

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 2012-2016, unless otherwise stated.

Terms used in this report:

Incidence (diagnosis): number of new cancers diagnosed in Queensland between 2012 and 2016.

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 region 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 2012 and 2016.

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 0.88 for all cancers among people who live in remote/very remote areas compared to those who live in major cities (see page 6 table) indicates that people living in remote/very remote areas have an 12 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 0.84-0.93. Since this does not include 1, this is considered to be significantly lower.
- An EHR of 1.18 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 11 table) indicates that people who live 6+ hours away have a 18% higher excess death rate (or lower survival) due to lung cancer compared to those who live <1 hour away.
- An SMR of 1.32 for melanoma among people living in the most disadvantaged areas compared to the least disadvantaged areas (see page 8 table) indicates that people living in the most disadvantaged areas have a 32% 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 2012 and 2016?

(All estimates are compared to Major City areas)

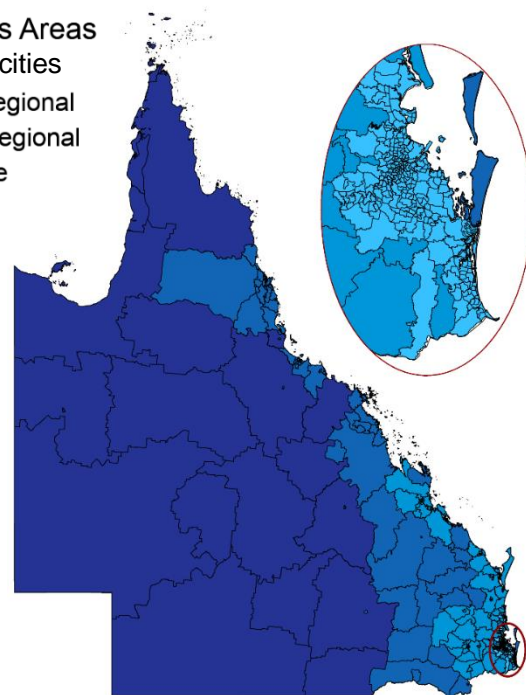
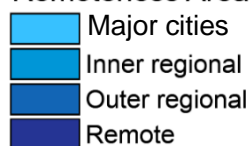
Cancer diagnosis: Rate of new cancers diagnosed

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	Yes Higher in regional areas, Lower in remote areas	Yes Lower in regional and remote areas	Yes Higher in regional areas
Prostate cancer	Yes Higher in regional areas, Lower in Remote areas	Yes No clear pattern	No
Melanoma	Yes Lower in outer regional and remote areas.	No	Yes Higher in regional areas, Lower in remote areas
Breast cancer	Yes Lower in regional and remote areas	No	No
Bowel cancer	Yes Higher in inner regional areas	No	Yes Higher in inner regional areas
Lung cancer	Yes Higher in outer regional and remote areas	Yes Lower in regional and remote areas	Yes Higher in regional and remote areas

Is there variation in cancer incidence, survival and mortality by area-level ‘Area disadvantage’ between 2012 and 2016?

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

Cancer diagnosis: Rate of new cancers diagnosed

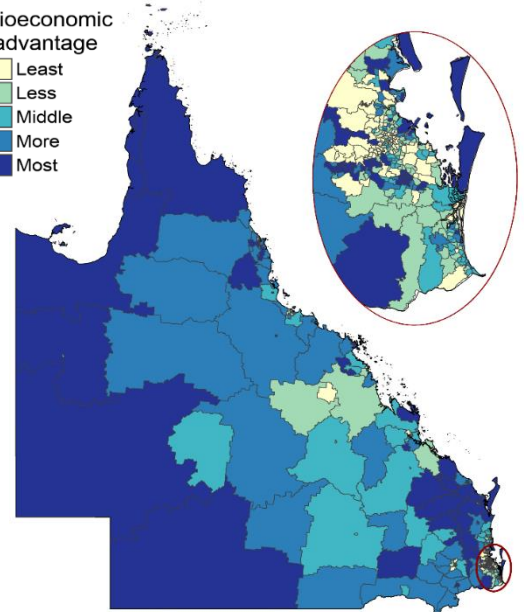
Cancer survival: Corresponds to the risk of people diagnosed with cancer dying from the disease within five years of diagnosis

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



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

Is there variation in cancer incidence, survival and mortality by ‘Accessibility’ between 2012 and 2016?

