

# 3

Chapter

## Surgery for Rectal Cancer

### Infocus – access and flows 2013

Queensland Health

Queensland Cancer Control Safety  
and Quality Partnership



## Queensland Cancer Control Analysis Team

### **For more information:**

Queensland Cancer Control Analysis Team  
Queensland Health  
Radiation Oncology Mater Centre  
31 Raymond Tce  
South Brisbane Queensland 4001 Australia  
Tel: (61+) (07) 3840 3200  
Email: [gccat@health.qld.gov.au](mailto:gccat@health.qld.gov.au)  
<https://gccat.health.qld.gov.au>

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#### **Chapter 3 Rectal Cancer**

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The Manager  
Queensland Cancer Control Analysis Team  
Queensland Health  
Radiation Oncology Mater Centre  
31 Raymond Tce  
South Brisbane Queensland 4001

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Colorectal cancer subcommittee

David Theile Snr (Chair), David Clark, Mark Doudle, John Hansen, Nick Lutton, Pieter Prinsloo and David Taylor.

The Cancer Surgery in Queensland: Infocus –access and flows 2013 Chapter 3 Rectal Cancer has been prepared by Michael Blake, Shoni Colquist, Danica Cossio, Tracey Guan, Hazel Harden, Julie Moore and Dannie Zarate, the Queensland Cancer Control Analysis Team.

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## Introduction

In 2013 an estimated 1,065 new cases of invasive rectal cancer will be diagnosed among Queensland residents<sup>1</sup>. With the ageing population, the number of new cases is expected to reach 1,385 by 2021<sup>1</sup>.

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

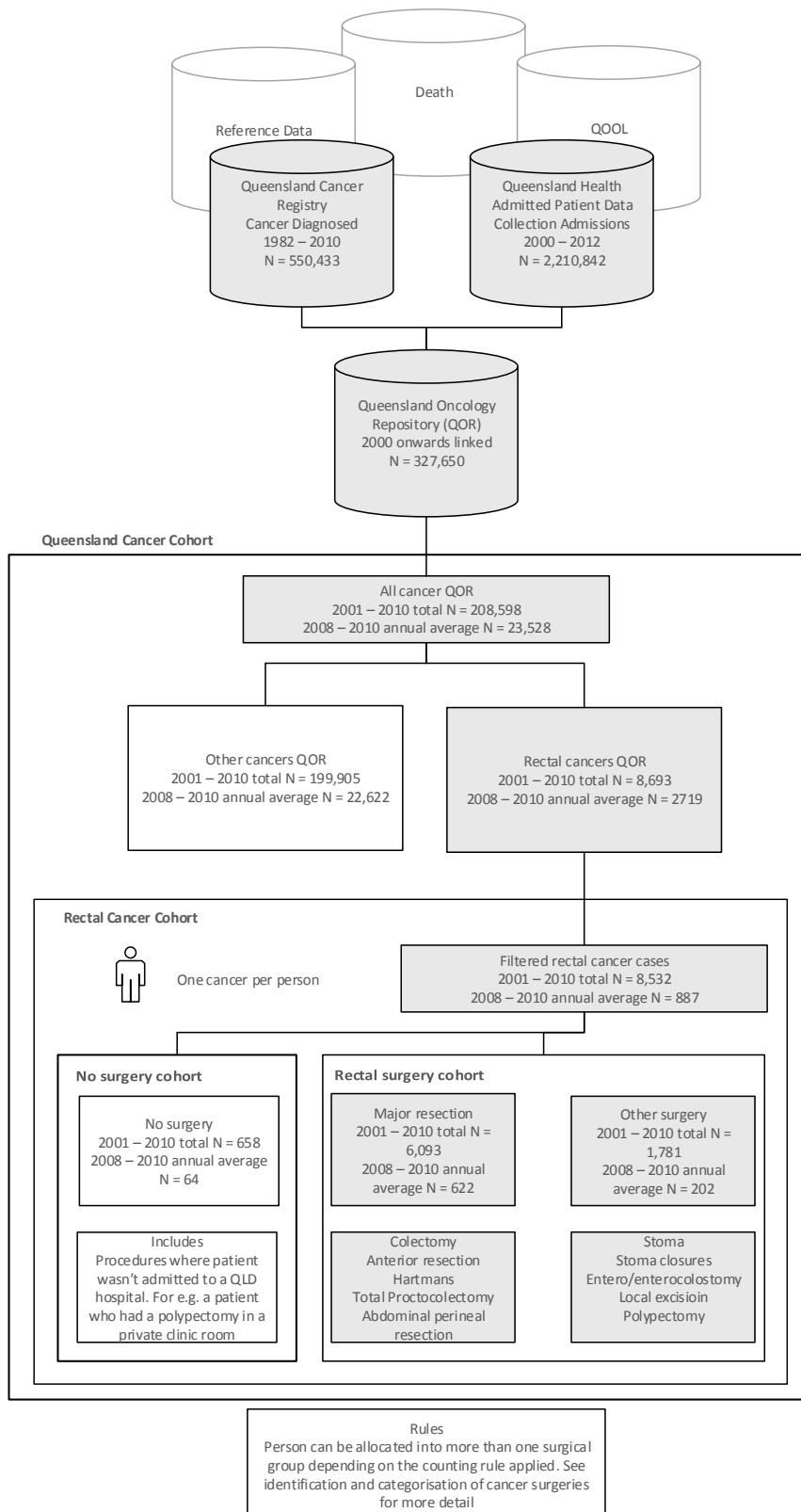
## Data sources and methods

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; Rectal Cancer Cohort; Rectal Surgery Cohort** and the **No Surgery Cohort**.

<sup>1</sup> 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 Rectal Cancer**  
Discharged patients from public or private hospitals  
Queensland residents  
All ages

**Rectal Cancer Cohort**  
Filtered cases  
Potential duplicate records  
If 2 or more diagnosis of same cancer earliest retained

**Rectal 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 rectal 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, 3<sup>rd</sup> edition (ICD-O-3).

Site	ICD-O-3	Morphology
Rectosigmoid junction	C19.9	All (invasive only)
Rectum	C20.9	All (invasive only)
Overlapping lesion of rectum, anus, and anal canal	C21.8	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 rectal 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 rectal 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 rectal cancer from the Australian Classification of Health Interventions (ACHI) International Classification of Diseases (ICD-10-AM) 7<sup>th</sup> 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 rectal cancer ICD-10-AM 7<sup>th</sup> edition coded procedures

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2001 – 2010	Annual average 2008 – 2010	2010
	<b>COLECTOMY</b>	<b>1,371</b>	<b>131</b>	<b>135</b>
	<b><i>A. Resection of rectal without stoma with anastomosis</i></b>	<b>1,111</b>	<b>109</b>	<b>117</b>
30566-00	Resection of small intestine with anastomosis	521	56	65
32003-00	Limited excision of large intestine with anastomosis	174	14	18
32003-01	Right hemicolectomy with anastomosis	164	13	11
32005-01	Extended right hemicolectomy with anastomosis	9		
32006-00	Left hemicolectomy with anastomosis	191	21	19
32005-00	Subtotal colectomy with anastomosis	22	2	3
32012-00	Total colectomy with anastomosis	30	3	1
	<b><i>B. Resection of rectal with stoma</i></b>	<b>260</b>	<b>22</b>	<b>18</b>
30565-00	Resection of small intestine with formation of stoma	45	3	2
32000-00	Limited excision of large intestine with formation of stoma	64	6	6
32000-01	Right hemicolectomy with formation of stoma	38	4	4
32004-01	Extended right hemicolectomy with formation of stoma	6		1
32006-01	Left hemicolectomy with formation of stoma	63	5	4
32004-00	Subtotal colectomy with formation of stoma	15	1	
32009-00	Total colectomy with ileostomy	29	3	1
	<b>LOCAL EXCISION, POLYPECTOMY</b>	<b>11,849</b>	<b>1,218</b>	<b>1,187</b>
	<b><i>C. Local excision, polypectomy</i></b>	<b>11,849</b>	<b>1,218</b>	<b>1,187</b>
32087-00	Fibreoptic colonoscopy to hepatic flexure, with polypectomy	220	24	21
32084-01	Fibreoptic colonoscopy to hepatic flexure, with biopsy	1,120	119	109
32093-00	Fibreoptic colonoscopy to caecum, with polypectomy	5,284	518	500
32090-01	Fibreoptic colonoscopy to caecum, with biopsy	4,425	474	481
90297-02	Endoscopic mucosal resection of large intestine	3	1	2
90959-00	Excision of other lesion of large intestine	37	3	4
32099-00	Per anal submucosal excision of lesion or tissue of rectum	182	15	9
32103-00	Per anal excision of lesion or tissue of rectum via stereoscopic rectoscopy	27	7	9
90341-00	Other excision of lesion of rectum	77	7	5
32142-01	Excision of anal polyp	27	3	4
32105-00	Per anal full thickness excision of anorectal lesion or tissue	162	16	16
90315-00	Endoscopic excision of lesion or tissue of anus	11	2	1
32075-01	Rigid sigmoidoscopy with biopsy	104	9	4
30075-14	Biopsy of large intestine	11	2	1
32096-00	Full thickness biopsy of rectum	90	9	10
30075-34	Biopsy of anus	32	3	4
90315-01	Excision of other lesion or tissue of anus	37	5	7



