Queensland Head and Neck Cancer Quality Index

Indicators of safe, quality cancer care

Public and private hospitals

2015 – 2019

cancer alliance queensland

the Partnership

qccat

qcr

Queensland Government

Acknowledgements

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The Head and Neck Cancer Sub-committee was established in 2019 as a Sub-committee of The Partnership to examine and improve outcomes for cancer patients who have been diagnosed with head and neck cancer across Queensland – an approach which has never been adopted for head and neck cancer in Queensland.

We wish to thank members of the Head and Neck Sub-committee: Sandro Porceddu (Chair), Martin Batstone, Michael Collins, Sam Dowthwaite, Brett Hughes, Liz Kenny, Rahul Ladwa, and Ben Panizza for reviewing the data and providing valuable comments.

This report was prepared by Danica Cossio, Theresa Negrello, Neal Rawson, John Harrington, Gary Francois, Shoni Philpot, and the Queensland Cancer Control Analysis Team (QCCAT).

We wish to thank Professor David E Theile AO for his invaluable assistance in the preparation of the dataset for this report.

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Message from the Chair

As the Chair of the Head and Neck Cancer Sub-committee of the Queensland Cancer Control and Safety Quality Partnership, I am privileged to introduce the **Head and Neck Cancer Quality Index, Indicators of safe, quality cancer care, public and private hospitals, 2015-2019** report.

This report provides the first population-wide profile of head and neck cancer diagnoses and treatment in Queensland, containing vital information about surgery and radiation therapy and systemic treatments provided to Queenslanders newly diagnosed with a head and neck cancer between 2015 and 2019.

Data are presented by age group, sex, socio-economic status, remoteness of residence, Aboriginal and Torres Strait Islander status and other patient characteristics. This report tracks Queensland's progress toward delivering safe, quality cancer care and will be provided to all public and private hospitals that provide head and neck cancer services.

By assessing variations that exist, this report reveals differences between hospitals which may not be obvious in daily clinical practice but become clear with this type of analysis. I encourage you to consider how this information will inform how head and neck cancer is managed in your jurisdiction in Queensland.

I wish to acknowledge the commitment of the members of the Head and Neck Cancer Sub-committee and the Queensland Cancer Control Analysis Team in providing the information, analyses, statistics, discussion, and recommendations for this report.

Professor Sandro V Porceddu
Chair
Head and Neck Cancer Sub-committee

What is the Queensland Head and Neck Cancer Quality Index?

The Queensland Head and Neck Cancer Quality Index report has been developed for public and private cancer services. It is an initiative of the Head and Neck 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://canceralliancеqld.health.qld.gov.au). The report tracks Queensland's progress delivering safe, quality cancer care and will be provided to all relevant public and private hospitals. The Queensland Head and Neck Cancer Quality Index highlights areas for improvement and identifies the areas where cancer services are performing well.

The Queensland Head and Neck Cancer Quality Index reports on 5 years of data from 2015-2019, however there may have been changes more recently that are not captured by the time periods reported. Regardless, the Queensland Head and Neck Cancer Quality Index provides an important tool 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 Head and Neck 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 Head and Neck Cancer Quality Index has been developed by the Cancer Alliance Queensland, lead clinicians and relevant persons 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 Head and Neck Cancer Quality Index is a tool for reviewing and comparing information on the safety and quality of cancer treatment and outcomes. The Partnership has prepared Queensland Head and Neck Cancer Quality Index to assist 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 Head and Neck Cancer Quality Index includes public and private cancer care services.

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 1982–2019. Our matching and linking processes provide the 570,000+ matched and linked records of cancer patients between 1982–2019 which provide the data for The Queensland Head and Neck Cancer Quality Index.

The Queensland Head and Neck 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.

