5

Chapter

Surgery for Oesophagogastric Cancer

Infocus – access and flows 2013

Queensland Health

Queensland Cancer Control
Safety and Quality Partnership

qccat
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Introduction

In 2013 an estimated 700 new cases of invasive oesophagogastric cancer will be diagnosed among Queensland residents[1]. With the ageing population, the number of new cases is expected to reach 925 by 2021[1].

Oesophagogastric cancer is one of five chapters in the ***Cancer Surgery in Queensland: Infocus - access and flows 2013*** series and should be read in conjunction with the background document, available at **https://qccat.health.qld.gov.au.**

Surgery is a critical component of the curative treatment of oesophagogastric cancer. This chapter is focused on two dimensions of access to cancer care services – surgery rates and patient flows. It provides population wide information on rates of surgery provision and flows based on patient Hospital and Health Service (HHS) of residence. The chapter contains information on oesophagogastric cancer surgery in Queensland from 2001 – 2010 and reflections on the trends in the data observed over the most recent three year time period 2008 – 2010.

For the first time, a population profile for oesophagogastric cancer surgery in Queensland and the HHSs is described including the characteristics of oesophagogastric cancer patients who receive surgery. Importantly, it provides information on the number and demographic characteristics of oesophagogastric cancer patients who do not receive surgery and where they live according to HHS of residence.

The baseline information provided in this chapter will inform the planning and funding of cancer services, provide HHSs with locally meaningful information and contribute to our understanding of variation in oesophagogastric cancer surgery across Queensland. This information enables Queensland to compare themselves with other Australian states and territories, internationally and published literature.

This chapter is framed around five important questions relevant to cancer surgery in Queensland.

1. How many Queenslanders who are newly diagnosed with oesophagogastric cancer have a surgical procedure as a result of their diagnosis?

2. What are the characteristics of Queenslanders who have a surgical procedure as a result of their oesophagogastric cancer diagnosis and those that do not have a surgical procedure?

