

9

Chapter

Surgery for Kidney Cancer

Infocus – access and flows for
public & private patients
2002-2011

Queensland Health

Queensland Cancer Control
Safety and Quality Partnership

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Cancer Surgery in Queensland: Infocus - access and flows for public & private patients 2002-2011

Chapter 9: Kidney Cancer

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Kidney cancer clinical lead
Geoff Coughlin

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Introduction

In 2014 an estimated 690 new cases of invasive kidney cancer will be diagnosed among Queensland residents¹. With the ageing population, the number of new cases is expected to reach 860 by 2021¹.

Kidney cancer is a chapter in the *Cancer Surgery in Queensland: Infocus - access and flows for public & private patients 2002-2011* 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 kidney 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 kidney cancer surgery in Queensland from 2002 - 2011 and reflections on the trends in the data observed over the most recent three year time period 2009 - 2011.

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

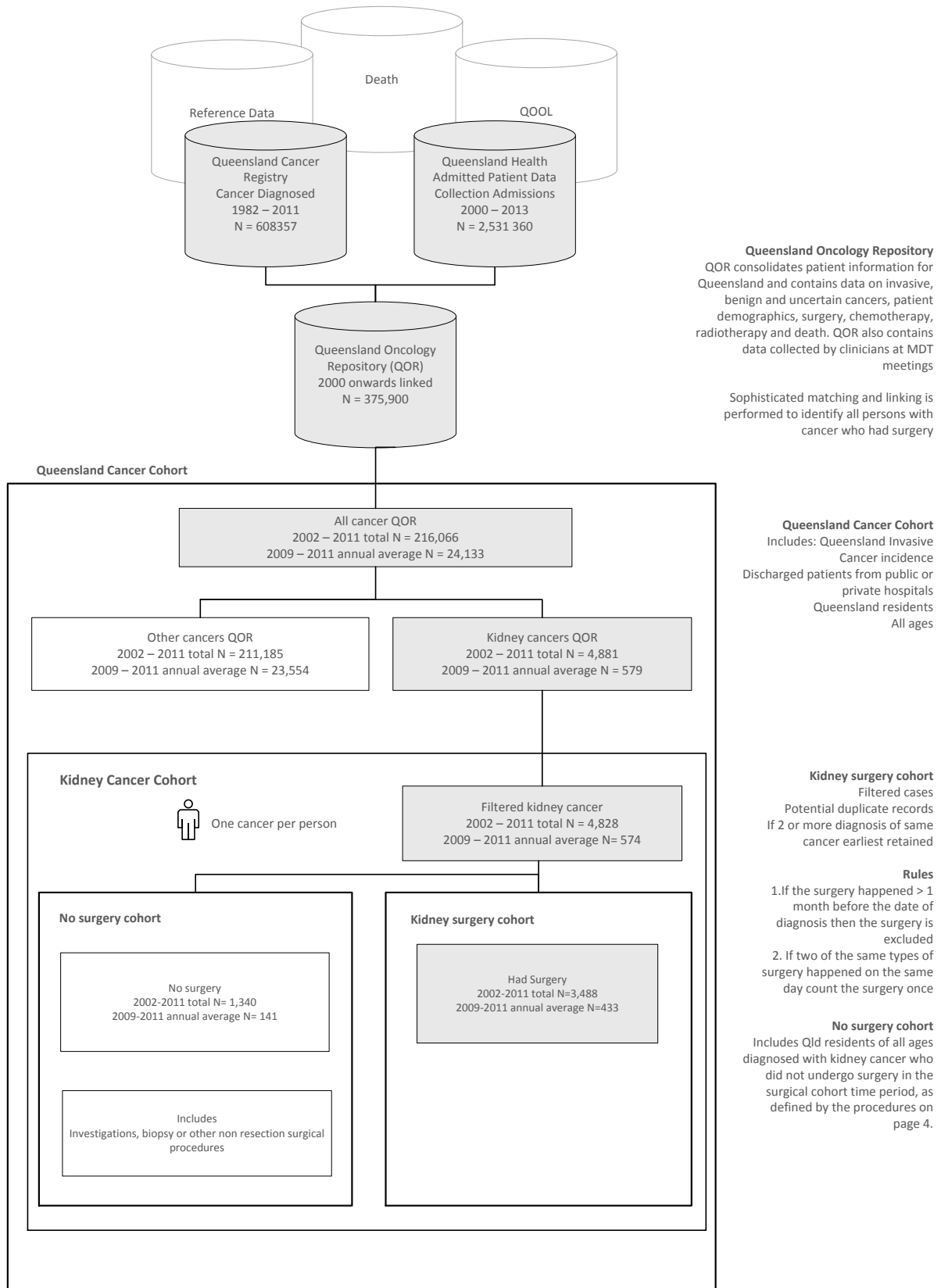
Data sources and methods

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 375 900 matched and linked records of cancer patients between 2000 – 2011, which are the starting point for this analysis. This chapter is structured around four cohorts of patients: **Queensland Cancer Cohort; Kidney Cancer Cohort; Kidney Surgery Cohort** and the **No Surgery Cohort**.

