

2

Chapter

Surgery for Colon Cancer

Infocus – access and flows

2013

Queensland Health

Queensland Cancer Control
Safety and Quality Partnership



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Chapter 2 Colon Cancer

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Colorectal cancer subcommittee

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Introduction

In 2013 an estimated 2,280 new cases of invasive colon cancer will be diagnosed among Queensland residents¹. With the ageing population, the number of new cases is expected to reach 3,030 by 2021¹.

Colon 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 colon 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 colon 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 colon cancer surgery in Queensland and the HHSs is described including the characteristics of colon cancer patients who receive surgery. Importantly, it provides information on the number and demographic characteristics of colon 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 colon 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 colon 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 colon cancer diagnosis and those that do not have a surgical procedure?
3. What types of surgery are performed for patients who are diagnosed with colon cancer?
4. What number of surgeries is performed by HHSs for Queenslanders newly diagnosed with colon cancer?
5. Where do patients receive their surgery?

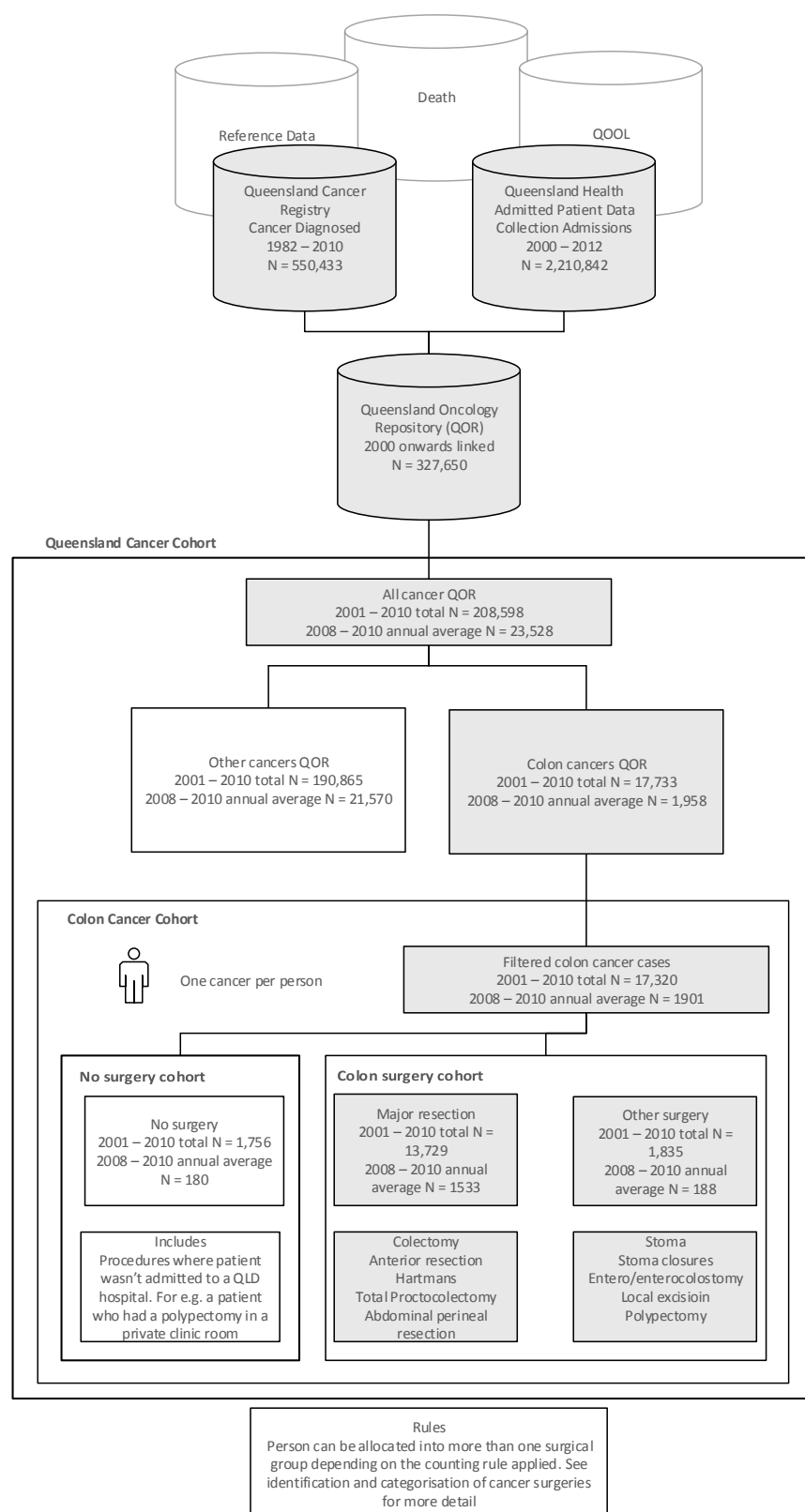
Data sources and methods

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**; **Colon Cancer Cohort**; **Colon 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

Invasive Colon Cancer
Discharged patients from public or private hospitals
Queensland residents
All ages

Colon Cancer Cohort
Filtered cases
Potential duplicate records
If 2 or more diagnosis of same cancer earliest retained
If 2 diagnosis of different cancer rectal diagnosis retained

Colon Surgery Cohort
Rules
1. If the surgery happened > 1 month before the date of diagnosis then the surgery is excluded
2. If two of the same types of surgery happened on the same day count the surgery once

No Surgery Cohort
Includes Qld residents of all ages diagnosed with invasive colon 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

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
Colon	C18	All (invasive only)

Exclusions

The following exclusions apply:

- Non Queensland residents
- People who were not admitted to a Queensland hospital for a procedure for invasive colon cancer e.g. a patient who had a polypectomy in a private clinic room
- Other conditions that patients may have had similar surgery for e.g. colectomy for diverticular disease

Identification and categorisation of cancer related procedures

Surgical procedures relevant to colon 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 colon 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 major resections, number of surgeries, other surgery, ever had surgery, definitive surgery and last major resection (see Definitions for further explanation)

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

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2001 – 2010	Annual average 2008 – 2010	2010
	COLECTOMY	12319	1321	1297
	<i>A. Resection of colon without stoma with anastomosis</i>	11560	1248	1235
3056600	Resection of small intestine with anastomosis	690	61	57
3200300	Limited excision of large intestine with anastomosis	1358	114	125
3200301	Right hemicolectomy with anastomosis	6318	708	692
3200501	Extended right hemicolectomy with anastomosis	1024	131	124
3200600	Left hemicolectomy with anastomosis	1258	150	151
3200500	Subtotal colectomy with anastomosis	658	60	60
3201200	Total colectomy with anastomosis	254	24	26
	<i>B. Resection of colon with stoma</i>	759	74	62
3056500	Resection of small intestine with formation of stoma	73	7	1
3200000	Limited excision of large intestine with formation of stoma	180	16	13
3200001	Right hemicolectomy with formation of stoma	149	16	17
3200401	Extended right hemicolectomy with formation of stoma	47	5	4
3200601	Left hemicolectomy with formation of stoma	157	16	12
3200400	Subtotal colectomy with formation of stoma	92	8	12
3200900	Total colectomy with ileostomy	61	6	3
	LOCAL EXCISION, POLYPECTOMY	21232	2341	2266
	<i>C. Local excision, polypectomy</i>	21232	2341	2266
3208700	Fibreoptic colonoscopy to hepatic flexure, with polypectomy	464	48	38
3208401	Fibreoptic colonoscopy to hepatic flexure, with biopsy	1153	133	125
3209300	Fibreoptic colonoscopy to caecum, with polypectomy	11219	1228	1207
3209001	Fibreoptic colonoscopy to caecum, with biopsy	8173	913	879
9029702	Endoscopic mucosal resection of large intestine	11	3	2
9095900	Excision of other lesion of large intestine	42	5	3
3209900	Per anal submucosal excision of lesion or tissue of rectum	50	4	4
3210300	Per anal excision of lesion or tissue of rectum via stereoscopic rectoscopy	3		
9034100	Other excision of lesion of rectum	17	2	1
3214201	Excision of anal polyp	11	1	1
3210500	Per anal full thickness excision of anorectal lesion or tissue	23	1	2
9031500	Endoscopic excision of lesion or tissue of anus	4	1	
3207501	Rigid sigmoidoscopy with biopsy	13	1	1
3007514	Biopsy of large intestine	20	2	2
3209600	Full thickness biopsy of rectum	9		
3007534	Biopsy of anus	5	1	1
9031501	Excision of other lesion or tissue of anus	15		