3. What types of surgery are performed for patients who are diagnosed with oesophagogastric cancer?

4. What number of surgeries is performed by HHSs for Queenslanders newly diagnosed with oesophagogastric cancer?

5. Where do patients receive their surgery?

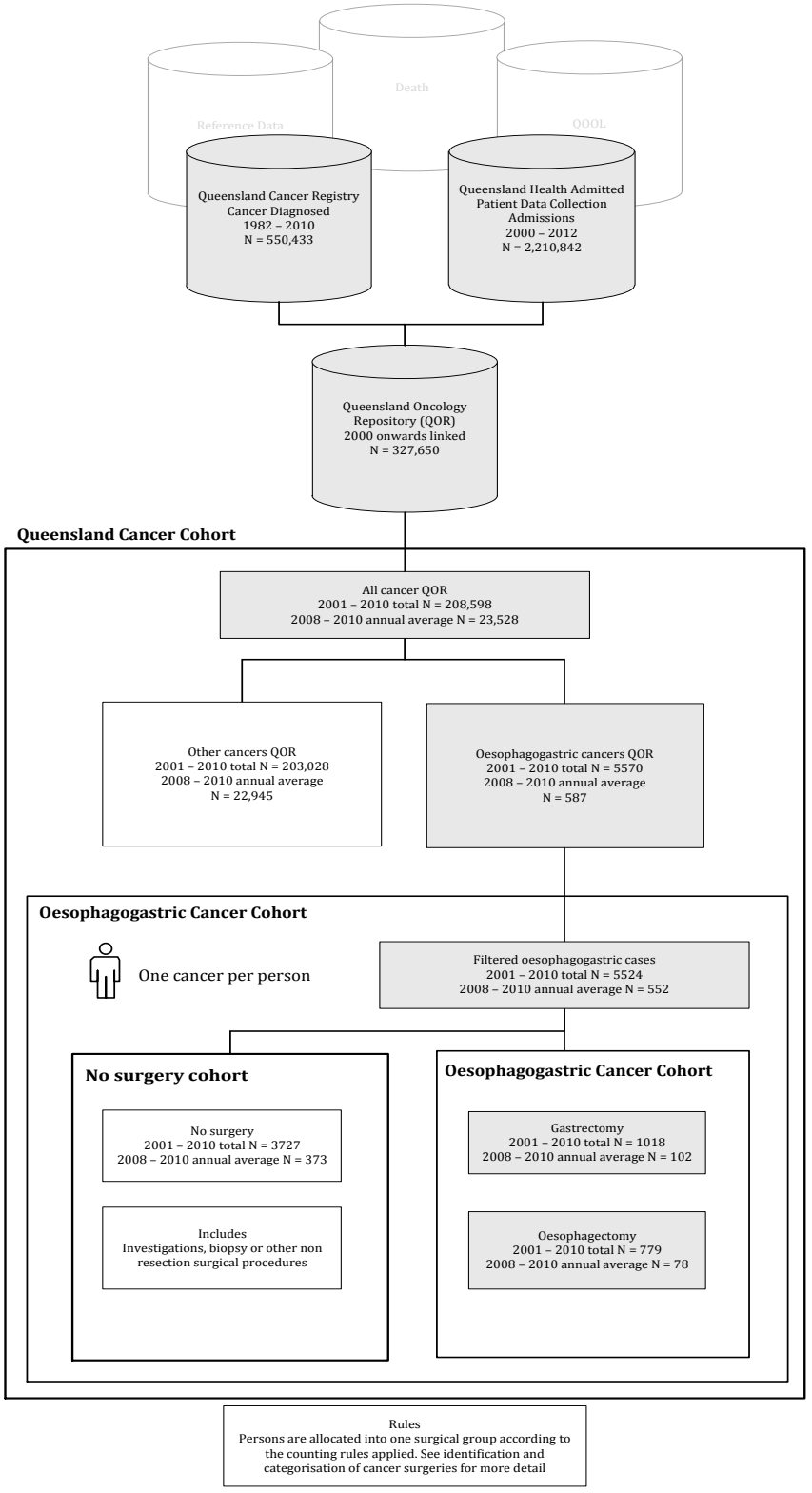
Data sources and methods

Key to QCCAT's program of work is our ability to link population based cancer information on an individual patient basis, using a master linkage key specifically developed by our team. This matched and linked data is housed in the Queensland Oncology Repository (QOR), a resource managed by QCCAT. This centralised repository, QOR, compiles and collates data from a range of source systems including Queensland Cancer Registry, hospital admissions data, death data, treatment systems, public and private pathology, hospital clinical data systems and QOOL. QOR contains approximately 32 million records between 1982 – 2013. Our matching and linking processes provide the 327, 650 matched and linked records of cancer patients between 2000 – 2010, which are the starting point for this analysis. This chapter is structured around four cohorts of patients: **Queensland Cancer Cohort; Oesophagogastric Cancer Cohort; Oesophagogastric Surgery Cohort** and the **No Surgery Cohort**.

[1] Queensland Health. *Oncology Analysis System (OASys).* Queensland Cancer Control Analysis Team: Brisbane; 2013. https://qool.health.qld.gov.au/OASys. Accessed 18/07/2013

How the cohorts were identified

2001 – 2010 AND 2008 – 2010 ANNUAL AVERAGE



Queensland Oncology Repository
QOR consolidates patient information for Queensland and contains data on invasive, benign and uncertain cancers, patient demographics, surgery, chemotherapy, radiotherapy and death. QOR also contains data collected by clinicians at MDT meetings

Sophisticated matching and linking is performed to identify all persons with cancer who had surgery

Queensland Cancer Cohort
Includes: Queensland Invasive Cancer incidence

Oesophagogastric cancer
Discharged patients from public or private hospitals
Queensland residents
All ages

Oesophagogastric Cancer Cohort
Filtered cases
Potential duplicate records removed
Oesophagogastric records retained
If 2 or more diagnosis of oesophagogastric cancer earliest retained

Oesophagogastric Surgery Cohort
Rules
1. If patient underwent oesophagectomy with either radical or total gastrectomy on the same day the patients falls into the gastrectomy cohort
2. If patient underwent oesophagectomy with a partial gastrectomy on the same day the patients falls into the oesphagectomy cohort
3. If person had more than one surgery in the same group then the most recent surgery counted

No Surgery Cohort
Includes: Qld residents of all ages diagnosed with invasive oesophagogastric cancer who did not undergo surgery as an admitted patient in the oesophagogastric surgery cohort time period as outlined on page 3

Time periods

Time period - 01 December 2000 to 31 December 2011

Diagnosis year - 01 January 2001 to 31 December 2010

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

Site	ICD-O-3	Morphology
Gastric	C16	All (invasive only)
Oesophagus	C15	All (invasive only)

Exclusions

The following exclusions apply:

- Non Queensland residents
- People who were not admitted to a Queensland hospital for a gastrectomy or oesophagectomy for invasive oesophagogastric cancer
- Other conditions that patients may have had similar surgery for e.g. gastrectomy for gastric ulcer

Identification and categorisation of cancer related procedures

Surgical procedures relevant to oesophagogastric cancer performed one month prior to or any time following diagnosis were included. The following process was used to assign surgical procedures to patients with cancer:

- Potential cancer related procedures were identified for oesophagogastric cancer from the Australian Classification of Health Interventions (ACHI) International Classification of Diseases (ICD-10-AM) 7th Edition, 2010
- Identified procedures were reviewed by expert clinicians for completeness and accuracy
- The following procedures were selected and categorised into groups referred to as gastrectomy or oesophagectomy

Number of oesophagogastric cancer ICD-10-AM 7th edition coded procedures

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2001 – 2010	Annual average 2008 – 2010	2010
	GASTRECTOMY	**1151**	**116**	**106**
30518-00	Partial distal gastrectomy with gastroduodenal anastomosis	91	9	9
30518-01	Partial distal gastrectomy with gastrojejunal anastomosis	86	9	8
30518-02	Partial proximal gastrectomy with oesophago-gastric anastomosis	121	12	15
30521-00	Total gastrectomy	255	26	22
30523-00	Subtotal gastrectomy	441	44	44
30524-00	Radical gastrectomy	157	16	8
	OESOPHAGECTOMY	**881**	**89**	**86**
30535-00	Oesophagectomy by abdominal and transthoracic mobilisation, with thoracic oesophagogastric anastomosis	287	29	26
30536-00	Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagogastric anastomosis	332	33	39
30536-01	Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagostomy	25	3	2
30541-00	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagogastric anastomosis	83	8	9
30541-01	Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagojejunal anastomosis	30	3	0
30545-00	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis, large intestine interposition and anastomosis	37	4	4
30545-01	Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis using Roux-en-Y reconstruction	51	5	3
30550-00	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis, large intestine interposition and anastomosis	15	2	1
30550-01	Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis using Roux-en-Y reconstruction	21	2	2

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

Surgery rate for oesophagogastric cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