¹ Queensland Health. *Oncology Analysis System (OASys)*. Queensland Cancer Control Analysis Team: Brisbane; 2014. <https://qccat.health.qld.gov.au/OASys>. Accessed 01/08/2014

How the cohorts were identified

2002 – 2011 AND 2009 – 2011 ANNUAL AVERAGE
PUBLIC & PRIVATE HOSPITAL PATIENTS



Time periods

Time period – 01 December 2001 to 31 December 2013

Diagnosis year - 01 January 2002 to 31 December 2011

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-0-3	Morphology
Malignant neoplasm of kidney, except renal pelvis	C64	All

Exclusions

The following exclusions apply:

- Non Queensland residents
- People not admitted to a hospital in Queensland for invasive kidney cancer

Identification and categorisation of cancer related procedures

A kidney surgery performed up to one month prior to or within twelve months following a cancer diagnosis was included. The following process was used to assign a kidney surgery to patients with cancer

- Potential cancer related procedures were identified for kidney 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

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

The following tables outlines the relevant kidney procedures included in this report for Queensland residents (both public & private) diagnosed with invasive kidney cancer:

ICD-10-AM	PROCEDURE/GROUPING	NUMBER OF PROCEDURES		
		2002-2011	Annual average 2009 -2011	2011
	NEPHRECTOMY	3609	448	472
	A. Partial Nephrectomy	559	90	99
36522-00	Laparoscopic partial nephrectomy	162	34	37
36522-01	Partial nephrectomy	391	56	62
36525-00	Laparoscopic partial nephrectomy complicated by previous surgery on same kidney	1	0	0
36525-01	Partial nephrectomy complicated by previous surgery on same kidney	5	0	0
	B. Nephroureterectomy	63	8	11
36531-00	Laparoscopic nephroureterectomy	31	6	8
36531-01	Nephroureterectomy	31	2	3
36533-00	Nephroureterectomy complicated by previous surgery on same kidney	1	0	0
	C. Radical Nephrectomy	2249	234	247
36528-00	Laparoscopic radical nephrectomy	1038	153	169
36528-01	Radical nephrectomy	1176	79	76
36529-00	Radical nephrectomy complicated by previous surgery on same kidney	35	2	2
	D. Complete Nephrectomy	738	116	115
36516-00	Laparoscopic complete nephrectomy, unilateral	531	95	102
36516-01	Complete nephrectomy, unilateral	200	20	11
36516-02	Laparoscopic complete nephrectomy, bilateral	1	0	0
36519-00	Laparoscopic complete nephrectomy for removal of transplanted kidney	2	0	1
36519-01	Complete nephrectomy for removal of transplanted kidney	2	1	1
36519-02	Laprosopic complete nephrectomy complicated by previous surgery on the same kidney	1	0	0
36519-03	Complete nephrectomy complicated by previous surgery on the same kidney	1	0	0

Surgery rate for kidney cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2009 – 2011

PUBLIC & PRIVATE HOSPITAL PATIENTS

EVER HAD
MUTUALLY
EXCLUSIVE

Characteristic	Annual Average		Had Surgery		No Surgery	
	Kidney cancer cohort	(Qld %)	n	(row %)	n	(row %)
Queensland	574	(100%)	433	(75%)	141	(25%)
Gender						
Male	365	(64%)	276	(76%)	89	(24%)
Female	209	(36%)	157	(75%)	52	(25%)
Age Group						
0-14	6	(1%)	6	(100%)		
15-24	1	(0%)	1	(75%)	1	(75%)
25-34	8	(1%)	7	(87%)	1	(13%)
35-44	32	(6%)	29	(90%)	3	(10%)
45-54	93	(16%)	84	(90%)	9	(10%)
55-64	160	(28%)	134	(84%)	26	(16%)
65-74	139	(24%)	111	(80%)	28	(20%)
75-84	94	(16%)	52	(56%)	42	(45%)
85+	40	(7%)	9	(21%)	32	(79%)
Indigenous Status						
Indigenous	7	(1%)	5	(70%)	2	(30%)
Non-Indigenous	507	(88%)	376	(74%)	131	(26%)
Not Stated/Unknown	61	(11%)	52	(86%)	8	(14%)
Socioeconomic Status						
Affluent	83	(15%)	68	(82%)	15	(18%)
Middle	385	(67%)	288	(75%)	97	(25%)
Disadvantaged	100	(17%)	77	(77%)	23	(23%)
Unknown	6	(1%)			6	(100%)
Remoteness						
Major City	364	(63%)	285	(78%)	80	(22%)
Inner Regional	130	(23%)	96	(74%)	33	(26%)
Outer Regional	67	(12%)	47	(70%)	20	(30%)
Remote & Very Remote	7	(1%)	5	(68%)	2	(32%)
Qld Unknown	6	(1%)			6	(100%)
Diagnosis Basis						
Histology	477	(83%)	428	(90%)	50	(10%)
Cytology	9	(2%)			9	(100%)
Clinical	73	(13%)	5	(6%)	69	(94%)
Other	14	(2%)	1	(7%)	14	(95%)
Comorbidity						
0	415	(72%)	333	(80%)	83	(20%)
1	109	(19%)	74	(68%)	34	(32%)
2+	50	(9%)	26	(53%)	24	(47%)

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

Surgery rate for kidney cancer by patient residence

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2009 – 2011
PUBLIC & PRIVATE HOSPITAL PATIENTS