## Number of rectal cancer ICD-10-AM 7<sup>th</sup> edition coded procedures

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2001 – 2010	Annual average 2008 – 2010	2010
	ABDOMINALPERINEAL RESECTION	1,030	96	94
	<b><i>D. AP Resection (with stoma)</i></b>	<b>1,030</b>	<b>96</b>	<b>94</b>
32039-00	Abdominoperineal proctectomy	1,030	96	94
	TOTAL PROCTOCOLECTOMY	127	12	9
	<b><i>E. Total proctocolectomy without stoma</i></b>	<b>24</b>	<b>2</b>	<b>3</b>
32051-00	Total proctocolectomy with ileo-anal anastomosis	24	2	3
	<b><i>F. Total proctocolectomy with stoma</i></b>	<b>103</b>	<b>10</b>	<b>6</b>
32015-00	Total proctocolectomy with ileostomy	72	8	5
32051-01	Total proctocolectomy with ileo-anal anastomosis and formation of temporary ileostomy	31	2	1
	ANTERIOR RESECTION	4,593	485	505
	<b><i>G. Anterior Resection</i></b>	<b>4,593</b>	<b>485</b>	<b>505</b>
32024-00	High anterior resection of rectum	795	57	51
32025-00	Low anterior resection of rectum	1,131	163	197
32026-00	Ultra low anterior resection of rectum	1,541	213	217
32028-00	Ultra low anterior resection of rectum with hand sutured coloanal anastomosis	1,085	40	26
92208-00	Anterior resection of rectum, level unspecified	41	13	14
	HARTMANN'S	298	27	27
	<b><i>I. Hartmann's with stoma</i></b>	<b>298</b>	<b>27</b>	<b>27</b>
32030-00	Rectosigmoidectomy with formation of stoma	298	27	27
	STOMA	1,259	149	148
	<b><i>J. Stoma</i></b>	<b>1,259</b>	<b>149</b>	<b>148</b>
30375-29	Temporary ileostomy	1,183	141	139
30375-01	Other enterostomy	76	8	9
	STOMA CLOSURES	692	55	50
	<b><i>K. Stoma Closures</i></b>	<b>692</b>	<b>55</b>	<b>50</b>
30562-02	Closure of loop colostomy	97	7	3
30562-03	Closure of colostomy with restoration of bowel continuity	38	2	
30562-05	Closure of other stoma of large intestine	1		
32033-00	Restoration of bowel continuity after Hartmann's procedure	60	6	5
30562-04	Closure of other stoma of small intestine	3		1
30562-00	Closure of loop ileostomy	454	38	39
32060-00	Restorative proctectomy	39	2	2
	ENTERO/ENTEROCOLOSTOMY	35	2	1
	<b><i>L. Entero/Enterocolostomy</i></b>	<b>35</b>	<b>2</b>	<b>1</b>
30515-01	Enterocolostomy	20	1	1
30515-02	Enteroenterostomy	15	1	

## Surgery rate for rectal cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

Characteristic	Annual average		Had surgery 824 (93%)				No surgery	
	Rectal cancer cohort	(Qld %)	Major resection n	(row %)	Other surgery* n	(row %)	n	(row %)
Queensland	887	(100%)	622	(70%)	202	(23%)	64	(7%)
<b>Gender</b>								
Male	562	(63%)	398	(71%)	128	(23%)	36	(6%)
Female	325	(37%)	224	(69%)	73	(22%)	28	(9%)
<b>Age Group</b>								
< 65	398	(45%)	292	(73%)	84	(21%)	22	(6%)
65-74	265	(30%)	193	(73%)	58	(22%)	14	(5%)
75-84	165	(19%)	112	(68%)	39	(24%)	15	(9%)
85+	59	(7%)	25	(42%)	21	(36%)	12	(20%)
<b>Indigenous Status</b>								
Indigenous	13	(1%)	8	(62%)	4	(31%)	2	(15%)
Non-Indigenous	798	(90%)	566	(71%)	176	(22%)	56	(7%)
Not Stated/Unknown	76	(9%)	48	(63%)	22	(29%)	6	(8%)
<b>Socioeconomic Status</b>								
Affluent	130	(15%)	89	(68%)	30	(23%)	10	(8%)
Middle	639	(72%)	446	(70%)	150	(23%)	43	(7%)
Disadvantaged	115	(13%)	85	(74%)	21	(18%)	9	(8%)
Unknown	3	(0%)	1	(33%)	1	(33%)	1	(33%)
<b>Remoteness</b>								
Major City	430	(48%)	290	(67%)	109	(25%)	31	(7%)
Inner Regional	284	(32%)	207	(73%)	61	(21%)	16	(6%)
Outer Regional	152	(17%)	113	(74%)	26	(17%)	13	(9%)
Remote & Very Remote	18	(2%)	11	(61%)	4	(22%)	2	(11%)
Qld Unknown	3	(0%)	1	(33%)	1	(33%)	1	(33%)
<b>Diagnosis Basis</b>								
Histology	853	(96%)	619	(73%)	193	(23%)	42	(5%)
Cytology	2	(0%)			1	(50%)	2	(100%)
Clinical	25	(3%)	3	(12%)	7	(28%)	15	(60%)
Other	7	(1%)			2	(29%)	5	(71%)
<b>Comorbidity</b>								
0	664	(75%)	472	(71%)	146	(22%)	47	(7%)
1	149	(17%)	103	(69%)	37	(25%)	10	(7%)
2+	74	(8%)	47	(64%)	19	(26%)	7	(9%)

\*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.

EVER HAD  
MUTUALLY  
EXCLUSIVE

## Surgery rate for rectal cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

	Annual average		Had surgery 824 (93%)				No surgery	
	Rectal cancer cohort	(Qld %)	Major resection n	(row %)	Other surgery* n	(row %)	n	(row %)
Queensland	887	(100%)	622	(70%)	202	(23%)	64	(7%)
<b>HHS (patient residence)</b>								
Metro South	183	(21%)	126	(69%)	50	(27%)	8	(4%)
Metro North	170	(19%)	116	(68%)	41	(24%)	13	(8%)
Gold Coast	103	(12%)	68	(66%)	24	(23%)	11	(11%)
Sunshine Coast	85	(10%)	63	(74%)	18	(21%)	3	(4%)
Darling Downs	65	(7%)	48	(74%)	13	(20%)	4	(6%)
Wide Bay	60	(7%)	45	(75%)	10	(17%)	4	(7%)
Cairns and Hinterland	52	(6%)	37	(71%)	11	(21%)	5	(10%)
Townsville	42	(5%)	32	(76%)	6	(14%)	4	(10%)
West Moreton	44	(5%)	31	(70%)	11	(25%)	2	(5%)
Central Queensland	34	(4%)	22	(65%)	9	(26%)	3	(9%)
Mackay	30	(3%)	22	(73%)	4	(13%)	3	(10%)
South West	5	(1%)	3	(60%)	2	(40%)	1	(20%)
North West	6	(1%)	4	(67%)	1	(17%)	1	(17%)
Central West	3	(0%)	2	(67%)	1	(33%)	1	(33%)
Torres Strait-Northern Peninsula	1	(0%)	1	(100%)			1	(100%)
Cape York	2	(0%)	2	(100%)			1	(50%)
Qld Unknown	3	(0%)	1	(33%)	1	(33%)	1	(33%)

\*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 rectal cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