Characteristic	Annual average Oesophagogastric cancer cohort	(Qld %)	Had surgery n	(row %)	No surgery n	(row %)
Queensland	578	(100%)	177	(31%)	401	(69%)
Gender						
Male	403	(70%)	128	(32%)	275	(68%)
Female	175	(30%)	49	(28%)	126	(72%)
Age Group						
< 65	198	(34%)	27	(41%)	118	(60%)
65-74	169	(29%)	57	(34%)	112	(66%)
75-84	139	(24%)	34	(24%)	105	(76%)
85+	72	(12%)	6	(8%)	66	(92%)
Indigenous Status						
Indigenous	10	(2%)	2	(20%)	8	(80%)
Non-Indigenous	549	(95%)	167	(30%)	382	(70%)
Not Stated/Unknown	20	(3%)	7	(35%)	13	(65%)
Socioeconomic Status						
Affluent	77	(13%)	29	(38%)	48	(62%)
Middle	418	(72%)	128	(31%)	290	(69%)
Disadvantaged	80	(14%)	19	(24%)	61	(76%)
Unknown	3	(1%)	1	(33%)	2	(67%)
Remoteness						
Major City	290	(50%)	95	(33%)	195	(67%)
Inner Regional	179	(31%)	52	(29%)	127	(71%)
Outer Regional	94	(16%)	26	(28%)	68	(72%)
Remote & Very Remote	12	(2%)	4	(33%)	8	(67%)
Qld Unknown	3	(1%)	1	(33%)	2	(67%)
Diagnosis Basis						
Histology	538	(93%)	176	(33%)	362	(67%)
Cytology	5	(1%)				
Clinical	20	(3%)	1	(5%)	19	(95%)
Other	15	(3%)				
Comorbidity						
0	368	(64%)	109	(30%)	259	(70%)
1	143	(25%)	47	(33%)	96	(67%)
2+	68	(12%)	21	(31%)	47	(69%)

In the interest of completeness, annual average numbers have been included with fewer than 16 cases. Numbers < 16 should be interpreted with caution due to poor reliability of calculations based on small numbers. Annual average numbers have been rounded up to the nearest whole number for those with less than one, therefore the totals may not add up.

Surgery rate for Oesophagogastric cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

	Annual average		Had surgery		No surgery	
	Oesophagogastric cancer cohort	**(Qld %)**	**n**	**(row %)**	**n**	**(row %)**
Queensland	578	(100%)	177	(31%)	401	(69%)
HHS (patient residence)						
Metro South	130	(22%)	46	(35%)	84	(65%)
Metro North	106	(18%)	36	(34%)	70	(66%)
Gold Coast	65	(11%)	18	(28%)	47	(72%)
Sunshine Coast	55	(10%)	14	(25%)	41	(75%)
Wide Bay	43	(7%)	15	(35%)	28	(65%)
Darling Downs	39	(7%)	11	(28%)	28	(72%)
West Moreton	28	(5%)	6	(21%)	22	(79%)
Townsville	31	(5%)	10	(32%)	21	(68%)
Central Queensland	25	(4%)	6	(24%)	19	(76%)
Cairns and Hinterland	24	(4%)	5	(21%)	19	(79%)
Mackay	19	(3%)	6	(32%)	13	(68%)
South West	3	(1%)	1	(33%)	2	(67%)
North West	3	(1%)	1	(33%)	2	(67%)
Central West	1	(0%)	1	(100%)		
Torres Strait-Northern Peninsula	1	(0%)				
Cape York	2	(0%)	1	(50%)	1	(50%)
Qld Unknown	3	(1%)	1	(33%)	2	(67%)

In the interest of completeness, annual average numbers have been included with fewer than 16 cases. Numbers < 16 should be interpreted with caution due to the poor reliability of calculations based on small numbers. Annual average numbers have been rounded up to the nearest whole number for those with less than one. For example if a HHS performed one surgery from 2008 - 2010 the annual average will be rounded up to one to reflect that this HHS is performing surgery. Therefore the totals may not add up.

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Type of definitive surgery for oesophagogastric cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

	Annual average		Had surgery		Oesophagectomy		Gastrectomy	
Characteristic	**Oesophagogastric cancer cohort**	**(Qld %)**	**n**	**(col %)**	**n**	**(row %)**	**n**	**(row %)**
Queensland	578	(100%)	177	(31%)	80	(45%)	97	(55%)
Gender								
Male	403	(70%)	128	(72%)	67	(52%)	61	(48%)
Female	175	(30%)	49	(28%)	13	(27%)	35	(71%)
Age Group								
<65	198	(34%)	27	(15%)	16	(59%)	11	(41%)
65-74	169	(29%)	57	(32%)	26	(46%)	31	(54%)
75-84	139	(24%)	34	(19%)	6	(18%)	28	(82%)
85+	72	(12%)	6	(3%)			6	(100%)
Indigenous Status								
Indigenous	10	(2%)	2	(1%)			2	(100%)
Non-Indigenous	549	(95%)	167	(94%)	78	(47%)	89	(53%)
Not Stated/Unknown	20	(3%)	7	(4%)	2	(29%)	5	(71%)
Socioeconomic Status								
Affluent	77	(13%)	29	(16%)	14	(48%)	16	(55%)
Middle	418	(72%)	128	(72%)	56	(44%)	72	(56%)
Disadvantaged	80	(14%)	19	(11%)	10	(53%)	9	(47%)
Unknown	3	(1%)	29	(16%)			1	(3%)
Remoteness								
Major City	290	(50%)	95	(54%)	40	(42%)	55	(58%)
Inner Regional	179	(31%)	52	(29%)	25	(48%)	27	(52%)
Outer Regional	94	(16%)	26	(15%)	13	(50%)	12	(46%)
Remote & Very Remote	12	(2%)	4	(2%)	1	(25%)	2	(50%)
Qld Unknown	3	(1%)	1	(1%)			1	(100%)
Comorbidities								
0	368	(64%)	109	(62%)	54	(50%)	55	(50%)
1	143	(25%)	47	(27%)	21	(45%)	26	(55%)
2+	68	(12%)	21	(12%)	5	(24%)	15	(71%)

In the interest of completeness, annual average numbers have been included with fewer than 16 cases. Numbers < 16 should be interpreted with caution due to poor reliability of calculations based on small numbers. Annual average numbers have been rounded up to the nearest whole number for those with less than one, therefore the totals may not add up.

