CANCER FACTS

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 2013-2017, unless otherwise stated.

Terms used in this report:

Incidence (diagnosis): number or rate of new cancers diagnosed in Queensland between 2013 and 2017.

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.

Mortality (deaths): number or rate of cancer deaths in Queensland during 2013 and 2017.

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.

Cancer survival: the percentage of people who survive for at least 5 years after their cancer diagnosis.

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.

Terms used to describe geographical areas (see page 13 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 2016. Categories are: <1 hour (reference), 1-<2 hours, 2-<4 hours, 4-<6 hours, 6+ hours.



Geographical differences in cancer across Queensland

Was there variation in cancer incidence, survival and mortality by 'remoteness' between 2013 and 2017?

(All estimates are compared to major city areas)

Cancer diagnosis rate: rate of new cancers diagnosed.

Cancer survival: the percentage of people who survive for at least 5 years after their cancer diagnosis.

Cancer death rate: 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).



	Is there a difference in cancer diagnosis rates based on remoteness?	Is there a difference in cancer survival based on remoteness?	Is there a difference in cancer death rates based on remoteness?
For all cancers	Yes	Yes	Yes
	Higher in regional areas	Lower in regional and	Higher in regional areas
	Lower in remote areas	remote areas	
For prostate cancer	Yes Higher in outer regional area Lower in Remote areas	Νο	Νο
For melanoma	Yes Lower in remote areas	Νο	Yes Higher in regional areas
For breast cancer	Yes Lower in regional and remote areas	Νο	Νο
For bowel cancer	Yes Higher in inner regional areas	Νο	No
For lung cancer	Yes Higher in outer regional and remote areas	Yes Lower in regional and remote areas	Yes Higher in outer regional and remote areas



Was there variation in cancer incidence, survival and mortality by area-level 'area disadvantage' between 2013 and 2017?

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

Cancer diagnosis rate: rate of new cancers diagnosed.

Cancer survival: the percentage of people who survive for at least 5 years after their cancer diagnosis.

Cancer death rate: 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).



	Is there a difference in	Is there a difference in	Is there a difference
	cancer diagnosis rates	cancer survival based	in cancer death rates
	based on socioeconomic	on socioeconomic	based on socioeconomic
	disadvantage?	disadvantage?	disadvantage?
For all cancers	Yes	Yes	Yes
	Higher in areas of	Lower in areas of	Higher in areas of
	greater disadvantage	greater disadvantage	greater disadvantage
For prostate cancer	Yes Lower in areas of greater disadvantage	Yes No clear pattern	Yes No clear pattern
For melanoma	Yes	Yes	Yes
	Lower in areas of	Lower in areas of	Higher in areas of
	greater disadvantage	greater disadvantage	greater disadvantage
For breast cancer	Yes Lower in areas of greater disadvantage	Yes Lower in areas of greater disadvantage	No
For bowel cancer	Yes	Yes	Yes
	Higher in areas of	Lower in areas of	Higher in areas of
	greater disadvantage	greater disadvantage	greater disadvantage
For lung cancer	Yes	Yes	Yes
	Higher in areas of	Lower in areas of	Higher in areas of
	greater disadvantage	greater disadvantage	greater disadvantage



Geographical differences in cancer across Queensland

Was there variation in cancer incidence, survival and mortality by 'accessibility' between 2013 and 2017?

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

Cancer diagnosis rate: rate of new cancers diagnosed.

Cancer survival: the percentage of people who survive for at least 5 years after their cancer diagnosis.

Cancer death rate: 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).



	Is there a difference in cancer diagnosis rates based on accessibility to the nearest radiation facility?	Is there a difference in cancer survival based on accessibility to the nearest radiation facility?	Is there a difference in cancer death rates based on accessibility to the nearest radiation facility?
For all cancers	Yes Lower in less accessible areas	Yes No clear pattern	Yes No clear pattern
For prostate cancer	Νο	Νο	No
For melanoma	Yes Lower in less accessible areas	Yes No clear pattern	Yes No clear pattern
For breast cancer	Yes Lower in less accessible areas	Νο	Νο
For bowel cancer	Νο	Νο	No
For lung cancer	Yes Higher in less accessible areas	Yes Lower in less accessible areas	Yes Higher in less accessible areas



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 6 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 1.13 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 13% higher excess death rate (or lower survival) due to lung cancer compared to those who live <1 hour away.