Head and neck cancer sub-site quality index overview

Head and neck cancers combined

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	62% 1,365 (2,186)	37% 819 (2,186)	**52%** **2,186 (4,192)**
Radiation therapy (RT)	72% 2,083 (2,885)	28% 801 (2,885)	**69%** **2,885 (4,192)**
IV systemic therapy (IVST)	89% 1,564 (1,762)	11% 198 (1,762)	**42%** **1,762 (4,192)**
2.3 | Efficient			
Hospital stay (median days and IQR)	6 (1-14)	1 (1-4)	**3** **(1-10)**
2.4 | Safe			
90-day mortality post surgery	2.4% 33 (1,365)	1.1% 9 (819)	**1.9%** **42 (2,186)**
2.5 | Surgical Survival			
2-year surgical survival	76%	90%	**81%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	55% 724 (1,317)	83% 672 (810)	**66%** **1,396 (2,127)**
Time from diagnosis to first radiation therapy within 45 days	51% 156 (306)	60% 122 (205)	**54%** **278 (512)**
Time from diagnosis to first IV systemic therapy within 45 days	70% 97 (138)	77% 10 (13)	**71%** **107 (151)**
Time from diagnosis to first concurrent IVST & RT within 45 days	57% 475 (829)	76% 154 (202)	**61%** **629 (1,031)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	39% 22 (57)	50% 3 (6)	**40%** **25 (63)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	51% 216 (427)	82% 119 (146)	**58%** **335 (573)**
Proportion of patients who live rurally and who receive surgery within 30 days	46% 269 (590)	84% 257 (307)	**59%** **526 (898)**

Patients can have surgery at an unknown facility causing the addition of facility type to have a lower total N.
*Section 2.2 shows proportional rate and is a summary of table 2.2.1.2. The public and private N is the n from the Queensland count.

Oral cavity

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	67% 628 (935)	33% 305 (935)	**80%** **935 (1,171)**
Radiation therapy (RT)	69% 349 (503)	30% 153 (503)	**43%** **503 (1,171)**
IV systemic therapy (IVST)	86% 182 (211)	14% 29 (211)	**18%** **211 (1,171)**
2.3 | Efficient			
Hospital stay (median days and IQR)	9 (3-15)	2 (1-7)	**6** **(1-12)**
2.4 | Safe			
90-day mortality post surgery	2.5% 16 (628)	1.3% 4 (305)	**2.1%** **20 (935)**
2.5 | Surgical Survival			
2-year surgical survival	77%	90%	**81%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	46% 286 (616)	78% 236 (304)	**57%** **522 (920)**
Time from diagnosis to first radiation therapy within 45 days	33% 15 (46)	26% 7 (27)	**30%** **22 (74)**
Time from diagnosis to first IV systemic therapy within 45 days	83% 15 (18)	33% 1 (3)	**76%** **16 (21)**
Time from diagnosis to first concurrent IVST & RT within 45 days	54% 14 (26)	88% 7 (8)	**62%** **21 (34)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	32% 7 (22)	50% 1 (2)	**33%** **8 (24)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	45% 90 (199)	77% 41 (53)	**52%** **131 (252)**
Proportion of patients who live rurally and who receive surgery within 30 days	34% 84 (244)	82% 97 (119)	**50%** **181 (364)**

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Oropharynx

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	49% 236 (480)	51% 244 (480)	**30%** **480 (1,584)**
Radiation therapy (RT)	76% 1,027 (1,349)	24% 322 (1,349)	**85%** **1,349 (1,584)**
IV systemic therapy (IVST)	89% 983 (1,104)	11% 121 (1,104)	**70%** **1,104 (1,584)**
2.3 | Efficient			
Hospital stay (median days and IQR)	1 (1-5)	1 (1-2)	**1** **(1-3)**
2.4 | Safe			
90-day mortality post surgery	1.3% 3 (236)	1.2% 3 (244)	**1.3%** **6 (480)**
2.5 | Surgical Survival			
2-year surgical survival	79%	91%	**83%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	57% 129 (226)	84% 204 (242)	**71%** **333 (468)**
Time from diagnosis to first radiation therapy within 45 days	56% 58 (104)	64% 36 (56)	**59%** **94 (160)**
Time from diagnosis to first IV systemic therapy within 45 days	62% 41 (66)	100% 5 (5)	**65%** **46 (71)**
Time from diagnosis to first concurrent IVST & RT within 45 days	56% 344 (616)	78% 123 (158)	**60%** **467 (774)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	36% 5 (14)	50% 2 (4)	**39%** **7 (18)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	48% 32 (67)	83% 30 (36)	**60%** **62 (103)**
Proportion of patients who live rurally and who receive surgery within 30 days	47% 53 (113)	82% 64 (78)	**61%** **117 (191)**