Type of definitive surgery for oesophagogastric cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

	Annual average		Had surgery		Oesophagectomy		Gastrectomy	
	Oesophagogastric cancer cohort	**(Qld %)**	**n**	**(col %)**	**n**	**(row %)**	**n**	**(row %)**
Queensland	578	(100%)	177	(31%)	80	(45%)	97	(55%)
HHS (patient residence)								
Metro South	130	(22%)	46	(26%)	24	(52%)	23	(50%)
Metro North	106	(18%)	36	(20%)	15	(42%)	21	(58%)
Gold Coast	65	(11%)	18	(10%)	6	(33%)	12	(67%)
Sunshine Coast	55	(10%)	14	(8%)	7	(50%)	8	(57%)
Wide Bay	43	(7%)	15	(8%)	7	(47%)	8	(53%)
Darling Downs	39	(7%)	11	(6%)	5	(45%)	5	(45%)
West Moreton	28	(5%)	6	(3%)	2	(33%)	4	(67%)
Townsville	31	(5%)	10	(6%)	5	(50%)	6	(60%)
Central Queensland	25	(4%)	6	(3%)	3	(50%)	3	(50%)
Cairns and Hinterland	24	(4%)	5	(3%)	2	(40%)	3	(60%)
Mackay	19	(3%)	6	(3%)	3	(50%)	2	(33%)
South West	3	(1%)	1	(1%)	1	(100%)	1	(100%)
North West	3	(1%)	1	(1%)			1	(100%)
Central West	1	(0%)	1	(1%)			1	(100%)
Torres Strait-Northern Peninsula	1	(0%)						
Cape York	2	(0%)	1	(1%)	1	(100%)	1	(100%)
Qld Unknown	3	(1%)	1	(1%)			1	(100%)

In the interest of completeness, annual average numbers have been included with fewer than 16 cases. Numbers < 16 should be interpreted with caution due to the poor reliability of calculations based on small numbers. Annual average numbers have been rounded up to the nearest whole number for those with less than one. For example if a HHS performed one surgery from 2008 - 2010 the annual average will be rounded up to one to reflect that this HHS is performing surgery. Therefore the totals may not add up.

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Characteristics of oesophagogastric cancer patients receiving gastrectomy

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

Characteristic

	Had surgery		Male		Median age at diagnosis	Disadvantaged		Indigenous		One or more comorbidities		Private		Emergency	
	n	**(Qld %)**	**n**	**(row %)**	**yrs**	**n**	**(row %)**	**n**	**(row %)**	**n**	**(row %)**	**n**	**(row %)**	**n**	**(row %)**
Queensland	97	55%	61	(63%)	70 yrs	9	(9%)	2	(2%)	41	(42%)	54	(56%)	12	(12%)
HHS (patient residence)															
Metro South	23	(24%)	13	(57%)	70 yrs	2	(9%)	1	(50%)	7	(30%)	15	(65%)	4	(17%)
Metro North	21	(22%)	12	(57%)	72 yrs	1	(5%)			9	(43%)	11	(52%)	2	(10%)
Gold Coast	12	(12%)	9	(75%)	71 yrs					4	(33%)	7	(58%)	1	(8%)
Sunshine Coast	8	(8%)	5	(63%)	74 yrs					3	(38%)	5	(63%)	1	(13%)
Wide Bay	8	(8%)	5	(63%)	68 yrs	3	(38%)	1	(50%)	4	(50%)	3	(38%)	2	(25%)
Townsville	6	(6%)	4	(67%)	67 yrs	1	(17%)	1	(50%)	4	(67%)	3	(50%)	1	(17%)
Darling Downs	5	(5%)	4	(80%)	71 yrs	1	(20%)			4	(80%)	3	(60%)	1	(20%)
West Moreton	4	(4%)	3	(75%)	67 yrs	1	(25%)			2	(50%)	2	(50%)	1	(25%)
Cairns and Hinterland	3	(3%)	1	(33%)	65 yrs			1	(50%)	1	(33%)	1	(33%)		
Central Queensland	3	(3%)	3	(100%)	68 yrs					1	(33%)	2	(67%)		
Mackay	2	(2%)	2	(100%)	69 yrs	1	(50%)			1	(50%)	2	(100%)		
North West	1	(1%)	1	(100%)	48 yrs			1	(50%)	1	(100%)			1	(100%)
Central West	1.0	(1%)	1	(100%)	72 yrs					1	(100%)				
South West	1	(1%)	1	(100%)	77 yrs					1	(100%)	1	(100%)		
Cape York	1	(1%)	1	(100%)	48 yrs			1	(50%)						
Torres Strait-Northern Peninsula															
Qld Unknown	1	(1%)			36 yrs										

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Characteristics of oesophagogastric cancer patients receiving oesophagectomy

