Queensland Youth Cancer Quality Index

Indicators of safe, quality cancer care

Public and Private Hospitals

2014-2018

cancer alliance queensland

the Partnership

qccat

qcr

Queensland Government

The Queensland Youth Cancer Quality Index has been developed under the auspices of the Queensland Cancer Control Safety and Quality Partnership (The Partnership). The members of The Partnership include: Professor David E Theile AO (Chair), Professor Joanne Aitken, Dr Marie-Frances Burke, Aniko Cooper, Professor Kwun Fong, Dr Hazel Harden, Adjunct Professor Liz Kenny AO, Professor Keith McNeil, Shoni Philpot, Professor Mark Smithers AM, Professor Euan Walpole and Associate Professor David Wyld.

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Message from the chair

As Chair of the Youth Cancer sub-committee of the Queensland Cancer Control Safety and Quality Partnership (The Partnership), I am pleased to introduce the **Queensland Youth Cancer Quality Index - Indicators of safe, quality cancer care Public and Private Hospitals 2014-2018** report. It is a population-based report providing a comprehensive review of Youth Cancer in Queensland for persons aged between 15-24 years of age who reside in Queensland.

Cancer diagnoses in this age group account for approximately 1% of all cancer diagnosis in Queensland. Adolescents and Young Adults (AYA) fair very well, with 92% of patients alive 5 years from diagnosis. The report provides an analysis of AYA cancer treatment; characteristics of patients receiving treatment, facility of treatment (Private vs Public and Adult vs Paediatric), treatment rates by HHS, rurality and timeliness of treatment. Unique to this patient cohort is the psychosocial care provided by specialist AYA health care professionals. This support is included in the analysis as a measure of care for those patients receiving treatment. Equitability of care is outlined in the final pages of the report by taking a closer look at treatment rates for Indigenous patients, those from a low socioeconomic group and those patients who must travel to receive treatment. An accompaniment to this report, *Cancer in Adolescents and Young Adults* provides similar data for those non-clinical individuals with an interest in AYA cancer.

Clinicians are the strongest advocates for service improvement, and we encourage you to develop strategies for continued improvement. We invite your feedback on the value and benefits of this report and hope that this information can make a positive contribution to the future of Youth Cancer in Queensland.

Dr Rick Walker
Chair
Youth Cancer Sub-committee

Key findings

- Most common cancers in Adolescents and Young Adults (AYA's) are melanoma, lymphoma, germ cell tumours and carcinomas
- Over all cancer incidence for AYA's has decreased by 18%. This decrease has been greatest for melanoma at 50%, leukemia by 40% and brain/CNS by 37%
- Increase in incidence has occurred for appendix tumours and thyroid carcinomas which is largely related to incidental findings. Hodgkin lymphoma in males has increased by 50%.
- 5 year relative survival has remained unchanged at 92%. However, rural regions have seen a decrease from 93% to 87%, this is greatest for patients diagnosed with Other invasive cancers
- 10 year relative survival has increased from 87% to 89%. The greatest improvements are seen in leukaemia and non-Hodgkin lymphoma. The poorest survival rates are in bone sarcoma and brain/CNS, with 50-55% of patients alive 10 years from diagnosis.
- Treatment disparity is seen between those living in a Major city, with 94% treated, and 88% for those living Remote and very remote
- Indigenous and non-indigenous patients had similar treatment rates, at 94% and 95% respectively.
- MDT review occurred for 52% of patients receiving treatment (excluding melanoma, thyroid carcinomas and appendix tumours)
- AYA Cancer Coordinator review occurred for 53% of patients receiving treatment (excluding melanoma, thyroid carcinomas and appendix tumours)
- 30-40% of patients diagnosed with leukaemia or lymphoma will receive systemic therapy and radiotherapy. Over half of brain/CNS patients will receive a combination of surgery, systemic therapy and/or radiotherapy
- Approximately 75% of care is delivered in the Public sector and 25% in the Private sector
- Allied health support during a hospital admission is twice as likely to occur in a Public hospital than it is in a Private hospital
- Fertility preservation occurred for 59% of female patients receiving IV systemic therapy
- Greater than 50% of patients travelled to receive treatment, most often this travel was to Brisbane City

What is the Queensland Youth Cancer Quality Index?

The Queensland Youth Cancer Quality Index has been developed for public and private cancer services. It is an initiative of the Youth Cancer Sub-committee, part of the Cancer Alliance Queensland which brings together the Cancer Control Safety and Quality Partnership (The Partnership), Queensland Cancer Control Analysis Team (QCCAT) and the Queensland Cancer Register (QCR) (https://cancerallianceqld.health.qld.gov.au). The report tracks Queensland's progress in delivering safe, quality cancer care and will be provided to all public and private hospitals that provide cancer treatment. The Queensland Youth Cancer Quality Index highlights areas for improvement and identifies the areas where cancer services are performing well.

The Queensland Youth Cancer Quality Index reports on five years of data from 2014-2018, however there may have been changes more recently that are not captured by the time periods reported. Regardless, the Queensland Youth Cancer Quality Index provides an important baseline for monitoring current investments in cancer care and changes in clinical practice. It also enables us to reflect on past improvement programs and identify areas where a renewed effort or new approach may be required.

Why develop the Queensland Youth Cancer Quality Index?

Performance indicators linked to clinical outcomes that align with national benchmarking is a key service action in the Cancer Care State-wide Health Service Strategy, 2014. The Queensland Youth Cancer Quality Index has been developed by the Cancer Alliance Queensland (CAQ) and lead clinicians and participants under the auspices of the Queensland Cancer Control Safety and Quality Partnership (The Partnership). The Cancer Alliance Queensland supports a clinician-led, safety and quality program for cancer across Queensland. The Partnership was gazetted as a quality assurance committee under Part 6, Division 1 of the Hospital and Health Boards Act 2011 in 2004. A key role of the Partnership is to provide cancer clinicians, Hospital and Health Services (HHS), hospitals, treatment facilities and Queensland Health with cancer information and tools to deliver the best patient care.

The Queensland Youth Cancer Quality Index is a tool for reviewing and comparing information on the safety and quality of cancer treatment and outcomes. The Queensland Youth Cancer Quality Index assists cancer clinicians and administrators to improve patient care. In some cases, it may prompt a change in the delivery and organisation of cancer services to improve health outcomes and performance. The Queensland Youth Cancer Quality Index includes public and private cancer care services.

The Queensland Youth Cancer Quality Index includes the following quality dimensions, developed by Cancer Alliance Queensland with clinical leadership. (Walpole, Theile, Philpot et al. 2019)

Quality Dimension	Description
1 | Effective	Achieving the best outcomes for Queenslanders with cancer
2 | Efficient	Optimally using resources to achieve desired outcomes
3 | Accessible	Making health services available in the most suitable setting in a reasonable time
4 | Equitable	Providing care and ensuring health status does not vary in quality because of personal characteristics

Where has the data come from?

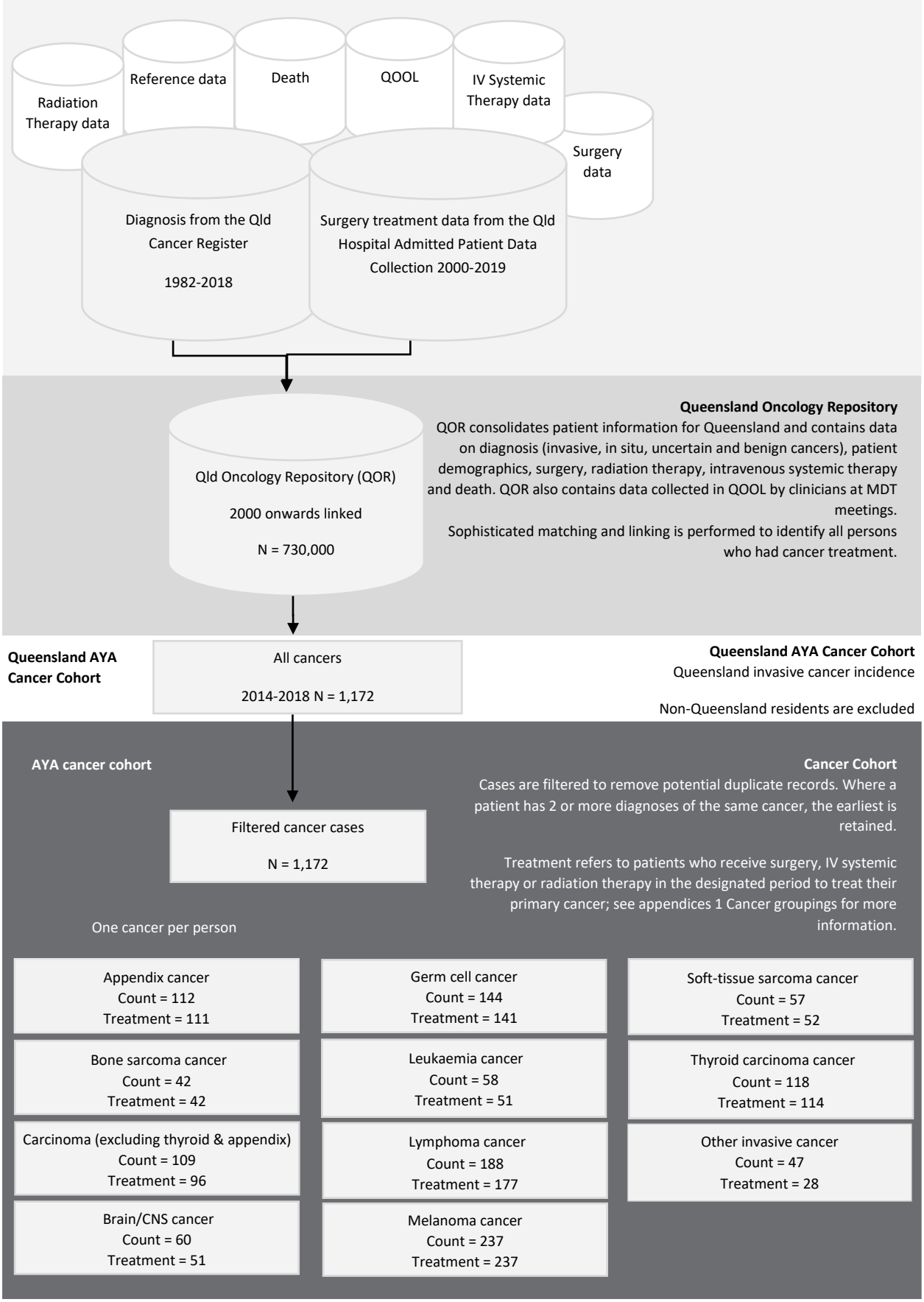
Since 2004 QCCAT have compiled and analysed a vast amount of information about cancer incidence, mortality, treatment, and survival. Key to QCCAT's program of work is the ability to match and link population-based cancer information on an individual patient basis. This matched and linked data is housed in the Queensland Oncology Repository (QOR), a resource managed by QCCAT. This centralised repository compiles and collates data from a range of source systems including the Queensland Cancer Register, private and public hospital admissions data, death data, treatment systems, public and private pathology, hospital clinical data systems and QOOL. QOR contains approximately 50 million records between 1982–2018. Our matching and linking processes provide the 570,000+ matched and linked records of cancer patients between 1982–2018 which provide the data for The Queensland Youth Cancer Quality Index.

The Queensland Youth Cancer Quality Index should be interpreted in the context of the previous publications by The Partnership. To access previous publication, go to https://cancerallianceqld.health.qld.gov.au/reports-publications.

Melanoma accounts for 20% of all cancer diagnoses in the AYA patient cohort. Surgical treatment for melanoma can take place in varied settings, ranging from outpatient community clinics to tertiary care centres. Due to this, facility of surgical treatment is not always known. A confirmed melanoma diagnosis can only be made by pathological sampling, therefore it is assumed that a patient diagnosed with melanoma has received surgical treatment. Melanoma is included in the Epidemiological analysis of the report, but has been excluded from the remainder of the report.

A manual review of all bone and soft tissue sarcoma patients has been undertaken due to the range of sites in which the disease can occur and the range of surgical procedures that can be performed to treat the cancer. The manual review included details of the procedure, facility, and date of procedure.

What data has been included in the Queensland Youth Cancer Quality Index?



0| Epidemiological overview

0.1 | Most common cancers in AYA

Diagnosis years 2014-2018

0.1.1 | What is the distribution of AYA cancer type?

Cancer[1]	Diagnosis	
	N	Qld %
Appendix tumour	112	10%
Bone sarcomas	42	4%
Carcinomas (excluding thyroid and appendix)	109	9%
Brain/CNS	60	5%
Germ cell	144	12%
Leukaemias	58	5%
Lymphomas	188	16%
Melanomas	237	20%
Soft-tissue sarcomas	57	5%
Thyroid carcinomas	118	10%
Other invasive	47	4%
Total AYA	**1,172**	**100%**

[1] See appendix 1 for cancer descriptions.

0.2 | Most common cancers by sex

Diagnosis years 2014-2018

0.2.1 | What is the distribution of AYA cancer by sex?