An SMR of 1.31 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 31% higher mortality rate due to melanoma compared to those who live in the least disadvantaged areas.



Overview of differences in cancer incidence, 5-year excess deaths and mortality by Remoteness, Area disadvantage and accessibility, 2013-2017



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).



All cancers

	Incidence				Exe	Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]	
Total Queensland	28,420	540.3			29.7			9076	170.7			
By remoteness	Overall significance ¹ , p<0.001			Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Major city	16,910	531.6	1		29.0	1		5173	160.3	1		
Inner regional	6,678	547.6	1.02	[1.01, 1.03]*	30.7	1.09	[1.06, 1.12]*	2133	169.2	1.04	[1.02, 1.07]*	
Outer regional	4,204	551.4	1.03	[1.01, 1.04]*	31.7	1.20	[1.17, 1.24]*	1287	172.9	1.06	[1.04, 1.09]*	
Remote/Very remote	490	499.8	0.89	[0.85, 0.94] *	33.9	1.32	[1.22, 1.43]*	161	180.2	1.00	[0.91, 1.10]	
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001					
Least disadvantaged	4,479	520.5	1		33.0	1		1202	143.3	1		
Less disadvantaged	5,857	525.5	1.01	[0.99, 1.03]	28.7	1.12	[1.07, 1.16]*	1707	154.5	1.08	[1.04, 1.11]*	
Middle 20%	6,164	532.7	1.02	[1.00, 1.04]	28.0	1.14	[1.10, 1.19]*	1858	161.0	1.12	[1.08, 1.15]*	
More disadvantaged	5,938	549.5	1.05	[1.03, 1.07]*	24.4	1.30	[1.25, 1.35]*	1958	174.9	1.21	[1.17, 1.25]*	
Most disadvantaged	5,841	558.5	1.07	[1.05, 1.09]*	29.3	1.35	[1.30, 1.40]*	2028	186.6	1.29	[1.25, 1.33]*	
By accessibility	Ove	rall signif	icance	^ı , p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
<1 hour	23,318	538.0	1		33.2	1		7151	162.8	1		
1-<2 hours	1,968	544.3	1.00	[0.98, 1.02]	32.7	1.18	[1.13, 1.23]*	652	175.1	1.05	[1.02, 1.09]*	
2-<4 hours	1,689	538.2	0.99	[0.97, 1.01]	30.0	1.13	[1.08, 1.19]*	562	176.2	1.07	[1.03, 1.11]*	
4-<6 hours	902	519.7	0.98	[0.96, 1.01]	33.0	1.07	[1.00, 1.14]	260	158.7	0.96	[0.91, 1.01]	
6+ hours	406	525.9	0.95	[0.91, 0.98]*	33.2	1.30	[1.19, 1.41]*	129	190.3	1.11	[1.03, 1.20]*	

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 2013-2017 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 2013-2017 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.