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

	Characteristic											
	Had Surgery		Male		Median age at diagnosis	Disadvantaged		One or more comorbidities		Private		Emergency	
	n	**(Qld %)**	**n**	**(row %)**	**yrs**	**n**	**(row %)**	**n**	**(row %)**	**n**	**(row %)**	**n**	**(row %)**
Queensland	80	(45%)	67	(84%)	62 yrs	10	(13%)	26	(33%)	42	(53%)	2	(3%)
HHS (patient residence)													
Metro South	24	(30%)	20	(83%)	62 yrs	3	(13%)	9	(38%)	13	(54%)	1	(4%)
Metro North	15	(19%)	11	(73%)	65 yrs	2	(13%)	5	(33%)	9	(60%)		
Gold Coast	6	(8%)	5	(83%)	62 yrs			3	(50%)	3	(50%)	1	(17%)
Sunshine Coast	7	(9%)	5	(71%)	63 yrs	1	(14%)	1	(14%)	3	(43%)		
Wide Bay	7	(9%)	6	(86%)	64 yrs	3	(43%)	2	(29%)	1	(14%)	1	(14%)
Townsville	5	(6%)	5	(100%)	65 yrs	1	(20%)	1	(20%)	3	(60%)		
Darling Downs	5	(6%)	4	(80%)	58 yrs	1	(20%)	2	(40%)	4	(80%)		
West Moreton	2	(3%)	2	(100%)	62 yrs	1	(50%)			1	(50%)		
Cairns and Hinterland	2	(3%)	1	(50%)	61 yrs			1	(50%)	1	(50%)		
Central Queensland	3	(4%)	2	(67%)	59 yrs			2	(67%)	2	(67%)		
Mackay	3	(4%)	3	(100%)	59 yrs	1	(33%)	2	(67%)	1	(33%)	1	(33%)
North West													
Central West													
South West	1	(1%)	1	(100%)	70 yrs	1	(100%)			1	(100%)		
Cape York	1	(1%)	1	(100%)	52 yrs					1	(100%)		
Torres Strait-Northern Peninsula													
Qld Unknown													

*No patients undergoing oesophagectomy were reported as indigenous

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Patient flows

10 year oesophagogastric cancer patient flows for gastrectomy

YEAR OF DIAGNOSIS 2001 – 2010 (COL% ROW %)

	HHS of surgery					
	Metro South	Metro North	Gold Coast	Sunshine Coast	Darling Downs	Wide Bay
Hospitals performing surgery*	7	9	6	6	3	6
HHS (patient residence)						
Metro South	206 (59% 87%)	31 (10% 13%)	1 (1% 0%)			
Metro North	40 (11% 17%)	198 (66% 83%)				
Gold Coast	9 (3% 7%)	2 (1% 2%)	114 (99% 91%)			
Sunshine Coast	15 (4% 18%)	7 (2% 8%)		62 (97% 74%)		
Darling Downs	18 (5% 30%)	13 (4% 22%)			29 (97% 48%)	
Wide Bay	13 (4% 18%)	26 (9% 36%)		2 (3% 3%)		32 (100% 44%)
Cairns and Hinterland	10 (3% 26%)	2 (1% 5%)				
Townsville	4 (1% 8%)	1 (0% 2%)				
West Moreton	17 (5% 38%)	6 (2% 13%)			1 (3% 2%)	
Central Queensland	12 (3% 33%)	11 (4% 31%)				
Mackay	2 (1% 9%)	2 (1% 9%)				
South West	1 (0% 100%)					
North West						
Central West	1 (0% 100%)					
Torres Strait-Northern Peninsula						
Cape York						
Queensland	348	300	115	64	30	32
(%)	(34%)	(29%)	(11%)	(6%)	(3%)	(3%)
Annual average	35	30	12	6	3	3

*the number of hospitals within a HHS performing gastrectomy

col% is used to show the distribution of residence for the total group of patients who were operated on by a single HHS. For example: of the 348 surgeries that Metro South performed, 206 (59%) of patients were also residents of Metro South. The other 142 (41%) patients who received surgery in Metro South reside in 12 other HHSs.

10 year oesophagogastric cancer patient flows for gastrectomy

YEAR OF DIAGNOSIS 2001 – 2010 (COL% ROW%)

	HHS of surgery							
Cairns and Hinterland	Townsville	West Moreton	Central Queensland	Mackay	North West	Qld	
3	2	2	2	2	1	49	
						n	(%)
						238	(23%)
						238	(23%)
						125	(12%)
						84	(8%)
						60	(6%)
						73	(7%)
23 (96% 59%)	4 (6% 10%)					39	(4%)
	43 (69% 90%)					48	(5%)
		21 (100% 47%)				45	(4%)
			13 (100% 36%)			36	(4%)
	12 (19% 52%)			7 (100% 30%)		23	(2%)
						1	(0%)
	2 (3% 50%)				2 (100% 50%)	4	(0%)
						1	(0%)
1						1	(0%)
	1 (2% 100%)					1	(0%)
(4% 100%)							
24 (2%)	62 (6%)	21 (2%)	13 (1%)	7 (1%)	2 (0%)	1018	(100%)
2	6	2	1	1	0	102	

row% is used to show the proportion of patients residing in a given HHS who also receive their surgery in the same HHS, and what proportion had their surgery in another HHS. For example: of the 238 patients who reside in Metro South, 206 (87%) also had their surgery in Metro South. The remaining 32 (13%) had surgery in two other HHS.

10 year oesophagogastric cancer patient flows for oesophagectomy

YEAR OF DIAGNOSIS 2001 – 2010 (COL% ROW %)

	HHS of surgery			
	Metro South	Metro North	Gold Coast	Sunshine Coast
Hospitals performing surgery*	3	3	2	1
HHS (patient residence)				
Metro South	148 (38% 93%)	12 (6% 8%)		
Metro North	43 (11% 29%)	106 (52% 71%)		
Gold Coast	8 (2% 9%)	3 (1% 4%)	74 (97% 87%)	
Sunshine Coast	34 (9% 40%)	23 (11% 27%)		28 (97% 33%)
Darling Downs	48 (12% 83%)	9 (4% 16%)		
Wide Bay	18 (5% 33%)	30 (15% 56%)	1 (1% 2%)	1 (3% 2%)
Cairns and Hinterland	23 (6% 62%)	6 (3% 16%)		
Townsville	5 (1% 11%)			
West Moreton	22 (6% 73%)	8 (4% 27%)		
Central Queensland	27 (7% 77%)	6 (3% 17%)		
Mackay	4 (1% 13%)	1 (0% 3%)		
South West	4 (1% 100%)			
North West			1 (1% 50%)	
Central West				
Torres Strait-Northern Peninsula				
Cape York	1 (0% 100%)			
Queensland	385	204	76	29
(%)	(49%)	(26%)	(10%)	(4%)
Annual average	39	20	8	3

*the number of hospitals within a HHS performing oesophagectomy.

col% is used to show the distribution of residence for the total group of patients who were operated on by a single HHS. For example: of the 385 surgeries that Metro South performed, 148 (38%) of patients were also residents of Metro South. The remaining 237 (62%) patients who received surgery in Metro South reside in twelve other HHS.