Cancer[1]	Diagnosis					
	Male		Female		Total	
	n	%	n	%	N	Qld %
Bone sarcomas	32	76%	10	24%	42	4%
Carcinomas (excluding thyroid and appendix)	34	31%	75	69%	109	9%
Brain/CNS	35	58%	25	42%	60	5%
Germ cell	126	88%	18	13%	144	12%
Leukaemias	37	64%	21	36%	58	5%
Lymphomas	90	48%	98	52%	188	16%
Soft-tissue sarcomas	34	60%	23	40%	57	5%
Other invasive	19	40%	28	60%	47	4%
Sub total	***407***	***58%***	***298***	***42%***	***705***	***60%***
Appendix tumour	40	36%	72	64%	112	10%
Melanomas	102	43%	135	57%	237	20%
Thyroid carcinomas	29	25%	89	75%	118	10%
Total AYA	**578**	**49%**	**594**	**51%**	**1,172**	**100%**

[1] See appendix 1 for cancer descriptions.

0.3 | Survival

0.3.1 | What percentage of AYA cancer patients are living 5 year after their diagnosis[1,2,3]?

Survival	**2008-2012**			**2013-2017**		
(% of people who would have survived after diagnosed)	**All**	**Urban**	**Rural**	**All**	**Urban**	**Rural**
Cancer group	**5-year survival**	**5-year survival**	**5-year survival**	**5-year survival**	**5-year survival**	**5-year survival**
Appendix tumour	96%	97%	80%	100%	100%	100%
Bone sarcomas	*59%*	*60%*	**	*57%*	*59%*	**
Ewing tumour	66%	71%	100%	**	**	**
Osteosarcoma	50%	**	100%	62%	74%	**
Other bone tumour	100%	100%	0%	100%	100%	100%
Carcinomas (excluding thyroid and appendix)	*79%*	*79%*	*79%*	*84%*	*86%*	*68%*
Brain/CNS	*56%*	*59%*	**	*69%*	*72%*	*61%*
Germ cell	*99%*	*99%*	*100%*	*95%*	*94%*	*100%*
Gonadal	99%	99%	100%	95%	95%	100%
Non-gonadal	100%	100%	100%	85%	85%	100%
Leukaemias	*76%*	*74%*	*81%*	*81%*	*84%*	**
Leukaemia (acute)	72%	72%	**	79%	82%	**
Leukaemia (chronic)	92%	89%	100%	100%	100%	100%
Lymphomas	*96%*	*96%*	*95%*	*96%*	*96%*	*96%*
Hodgkin lymphoma	97%	97%	100%	95%	96%	94%
Non-Hodgkin lymphoma	92%	94%	85%	97%	96%	100%
Melanomas	*97%*	*96%*	*100%*	*98%*	*97%*	*100%*
Soft-tissue sarcomas	*77%*	*72%*	*100%*	*84%*	*81%*	*100%*
Thyroid carcinomas	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*
Other invasive	*96%*	*95%*	*100%*	*84%*	*89%*	*71%*
Total AYA	**92%**	**91%**	**93%**	**92%**	**93%**	**87%**

[1] See appendix 1 for cancer descriptions.

[2] Rural includes outer regional, remote and very remote.

[3] Relative survival was calculated using the Ederer II method, and the period approach was used. Relative survival was calculated for all persons aged 0-89 at diagnosis.

** Insufficient data for analysis.

0.3.2 | What percentage of AYA cancer patients are living 10 year after their diagnosis[1,2]?

Survival *(% of people who would have survived after diagnosed)* **Cancer group**	**1991-2001** **10-year survival**	**2012-2016** **10-year survival**
Appendix tumour	97%	98%
Bone sarcomas	*64%*	*53%*
Ewing tumour	56%	**
Osteosarcoma	60%	51%
Other bone tumour	91%	100%
Carcinomas (excluding thyroid and appendix)	*90%*	*87%*
Brain/CNS	*53%*	*55%*
Germ cell	*94%*	*96%*
Gonadal	94%	97%
Non-gonadal	90%	86%
Leukaemias	*52%*	*74%*
Leukaemia (acute)	51%	73%
Leukaemia (chronic)	**	82%
Lymphomas	*86%*	*93%*
Hodgkin lymphoma	96%	92%
Non-Hodgkin lymphoma	69%	96%
Melanomas	*94%*	*97%*
Soft-tissue sarcomas	*80%*	*75%*
Thyroid carcinomas	*100%*	*99%*
Other invasive	**	*85%*
Total AYA	**87%**	**89%**

[1] See appendix 1 for cancer descriptions.

[2] Relative survival was calculated using the Ederer II method, and the period approach was used. Relative survival was calculated for all persons aged 0-89 at diagnosis.

** Insufficient data for analysis.

0.4 | Characteristics of AYA's with cancer

Diagnosis years 2014-2018

0.4.1 | What are the characteristics of AYA cancer patients who received treatment?

	Diagnosis		Had treatment[1]	
	N	Qld %	n	%
Queensland	**1,172**	**100%**	**1,099**	**94%**
Sex				
Male	578	49%	546	94%
Female	594	51%	553	93%
Age Group				
15 - 18	324	28%	314	97%
19 - 24	848	72%	785	93%
Indigenous status				
Indigenous	48	4%	45	94%
Non-Indigenous	1,077	92%	1,018	95%
Not stated/unknown	47	4%	36	77%
Socioeconomic status				
Affluent	231	20%	220	95%
Middle	737	63%	691	94%
Disadvantaged	204	17%	188	92%
Remoteness				
Major city	800	68%	751	94%
Inner regional	238	20%	226	95%
Outer regional	117	10%	107	91%
Remote & very remote	17	1%	15	88%
MDT[2]				
MDT review	425	36%	409	96%
No MDT review	747	64%	690	92%
Comorbidities				
0 Comorbidities	1,087	93%	1,019	94%
1 Comorbidities	68	6%	64	94%
2+ Comorbidities	17	1%	16	94%

[1] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[2] MDT rate includes facilities that use QOOL to capture MDT review

Appendix, thyroid and melanoma cancer

Treatment for patients diagnosed with appendix, thyroid and melanoma cancer is typically uncomplicated and survival is very good. Treatment most often involves surgery and with quicker recovery time in comparison to other cancers common among AYAs. For these reasons, the analysis of these cancers will be outlined here and omitted from the remainder of the report.

0.5 | Appendix tumour

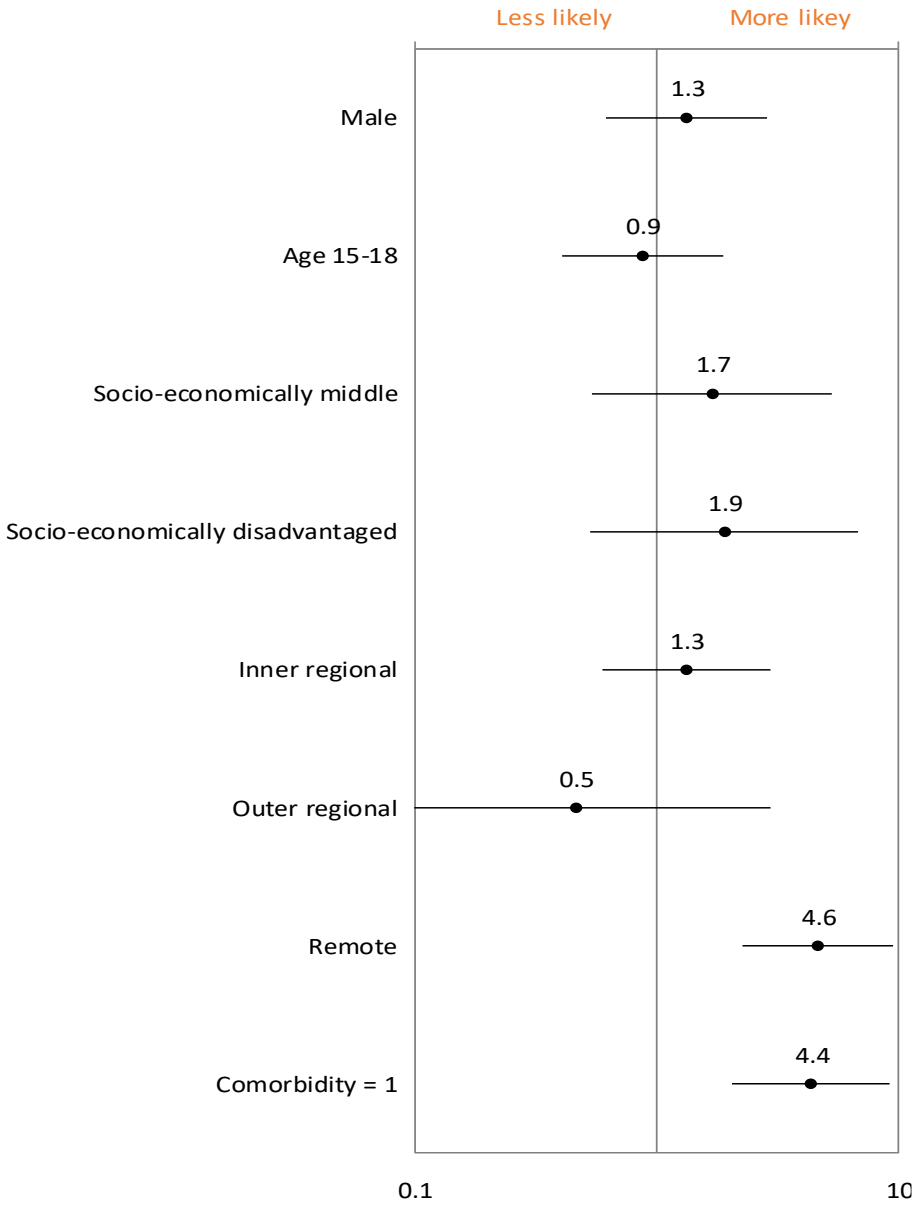
In the diagnosis years of 2014-2018, there were 112 patients diagnosed with an Appendix tumour. Of these 112 patients, 109 presented with appendicitis, 1 presented with an identifiable wound and 1 presented with Crohn's. Most morphologies were of the carcinoid or carcinoma type:

- Carcinoid tumour – 95
- Aytpical carcinoid tumour – 7
- Neuroendocrine carcinoma – 7
- Enterochromaffin cell carcinoid – 2
- Mucinous adenocarcinoma = 1

All patients presenting with appendicitis had appendicectomy and 25 of these patients went on to have additional major colorectal surgery. Multidisciplinary review took place for 10 of these patients. The identifiable wound patient and the Crohn's patient both had major colorectal surgery as their first surgery.

An additional review of the Appendix tumour patients was undertaken to further understand what appears to be a higher than expected rate of incidence. Histopathology revealed most cases were incidental findings of carcinoma. Historically these specimens were not sent for pathology, but a change in practise requiring the appendix to be sent to pathology may explain this apparent "increase" in incidence.

0.5.1 | Factors associated with receiving major resection following appendicectomy for appendix cancer



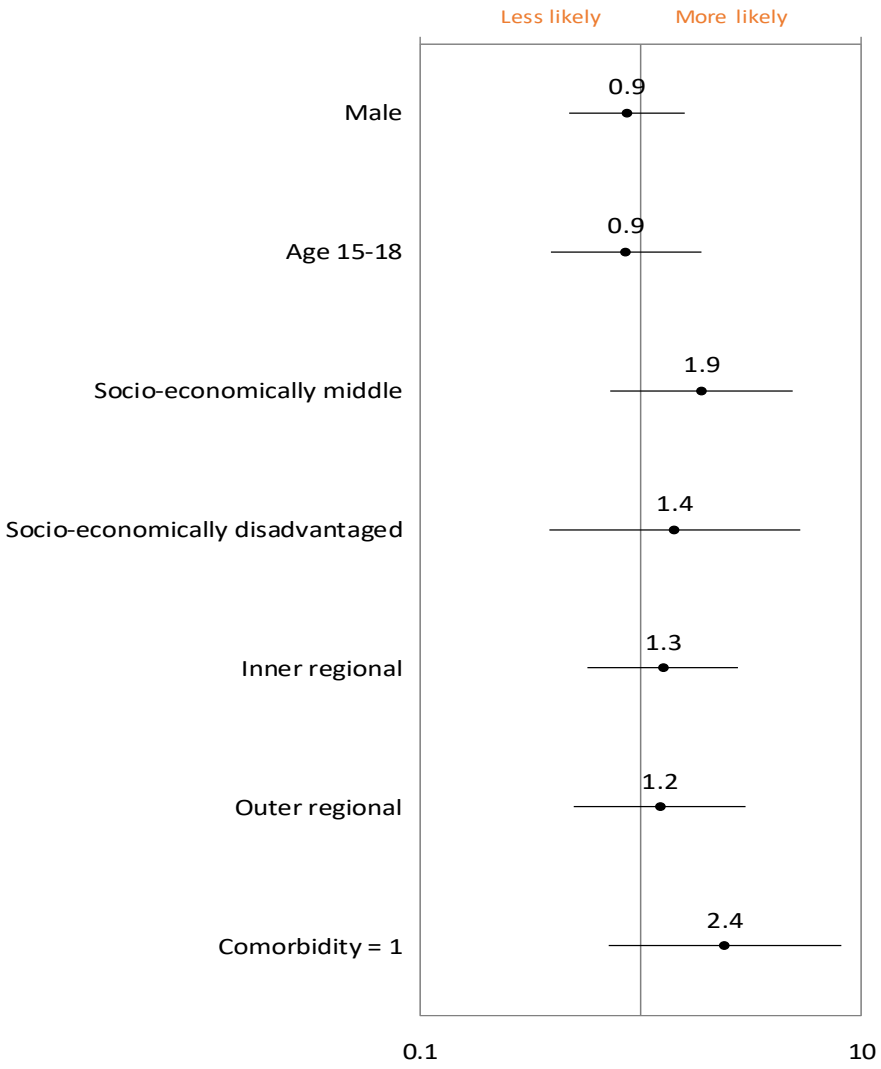
The above graph (forest plot) is a graphical display of the hazard ratios for each covariate in the analysis. The dot represents the estimate of the hazard ratio with the confidence interval of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central vertical line then the effect is considered not to be statistically significant. Hazard ratios for those from Middle and Disadvantaged socio-economic areas are obtained by comparing to those from Affluent areas. Inner and Outer Regional, and Remote areas are compared with Major Cities. Patients with comorbidities are compared to those with no comorbidities. Patients aged 15-18 compared with patients aged 19-24. Male patients compared to female patients.