DEFINITIVE  
SURGERY  
MUTUALLY  
EXCLUSIVE

Characteristic	Annual average		Had surgery		Colectomy		Anterior Resection		Hartmanns		Total Proctocolectomy		Abdominal Perineal Resection		Local excision, polypectomy		Stoma related surgery	
	Rectal cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	887	(100%)	823	(93%)	24	(3%)	466	(57%)	26	(3%)	10	(1%)	95	(12%)	193	(23%)	8	(1%)
<b>Gender</b>																		
Male	562	(63%)	526	(64%)	14	(3%)	304	(58%)	16	(3%)	6	(1%)	58	(11%)	122	(23%)	7	(1%)
Female	325	(37%)	297	(36%)	10	(3%)	162	(55%)	11	(4%)	4	(1%)	37	(12%)	72	(24%)	2	(1%)
<b>Age Group</b>																		
< 65	398	(45%)	376	(46%)	8	(2%)	225	(60%)	11	(3%)	4	(1%)	43	(11%)	79	(21%)	4	(1%)
65-74	265	(30%)	251	(30%)	10	(4%)	148	(59%)	7	(3%)	2	(1%)	26	(10%)	56	(22%)	2	(1%)
75-84	165	(19%)	151	(18%)	4	(3%)	76	(50%)	5	(3%)	4	(3%)	23	(15%)	37	(25%)	2	(1%)
85+	59	(7%)	46	(6%)	2	(4%)	17	(37%)	3	(7%)	1	(2%)	3	(7%)	21	(46%)		
<b>Indigenous Status</b>																		
Indigenous	13	(1%)	12	(1%)	1	(8%)	5	(42%)	1	(8%)	1	(8%)	1	(8%)	3	(25%)	1	(8%)
Non-Indigenous	798	(90%)	742	(90%)	23	(3%)	420	(57%)	24	(3%)	9	(1%)	90	(12%)	169	(23%)	7	(1%)
Not Stated/Unknown	76	(9%)	70	(9%)	1	(1%)	42	(60%)	1	(1%)	1	(1%)	4	(6%)	22	(31%)		
<b>Socioeconomic Status</b>																		
Affluent	130	(15%)	119	(14%)	1	(1%)	72	(61%)	3	(3%)	1	(1%)	12	(10%)	29	(24%)	1	(1%)
Middle	639	(72%)	596	(72%)	19	(3%)	333	(56%)	19	(3%)	9	(2%)	67	(11%)	143	(24%)	7	(1%)
Disadvantaged	115	(13%)	106	(13%)	4	(4%)	61	(58%)	4	(4%)	1	(1%)	16	(15%)	20	(19%)	1	(1%)
Unknown	3	(0%)	2	(0%)			1	(50%)					1	(50%)	1	(50%)		
<b>Remoteness</b>																		
Major City	430	(48%)	399	(48%)	9	(2%)	221	(55%)	11	(3%)	5	(1%)	44	(11%)	103	(26%)	6	(2%)
Inner Regional	284	(32%)	268	(33%)	9	(3%)	153	(57%)	9	(3%)	3	(1%)	32	(12%)	60	(22%)	2	(1%)
Outer Regional	152	(17%)	139	(17%)	5	(4%)	83	(60%)	6	(4%)	2	(1%)	17	(12%)	25	(18%)	1	(1%)
Remote & Very Remote	18	(2%)	15	(2%)	1	(7%)	9	(60%)					2	(13%)	4	(27%)		
Qld Unknown	3	(0%)	2	(0%)			1	(50%)					1	(50%)	1	(50%)		
<b>Comorbidity</b>																		
0	664	(75%)	617	(75%)	17	(3%)	363	(59%)	16	(3%)	6	(1%)	70	(11%)	140	(23%)	6	(1%)
1	149	(17%)	139	(17%)	4	(3%)	72	(52%)	7	(5%)	2	(1%)	18	(13%)	35	(25%)	2	(1%)
2+	74	(8%)	67	(8%)	3	(4%)	32	(48%)	3	(4%)	2	(3%)	7	(10%)	18	(27%)	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 definitive surgery for rectal 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	
	Rectal cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	Local excision, polypectomy	Stoma related surgery
Queensland	887	(100%)	823	(93%)	24	(3%)	466	(57%)	26	(3%)	10	(1%)	95	(12%)	193	(23%)
<b>HHS (patient residence)</b>																
Metro South	183	(21%)	175	(21%)	5	(3%)	96	(55%)	4	(2%)	2	(1%)	19	(11%)	48	(27%)
Metro North	170	(19%)	157	(19%)	3	(2%)	89	(57%)	4	(3%)	2	(1%)	17	(11%)	39	(25%)
Gold Coast	103	(12%)	92	(11%)	2	(2%)	51	(55%)	4	(4%)	1	(1%)	10	(11%)	23	(25%)
Sunshine Coast	85	(10%)	81	(10%)	3	(4%)	47	(58%)	3	(4%)	1	(1%)	10	(12%)	18	(22%)
Darling Downs	65	(7%)	60	(7%)	3	(5%)	35	(58%)	3	(5%)	1	(2%)	7	(12%)	12	(20%)
Wide Bay	60	(7%)	55	(7%)	3	(5%)	33	(60%)	1	(2%)	1	(2%)	7	(13%)	10	(18%)
Cairns and Hinterland	52	(6%)	47	(6%)	2	(4%)	28	(60%)	2	(4%)	1	(2%)	4	(9%)	11	(23%)
Townsville	42	(5%)	38	(5%)	1	(3%)	26	(68%)	1	(3%)	1	(3%)	4	(11%)	6	(16%)
West Moreton	44	(5%)	42	(5%)	1	(2%)	22	(52%)	1	(2%)			7	(17%)	10	(24%)
Central Queensland	34	(4%)	31	(4%)			17	(55%)	2	(6%)	1	(3%)	2	(6%)	8	(26%)
Mackay	30	(3%)	27	(3%)	1	(4%)	15	(56%)	2	(7%)	1	(4%)	5	(19%)	4	(15%)
South West	5	(1%)	5	(1%)	1	(20%)	2	(40%)					1	(20%)	2	(40%)
North West	6	(1%)	5	(1%)			3	(60%)					1	(20%)	1	(20%)
Central West	3	(0%)	3	(0%)	1	(33%)	1	(33%)					1	(33%)	1	(33%)
Torres Strait-Northern Peninsula	1	(0%)	1	(0%)	1	(100%)							1	(100%)		
Cape York	2	(0%)	2	(0%)			1	(50%)					1	(50%)		
Qld Unknown	3	(0%)	2	(0%)			1	(50%)					1	(50%)	1	(50%)

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 rectal cancer patients receiving a major resection

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2008 – 2010

	Had surgery		Male		Median age at diagnosis	Disadvantaged		Characteristic Indigenous		One or more comorbidities		Private		Emergency	
	n	(Qld %)	n	(row %)	n	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	622	(81%)	398	(64%)	65 yrs	85	(14%)	8	(1%)	150	(24%)	328	(53%)	39	(6%)
<b>HHS (patient residence)</b>															
Metro South	126	(20%)	72	(57%)	64 yrs	14	(11%)	1	(1%)	25	(20%)	61	(48%)	8	(6%)
Metro North	116	(19%)	76	(66%)	67 yrs	11	(9%)	1	(1%)	28	(24%)	63	(54%)	8	(7%)
Gold Coast	68	(11%)	42	(62%)	67 yrs			1	(1%)	13	(19%)	43	(63%)	3	(4%)
Sunshine Coast	63	(10%)	41	(65%)	65 yrs	5	(8%)	1	(2%)	18	(29%)	36	(57%)	2	(3%)
Darling Downs	48	(8%)	32	(67%)	65 yrs	12	(25%)	1	(2%)	14	(29%)	27	(56%)	3	(6%)
Wide Bay	45	(7%)	31	(69%)	68 yrs	23	(51%)	1	(2%)	13	(29%)	22	(49%)	4	(9%)
Cairns and Hinterland	37	(6%)	26	(70%)	65 yrs	5	(14%)	1	(3%)	7	(19%)	17	(46%)	1	(3%)
Townsville	32	(5%)	18	(56%)	62 yrs	7	(22%)	1	(3%)	6	(19%)	16	(50%)	3	(9%)
West Moreton	31	(5%)	21	(68%)	67 yrs	2	(6%)			8	(26%)	17	(55%)	2	(6%)
Central Queensland	22	(4%)	15	(68%)	63 yrs	1	(5%)			7	(32%)	12	(55%)	2	(9%)
Mackay	22	(4%)	16	(73%)	65 yrs	4	(18%)	1	(5%)	7	(32%)	10	(45%)	2	(9%)
South West	3	(0%)	2	(67%)	62 yrs	1	(33%)			1	(33%)	2	(67%)		
North West	4	(1%)	3	(75%)	59 yrs			1	(25%)	1	(25%)	2	(50%)		
Central West	2	(0%)	2	(100%)	76 yrs					1	(50%)	1	(50%)	1	(50%)
Torres Strait-Northern Peninsula	1	(0%)			36 yrs	1	(100%)	1	(100%)						
Cape York	2	(0%)	2	(100%)	68 yrs			1	(50%)	1	(50%)	1	(50%)		
Qld Unknown	1	(0%)	1	(100%)	57 yrs									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.