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

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2001 – 2010	Annual average 2008 – 2010	2010
	ABDOMINALPERINEAL RESECTION	51	2	1
	D. AP Resection (with stoma)	51	2	1
3203900	Abdominoperineal proctectomy	51	2	1
	TOTAL PROCTOCOLECTOMY	77	7	5
	E. Total proctocolectomy without stoma	22	2	2
3205100	Total proctocolectomy with ileo-anal anastomosis	22	2	2
	F. Total proctocolectomy with stoma	55	5	3
3201500	Total proctocolectomy with ileostomy	32	4	1
3205101	Total proctocolectomy with ileo-anal anastomosis and formation of temporary ileostomy	23	1	2
	ANTERIOR RESECTION	2788	338	354
	G. Anterior Resection	2788	338	354
3202400	High anterior resection of rectum	1912	221	241
3202500	Low anterior resection of rectum	454	72	73
3202600	Ultra low anterior resection of rectum	277	21	12
3202800	Ultra low anterior resection of rectum with hand sutured coloanal anastomosis	81	3	
9220800	Anterior resection of rectum, level unspecified	64	21	28
	HARTMANN'S	463	48	57
	I. Hartmann's with stoma	463	48	57
3203000	Rectosigmoidectomy with formation of stoma	463	48	57
	STOMA	462	51	34
	J. Stoma	462	51	34
3037529	Temporary ileostomy	351	39	24
3037501	Other enterostomy	111	12	10
	STOMA CLOSURES	330	33	30
	K. Stoma Closures	330	33	30
3056202	Closure of loop colostomy	34	2	2
3056203	Closure of colostomy with restoration of bowel continuity	29	2	2
3056205	Closure of other stoma of large intestine	3		
3203300	Restoration of bowel continuity after Hartmann's procedure	118	14	11
3056204	Closure of other stoma of small intestine	4		1
3056200	Closure of loop ileostomy	122	13	14
3206000	Restorative proctectomy	20	1	
	ENTERO/ENTEROCOLOSTOMY	237	19	17
	L. Entero/Enterocolostomy	237	19	17
3051501	Enterocolostomy	176	16	15
3051502	Enteroenterostomy	61	3	2

Surgery rate for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

EVER HAD
MUTUALLY
EXCLUSIVE

Characteristic	Annual average		Had surgery 1721 (91%)				No surgery	
	Colon cancer cohort	(Qld %)	Major resection n	(row %)	Other surgery* n	(row %)	n	(row %)
Queensland	1901	(100%)	1533	(81%)	188	(10%)	180	(9%)
Gender								
Male	955	(50%)	771	(81%)	109	(11%)	76	(8%)
Female	946	(50%)	762	(81%)	79	(8%)	105	(11%)
Age Group								
< 65	571	(30%)	477	(84%)	55	(10%)	39	(7%)
65-74	577	(30%)	488	(85%)	57	(10%)	32	(6%)
75-84	537	(28%)	435	(81%)	50	(9%)	52	(10%)
85+	216	(11%)	134	(62%)	25	(12%)	57	(26%)
Indigenous Status								
Indigenous	18	(1%)	15	(83%)	2	(11%)	2	(11%)
Non-Indigenous	1706	(90%)	1378	(81%)	163	(10%)	165	(10%)
Not Stated/Unknown	177	(9%)	140	(79%)	23	(13%)	13	(7%)
Socioeconomic Status								
Affluent	264	(14%)	210	(80%)	33	(13%)	21	(8%)
Middle	1392	(73%)	1134	(81%)	132	(9%)	126	(9%)
Disadvantaged	237	(12%)	188	(79%)	21	(9%)	28	(12%)
Unknown	8	(0%)	1	(13%)	2	(25%)	6	(75%)
Remoteness								
Major City	911	(48%)	729	(80%)	98	(11%)	84	(9%)
Inner Regional	623	(33%)	520	(83%)	54	(9%)	49	(8%)
Outer Regional	328	(17%)	258	(79%)	31	(9%)	38	(12%)
Remote & Very Remote	31	(2%)	25	(81%)	3	(10%)	3	(10%)
Qld Unknown	8	(0%)	1	(13%)	2	(25%)	6	(75%)
Diagnosis Basis								
Histology	1766	(93%)	1522	(86%)	174	(10%)	70	(4%)
Cytology	5	(0%)	1	(20%)	1	(20%)	3	(60%)
Clinical	86	(5%)	7	(8%)	11	(13%)	68	(79%)
Other	45	(2%)	3	(7%)	3	(7%)	39	(87%)
Comorbidity								
0	1360	(72%)	582	(43%)	133	(10%)	127	(9%)
1	348	(18%)	171	(49%)	32	(9%)	34	(10%)
2+	194	(10%)	106	(55%)	23	(12%)	19	(10%)

*Includes local excision, polypectomy and stoma related surgery

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, therefore the totals may not add up.

Surgery rate for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

	Annual average		Had surgery 1721 (91%)				No surgery	
	Colon cancer cohort	(Qld %)	Major resection n	(row %)	Other surgery* n	(row %)	n	(row %)
Queensland	1901	(100%)	1533	(81%)	188	(10%)	180	(9%)
HHS (patient residence)								
Metro South	371	(20%)	301	(81%)	41	(11%)	29	(8%)
Metro North	340	(18%)	278	(82%)	31	(9%)	31	(9%)
Gold Coast	240	(13%)	187	(78%)	25	(10%)	28	(12%)
Sunshine Coast	199	(10%)	166	(83%)	21	(11%)	12	(6%)
Darling Downs	147	(8%)	121	(82%)	10	(7%)	16	(11%)
Wide Bay	130	(7%)	107	(82%)	9	(7%)	13	(10%)
Cairns and Hinterland	103	(5%)	82	(80%)	7	(7%)	14	(14%)
Townsville	97	(5%)	77	(79%)	10	(10%)	10	(10%)
West Moreton	90	(5%)	71	(79%)	11	(12%)	8	(9%)
Central Queensland	81	(4%)	68	(84%)	9	(11%)	4	(5%)
Mackay	66	(3%)	50	(76%)	9	(14%)	7	(11%)
South West	11	(1%)	8	(73%)	1	(9%)	1	(9%)
North West	9	(0%)	7	(78%)	1	(11%)	2	(22%)
Central West	7	(0%)	6	(86%)	1	(14%)		
Torres Strait-Northern Peninsula	2	(0%)	1	(50%)			1	(50%)
Cape York	1	(0%)	1	(100%)				
Qld Unknown	8	(0%)	1	(13%)	2	(25%)	6	(75%)

*Includes local excision, polypectomy and stoma related surgery

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.

EVER HAD
MUTUALLY
EXCLUSIVE

Type of definitive surgery for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

Other surgery

Characteristic	Annual average		Had surgery		Colectomy		Anterior Resection		Hartmanns		Total Proctocolectomy		Abdominal Perineal Resection		Local excision, polypectomy		Stoma related surgery	
	Colon cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	1901	(100%)	1721	(91%)	1154	(67%)	326	(19%)	46	(3%)	5	(0%)	2	(0%)	168	(10%)	20	(1%)
Gender																		
Male	955	(50%)	880	(51%)	548	(62%)	193	(22%)	25	(3%)	3	(0%)	1	(0%)	97	(11%)	12	(1%)
Female	946	(50%)	841	(49%)	606	(72%)	133	(16%)	21	(2%)	2	(0%)	1	(0%)	72	(9%)	7	(1%)
Age Group																		
< 65	571	(30%)	532	(31%)	321	(60%)	134	(25%)	20	(4%)	2	(0%)	1	(0%)	50	(9%)	5	(1%)
65-74	577	(30%)	545	(32%)	364	(67%)	108	(20%)	13	(2%)	3	(1%)	1	(0%)	52	(10%)	6	(1%)
75-84	537	(28%)	485	(28%)	354	(73%)	70	(14%)	9	(2%)	1	(0%)	1	(0%)	44	(9%)	6	(1%)
85+	216	(11%)	159	(9%)	116	(73%)	14	(9%)	4	(3%)					23	(14%)	2	(1%)
Indigenous Status																		
Indigenous	18	(1%)	16	(1%)	11	(69%)	2	(13%)	1	(6%)					2	(13%)		
Non-Indigenous	1706	(90%)	1541	(90%)	1034	(67%)	295	(19%)	43	(3%)	5	(0%)	2	(0%)	144	(9%)	19	(1%)
Not Stated/Unknown	177	(9%)	164	(10%)	109	(66%)	29	(18%)	2	(1%)	1	(1%)			23	(14%)	1	(1%)
Socioeconomic Status																		
Affluent	264	(14%)	243	(14%)	147	(60%)	56	(23%)	6	(2%)	1	(0%)	1	(0%)	30	(12%)	3	(1%)
Middle	1392	(73%)	1266	(74%)	864	(68%)	231	(18%)	34	(3%)	4	(0%)	1	(0%)	119	(9%)	13	(1%)
Disadvantaged	237	(12%)	209	(12%)	142	(68%)	39	(19%)	6	(3%)	1	(0%)			18	(9%)	3	(1%)
Unknown	8	(0%)	3	(0%)	1	(33%)			1	(33%)					1	(33%)	1	(33%)
Remoteness																		
Major City	911	(48%)	827	(48%)	529	(64%)	173	(21%)	23	(3%)	3	(0%)	1	(0%)	89	(11%)	9	(1%)
Inner Regional	623	(33%)	574	(33%)	403	(70%)	98	(17%)	17	(3%)	1	(0%)	1	(0%)	47	(8%)	7	(1%)
Outer Regional	328	(17%)	290	(17%)	202	(70%)	49	(17%)	5	(2%)	2	(1%)	1	(0%)	29	(10%)	3	(1%)
Remote & Very Remote	31	(2%)	28	(2%)	19	(68%)	6	(21%)	1	(4%)					2	(7%)	1	(4%)
Qld Unknown	8	(0%)	3	(0%)	1	(33%)			1	(33%)					1	(33%)	1	(33%)
Comorbidity																		
0	1360	(72%)	1233	(72%)	813	(66%)	251	(20%)	32	(3%)	3	(0%)	1	(0%)	120	(10%)	13	(1%)
1	348	(18%)	313	(18%)	220	(70%)	50	(16%)	10	(3%)	2	(1%)	1	(0%)	28	(9%)	4	(1%)
2+	194	(10%)	175	(10%)	122	(70%)	25	(14%)	5	(3%)	1	(1%)	1	(1%)	20	(11%)	3	(2%)

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, therefore the totals may not add up.