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Major salivary glands

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	50% 113 (227)	50% 114 (227)	**89%** **227 (254)**
Radiation therapy (RT)	60% 96 (160)	40% 64 (160)	**63%** **160 (254)**
IV systemic therapy (IVST)	69% 11 (16)	31% 5 (16)	**6.3%** **16 (254)**
2.3 | Efficient			
Hospital stay (median days and IQR)	3 (2-5)	2 (1-4)	**3** **(2-4)**
2.4 | Safe			
90-day mortality post surgery	 (113)	 (114)	 **(227)**
2.5 | Surgical Survival			
2-year surgical survival	88%	97%	**93%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	61% 67 (110)	85% 96 (113)	**73%** **163 (223)**
Time from diagnosis to first radiation therapy within 45 days	22% 2 (9)	67% 4 (6)	**40%** **6 (15)**
Time from diagnosis to first IV systemic therapy within 45 days	100% 1 (1)	 (1)	**50%** **1 (2)**
Time from diagnosis to first concurrent IVST & RT within 45 days	 (1)		 **(1)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	 (2)		 **(2)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	57% 21 (37)	86% 18 (21)	**67%** **39 (58)**
Proportion of patients who live rurally and who receive surgery within 30 days	60% 32 (53)	80% 35 (44)	**69%** **67 (97)**

Patients can have surgery at an unknown facility causing the addition of facility type to have a lower total N.
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Nasopharynx

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	63% 5 (8)	38% 3 (8)	**7.2%** **8 (111)**
Radiation therapy (RT)	82% 76 (93)	18% 17 (93)	**84%** **93 (111)**
IV systemic therapy (IVST)	83% 65 (78)	17% 13 (78)	**70%** **78 (111)**
2.3 | Efficient			
Hospital stay (median days and IQR)	1 (1-14)	1 (1-1)	**1** **(1-1)**
2.4 | Safe			
90-day mortality post surgery	(5)	(3)	**(8)**
2.5 | Surgical Survival			
2-year surgical survival	75%	86%	**77%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	80% 4 (5)	100% 3 (3)	**88%** **7 (8)**
Time from diagnosis to first radiation therapy within 45 days	50% 7 (14)	40% 2 (5)	**47%** **9 (19)**
Time from diagnosis to first IV systemic therapy within 45 days	78% 14 (18)	100% 1 (1)	**79%** **15 (19)**
Time from diagnosis to first concurrent IVST & RT within 45 days	64% 27 (42)	90% 9 (10)	**69%** **36 (52)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	100% 1 (1)		**100%** **1 (1)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	100% 3 (3)		**100%** **3 (3)**
Proportion of patients who live rurally and who receive surgery within 30 days	100% 1 (1)		**100%** **1 (1)**

Patients can have surgery at an unknown facility causing the addition of facility type to have a lower total N.
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Hypopharynx

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	92% 76 (83)	8.4% 7 (83)	**36%** **83 (230)**
Radiation therapy (RT)	78% 139 (178)	22% 39 (178)	**77%** **178 (230)**
IV systemic therapy (IVST)	94% 115 (122)	5.7% 7 (122)	**53%** **122 (230)**
2.3 | Efficient			
Hospital stay (median days and IQR)	16 (8-29)	1 (1-1)	**15** **(3-27)**
2.4 | Safe			
90-day mortality post surgery	5.3% 4 (76)	 (7)	**4.8%** **4 (83)**
2.5 | Surgical Survival			
2-year surgical survival	58%	92%	**62%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	58% 38 (65)	100% 7 (7)	**63%** **45 (72)**
Time from diagnosis to first radiation therapy within 45 days	52% 12 (23)	46% 6 (13)	**50%** **18 (36)**
Time from diagnosis to first IV systemic therapy within 45 days	73% 11 (15)	100% 1 (1)	**75%** **12 (16)**
Time from diagnosis to first concurrent IVST & RT within 45 days	54% 30 (56)	58% 7 (12)	**54%** **37 (68)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	29% 2 (7)		**29%** **2 (7)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	52% 14 (27)	100% 2 (2)	**55%** **16 (29)**
Proportion of patients who live rurally and who receive surgery within 30 days	48% 16 (33)	100% 1 (1)	**50%** **17 (34)**

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Nasal cavity and paranasal sinuses