EVER HAD
MUTUALLY
EXCLUSIVE

	Kidney cancer cohort	(Qld %)	Had Surgery		No Surgery	
			n	(row %)	n	(row %)
Queensland	574	(100%)	433	(75%)	141	(25%)
HHS (patient residence)						
Metro South	132	(23%)	103	(78%)	29	(22%)
Metro North	102	(18%)	77	(76%)	25	(25%)
Gold Coast	68	(12%)	52	(77%)	16	(23%)
Sunshine Coast	56	(10%)	48	(86%)	8	(14%)
Darling Downs	41	(7%)	31	(75%)	10	(25%)
Wide Bay	33	(6%)	25	(77%)	8	(23%)
Central Queensland	30	(5%)	21	(72%)	8	(28%)
Cairns and Hinterland	29	(5%)	19	(64%)	11	(36%)
West Moreton	28	(5%)	23	(82%)	5	(18%)
Townsville	22	(4%)	16	(72%)	6	(28%)
Mackay	19	(3%)	12	(63%)	7	(37%)
South West	3	(0%)	2	(88%)	1	(38%)
North West	2	(0%)	1	(50%)	1	(50%)
Central West	1	(0%)	1	(100%)		
Torres Strait and Cape York	1	(0%)	1	(75%)	1	(75%)
Qld Unknown	6	(1%)			6	(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 2009 - 2011 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 definitive surgery for kidney cancer

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2009 – 2011

PUBLIC & PRIVATE HOSPITAL PATIENTS

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

Characteristic	Kidney cancer cohort	(Qld %)	Had Surgery		Partial Nephrectomy		Nephroureterectomy		Radical Nephrectomy		Complete Nephrectomy	
			n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	574	(100%)	433	(75%)	84	(19%)	8	(2%)	229	(53%)	113	(26%)
Gender												
Male	365	(64%)	276	(64%)	54	(20%)	5	(2%)	149	(54%)	68	(25%)
Female	209	(36%)	157	(36%)	29	(19%)	3	(2%)	80	(51%)	45	(29%)
Age Group												
0-14	6	(1%)	6	(1%)	1	(16%)			4	(68%)	1	(16%)
15-24	1	(0%)	1	(0%)	1	(100%)			1	(100%)		
25-34	8	(1%)	7	(2%)	3	(50%)			3	(40%)	1	(15%)
35-44	32	(6%)	29	(7%)	8	(26%)			14	(49%)	7	(24%)
45-54	93	(16%)	84	(19%)	20	(24%)	1	(2%)	41	(48%)	22	(26%)
55-64	160	(28%)	134	(31%)	26	(19%)	3	(2%)	68	(51%)	37	(27%)
65-74	139	(24%)	111	(26%)	19	(17%)	2	(2%)	59	(53%)	31	(28%)
75-84	94	(16%)	52	(12%)	6	(12%)	1	(2%)	32	(61%)	13	(26%)
85+	40	(7%)	9	(2%)			1	(12%)	8	(88%)	1	(12%)
Indigenous Status												
Indigenous	7	(1%)	5	(1%)	1	(21%)			2	(50%)	2	(36%)
Non-Indigenous	507	(88%)	376	(87%)	74	(20%)	8	(2%)	192	(51%)	102	(27%)
Not Stated/Unknown	61	(11%)	52	(12%)	9	(17%)	1	(2%)	34	(66%)	9	(17%)
Socioeconomic Status												
Affluent	83	(15%)	68	(16%)	21	(30%)	1	(1%)	34	(50%)	12	(18%)
Middle	385	(67%)	288	(67%)	51	(18%)	6	(2%)	155	(54%)	77	(27%)
Disadvantaged	100	(17%)	77	(18%)	12	(16%)	2	(2%)	40	(52%)	23	(30%)
Unknown	6	(1%)										
Remoteness												
Major City	364	(63%)	285	(66%)	59	(21%)	6	(2%)	146	(51%)	74	(26%)
Inner Regional	130	(23%)	96	(22%)	15	(16%)	1	(1%)	53	(55%)	27	(28%)
Outer Regional	67	(12%)	47	(11%)	9	(19%)	1	(2%)	26	(56%)	11	(23%)
Remote & Very Remote	7	(1%)	5	(1%)	1	(20%)			3	(60%)	1	(20%)
Qld Unknown	6	(1%)										
Comorbidity												
0	415	(72%)	333	(77%)	65	(20%)	7	(2%)	177	(53%)	83	(25%)
1	109	(19%)	74	(17%)	14	(19%)	1	(1%)	39	(53%)	20	(27%)
2+	50	(9%)	26	(6%)	4	(16%)	1	(4%)	12	(47%)	9	(35%)