0.6 | Melanoma

Melanoma accounts for 20% of all cancer diagnoses in the AYA patient cohort. Surgical treatment for melanoma can take place in a variety of settings, ranging from outpatient community clinics to tertiary care centres. Due to this, facility of surgical treatment is not always known. A confirmed melanoma diagnosis can only be made by pathological sampling, therefore it is assumed that a patient diagnosed with melanoma has received surgical treatment.

237 melanoma diagnosis occurred from 2014-2018. Of these patients, 140 were admitted to hospital for treatment and 97 were not. Of patients who were admitted to hospital, 39 went on to receive skin lesion excision with lymph node surgery. MDT review occurred for 17 of these 39 patients.

0.6.1 | Factors associated with receiving nodal surgery for melanoma cancer



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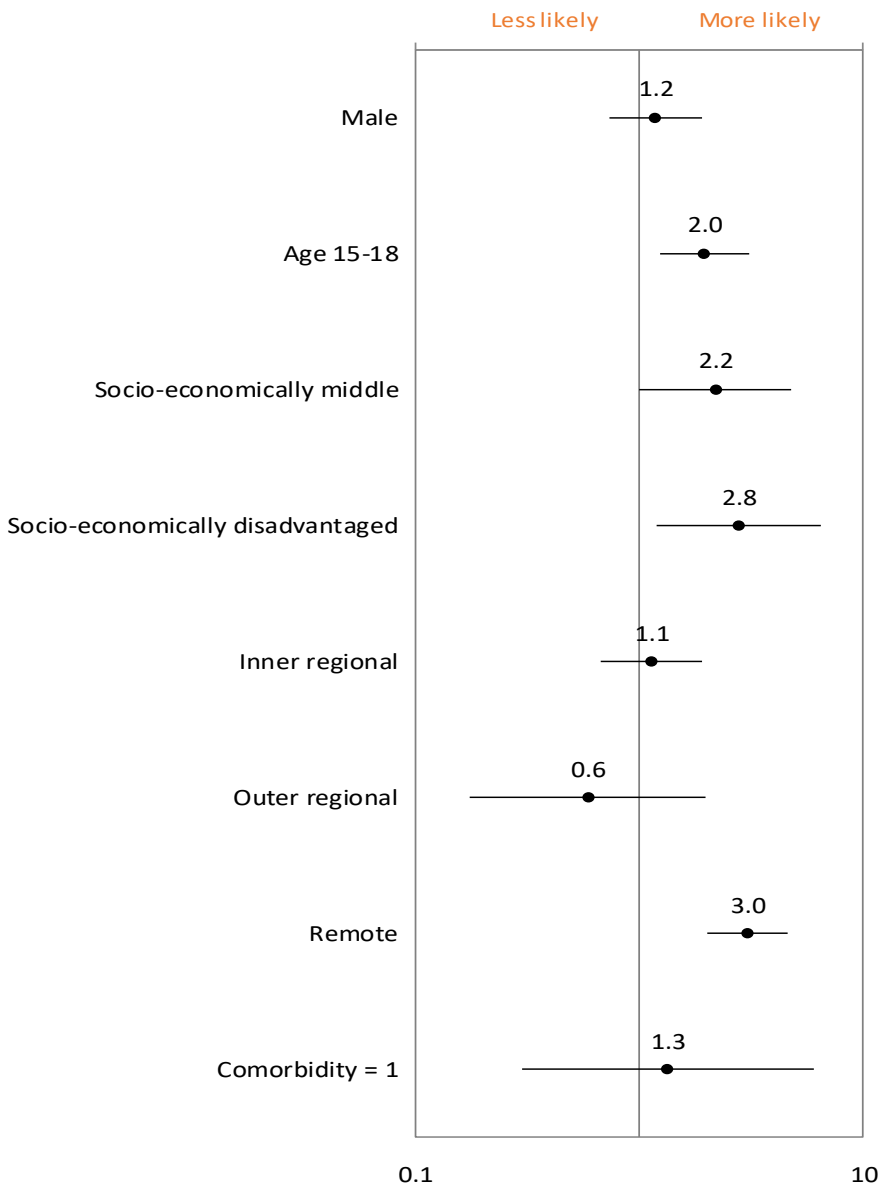
0.7 | Thyroid carcinoma

118 patients were diagnosed with thyroid carcinoma and 114 of these patients received treatment. Unsealed radioisotope – iodine was provided for 44 patients, 113 patients received thyroid surgery. MDT review occurred for 36 of these patients.

0.7.1 | Factors associated with receiving unsealed radioisotope - iodine for thyroid carcinoma cancer



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The remainder of this report will exclude appendix tumours, melanoma and thyroid carcinoma patients from the analysis.

1| Effective

Achieving the best outcomes for Queenslanders with cancer.

1.1 | First treatment received by AYA cancer patients

Diagnosis years 2014-2018

1.1.1 | What is the first treatment received by AYA cancer patients[1]?

Cancer[2]	Diagnosis	Treatment[3]		Surgery		IV systemic therapy (IVST)		Concurrent IVST & RT		Radiation therapy (RT)	
	N	n	%	n	%	n	%	n	%	n	%
Bone sarcomas	*42*	*42*	*100%*	*13*	*31%*	*22*	*52%*	*7*	*17%*	*0*	*0%*
Ewing tumour	17	17	100%	3	18%	7	41%	7	41%	0	0%
Osteosarcoma	17	17	100%	2	12%	15	88%	0	0%	0	0%
Other bone tumour	8	8	100%	8	100%	0	0%	0	0%	0	0%
Carcinomas (excluding thyroid and appendix)	*109*	*96*	*88%*	*76*	*79%*	*11*	*11%*	*7*	*7%*	*2*	*2%*
Breast	7	7	100%	0	0%	6	86%	1	14%	0	0%
Cervix	12	10	83%	7	70%	0	0%	3	30%	0	0%
Gastrointestinal tract	27	26	96%	25	96%	1	4%	0	0%	0	0%
Genitourinary tract	13	10	77%	9	90%	1	10%	0	0%	0	0%
Gonads	3	3	100%	3	100%	0	0%	0	0%	0	0%
Other carcinoma[4]	6	4	67%	0	0%	2	50%	0	0%	2	50%
Other head and neck	30	26	87%	23	88%	0	0%	3	12%	0	0%
Trachea, bronchus and lung	11	10	91%	9	90%	1	10%	0	0%	0	0%
Brain/CNS	*60*	*51*	*85%*	*44*	*86%*	*1*	*2%*	*0*	*0%*	*6*	*12%*
Glioblastoma and anaplastic astrocytoma	14	14	100%	11	79%	0	0%	0	0%	3	21%
Medulloblastoma	5	5	100%	4	80%	0	0%	0	0%	1	20%
Other astrocytoma, glioma or ependymoma	38	30	79%	29	97%	0	0%	0	0%	1	3%
Other central nervous system tumour	3	2	67%	0	0%	1	50%	0	0%	1	50%

Section 1.1.1 (continued)

Cancer[2]	Diagnosis	Treatment[3]		Surgery		IV systemic therapy (IVST)		Concurrent IVST & RT		Radiation therapy (RT)	
	N	n	%	n	%	n	%	n	%	n	%
Germ cell	*144*	*141*	*98%*	*130*	*92%*	*10*	*7%*	*0*	*0%*	*1*	*1%*
Gonadal (testicular/ovary)	138	136	99%	129	95%	7	5%	0	0%	0	0%
Non-gonadal	6	5	83%	1	20%	3	60%	0	0%	1	20%
Leukaemias	*58*	*51*	*88%*	*0*	*0%*	*48*	*94%*	*2*	*4%*	*1*	*2%*
Leukaemia (acute)	52	50	96%	0	0%	47	94%	2	4%	1	2%
Leukaemia (chronic)	6	1	17%	0	0%	1	100%	0	0%	0	0%
Lymphomas	*188*	*177*	*94%*	*0*	*0%*	*170*	*96%*	*0*	*0%*	*7*	*4%*
Hodgkin Lymphoma	135	131	97%	0	0%	128	98%	0	0%	3	2%
Non-Hodgkin Lymphoma	53	46	87%	0	0%	42	91%	0	0%	4	9%
Soft-tissue sarcomas	*57*	*52*	*91%*	*34*	*65%*	*11*	*21%*	*5*	*10%*	*2*	*4%*
Rhabdomyosarcoma	13	13	100%	4	31%	4	31%	5	38%	0	0%
Other soft-tissue sarcoma	44	39	89%	30	77%	7	18%	0	0%	2	5%
Other invasive	*47*	*28*	*60%*	*17*	*61%*	*8*	*29%*	*2*	*7%*	*1*	*4%*

[1] A patient can only have one first treatment.
[2] See appendix 1 for cancer descriptions.
[3] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[4] Includes skin and breast carcinoma in males.

1.2 | Treatments received by AYA cancer patients

Diagnosis years 2014-2018

1.2.1 | What treatments do AYA cancer patients receive[2,]?

Cancer[1]	Diagnosis	Surgery		IV systemic therapy (IVST)		Radiation therapy (RT)	
	N	n	%	n	%	n	%
Bone sarcomas	*42*	*31*	*74%*	*33*	*79%*	*11*	*26%*
Ewing tumour	17	9	53%	17	100%	7	41%
Osteosarcoma	17	14	82%	16	94%	2	12%
Other bone tumour	8	8	100%	0	0%	2	25%
Carcinomas (excluding thyroid and appendix)	*109*	*77*	*71%*	*33*	*30%*	*25*	*23%*
Breast	7	0	0%	7	100%	5	71%
Cervix	12	7	58%	4	33%	4	33%
Gastrointestinal tract	27	26	96%	9	33%	0	0%
Genitourinary tract	13	9	69%	1	8%	1	8%
Gonads	3	3	100%	1	33%	0	0%
Other carcinoma[3]	6	0	0%	3	50%	2	33%
Other head and neck	30	23	77%	7	23%	12	40%
Trachea, bronchus and lung	11	9	82%	1	9%	1	9%
Brain/CNS	*60*	*46*	*77%*	*18*	*30%*	*31*	*52%*
Glioblastoma and anaplastic astrocytoma	14	13	93%	6	43%	13	93%
Medulloblastoma	5	4	80%	5	100%	5	100%
Other astrocytoma, glioma or ependymoma	38	29	76%	5	13%	11	29%
Other central nervous system tumour	3	0	0%	2	67%	2	67%

Section 1.2.1 (continued)

Cancer[1]	Diagnosis	Surgery		IV systemic therapy (IVST)		Radiation therapy (RT)	
	N	n	%	n	%	n	%
Germ cell	*144*	*132*	*92%*	*82*	*57%*	*5*	*3%*
Gonadal (testicular/ovary)	138	131	95%	78	57%	1	1%
Non-gonadal	6	1	17%	4	67%	4	67%
Leukaemias	*58*	-	-	*51*	*88%*	*18*	*31%*
Leukaemia (acute)	52	0	0%	50	96%	17	33%
Leukaemia (chronic)	6	0	0%	1	17%	1	17%
Lymphomas	*188*	-	-	*171*	*91%*	*80*	*43%*
Hodgkin Lymphoma	135	0	0%	128	95%	58	43%
Non-Hodgkin Lymphoma	53	0	0%	43	81%	22	42%
Soft-tissue sarcomas	*57*	*38*	*67%*	*23*	*40%*	*19*	*33%*
Rhabdomyosarcoma	13	6	46%	13	100%	11	85%
Other soft-tissue sarcoma	44	32	73%	10	23%	8	18%
Other invasive	*47*	*17*	*36%*	*11*	*23%*	*4*	*9%*

[1] See appendix 1 for cancer descriptions.
[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[3] Includes skin and breast carcinoma in males.

1.3 | AYA cancer treatment by facility type

Diagnosis years 2014-2018

1.3.1 | Where do AYA cancer patients receive their treatment[2]?