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	69% 76 (110)	31% 34 (110)	**60%** **110 (182)**
Radiation therapy (RT)	72% 94 (131)	28% 37 (131)	**72%** **131 (182)**
IV systemic therapy (IVST)	77% 41 (53)	23% 12 (53)	**29%** **53 (182)**
2.3 | Efficient			
Hospital stay (median days and IQR)	5 (1-10)	1 (1-3)	**2.5** **(1-8)**
2.4 | Safe			
90-day mortality post surgery	 (76)	 (34)	 **(110)**
2.5 | Surgical Survival			
2-year surgical survival	81%	82%	**81%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	54% 41 (76)	73% 24 (33)	**60%** **65 (109)**
Time from diagnosis to first radiation therapy within 45 days	50% 8 (16)	63% 10 (16)	**56%** **18 (32)**
Time from diagnosis to first IV systemic therapy within 45 days	100% 6 (6)	100% 2 (2)	**100%** **8 (8)**
Time from diagnosis to first concurrent IVST & RT within 45 days	80% 8 (10)	 (2)	**67%** **8 (12)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days			
Proportion of socially disadvantaged patients who receive surgery within 30 days	30% 7 (23)	57% 4 (7)	**37%** **11 (30)**
Proportion of patients who live rurally and who receive surgery within 30 days	38% 15 (39)	75% 9 (12)	**47%** **24 (51)**

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Larynx

Indicator summary | 2015-2019	Public hospitals Rate n (N)	Private hospitals Rate n (N)	Queensland Rate n (N)
2.2 | Effectiveness*			
Surgery	67% 226 (335)	33% 109 (335)	**54%** **335 (621)**
Radiation therapy (RT)	64% 283 (440)	36% 157 (440)	**71%** **440 (621)**
IV systemic therapy (IVST)	94% 150 (159)	5.7% 9 (159)	**26%** **159 (621)**
2.3 | Efficient			
Hospital stay (median days and IQR)	2.5 (1-16)	1 (1-1)	**1** **(1-13)**
2.4 | Safe			
90-day mortality post surgery	4.4% 10 (226)	1.8% 2 (109)	**3.6%** **12 (335)**
2.5 | Surgical Survival			
2-year surgical survival	69%	85%	**74%**
2.6 | Accessible			
Time from diagnosis to first surgery within 30 days	73% 157 (215)	94% 100 (106)	**80%** **257 (321)**
Time from diagnosis to first radiation therapy within 45 days	57% 52 (91)	67% 51 (76)	**62%** **103 (167)**
Time from diagnosis to first IV systemic therapy within 45 days	64% 9 (14)		**64%** **9 (14)**
Time from diagnosis to first concurrent IVST & RT within 45 days	65% 43 (66)	71% 5 (7)	**66%** **48 (73)**
2.7 | Equitable			
Proportion of First Nations patients who receive surgery within 30 days	64% 7 (11)		**64%** **7 (11)**
Proportion of socially disadvantaged patients who receive surgery within 30 days	70% 49 (70)	89% 24 (27)	**75%** **73 (97)**
Proportion of patients who live rurally and who receive surgery within 30 days	64% 67 (105)	96% 51 (53)	**75%** **118 (158)**

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Quality Dimensions	
Effectiveness	Achieving the best outcomes for Queenslanders with head and neck cancer
Efficient	Optimally using resources to achieve desired outcomes
Safe	Avoiding and preventing adverse outcomes or injuries by healthcare management
Surgical Survival	Understanding the outcomes of surgery
Accessible	Making health services available to patients
Equitable	Providing care and ensuring health status does not vary in quality because of personal characteristics

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Where has the data come from?