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

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

Type of definitive surgery for kidney cancer by patient residence

AVERAGE YEAR OF DIAGNOSIS 2009 – 2011

PUBLIC & PRIVATE HOSPITAL PATIENTS

	Kidney cancer cohort	(Qld %)	Had Surgery		Partial Nephrectomy		Nephroureterectomy		Radical Nephrectomy		Complete Nephrectomy	
			n	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	574	(100%)	433	(75%)	84	(19%)	8	(2%)	229	(53%)	113	(26%)
HHS (patient residence)												
Metro South	132	(23%)	103	(24%)	25	(24%)	2	(2%)	43	(42%)	32	(31%)
Metro North	102	(18%)	77	(18%)	21	(27%)	1	(2%)	41	(53%)	14	(18%)
Gold Coast	68	(12%)	52	(12%)	7	(13%)	1	(2%)	30	(57%)	15	(29%)
Sunshine Coast	56	(10%)	48	(11%)	6	(12%)	2	(4%)	28	(59%)	12	(25%)
Darling Downs	41	(7%)	31	(7%)	5	(17%)			19	(60%)	7	(23%)
Wide Bay	33	(6%)	25	(6%)	2	(9%)	1	(4%)	16	(65%)	6	(24%)
Central Queensland	30	(5%)	21	(5%)	4	(19%)			11	(53%)	6	(28%)
Cairns and Hinterland	29	(5%)	19	(4%)	6	(30%)	1	(5%)	9	(48%)	3	(18%)
West Moreton	28	(5%)	23	(5%)	3	(13%)			13	(54%)	8	(33%)
Townsville	22	(4%)	16	(4%)	2	(10%)	1	(6%)	10	(60%)	4	(27%)
Mackay	19	(3%)	12	(3%)	2	(14%)	1	(8%)	6	(47%)	4	(36%)
South West	3	(0%)	2	(1%)	1	(43%)			2	(71%)		
North West	2	(0%)	1	(0%)					1	(100%)	1	(100%)
Central West	1	(0%)	1	(0%)	1	(75%)			1	(75%)	1	(75%)
Torres Strait and Cape York	1	(0%)	1	(0%)	1	(100%)					1	(100%)
Qld Unknown	6	(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. For example if a HHS performed one surgery from 2009 - 2011 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 definitive surgery for kidney cancer by HHS performing surgery

AVERAGE YEAR OF DIAGNOSIS 2009 – 2011

PUBLIC & PRIVATE HOSPITAL PATIENTS

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

	Annual Average		Partial Nephrectomy		Nephroureterectomy		Radical Nephrectomy		Complete Nephrectomy	
	Had Surgery	(col %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	433	(100%)	84	(19%)	8	(2%)	229	(53%)	112	(26%)
HHS (performing surgery)										
Metro South	178	(41%)	42	(50%)	4	(50%)	76	(33%)	55	(50%)
Metro North	109	(25%)	28	(34%)	1	(13%)	62	(27%)	18	(16%)
Gold Coast	47	(11%)	5	(6%)	1	(13%)	27	(12%)	14	(13%)
Sunshine Coast	38	(9%)	4	(5%)	2	(25%)	22	(10%)	10	(9%)
Townsville	16	(4%)	2	(2%)	1	(13%)	9	(4%)	5	(4%)
West Moreton	16	(4%)	1	(2%)			10	(4%)	5	(4%)
Wide Bay	13	(3%)	1	(1%)			10	(5%)	2	(2%)
Darling Downs	7	(2%)								
Children's Health Queensland	6	(1%)	1	(1%)			4	(2%)	1	(1%)
Mackay	2	(1%)	1	(1%)			1	(1%)	1	(1%)
Central Queensland	1	(0%)					1	(0%)	1	(1%)

*The Cairns and Hinterland, South West, North West, Central West, Torres Strait & Cape York and Qld Unknown HHSs did not perform kidney cancer 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 2009 - 2011 the annual average will be rounded up to one to reflect that this HHS is performing surgery. Therefore the totals may not add up.

Characteristics of patients receiving kidney surgery by patient residence

ANNUAL AVERAGE YEAR OF DIAGNOSIS 2009 – 2011

PUBLIC & PRIVATE HOSPITAL PATIENTS

	Had Surgery		Male		Median Age at Diagnosis yrs	Disadvantaged		Indigenous		One or more comorbidities		Private		Emergency	
	n	(Qld %)	n	(row %)		n	(row %)	n	(row %)	n	(row %)	n	(row %)	n	(row %)
Queensland	433	(75%)	276	(64%)	64 yrs	77	(18%)	5	(1%)	101	(23%)	233	(54%)	11	(3%)
HHS (patient residence)															
Metro South	103	(24%)	65	(64%)	64 yrs	14	(14%)	2	(2%)	26	(26%)	53	(52%)	3	(3%)
Metro North	77	(18%)	50	(64%)	64 yrs	11	(14%)	1	(1%)	16	(21%)	46	(59%)	3	(3%)
Gold Coast	52	(12%)	33	(64%)	67 yrs	1	(2%)			8	(15%)	30	(58%)	2	(3%)
Sunshine Coast	48	(11%)	32	(67%)	64 yrs	8	(17%)	1	(2%)	12	(26%)	20	(41%)	1	(2%)
Darling Downs	31	(7%)	19	(60%)	66 yrs	6	(19%)	1	(3%)	8	(27%)	18	(57%)		
Wide Bay	25	(6%)	16	(63%)	66 yrs	22	(87%)			5	(21%)	11	(43%)	1	(4%)
West Moreton	23	(5%)	14	(61%)	59 yrs	3	(14%)			5	(21%)	11	(49%)	1	(4%)
Central Queensland	21	(5%)	13	(59%)	62 yrs	1	(5%)			5	(23%)	14	(66%)	1	(5%)
Cairns and Hinterland	19	(4%)	10	(55%)	60 yrs	8	(41%)	1	(5%)	4	(21%)	10	(54%)		
Townsville	16	(4%)	11	(69%)	64 yrs	1	(6%)			6	(35%)	12	(75%)	1	(6%)
Mackay	12	(3%)	8	(69%)	65 yrs	1	(8%)			2	(19%)	6	(50%)	1	(8%)
South West	2	(1%)	2	(86%)	59 yrs	1	(43%)			1	(43%)	1	(43%)	1	(43%)
North West	1	(0%)	1	(100%)	60 yrs	1	(100%)			1	(100%)				
Central West	1	(0%)	1	(75%)	59 yrs	1	(75%)			1	(75%)	1	(75%)		
Torres Strait and Cape York	1	(0%)	1	(100%)	48 yrs	1	(100%)	1	(100%)	1	(100%)			1	(100%)