## Type of major resections for rectal 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	
	Rectal cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	887	(100%)	622	(70%)	109	(18%)	479	(77%)	26	(4%)	12	(2%)	96	(15%)
<b>Gender</b>														
Male	562	(63%)	398	(64%)	71	(18%)	314	(79%)	16	(4%)	7	(2%)	59	(15%)
Female	325	(37%)	224	(36%)	38	(17%)	165	(74%)	11	(5%)	5	(2%)	37	(17%)
<b>Age Group</b>														
< 65	398	(45%)	292	(47%)	44	(15%)	235	(80%)	11	(4%)	6	(2%)	44	(15%)
65-74	265	(30%)	193	(31%)	41	(21%)	150	(78%)	7	(4%)	2	(1%)	26	(13%)
75-84	165	(19%)	112	(18%)	18	(16%)	76	(68%)	5	(4%)	4	(4%)	23	(21%)
85+	59	(7%)	25	(4%)	6	(24%)	18	(72%)	3	(12%)	1	(4%)	3	(12%)
<b>Indigenous Status</b>														
Indigenous	13	(1%)	8	(1%)	1	(13%)	5	(63%)	1	(13%)	1	(13%)	1	(13%)
Non-Indigenous	798	(90%)	566	(91%)	99	(17%)	432	(76%)	24	(4%)	11	(2%)	91	(16%)
Not Stated/Unknown	76	(9%)	48	(8%)	9	(19%)	42	(88%)	1	(2%)	1	(2%)	4	(8%)
<b>Socioeconomic Status</b>														
Affluent	130	(15%)	89	(14%)	16	(18%)	74	(83%)	3	(3%)	1	(1%)	12	(13%)
Middle	639	(72%)	446	(72%)	79	(18%)	342	(77%)	19	(4%)	10	(2%)	67	(15%)
Disadvantaged	115	(13%)	85	(14%)	13	(15%)	62	(73%)	4	(5%)	1	(1%)	16	(19%)
Unknown	3	(0%)	1	(0%)	1	(100%)	1	(100%)					1	(100%)
<b>Remoteness</b>														
Major City	430	(48%)	290	(47%)	61	(21%)	227	(78%)	11	(4%)	6	(2%)	44	(15%)
Inner Regional	284	(32%)	207	(33%)	31	(15%)	158	(76%)	9	(4%)	4	(2%)	32	(15%)
Outer Regional	152	(17%)	113	(18%)	15	(13%)	85	(75%)	6	(5%)	2	(2%)	17	(15%)
Remote & Very Remote	18	(2%)	11	(2%)	2	(18%)	9	(82%)					2	(18%)
Qld Unknown	3	(0%)	1	(0%)	1	(100%)	1	(100%)					1	(100%)
<b>Comorbidity</b>														
0	664	(75%)	472	(76%)	79	(17%)	371	(79%)	16	(3%)	7	(1%)	70	(15%)
1	149	(17%)	103	(17%)	20	(19%)	75	(73%)	7	(7%)	2	(2%)	18	(17%)
2+	74	(8%)	47	(8%)	10	(21%)	34	(72%)	3	(6%)	2	(4%)	7	(15%)

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## Type of major resections for rectal 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	
	Rectal cancer cohort	(Qld %)	n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	887	(100%)	622	(70%)	109	(18%)	479	(77%)	26	(4%)	12	(2%)	96	(15%)
<b>HHS (patient residence)</b>														
Metro South	183	(21%)	126	(20%)	23	(18%)	98	(78%)	4	(3%)	3	(2%)	19	(15%)
Metro North	170	(19%)	116	(19%)	18	(16%)	92	(79%)	4	(3%)	2	(2%)	17	(15%)
Gold Coast	103	(12%)	68	(11%)	24	(35%)	52	(76%)	4	(6%)	1	(1%)	10	(15%)
Sunshine Coast	85	(10%)	63	(10%)	10	(16%)	49	(78%)	3	(5%)	1	(2%)	10	(16%)
Darling Downs	65	(7%)	48	(8%)	7	(15%)	36	(75%)	3	(6%)	1	(2%)	7	(15%)
Wide Bay	60	(7%)	45	(7%)	8	(18%)	34	(76%)	1	(2%)	1	(2%)	7	(15%)
Cairns and Hinterland	52	(6%)	37	(6%)	6	(16%)	28	(76%)	2	(5%)	1	(3%)	4	(11%)
Townsville	42	(5%)	32	(5%)	4	(13%)	27	(84%)	1	(3%)	1	(3%)	4	(12%)
West Moreton	44	(5%)	31	(5%)	4	(13%)	23	(74%)	1	(3%)	1	(3%)	7	(23%)
Central Queensland	34	(4%)	22	(4%)	1	(5%)	18	(82%)	2	(9%)	1	(5%)	2	(10%)
Mackay	30	(3%)	22	(4%)	1	(5%)	15	(68%)	2	(9%)	1	(5%)	5	(23%)
South West	5	(1%)	3	(0%)	1	(33%)	2	(67%)					1	(33%)
North West	6	(1%)	4	(1%)	1	(25%)	3	(75%)					1	(25%)
Central West	3	(0%)	2	(0%)	1	(50%)	1	(50%)					1	(50%)
Torres Strait-Northern Peninsula	1	(0%)	1	(0%)	1	(100%)							1	(100%)
Cape York	2	(0%)	2	(0%)			1	(50%)					1	(50%)
Qld Unknown	3	(0%)	1	(0%)	1	(100%)	1	(100%)					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.



# Patient flows



## 10 year rectal cancer patient flows for colectomy

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

Hospitals performing surgery*	HHS of surgery					
	Metro South 9	Metro North 11	Gold Coast 5	Sunshine Coast 6	Darling Downs 4	Wide Bay 5
HHS (patient residence)						
Metro South	177 ( 80% 85% )	25 ( 9% 12% )	6 ( 2% 3% )	1 ( 1% 0% )		
Metro North	13 ( 6% 7% )	173 ( 62% 90% )		4 ( 4% 2% )	1 ( 2% 1% )	
Gold Coast	4 ( 2% 2% )	2 ( 1% 1% )	237 ( 96% 98% )			
Sunshine Coast	6 ( 3% 6% )	19 ( 7% 17% )	1 ( 0% 1% )	83 ( 89% 76% )		
Darling Downs	3 ( 1% 4% )	13 ( 5% 16% )		2 ( 2% 3% )	61 ( 92% 77% )	
Wide Bay	3 ( 1% 4% )	23 ( 8% 32% )	1 ( 0% 1% )			44 ( 96% 61% )
Cairns and Hinterland	2 ( 1% 4% )	4 ( 1% 8% )				
Townsville		3 ( 1% 5% )				
West Moreton	9 ( 4% 24% )	9 ( 3% 24% )			1 ( 2% 3% )	
Central Queensland	3 ( 1% 12% )	6 ( 2% 24% )				2 ( 4% 8% )
Mackay	1 ( 0% 3% )	1 ( 0% 3% )				
South West		2 ( 1% 40% )			3 ( 5% 60% )	
North West			1 ( 0% 100% )			
Central West				1 ( 1% 25% )		
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown				2 ( 2% 100% )		
Queensland	221	280	246	93	66	46
(%)	(20%)	(25%)	(22%)	(8%)	(6%)	(4%)
Annual average	22	28	25	9	7	5

\*the number of hospitals within a hospital and health service 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 221 surgeries that Metro South performed, 177 (80%) patients were also residents of Metro South. The other 44 (20%) who received surgery in Metro South reside in nine other HHSs.

10 year rectal cancer patient flows for colectomy

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

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery					Qld	
Cairns and Hinterland 3	Townsville 3	West Moreton 2	Central Queensland 2	Mackay 3	n	53 (%)
					209	(19%)
	1 ( 1% 1% )				192	(17%)
					243	(22%)
					109	(10%)
					79	(7%)
		1 ( 5% 1% )			72	(6%)
43 ( 90% 84% )	2 ( 3% 4% )				51	(5%)
2 ( 4% 3% )	54 ( 77% 92% )				59	(5%)
		18 ( 95% 49% )			37	(3%)
	1 ( 1% 4% )		12 ( 86% 48% )	1 ( 5% 4% )	25	(2%)
	12 ( 17% 35% )			20 ( 91% 59% )	34	(3%)
					5	(0%)
					1	(0%)
			2 ( 14% 50% )	1 ( 5% 25% )	4	(0%)
1 ( 2% 100% )					1	(0%)
2 ( 4% 100% )					2	(0%)
					2	(0%)
48 (4%)	70 (6%)	19 (2%)	14 (1%)	22 (2%)	1125	(100%)
5	7	2	1	2	113	

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 209 residents of Metro South 177 (85%) also received surgery in Metro South. The other 32 (15%) patients received surgery in three other HHSs.

## 10 year rectal cancer patient flows for anterior resection

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

Hospitals performing surgery*	HHS of surgery					
	Metro South 7	Metro North 11	Gold Coast 5	Sunshine Coast 5	Darling Downs 3	Wide Bay 6
HHS (patient residence)						
Metro South	786 ( 78% 86% )	106 ( 8% 12% )	8 ( 2% 1% )	1 ( 0% 0% )		
Metro North	64 ( 6% 7% )	813 ( 60% 92% )		5 ( 1% 1% )		
Gold Coast	21 ( 2% 4% )	12 ( 1% 2% )	514 ( 98% 93% )		1 ( 0% 0% )	
Sunshine Coast	14 ( 1% 3% )	58 ( 4% 12% )		415 ( 94% 85% )		
Darling Downs	24 ( 2% 8% )	74 ( 5% 25% )	1 ( 0% 0% )	5 ( 1% 2% )	196 ( 90% 65% )	1 ( 1% 0% )
Wide Bay	17 ( 2% 6% )	126 ( 9% 42% )		11 ( 2% 4% )		143 ( 97% 48% )
Cairns and Hinterland	4 ( 0% 2% )	32 ( 2% 14% )				
Townsville	3 ( 0% 1% )	9 ( 1% 3% )				
West Moreton	53 ( 5% 31% )	29 ( 2% 17% )	2 ( 0% 1% )		10 ( 5% 6% )	
Central Queensland	11 ( 1% 6% )	61 ( 5% 33% )	1 ( 0% 1% )	2 ( 0% 1% )	2 ( 1% 1% )	3 ( 2% 2% )
Mackay	4 ( 0% 3% )	13 ( 1% 9% )				
South West	4 ( 0% 20% )	7 ( 1% 35% )		1 ( 0% 5% )	8 ( 4% 40% )	
North West		3 ( 0% 15% )	1 ( 0% 5% )			
Central West		4 ( 0% 36% )		1 ( 0% 9% )	1 ( 0% 9% )	
Torres Strait-Northern Peninsula						
Cape York	1 ( 0% 25% )					
Qld Unknown	1 ( 0% 50% )	1 ( 0% 50% )				
Queensland	1007	1348	527	441	218	147
(%)	(22%)	(30%)	(12%)	(10%)	(5%)	(3%)
Annual average	101	135	53	44	22	15

\*the number of hospitals within a hospital and health service 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 1007 surgeries that Metro South performed, 786 (78%) patients were also residents of Metro South. The other 221 (22%) who received surgery in Metro South reside in 13 other HHSs.