Prostate cancer

		Inc	idence		Exe	cess dea	ths	Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]
Total Queensland	4081	74.2			5.9			644	27.5		
By remoteness	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Major city	2323	70.9	1		5.7	1		360	25.9	1	
Inner regional	1012	76.7	1.04	[1.00, 1.07]	5.2	0.79	[0.60, 1.04]	151	26.3	1.01	[0.93, 1.10]
Outer regional	646	80.3	1.05	[1.01, 1.09]*	7.9	1.16	[0.89, 1.52]	89	26.1	1.04	[0.94, 1.15]
Remote/Very remote	71	70.0	0.80	[0.69, 0.91]*	9.8	1.41	[0.77, 2.58]	12	31.6	0.91	[0.62, 1.33]
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Least disadvantaged	689	79.1	1		7.4	1		87	25.2	1	
Less disadvantaged	847	73.5	0.93	[0.89, 0.97]*	6.6	1.06	[0.75, 1.50]	115	24.2	0.97	[0.86, 1.10]
Middle 20%	874	72.3	0.90	[0.86, 0.94]*	5.8	1.31	[0.95, 1.82]	143	28.1	1.13	[1.00, 1.27]
More disadvantaged	844	72.9	0.90	[0.86, 0.94]*	4.6	1.28	[0.92, 1.79]	144	28.1	1.12	[0.99, 1.26]
Most disadvantaged	798	71.3	0.88	[0.84, 0.92]*	5.7	1.00	[0.69, 1.44]	124	24.8	0.99	[0.87, 1.11]
By accessibility	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Ove	rall signit	ficance	¹ , p<0.001
<1 hour	3283	72.8	1		7.4	1		500	26.2	1	
1-<2 hours	306	76.5	0.99	[0.94, 1.04]	7.5	0.99	[0.66, 1.47]	49	27.2	1.05	[0.92, 1.20]
2-<4 hours	269	80.5	1.04	[0.98, 1.10]	5.6	1.32	[0.93, 1.87]	40	26.5	1.04	[0.90, 1.20]
4-<6 hours	136	75.5	0.97	[0.90, 1.05]	8.0	0.99	[0.56, 1.75]	14	19.2	0.73	[0.58, 0.93]*
6+ hours	58	74.9	0.87	[0.78, 0.98]*	7.4	1.17	[0.52, 2.63]	10	34.1	1.23	[0.92, 1.63]

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 2013-2017 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 2013-2017 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.



Melanoma

	Incidence				Exe	Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]	
Total Queensland	3,885	75.4			7.0			364	6.9			
By remoteness	Overall significance ¹ , p<0.001			Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Major city	2,366	75.3	1		6.7	1		193	6.0	1		
Inner regional	906	78.4	1.02	[0.99, 1.06]	8.2	1.24	[1.02, 1.51]	92	7.6	1.22	[1.09, 1.36]*	
Outer regional	550	73.3	0.96	[0.92, 1.00]	8.5	1.28	[1.01, 1.61]	55	7.6	1.20	[1.05, 1.38]*	
Remote/Very remote	54	55.2	0.74	[0.64, 0.87]*	2.4	0.70	[0.27, 1.78]	5	5.2	0.84	[0.49, 1.42]	
By area disadvantage	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001					
Least disadvantaged	674	77.3	1		8.0	1		48	5.6	1		
Less disadvantaged	842	76.2	0.98	[0.93, 1.02]	7.3	1.23	[0.91, 1.67]	68	6.3	1.08	[0.92, 1.28]	
Middle 20%	883	77.5	0.99	[0.95, 1.04]	6.6	1.25	[0.93, 1.69]	73	6.4	1.10	[0.93, 1.29]	
More disadvantaged	768	74.5	0.95	[0.90, 0.99]*	5.0	1.65	[1.23, 2.20]*	76	7.0	1.20	[1.03, 1.42]*	
Most disadvantaged	709	70.6	0.91	[0.86, 0.95]*	7.0	1.76	[1.32, 2.35]*	80	7.6	1.31	[1.11, 1.53]*	
By accessibility	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
<1 hour	3,256	76.5	1		6.6	1		279	6.4	1		
1-<2 hours	248	73.5	0.94	[0.88, 0.99]*	12.0	0.96	[0.67, 1.38]	28	7.6	1.16	[0.97, 1.38]	
2-<4 hours	218	72.6	0.93	[0.87, 0.98]*	8.9	1.85	[1.42, 2.43]*	25	8.4	1.23	[1.02, 1.47]*	
4-<6 hours	109	62.9	0.81	[0.74, 0.88]*	1.0	1.73	[1.19, 2.52]*	11	6.4	0.96	[0.73, 1.27]	
6+ hours	44	56.8	0.69	[0.61, 0.79]*	6.6	0.48	[0.12, 1.92]	3	4.6	0.66	[0.40, 1.08]	

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 2013-2017 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 2013-2017 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.