DEFINITIVE
SURGERY
MUTUALLY
EXCLUSIVE

*No patients from Qld Unknown were reported as undergoing kidney surgery

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Patient flows



10 year kidney cancer patient flows for surgery

YEAR OF DIAGNOSIS 2002 – 2011 (COL% ROW %)

PUBLIC & PRIVATE HOSPITAL PATIENTS

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					
	Metro South 9	Metro North 8	Gold Coast 4	Sunshine Coast 4	Darling Downs 3	Wide Bay 6
Metro South	693~ (50% 87%)	90 (10% 11%)	3 (1% 0%)	2 (1% 0%)		
Metro North	128 (9% 19%)	517 (57% 78%)		1 (0% 0%)		
Gold Coast	30 (2% 7%)	7 (1% 2%)	380 (97% 90%)			
Sunshine Coast	38 (3% 11%)	60 (7% 18%)	1 (0% 0%)	234 (96% 69%)		
Darling Downs	121 (9% 51%)	39 (4% 17%)	2 (1% 1%)		61 (87% 26%)	
Wide Bay	32 (2% 16%)	77 (9% 40%)	1 (0% 1%)	7 (3% 4%)		75 (100% 39%)
Central Queensland	92 (7% 60%)	36 (4% 23%)				
Cairns and Hinterland	87 (6% 57%)	43 (5% 28%)				
West Moreton	64 (5% 33%)	13 (1% 7%)	2 (1% 1%)		3 (4% 2%)	
Townsville	13 (1% 8%)	7 (1% 4%)	1 (0% 1%)			
Mackay	51 (4% 41%)	9 (1% 7%)				
South West	12 (1% 63%)		1 (0% 5%)		5 (7% 26%)	
North West	2 (0% 15%)	4 (0% 31%)				
Central West	2 (0% 33%)	2 (0% 33%)			1 (1% 17%)	
Torres Strait and Cape York	6 (0% 100%)					
Qld Unknown	2 (0% 100%)					
Queensland	1373~	904	391	244	70	75
Qld (%)	(39%)	(26%)	(11%)	(7%)	(2%)	(2%)
Annual Average	137	90	39	24	7	8

*the number of hospitals within a HHS performing kidney surgery

~Using Metro South as an example:

800 – Total number of patients who lived in Metro South.

1,373 – Total number of kidney surgeries that Metro South performed.

693 – Number of patients who had kidney surgery in Metro South and lived in Metro South.

50% – Of the 1,373 patients who had kidney surgery in Metro South 693 also lived in Metro South (693/1373 = 50%) .

87% – Of the 800 patients who lived in Metro South 693 had kidney surgery in Metro South (693/800 = 87%).

10 year kidney cancer patient flows for surgery

YEAR OF DIAGNOSIS 2002 – 2011 (COL% ROW %)
PUBLIC & PRIVATE HOSPITAL PATIENTS

EVER HAD
1 SURGERY:
1 PATIENT

HHS of surgery

Central Queensland 2	Cairns and Hinterland 3	West Moreton 2	Townsville 3	Mackay 2	North West 1	Children's Health Queensland 1	Qld 48	
							n	%
		8 (6% 1%)				4 (10% 1%)	800~	(23%)
		1 (1% 0%)				12 (29% 2%)	659	(19%)
						5 (12% 1%)	422	(12%)
						4 (10% 1%)	337	(10%)
	1 (7% 0%)	10 (8% 4%)				1 (2% 0%)	235	(7%)
						2 (5% 1%)	194	(6%)
22 (100% 14%)						4 (10% 3%)	154	(4%)
	14 (93% 9%)		6 (3% 4%)			2 (5% 1%)	152	(4%)
		108 (84% 56%)				4 (10% 2%)	194	(6%)
			147 (75% 86%)			3 (7% 2%)	171	(5%)
			36 (18% 29%)	27 (96% 22%)		1 (2% 1%)	124	(4%)
		1 (1% 5%)					19	(1%)
			6 (3% 46%)		1 (100% 8%)		13	(0%)
				1 (4% 17%)			6	(0%)
							6	(0%)
							2	(0%)
22 (1%) 2	15 (0%) 2	128 (4%) 13	195 (6%) 20	28 (1%) 3	1 (0%) 0	42 (1%) 4	348 8	(100%)

2011 kidney cancer patient flows for surgery

YEAR OF DIAGNOSIS 2011 (COL%. ROW%)

PUBLIC & PRIVATE HOSPITAL PATIENTS

Hospitals performing surgery* HHS (patient residence)	HHS of surgery					
	Metro South 6	Metro North 5	Gold Coast 4	Sunshine Coast 3	Darling Downs 2	Wide Bay 5
Metro South	89~ (49% 85%)	14 (11% 13%)				
Metro North	15 (8% 17%)	73 (59% 81%)				
Gold Coast	4 (2% 7%)	1 (1% 2%)	56 (98% 92%)			
Sunshine Coast	5 (3% 11%)	9 (7% 19%)		33 (97% 70%)		
Darling Downs	14 (8% 44%)	10 (8% 31%)	1 (2% 3%)		6 (86% 19%)	
Wide Bay	4 (2% 15%)	6 (5% 22%)		1 (3% 4%)		16 (100% 59%)
Central Queensland	13 (7% 62%)	5 (4% 24%)				
Cairns and Hinterland	18 (10% 90%)	1 (1% 5%)				
West Moreton	6 (3% 25%)	3 (2% 13%)				
Townsville		1 (1% 8%)				
Mackay	9 (5% 64%)					
South West	1 (1% 50%)				1 (14% 50%)	
North West						
Central West	1 (1% 100%)					
Torres Strait and Cape York	1 (1% 100%)					
Qld Unknown						
Queensland	180~	123	57	34	7	16
Qld (%)	(39%)	(27%)	(12%)	(7%)	(2%)	(3%)

*the number of hospitals within a HHS performing kidney surgery

~Using Metro South as an example:

105 – Total number of patients who lived in Metro South.