10 year rectal cancer patient flows for anterior resection

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

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery						Qld	
Cairns and Hinterland	Townsville	West Moreton	Central Queensland	Mackay	North West	52	
3	3	2	4	2	1	n	(%)
		9 ( 10% 1% )				910	(20%)
	1 ( 0% 0% )	1 ( 1% 0% )				884	(20%)
1 ( 0% 0% )		1 ( 1% 0% )				550	(12%)
						487	(11%)
		1 ( 1% 0% )				302	(7%)
		1 ( 1% 0% )	1 ( 1% 0% )			299	(7%)
184 ( 90% 79% )	12 ( 3% 5% )					232	(5%)
16 ( 8% 6% )	261 ( 69% 90% )					289	(6%)
		78 ( 86% 45% )				172	(4%)
	2 ( 1% 1% )		104 ( 96% 56% )	1 ( 2% 1% )		187	(4%)
	85 ( 23% 57% )		1 ( 1% 1% )	45 ( 96% 30% )		148	(3%)
						20	(0%)
	13 ( 3% 65% )				3 ( 100% 15% )	20	(0%)
	2 ( 1% 18% )		2 ( 2% 18% )	1 ( 2% 9% )		11	(0%)
3 ( 1% 75% )						4	(0%)
						2	(0%)
204 (5%)	376 (8%)	91 (2%)	108 (2%)	47 (1%)	3 (0%)	4517	(100%)
20	38	9	11	5	0	452	

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 910 residents of Metro South 786 (86%) also received surgery in Metro South. The other 124 (18%) patients received surgery in four other HHSs.

## 10 year rectal cancer patient flows for hartmanns

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

Hospitals performing surgery*	HHS of surgery					
	Metro South 9	Metro North 9	Gold Coast 4	Sunshine Coast 5	Darling Downs 4	Wide Bay 3
HHS (patient residence)						
Metro South	34 ( 79% 85% )	5 ( 7% 13% )				
Metro North	2 ( 5% 4% )	47 ( 62% 96% )				
Gold Coast	2 ( 5% 5% )	2 ( 3% 5% )	38 ( 100% 90% )			
Sunshine Coast		3 ( 4% 12% )		22 ( 100% 88% )		
Darling Downs	2 ( 5% 7% )	4 ( 5% 14% )			22 ( 92% 79% )	
Wide Bay		4 ( 5% 27% )				11 ( 100% 73% )
Cairns and Hinterland		2 ( 3% 8% )				
Townsville						
West Moreton	1 ( 2% 7% )	3 ( 4% 21% )			1 ( 4% 7% )	
Central Queensland		3 ( 4% 19% )				
Mackay	2 ( 5% 13% )	2 ( 3% 13% )				
South West		1 ( 1% 50% )			1 ( 4% 50% )	
North West						
Central West						
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown						
Queensland (%)	43 (15%)	76 (26%)	38 (13%)	22 (8%)	24 (8%)	11 (4%)
Annual average	4	8	4	2	2	1

\*the number of hospitals within a hospital and health service 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 43 surgeries that Metro South performed, 34 (79%) patients were also residents of Metro South. The other nine (21%) who received surgery in Metro South reside in five other HHSs.

10 year rectal cancer patient flows for hartmanns

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

EVER HAD  
1 SURGERY: 1  
PATIENT

19

Rectal

HHS of surgery					Qld	
Cairns and Hinterland 2	Townsville 2	West Moreton 2	Central Queensland 3	Mackay 3	n	(%)
		1 ( 10% 3% )			40	(14%)
					49	(17%)
					42	(15%)
					25	(9%)
					28	(10%)
					15	(5%)
23 ( 85% 92% )					25	(9%)
2 ( 7% 15% )	11 ( 69% 85% )				13	(4%)
		9 ( 90% 64% )			14	(5%)
			13 ( 93% 81% )		16	(6%)
	3 ( 19% 20% )			8 ( 100% 53% )	15	(5%)
					2	(1%)
	2 ( 13% 100% )				2	(1%)
			1 ( 7% 100% )		1	(0%)
2 ( 7% 100% )					2	(1%)
27 (9%)	16 (6%)	10 (3%)	14 (5%)	8 (3%)	289	(100%)
3	2	1	1	1	29	

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 40 residents of Metro South 34 (85%) also received surgery in Metro South. The other six (15%) patients received surgery in two other HHSs.

## 10 year rectal cancer patient flows for total proctocolectomy

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

Hospitals performing surgery*	HHS of surgery				
	Metro South 7	Metro North 9	Gold Coast 3	Sunshine Coast 3	Darling Downs 3
HHS (patient residence)					
Metro South	18 ( 69% 90% )	2 ( 7% 10% )			
Metro North	4 ( 15% 19% )	16 ( 55% 76% )		1 ( 8% 5% )	
Gold Coast		1 ( 3% 7% )	14 ( 100% 93% )		
Sunshine Coast		1 ( 3% 9% )		10 ( 83% 91% )	
Darling Downs				1 ( 8% 13% )	7 ( 88% 88% )
Wide Bay	3 ( 12% 23% )	5 ( 17% 38% )			
Cairns and Hinterland		1 ( 3% 9% )			
Townsville		1 ( 3% 13% )			
West Moreton	1 ( 4% 20% )				1 ( 13% 20% )
Central Queensland		2 ( 7% 33% )			
Mackay					
South West					
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland	26	29	14	12	8
(%)	(21%)	(23%)	(11%)	(10%)	(6%)
Annual average	3	3	1	1	1

\*the number of hospitals within a hospital and health service 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 26 surgeries that Metro South performed, 18 (69%) patients were also residents of Metro South. The other eight (31%) who received surgery in Metro South reside in three other HHSs.



# 10 year rectal cancer patient flows for total proctocolectomy

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

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery						Qld	
Wide Bay 3	Cairns and Hinterland 2	Townsville 2	West Moreton 2	Central Queensland 1	Mackay 1	n	36 (%)
						20	(16%)
						21	(17%)
						15	(12%)
						11	(9%)
						8	(6%)
5 ( 100% 38% )						13	(10%)
	10 ( 83% 91% )					11	(9%)
		7 ( 58% 88% )				8	(6%)
			3 ( 100% 60% )			5	(4%)
				4 ( 100% 67% )		6	(5%)
		5 ( 42% 83% )			1 ( 100% 17% )	6	(5%)
	1 ( 8% 100% )					1	(1%)
	1 ( 8% 100% )					1	(1%)
5 (4%)	12 (10%)	12 (10%)	3 (2%)	4 (3%)	1 (1%)	126	(100%)
1	1	1	0	0	0	13	

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 20 (90%) also received surgery in Metro South. The other two (10%) patients received surgery in one other HHS.

## 10 year rectal cancer patient flows for abdominal perineal resection

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

Hospitals performing surgery*	HHS of surgery					
	Metro South 7	Metro North 9	Gold Coast 4	Sunshine Coast 6	Darling Downs 3	Wide Bay 5
HHS (patient residence)						
Metro South	174 ( 76% 88% )	21 ( 7% 11% )	2 ( 2% 1% )			
Metro North	11 ( 5% 6% )	184 ( 60% 93% )	1 ( 1% 1% )	1 ( 1% 1% )		
Gold Coast	5 ( 2% 4% )	1 ( 0% 1% )	115 ( 96% 95% )			
Sunshine Coast	2 ( 1% 2% )	13 ( 4% 13% )	1 ( 1% 1% )	83 ( 97% 84% )		
Darling Downs	9 ( 4% 13% )	15 ( 5% 22% )			44 ( 80% 65% )	
Wide Bay	3 ( 1% 4% )	39 ( 13% 51% )	1 ( 1% 1% )	1 ( 1% 1% )		32 ( 97% 42% )
Cairns and Hinterland	2 ( 1% 3% )	8 ( 3% 13% )				
Townsville						
West Moreton	16 ( 7% 27% )	6 ( 2% 10% )			4 ( 7% 7% )	
Central Queensland	4 ( 2% 9% )	11 ( 4% 25% )			1 ( 2% 2% )	
Mackay		3 ( 1% 8% )				
South West	2 ( 1% 18% )	3 ( 1% 27% )			6 ( 11% 55% )	
North West		2 ( 1% 40% )				
Central West		1 ( 0% 100% )				
Torres Strait-Northern Peninsula		1 ( 0% 25% )				
Cape York						
Qld Unknown				1 ( 1% 50% )		1 ( 3% 50% )
Queensland	228	308	120	86	55	33
(%)	(22%)	(30%)	(12%)	(8%)	(5%)	(3%)
Annual average	23	31	12	9	6	3

\*the number of hospitals within a hospital and health service 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 228 surgeries that Metro South performed, 174 (76%) patients were also residents of Metro South. The other 54 (24%) who received surgery in Metro South reside in nine other HHS.