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

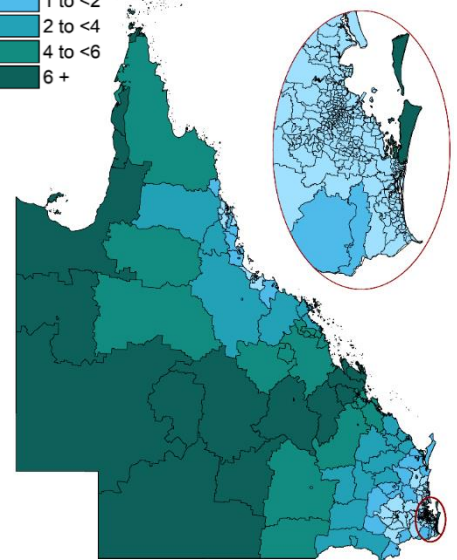
Cancer diagnosis: Rate of new cancers diagnosed

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

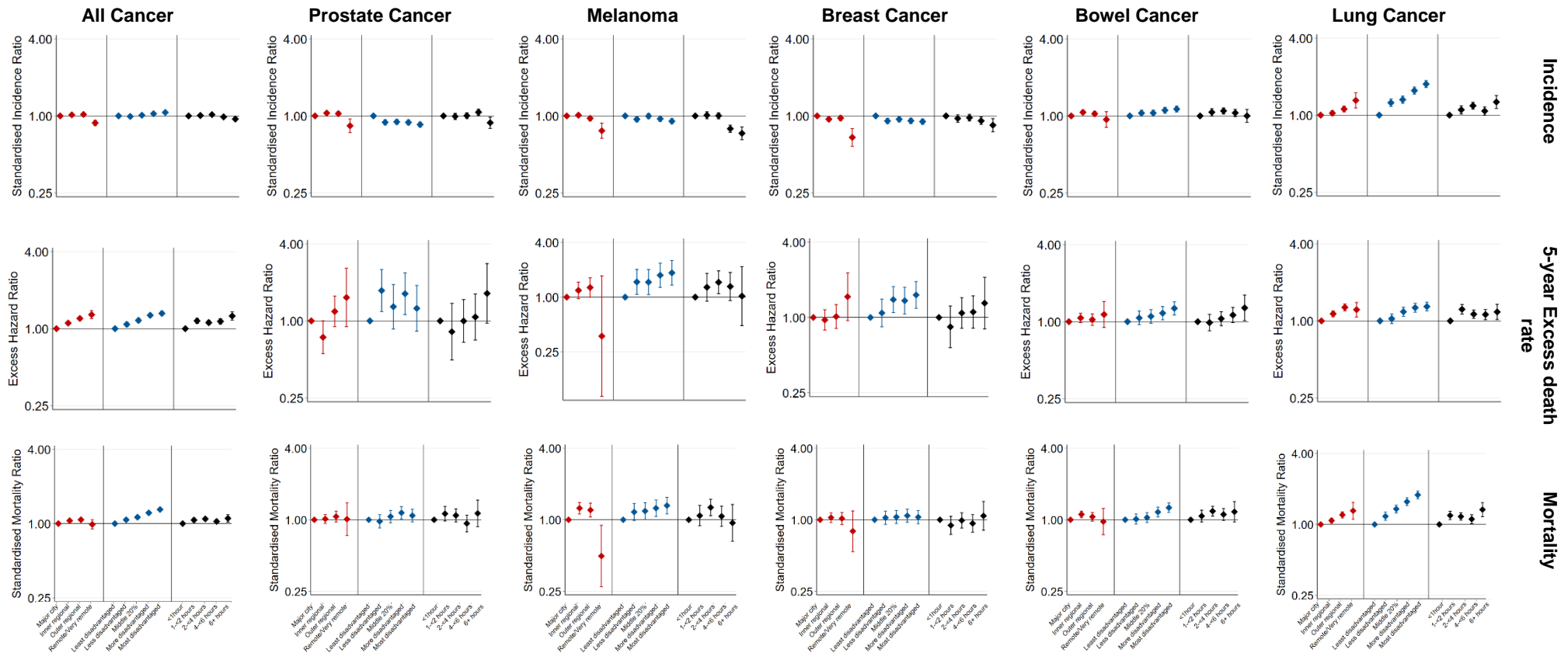
The following summary is based on the data tables on pages 6-11
(Note that Cancer survival is the inverse of Excess deaths).