Type of definitive surgery for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

	Annual average		Had surgery		Colectomy		Anterior Resection		Hartmanns		Total Proctocolectomy		Abdominal Perineal Resection		Other surgery			
	Colon cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	Local excision, polypectomy	n	(row %)	Stoma related surgery
Queensland	1901	(100%)	1721	(91%)	1154	(67%)	326	(19%)	46	(3%)	5	(0%)	2	(0%)	168	(10%)	20	(1%)
HHS (patient residence)																		
Metro South	371	(20%)	342	(20%)	215	(63%)	74	(22%)	10	(3%)	1	(0%)			37	(11%)	4	(1%)
Metro North	340	(18%)	309	(18%)	212	(69%)	59	(19%)	6	(2%)	1	(0%)	1	(0%)	28	(9%)	3	(1%)
Gold Coast	240	(13%)	213	(12%)	133	(62%)	45	(21%)	7	(3%)	1	(0%)	1	(0%)	24	(11%)	2	(1%)
Sunshine Coast	199	(10%)	187	(11%)	127	(68%)	34	(18%)	6	(3%)					18	(10%)	2	(1%)
Darling Downs	147	(8%)	132	(8%)	91	(69%)	27	(20%)	3	(2%)	1	(1%)			10	(8%)	1	(1%)
Wide Bay	130	(7%)	117	(7%)	86	(74%)	19	(16%)	3	(3%)					7	(6%)	2	(2%)
Cairns and Hinterland	103	(5%)	89	(5%)	69	(78%)	12	(13%)	1	(1%)	1	(1%)	1	(1%)	6	(7%)	1	(1%)
Townsville	97	(5%)	87	(5%)	57	(66%)	18	(21%)	2	(2%)	1	(1%)			10	(11%)	1	(1%)
West Moreton	90	(5%)	82	(5%)	51	(62%)	17	(21%)	2	(2%)			1	(1%)	10	(12%)	1	(1%)
Central Queensland	81	(4%)	76	(4%)	52	(68%)	11	(14%)	4	(5%)	1	(1%)	1	(1%)	7	(9%)	2	(3%)
Mackay	66	(3%)	59	(3%)	42	(71%)	6	(10%)	1	(2%)					8	(14%)	1	(2%)
South West	11	(1%)	10	(1%)	6	(60%)	2	(20%)							1	(10%)	1	(10%)
North West	9	(0%)	7	(0%)	5	(71%)	1	(14%)	1	(14%)					1	(14%)	1	(14%)
Central West	7	(0%)	7	(0%)	5	(71%)	1	(14%)							1	(14%)		
Torres Strait-Northern Peninsula	2	(0%)	1	(0%)	1	(100%)												
Cape York	1	(0%)	1	(0%)	1	(100%)	1	(100%)										
Qld Unknown	8	(0%)	3	(0%)	1	(33%)			1	(33%)					1	(33%)	1	(33%)

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.


 LAST MAJOR
RESECTION

Characteristics of colon cancer patients receiving a major resection

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

	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	1533	(81%)	771	(50%)	71 yrs	188	(12%)	15	(1%)	433	(28%)	833	(54%)	270	(18%)
HHS (patient residence)															
Metro South	301	(20%)	149	(50%)	70 yrs	31	(10%)	1	(0%)	83	(28%)	156	(52%)	59	(20%)
Metro North	278	(18%)	131	(47%)	73 yrs	16	(6%)	1	(0%)	78	(28%)	154	(55%)	48	(17%)
Gold Coast	187	(12%)	91	(49%)	71 yrs			1	(1%)	41	(22%)	107	(57%)	28	(15%)
Sunshine Coast	166	(11%)	87	(52%)	72 yrs	12	(7%)	1	(1%)	51	(31%)	91	(55%)	24	(14%)
Darling Downs	121	(8%)	58	(48%)	71 yrs	30	(25%)	1	(1%)	39	(32%)	71	(59%)	21	(17%)
Wide Bay	107	(7%)	57	(53%)	71 yrs	60	(56%)	1	(1%)	35	(33%)	52	(49%)	22	(21%)
Cairns and Hinterland	82	(5%)	47	(57%)	68 yrs	11	(13%)	3	(4%)	17	(21%)	40	(49%)	14	(17%)
Townsville	77	(5%)	40	(52%)	67 yrs	12	(16%)	2	(3%)	20	(26%)	39	(51%)	13	(17%)
West Moreton	71	(5%)	40	(56%)	69 yrs	5	(7%)	1	(1%)	22	(31%)	41	(58%)	16	(23%)
Central Queensland	68	(4%)	34	(50%)	70 yrs	2	(3%)	1	(1%)	24	(35%)	42	(62%)	14	(21%)
Mackay	50	(3%)	26	(52%)	67 yrs	3	(6%)	1	(2%)	13	(26%)	29	(58%)	7	(14%)
South West	8	(1%)	3	(38%)	70 yrs	1	(13%)			3	(38%)	5	(63%)	2	(25%)
North West	7	(0%)	4	(57%)	61 yrs	1	(14%)	2	(29%)	3	(43%)	2	(29%)	1	(14%)
Central West	6	(0%)	3	(50%)	71 yrs	1	(17%)	1	(17%)	2	(33%)	4	(67%)	1	(17%)
Torres Strait-Northern Peninsula	1	(0%)	1	(100%)	61 yrs	1	(100%)	1	(100%)					1	(100%)
Cape York	1	(0%)	1	(100%)	60 yrs	1	(100%)	1	(100%)					1	(100%)
Qld Unknown	1	(0%)	1	(100%)	67 yrs					1	(100%)	1	(100%)	1	(100%)

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Type of major resections for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

EVER HAD
NOT MUTUALLY
EXCLUSIVE

Characteristic	Annual average		Had major resection		Colectomy		Anterior Resection		Hartmanns		Total Proctocolectomy		Abdominal Perineal Resection	
	Colon cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	1901	(100%)	1533	(81%)	1214	(79%)	331	(22%)	46	(3%)	7	(0%)	2	(0%)
Gender														
Male	955	(50%)	771	(50%)	583	(76%)	197	(26%)	25	(3%)	4	(1%)	1	(0%)
Female	946	(50%)	762	(50%)	631	(83%)	134	(18%)	21	(3%)	3	(0%)	1	(0%)
Age Group														
< 65	571	(30%)	477	(31%)	344	(72%)	137	(29%)	20	(4%)	2	(0%)	1	(0%)
65-74	577	(30%)	488	(32%)	381	(78%)	110	(23%)	13	(3%)	3	(1%)	1	(0%)
75-84	537	(28%)	435	(28%)	367	(84%)	71	(16%)	9	(2%)	2	(0%)	1	(0%)
85+	216	(11%)	134	(9%)	122	(91%)	14	(10%)	4	(3%)				
Indigenous Status														
Indigenous	18	(1%)	15	(1%)	11	(73%)	3	(20%)	1	(7%)				
Non-Indigenous	1706	(90%)	1378	(90%)	1090	(79%)	299	(22%)	43	(3%)	6	(0%)	2	(0%)
Not Stated/Unknown	177	(9%)	140	(9%)	112	(80%)	29	(21%)	2	(1%)	1	(1%)		
Socioeconomic Status														
Affluent	264	(14%)	210	(14%)	158	(75%)	56	(27%)	6	(3%)	1	(0%)	1	(0%)
Middle	1392	(73%)	1134	(74%)	907	(80%)	235	(21%)	34	(3%)	4	(0%)	1	(0%)
Disadvantaged	237	(12%)	188	(12%)	147	(78%)	40	(21%)	6	(3%)	2	(1%)		
Unknown	8	(0%)	1	(0%)	1	(100%)			1	(100%)				
Remoteness														
Major City	911	(48%)	729	(48%)	566	(78%)	176	(24%)	23	(3%)	3	(0%)	1	(0%)
Inner Regional	623	(33%)	520	(34%)	417	(80%)	100	(19%)	17	(3%)	1	(0%)	1	(0%)
Outer Regional	328	(17%)	258	(17%)	210	(81%)	50	(19%)	5	(2%)	2	(1%)	1	(0%)
Remote & Very Remote	31	(2%)	25	(2%)	20	(80%)	6	(24%)	1	(4%)	1	(4%)		
Qld Unknown	8	(0%)	1	(0%)	1	(100%)			1	(100%)				
Comorbidity														
0	1360	(72%)	1100	(72%)	856	(78%)	254	(23%)	32	(3%)	5	(0%)	1	(0%)
1	348	(18%)	281	(18%)	230	(82%)	52	(19%)	10	(4%)	2	(1%)	1	(0%)
2+	194	(10%)	152	(10%)	128	(84%)	26	(17%)	5	(3%)	1	(1%)	1	(1%)

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, therefore the totals may not add up.