# 10 year rectal cancer patient flows for abdominal perineal resection

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

EVER HAD

1 SURGERY: 1

PATIENT

HHS of surgery						Qld	
Cairns and Hinterland	Townsville	West Moreton	Central Queensland	Mackay	North West	n	(%)
2	3	2	3	2	1	47	
		1 ( 3% 1% )				198	(19%)
						197	(19%)
						121	(12%)
						99	(10%)
						68	(7%)
		1 ( 3% 1% )				77	(7%)
49 ( 86% 80% )	2 ( 3% 3% )					61	(6%)
4 ( 7% 10% )	38 ( 56% 90% )					42	(4%)
		34 ( 94% 57% )				60	(6%)
			28 ( 100% 64% )			44	(4%)
	26 ( 38% 70% )			8 ( 100% 22% )		37	(4%)
						11	(1%)
	2 ( 3% 40% )				1 ( 100% 20% )	5	(0%)
						1	(0%)
3 ( 5% 75% )						4	(0%)
1 ( 2% 100% )						1	(0%)
						2	(0%)
57 (6%)	68 (7%)	36 (4%)	28 (3%)	8 (1%)	1 (0%)	1028	(100%)
6	7	4	3	1	0	103	

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 198 residents of Metro South 174 (88%) received surgery in Metro South. The other 24 (12%) patients received surgery in three other HHSs.

## 2010 rectal cancer patient flows for colectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					
	Metro South 5	Metro North 7	Gold Coast 4	Sunshine Coast 4	Darling Downs 3	Wide Bay 3
Metro South	12 ( 86% 57% )	6 ( 15% 29% )	3 ( 10% 14% )			
Metro North		21 ( 51% 100% )				
Gold Coast			28 ( 90% 100% )			
Sunshine Coast		4 ( 10% 44% )		5 ( 100% 56% )		
Darling Downs		2 ( 5% 29% )			5 ( 100% 71% )	
Wide Bay		4 ( 10% 57% )				3 ( 100% 43% )
Cairns and Hinterland		1 ( 2% 17% )				
Townsville		1 ( 2% 25% )				
West Moreton	1 ( 7% 33% )	1 ( 2% 33% )				
Central Queensland	1 ( 7% 50% )	1 ( 2% 50% )				
Mackay						
South West						
North West						
Central West						
Torres Strait-Northern Peninsula						
Cape York						
Qld Unknown						
Queensland (%)	14 (13%)	41 (37%)	31 (28%)	5 (5%)	5 (5%)	3 (3%)

\*the number of hospitals within a hospital and health service 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 14 surgeries that Metro South performed, 12 (86%) patients were also residents of Metro South. The other two (14%) who received surgery in Metro South reside in two other HHSs.

2010 rectal cancer patient flows for colectomy

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery					Qld	
Cairns and Hinterland	Townsville	West Moreton	Central Queensland	Mackay	n	33 (%)
					21	(19%)
					21	(19%)
					28	(25%)
					9	(8%)
					7	(6%)
					7	(6%)
5 ( 100% 83% )					6	(5%)
	3 ( 100% 75% )				4	(4%)
		1 ( 100% 33% )			3	(3%)
					2	(2%)
				1 ( 100% 100% )	1	(1%)
			1 ( 100% 100% )		1	(1%)
5 (5%)	3 (3%)	1 (1%)	1 (1%)	1 (1%)	110	(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 21 residents of Metro South 12 (57%) also received surgery in Metro South. The other nine (43%) patients received surgery in two other HHSs.

## 2010 rectal 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	72 ( 72% 79% )	15 ( 8% 16% )	3 ( 4% 3% )		
Metro North	4 ( 4% 4% )	95 ( 53% 95% )			
Gold Coast	4 ( 4% 6% )		66 ( 93% 94% )		
Sunshine Coast	2 ( 2% 4% )	10 ( 6% 20% )		38 ( 97% 76% )	
Darling Downs	5 ( 5% 14% )	9 ( 5% 24% )			22 ( 88% 59% )
Wide Bay		24 ( 13% 67% )		1 ( 3% 3% )	
Cairns and Hinterland	1 ( 1% 4% )	6 ( 3% 22% )			
Townsville	1 ( 1% 3% )	2 ( 1% 7% )			
West Moreton	6 ( 6% 24% )	5 ( 3% 20% )	1 ( 1% 4% )		2 ( 8% 8% )
Central Queensland	3 ( 3% 20% )	10 ( 6% 67% )	1 ( 1% 7% )		1 ( 4% 7% )
Mackay	1 ( 1% 8% )	2 ( 1% 15% )			
South West	1 ( 1% 100% )				
North West		2 ( 1% 33% )			
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	100 (20%)	180 (36%)	71 (14%)	39 (8%)	25 (5%)

\*the number of hospitals within a hospital and health service 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 100 surgeries that Metro South performed, 72 (72%) of patients were also residents of Metro South. The other 28 (28%) who received surgery in Metro South reside in 10 other HHSs.

2010 rectal cancer patient flows for anterior resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD  
1 SURGERY: 1  
PATIENT

27

Rectal

HHS of surgery					Qld	
Wide Bay 4	Cairns and Hinterland 2	Townsville 2	West Moreton 2	Central Queensland 1	n	(%)
			1 ( 7% 1% )		91	(18%)
			1 ( 7% 1% )		100	(20%)
					70	(14%)
					50	(10%)
			1 ( 7% 3% )		37	(7%)
11 ( 100% 31% )					36	(7%)
	16 ( 100% 59% )	4 ( 9% 15% )			27	(5%)
		26 ( 59% 90% )			29	(6%)
			11 ( 79% 44% )		25	(5%)
					15	(3%)
		10 ( 23% 77% )			13	(3%)
					1	(0%)
		4 ( 9% 67% )			6	(1%)
				1 ( 100% 100% )	1	(0%)
11 (2%)	16 (3%)	44 (9%)	14 (3%)	1 (0%)	501	(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 91 residents of Metro South 72 (79%) also received surgery in Metro South. The other 19 (21%) patients received surgery in three other HHSs.

## 2010 rectal cancer patient flows for hartmanns

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 4	Metro North 6	Gold Coast 2	Sunshine Coast 1	Darling Downs 1
Metro South	4 ( 100% 80% )				
Metro North		7 ( 70% 100% )			
Gold Coast			5 ( 100% 100% )		
Sunshine Coast		1 ( 10% 50% )		1 ( 100% 50% )	
Darling Downs		1 ( 10% 33% )			2 ( 100% 67% )
Wide Bay		1 ( 10% 50% )			
Cairns and Hinterland					
Townsville					
West Moreton					
Central Queensland					
Mackay					
South West					
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	4 (15%)	10 (38%)	5 (19%)	1 (4%)	2 (8%)

\*the number of hospitals within a hospital and health service 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 four surgeries that Metro South performed, 100% of patients were also residents of Metro South.



2010 rectal cancer patient flows for hartmanns

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery					
Wide Bay 1	Townsville 1	West Moreton 1	Mackay 1	Qld 18 n	(%)
		1 ( 100% 20% )		5	(19%)
				7	(27%)
				5	(19%)
				2	(8%)
				3	(12%)
1 ( 100% 50% )				2	(8%)
	1 ( 100% 50% )		1 ( 100% 50% )	2	(8%)
1 (4%)	1 (4%)	1 (4%)	1 (4%)	26	(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 five residents of Metro South four (80%) also received surgery in Metro South. The other 20% patients received surgery in one other HHS.

## 2010 rectal cancer patient flows for abdominal perineal resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

Hospitals performing surgery* HHS (patient residence)	HHS of surgery				
	Metro South 4	Metro North 6	Gold Coast 4	Sunshine Coast 4	Darling Downs 2
Metro South	14 ( 67% 93% )		1 ( 7% 7% )		
Metro North		14 ( 70% 100% )			
Gold Coast			13 ( 93% 100% )		
Sunshine Coast		2 ( 10% 18% )		9 ( 100% 82% )	
Darling Downs	4 ( 19% 40% )				6 ( 100% 60% )
Wide Bay		3 ( 15% 43% )			
Cairns and Hinterland					
Townsville					
West Moreton	2 ( 10% 50% )				
Central Queensland	1 ( 5% 25% )	1 ( 5% 25% )			
Mackay					
South West					
North West					
Central West					
Torres Strait-Northern Peninsula					
Cape York					
Qld Unknown					
Queensland (%)	21 (22%)	20 (21%)	14 (15%)	9 (10%)	6 (6%)

\*the number of hospitals within a hospital and health service 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 21 surgeries that Metro South performed, 14 (67%) patients were also residents of Metro South. The other seven (33%) who received surgery in Metro South reside in three other HHSs.