10 year oesophagogastric cancer patient flows for oesophagectomy

YEAR OF DIAGNOSIS 2001 – 2010 (COL%. ROW%)

	HHS of surgery				
Wide Bay	Cairns and Hinterland	Townsville	Qld		
2	1	2	14		
			n	(%)	
			160	(21%)	
			149	(19%)	
			85	(11%)	
			85	(11%)	
		1 (1% 2%)	58	(7%)	
4 (80% 7%)			54	(7%)	
	2 (67% 5%)	6 (8% 16%)	37	(5%)	
	1 (33% 2%)	41 (53% 87%)	47	(6%)	
			30	(4%)	
1 (20% 3%)		1 (1% 3%)	35	(4%)	
		27 (35% 84%)	32	(4%)	
			4	(1%)	
		1 (1% 50%)	2	(0%)	
			0		
			0		
			1	(0%)	
5 (1%)	3 (0%)	77 (10%)	779	(100%)	
1	0	8	78		

row% is used to show the proportion of patients residing in a given HHS who also receive their surgery in the same HHS, and what proportion had their surgery in another HHS. For example: of the 160 residents of Metro South, 148 (93%) also had their surgery in Metro South. The remaining 12 (7%) had surgery in one other HHS.

2010 oesophagogastric cancer patient flows for gastrectomy

YEAR OF DIAGNOSIS 2010 (COL%. ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery: Metro South 4	Metro North 6	Gold Coast 3	Sunshine Coast 3	Darling Downs 2
Metro South	17 (55% 85%)	3 (13% 15%)			
Metro North	2 (6% 11%)	16 (67% 89%)			
Gold Coast			13 (100% 100%)		
Sunshine Coast		2 (8% 29%)		5 (100% 71%)	
Darling Downs	3 (10% 50%)	1 (4% 17%)			2 (100% 33%)
Wide Bay	3 (10% 60%)	1 (4% 20%)			
Cairns and Hinterland					
Townsville					
West Moreton	4 (13% 57%)				
Central Queensland	1 (3% 50%)				
Mackay		1 (4% 25%)			
South West	1 (3% 100%)				
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland	31 (34%)	24 (26%)	13 (14%)	5 (5%)	2 (2%)

*the number of hospitals within a HHS performing gastrectomy

col% is used to show the distribution of residence for the total group of patients who were operated on by a single HHS. For example: of the 31 surgeries that Metro South performed, 17 (55%) were also residents of Metro South. The other 14 (45%) who received surgery in Metro South reside in six other HHS.

2010 oesophagogastric cancer patient flows for gastrectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW %)

	HHS of surgery					
Wide Bay	Townsville	West Moreton	Central Queensland	North West	Qld	
1	2	1	1	1	22	
					n	(%)
					20	(22%)
					18	(20%)
					13	(14%)
					7	(8%)
					6	(7%)
1 (100% 20%)					5	(5%)
	2 (20% 100%)				2	(2%)
	4 (40% 100%)				4	(4%)
		3 (100% 43%)			7	(8%)
			1 (100% 50%)		2	(2%)
	3 (30% 75%)				4	(4%)
					1	(1%)
	1 (10% 50%)			1 (100% 50%)	2	(2%)
					0	
					0	
					0	
					0	
1 (1%)	10 (11%)	3 (3%)	1 (1%)	1 (1%)	91	

row% is used to show the proportion of patients residing in a given HHS who also receive their surgery in the same HHS, and what proportion had their surgery in another HHS. For example: of the 20 residents of Metro South, 17 (85%) also received surgery in Metro South. The other three (15%) received surgery in one other HHS.

2010 oesophagogastric cancer patient flows for oesophagectomy

YEAR OF DIAGNOSIS 2010 (COL%. ROW%)

	HHS of surgery						
	Metro South	Metro North	Gold Coast	Sunshine Coast	Townsville	Qld	
Hospitals performing surgery*	3	3	2	1	2	11	(%)
HHS (patient residence)							
Metro South	24 (55% 96%)	1 (6% 4%)				25	(32%)
Metro North	3 (7% 25%)	9 (50% 75%)				12	(16%)
Gold Coast			7 (88% 100%)			7	(9%)
Sunshine Coast	6 (14% 67%)	2 (11% 22%)		1 (100% 11%)		9	(12%)
Darling Downs	3 (7% 100%)					3	(4%)
Wide Bay	2 (5% 25%)	5 (28% 63%)	1 (13% 13%)			8	(10%)
Cairns and Hinterland	1 (2% 50%)	1 (6% 50%)				2	(3%)
Townsville	1 (2% 25%)				3 (50% 75%)	4	(5%)
West Moreton	2 (5% 100%)					2	(3%)
Central Queensland					1 (17% 100%)	1	(1%)
Mackay	2 (5% 50%)				2 (33% 50%)	4	(5%)
South West						0	
North West						0	
Central West						0	
Torres Strait-Northern Peninsula						0	
Cape York						0	
Qld Unknown						0	
Queensland	44	18	8	1	6	77	
	(57%)	(23%)	(10%)	(1%)	(8%)		

*The number of hospitals within a HHS performing oesophagectomy

col% is used to show the distribution of residence for the total group of patients who were operated on by a single HHS. For example: of the 44 surgeries that Metro South performed, 24 (55%) patients were also residents of Metro South. The other 20 (45%) patients who received surgery in Metro South reside in eight other HHS.

row% is used to show the proportion of patients residing in a given HHS who also receive their surgery in the same HHS, and what proportion had their surgery in another HHS. For example: of the 25 residents of Metro South, 24 (96%) also had their surgery in Metro South. The remaining one (4%) patient had surgery in one other HHS.