180 – Total number of kidney surgeries that Metro South performed.

89 – Number of patients who had kidney surgery in Metro South and lived in Metro South.

49% – Of the 180 patients who had kidney surgery in Metro South 89 also lived in Metro South ($89/180 = 49\%$).

85% – Of the 105 patients who lived in Metro South 89 had kidney surgery in Metro South ($89/105 = 85\%$).

EVER HAD
1 SURGERY:
1 PATIENT

2011 kidney cancer patient flows for surgery

YEAR OF DIAGNOSIS 2011 (COL%. ROW%)

PUBLIC & PRIVATE HOSPITAL PATIENTS

HHS of surgery					Qld	
Central Queensland 2	West Moreton 2	Townsville 2	Mackay 2	Children's Health Queensland 1	n	%
	1 (6% 1%)			1 (25% 1%)	105~	(23%)
				2 (50% 2%)	90	(20%)
					61	(13%)
					47	(10%)
	1 (6% 3%)				32	(7%)
					27	(6%)
2 (100% 10%)				1 (25% 5%)	21	(5%)
		1 (6% 5%)			20	(4%)
	15 (88% 63%)				24	(5%)
		12 (75% 92%)			13	(3%)
		3 (19% 21%)	2 (100% 14%)		14	(3%)
					2	(0%)
					1	(0%)
					1	(0%)
2 (0%)	17 (4%)	16 (3%)	2 (0%)	4 (1%)	458	(100%)

Surgery rates



10 year surgery rates for kidney surgery by patient residence

YEAR OF DIAGNOSIS 2002 – 2011
PUBLIC & PRIVATE HOSPITAL PATIENTS

EVER HAD
1 SURGERY:
1 PATIENT

	Kidney cancer cohort		Had Surgery		Year of Diagnosis																			
					2002		2003		2004		2005		2006		2007		2008		2009		2010		2011	
	N	(col %)	n	(row %)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)		
Queensland	4828	(100%)	3488	(72%)	241	(66%)	268	(70%)	282	(70%)	304	(69%)	367	(71%)	382	(73%)	344	(73%)	435	(75%)	407	(74%)	458	(77%)
HHS (patient residence)																								
Metro South	1064	(22%)	800	(75%)	60	(68%)	59	(76%)	62	(70%)	60	(79%)	78	(71%)	91	(76%)	82	(75%)	110	(81%)	93	(73%)	105	(79%)
Metro North	940	(19%)	659	(70%)	40	(61%)	46	(57%)	56	(66%)	56	(60%)	86	(74%)	75	(72%)	68	(76%)	69	(76%)	73	(74%)	90	(78%)
Gold Coast	575	(12%)	422	(73%)	38	(76%)	31	(69%)	40	(75%)	38	(67%)	41	(72%)	43	(74%)	34	(68%)	46	(70%)	50	(74%)	61	(86%)
Sunshine Coast	422	(9%)	337	(80%)	22	(67%)	25	(68%)	18	(67%)	30	(79%)	33	(77%)	33	(89%)	31	(82%)	58	(85%)	40	(85%)	47	(87%)
Darling Downs	329	(7%)	235	(71%)	16	(59%)	21	(84%)	17	(71%)	20	(69%)	26	(72%)	18	(60%)	24	(71%)	36	(73%)	25	(81%)	32	(73%)
Wide Bay	269	(6%)	194	(72%)	15	(79%)	9	(53%)	18	(82%)	12	(60%)	22	(61%)	24	(80%)	19	(70%)	19	(76%)	29	(74%)	27	(79%)
West Moreton	247	(5%)	194	(79%)	15	(63%)	21	(81%)	10	(59%)	20	(83%)	20	(87%)	25	(86%)	13	(68%)	23	(77%)	23	(85%)	24	(86%)
Central Queensland	232	(5%)	154	(66%)	6	(75%)	12	(67%)	11	(55%)	19	(79%)	9	(47%)	16	(57%)	17	(65%)	22	(81%)	21	(70%)	21	(66%)
Cairns and Hinterland	225	(5%)	152	(68%)	8	(53%)	12	(80%)	18	(86%)	15	(71%)	15	(58%)	13	(72%)	15	(71%)	17	(55%)	19	(61%)	20	(77%)
Townsville	222	(5%)	171	(77%)	14	(82%)	20	(83%)	15	(68%)	14	(82%)	14	(88%)	22	(79%)	24	(77%)	16	(67%)	19	(83%)	13	(65%)
Mackay	175	(4%)	124	(71%)	6	(55%)	9	(82%)	11	(79%)	19	(76%)	16	(76%)	19	(76%)	8	(73%)	13	(72%)	9	(56%)	14	(61%)
South West	28	(1%)	19	(68%)					3	(60%)			3	(100%)			6	(86%)	3	(100%)	2	(100%)	2	(67%)
North West	20	(0%)	13	(65%)	1	(100%)	1	(33%)	3	(100%)	1	(100%)	2	(67%)	1	(50%)	1	(100%)	2	(40%)	1	(100%)		
Torres Strait and Cape York	11	(0%)	6	(55%)			1	(50%)						1	(100%)	2	(67%)			1	(100%)	1	(33%)	
Central West	9	(0%)	6	(67%)			1	(100%)					1	(100%)					1	(100%)	2	(100%)	1	(100%)
Qld Unknown	60	(1%)	2	(3%)									1	(10%)	1	(9%)								

Note: %'s for each year are used to show the percentage of patients who had surgery out of the total number of incidences for that year of kidney cancer. For example in Queensland in 2002 there were 241 patients who had surgery which is 66% of the total incidences of kidney cancer in 2002.