2010 rectal cancer patient flows for abdominal perineal resection

YEAR OF DIAGNOSIS 2010 (COL% ROW%)

EVER HAD  
1 SURGERY: 1  
PATIENT

HHS of surgery					Qld 30 n (%)
Wide Bay 4	Cairns and Hinterland 2	Townsville 2	West Moreton 1	Central Queensland 1	
					15 (16%)
					14 (15%)
					13 (14%)
					11 (12%)
					10 (11%)
4 ( 100% 57% )					7 (7%)
	3 ( 75% 100% )				3 (3%)
	1 ( 25% 20% )	4 ( 33% 80% )			5 (5%)
			2 ( 100% 50% )		4 (4%)
				2 ( 100% 50% )	4 (4%)
		7 ( 58% 100% )			7 (7%)
		1 ( 8% 100% )			1 (1%)
4 (4%)	4 (4%)	12 (13%)	2 (2%)	2 (2%)	94 (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 15 residents of Metro South 14 (93%) also received surgery in Metro South. The other 7% patients received surgery in one other HHS.

## 2010 rectal 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	
	Metro South	Metro North	Gold Coast	Cairns and Hinterland	Central Queensland	n	(%)
	2	1	1	1	1	6	
	( 100% 100% )						
Metro South	2					2	(22%)
	( 100% 100% )						
Metro North		2				2	(22%)
		( 50% 100% )					
Gold Coast			1			1	(11%)
			( 100% 100% )				
Sunshine Coast							
Darling Downs							
Wide Bay		1				1	(11%)
		( 25% 100% )					
Cairns and Hinterland				1		1	(11%)
				( 100% 100% )			
Townsville							
West Moreton							
Central Queensland		1			1	2	(22%)
		( 25% 50% )			( 100% 50% )		
Mackay							
South West							
North West							
Central West							
Torres Strait-Northern Peninsula							
Cape York							
Qld Unknown							
Queensland (%)	2 (22%)	4 (44%)	1 (11%)	1 (11%)	1 (11%)	9	(100%)

\*the number of hospitals within a hospital and health service 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 two surgeries 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 two residents of Metro South two (100%) also received surgery in Metro South.

# Surgery rates



## 10 year surgery rate for colectomy

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD  
1 SURGERY: 1  
PATIENT

					Year of diagnosis																			
	Rectal 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	8532	(100%)	1125	(13%)	103	(13%)	94	(12%)	122	(16%)	131	(15%)	101	(12%)	134	(15%)	112	(12%)	122	(13%)	96	(11%)	110	(12%)
HHS (patient residence)																								
Metro South	1744	(20%)	209	(12%)	18	(10%)	16	(10%)	22	(14%)	21	(12%)	19	(12%)	22	(13%)	21	(11%)	25	(13%)	24	(13%)	21	(12%)
Metro North	1605	(19%)	192	(12%)	23	(18%)	5	(4%)	29	(17%)	18	(11%)	14	(9%)	27	(15%)	21	(11%)	19	(11%)	15	(10%)	21	(12%)
Gold Coast	1100	(13%)	243	(22%)	13	(16%)	25	(20%)	30	(28%)	31	(25%)	15	(13%)	31	(24%)	27	(24%)	28	(27%)	15	(18%)	28	(23%)
Sunshine Coast	840	(10%)	109	(13%)	12	(17%)	14	(18%)	7	(9%)	16	(20%)	15	(15%)	9	(9%)	7	(8%)	12	(12%)	8	(11%)	9	(11%)
Darling Downs	584	(7%)	79	(14%)	11	(16%)	7	(16%)	7	(18%)	10	(17%)	8	(14%)	8	(14%)	6	(9%)	6	(10%)	9	(13%)	7	(11%)
Wide Bay	546	(6%)	72	(13%)	7	(16%)	6	(13%)	2	(5%)	10	(16%)	3	(6%)	14	(22%)	6	(11%)	8	(13%)	9	(16%)	7	(11%)
Townsville	472	(6%)	59	(13%)	5	(11%)	7	(15%)	4	(8%)	6	(12%)	11	(21%)	3	(7%)	10	(19%)	6	(15%)	3	(7%)	4	(9%)
Cairns and Hinterland	460	(5%)	51	(11%)	3	(8%)	5	(14%)	6	(14%)	6	(15%)	3	(7%)	4	(7%)	7	(15%)	5	(10%)	6	(10%)	6	(13%)
West Moreton	369	(4%)	37	(10%)	3	(10%)	1	(3%)	7	(28%)	3	(8%)	3	(9%)	4	(13%)	4	(9%)	3	(7%)	6	(12%)	3	(7%)
Central Queensland	353	(4%)	25	(7%)	1	(3%)	4	(10%)	2	(6%)	4	(11%)	4	(10%)	4	(9%)	2	(9%)	2	(5%)			2	(6%)
Mackay	289	(3%)	34	(12%)	7	(26%)	3	(10%)	3	(12%)	6	(18%)	6	(20%)	5	(23%)	1	(3%)	2	(8%)			1	(3%)
South West	51	(1%)	5	(10%)			1	(17%)	1	(14%)									2	(29%)	1	(25%)		
North West	42	(0%)	1	(2%)															1	(20%)				
Central West	24	(0%)	4	(17%)					1						1	(20%)			1	(25%)			1	(50%)
Cape York	15	(0%)	2	(13%)											2	(100%)								
Torres Strait-Northern Peninsula	8	(0%)	1	(13%)															1					
Qld Unknown	30	(0%)	2	(7%)					1	(50%)									1					

## 10 year surgery rate for anterior resection

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD  
1 SURGERY: 1  
PATIENT

					Year of diagnosis																			
	Rectal 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	8532	(100%)	4517	(53%)	372	(49%)	410	(52%)	402	(51%)	452	(52%)	453	(53%)	492	(54%)	499	(55%)	482	(53%)	454	(54%)	501	(55%)
HHS (patient residence)																								
Metro South	1744	(20%)	910	(52%)	83	(46%)	89	(53%)	77	(49%)	85	(48%)	82	(50%)	90	(55%)	110	(60%)	100	(51%)	103	(58%)	91	(52%)
Metro North	1605	(19%)	884	(55%)	74	(56%)	70	(59%)	83	(50%)	95	(60%)	84	(54%)	99	(56%)	103	(54%)	90	(51%)	86	(57%)	100	(55%)
Gold Coast	1100	(13%)	550	(50%)	43	(52%)	60	(48%)	45	(41%)	63	(51%)	57	(51%)	75	(58%)	51	(46%)	46	(44%)	40	(48%)	70	(58%)
Sunshine Coast	840	(10%)	487	(58%)	43	(62%)	37	(48%)	45	(57%)	45	(55%)	63	(63%)	55	(58%)	51	(61%)	59	(60%)	39	(55%)	50	(59%)
Darling Downs	584	(7%)	302	(52%)	32	(46%)	21	(48%)	16	(41%)	29	(50%)	28	(50%)	32	(57%)	37	(55%)	29	(50%)	41	(59%)	37	(56%)
Wide Bay	546	(6%)	299	(55%)	23	(53%)	31	(65%)	24	(60%)	32	(52%)	30	(56%)	27	(42%)	31	(56%)	32	(52%)	33	(59%)	36	(59%)
Townsville	472	(6%)	289	(61%)	18	(39%)	25	(54%)	40	(75%)	26	(51%)	32	(62%)	31	(69%)	36	(68%)	28	(68%)	24	(59%)	29	(66%)
Cairns and Hinterland	460	(5%)	232	(50%)	19	(50%)	19	(51%)	25	(60%)	16	(41%)	19	(44%)	22	(37%)	27	(59%)	32	(67%)	26	(43%)	27	(57%)
West Moreton	369	(4%)	172	(47%)	11	(38%)	13	(39%)	9	(36%)	20	(56%)	10	(29%)	20	(63%)	21	(46%)	22	(52%)	21	(43%)	25	(60%)
Central Queensland	353	(4%)	187	(53%)	14	(44%)	24	(59%)	20	(61%)	21	(57%)	24	(57%)	19	(43%)	12	(52%)	21	(55%)	17	(55%)	15	(47%)
Mackay	289	(3%)	148	(51%)	9	(33%)	18	(58%)	14	(54%)	13	(38%)	19	(63%)	12	(55%)	18	(60%)	14	(54%)	18	(58%)	13	(41%)
South West	51	(1%)	20	(39%)	1	(20%)	2	(33%)	2	(29%)	3	(38%)	2	(67%)	3	(75%)	1	(33%)	5	(71%)			1	(25%)
North West	42	(0%)	20	(48%)	1	(25%)			1	(33%)	3	(60%)	3	(60%)	2	(100%)	1	(33%)	2	(40%)	1	(25%)	6	(67%)
Central West	24	(0%)	11	(46%)	1	(33%)	1	(50%)	1		1	(50%)			4	(80%)			1	(25%)	1	(25%)	1	(50%)
Cape York	15	(0%)	4	(27%)																4	(80%)			
Torres Strait-Northern Peninsula	8	(0%)																						
Qld Unknown	30	(0%)	2	(7%)											1	(25%)			1					