Surgery rates

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

10 year surgery trend for gastrectomy

YEAR OF DIAGNOSIS 2001 – 2010

	Had Surgery	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Queensland	1018	100	98	111	107	118	112	82	96	103	91
HHS (patient residence)											
Metro South	238	21	20	24	18	30	31	26	25	23	20
Metro North	238	29	23	23	33	25	27	15	19	26	18
Gold Coast	125	15	14	13	12	14	10	11	12	11	13
Sunshine Coast	84	7	7	9	11	10	9	8	7	9	7
Wide Bay	73	7	6	11	4	10	9	3	9	9	5
Darling Downs	60	6	10	9	5	4	3	7	6	4	6
West Moreton	45	2	3	8	5	6	4	4	3	3	7
Townsville	48	3	2	2	7	7	8	2	6	7	4
Central Queensland	36	5	3	5	2	4	5	2	3	5	2
Cairns and Hinterland	39	2	6	4	7	4	4	4	3	3	2
Mackay	23	3	3	3	2	4	1		1	2	4
South West	1										1
North West	4				1		1				2
Central West	1									1	
Cape York	1								1		
Torres Strait-Northern Peninsula	1		1								

10 year surgery trend for oesophagectomy

YEAR OF DIAGNOSIS 2001 - 2010

DEFINITIVE SURGERY MUTUALLY EXCLUSIVE

	Had Surgery	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Queensland	779	96	74	79	72	74	79	65	79	84	77
HHS (patient residence)											
Metro South	160	14	12	12	8	13	13	17	18	28	25
Metro North	149	17	17	15	17	13	18	8	15	17	12
Gold Coast	85	11	16	8	12	4	11	4	4	8	7
Sunshine Coast	85	16	4	10	8	9	10	8	8	3	9
Wide Bay	54	4	4	5	5	8	3	4	6	7	8
Darling Downs	58	8	4	6	4	8	7	5	11	2	3
West Moreton	30	4	2	5		2	5	6	3	1	2
Townsville	47	10	5	5	3	4	4	2	3	7	4
Central Queensland	35	4	2	6	4	3	5	3	4	3	1
Cairns and Hinterland	37	4	6	3	8	7		2	2	3	2
Mackay	32	3	2	3	3	3	2	6	3	3	4
South West	4	1							1	2	
North West	2			1			1				
Central West											
Cape York	1								1		
Torres Strait-Northern Peninsula											

Technical appendix

How different counting rules can be applied to a patient

The calculations of surgery counts were defined for each data sheet and were tailored to each cancer. Below are examples of how the counting rules are applied.

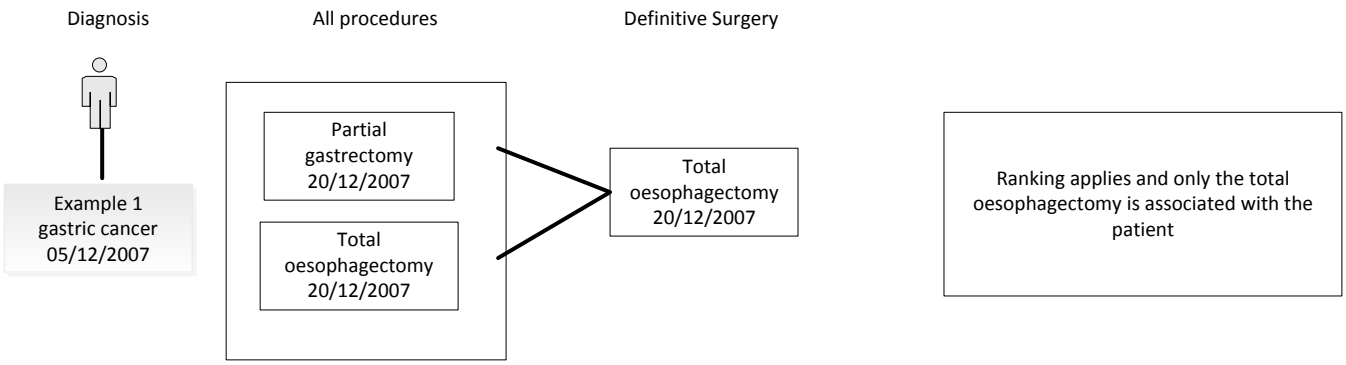
ICD classification and coding practices currently limit the accuracy of primary site designation for oesophagogastric cancers, particularly those arising at the junction between the oesophagus and the stomach. In this analysis, resections are classified into oesophagectomy or gastrectomy based on the extent of the resection.