Type of major resections for colon cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

EVER HAD
NOT MUTUALLY
EXCLUSIVE

	Annual average		Had major resection		Colectomy		Anterior Resection		Hartmanns		Total Proctocolectomy		Abdominal Perineal Resection	
	Colon Cancer Cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	1901	(100%)	1533	(81%)	1214	(79%)	331	(22%)	46	(3%)	7	(0%)	2	(0%)
HHS (patient residence)														
Metro South	371	(20%)	301	(20%)	222	(74%)	75	(25%)	10	(3%)	1	(0%)		
Metro North	340	(18%)	278	(18%)	222	(80%)	59	(21%)	6	(2%)	1	(0%)	1	(0%)
Gold Coast	240	(13%)	187	(12%)	152	(81%)	47	(25%)	7	(4%)	1	(1%)	1	(1%)
Sunshine Coast	199	(10%)	166	(11%)	133	(80%)	34	(20%)	6	(4%)				
Darling Downs	147	(8%)	121	(8%)	94	(78%)	27	(22%)	3	(2%)	1	(1%)		
Wide Bay	130	(7%)	107	(7%)	89	(83%)	19	(18%)	3	(3%)	1	(1%)		
Cairns and Hinterland	103	(5%)	82	(5%)	72	(88%)	12	(15%)	1	(1%)	1	(1%)	1	(1%)
Townsville	97	(5%)	77	(5%)	60	(78%)	18	(23%)	2	(3%)	1	(1%)		
West Moreton	90	(5%)	71	(5%)	56	(79%)	18	(25%)	2	(3%)			1	(1%)
Central Queensland	81	(4%)	68	(4%)	54	(79%)	12	(18%)	4	(6%)	1	(1%)	1	(1%)
Mackay	66	(3%)	50	(3%)	43	(86%)	6	(12%)	1	(2%)	1	(2%)		
South West	11	(1%)	8	(1%)	7	(88%)	2	(25%)			1	(13%)		
North West	9	(0%)	7	(0%)	6	(86%)	1	(14%)	1	(14%)				
Central West	7	(0%)	6	(0%)	5	(83%)	1	(17%)						
Torres Strait-Northern Peninsula	2	(0%)	1	(0%)	1	(100%)								
Cape York	1	(0%)	1	(0%)	1	(100%)	1	(100%)						
Qld Unknown	8	(0%)	1	(0%)	1	(100%)			1	(100%)				

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Patient flows



10 year colon cancer patient flows for colectomy

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

Hospitals performing surgery* HHS (patient residence)	HHS of surgery						
	Metro South	Metro North	Gold Coast	Sunshine Coast	Darling Downs	Wide Bay	Cairns and Hinterland
	11	14	5	6	6	6	3
Metro South	1935 (81% 88%)	241 (9% 11%)	14 (1% 1%)	4 (0% 0%)			
Metro North	192 (8% 9%)	1992 (76% 91%)	3 (0% 0%)	8 (1% 0%)	3 (0% 0%)		
Gold Coast	58 (2% 4%)	20 (1% 1%)	1291 (97% 94%)	1 (0% 0%)	1 (0% 0%)		1 (0% 0%)
Sunshine Coast	22 (1% 2%)	62 (2% 6%)	1 (0% 0%)	1025 (95% 92%)	3 (0% 0%)	2 (0% 0%)	
Darling Downs	33 (1% 4%)	46 (2% 6%)	1 (0% 0%)	17 (2% 2%)	703 (86% 87%)	5 (1% 1%)	
Wide Bay	20 (1% 3%)	98 (4% 12%)	1 (0% 0%)	13 (1% 2%)	3 (0% 0%)	640 (98% 82%)	1 (0% 0%)
Cairns and Hinterland	6 (0% 1%)	7 (0% 1%)		2 (0% 0%)		2 (0% 0%)	542 (92% 96%)
Townsville	3 (0% 1%)	4 (0% 1%)	2 (0% 0%)		1 (0% 0%)		16 (3% 3%)
West Moreton	59 (2% 12%)	39 (1% 8%)	2 (0% 0%)		57 (7% 11%)	1 (0% 0%)	
Central Queensland	24 (1% 5%)	65 (2% 14%)	1 (0% 0%)	2 (0% 0%)	7 (1% 2%)	2 (0% 0%)	
Mackay	8 (0% 2%)	15 (1% 4%)			2 (0% 1%)		
South West	11 (0% 18%)	9 (0% 15%)	4 (0% 7%)		30 (4% 49%)		
North West	2 (0% 4%)	7 (0% 15%)		1 (0% 2%)			4 (1% 9%)
Central West	1 (0% 3%)	12 (0% 35%)	1 (0% 3%)		4 (0% 12%)		
Torres Strait-Northern Peninsula	1 (0% 13%)						7 (1% 88%)
Cape York							15 (3% 100%)
Qld Unknown		3 (0% 30%)	4 (0% 40%)	1 (0% 10%)	1 (0% 10%)		
Queensland (%)	2375 (21%)	2620 (24%)	1325 (12%)	1074 (10%)	815 (7%)	652 (6%)	586 (5%)
Annual average	238	262	133	107	82	65	59

*the number of hospitals within a HHS performing colectomies

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 2375 surgeries that Metro South performed, 1935 (81%) patients were also residents of Metro South. The other 440 (19%) patients who received surgery in Metro South reside in fourteen other HHSs.

10 year colon cancer patient flows for colectomy

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

EVER HAD
1 SURGERY: 1
PATIENT

15

Colon

HHS of surgery							Qld	
Townsville	West Moreton	Central Queensland	Mackay	South West	North West	Central West		
3	2	6	3	1	1	1	n	(%)
2 (0% 0%)	3 (1% 0%)		1 (0% 0%)				2200	(20%)
	2 (1% 0%)						2200	(20%)
	1 (0% 0%)						1373	(12%)
							1115	(10%)
	4 (1% 0%)	1 (0% 0%)		2 (22% 0%)			812	(7%)
1 (0% 0%)	2 (1% 0%)	6 (2% 1%)					785	(7%)
2 (0% 0%)			1 (0% 0%)				562	(5%)
526 (84% 95%)							552	(5%)
	345 (97% 69%)						503	(5%)
		356 (96% 78%)	2 (1% 0%)				459	(4%)
66 (11% 18%)		1 (0% 0%)	275 (99% 75%)				367	(3%)
				7 (78% 11%)			61	(1%)
20 (3% 43%)					12 (100% 26%)		46	(0%)
8 (1% 24%)		6 (2% 18%)				2 (100% 6%)	34	(0%)
							8	(0%)
							15	(0%)
1 (0% 10%)							10	(0%)
626 (6%)	357 (3%)	370 (3%)	279 (3%)	9 (0%)	12 (0%)	2 (0%)	11102	(100%)
63	36	37	28	1	1	0	1110	

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 2200 residents of Metro South 1935 (88%) also received surgery in Metro South. The other 265 (12%) patients received surgery in six other HHSs.

10 year colon cancer patient flows for anterior resection

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

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 8	Metro North 12	Gold Coast 5	Sunshine Coast 6	Darling Downs 3
Metro South	510 (77% 82%)	109 (15% 17%)	5 (1% 1%)		
Metro North	73 (11% 13%)	473 (64% 86%)	1 (0% 0%)	2 (1% 0%)	
Gold Coast	13 (2% 3%)	13 (2% 3%)	374 (97% 94%)		
Sunshine Coast	5 (1% 2%)	25 (3% 9%)		257 (96% 90%)	
Darling Downs	8 (1% 5%)	17 (2% 11%)	1 (0% 1%)	2 (1% 1%)	127 (81% 81%)
Wide Bay	7 (1% 4%)	36 (5% 22%)		8 (3% 5%)	2 (1% 1%)
Cairns and Hinterland	4 (1% 4%)	5 (1% 5%)			
Townsville	4 (1% 3%)	1 (0% 1%)			1 (1% 1%)
West Moreton	27 (4% 24%)	18 (2% 16%)			15 (10% 13%)
Central Queensland	4 (1% 4%)	22 (3% 25%)	2 (1% 2%)		1 (1% 1%)
Mackay	2 (0% 4%)	9 (1% 18%)			
South West	5 (1% 25%)	5 (1% 25%)	2 (1% 10%)		8 (5% 40%)
North West		2 (0% 33%)			
Central West	1 (0% 11%)	2 (0% 22%)			2 (1% 22%)
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown	1 (0% 33%)	1 (0% 33%)	1 (0% 33%)		
Queensland (%)	664 (24%)	738 (27%)	386 (14%)	269 (10%)	156 (6%)
Annual average	66	74	39	27	16

*the number of hospitals within a HHS performing anterior resections

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 664 surgeries that Metro South performed, 510 (77%) patients were also residents of Metro South. The other 154 (23%) patients who received surgery in Metro South reside in 13 other HHSs.