10 year surgery rates for kidney surgery by HHS performing surgery

YEAR OF DIAGNOSIS 2002 – 2011
PUBLIC & PRIVATE HOSPITAL PATIENTS

EVER HAD
1 SURGERY:
1 PATIENT

	Had Surgery		Year of Diagnosis																			
			2002		2003		2004		2005		2006		2007		2008		2009		2010		2011	
	n	(row %)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Queensland	3488	(100%)	241	(100%)	268	(100%)	282	(100%)	304	(100%)	367	(100%)	382	(100%)	344	(100%)	435	(100%)	407	(100%)	458	(100%)
HHS (performing surgery)																						
Metro South	1373	(39%)	68	(28%)	100	(37%)	106	(38%)	106	(35%)	149	(41%)	153	(40%)	157	(46%)	189	(43%)	165	(41%)	180	(39%)
Metro North	904	(26%)	71	(29%)	69	(26%)	74	(26%)	92	(30%)	107	(29%)	90	(24%)	73	(21%)	99	(23%)	106	(26%)	123	(27%)
Gold Coast	391	(11%)	37	(15%)	30	(11%)	38	(13%)	30	(10%)	39	(11%)	41	(11%)	36	(10%)	38	(9%)	45	(11%)	57	(12%)
Sunshine Coast	244	(7%)	15	(6%)	14	(5%)	13	(5%)	16	(5%)	21	(6%)	29	(8%)	21	(6%)	51	(12%)	30	(7%)	34	(7%)
Townsville	195	(6%)	14	(6%)	21	(8%)	20	(7%)	21	(7%)	19	(5%)	29	(8%)	23	(7%)	16	(4%)	16	(4%)	16	(3%)
West Moreton	128	(4%)	8	(3%)	13	(5%)	8	(3%)	12	(4%)	11	(3%)	18	(5%)	11	(3%)	16	(4%)	14	(3%)	17	(4%)
Wide Bay	75	(2%)	7	(3%)	3	(1%)	6	(2%)	3	(1%)	6	(2%)	7	(2%)	4	(1%)	8	(2%)	15	(4%)	16	(3%)
Darling Downs	70	(2%)	9	(4%)	5	(2%)	7	(2%)	5	(2%)	10	(3%)	8	(2%)	6	(2%)	7	(2%)	6	(1%)	7	(2%)
Children's Health Queensland	42	(1%)	3	(1%)			1	(0%)	7	(2%)	2	(1%)	3	(1%)	7	(2%)	8	(2%)	7	(2%)	4	(1%)
Mackay	28	(1%)	4	(2%)	6	(2%)	3	(1%)	5	(2%)	1	(0%)	1	(0%)	1	(0%)	2	(0%)	3	(1%)	2	(0%)
Central Queensland	22	(1%)	1	(0%)	4	(1%)	2	(1%)	4	(1%)			3	(1%)	5	(1%)	1	(0%)			2	(0%)
Cairns and Hinterland	15	(0%)	4	(2%)	3	(1%)	4	(1%)	3	(1%)	1	(0%)										
North West	1	(0%)									1	(0%)										

*The South West, Central West, Torres Strait & Cape York and Qld Unknown HHSs did not perform kidney surgery.