Breast cancer (females only)

		Inc	idence		Exe	Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]	
Total Queensland	3405	127.6			8.9			565	20.3			
By remoteness	Ove	rall signif	icance	, p<0.001	Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Major city	2152	131.1	1		8.9	1		332	19.1	1		
Inner regional	734	121.8	0.93	[0.90, 0.97]*	9.5	1.07	[0.90, 1.26]	126	19.8	1.03	[0.94, 1.13]	
Outer regional	452	119.9	0.91	[0.87, 0.95]*	8.9	1.05	[0.86, 1.29]	71	18.7	0.97	[0.86, 1.09]	
Remote/Very remote	49	102.2	0.73	[0.61, 0.87]*	10.5	1.23	[0.75, 2.02]	8	19.0	1.00	[0.67, 1.50]	
By area disadvantage	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Least disadvantaged	605	133.7	1		10.3	1		83	17.9	1		
Less disadvantaged	763	131.0	0.98	[0.94, 1.03]	7.8	1.17	[0.93, 1.48]	116	19.3	1.08	[0.96, 1.23]	
Middle 20%	736	124.3	0.93	[0.89, 0.98]*	9.0	1.14	[0.90, 1.46]	118	19.5	1.08	[0.95, 1.22]	
More disadvantaged	664	125.6	0.94	[0.89, 0.99]*	7.6	1.42	[1.13, 1.80]*	113	20.1	1.10	[0.97, 1.25]	
Most disadvantaged	619	120.1	0.91	[0.86, 0.95]*	9.0	1.52	[1.20, 1.93]*	107	19.3	1.08	[0.95, 1.22]	
By accessibility	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
<1 hour	2865	129.0	1		9.1	1		452	19.3	1		
1-<2 hours	200	118.5	0.90	[0.85, 0.96]*	9.9	0.95	[0.70, 1.28]	35	19.6	0.99	[0.85, 1.15]	
2-<4 hours	177	116.5	0.90	[0.84, 0.96]*	8.8	1.19	[0.89, 1.57]	29	18.0	0.92	[0.78, 1.09]	
4-<6 hours	103	120.5	0.93	[0.85, 1.02]	11.5	1.04	[0.71, 1.52]	15	18.4	0.94	[0.75, 1.18]	
6+ hours	42	111.2	0.84	[0.74, 0.97]*	9.1	1.39	[0.83, 2.30]	7	20.7	1.06	[0.76, 1.47]	

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 2013-2017 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 2013-2017 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.



Bowel cancer

	Incidence				Exe	Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]	
Total Queensland	3161	60.3			31.1			1093	20.6			
By remoteness	Ove	rall signif	icance	, p<0.001	Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Major city	1860	58.6	1		31.0	1		626	19.4	1		
Inner regional	776	63.3	1.07	[1.03, 1.11]*	32.1	1.05	[0.97, 1.13]	264	21.1	1.08	[1.01, 1.15]	
Outer regional	454	60.9	1.03	[0.98, 1.07]	31.9	1.04	[0.94, 1.15]	146	20.1	1.02	[0.94, 1.10]	
Remote/Very remote	58	61.7	1.02	[0.88, 1.19]	30.0	1.03	[0.80, 1.34]	19	22.4	1.03	[0.78, 1.36]	
By area disadvantage	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Least disadvantaged	471	56.2	1		34.0	1		144	17.1	1		
Less disadvantaged	645	58.4	1.05	[1.00, 1.11]*	28.9	1.18	[1.05, 1.34]*	215	19.5	1.14	[1.04, 1.25]*	
Middle 20%	681	59.4	1.06	[1.01, 1.12]*	31.0	1.09	[0.97, 1.23]	213	18.5	1.08	[0.98, 1.19]	
More disadvantaged	685	62.8	1.12	[1.06, 1.18]*	27.6	1.32	[1.17, 1.49]*	239	21.5	1.24	[1.13, 1.36]*	
Most disadvantaged	666	63.0	1.12	[1.06, 1.18]*	31.2	1.32	[1.17, 1.48]*	243	22.4	1.30	[1.18, 1.42]*	
By accessibility	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
<1 hour	2569	59.5	1		33.0	1		861	19.6	1		
1-<2 hours	232	63.1	1.06	[1.00, 1.13]	31.8	1.10	[0.97, 1.24]	78	21.3	1.06	[0.96, 1.18]	
2-<4 hours	196	62.4	1.04	[0.98, 1.11]	34.3	1.01	[0.88, 1.16]	65	20.5	1.04	[0.93, 1.16]	
4-<6 hours	105	62.8	1.04	[0.95, 1.13]	27.1	1.07	[0.89, 1.29]	36	22.2	1.12	[0.96, 1.30]	
6+ hours	46	62.0	1.02	[0.90, 1.16]	33.0	1.00	[0.74, 1.34]	14	23.1	1.03	[0.82, 1.31]	

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 2013-2017 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 2013-2017 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.