10 year colon cancer patient flows for anterior resection

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

EVER HAD
1 SURGERY: 1
PATIENT

17

Colon

HHS of surgery						Qld 53	
Wide Bay 6	Cairns and Hinterland 3	Townsville 3	West Moreton 2	Central Queensland 3	Mackay 2	n	(%)
			1 (2% 0%)			625	(23%)
						549	(20%)
						400	(15%)
						287	(11%)
				2 (3% 1%)		157	(6%)
113 (100% 68%)				1 (2% 1%)		167	(6%)
	99 (92% 91%)	1 (1% 1%)				109	(4%)
	5 (5% 4%)	127 (83% 92%)				138	(5%)
			54 (98% 47%)			114	(4%)
				60 (91% 67%)		89	(3%)
		20 (13% 40%)			19 (100% 38%)	50	(2%)
						20	(1%)
		4 (3% 67%)				6	(0%)
		1 (1% 11%)		3 (5% 33%)		9	(0%)
	4 (4% 100%)					4	(0%)
						3	(0%)
113 (4%) 11	108 (4%) 11	153 (6%) 15	55 (2%) 6	66 (2%) 7	19 (1%) 2	2727	(100%)
						273	

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 625 residents of Metro South 510 (82%) also received surgery in Metro South. The other 115 (18%) patients received surgery in three other HHSs.

10 year colon cancer patient flows for hartmanns

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

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					
	Metro South 7	Metro North 8	Gold Coast 4	Sunshine Coast 3	Darling Downs 5	Wide Bay 6
Metro South	77 (89% 95%)	4 (4% 5%)				
Metro North	3 (3% 4%)	79 (81% 95%)		1 (3% 1%)		
Gold Coast	1 (1% 2%)	1 (1% 2%)	52 (95% 96%)			
Sunshine Coast	1 (1% 3%)	1 (1% 3%)		32 (97% 91%)		
Darling Downs		2 (2% 7%)			26 (87% 87%)	1 (4% 3%)
Wide Bay		6 (6% 20%)	1 (2% 3%)			23 (92% 77%)
Cairns and Hinterland						1 (4% 4%)
Townsville						
West Moreton	3 (3% 11%)	1 (1% 4%)			4 (13% 14%)	
Central Queensland	1 (1% 3%)	2 (2% 6%)	1 (2% 3%)			
Mackay						
South West						
North West	1 (1% 33%)					
Central West						
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown		1 (1% 50%)	1 (2% 50%)			
Queensland (%)	87 (20%)	97 (22%)	55 (12%)	33 (7%)	30 (7%)	25 (6%)
Annual average	9	10	6	3	3	3

*the number of hospitals within a HHS performing hartmanns

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 87 surgeries that Metro South performed, 77 (89%) patients were also residents of Metro South. The other ten (11%) patients who received surgery in Metro South reside in six other HHSs.

10 year colon cancer patient flows for hartmanns

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

EVER HAD
1 SURGERY: 1
PATIENT

19

Colon

HHS of surgery						Qld	
Cairns and Hinterland 3	Townsville 2	West Moreton 1	Central Queensland 4	Mackay 2	South West 1	n	46 (%)
						81	(18%)
						83	(19%)
						54	(12%)
			1 (3% 3%)			35	(8%)
		1 (5% 3%)				30	(7%)
						30	(7%)
23 (79% 96%)						24	(5%)
2 (7% 11%)	17 (74% 89%)					19	(4%)
		20 (95% 71%)				28	(6%)
			31 (97% 89%)			35	(8%)
	5 (22% 28%)			13 (100% 72%)		18	(4%)
					1 (100% 100%)	1	(0%)
1 (3% 33%)	1 (4% 33%)					3	(1%)
1 (3% 100%)						1	(0%)
2 (7% 100%)						2	(0%)
						2	(0%)
29 (7%) 3	23 (5%) 2	21 (5%) 2	32 (7%) 3	13 (3%) 1	1 (0%) 0	446	(100%)
						45	

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 81 residents of Metro South 77 (95%) also received surgery in Metro South. The other four (5%) patients received surgery in one other HHS.

10 year colon cancer patient flows for total proctocolectomy

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

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 5	Metro North 7	Gold Coast 2	Sunshine Coast 1	Darling Downs 1
Metro South	16 (76% 89%)	1 (4% 6%)			
Metro North		14 (54% 100%)			
Gold Coast			10 (100% 100%)		
Sunshine Coast		2 (8% 67%)		1 (50% 33%)	
Darling Downs	2 (10% 33%)	1 (4% 17%)		1 (50% 17%)	2 (100% 33%)
Wide Bay	1 (5% 20%)	3 (12% 60%)			
Cairns and Hinterland					
Townsville					
West Moreton	1 (5% 20%)	2 (8% 40%)			
Central Queensland		1 (4% 100%)			
Mackay		2 (8% 33%)			
South West	1 (5% 100%)				
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	21 (28%)	26 (34%)	10 (13%)	2 (3%)	2 (3%)
Annual average	2	3	1	0	0

*the number of hospitals within a HHS performing total proctocolectomies

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 21 surgeries that Metro South performed, 16 (76%) patients were also residents of Metro South. The other five (24%) patients who received surgery in Metro South reside in four other HHSs.

10 year colon cancer patient flows for total proctocolectomy

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

EVER HAD
1 SURGERY: 1
PATIENT

21

Colon

HHS of surgery

Wide Bay 1	Cairns and Hinterland 1	Townsville 2	West Moreton 2	Qld 22 n (%)
		1 (9% 6%)		18 (24%)
				14 (18%)
				10 (13%)
				3 (4%)
				6 (8%)
1 (100% 20%)				5 (7%)
	1 (100% 100%)			1 (1%)
		6 (55% 100%)		6 (8%)
			2 (100% 40%)	5 (7%)
				1 (1%)
		4 (36% 67%)		6 (8%)
				1 (1%)
1 (1%) 0	1 (1%) 0	11 (14%) 1	2 (3%) 0	76 (100%) 8

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 18 residents of Metro South 16 (89%) also received surgery in Metro South. The other two (11%) patients received surgery in two other HHSs.

10 year colon cancer patient flows for abdominal perineal resection

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

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 3	Metro North 7	Gold Coast 2	Sunshine Coast 1	Wide Bay 2
Metro South	5 (63% 100%)				
Metro North		15 (75% 100%)			
Gold Coast	1 (13% 10%)	1 (5% 10%)	8 (100% 80%)		
Sunshine Coast				1 (100% 100%)	
Darling Downs	1 (13% 100%)				
Wide Bay					2 (100% 100%)
Cairns and Hinterland		1 (5% 25%)			
Townsville					
West Moreton	1 (13% 33%)				
Central Queensland		2 (10% 67%)			
Mackay					
South West					
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown		1 (5% 100%)			
Queensland (%)	8 (16%)	20 (41%)	8 (16%)	1 (2%)	2 (4%)
Annual average	1	2	1	0	0

*the number of hospitals within a HHS performing abdominal perineal resections

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 eight surgeries that Metro South performed, five (63%) patients were also residents of Metro South. The other three (37%) patients who received surgery in Metro South reside in three other HHSs.

10 year colon cancer patient flows for abdominal perineal resection

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

EVER HAD
1 SURGERY: 1
PATIENT

23

Colon

HHS of surgery

Cairns and Hinterland 1	Townsville 2	West Moreton 1	Central Queensland 1	Qld 20 n (%)
				5 (10%)
				15 (31%)
				10 (20%)
				1 (2%)
				1 (2%)
				2 (4%)
3 (60% 75%)				4 (8%)
2 (40% 67%)	1 (50% 33%)			3 (6%)
		2 (100% 67%)		3 (6%)
			1 (100% 33%)	3 (6%)
	1 (50% 100%)			1 (2%)
				1 (2%)
5 (10%) 1	2 (4%) 0	2 (4%) 0	1 (2%) 0	49 (100%) 5

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 five residents of Metro South five (100%) also received surgery in Metro South.