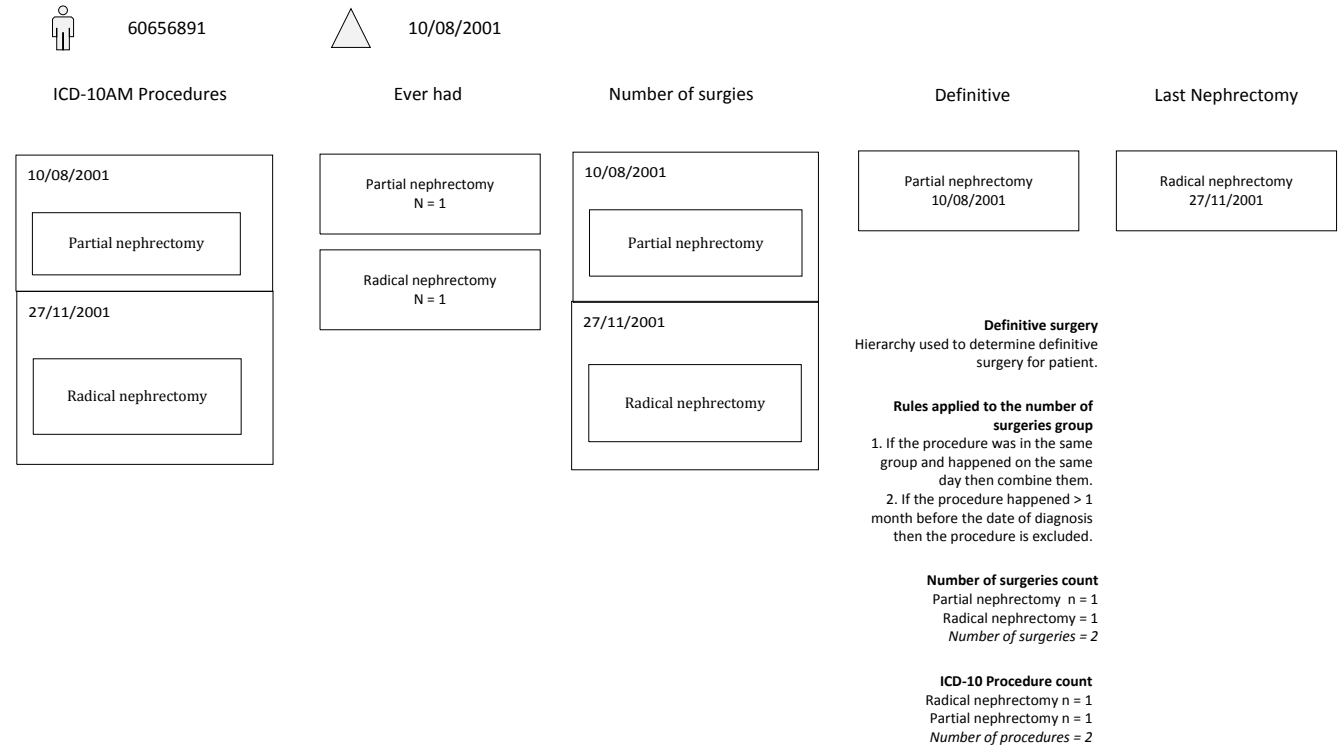
Note: %'s for each year are used to show the percentage of patients who had surgery out of the total number of surgeries for that year for kidney cancer. For example in Queensland in 2002 Metro South performed 28% of the total kidney cancer surgeries.

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 5 examples of how the counting rules are applied.



Counts of surgery across groups for patients diagnosed with kidney cancer from 2002 to 2011

SURGERY	NO OF PROCEDURES	EVER HAD*	NUMBER OF SURGERIES*	DEFINITIVE**	LAST NEPHRECTOMY*
Partial nephrectomy	6360	506	516	506	500
Nephroureterectomy	1412	61	61	61	61
Radical nephrectomy	32513	2216	2216	2208	2209
Complete nephrectomy~	8647	721	723	713	717
Total	48932	3504	3516	3488	3487

} NEPHRECTOMY

~Within this report the complete nephrectomy and complete nephrectomy for removal of transplanted kidney are combined into one complete nephrectomy group.

*Rules applied to surgical cohort

- Procedure 1 month before or any time after patient diagnosis
- If the same surgery happened on the same day than the surgery is only counted once. For example: a patient has 2 partial nephrectomies on the 21/07/2001. The count of partial nephrectomies is 1.

+Rules applied to definitive surgery cohort

- Hierarchy used to determine definitive surgery for patient. For example if a patient had a radical nephrectomy, partial nephrectomy and other excisions procedures on kidney the patients definitive surgery will be the partial nephrectomy.

Kidney surgery hierarchy

1. Partial nephrectomy
2. Nephroureterectomy
3. Complete nephrectomy for removal of transplanted kidney
4. Radical nephrectomy
5. Complete nephrectomy

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 1.

Chargeable status - public and private

On admission to hospital, an eligible patient must elect to be either a public or private patient.

A public patient is a patient who:

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

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

Cohort

Queensland cancer cohort

Queenslanders who were identified in Queensland Oncology Repository as being diagnosed with cancer between 1 January 2002 and 31 December 2011.

Kidney cancer cohort

Queenslanders who were diagnosed with kidney cancer between 1 January 2002 and 31 December 2011.

Kidney cancer surgery cohort

Anyone in the kidney cancer cohort who had any of the identified cancer related procedures, one month before or within twelve months of diagnosis as outlined on page 4.

No surgery cohort

Anyone in the kidney 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 after diagnosis with cancer.

Comorbidity is derived from hospital admissions data following the Quan algorithm¹ for classifying ICD-10 coded conditions, modified to exclude metastasis, which is represented by a separate and distinct metastasis dimension.

Comorbidity is limited to conditions coded in any admission episode between 12 months before and 12 months after the date of cancer diagnosis.

For any given cancer diagnosis, comorbidity is restricted to conditions other than the primary cancer. For example: a breast cancer can be a comorbidity to a lung 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 kidney cancer surgery hierarchy outline on page 21.

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 partial nephrectomies, one complete nephrectomy and one nephroureterectomy. The patient would be counted as one partial nephrectomy, one complete nephrectomy and one nephroureterectomy.

Had surgery

Includes Queensland residents of all ages diagnosed with invasive kidney 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 partial nephrectomies on the same day the partial nephrectomy 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 Nephrectomy

The last nephrectomy the patient ever had. To be included in this group the patient underwent one of the following surgical procedures outlined on page 4: A. Partial Nephrectomy; B. Nephroureterectomy; C. Radical Nephrectomy; D. Complete Nephrectomy;.

Median age

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

No surgery

Includes Queensland residents of all ages diagnosed with invasive kidney cancer who did not undergo surgery as an admitted patient in the surgical cohort time period, as defined by the procedures outlined on page 4.

Number of procedures

Includes Queensland residents of all ages diagnosed with invasive kidney cancer who underwent a relevant kidney cancer procedure. The procedure could have occurred at any time with no counting rules applied as outlined on page 2.

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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