Lung cancer

	Incidence				Exe	Excess deaths			Mortality			
	Count	Rate	SIR	[95% CI]	5-year (%)	EHR	[95% CI]	Count	Rate	SMR	[95% CI]	
Total Queensland	2523	47.2			81.3			1834	34.3			
By remoteness	Ove	rall signif	icance	, p<0.001	Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001			
Major city	1450	45.3	1		80.0		1		1016	31.7	1	
Inner regional	601	46.8	1.02	[0.98, 1.07]	82.5	1.09	[1.03, 1.15]*	434	33.7	1.05	[1.00, 1.11]	
Outer regional	403	52.2	1.14	[1.09, 1.20]*	84.2	1.24	[1.17, 1.32]*	289	37.9	1.18	[1.11, 1.25]*	
Remote/Very remote	53	56.3	1.30	[1.11, 1.51]*	86.5	1.30	[1.13, 1.50]*	40	42.5	1.35	[1.12, 1.62]*	
By area disadvantage	Overall significance ¹ , p<0.001			Overall sig	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
Least disadvantaged	292	35.0	1		83.9	1		210	25.4	1		
Less disadvantaged	451	40.6	1.16	[1.09, 1.24]*	79.5	1.00	[0.92, 1.09]	314	28.4	1.12	[1.04, 1.21]*	
Middle 20%	539	46.3	1.32	[1.24, 1.40]*	77.4	1.03	[0.95, 1.12]	362	31.1	1.22	[1.13, 1.32]*	
More disadvantaged	595	52.8	1.50	[1.41, 1.60]*	79.5	1.18	[1.10, 1.28]*	427	37.7	1.48	[1.37, 1.59]*	
Most disadvantaged	631	57.6	1.64	[1.54, 1.75]*	80.5	1.27	[1.17, 1.37]*	465	42.4	1.66	[1.54, 1.78]*	
By accessibility	Ove	rall signif	icance	, p<0.001	Overall significance ¹ , p<0.001			Overall significance ¹ , p<0.001				
<1 hour	2013	45.8	1		86.3	1		1418	32.3	1		
1-<2 hours	209	54.1	1.17	[1.10, 1.25]*	83.6	1.23	[1.14, 1.33]*	150	38.7	1.18	[1.10, 1.28]*	
2-<4 hours	165	51.0	1.09	[1.02, 1.17]*	81.9	1.17	[1.08, 1.28]*	126	38.9	1.19	[1.09, 1.29]*	
4-<6 hours	76	44.9	0.97	[0.88, 1.07]	86.6	1.06	[0.93, 1.20]	51	30.3	0.93	[0.82, 1.05]	
6+ hours	44	61.7	1.27	[1.11, 1.45]*	86.3	1.31	[1.13, 1.52]*	34	47.4	1.41	[1.21, 1.65]*	

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 2013-2017 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 2013-2017 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.



More details about how we classify geographical areas

Remoteness: Remoteness was determined using the Australian Statistical Geography Standard (ASGS) remoteness structure (Volume 5 – Remoteness structure, 2016) developed by the Australian Bureau of Statistics (ABS), with the 'Remote' and 'Very Remote' categories combined into one category. <u>http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure#Anchor2b</u>

Area disadvantage: Area disadvantage was categorised by the Socioeconomic Indexes For Areas (SEIFA) The Index of Relative Socio-Economic Disadvantage (IRSD) 2016. 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 2016. Statistical Area Level 2 (SA2) regions as defined by the ABS in the 2016 Australian Statistical Geography Standard (ASGS) were used for mapping.



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