Driving time (hours)



	Cancer diagnoses?	Cancer survival?	Cancer deaths?
All cancers	Yes Lower in less accessible areas	Yes Lower in less accessible areas	Yes Higher in less accessible areas
Prostate cancer	Yes No consistent pattern	No	No
Melanoma	Yes Lower in less accessible areas	No	No
Breast cancer	Yes Lower in less accessible areas	No	No
Bowel cancer	Yes Higher in moderately less accessible areas (1-<4 hours travelling)	No	Yes Higher in moderately less accessible areas (2-<4 hours travelling)
Lung cancer	Yes Higher in less accessible areas	Yes Lower in less accessible areas	Yes Higher in less accessible areas

Overview of differences in cancer incidence, 5-year excess deaths and mortality by Remoteness, Area disadvantage and accessibility, 2012-2016



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 (2012-2016)

All cancers

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	27,518	538.1			30.0			8,910	173.1		
By remoteness	Overall significance ¹ , p<0.001				Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Major city	16,380	529.3	1		28.7	1		4,983	159.4	1	
Inner regional	6,448	545.2	1.02	[1.01, 1.03]*	30.6	1.11	[1.08, 1.14]*	2,068	170.0	1.06	[1.03, 1.08]*
Outer regional	3,997	551.1	1.03	[1.01, 1.04]*	30.8	1.20	[1.16, 1.24]*	1,225	173.5	1.08	[1.05, 1.11]*
Remote/Very remote	563	488.8	0.88	[0.84, 0.93]*	34.4	1.29	[1.20, 1.38]*	185	174.8	0.99	[0.90, 1.07]
By area disadvantage	Overall significance ¹ , p<0.001				Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Least disadvantaged	4,584	524.2	1		23.3	1		1,188	143.6	1	
Less disadvantaged	5,378	518.4	0.99	[0.97, 1.01]	27.2	1.08	[1.04, 1.13]*	1,532	153.0	1.07	[1.03, 1.11]*
Middle 20%	5,753	529.7	1.01	[1.00, 1.03]	29.2	1.16	[1.12, 1.21]*	1,783	160.4	1.13	[1.09, 1.16]*
More disadvantaged	5,862	546.0	1.04	[1.02, 1.06]*	32.2	1.27	[1.22, 1.32]*	1,935	174.6	1.22	[1.18, 1.26]*
Most disadvantaged	5,810	557.8	1.07	[1.05, 1.08]*	34.5	1.32	[1.27, 1.37]*	2,020	186.6	1.30	[1.26, 1.34]*
By accessibility	Overall significance ¹ , p=0.0013				Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
<1 hour	21,420	533.7	1		28.8	1		6,519	161.3	1	
1-<2 hours	1,609	545.4	1.01	[0.99, 1.03]	32.2	1.15	[1.10, 1.20]*	535	175.5	1.07	[1.03, 1.11]*
2-<4 hours	2,168	555.4	1.03	[1.01, 1.05]*	34.5	1.12	[1.07, 1.16]*	727	179.3	1.09	[1.05, 1.13]*
4-<6 hours	1,657	528.0	0.98	[0.96, 1.01]	31.5	1.14	[1.09, 1.19]*	513	168.8	1.04	[1.00, 1.08]*
6+ hours	534	516.3	0.95	[0.91, 0.98]*	34.2	1.26	[1.17, 1.35]*	169	184.3	1.10	[1.03, 1.18]*

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 2012-2016 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 2012-2016 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 (2012-2016) (cont.)