Cancer[1]	Diagnosis	Surgery						IV systemic therapy (IVST)						Radiation therapy (RT)					
		Total		Public		Private		Total		Public		Private		Total		Public		Private	
	N	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Bone sarcomas	*42*	*31*	*74%*	*20*	*65%*	*11*	*35%*	*33*	*79%*	*27*	*82%*	*6*	*18%*	*11*	*26%*	*10*	*91%*	*1*	*9%*
Ewing tumour	17	9	53%	6	67%	3	33%	17	100%	15	88%	2	12%	7	41%	7	100%	0	0%
Osteosarcoma	17	14	82%	8	57%	6	43%	16	94%	12	75%	4	25%	2	12%	2	100%	0	0%
Other bone tumour	8	8	100%	6	75%	2	25%	0	0%	0	-	0	-	2	25%	1	50%	1	50%
Carcinomas (excluding thyroid and appendix)	*109*	*77*	*71%*	*48*	*62%*	*29*	*38%*	*33*	*30%*	*22*	*67%*	*11*	*33%*	*25*	*23%*	*15*	*60%*	*10*	*40%*
Breast	7	0	0%	0	-	0	-	7	100%	4	57%	3	43%	5	71%	2	40%	3	60%
Cervix	12	7	58%	5	71%	2	29%	4	33%	3	75%	1	25%	4	33%	2	50%	2	50%
Gastrointestinal tract	27	26	96%	13	50%	13	50%	9	33%	3	33%	6	67%	0	0%	0	-	0	-
Genitourinary tract	13	9	69%	8	89%	1	11%	1	8%	1	100%	0	0%	1	8%	1	100%	0	0%
Gonads	3	3	100%	3	100%	0	0%	1	33%	1	100%	0	0%	0	0%	0	-	0	-
Other carcinoma[3]	6	0	0%	0	-	0	-	3	50%	2	67%	1	33%	2	33%	1	50%	1	50%
Other head and neck	30	23	77%	13	57%	10	43%	7	23%	7	100%	0	0%	12	40%	9	75%	3	25%
Trachea, bronchus and lung	11	9	82%	6	67%	3	33%	1	9%	1	100%	0	0%	1	9%	0	0%	1	100%
Brain/CNS	*60*	*46*	*77%*	*40*	*87%*	*6*	*13%*	*18*	*30%*	*16*	*89%*	*2*	*11%*	*31*	*52%*	*27*	*87%*	*4*	*13%*
Glioblastoma and anaplastic astrocytoma	14	13	93%	11	85%	2	15%	6	43%	4	67%	2	33%	13	93%	11	85%	2	15%
Medulloblastoma	5	4	80%	4	100%	0	0%	5	100%	5	100%	0	0%	5	100%	5	100%	0	0%
Other astrocytoma, glioma or ependymoma	38	29	76%	25	86%	4	14%	5	13%	5	100%	0	0%	11	29%	9	82%	2	18%
Other central nervous system tumour	3	0	0%	0		0	-	2	67%	2	100%	0	0%	2	67%	2	100%	0	0%

Section 1.3.1 (continued)

Cancer[1]	Diagnosis	Surgery						IV systemic therapy (IVST)						Radiation therapy (RT)					
		Total		Public		Private		Total		Public		Private		Total		Public		Private	
	N	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Germ cell	*144*	*132*	*92%*	*97*	*73%*	*35*	*27%*	*82*	*57%*	*61*	*74%*	*21*	*26%*	*5*	*3%*	*5*	*100%*	*0*	*0%*
Gonadal (testicular/ovary)	138	131	95%	96	73%	35	27%	78	57%	57	73%	21	27%	1	1%	1	100%	0	0%
Non-gonadal	6	1	17%	1	100%	0	0%	4	67%	4	100%	0	0%	4	67%	4	100%	0	0%
Leukaemias	*58*	-	-	-	-	-	-	*51*	*88%*	*46*	*90%*	*5*	*10%*	*18*	*31%*	*18*	*100%*	*0*	*0%*
Leukaemia (acute)	52	-	-	-	-	-	-	50	96%	45	90%	5	10%	17	33%	17	100%	0	0%
Leukaemia (chronic)	6	-	-	-	-	-	-	1	17%	1	100%	0	0%	1	17%	1	100%	0	0%
Lymphomas	*188*	-	-	-	-	-	-	*171*	*91%*	*120*	*70%*	*51*	*30%*	*80*	*43%*	*57*	*71%*	*23*	*29%*
Hodgkin Lymphoma	135	-	-	-	-	-	-	128	95%	87	68%	41	32%	58	43%	40	69%	18	31%
Non-Hodgkin Lymphoma	53	-	-	-	-	-	-	43	81%	33	77%	10	23%	22	42%	17	77%	5	23%
Soft-tissue sarcomas	*57*	*38*	*67%*	*26*	*68%*	*12*	*32%*	*23*	*40%*	*20*	*87%*	*3*	*13%*	*19*	*33%*	*14*	*74%*	*5*	*26%*
Rhabdomyosarcoma	13	6	46%	3	50%	3	50%	13	100%	11	85%	2	15%	11	85%	9	82%	2	18%
Other soft-tissue sarcoma	44	32	73%	23	72%	9	28%	10	23%	9	90%	1	10%	8	18%	5	63%	3	38%
Other invasive	*47*	*17*	*36%*	*10*	*59%*	*7*	*41%*	*11*	*23%*	*10*	*91%*	*1*	*9%*	*4*	*9%*	*2*	*50%*	*2*	*50%*
Total AYA	**705**	**341**	**48%**	**241**	**71%**	**100**	**29%**	**422**	**60%**	**322**	**76%**	**100**	**24%**	**193**	**27%**	**148**	**77%**	**45**	**23%**

[1] See appendix 1 for cancer descriptions.

[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.

[3] Includes skin and breast carcinoma in males.

1.4 | AYA cancer treatment by facility

Diagnosis years 2014-2018

1.4.1 | What proportion of AYA cancer patients receive their surgery by AIHW Peer Group[1,2]?

AIHW Peer Group	Germ cell		Carcinomas (excluding thyroid and appendix)		Brain/CNS		Soft-tissue sarcomas		Bone sarcomas		Other invasive	
	n	%	n	%	n	%	n	%	n	%	n	%
Principal referral hospitals	*41*	*31%*	*29*	*38%*	*33*	*72%*	*19*	*50%*	*14*	*45%*	*5*	*29%*
Group A hospitals	*71*	*54%*	*34*	*44%*	*8*	*17%*	*14*	*37%*	*11*	*35%*	*5*	*29%*
Public hospitals	50	70%	16	47%	3	38%	4	29%	1	9%	1	20%
Private hospitals	21	30%	18	53%	5	63%	10	71%	10	91%	4	80%
Group B hospitals	*4*	*3%*	*4*	*5%*	*1*	*2%*	*0*	*0%*	*1*	*3%*	*0*	*0%*
Public hospitals	0	0%	1	25%	0	0%	0	-	0	0%	0	-
Private hospitals	4	100%	3	75%	1	100%	0	-	1	100%	0	-
Other hospitals	*16*	*12%*	*10*	*13%*	*4*	*9%*	*5*	*13%*	*5*	*16%*	*7*	*41%*
Public hospitals	6	38%	2	20%	4	100%	3	60%	5	100%	4	57%
Private hospitals	10	63%	8	80%	0	0%	2	40%	0	0%	3	43%
Queensland	**132**	**100%**	**77**	**100%**	**46**	**100%**	**38**	**100%**	**31**	**100%**	**17**	**100%**

[1] See appendix 1 for cancer descriptions.
[2] See appendix 5 for AIHW Peer Group descriptions.

1.4.2 | What proportion of AYA cancer patients receive their IV systemic therapy by AIHW Peer Group[1,2]?

AIHW Peer Group	Lymphomas		Leukaemias		Bone sarcomas		Carcinomas (excluding thyroid and appendix)		Soft-tissue sarcomas		Germ cell		Other invasive		Brain/CNS	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Principal referral hospitals	*82*	*48%*	*31*	*65%*	*10*	*45%*	*4*	*36%*	*8*	*73%*	*6*	*60%*	*3*	*38%*	*0*	*0%*
Group A hospitals	*41*	*24%*	*5*	*10%*	*0*	*0%*	*3*	*27%*	*0*	*0%*	*2*	*20%*	*2*	*25%*	*0*	*0%*
Public hospitals	16	39%	2	40%	0	-	3	100%	0	-	2	100%	2	100%	0	-
Private hospitals	25	61%	3	60%	0	-	0	0%	0	-	0	0%	0	0%	0	-
Group B hospitals	*4*	*2%*	*0*	*0%*	*0*	*0%*	*0*	*0%*	*0*	*0%*	*0*	*0%*	*0*	*0%*	*0*	*0%*
Public hospitals	2	50%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Private hospitals	2	50%	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Other hospitals	*43*	*25%*	*12*	*25%*	*12*	*55%*	*4*	*36%*	*3*	*27%*	*2*	*20%*	*3*	*38%*	*1*	*100%*
Public hospitals	19	44%	10	83%	6	50%	0	0%	1	33%	0	0%	2	67%	1	100%
Private hospitals	24	56%	2	17%	6	50%	4	100%	2	67%	2	100%	1	33%	0	0%
Queensland	**170**	**100%**	**48**	**100%**	**22**	**100%**	**11**	**100%**	**11**	**100%**	**10**	**100%**	**8**	**100%**	**1**	**100%**

[1] See appendix 1 for cancer descriptions.
[2] See appendix 5 for AIHW Peer Group descriptions.

1.4.3 | What proportion of AYA cancer patients receive their radiation therapy by AIHW Peer Group[1,2]?

AIHW Peer Group	Lymphomas		Brain/CNS		Carcinomas		Soft-tissue		Leukaemias		Germ cell		Other invasive	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Principal referral hospitals	*2*	*29%*	*2*	*33%*	*1*	*50%*	*0*	*0%*	*1*	*100%*	*1*	*100%*	*0*	*0%*
Group A hospitals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Group B hospitals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other hospitals	*5*	*71%*	*4*	*67%*	*1*	*50%*	*2*	*100%*	*0*	*0%*	*0*	*0%*	*1*	*100%*
Public hospitals	2	40%	4	100%	0	0%	0	0%	0	-	0	-	0	0%
Private hospitals	3	60%	0	0%	1	100%	2	100%	0	-	0	-	1	100%
Queensland	**7**	**100%**	**6**	**100%**	**2**	**100%**	**2**	**100%**	**1**	**100%**	**1**	**100%**	**1**	**100%**

[1] See appendix 1 for cancer descriptions.
[2] See appendix 5 for AIHW Peer Group descriptions.

1.5 | Characteristics of AYA cancer patients receiving treatment by Hospital and Health Services (HHS) of residence

Diagnosis years 2014-2018

1.5.1 | What are the characteristics of AYA cancer patients who received treatment[1,2,3,4]?

HHS of residence	Had treatment		Median age at diagnosis (yrs)	Male		Age 19-24		Disadvantaged		Rural		Indigenous		1+ Comorbidities		Had MDT review		Had YCS review	
	N	%		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Cairns and Hinterland	30	5%	21	20	67%	23	77%	7	23%	30	100%	5	17%	3	10%	14	47%	6	20%
Central Queensland	27	4%	21	20	74%	21	78%	1	4%	7	26%	0	0%	5	19%	14	52%	14	52%
Central West	2	0%	22	2	100%	2	100%	0	0%	2	100%	0	0%	0	0%	1	50%	2	100%
Darling Downs	31	5%	21	16	52%	21	68%	13	42%	8	26%	3	10%	5	16%	19	61%	13	42%
Gold Coast	81	13%	21	44	54%	69	85%	4	5%	0	0%	2	2%	13	16%	47	58%	52	64%
Mackay	26	4%	19	16	62%	20	77%	2	8%	11	42%	4	15%	4	15%	13	50%	16	62%
Metro North	130	20%	20	81	62%	107	82%	14	11%	0	0%	3	2%	5	4%	68	52%	70	54%
Metro South	175	27%	20	105	60%	135	77%	33	19%	2	1%	6	3%	21	12%	76	43%	93	53%
North West	2	0%	20	1	50%	2	100%	2	100%	2	100%	2	100%	0	0%	2	100%	2	100%
South West	3	0%	20	1	33%	2	67%	0	0%	3	100%	0	0%	1	33%	1	33%	1	33%
Sunshine Coast	43	7%	20	21	49%	31	72%	4	9%	0	0%	3	7%	5	12%	30	70%	20	47%
Torres and Cape	1	0%	21	0	0%	1	100%	1	100%	1	100%	1	100%	1	100%	1	100%	1	100%
Townsville	30	5%	19	17	57%	20	67%	5	17%	7	23%	3	10%	2	7%	14	47%	20	67%
West Moreton	35	5%	21	19	54%	27	77%	15	43%	0	0%	2	6%	4	11%	19	54%	14	40%
Wide Bay	22	3%	19	14	64%	14	64%	14	64%	0	0%	1	5%	5	23%	12	55%	12	55%
Queensland	**638**	**100%**	**20**	**377**	**59%**	**495**	**78%**	**115**	**18%**	**73**	**11%**	**35**	**5%**	**74**	**12%**	**331**	**52%**	**336**	**53%**

[1] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[2] Rural includes outer regional, remote and very remote.
[3] MDT rate includes facilities that use QOOL to capture MDT review.
[4] AYA care coordinator (AYA CC) review includes facilities that use QOOL to capture this review.

1.6 | Characteristics of AYA cancer patients receiving treatment by cancer

Diagnosis years 2014-2018

1.6.1 | What are the characteristics of AYA cancer patients who received treatment[1,2,3,4,5,6]?