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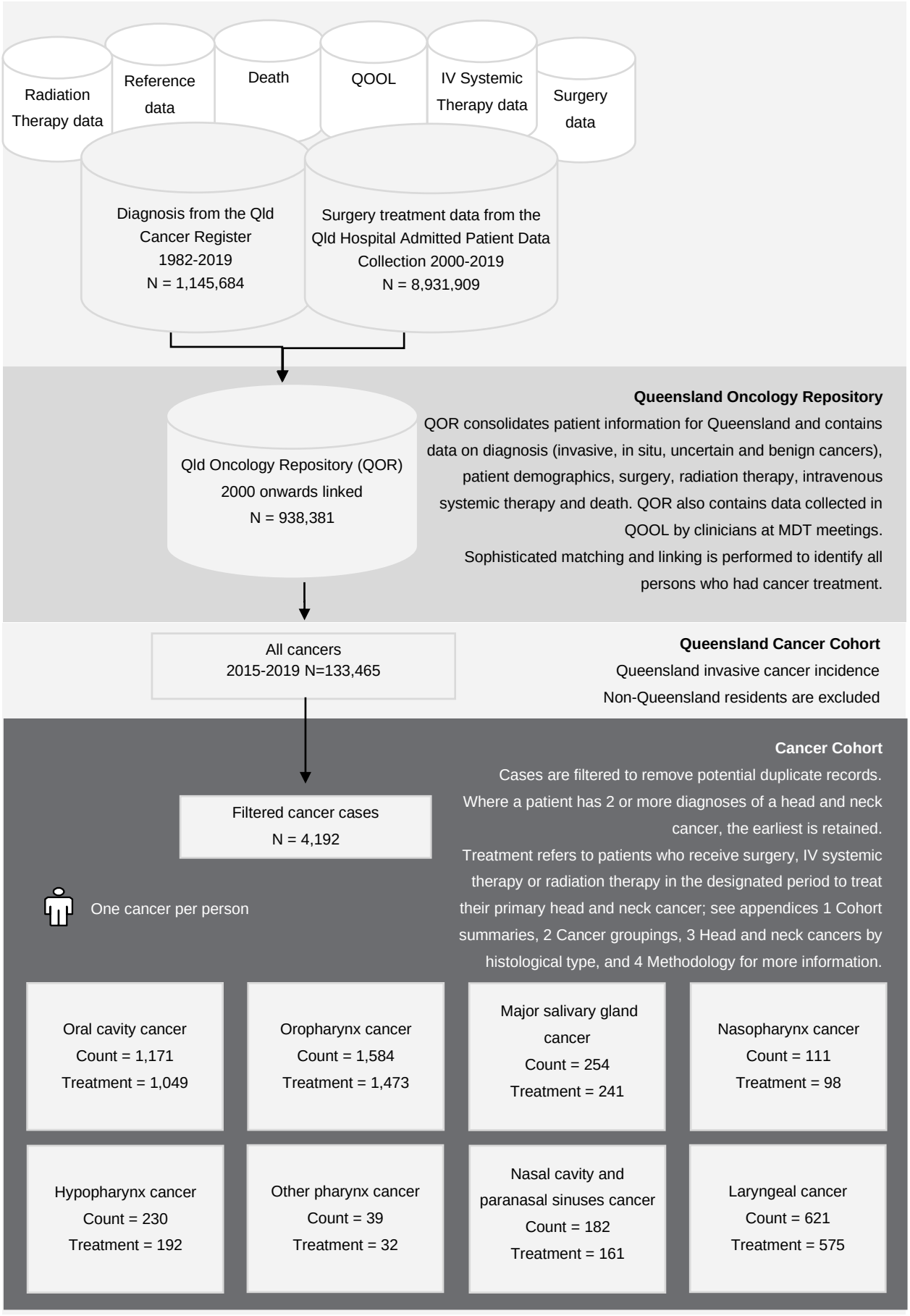
What data have been included in The Head and Neck Cancer Quality Index?