Prostate cancer

	Incidence			Excess deaths			Mortality		
	Count	Rate	SIR [95% CI]	5-year (%)	EHR [95% CI]	Count	Rate	SMR [95% CI]	
Total Queensland	4,046	75.9		6.1		650	29.0		
By remoteness	Overall significance ¹ , p=0.04			Overall significance ¹ , p=0.024			Overall significance ¹ , p=0.717		
Major city	2,302	72.3	1	5.8	1	353	26.3	1	
Inner regional	1,012	79.5	1.05 [1.02, 1.09] *	4.5	0.74 [0.55, 1.00]	147	26.8	1.02 [0.93, 1.11]	
Outer regional	619	81.7	1.04 [1.00, 1.08]*	7.2	1.19 [0.90, 1.56]	87	27.5	1.06 [0.96, 1.18]	
Remote/Very remote	85	72.2	0.83 [0.74, 0.95]*	9.5	1.52 [0.90, 2.58]	14	32.2	1.01 [0.74, 1.39]	
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p=0.019			Overall significance ¹ , p=0.039		
Least disadvantaged	738	83.3	1	5.2	1	86	25.6	1	
Less disadvantaged	786	74.1	0.89 [0.85, 0.93] *	7.3	1.73 [1.18, 2.52]*	103	24.1	0.97 [0.85, 1.10]	
Middle 20%	848	74.3	0.90 [0.86, 0.94] *	5.6	1.29 [0.87, 1.93]	132	26.8	1.06 [0.94, 1.20]	
More disadvantaged	849	74.6	0.89 [0.85, 0.93] *	6.8	1.63 [1.12, 2.38]*	144	28.8	1.14 [1.02, 1.29] *	
Most disadvantaged	797	71.5	0.86 [0.82, 0.90] *	3.9	1.25 [0.83, 1.89]	136	27.5	1.08 [0.96, 1.22]	
By accessibility	Overall significance ¹ , p=0.017			Overall significance ¹ , p=0.396			Overall significance ¹ =0.201		
<1 hour	3,081	74.1	1	5.7	1	460	26.4	1	
1-<2 hours	254	77.5	0.99 [0.94, 1.05]	5.1	0.82 [0.49, 1.37]	42	29.5	1.13 [0.98, 1.30]	
2-<4 hours	335	78.0	1.00 [0.95, 1.06]	5.7	1.00 [0.68, 1.47]	55	28.9	1.09 [0.96, 1.23]	
4-<6 hours	270	83.9	1.07 [1.01, 1.13] *	6.0	1.07 [0.71, 1.62]	32	24.1	0.93 [0.79, 1.09]	
6+ hours	79	74.9	0.88 [0.80, 0.98] *	8.0	1.64 [0.96, 2.81]	12	32.5	1.13 [0.87, 1.47]	

Notes:

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

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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 2012-2016 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 (2012-2016) (cont.)

Melanoma

	Incidence				Excess deaths			Mortality			
	Count	Rate	SIR [95% CI]		5-year (%)	EHR [95% CI]		Count	Rate	SMR [95% CI]	
Total Queensland	3,731	74.3			7.2			364	7.18		
By remoteness	Overall significance ¹ , p=0.0002				Overall significance ¹ , p=0.073			Overall significance ¹ , p<0.001			
Major city	2,280	74.5	1		6.3	1		193	6.21	1	
Inner regional	862	76.8	1.01	[0.98, 1.05]	7.7	1.19	[0.96, 1.46]	94	7.98	1.25	[1.12, 1.40]*
Outer regional	520	72.4	0.96	[0.92, 1.00]*	8.1	1.28	[1.00, 1.63]	54	7.86	1.21	[1.05, 1.38]*
Remote/Very remote	63	54.6	0.77	[0.67, 0.88]*	1.4	0.37	[0.08, 1.71]	4	3.63	0.50	[0.27, 0.90]*
By area disadvantage	Overall significance ¹ , p=0.0001				Overall significance ¹ , p=0.002			Overall significance ¹ , p=0.015			
Least disadvantaged	687	77.0	1		8.2	1		48	5.75	1	
Less disadvantaged	758	72.7	0.94	[0.90, 0.99]*	8.3	1.47	[1.07, 2.01]	67	6.65	1.16	[0.99, 1.37]
Middle 20%	816	72.7	1.01	[0.95, 1.04]	7.3	1.46	[1.07, 2.01]*	73	6.77	1.18	[1.00, 1.39]*
More disadvantaged	764	74.1	0.95	[0.91, 0.99]*	6.6	1.74	[1.28, 2.37]*	77	7.18	1.25	[1.07, 1.47]*
Most disadvantaged	700	70.0	0.91	[0.87, 0.95]*	3.9	1.85	[1.35, 2.53]*	79	7.60	1.32	[1.12, 1.55]*
By accessibility	Overall significance ¹ , p<0.001				Overall significance ¹ , p=0.059			Overall significance ¹ , p=0.060			
<1 hour	2,978	75.2	1		6.5	1		262	6.55	1	
1-<2 hours	215	78.2	1.01	[0.95, 1.08]	7.1	1.28	[0.90, 1.83]	21	7.19	1.08	[0.89, 1.32]
2-<4 hours	283	77.4	1.01	[0.95, 1.06]	8.7	1.46	[1.09, 1.94]*	33	8.71	1.27	[1.08, 1.49]*
4-<6 hours	190	60.2	0.79	[0.74, 0.85]*	8.6	1.31	[0.92, 1.87]	22	7.01	1.07	[0.88, 1.30]
6+ hours	60	57.6	0.73	[0.65, 0.82]*	5.7	1.03	[0.49, 2.17]	6	6.82	0.94	[0.66, 1.34]