2010 colon cancer patient flows for colectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					
	Metro South 8	Metro North 9	Gold Coast 4	Sunshine Coast 5	Darling Downs 4	Wide Bay 5
Metro South	203 (80% 90%)	20 (7% 9%)	2 (1% 1%)	1 (1% 0%)		
Metro North	10 (4% 5%)	194 (71% 94%)	1 (1% 0%)	2 (2% 1%)		
Gold Coast	10 (4% 7%)	3 (1% 2%)	136 (98% 91%)			
Sunshine Coast	2 (1% 1%)	10 (4% 7%)		121 (94% 90%)	1 (1% 1%)	
Darling Downs	7 (3% 7%)	5 (2% 5%)		2 (2% 2%)	80 (92% 82%)	1 (1% 1%)
Wide Bay	4 (2% 4%)	18 (7% 20%)		1 (1% 1%)		68 (99% 75%)
Cairns and Hinterland						
Townsville		1 (0% 2%)				
West Moreton	11 (4% 22%)	3 (1% 6%)			4 (5% 8%)	
Central Queensland	2 (1% 4%)	15 (5% 29%)		1 (1% 2%)	1 (1% 2%)	
Mackay	2 (1% 4%)	4 (1% 9%)				
South West	2 (1% 67%)	1 (0% 33%)				
North West				1 (1% 17%)		
Central West	1 (0% 50%)	1 (0% 50%)				
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown					1 (1% 100%)	
Queensland (%)	254 (21%)	275 (23%)	139 (12%)	129 (11%)	87 (7%)	69 (6%)

*the number of hospitals within a HHS performing colectomies

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 254 surgeries that Metro South performed, 203 (80%) patients were also residents of Metro South. The other 51 (20%) patients who received surgery in Metro South reside in 10 other HHSs.

2010 colon cancer patient flows for colectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD
1 SURGERY: 1
PATIENT

25

Colon

HHS of surgery						Qld	
Cairns and Hinterland 2	Townsville 2	West Moreton 2	Central Queensland 5	Mackay 2	North West 1	n	49 (%)
						226	(19%)
						207	(17%)
						149	(12%)
						134	(11%)
		2 (6% 2%)				97	(8%)
						91	(8%)
76 (94% 100%)						76	(6%)
3 (4% 5%)	58 (83% 94%)					62	(5%)
		32 (94% 64%)				50	(4%)
			32 (100% 63%)			51	(4%)
	9 (13% 20%)			30 (100% 67%)		45	(4%)
						3	(0%)
1 (1% 17%)	3 (4% 50%)				1 (100% 17%)	6	(0%)
						2	(0%)
1 (1% 100%)						1	(0%)
						1	(0%)
81 (7%)	70 (6%)	34 (3%)	32 (3%)	30 (2%)	1 (0%)	1201	(100%)

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 226 residents of Metro South 203 (90%) also received surgery in Metro South. The other 23 (10%) patients received surgery in three other HHSs.

2010 colon cancer patient flows for anterior resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 7	Metro North 9	Gold Coast 4	Sunshine Coast 5	Darling Downs 3
Metro South	70 (85% 83%)	12 (15% 14%)	2 (4% 2%)		
Metro North	1 (1% 2%)	51 (63% 98%)			
Gold Coast	2 (2% 4%)		52 (95% 96%)		
Sunshine Coast		4 (5% 12%)		30 (100% 88%)	
Darling Downs	1 (1% 5%)	2 (2% 10%)	1 (2% 5%)		16 (84% 80%)
Wide Bay	1 (1% 5%)	3 (4% 15%)			
Cairns and Hinterland					
Townsville					
West Moreton	6 (7% 27%)	1 (1% 5%)			1 (5% 5%)
Central Queensland		5 (6% 33%)			1 (5% 7%)
Mackay		3 (4% 33%)			
South West	1 (1% 50%)				1 (5% 50%)
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	82 (24%)	81 (23%)	55 (16%)	30 (9%)	19 (5%)

*the number of hospitals within a HHS performing anterior resections

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 84 surgeries that Metro South performed, 70 (85%) patients were also residents of Metro South. The other twelve (15%) patients who received surgery in Metro South reside in six other HHSs.

2010 colon cancer patient flows for anterior resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD
1 SURGERY: 1
PATIENT

27

Colon

HHS of surgery						Qld	
Wide Bay 5	Cairns and Hinterland 2	Townsville 2	West Moreton 2	Central Queensland 2	Mackay 1	n	(%)
						84	(24%)
						52	(15%)
						54	(16%)
						34	(10%)
						20	(6%)
16 (100% 80%)						20	(6%)
	10 (83% 100%)					10	(3%)
	1 (8% 5%)	20 (77% 95%)				21	(6%)
			14 (100% 64%)			22	(6%)
				9 (90% 60%)		15	(4%)
		4 (15% 44%)			2 (100% 22%)	9	(3%)
						2	(1%)
		2 (8% 100%)				2	(1%)
				1 (10% 100%)		1	(0%)
	1 (8% 100%)					1	(0%)
16 (5%)	12 (3%)	26 (7%)	14 (4%)	10 (3%)	2 (1%)	347	(100%)

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 84 residents of Metro South 70 (83%) also received surgery in Metro South. The other fourteen (17%) patients received surgery in two other HHSs.

2010 colon cancer patient flows for hartmanns

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 6	Metro North 4	Gold Coast 3	Sunshine Coast 1	Darling Downs 2
Metro South	15 (94% 100%)				
Metro North		5 (83% 100%)			
Gold Coast			10 (100% 100%)		
Sunshine Coast				4 (100% 100%)	
Darling Downs					3 (100% 100%)
Wide Bay					
Cairns and Hinterland					
Townsville					
West Moreton	1 (6% 25%)	1 (17% 25%)			
Central Queensland					
Mackay					
South West					
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	16 (29%)	6 (11%)	10 (18%)	4 (7%)	3 (5%)

*the number of hospitals within a HHS performing hartmanns

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 16 surgeries that Metro South performed, 15 (94%) patients were also residents of Metro South. The other one (6%) patient who received surgery in Metro South resides in one other HHS.

2010 colon cancer patient flows for hartmanns

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD
1 SURGERY: 1
PATIENT

29

Colon

HHS of surgery						Qld 26 n (%)	
Wide Bay 2	Cairns and Hinterland 1	Townsville 2	West Moreton 1	Central Queensland 3	Mackay 1		
						15	(27%)
						5	(9%)
						10	(18%)
						4	(7%)
						3	(5%)
3 (100% 100%)						3	(5%)
	1 (100% 100%)					1	(2%)
		3 (60% 100%)				3	(5%)
			2 (100% 50%)			4	(7%)
				5 (100% 100%)		5	(9%)
		2 (40% 67%)			1 (100% 33%)	3	(5%)
3 (5%)	1 (2%)	5 (9%)	2 (4%)	5 (9%)	1 (2%)	56	(100%)

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 fifteen residents of Metro South fifteen (100%) also received surgery in Metro South.

2010 colon cancer patient flows for total proctocolectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD
1 SURGERY: 1
PATIENT

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					Qld n (%)
	Metro South 1	Metro North 1	Gold Coast	Sunshine Coast	Townsville 2	
Metro South	1 (100% 100%)					1 (25%)
Metro North		1 (100% 100%)				1 (25%)
Gold Coast						
Sunshine Coast						
Darling Downs						
Wide Bay						
Cairns and Hinterland						
Townsville					2 (100% 100%)	2 (50%)
West Moreton						
Central Queensland						
Mackay						
South West						
North West						
Central West						
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown						
Queensland (%)	1 (25%)	1 (25%)			2 (50%)	4 (100%)

*the number of hospitals within a HHS performing total proctocolectomies

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 one surgery that Metro South performed, 100% of patients were also residents of Metro South.

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 one resident of Metro South one (100%) also received surgery in Metro South.

2010 colon cancer patient flows for abdominal perineal resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD
1 SURGERY: 1
PATIENT

31

Colon

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					Qld n 1 (%)
	Metro South 1	Metro North	Gold Coast	Sunshine Coast	Darling Downs	
Metro South						
Metro North						
Gold Coast						
Sunshine Coast						
Darling Downs						
Wide Bay						
Cairns and Hinterland						
Townsville						
West Moreton	1 (100% 100%)					1 (100%)
Central Queensland						
Mackay						
South West						
North West						
Central West						
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown						
Queensland (%)	1 (100%)					1 (100%)

*the number of hospitals within a HHS performing abdominal perineal resections

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 one surgery that Metro South performed, 0% of patients were also residents of Metro South. The 100% who received surgery in Metro South reside in one 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 one resident of West Moreton zero (0%) also received surgery in West Moreton.