Cancer	Had treatment	Median age at diagnosis (yrs)	Male		Age 19-24		Disadvantaged		Rural		Indigenous		1+ Comorbidities		Had MDT review		Had YCS review	
	N		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Bone sarcomas	*42*	*18*	*32*	*76%*	*22*	*52%*	*9*	*21%*	*6*	*14%*	*4*	*10%*	*7*	*17%*	*32*	*76%*	*30*	*71%*
Ewing tumour	17	17	11	65%	7	41%	3	18%	3	18%	1	6%	2	12%	15	88%	16	94%
Osteosarcoma	17	18	15	88%	9	53%	4	24%	3	18%	2	12%	4	24%	12	71%	13	76%
Other bone tumour	8	19	6	75%	6	75%	2	25%	0	0%	1	13%	1	13%	5	63%	1	13%
Carcinomas (excluding thyroid and appendix)	*96*	*22*	*29*	*30%*	*82*	*85%*	*14*	*15%*	*11*	*11%*	*5*	*5%*	*6*	*6%*	*44*	*46%*	*26*	*27%*
Breast	7	22	0	0%	7	100%	1	14%	0	0%	0	0%	0	0%	3	43%	2	29%
Cervix	10	24	0	0%	9	90%	2	20%	1	10%	3	30%	0	0%	2	20%	3	30%
Gastrointestinal tract	26	22	6	23%	21	81%	3	12%	5	19%	0	0%	4	15%	9	35%	3	12%
Genitourinary tract	10	21	2	20%	10	100%	3	30%	3	30%	2	20%	1	10%	2	20%	2	20%
Gonads	3	21	0	0%	3	100%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Other carcinoma (including skin and breast in males)	4	22	3	75%	4	100%	1	25%	0	0%	0	0%	0	0%	2	50%	2	50%
Other head and neck	26	20	14	54%	19	73%	4	15%	2	8%	0	0%	1	4%	21	81%	13	50%
Trachea, bronchus and lung	10	19	4	40%	9	90%	0	0%	0	0%	0	0%	0	0%	5	50%	1	10%
Brain/CNS	*51*	*20*	*32*	*63%*	*38*	*75%*	*9*	*18%*	*5*	*10%*	*0*	*0%*	*9*	*18%*	*38*	*75%*	*30*	*59%*
Glioblastoma and anaplastic astrocytoma	14	20	8	57%	9	64%	2	14%	3	21%	0	0%	6	43%	10	71%	10	71%
Medulloblastoma	5	19	4	80%	3	60%	1	20%	0	0%	0	0%	0	0%	5	100%	5	100%
Other astrocytoma, glioma or ependymoma	30	20	18	60%	25	83%	5	17%	2	7%	0	0%	3	10%	21	70%	13	43%
Other central nervous system tumour	2	17	2	100%	1	50%	1	50%	0	0%	0	0%	0	0%	2	100%	2	100%

Section 1.6.1 (continued)

Cancer	Had treatment	Median age at diagnosis (yrs)	Male		Age 19-24		Disadvantaged		Rural		Indigenous		1+ Comorbidities		Had MDT review		Had YCS review	
	N		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Germ cell	*141*	*21*	*124*	*88%*	*124*	*88%*	*19*	*13%*	*10*	*7%*	*9*	*6%*	*6*	*4%*	*37*	*26%*	*57*	*40%*
Gonadal	136	22	119	88%	121	89%	18	13%	10	7%	9	7%	6	4%	32	24%	52	38%
Non-gonadal	5	18	5	100%	3	60%	1	20%	0	0%	0	0%	0	0%	5	100%	5	100%
Leukaemias	*51*	*19*	*32*	*63%*	*35*	*69%*	*10*	*20%*	*6*	*12%*	*1*	*2%*	*15*	*29%*	*29*	*57%*	*44*	*86%*
Leukaemia (acute)	50	19	31	62%	34	68%	10	20%	6	12%	1	2%	15	30%	28	56%	43	86%
Leukaemia (chronic)	1	24	1	100%	1	100%	0	0%	0	0%	0	0%	0	0%	1	100%	1	100%
Lymphomas	*177*	*20*	*84*	*47%*	*137*	*77%*	*35*	*20%*	*24*	*14%*	*8*	*5%*	*22*	*12%*	*113*	*64%*	*118*	*67%*
Hodgkin Lymphoma	131	20	57	44%	103	79%	21	16%	19	15%	6	5%	11	8%	79	60%	85	65%
Non-Hodgkin Lymphoma	46	20	27	59%	34	74%	14	30%	5	11%	2	4%	11	24%	34	74%	33	72%
Soft-tissue sarcomas	*52*	*19*	*32*	*62%*	*38*	*73%*	*15*	*29%*	*6*	*12%*	*5*	*10%*	*2*	*4%*	*27*	*52%*	*24*	*46%*
Rhabdomyosarcoma	13	17	9	69%	6	46%	2	15%	1	8%	0	0%	1	8%	10	77%	12	92%
Other soft-tissue sarcoma	39	20	23	59%	32	82%	13	33%	5	13%	5	13%	1	3%	17	44%	12	31%
Other invasive	*28*	*20*	*12*	*43%*	*19*	*68%*	*4*	*14%*	*5*	*18%*	*3*	*11%*	*7*	*25%*	*11*	*39%*	*7*	*25%*
Total AYA	***638***	**21**	***377***	***59%***	***495***	***78%***	***115***	***18%***	***73***	***11%***	***35***	***5%***	***74***	***12%***	***331***	***52%***	***336***	***53%***

[1] See appendix 1 for cancer descriptions.
[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[3] Rural includes outer regional, remote and very remote.
[4] MDT rate includes facilities that use QOOL to capture MDT review.
[5] AYA care coordinator (AYA CC) review includes facilities that use QOOL to capture this review.
[6] Includes skin and breast carcinoma in males.

1.7 | AYA cancer treatment rates by remoteness of residence

Diagnosis years 2014-2018

1.7.1 | What proportion of AYA cancer patients residing in rural area received treatment?

Cancer[1]	Rural[2]	Inner regional	Major city
	n(N)	n(N)	n(N)
Bone sarcomas	100% 6(6)	100% 6(6)	100% 30(30)
Carcinomas (excluding thyroid and appendix)	85% 11(13)	79% 15(19)	91% 70(77)
Brain/CNS	71% 5(7)	100% 9(9)	84% 37(44)
Germ cell	91% 10(11)	97% 30(31)	99% 101(102)
Leukaemias	86% 6(7)	100% 13(13)	84% 32(38)
Lymphomas	92% 24(26)	100% 36(36)	93% 117(126)
Soft-tissue sarcomas	100% 6(6)	82% 9(11)	93% 37(40)
Other invasive	63% 5(8)	60% 6(10)	59% 17(29)

[1] See appendix 1 for cancer descriptions.

[2] Rural includes outer regional, remote and very remote.

2| Efficient

Optimally using resources to achieve desired outcomes

2.1 | Allied health support

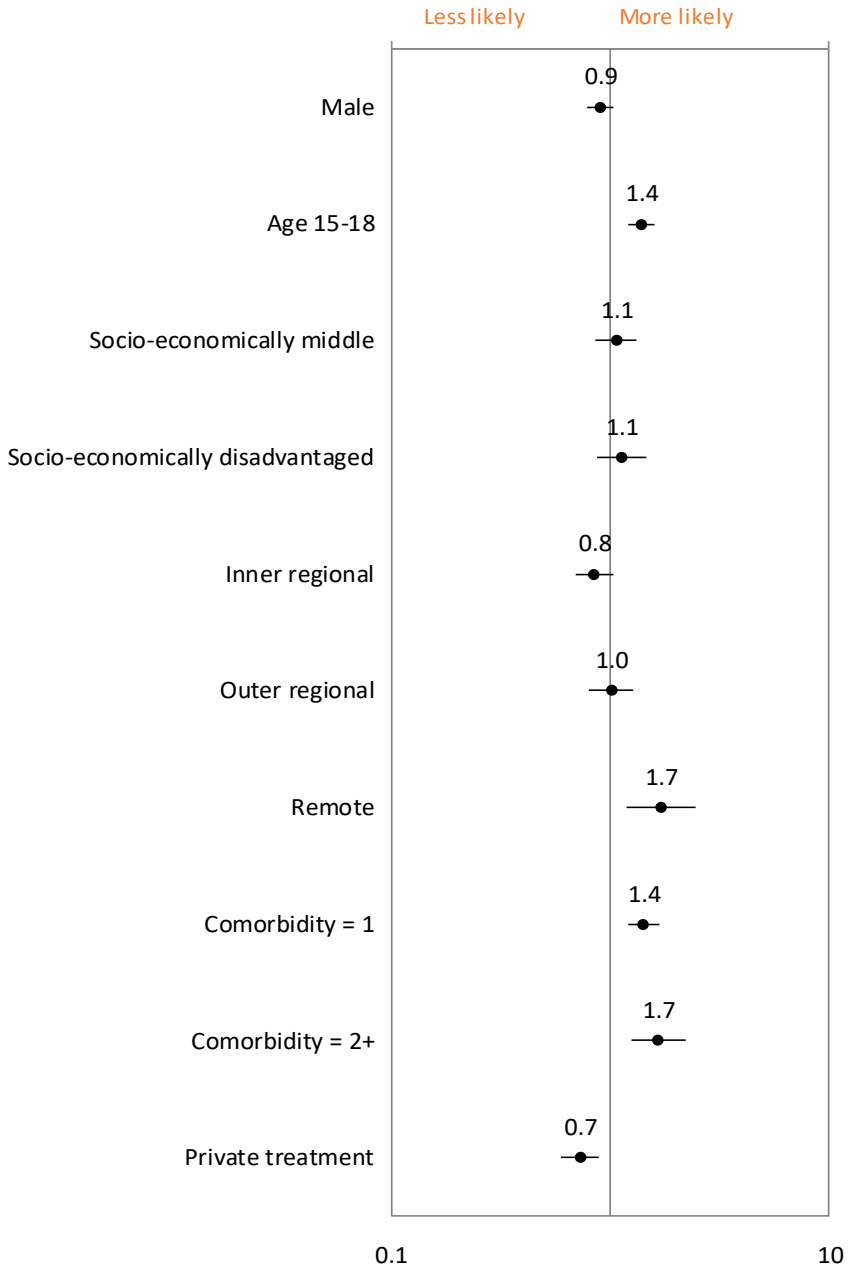
Diagnosis years 2014-2018

2.1.1 | What are the characteristics of AYA cancer patients who received allied health support during a hospital admission?

	Had Treatment[1]		Had Allied heath intervention[2]	
	N	Qld %	n	%
Queensland	638	**100%**	341	**53%**
Sex				
Male	377	59%	209	55%
Female	261	41%	132	51%
Age Group				
15 - 18	201	32%	133	66%
19 - 24	437	68%	208	48%
Indigenous status				
Indigenous	35	5%	18	51%
Non-Indigenous	602	94%	323	54%
Not stated/unknown	1	0%	0	0%
Socioeconomic status				
Affluent	121	19%	62	51%
Middle	402	63%	211	52%
Disadvantaged	115	18%	68	59%
Remoteness				
Major city	441	69%	247	56%
Inner regional	124	19%	60	48%
Outer regional	63	10%	27	43%
Remote & very remote	10	2%	7	70%
MDT[3]				
MDT review	331	52%	258	78%
No MDT review	307	48%	83	27%
Comorbidities				
0 Comorbidities	564	88%	290	51%
1 Comorbidities	58	9%	41	71%
2+ Comorbidities	16	3%	10	63%

[1] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[2] See appendix 3 for allied health descriptions.
[3] MDT rate includes facilities that use QOOL to capture MDT review.

2.1.2 | Factors associated with receiving allied health support during a hospital admission



The above graph (forest plot) is a graphical display of the hazard ratios for each covariate in the analysis. The dot represents the estimate of the hazard ratio with the confidence interval of the estimate represented by a horizontal line. The central vertical line represents no effect, if the confidence intervals for an estimate cross this central vertical line then the effect is considered not to be statistically significant. Hazard ratios for those from Middle and Disadvantaged socio-economic areas are obtained by comparing to those from Affluent areas. Inner and Outer Regional, and Remote areas are compared with Major Cities. Patients with comorbidities are compared to those with no comorbidities. Patients aged 15-18 compared with patients aged 19-24. Patients treated at private compared with public facilities. Male patients compared to female patients.

2.1.3 | What is the distribution of AYA cancer patients who received allied health support during a hospital admission?

Cancer[1]	Had treatment[2]	Had allied health interventions[3]	
	N	n	%
Bone sarcomas	42	39	93%
Carcinomas (excluding thyroid and appendix)	96	56	58%
Brain/CNS	51	40	78%
Germ cell	141	37	26%
Leukaemias	51	34	67%
Lymphomas	177	87	49%
Soft-tissue sarcomas	52	31	60%
Other invasive	28	9	32%

[1] See appendix 1 for cancer descriptions.
[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[3] See appendix 3 for allied health descriptions.

2.2 | Fertility preservation

Diagnosis years 2014-2018

2.2.1 | What proportion of AYA cancer patients receiving IV systemic therapy had fertility preservation[1,2]?

Cancer	Male			Female		
	Had IVST	Had fertility preservation	%	Had IVST	Had fertility preservation	%
Bone sarcomas	22	13	59%	7	7	100%
Carcinomas (excluding thyroid and appendix)	5	4	80%	13	8	62%
Brain/CNS	10	6	60%	6	3	50%
Germ cell	42	26	62%	6	3	50%
Leukaemias	29	18	62%	15	8	53%
Lymphomas	53	36	68%	64	37	58%
Soft-tissue sarcomas	15	11	73%	4	3	75%
Other invasive	1	0	0%	3	1	33%
Total AYA	**177**	**114**	**64%**	**118**	**70**	**59%**

[1] See appendix 1 for cancer descriptions.
[2] Fertility preservation includes Zoladex

3| Accessible

Making health services available in the most suitable setting in a reasonable time.

