678	64.4	1.09 [1.03, 1.15] *		32.2	1.15 [1.02, 1.29] *		225	20.9	1.15 [1.05, 1.26] *	
Most disadvantaged	679	65.7	1.11 [1.06, 1.17] *		34.1	1.27 [1.13, 1.43] *		243	23.1	1.27 [1.15, 1.39] *	
<b>By accessibility</b>	Overall significance <sup>1</sup> , p=0.007				Overall significance <sup>1</sup> , p=0.060			Overall significance <sup>1</sup> , p=0.004			
<1 hour	2,373	61.3	1		30.6	1		766	19.7	1	
1-<2 hours	190	65.0	1.05 [0.99, 1.13]		30.8	1.01 [0.88, 1.17]		64	21.9	1.09 [0.97, 1.22]	
2-<4 hours	264	69.3	1.10 [1.04, 1.16] *		31.1	1.08 [0.96, 1.22]		92	23.5	1.18 [1.07, 1.30] *	
4-<6 hours	193	64.0	1.04 [0.97, 1.11]		33.5	1.10 [0.96, 1.27]		57	19.5	0.98 [0.87, 1.11]	
6+ hours	58	58.5	0.96 [0.85, 1.08]		36.2	1.34 [1.07, 1.68] *		21	23.8	1.19 [0.98, 1.44]	

#### Notes:

SIR=Standardised Incidence Ratio, EHR=Excess Hazard Ratio, SMR=Standardised Mortality Ratio

Rates expressed per 100,000 and are age-standardised to the 2001 Australian standard population

Count reported as average number of cases/deaths observed per year aggregated over 2011-2015 period.

Counts do not sum to the Queensland total as some cases could not be assigned to an area.

5-year excess death rate calculated as = 100% - 5-year relative survival calculated using the period method for 'at-risk' cases during 2011-2015 for ages 0-89 years.

SIR and SMR are obtained using Poisson models adjusted for broad age groups and sex.

EHR are additionally adjusted for broad types of cancer.

High EHR equates to low survival

Models are run separately for remoteness, area disadvantage and accessibility

1. Overall significance of geographical variable assessed using the likelihood ratio test
2. \* Statistical differences (p<0.05) for the specific geographical category compared to the reference category. Only relevant when there is a significant overall effect for that variable.

## Differences by type of cancer (2011-2015) (cont.)

### Lung cancer

	Incidence				Excess deaths				Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]			Count	Rate	SMR [95% CI]	
Total Queensland	2,309	46.0			83.6				1,759	35.2		
<b>By remoteness</b>	Overall significance <sup>1</sup> , p=0.0001				Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001			
Major city	1,339	44.6	1		81.8	1			978	32.6	1	
Inner regional	558	46.4	1.03	[0.99, 1.08]	85.4	1.15	[1.09, 1.21]*		430	35.8	1.09	[1.03, 1.14]*
Outer regional	347	49.1	1.09	[1.04, 1.15]*	87.2	1.28	[1.20, 1.37]*		269	38.8	1.17	[1.10, 1.24]*
Remote/Very remote	65	58.7	1.29	[1.12, 1.48]*	85.1	1.23	[1.09, 1.40]*		48	43.4	1.27	[1.07, 1.50]*
<b>By area disadvantage</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001			
Least disadvantaged	285	35.4	1		79.6	1			199	25.0	1	
Less disadvantaged	395	40.5	1.15	[1.08, 1.23]*	79.6	1.03	[0.95, 1.12]		278	28.7	1.16	[1.07, 1.26]*
Middle 20%	472	43.8	1.25	[1.17, 1.34]*	83.2	1.17	[1.08, 1.27]*		359	33.3	1.35	[1.25, 1.45]*
More disadvantaged	542	50.3	1.44	[1.35, 1.53]*	86.0	1.26	[1.17, 1.36]*		411	38.2	1.54	[1.42, 1.66]*
Most disadvantaged	615	58.1	1.66	[1.55, 1.76]*	86.0	1.30	[1.21, 1.41]*		478	45.0	1.81	[1.68, 1.94]*
<b>By accessibility</b>	Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001				Overall significance <sup>1</sup> , p<0.0001			
<1 hour		44.5	1		82.9	1			1,290	33.1	1	
1-<2 hours	153	50.1	1.11	[1.03, 1.20]*	85.7	1.20	[1.10, 1.31]*		121	39.8	1.18	[1.09, 1.29]*
2-<4 hours	214	53.4	1.17	[1.10, 1.25]*	84.9	1.09	[1.01, 1.18]*		157	38.9	1.15	[1.07, 1.24]*
4-<6 hours	146	48.1	1.08	[1.00, 1.16]	86.4	1.16	[1.06, 1.26]*		113	38.0	1.14	[1.04, 1.24]*
6+ hours	58	58.9	1.31	[1.17, 1.48]*	85.6	1.19	[1.04, 1.36]*		44	45.5	1.35	[1.18, 1.55]*

#### Notes:

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## More details about how we classify geographical areas

**Remoteness:** Remoteness was determined using the Australian Statistical Geography Standard (ASGS) remoteness structure (Volume 5 – Remoteness areas, July 2011) developed by the Australian Bureau of Statistics (ABS), with the “Remote” and “Very Remote” categories combined into one category.

<http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure#Anchor2b>

**Area disadvantage:** Area disadvantage was categorized by the Socioeconomic Indexes For Areas (SEIFA) The Index of Relative Socio-Economic Disadvantage (IRSD) 2011. SEIFA is developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage. The indexes are based on information from the five-yearly Census.

**Accessibility:** Travel to Cancer Treatment Areas (TRACT) calculated utilising Geographic Information Systems (GIS) technology using MapInfo Professional® and MapMarker® software packages to determine the travel distance to the nearest public and private radiotherapy facility in Queensland in 2011. Statistical Area Level 2 (SA2) regions as defined by the ABS in the 2011 Australian Statistical Geography Standard (ASGS) were used for mapping.