Surgery rates



10 year surgery rate for colectomy

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD
1 SURGERY: 1
PATIENT

					Year of diagnosis																			
	Colon cancer cohort		Had colectomy		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	N	(col %)	n	(row %)	n	(%)	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Queensland	17320	(100%)	11102	(64%)	1003	(63%)	1020	(66%)	999	(65%)	1027	(65%)	1094	(64%)	1118	(62%)	1200	(65%)	1206	(64%)	1234	(65%)	1201	(63%)
HHS (patient residence)																								
Metro South	3541	(20%)	2200	(62%)	203	(63%)	216	(65%)	216	(65%)	207	(61%)	228	(69%)	218	(57%)	246	(63%)	197	(59%)	243	(64%)	226	(57%)
Metro North	3375	(19%)	2200	(65%)	218	(67%)	213	(70%)	200	(67%)	230	(67%)	216	(61%)	214	(60%)	243	(65%)	215	(66%)	244	(65%)	207	(65%)
Gold Coast	2165	(13%)	1373	(63%)	117	(62%)	116	(62%)	111	(65%)	126	(65%)	138	(60%)	149	(65%)	161	(65%)	157	(66%)	149	(62%)	149	(61%)
Sunshine Coast	1701	(10%)	1115	(66%)	90	(67%)	107	(70%)	94	(63%)	93	(60%)	112	(64%)	113	(67%)	108	(64%)	132	(67%)	132	(66%)	134	(67%)
Darling Downs	1227	(7%)	812	(66%)	71	(63%)	78	(74%)	72	(71%)	77	(69%)	74	(68%)	74	(64%)	85	(66%)	110	(66%)	74	(54%)	97	(69%)
Wide Bay	1141	(7%)	785	(69%)	67	(71%)	70	(73%)	58	(67%)	70	(62%)	73	(64%)	95	(70%)	86	(77%)	77	(67%)	98	(72%)	91	(66%)
Townsville	860	(5%)	552	(64%)	57	(66%)	48	(62%)	55	(64%)	59	(69%)	50	(61%)	57	(72%)	47	(64%)	59	(58%)	58	(68%)	62	(59%)
Cairns and Hinterland	843	(5%)	562	(67%)	54	(66%)	53	(68%)	34	(61%)	35	(67%)	47	(64%)	66	(63%)	57	(64%)	76	(68%)	64	(66%)	76	(76%)
West Moreton	792	(5%)	503	(64%)	49	(69%)	38	(59%)	48	(63%)	42	(76%)	46	(56%)	48	(60%)	64	(68%)	64	(65%)	54	(64%)	50	(58%)
Central Queensland	733	(4%)	459	(63%)	36	(47%)	33	(52%)	52	(71%)	35	(63%)	48	(63%)	41	(60%)	53	(68%)	49	(63%)	61	(73%)	51	(64%)
Mackay	576	(3%)	367	(64%)	29	(49%)	29	(55%)	42	(67%)	35	(64%)	44	(77%)	26	(59%)	34	(71%)	46	(63%)	37	(65%)	45	(67%)
South West	109	(1%)	61	(56%)	3	(33%)	5	(56%)	6	(50%)	7	(54%)	9	(64%)	7	(64%)	4	(44%)	9	(64%)	8	(80%)	3	(38%)
North West	69	(0%)	46	(67%)	2	(50%)	5	(71%)	5	(83%)	5	(83%)	4	(67%)	5	(56%)	3	(75%)	6	(60%)	5	(71%)	6	(60%)
Central West	50	(0%)	34	(68%)	4	(80%)	5	(100%)	3		2	(100%)	1	(50%)	1	(100%)	4	(44%)	6	(60%)	6	(100%)	2	(40%)
Cape York	24	(0%)	15	(63%)	2	(67%)	2	(100%)	1	(50%)	2	(100%)	1	(100%)	1	(50%)	5	(63%)					1	(50%)
Torres Strait-Northern Peninsula	10	(0%)	8	(80%)			1	(100%)			1		2	(100%)	1	(100%)			2		1	(50%)		
Qld Unknown	104	(1%)	10	(10%)	1	(11%)	1	(10%)	2	(12%)	1		1	(10%)	2	(15%)			1				1	(25%)

10 year surgery rate for anterior resection

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD
1 SURGERY: 1
PATIENT

	Year of diagnosis																							
	Colon cancer cohort		Had anterior resection		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	N	(col %)	n	(row %)	n	(%)	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Queensland	17320	(100%)	2727	(16%)	222	(14%)	221	(14%)	207	(13%)	218	(14%)	282	(16%)	277	(15%)	306	(17%)	330	(17%)	317	(17%)	347	(18%)
HHS (patient residence)																								
Metro South	3541	(20%)	625	(18%)	58	(18%)	46	(14%)	45	(14%)	52	(15%)	50	(15%)	71	(19%)	79	(20%)	70	(21%)	70	(18%)	84	(21%)
Metro North	3375	(19%)	549	(16%)	38	(12%)	50	(16%)	34	(11%)	55	(16%)	61	(17%)	66	(19%)	67	(18%)	62	(19%)	64	(17%)	52	(16%)
Gold Coast	2165	(13%)	400	(18%)	30	(16%)	35	(19%)	30	(17%)	27	(14%)	53	(23%)	41	(18%)	43	(17%)	36	(15%)	51	(21%)	54	(22%)
Sunshine Coast	1701	(10%)	287	(17%)	19	(14%)	23	(15%)	24	(16%)	27	(17%)	36	(21%)	23	(14%)	34	(20%)	34	(17%)	33	(16%)	34	(17%)
Darling Downs	1227	(7%)	157	(13%)	16	(14%)	7	(7%)	5	(5%)	9	(8%)	11	(10%)	13	(11%)	15	(12%)	32	(19%)	29	(21%)	20	(14%)
Wide Bay	1141	(7%)	167	(15%)	14	(15%)	14	(15%)	14	(16%)	11	(10%)	22	(19%)	18	(13%)	17	(15%)	21	(18%)	16	(12%)	20	(15%)
Townsville	860	(5%)	138	(16%)	13	(15%)	13	(17%)	16	(19%)	15	(18%)	14	(17%)	4	(5%)	10	(14%)	20	(20%)	12	(14%)	21	(20%)
Cairns and Hinterland	843	(5%)	109	(13%)	17	(21%)	12	(15%)	9	(16%)	5	(10%)	7	(10%)	11	(10%)	13	(15%)	14	(13%)	11	(11%)	10	(10%)
West Moreton	792	(5%)	114	(14%)	5	(7%)	7	(11%)	8	(11%)	4	(7%)	10	(12%)	16	(20%)	11	(12%)	16	(16%)	15	(18%)	22	(26%)
Central Queensland	733	(4%)	89	(12%)	5	(7%)	9	(14%)	9	(12%)	7	(13%)	9	(12%)	5	(7%)	10	(13%)	10	(13%)	10	(12%)	15	(19%)
Mackay	576	(3%)	50	(9%)	3	(5%)	5	(9%)	7	(11%)	4	(7%)	3	(5%)	6	(14%)	3	(6%)	7	(10%)	3	(5%)	9	(13%)
South West	109	(1%)	20	(18%)	4	(44%)			2	(17%)	1	(8%)	3	(21%)	1	(9%)	3	(33%)	3	(21%)	1	(10%)	2	(25%)
North West	69	(0%)	6	(9%)									1	(17%)	1	(11%)			1	(10%)	1	(14%)	2	(20%)
Central West	50	(0%)	9	(18%)					2		1	(50%)	1	(50%)			1	(11%)	3	(30%)			1	(20%)
Cape York	24	(0%)	4	(17%)					1	(50%)									1		1	(100%)	1	(50%)
Torres Strait-Northern Peninsula	10	(0%)																						
Qld Unknown	104	(1%)	3	(3%)					1	(6%)			1	(10%)	1	(8%)								

10 year surgery rate for hartmanns

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD
1 SURGERY: 1
PATIENT

	Year of diagnosis																							
	Colon cancer cohort		Had hartmanns		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	N	(col %)	n	(row %)	n	(%)	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Queensland	17320	(100%)	446	(3%)	38	(2%)	40	(3%)	49	(3%)	41	(3%)	52	(3%)	48	(3%)	40	(2%)	42	(2%)	40	(2%)	56	(3%)
HHS (patient residence)																								
Metro South	3541	(20%)	81	(2%)	6	(2%)	8	(2%)	9	(3%)	7	(2%)	5	(2%)	9	(2%)	6	(2%)	10	(3%)	6	(2%)	15	(4%)
Metro North	3375	(19%)	83	(2%)	10	(3%)	5	(2%)	12	(4%)	11	(3%)	11	(3%)	10	(3%)	5	(1%)	7	(2%)	7	(2%)	5	(2%)
Gold Coast	2165	(13%)	54	(2%)	4	(2%)	8	(4%)	5	(3%)	4	(2%)	4	(2%)	3	(1%)	4	(2%)	4	(2%)	8	(3%)	10	(4%)
Sunshine Coast	1701	(10%)	35	(2%)	3	(2%)	2	(1%)	2	(1%)	1	(1%)	3	(2%)	2	(1%)	5	(3%)	7	(4%)	6	(3%)	4	(2%)
Darling Downs	1227	(7%)	30	(2%)	3	(3%)	4	(4%)	4	(4%)	2	(2%)	6	(6%)	1	(1%)	1	(1%)	1	(1%)	5	(4%)	3	(2%)
Wide Bay	1141	(7%)	30	(3%)	1	(1%)	2	(2%)	4	(5%)	4	(4%)	4	(4%)	4	(3%)	2	(2%)	4	(3%)	2	(1%)	3	(2%)
Townsville	860	(5%)	19	(2%)	3	(3%)	3	(4%)	1	(1%)	2	(2%)	2	(2%)			2	(3%)	1	(1%)	2	(2%)	3	(3%)
Cairns and Hinterland	843	(5%)	24	(3%)	4	(5%)	3	(4%)	2	(4%)	3	(6%)	6	(8%)	4	(4%)	1	(1%)					1	(1%)
West Moreton	792	(5%)	28	(4%)	2	(3%)	3	(5%)	5	(7%)	1	(2%)	5	(6%)	2	(3%)	3	(3%)	1	(1%)	2	(2%)	4	(5%)
Central Queensland	733	(4%)	35	(5%)	1	(1%)	1	(2%)	3	(4%)	2	(4%)	3	(4%)	8	(12%)	6	(8%)	4	(5%)	2	(2%)	5	(6%)
Mackay	576	(3%)	18	(3%)	1	(2%)	1	(2%)	2	(3%)	3	(5%)	1	(2%)	3	(7%)	3	(6%)	1	(1%)			3	(4%)
South West	109	(1%)	1	(1%)									1	(7%)										
North West	69	(0%)	3	(4%)									1	(17%)	1	(11%)			1	(10%)				
Central West	50	(0%)																						
Cape York	24	(0%)	2	(8%)							1	(50%)					1	(13%)						
Torres Strait-Northern Peninsula	10	(0%)	1	(10%)											1	(100%)								
Qld Unknown	104	(1%)	2	(2%)													1	(8%)	1					