3.1 | Timeliness

Diagnosis years 2014-2018

3.1.1 | What proportion of AYA cancer patients received their first cancer treatment within 30 days of diagnosis by patient demographic?

	Diagnosis		Had treatment[1]		Received first treatment within 30 days of diagnosis		Median days from diagnosis to first treatment
	N	Qld %	n	%	n	%	
Queensland	**705**	**100%**	**638**	**90%**	**523**	**82%**	6
Sex							
Male	407	58%	377	93%	321	85%	3
Female	298	42%	261	88%	202	77%	9
Age Group							
15 - 18	211	30%	201	95%	170	85%	7
19 - 24	494	70%	437	88%	353	81%	7
Indigenous status							
Indigenous	38	5%	35	92%	25	71%	11
Non-Indigenous	657	93%	602	92%	497	83%	6
Not stated/unknown	10	1%	1	10%	1	100%	0
Socioeconomic status							
Affluent	132	19%	121	92%	98	81%	5
Middle	443	63%	402	91%	336	84%	6
Disadvantaged	130	18%	115	88%	89	77%	6
Remoteness							
Major city	486	69%	441	91%	365	83%	5
Inner regional	135	19%	124	92%	100	81%	7
Outer regional	72	10%	63	88%	48	76%	8
Remote & very remote	12	2%	10	83%	10	100%	8
AYA care coordinator review[2]							
AYA care coordinator review	341	48%	336	99%	287	85%	7
No AYA care coordinator review	364	52%	302	83%	236	78%	7
MDT[3]							
MDT review	345	49%	331	96%	265	80%	9
No MDT review	360	51%	307	85%	258	84%	1
Comorbidities							
0 Comorbidities	626	89%	564	90%	459	81%	6
1 Comorbidities	62	9%	58	94%	54	93%	6
2+ Comorbidities	17	2%	16	94%	10	63%	6

[1] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[2] AYA care coordinator review includes facilities that use QOOL to capture this review.
[3] MDT rate includes facilities that use QOOL to capture MDT review.

3.1.2 | What proportion of AYA cancer patients received their first cancer treatment within 30 days of diagnosis by cancer type?

Cancer[1]	Diagnosis	Had treatment[2]		Received first treatment within 30 days of diagnosis		Median days from diagnosis to first treatment
	N	n	%	n	%	
Bone sarcomas	42	42	100%	36	86%	14
Carcinomas (excluding thyroid and appendix)	109	96	88%	72	75%	10
Brain/CNS	60	51	85%	45	88%	0
Germ cell	144	141	98%	138	98%	0
Leukaemias	58	51	88%	51	100%	3
Lymphomas	188	177	94%	136	77%	15
Soft-tissue sarcomas	57	52	91%	30	58%	19
Other invasive	47	28	60%	15	54%	19

[1] See appendix 1 for cancer descriptions.

[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.

4| Equitable

Providing care and ensuring health status does not vary in quality because of personal characteristics.

4.1 | Indigenous

Diagnosis years 2014-2018

4.1.1 | What percentage of indigenous AYA cancer patients received their first treatment within 30 days of diagnosis[3]?

Cancer[1]	Received first treatment[2] within 30 days of diagnosis					
	Indigenous			Non-Indigenous		
	n	N	%	n	N	%
Bone sarcomas	3	4	75%	33	38	87%
Carcinomas (excluding thyroid and appendix)	4	5	80%	68	91	75%
Brain/CNS	0	0	-	44	50	88%
Germ cell	9	9	100%	129	132	98%
Leukaemias	1	1	100%	50	50	100%
Lymphomas	6	8	75%	130	169	77%
Soft-tissue sarcomas	1	5	20%	29	47	62%
Other invasive	1	3	33%	14	25	56%

[1] See appendix 1 for cancer descriptions.
[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.
[3] Indigenous status defined as not stated/unknown is not included in analysis.

4.2 | Socio-economically disadvantaged

Diagnosis years 2014-2018

4.2.1 | What percentage of socio-economically disadvantaged AYA cancer patients received their first treatment within 30 days of diagnosis?

Cancer[1]	Received first treatment[2] within 30 days of diagnosis								
	Disadvantaged			Middle			Affluent		
	n	N	%	n	N	%	n	N	%
Bone sarcomas	7	9	78%	23	26	88%	6	7	86%
Carcinomas (excluding thyroid and appendix)	10	14	71%	49	62	79%	13	20	65%
Brain/CNS	9	9	100%	28	33	85%	8	9	89%
Germ cell	19	19	100%	87	89	98%	32	33	97%
Leukaemias	10	10	100%	34	34	100%	7	7	100%
Lymphomas	26	35	74%	85	110	77%	25	32	78%
Soft-tissue sarcomas	6	15	40%	19	28	68%	5	9	56%
Other invasive	2	4	50%	11	20	55%	2	4	50%

[1] See appendix 1 for cancer descriptions.
[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.

4.3 | In-flow

Diagnosis years 2014-2018

4.3.1 | What percent of AYA cancer patients did I treat (1st treatment) that lived outside of my HHS[1,4]?

HHS of treatment[3]	Treatment for patients outside of my HHS		Treatment for patients from within my HHS		Total
	n	%	n	%	N
Cairns and Hinterland	-		16	100%	16
Central Queensland	2	22%	7	78%	9
Central West	-	-	-	-	-
Children's Health Queensland[2]	-	-	-	-	0
Darling Downs	2	12%	15	88%	17
Gold Coast	3	4%	64	96%	67
Mackay	-		8	100%	8
Metro North	76	42%	104	58%	180
Metro South	74	35%	140	65%	214
North West	-	-	-	-	-
South West	-	-	-	-	-
Sunshine Coast	1	5%	21	95%	22
Townsville	12	34%	23	66%	35
West Moreton	2	14%	12	86%	14
Wide Bay	-		2	100%	2
Queensland	**226**	**35%**	**412**	**65%**	**638**

[1] A patient can only have one first treatment

[2] Children's Health Queensland is a state-wide service with no geographical boundary

[3] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.

[4] **Example – Metro North treated 76 (42%) patients from another HHS, and treated 104 (58%) patients from the Metro North HHS**

4.4 | Out-flows

Diagnosis years 2014-2018

4.4.1 | What percent of AYA patients had their 1st treatment outside of the HHS they reside in[1,3]?

HHS of residence	Treatment outside the HHS a patient resides in[2]		Treatment within the HHS a patient resides in[2]		Total
	n	%	n	%	N
Cairns and Hinterland	14	47%	16	53%	30
Central Queensland	20	74%	7	26%	27
Central West	2	100%	0	0%	2
Darling Downs	16	52%	15	48%	31
Gold Coast	17	21%	64	79%	81
Mackay	18	69%	8	31%	26
Metro North	26	20%	104	80%	130
Metro South	35	20%	140	80%	175
North West	2	100%	0	0%	2
South West	3	100%	0	0%	3
Sunshine Coast	22	51%	21	49%	43
Townsville	7	23%	23	77%	30
West Moreton	23	66%	12	34%	35
Wide Bay	20	91%	2	9%	22
Queensland	**226**	**35%**	**412**	**65%**	**638**

[1] A patient can only have one first treatment.

[2] Treatment is isolated to IV systemic therapy, radiation therapy, and surgery.

[3] **Example – Of the Metro North patients, 26 (20%) received treatment outside of Metro North, and 104 (80%) received treatment within Metro North.**

4.5 | AYA Cancer Coordinator Review

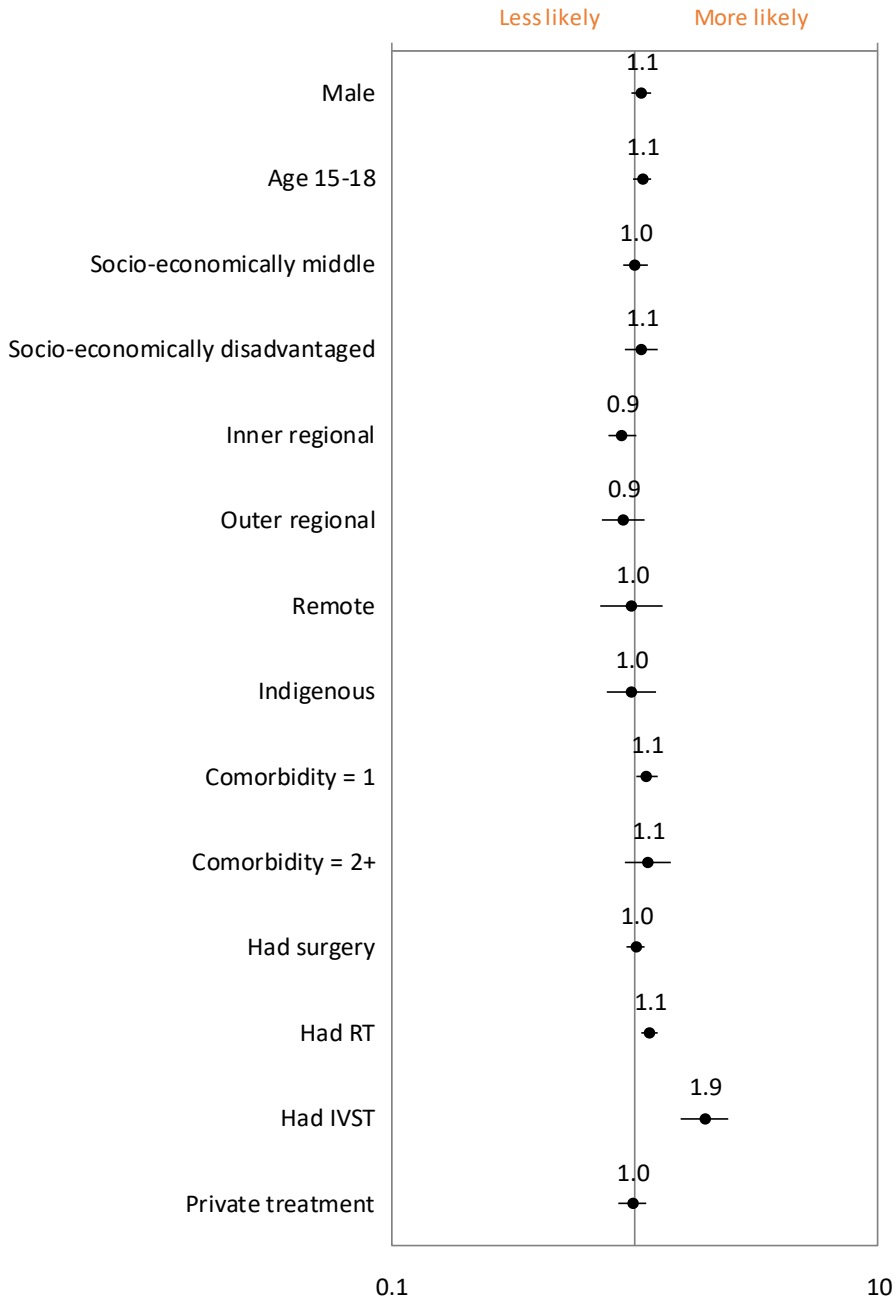
Diagnosis years 2014-2018

4.5.1 | What are the characteristics of AYA cancer patients who receive review from an AYA Cancer Coordinator?

	Treatment		AYA CC review[1]	
	N	Qld %	n	%
Queensland	638	**100%**	341	**48%**
Sex				
Male	377	59%	209	51%
Female	261	41%	132	44%
Age Group				
15 - 18	201	32%	133	63%
19 - 24	437	68%	208	42%
Indigenous status				
Indigenous	35	5%	18	47%
Non-Indigenous	602	94%	323	49%
Not stated/unknown	1	0%	0	0%
Socioeconomic status				
Affluent	121	19%	62	47%
Middle	402	63%	211	48%
Disadvantaged	115	18%	68	52%
Remoteness				
Major city	441	69%	247	51%
Inner regional	124	19%	60	44%
Outer regional	63	10%	27	38%
Remote & very remote	10	2%	7	58%
Comorbidities				
0 Comorbidities	564	88%	290	46%
1 Comorbidities	58	9%	41	66%
2+ Comorbidities	16	3%	10	59%

[1] Youth has been reviewed by QYCS captured in QOOL.