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD  
1 SURGERY: 1  
PATIENT

[illegible]



## 10 year surgery rate for total proctocolectomy

YEAR OF DIAGNOSIS 2001 - 2010

EVER HAD  
1 SURGERY: 1  
PATIENT

					Year of diagnosis																			
	Rectal cancer cohort		Had total proctocolectomy		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	8532	(100%)	126	(1%)	15	(2%)	14	(2%)	13	(2%)	10	(1%)	14	(2%)	16	(2%)	8	(1%)	14	(2%)	13	(2%)	9	(1%)
HHS (patient residence)																								
Metro South	1744	(20%)	20	(1%)			5	(3%)			3	(2%)	3	(2%)					2	(1%)	5	(3%)	2	(1%)
Metro North	1605	(19%)	21	(1%)	2	(2%)			1	(1%)	2	(1%)	1	(1%)	6	(3%)	2	(1%)	4	(2%)	1	(1%)	2	(1%)
Gold Coast	1100	(13%)	15	(1%)	4	(5%)	3	(2%)	3	(3%)							1	(1%)	2	(2%)	1	(1%)	1	(1%)
Sunshine Coast	840	(10%)	11	(1%)					4	(5%)	1	(1%)			1	(1%)	2	(2%)	1	(1%)	2	(3%)		
Darling Downs	584	(7%)	8	(1%)	2	(3%)	1	(2%)	1	(3%)	2	(3%)	1	(2%)					1	(2%)				
Wide Bay	546	(6%)	13	(2%)	1	(2%)	2	(4%)	1	(3%)	1	(2%)	2	(4%)	1	(2%)	2	(4%)	2	(3%)			1	(2%)
Townsville	472	(6%)	8	(2%)	2	(4%)			2	(4%)			3	(6%)							1	(2%)		
Cairns and Hinterland	460	(5%)	11	(2%)	1	(3%)	2	(5%)							6	(10%)	1	(2%)					1	(2%)
West Moreton	369	(4%)	5	(1%)	1	(3%)							3	(9%)					1	(2%)				
Central Queensland	353	(4%)	6	(2%)					1	(3%)	1	(3%)							1	(3%)	1	(3%)	2	(6%)
Mackay	289	(3%)	6	(2%)	2	(7%)	1	(3%)							1	(5%)					2	(6%)		
South West	51	(1%)																						
North West	42	(0%)																						
Central West	24	(0%)																						
Cape York	15	(0%)	1	(7%)											1	(50%)								
Torres Strait-Northern Peninsula	8	(0%)	1	(13%)									1	(50%)										
Qld Unknown	30	(0%)																						

EVER HAD  
1 SURGERY: 1  
PATIENT

## 10 year surgery rate for abdominal perineal resection (APR)

YEAR OF DIAGNOSIS 2001 - 2010


	Year of diagnosis																							
	Rectal cancer cohort		Had APR		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	8532	(100%)	1028	(12%)	106	(14%)	104	(13%)	103	(13%)	112	(13%)	105	(12%)	114	(13%)	97	(11%)	101	(11%)	92	(11%)	94	(10%)
HHS (patient residence)																								
Metro South	1744	(20%)	198	(11%)	27	(15%)	17	(10%)	25	(16%)	15	(8%)	21	(13%)	21	(13%)	15	(8%)	25	(13%)	17	(9%)	15	(9%)
Metro North	1605	(19%)	197	(12%)	13	(10%)	18	(15%)	25	(15%)	22	(14%)	17	(11%)	25	(14%)	25	(13%)	21	(12%)	17	(11%)	14	(8%)
Gold Coast	1100	(13%)	121	(11%)	13	(16%)	19	(15%)	12	(11%)	14	(11%)	10	(9%)	12	(9%)	10	(9%)	12	(12%)	6	(7%)	13	(11%)
Sunshine Coast	840	(10%)	99	(12%)	10	(14%)	14	(18%)	7	(9%)	8	(10%)	13	(13%)	10	(11%)	8	(10%)	11	(11%)	7	(10%)	11	(13%)
Darling Downs	584	(7%)	68	(12%)	6	(9%)	4	(9%)	6	(15%)	8	(14%)	8	(14%)	5	(9%)	9	(13%)	5	(9%)	7	(10%)	10	(15%)
Wide Bay	546	(6%)	77	(14%)	5	(12%)	4	(8%)	3	(8%)	14	(23%)	6	(11%)	16	(25%)	7	(13%)	9	(15%)	6	(11%)	7	(11%)
Townsville	472	(6%)	42	(9%)	8	(17%)	3	(7%)	7	(13%)	4	(8%)	3	(6%)	6	(13%)					6	(15%)	5	(11%)
Cairns and Hinterland	460	(5%)	61	(13%)	6	(16%)	4	(11%)	4	(10%)	8	(21%)	7	(16%)	9	(15%)	10	(22%)	3	(6%)	7	(11%)	3	(6%)
West Moreton	369	(4%)	60	(16%)	5	(17%)	8	(24%)	4	(16%)	6	(17%)	8	(23%)	4	(13%)	4	(9%)	8	(19%)	9	(18%)	4	(10%)
Central Queensland	353	(4%)	44	(12%)	5	(16%)	4	(10%)	3	(9%)	5	(14%)	8	(19%)	5	(11%)	7	(30%)	1	(3%)	2	(6%)	4	(13%)
Mackay	289	(3%)	37	(13%)	5	(19%)	6	(19%)	4	(15%)	5	(15%)	2	(7%)			1	(3%)	3	(12%)	4	(13%)	7	(22%)
South West	51	(1%)	11	(22%)	1	(20%)	1	(17%)	3	(43%)	3	(38%)	1	(33%)					2	(29%)				
North West	42	(0%)	5	(12%)	2	(50%)	1	(50%)													1	(25%)	1	(11%)
Central West	24	(0%)	1	(4%)																	1	(25%)		
Cape York	15	(0%)	1	(7%)																	1	(20%)		
Torres Strait-Northern Peninsula	8	(0%)	4	(50%)			1	(50%)					1	(50%)	1	(100%)					1	(50%)		
Qld Unknown	30	(0%)	2	(7%)													1	(17%)	1					

# 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

Fibreoptic colonoscopy to caecum, with polypectomy

Fibreoptic colonoscopy to caecum, with biopsy

31/03/2003

Temporary ileostomy

Ultra low anterior resection of rectum

02/09/2003

Resection of small intestine with anastomosis

16/06/2004

Limited excision of large intestine with anastomosis

\*Resection of small intestine with formation of stoma

17/04/2007

Resection of small intestine with anastomosis

\*Resection of small intestine with formation of stoma

02/05/2007

Resection of small intestine with anastomosis

\*Subtotal colectomy with formation of stoma

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

**Definitive surgery**  
Hierarchy used to determine definitive surgery for patient.

**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.

**Number of surgeries count**  
Local excision n = 1  
Colectomy n = 4  
Anterior Resection n = 1  
Stoma n = 4  
*Number of surgeries = 10*

**ICD-10-AM Procedure count**  
Local excision n = 2  
Colectomy n = 7  
Anterior Resection n = 1  
Stoma n = 4  
*Number of procedures = 14*

\*ICD Procedure split into two procedures for counting

## Counts of surgery across groups for patients diagnosed with rectal cancer from 2001 to 2010

SURGERY	NO OF PROCEDURES	EVER HAD*	NUMBER OF SURGERIES*	DEFINITIVE*	LAST MAJOR*
<b>Colectomy</b>	1371	1125	1302	300	830
<b>Anterior Resection</b>	4593	4517	4576	4381	3943
<b>Hartmanns</b>	298	289	291	289	256
<b>Total Proctocolectomy</b>	127	126	127	98	104
<b>AP Resection</b>	1030	1028	1029	1025	960
<b>Local excision, polypectomy</b>	11849	6777	10467	1697	-
<b>Entero/Enterocolostomy</b>	35	31	32	9	-
<b>Stoma</b>	1259	3061	3238	74	-
<b>Stoma Closures</b>	692	679~	691~	1	-
<b>Total</b>	21254	19387	22506	7874	7874

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 rectal 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 rectal 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.

Rectal cancer cohort

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

Rectal cancer surgery cohort

Anyone in the rectal 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 rectal 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 algorithm<sup>1</sup> 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		

### Definitive surgery

The highest ranked surgery the patient ever had defined by the rectal surgery hierarchy outlined on page 41.

### 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 rectal 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 2 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 rectal 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 rectal 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 rectal 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 rectal 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 rectal 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**

Queensland Cancer Control Analysis Team

Queensland Health

ROMC, 31 Raymond Tce, South Brisbane, Queensland 4001 Australia

Tel: (+61) (07) 3840 3200

Email: [gccat@health.qld.gov.au](mailto:gccat@health.qld.gov.au)

<https://gccat.health.qld.gov.au>