10 year surgery rate for abdominal perineal resection (APR)

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD
1 SURGERY: 1
PATIENT



	Colon cancer cohort				Year of diagnosis																			
					2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	N	(col %)	n	(row %)	n	(%)	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Queensland	17320	(100%)	49	(0%)	8	(1%)	7	(0%)	11	(1%)	5	(0%)	5	(0%)	6	(0%)	2	(0%)	2	(0%)	2	(0%)	1	(0%)
HHS (patient residence)																								
Metro South	3541	(20%)	5	(0%)	2	(1%)	1	(0%)			2	(1%)												
Metro North	3375	(19%)	15	(0%)	4	(1%)	3	(1%)	1	(0%)			2	(1%)	3	(1%)	1	(0%)	1	(0%)				
Gold Coast	2165	(13%)	10	(0%)	1	(1%)	2	(1%)	3	(2%)	1	(1%)	1	(0%)	1	(0%)			1	(0%)				
Sunshine Coast	1701	(10%)	1	(0%)											1	(1%)								
Darling Downs	1227	(7%)	1	(0%)													1	(1%)						
Wide Bay	1141	(7%)	2	(0%)	1	(1%)			1	(1%)														
Townsville	860	(5%)	3	(0%)					2	(2%)			1	(1%)										
Cairns and Hinterland	843	(5%)	4	(0%)					2	(4%)	1	(2%)									1	(1%)		
West Moreton	792	(5%)	3	(0%)					1	(1%)	1	(2%)											1	(1%)
Central Queensland	733	(4%)	3	(0%)									1	(1%)	1	(1%)					1	(1%)		
Mackay	576	(3%)	1	(0%)					1	(2%)														
South West	109	(1%)																						
North West	69	(0%)																						
Central West	50	(0%)																						
Cape York	24	(0%)																						
Torres Strait-Northern Peninsula	10	(0%)																						
Qld Unknown	104	(1%)	1	(1%)			1	(10%)																

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 five examples of how the counting rules are applied.

 73002866	 27/11/2002			
ICD-10AM Procedures	Ever had	Number of surgeries	Definitive	Last Major
27/11/2002 Fiberoptic colonoscopy to caecum, with polypectomy Fiberoptic colonoscopy to caecum, with biopsy	Local excision, polypectomy 27/11/2002 N = 1 Anterior Resection 31/03/2003 N = 1 Stoma 31/03/2003 N = 1 Colectomy 02/09/2003 N = 1	27/11/2002 Local excision, polypectomy 31/03/2003 Stoma Anterior Resection 02/09/2003 Colectomy 16/06/2004 Colectomy Stoma 17/04/2007 Colectomy Stoma 02/05/2007 Colectomy Stoma	Anterior Resection 31/03/2003	Colectomy 02/05/2007
31/03/2003 Temporary ileostomy Ultra low anterior resection of rectum			Definitive surgery Hierarchy used to determine definitive surgery for patient.	
02/09/2003 Resection of small intestine with anastomosis			Rules applied to the number of surgeries group 1. If the procedure was in the same group and happened on the same day then combine them. For example on the 16/06/2004 the patient had 2 colectomies. These 2 colectomies group up into 1 colectomy when the rules are applied 2. If the procedure happened > 1 month before the date of diagnosis then the procedure is excluded.	
16/06/2004 Limited excision of large intestine with anastomosis *Resection of small intestine with formation of stoma			Number of surgeries count Local excision n = 1 Colectomy n = 4 Anterior Resection n = 1 Stoma n = 4 <i>Number of surgeries = 10</i>	
17/04/2007 Resection of small intestine with anastomosis *Resection of small intestine with formation of stoma			ICD-10-AM Procedure count Local excision n = 2 Colectomy n = 7 Anterior Resection n = 1 Stoma n = 4 <i>Number of procedures = 14</i>	
02/05/2007 Resection of small intestine with anastomosis *Subtotal colectomy with formation of stoma				

*ICD Procedure split into two procedures for counting

Counts of surgery across groups for patients diagnosed with colon cancer from 2001 – 2010

SURGERY	NO OF PROCEDURES	EVER HAD*	NUMBER OF SURGERIES*	DEFINITIVE**	LAST MAJOR*
Colectomy	12319	11102	11837	10518	10676
Anterior Resection	2788	2727	2760	2675	2562
Hartmanns	463	446	451	446	384
Total Proctocolectomy	77	76	76	43	58
AP Resection	51	49	49	47	49
Local excision, polypectomy	21232	11989	18060	1662	-
Entero/Enterocolostomy	237	229	232	94	
Stoma	462	1895~	2013~	74	
Stoma Closures	330	319	327	5	
Total	37959	32840	39858	15564	15564

MAJOR
RESECTIONS

OTHER SURGERY

*Rules applied to surgical cohort

- Procedure 1 month before or any time after patient diagnosis
- If the same surgery happened on the same day then the surgery is only counted once according to the colon surgery hierarchy. For example: a patient has 2 colectomies on the 1/1/2001. The count of colectomies is 1

~Rules applied to stoma cohort

- If the procedure was in one of the following groups defined on page 4 then the count of stoma is 1. B. Resection of colon with stoma; D. AP Resection (with stoma); I. Hartmanns with stoma; J. Stoma; L. Entero/Enterocolostomy; F. Total proctocolectomy with stoma

+Rules applied to definitive surgery cohort

- Hierarchy used to determine definitive surgery for patient. For example if a patient had a Colectomy, Abdominal perineal resection and Hartmanns the patients definitive surgery will be the Hartmanns

Order of the Colon surgery hierarchy

1. Hartmanns
2. Abdominal perineal resection
3. Anterior resection
4. Colectomy
5. Total Proctocolectomy
6. Entero/Enterocolostomy
7. Stoma
8. Local excision, polypectomy
9. Stoma closure

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 as 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.

Colon cancer cohort

Queenslanders who were diagnosed with colon cancer between 1 January 2001 and 31 December 2010.

Colon cancer surgery cohort

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

No surgery cohort

Anyone in the Colon cancer cohort who did not undergo surgery as an admitted patient in the surgical cohort time period, as defined by the procedures 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.

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 twelve months before and twelve 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 twelve 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 colon surgery hierarchy outlined on page 40.

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.

Ever had surgery

Patients are counted once within the surgical groups but can be across multiple groups. For example: a patient had two local excisions, one colectomy and one anterior resection. The patient would be counted as one local excision, one colectomy and one anterior resection.

Had surgery

Includes Queensland residents of all ages diagnosed with invasive colon 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 that fall in the same group then the surgery is counted once. For example if a patient had two colectomies on the same day the colectomy is counted once.

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.

Last major resection

The last major resection the patient ever had. To be included in this group the patient underwent one of the following surgical procedures outlined on page 4: A. Resection of colon without stoma with anastomosis; B. Resection of colon with stoma; D. AP resection (with stoma); E. Total Proctocolectomy without stoma; F. Total Proctocolectomy with stoma; G. Anterior resection; I. Hartmanns with stoma.

Major resection

Includes Queensland residents of all ages diagnosed with invasive colon cancer in the surgical cohort time period who underwent one of the following surgical procedures outlined on page 4: A. Resection of colon without stoma with anastomosis; B. Resection of colon with stoma; D. AP resection (with stoma); E. Total Proctocolectomy without stoma; F. Total Proctocolectomy with stoma; G. Anterior resection; I. Hartmanns with stoma.

Median age (yrs)

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 colon 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. Exclusion example: Polypectomy performed in a private room, private radiology clinic.

Number of procedures

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

Number of surgeries

Includes Queensland residents of all ages diagnosed with invasive colon cancer in the surgical cohort time period who underwent a major resection or other surgery.

Other surgery

Includes Queensland residents of all ages diagnosed with invasive colon cancer in the surgical cohort time period who did not undergo a major resection. This group may be split into the following groups: local excision, polypectomy (includes C. Local Excision, polypectomy) and stoma related surgery (includes J. Stoma, K. Stoma Closure and L. Entero/Enterocolostomy).

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.

For more information

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