4.5.2 | Factors associated with receiving review by QYCS



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Appendix

Appendix 1 | AYA SEER cancer groupings[2]

Cancer group	Primary site code	Primary site code description	Morphology descriptions	Diagnosis
Appendix tumour				***112***
	C181	Appendix	Atypical carcinoid tumour	7
			Carcinoid tumour	95
			Enterochromaffin cell carcinoid	2
			Mucinous adenocarcinoma	1
			Neuroendocrine carcinoma	7
Bone sarcomas				***42***
	C40	Bone and articular cartilage of limbs	Central osteosarcoma	1
			Chondroblastic osteosarcoma	1
			Chondrosarcoma	2
			Ewing sarcoma	6
			Osteosarcoma	11
			Parosteal osteosarcoma	1
	C41	Bone and articular cartilage of other and unspecified sites	Chondroblastic osteosarcoma	1
			Chondrosarcoma	3
			Chordoma	1
			Ewing sarcoma	5
			Juxtacortical chondrosarcoma	1
			Osteosarcoma	2
	C49	Other connective and soft tissue	Ewing sarcoma	5
			Myxoid chondrosarcoma	1
	C76	Other and ill-defined sites	Ewing sarcoma	1
Carcinomas (excluding thyroid and appendix)				***109***
	C00	Lip	Squamous cell carcinoma	1
			Squamous cell carcinoma, keratinising	1
	C02	Other and unspecified parts of tongue	Squamous cell carcinoma	3
			Squamous cell carcinoma, keratinising	3
	C05	Palate	Carcinoma	1
			Mucoepidermoid carcinoma	3
	C07	Parotid gland	Acinar cell carcinoma	6
			Carcinoma	1
			Mucoepidermoid carcinoma	4
	C08	Other and unspecified major salivary glands	Mucoepidermoid carcinoma	1
	C09	Tonsil	Squamous cell carcinoma	1
	C11	Nasopharynx	Lymphoepithelial carcinoma	1
			Squamous cell carcinoma	1
			Squamous cell carcinoma, keratinising	1
	C16	Stomach	Mucinous adenocarcinoma	1
			Signet ring cell carcinoma	1
	C18	Colon	Adenocarcinoma	3
			Adenocarcinoma in adenomatous polyp	1
			Adenocarcinoma in adenomatous polyposis coli	1
			Adenocarcinoma in tubulovillous adenoma	3
			Mucinous adenocarcinoma	1
			Neuroendocrine carcinoma	1
			Signet ring cell carcinoma	1
	C19/C20	Rectosigmoid junction/Rectum	Adenocarcinoma	4
	C22	Liver and intrahepatic bile ducts	Hepatocellular carcinoma, fibrolamellar	2
	C25	Pancreas	Neuroendocrine carcinoma	2
			Solid pseudopapillary carcinoma	6
	C31	Accessory sinuses	Squamous cell carcinoma, keratinising	1
			Squamous cell carcinoma, large cell, nonkeratinising	1
	C34	Bronchus and lung	Atypical carcinoid tumour	1
			Carcinoid tumour	7
			Mucinous adenocarcinoma	1
			Non-small cell carcinoma	1
			Small cell carcinoma	1
	C37	Thymus	Thymoma type, B3, malignant	1
			Thymoma, type AB, malignant	1
	C50	Breast	Infiltrating duct carcinoma	6
			Intraductal papillary adenocarcinoma with invasion	1
	C51	Vulva	Squamous cell carcinoma	1
	C53	Cervix uteri	Adenocarcinoma	1
			Clear cell adenocarcinoma	1
			Spindle cell carcinoma	1
			Squamous cell carcinoma	7
			Squamous cell carcinoma, microinvasive	2
	C56	Ovary	Mucinous adenocarcinoma	1
			Serous cystadenocarcinoma	2
	C64	Kidney, except renal pelvis	Clear cell adenocarcinoma	3
			Cyst-associated renal cell carcinoma	1
			Papillary adenocarcinoma	1
			Renal cell carcinoma	4
			Renal cell carcinoma, chromophobe type	1
	C65	Renal pelvis	Transitional cell carcinoma	1
	C67	Bladder	Transitional cell carcinoma	1
	C80	Malignant neoplasm without specification of site	Acinar cell carcinoma	1
			Adenocarcinoma	3

Cancer group	Primary site code	Primary site code description	Morphology descriptions	Diagnosis
Brain/CNS				***60***
	C71	Brain	Astrocytoma	10
			Astrocytoma, anaplastic	3
			Ependymoma	2
			Ependymoma, anaplastic	1
			Giant cell glioblastoma	1
			Glioblastoma	10
			Glioma, malignant	10
			Medulloblastoma	5
			Oligodendroglioma	6
			Oligodendroglioma, anaplastic	2
			Pleomorphic xanthoastrocytoma	3
	C72	Spinal cord, cranial nerves and other parts of central nervous system	Astrocytoma	1
			Ependymoma	3
	C75	Other endocrine glands and related	Pineoblastoma	3
Germ cell				***144***
	C38	Heart, mediastinum and pleura	Germ cell tumour, nonseminomatous	1
	C56	Ovary	Dysgerminoma	3
			Germinoma	1
			Mixed germ cell tumour	3
			Teratoma, malignant	8
			Yolk sac tumour	2
	C62	Testis	Choriocarcinoma	1
			Choriocarcinoma combined with other germ cell elements	5
			Embryonal carcinoma	12
			Germ cell tumour, nonseminomatous	10
			Germinoma	3
			Mixed germ cell tumour	64
			Seminoma	22
			Teratocarcinoma	1
			Teratoma, malignant	3
	C71	Brain	Mixed germ cell tumour	1
	C75	Other endocrine glands and related	Germinoma	4
Leukaemias				***58***
	C91	Lymphoid leukaemia	B lymphoblastic leukaemia/lymphoma with t(12;21)(p13;q22); TEL-AML1	2
			B lymphoblastic leukaemia/lymphoma,	6
			Burkitt cell leukaemia	1
			Precursor B-cell lymphoblastic leukaemia	7
			Precursor cell lymphoblastic leukaemia	10
			Precursor T-cell lymphoblastic leukaemia	4
			T-cell large granular lymphocytic leukaemia	1
	C92	Myeloid leukaemia	Acute myeloid leukaemia	5
			Acute myeloid leukaemia with abnormal marrow eosinophils	2
			Acute myeloid leukaemia without maturation	1
			Acute myeloid leukaemia, minimal differentiation	1
			Acute myeloid leukaemia, t(8;21)(q22;q22)	1
			Acute myelomonocytic leukaemia	2
			Acute promyelocytic leukaemia	5
			Chronic myeloid leukaemia	5
	C93	Monocytic leukaemia	Acute monocytic leukaemia	5
Lymphomas				***188***
	C81	Hodgkin lymphoma	Hodgkin disease, mixed cellularity	8
			Hodgkin lymphoma	31
			Hodgkin lymphoma, lymphocyte-rich	2
			Hodgkin lymphoma, nodular lymphocyte predominance	4
			Hodgkin lymphoma, nodular sclerosis	88
			Hodgkin lymphoma, nodular sclerosis, cellular phase	1
			Hodgkin lymphoma, nodular sclerosis, grade 1	1
	C82	Follicular lymphoma	Follicular lymphoma, grade 3	1
	C83	Non-follicular lymphoma	Burkitt lymphoma	7
			Lymphoma, large B-cell, diffuse	16
			Precursor cell lymphoblastic lymphoma	1
	C84	Mature t/nk-cell lymphomas	Anaplastic large cell lymphoma, T cell and Null cell type	5
			Cutaneous T-cell lymphoma	2
			Mycosis fungoides	2
	C85	Other and unspecified types of non-hodgkin lymphoma	Composite Hodgkin and non-Hodgkin lymphoma	2
			Lymphoma, non-Hodgkin	3
			Malignant lymphoma	1
			Mediastinal large B-cell lymphoma	4
			Precursor T-cell lymphoblastic lymphoma	5
	C86	Other specified types of t/nk-cell lymphoma	Primary cutaneous CD30+ T-cell lymphoproliferative disorder	1
			Subcutaneous panniculitis-like T-cell lymphoma	1
	C88	Malignant immunoproliferative diseases	Marginal zone B-cell lymphoma	2

Cancer group	Primary site code	Primary site code description	Morphology descriptions	Diagnosis
Melanomas				***237***
	C20	Rectum	Malignant melanoma	1
	C43	Skin	Malignant melanoma	232
	C69	Eye and adnexa	Malignant melanoma	2
	C80	Malignant neoplasm without specification of site	Malignant melanoma	2
Soft-tissue sarcomas				***57***
	C22	Liver and intrahepatic bile ducts	Epithelioid haemangioendothelioma, malignant	1
	C30	Nasal cavity and middle ear	Alveolar rhabdomyosarcoma	1
	C31	Accessory sinuses	Embryonal rhabdomyosarcoma	1
			Rhabdomyosarcoma	1
	C38	Heart, mediastinum and pleura	Rhabdomyosarcoma	1
	C44	Other malignant neoplasms of skin	Dermatofibrosarcoma	14
			Leiomyosarcoma	2
	C47	Peripheral nerves and autonomic nervous system	Malignant peripheral nerve sheath tumour	2
	C49	Other connective and soft tissue	Alveolar rhabdomyosarcoma	4
			Alveolar soft part sarcoma	1
			Desmoplastic small round cell tumour	1
			Embryonal rhabdomyosarcoma	1
			Epithelioid sarcoma	3
			Fibromyxosarcoma	3
			Leiomyosarcoma	1
			Liposarcoma	1
			Malignant myoepithelioma	1
			Mesenchymoma, malignant	1
			Myxoid liposarcoma	2
			Sarcoma	2
			Small cell sarcoma	1
			Spindle cell rhabdomyosarcoma	1
			Spindle cell sarcoma	1
			Synovial sarcoma	4
			Synovial sarcoma, biphasic	2
	C53	Cervix uteri	Embryonal rhabdomyosarcoma	1
	C61	Prostate	Embryonal rhabdomyosarcoma	1
	C62	Testis	Embryonal rhabdomyosarcoma	1
	C80	Malignant neoplasm without specification of site	Desmoplastic small round cell tumour	1
Thyroid carcinomas				***118***
	C73	Thyroid gland	Follicular adenocarcinoma	3
			Follicular carcinoma, minimally invasive	7
			Insular carcinoma	1
			Medullary carcinoma with amyloid stroma	1
			Nonencapsulated sclerosing carcinoma	2
			Oxyphilic adenocarcinoma	1
			Papillary adenocarcinoma	67
			Papillary carcinoma	2
			Papillary carcinoma, columnar cell	1
			Papillary carcinoma, encapsulated	6
			Papillary carcinoma, follicular variant	14
			Papillary carcinoma, oxyphilic cell	1
			Papillary microcarcinoma	12
Other invasive				***47***
	C16	Stomach	Gastrointestinal stromal sarcoma	1
			Neoplasm, malignant	1
	C20	Rectum	Carcinoid tumour	3
	C24	Other and unspecified parts of biliary tract	Adenocarcinoma	1
	C25	Pancreas	Pancreatic endocrine tumour, malignant	1
	C30	Nasal cavity and middle ear	Malignant tumour, spindle cell type	1
	C48	Retroperitoneum and peritoneum	Paraganglioma, malignant	1
	C50	Breast	Phyllodes tumour, malignant	3
	C54	Corpus uteri	Adenosarcoma	1
			Endometrioid adenocarcinoma	1
	C56	Ovary	Sertoli-Leydig cell tumour, poorly differentiated	1
	C96	Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue	Langerhans cell histiocytosis	13
			Myeloproliferative neoplasm, unclassifiable	2
	D45	Polycythaemia vera	Polycythaemia vera	2
	D46	Myelodysplastic syndromes	Refractory anaemia	1
			Refractory anaemia with excess of blasts	1
			Refractory cytopenia with multilineage dysplasia	1
			Therapy-related myelodysplastic syndrome	1
	D47	Other neoplasms of uncertain or unknown behaviour of lymphoid, haematopoietic and	Chronic eosinophilic leukaemia	1
			Essential thrombocythaemia	10
AYA Total				**1,172**

[2] Surveillance, Epidemiology and End Results (SEER)(US). AYA Site Recode/WHO 2008 Definition [Internet]. 2008 [cited 2019 October 14]. Available from https://seer.cancer.gov/ayarecode/aya-who2008.html.

Appendix 2 | Patient cohort ICD-10-AM procedure codes

PROCEDURE/GROUPING	ICD-10-AM
Bladder	
Excision	
Endo. destruction of a single bladder lesion ≤ 2 cm or tissue of bladder	36840-03
Endoscopic destruction of a single lesion of bladder > 2 cm in diameter	36845-06
Endoscopic destruction of multiple lesions of bladder	36845-07
Endo. resection of a single bladder lesion ≤ 2cm or tissue of bladder	36840-02
Endoscopic resection of a single lesion of bladder > 2 cm in diameter	36845-04
Endoscopic resection of multiple lesions of bladder	36845-05
Segmental Cystectomy	
Laparoscopic partial excision of bladder	37000-00
Partial excision of bladder	37000-01
Radical Cystectomy	
Total excision of bladder	37014-00
Breast	
Excision of Lesion/Breast Conserving Surgery	
Complete excision of lesion without guidewire	31536-00
Complete excision of lesion with guidewire	31500-00
Mastectomy	
Total mastectomy (unilateral)	31518-00
Total mastectomy (bilateral)	31518-01
Subcutaneous mastectomy (unilateral)	31524-00
Subcutaneous mastectomy (bilateral)	31524-01
Colorectal	
Colectomy **Resection of colon without stoma with anastomosis**	
Resection of small intestine with anastomosis	30566-00
Limited excision of large intestine with anastomosis	32003-00
Right hemicolectomy with anastomosis	32003-01
Extended right hemicolectomy with anastomosis	32005-01
Left hemicolectomy with anastomosis	32006-00
Subtotal colectomy with anastomosis	32005-00
Total colectomy with anastomosis	32012-00
Resection of colon with stoma	
Resection of small intestine with formation of stoma	30565-00
Limited excision of large intestine with formation of stoma	32000-00
Right hemicolectomy with formation of stoma	32000-01
Extended right hemicolectomy with formation of stoma	32004-01
Left hemicolectomy with formation of stoma	32006-01
Subtotal colectomy with formation of stoma	32004-00
Total colectomy with ileostomy	32009-00
Abdominalperineal Resection **AP Resection (with stoma)**	
Abdominoperineal proctectomy	32039-00
Total Proctoclectomy **Total proctocolectomy without stoma**	
Total proctocolectomy with ileo-anal anastomosis	32051-00
Total proctocolectomy with stoma	
Total proctocolectomy with ileostomy	32015-00
Total proctocolectomy with ileo-anal anastomosis and formation of temporary ileostomy	32051-01
Anterior Resection	
High anterior resection of rectum	32024-00
Low anterior resection of rectum	32025-00
Ultra low anterior resection of rectum	32026-00
Ultra low anterior resection of rectum with hand sutured coloanal anastomosis	32028-00
Anterior resection of rectum, level unspecified	92208-00
Hartmanns with stoma	
Rectosigmoidectomy with formation of stoma	32030-00