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 2012-2016 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 2012-2016 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 (2012-2016) (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	3,327	127.9		9.6		557	20.5		
By remoteness	Overall significance ¹ , p<0.001			Overall significance ¹ , p=0.340			Overall significance ¹ , p=0.541		
Major city	2,090	130.8	1	8.8	1	320	19.0	1	
Inner regional	719	122.7	0.94 [0.91, 0.98] *	8.4	0.96 [0.79, 1.15]	123	19.5	1.04 [0.95, 1.14]	
Outer regional	454	125.6	0.96 [0.92, 1.01]	9.1	1.02 [0.82, 1.27]	71	19.6	1.02 [0.91, 1.15]	
Remote/Very remote	51	92.0	0.68 [0.58, 0.80] *	12.2	1.46 [0.94, 2.27]	9	17.5	0.80 [0.54, 1.19]	
By area disadvantage	Overall significance ¹ , p=0.0003			Overall significance ¹ , p=0.003			Overall significance ¹ , p=0.818		
Least disadvantaged	639	136.8	1	10.8	1	85	18.2	1	
Less disadvantaged	678	124.4	0.91 [0.87, 0.96] *	9.1	1.09 [0.84, 1.40]	104	18.9	1.04 [0.91, 1.18]	
Middle 20%	707	129.4	0.94 [0.90, 0.99] *	9.2	1.39 [1.09, 1.76] *	113	19.5	1.05 [0.93, 1.20]	
More disadvantaged	663	125.2	0.92 [0.87, 0.96] *	8.2	1.36 [1.07, 1.74] *	113	20.2	1.08 [0.95, 1.23]	
Most disadvantaged	626	121.9	0.90 [0.86, 0.95] *	6.9	1.51 [1.18, 1.93] *	106	19.2	1.05 [0.93, 1.20]	
By accessibility	Overall significance ¹ , p=0.004			Overall significance ¹ , p=0.600			Overall significance ¹ , p=0.669		
<1 hour	2,666	129.1	1	8.7	1	419	19.4	1	
1-<2 hours	174	123.9	0.96 [0.89, 1.02]	8.7	0.84 [0.57, 1.23]	26	17.8	0.90 [0.75, 1.07]	
2-<4 hours	233	123.9	0.97 [0.91, 1.03]	9.7	1.09 [0.82, 1.44]	38	19.1	0.99 [0.85, 1.14]	
4-<6 hours	185	118.7	0.92 [0.86, 0.98] *	9.1	1.11 [0.82, 1.49]	29	18.0	0.93 [0.79, 1.10]	
6+ hours	56	110.0	0.85 [0.75, 0.95] *	10.9	1.30 [0.81, 2.09]	10	22.2	1.08 [0.81, 1.43]	

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 2012-2016 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 (2012-2016) (cont.)