Hierarchy
Gastrectomy has been defined as a resection for patients who underwent any of the following procedures:

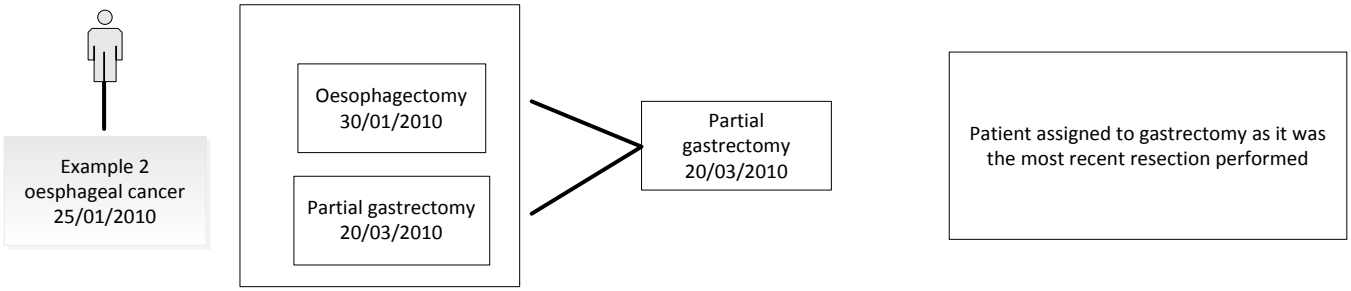
- Total or radical gastrectomy only,
- Total or radical gastrectomy and partial oesophagectomy, or
- Subtotal or partial (distal or proximal) gastrectomy only

Oesophagectomy has been defined as a resection for patients who underwent either:

- Oesophagectomy only, or
- Oesophagectomy and partial or subtotal gastrectomy



In cases of patients undergoing both gastrectomy and oesophagectomy at different periods, patients were assigned to the resection group based on the most recent resection performed



Those who underwent gastrectomy or oesophagectomy for causes other than Oesophagogastric cancer were excluded.

Definitions

Annual average
Annual average refers to the sum of numbers divided by the number of years being reported. In this report annual average numbers have been rounded up to the nearest whole number for those with less than one.

Chargeable status (public and private)
On admission to hospital, an eligible patient must elect to be either a public or private patient.

A public patient is a patient who:
- Elects to be treated as a public patient, and so cannot choose the doctor who treats them, or
- Is receiving treatment in a private hospital under a contract arrangement with a public hospital or health authority.

A private patient is a patient who, by choosing the doctor who will treat them (provided the doctor has 'right of private practice' or is a general practitioner/specialist with admitting rights) has elected to be treated as a private patient.

Cohort
Queensland cancer cohort
Queenslanders who were identified in Queensland Oncology Repository as being diagnosed with cancer between 1 January 2001 and 31 December 2010.

Oesophagogastric cancer cohort
Queenslanders who were diagnosed with oesophagogastric cancer between 1 January 2001 and 31 December 2010.

Oesophagogastric cancer surgery cohort
Anyone in the oesophagogastric cancer cohort who had any of the identified cancer related procedures one month before or any time after their diagnosis, as outlined on page 4.

No surgery cohort
Anyone in the oesophagogastric cancer cohort who did not have any of the defined surgeries during the designated time period, as outlined on page 4.

Col %
Percentage of the column total

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

Comorbidity is derived from hospital admissions data following the Quan algorithm1 for classifying ICD-10 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 colorectal cancer diagnosis and vice versa, if they are diagnosed within 12 months of each other.

Benign tumours are not considered comorbidities.

Co-morbidity list

- AIDS
- Acute Myocardial
- 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

1. Quan H, Sundararajan V, Halfon P, Fong A, Burnand B, Luthi JC, Duncan Saunders L, Beck CA, Feasby TE, Ghali WA. Coding algorithms for defining comorbidities in ICD-9-CM and ICD-10 administrative data. Med Care 2005; 43: 1073-1077

Definitive surgery
The highest ranked surgery the patient ever had defined by the oesophagogastric cancer hierarchy outlined on page 22.

Diagnosis Basis
Confirmation of cancer through clinical or histological tests.

Elective Status
Emergency Admission
A patient admitted to hospital at short notice because of clinical need or if alternative care is not available.

Elective Admission
A patient who is admitted into hospital for treatment from the waiting list.

Had surgery
Includes Queensland residents of all ages diagnosed with invasive oesophagogastric cancer in the surgical cohort time period who underwent surgery as defined by the procedures outlined on page 4. If the patient had multiple surgeries on the same day a hierarchy is applied as per diagram on page 22.

Hospital and Health Service (HHS)
For residence considerations, the Hospital and Health Service is a geographic area defined by a collection of Statistical Local Areas (SLA). For public hospitals and health service facilities, the term Hospital and Health Service is synonymous with a group of Queensland Health facilities and staff responsible for providing and delivering health resources and services to an area which may consist of one or more residential areas.

Queensland unknown residence includes addresses reported as overseas, unknown, or not fixed.

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

Median age
The age that divides a population into two halves: one older than the median, the other younger than the median.

No surgery
Includes Queensland residents of all ages diagnosed with invasive oesophagogastric cancer who did not undergo surgery as an admitted patient in the surgical cohort time period, as defined by the procedures outlined on page 4.

Number of procedures
Includes Queensland residents of all ages diagnosed with invasive oesophagogastric cancer who underwent a relevant cancer procedure. The procedure could have occurred at any time. For example: a patient had a gastrectomy in 2001 for a benign disease. The same patient was later diagnosed with invasive gastric cancer in 2003. The gastrectomy would still be counted in this group because no rules have been applied.

Patient flows
Col% is used to show the distribution of residence for the total group of patients who were operated on by a single HHS. Row% is used to show the proportion of patients residing in a given HHS who also receive their surgery in the same HHS, and what proportion had their surgery in another HHS.

Qld %
Percentage of the Queensland total.

Remoteness
The relative remoteness of residence at time of diagnosis, based on the Australian Standard Geographical Classification (ASGC). This document classifies remoteness into four groups: Major City, Inner Regional, Outer Regional, and Remote/Very remote.

Row %
Percentage of the row total

Sex
Refers to the biological and physiological characteristics that define men and women.

Socioeconomic Status
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 Local Areas (SLA).

The ABS uses 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%

The proportion of cases in each group will vary depending on the subset of the population being examined. For example, the proportion in the Disadvantaged group may be higher than 20% when the data is limited to cancers that are more common in poor compared to rich people.

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