NSCLC	
Partial Resection	
Endoscopic wedge resection of lung	90169-00
Radical wedge resection of lung	38440-01
Segmental wedge resection of lung	38438-00
Wedge resection of lung	38440-00
Lobectomy of lung	
Lobectomy of lung	38438-01
Radical lobectomy	38441-00
Pneumonectomy	
Pneumonectomy	38438-02
Radical pneumonectomy	38441-01
Gastrectomy	
Partial distal gastrectomy with gastroduodenal anastomosis	30518-00
Partial distal gastrectomy with gastrojejunal anastomosis	30518-01
Partial proximal gastrectomy with oesophago-gastric anastomosis	30518-02
Total gastrectomy	30521-00
Subtotal gastrectomy	30523-00
Radical gastrectomy	30524-00
Oesophagectomy	
Oesophagectomy by abdominal and transthoracic mobilisation, with thoracic oesophagogastric anastomosis	30535-00
Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagogastric anastomosis	30536-00
Oesophagectomy by abdominal and transthoracic mobilisation, with cervical oesophagostomy	30536-01
Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagogastric anastomosis	30541-00
Trans-hiatal oesophagectomy by abdominal and cervical mobilisation, with oesophagojejunal anastomosis	30541-01
Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis, large intestine interposition and anastomosis	30545-00
Oesophagectomy by abdominal and thoracic mobilisation with thoracic anastomosis using Roux-en-Y reconstruction	30545-01
Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis, large intestine interposition and anastomosis	30550-00
Oesophagectomy by abdominal and thoracic mobilisation with cervical anastomosis using Roux-en-Y reconstruction	30550-01

Appendix 3 | Intervention groupings

Intervention	ICD-code	ICD-code descriptions
Allied health	9555000	Allied health intervention, dietetics
	9555001	Allied health intervention, social work
	9555002	Allied health intervention, occupational therapy
	9555003	Allied health intervention, physiotherapy
	9555004	Allied health intervention, podiatry
	9555005	Allied health intervention, speech pathology
	9555006	Allied health intervention, audiology
	9555008	Allied health intervention, prosthetics and orthotics
	9555010	Allied health intervention, psychology
	9555011	Allied health intervention, other
	9555012	Allied health intervention, spiritual care
	9555014	Allied health intervention, diabetes education
	9610400	Music therapy
	9614800	Play/leisure/recreation therapy

Appendix 4 | AIHW Hospital Peer Groups

Principal referral hospitals

Principal referral hospitals are public acute hospitals that provide a very broad range of services, have a range of highly specialised service units, and have very large patient volumes. The term 'referral' recognises that these hospitals have specialist facilities not typically found in smaller hospitals.

Hospital list	
Gold Coast University Hospital	Princess Alexandra Hospital
Royal Brisbane & Women's Hospital	The Prince Charles Hospital
The Townsville Hospital	Sunshine Coast University Hospital

Public acute group A hospitals (Group A hospitals – Public)

Public acute group A hospitals are public acute hospitals that provide a wide range of services typically including a 24-hour emergency department, intensive care unit, coronary care unit and oncology unit, but do not provide the breadth of services provided by *Principal referral hospitals.*

Hospital list	
Bundaberg Base Hospital	Cairns Hospital
Hervey Bay Hospital	Ipswich Hospital
Logan Hospital	Mackay Base Hospital
Mater Hospital Brisbane	Nambour General Hospital
Queen Elizabeth II Jubilee Hospital	Redcliffe Hospital
Rockhampton Hospital	Toowoomba Hospital

Private acute group A hospitals (Group A hospitals – Private)

Private acute group A hospitals are private acute hospitals that have a 24-hour emergency department and an intensive care unit and provide a number of other specialised services such as coronary care, special care nursery, cardiac surgery and neurosurgery.

Hospital list	
Gold Coast Private Hospital	Greenslopes Private Hospital
Holy Spirit Northside	John Flynn Private Hospital
Mater Private Hospital Brisbane	Noosa Hospital
Pindara Private Hospital	St Andrew's War Memorial Hospital
The Wesley Hospital	

Public acute group B hospitals (Group B hospitals)

Public acute group B hospitals are those public acute hospitals that do not have the service profile of the *Principal referral hospitals and Group A hospitals,* but do have 24-hour emergency department; they typically provide elective surgery and have specialised service units such as obstetric, paediatric and psychiatric units.

Hospital list	
Caboolture Hospital	Gladstone Hospital
Caloundra Hospital	Mount Isa Base Hospital
Gympie Hospital	Robina Hospital
Redland Hospital	

Private acute group B hospitals (Group B hospitals)

Private acute group B hospitals are private acute hospitals that do not have a 24-hour emergency department but do have an intensive care unit and a number of other specialised services including coronary care, special care nursery, cardiac surgery and neurosurgery.

Hospital list	
Buderim Private Hospital	Mater Hospital Pimlico
Friendly Society Private Hospital	St Vincent's Hospital Toowoomba
St Andrew's Toowoomba Hospital	The Sunshine Coast Private Hospital
Sunshine Coast University Private Hospital	

Other hospitals

Hospital list	
Atherton Hospital	Icon Cancer Care Southport
Bowen Hospital	Icon Cancer Care Townsville
Collinsville Hospital	Icon Cancer Care Wesley
Dalby Hospital	Icon Cancer Centre Mackay
Emerald Hospital	Icon Integrated Cancer Care North Lakes
Goondiwindi Hospital	Icon Integrated Cancer Centre Bundaberg
Ingham Hospital	Mater Hospitals Brisbane/Icon Cancer Care South Brisbane
Innisfail Hospital	Mater Misericordiae Day Unit
Julia Creek Hospital	Mater Misericordiae Hospital Bundaberg
Kingaroy Hospital	Mater Misericordiae Hospital Gladstone
Queensland Children's Hospital/Lady Cilento Children's Hospital	Mater Misericordiae Hospital Mackay
Miles Hospital	Mater Misericordiae Hospital Rockhampton
Monto Hospital	Mater Private Hospital Redland
Proserpine Hospital	Mater Private Hospital Springfield
Roma Hospital	Mater Women's and Children's Hospital Hyde Park
Tully Hospital	Nambour Selangor Private Hospital
Warwick Hospital	North Lakes Day Hospital
Winton Hospital	North West Private Hospital
Brisbane Private Hospital	Pacific Private Day Hospital
Caboolture Private Hospital	Peninsula Private Hospital
Cairns Haematology and Oncology Clinic	St Andrew's - Ipswich Private Hospital
Cairns Private Hospital	St Stephen's Hospital Hervey Bay
Canossa Private Hospital	St Stephen's Private Hospital Maryborough
Chermside Day Hospital	Sunnybank Private Hospital
Gympie Private Hospital	Sunshine Coast Haematology & Oncology Clinic
Icon Cancer Care Chermside	Tasman Health Care Day Infusion Unit
Icon Cancer Care South Brisbane	The Wesley Hospital/Icon Cancer Care Wesley

Sourced from the Australian Institute of Health and Welfare 2015. Australian hospital peer groups. Health services series no. 66. Cat. no. HSE 170. Canberra: AIHW. http://www.aihw.gov.au

Appendix 5 | Quality Index indicator calculations

1 | Effective

Surgery

n – The number of AYA cancer patients who cancer surgery 30 days prior and up to 12 months following diagnosis.

N – The number of AYA cancer patients.

IV systemic therapy

n – The number of AYA cancer patients who had IV systemic therapy after diagnosis.

N – The number of AYA cancer patients.

Radiation therapy

n – The number of AYA cancer patients who had radiation therapy after diagnosis.

N – The number of AYA cancer patients.

Treatment

n – The number of AYA cancer patients who IV systemic therapy, radiation therapy, and/or surgery after diagnosis.

N – The number of AYA cancer patients.

2 | Efficient

Allied health

n – The number of AYA cancer patients who have received allied health support following their IV systemic therapy, radiation therapy, and/or surgery.

N – The number of AYA cancer patients who had IV systemic therapy, radiation therapy, and/or surgery.

3 | Accessible

Received first treatment within 30 days of diagnosis

n – The number of AYA cancer patients who had their first treatment within 30 days of diagnosis.

N – The number of AYA cancer patients who had a cancer treatment.

4 | Equitable

Received first treatment within 30 days of diagnosis by Indigenous status

n – The number of AYA cancer patients, who identify as Aboriginal and/or Torres Strait Islander who had their first treatment within 30 days of diagnosis.

N – The number of AYA cancer patients, who identify as Aboriginal and/or Torres Strait Islander who had a cancer treatment.

Received first treatment within 30 days of diagnosis by disadvantaged status

n – The number of AYA cancer patients, whose socio-economic status is disadvantaged, and who had their first treatment within 30 days of diagnosis.

N – The number of AYA cancer patients, whose socio-economic status is disadvantaged and had a cancer treatment.

References

Walpole E, Theile DE, Philpot S, Youl PH, for Cancer Alliance Queensland. 2019. Development and Implementation of a Cancer Quality Index in Queensland, Australia: A Tool for Monitoring Cancer Care. J Oncol Pract. May 31:JOP1800372. doi: 10.1200/JOP. 18.00372 [Epub ahead of print]

Method

Assigning a surgery record to a person

To assign a surgery record to a person with cancer, the earliest diagnosis in the cancer group is used. For example, if a person was diagnosed with cancer in 2014 and 2018, the surgery record will be linked to the 2014 diagnosis.

Diagnosis year

This report is structured around diagnosis years as recorded in the Queensland Cancer Register, the latest incident year being 2018. Patients diagnosed between 2014 and 2018 are included in this report. Patients that had treatment between 2014 and 2018 but were diagnosed in an earlier year are excluded from the report.

Changes in historical incidence

Cancer incidence has increased slightly due to an increased number of sources notifying cancer, as well as improved processes within the Queensland Cancer Register, and an increase in electronic notifications from public and private pathology laboratories (around 2-3% annually for 2010 to 2014). This means that caution should be used when comparing this report to previous editions.

Glossary

5-year relative survival

Relative survival was calculated using the period method for all reported time periods. This method calculates survival from a given follow-up or at-risk period. Survival is based on the survival experience of people who were diagnosed before or during this period, and who were at risk of dying during this period.

Flows

In-flows

In-flows show the distribution of residence for the total group of patients who were operated on by a hospital, group of hospitals or HHS.

Out-flows

Out-flows shows the proportion of patients residing in a given HHS who receive their surgery in a different HHS.

Aboriginal and Torres Strait Islander status

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

HHS of Residence

Hospital and Health Service of residence is a geographic area defined by a collection of Statistical Areas Level 2 (SA2s) where the patient resides at time of diagnosis. 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.

MDT Review

Cancer patients are discussed by a Multidisciplinary Team (MDT) to ensure all available treatment options are considered. Note that in this report, the MDT rate is limited to hospitals that use QOOL to capture MDT review data or provide MDT data to The Partnership.

Number of surgeries

Includes Queensland residents of all ages diagnosed with invasive cancer in the surgical cohort time period who underwent surgery.

Private hospital

All hospitals that are not Queensland Health hospitals.

Public hospital

Queensland Health hospitals.

QOOL

QOOL supports cancer multidisciplinary teams by assisting meeting preparation, communication and documentation of essential clinical information such as diagnosis, cancer stage and recommended treatment plans. QOOL provides continuity of care and state-wide multidisciplinary team linkage and provides access to clinical outcomes and system performance data for quality improvement. The system provides a central view of patient data for multiple users, accessible at multiple locations.

QYCS

Facilities used in QOOL to capture Queensland Youth Cancer Services.

Radiation therapy

Includes Queensland residents of all ages diagnosed with invasive cancer who had radiation therapy 30 days prior and within 150 days of diagnosis.

Remoteness

The relative remoteness of residence at time of diagnosis, derived from the Australian Standard Geographical Classification (ASGC). In this report, remoteness is classified into three groups based on the original ASGC grouping.

ASGC classifications	Modified ASGC classification
Major City	Metropolitan
Inner Regional	Regional
Outer Regional	Rural and Remote
Remote	
Very Remote	

An exception to this grouping is the metropolitan area of Townsville (originally classified as Rural). Townsville has been classified as Metropolitan because of the availability of tertiary level cancer services.

Sex

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

Socioeconomic status

Socioeconomic status 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 use SEIFA scores to rank regions into ten groups or deciles numbered one to ten, with one being the most disadvantaged and ten 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)
Disadvantaged	1-2	20%
Middle	3-8	60%
Affluent	9-10	20%

Systemic therapy

Includes Queensland residents of all ages diagnosed with invasive cancer who had intravenous (IV) systemic therapy after diagnosis.

FOR MORE INFORMATION

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