Bowel cancer

	Incidence			Excess deaths			Mortality		
	Count	Rate	SIR [95% CI]	5-year (%)	EHR [95% CI]	Count	Rate	SMR [95% CI]	
Total Queensland	3,115	61.2		30.9		1,063	20.7		
By remoteness	Overall significance ¹ , p=0.035			Overall significance ¹ , p=0.328			Overall significance ¹ , p=0.015		
Major city	1,833	59.4	1	29.9	1	593	19.0	1	
Inner regional	762	64.1	1.07 [1.03, 1.11]*	31.6	1.07 [0.98, 1.16]	256	21.2	1.11 [1.04, 1.19]*	
Outer regional	444	62.8	1.04 [0.99, 1.09]	30.2	1.04 [0.94, 1.15]	141	20.5	1.06 [0.98, 1.15]	
Remote/Very remote	66	58.8	0.94 [0.81, 1.08]	29.6	1.14 [0.90, 1.44]	19	20.6	0.97 [0.75, 1.24]	
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p=0.001			Overall significance ¹ , p<0.001		
Least disadvantaged	482	57.4	1	33.9	1	148	18.0	1	
Less disadvantaged	605	59.6	1.05 [1.00, 1.11]	31.4	1.07 [0.95, 1.21]	180	18.0	1.01 [0.92, 1.12]	
Middle 20%	653	59.9	1.05 [1.00, 1.11]*	29.3	1.10 [0.97, 1.24]	207	18.6	1.04 [0.95, 1.15]	
More disadvantaged	683	62.9	1.11 [1.05, 1.17]*	28.1	1.17 [1.04, 1.31]*	230	20.8	1.16 [1.06, 1.27]*	
Most disadvantaged	682	64.4	1.13 [1.07, 1.19]*	28.0	1.27 [1.13, 1.43]*	245	22.7	1.26 [1.15, 1.38]*	
By accessibility	Overall significance ¹ , p=0.007			Overall significance ¹ , p=0.108			Overall significance ¹ , p=0.003		
<1 hour	2,393	59.9	1	30.0	1	771	19.1	1	
1-<2 hours	193	64.3	1.07 [1.00, 1.14]*	29.8	0.98 [0.85, 1.14]	63	21.1	1.07 [0.96, 1.21]	
2-<4 hours	263	67.2	1.09 [1.03, 1.16]*	30.9	1.05 [0.93, 1.19]	92	22.9	1.18 [1.07, 1.30]*	
4-<6 hours	196	63.8	1.06 [0.99, 1.13]	33.7	1.13 [0.98, 1.29]	64	21.3	1.11 [0.99, 1.24]	
6+ hours	60	60.8	1.00 [0.89, 1.12]	34.0	1.28 [1.02, 1.62]*	21	23.2	1.17 [0.96, 1.42]	

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 2012-2016 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 2012-2016 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 (2012-2016) (cont.)

Lung cancer

	Incidence			Excess deaths			Mortality		
	Count	Rate	SIR [95% CI]	5-year (%)	EHR [95% CI]	Count	Rate	SMR [95% CI]	
Total Queensland	2,408	46.6		82.7		1,814	35.1		
By remoteness	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001		
Major city	1,384	44.6	1	80.7	1	980	31.6	1	
Inner regional	578	46.6	1.04 [0.99, 1.08]	84.3	1.14 [1.08, 1.20]*	427	34.4	1.08 [1.03, 1.14]*	
Outer regional	366	50.3	1.12 [1.06, 1.18]*	85.9	1.28 [1.20, 1.36]*	278	38.6	1.21 [1.14, 1.28]*	
Remote/Very remote	65	58.2	1.30 [1.14, 1.50]*	85.1	1.22 [1.07, 1.39]*	46	42.1	1.31 [1.11, 1.54]*	
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001		
Least disadvantaged	279	33.5	1	84.9	1	200	24.3	1	
Less disadvantaged	420	41.6	1.25 [1.17, 1.34]*	85.4	1.04 [0.95, 1.13]	283	28.2	1.17 [1.08, 1.27]*	
Middle 20%	485	43.8	1.32 [1.24, 1.41]*	81.8	1.18 [1.05, 1.34]*	361	32.5	1.35 [1.25, 1.46]*	
More disadvantaged	573	51.8	1.56 [1.46, 1.66]*	78.5	1.27 [1.17, 1.37]*	418	37.7	1.56 [1.45, 1.68]*	
Most disadvantaged	635	58.1	1.75 [1.64, 1.86]*	78.1	1.29 [1.20, 1.40]*	470	42.9	1.78 [1.65, 1.92]*	
By accessibility	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001		
<1 hour	1805	44.7	1	81.7	1	1,298	32.2	1	
1-<2 hours	157	49.9	1.10 [1.02, 1.19]*	86.0	1.23 [1.13, 1.34]*	123	38.7	1.19 [1.10, 1.29]*	
2-<4 hours	223	54.1	1.19 [1.11, 1.26]*	84.1	1.13 [1.05, 1.22]*	159	38.1	1.17 [1.08, 1.26]*	
4-<6 hours	149	48.5	1.08 [1.00, 1.16]	84.9	1.12 [1.02, 1.23]*	110	36.2	1.11 [1.02, 1.21]*	
6+ hours	57	58.3	1.27 [1.13, 1.43]*	85.4	1.18 [1.03, 1.35]*	43	44.6	1.34 [1.17, 1.53]*	

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.