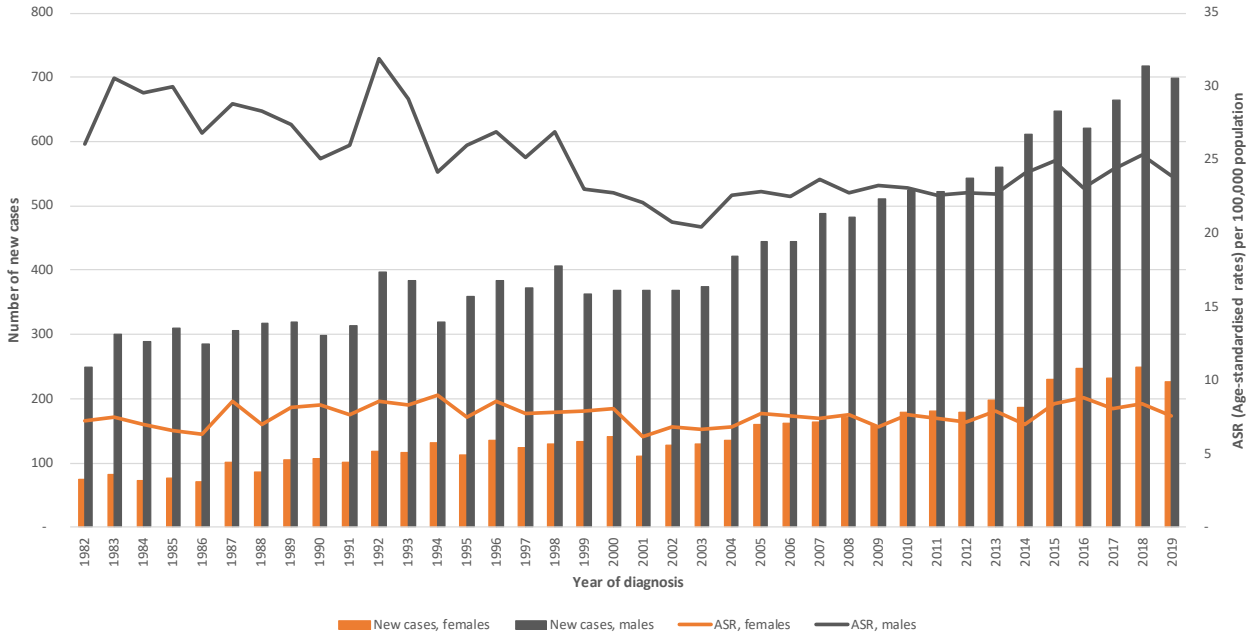


Part 1 | Epidemiological overview

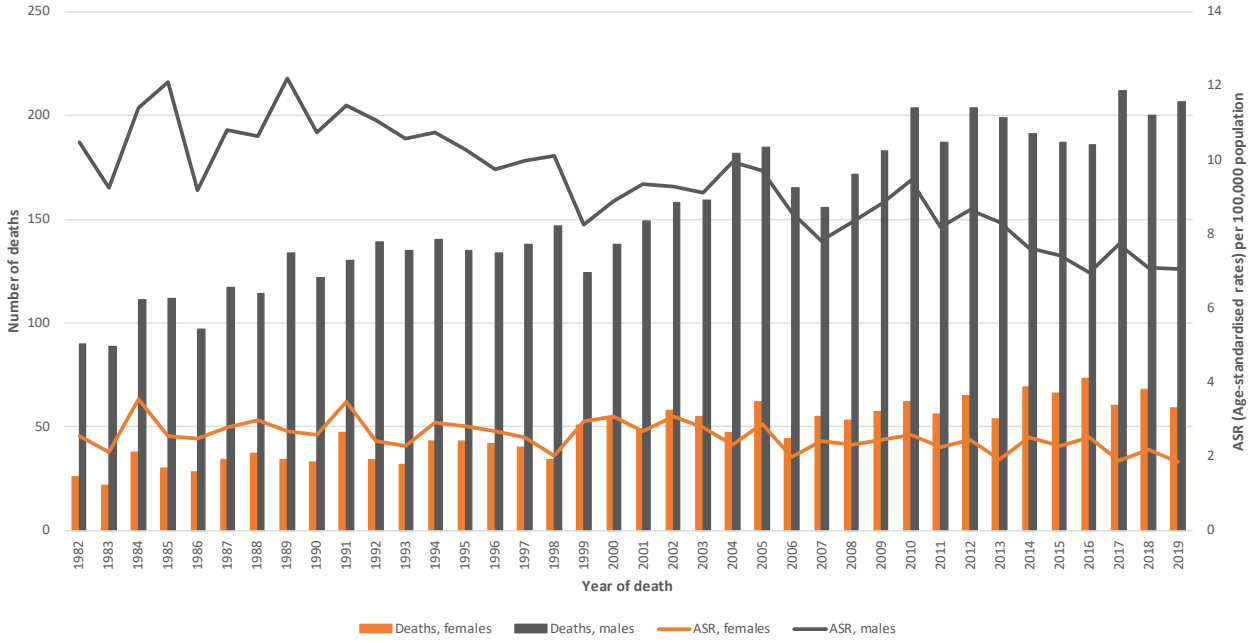
Understanding the characteristics of Queenslanders diagnosed with head and neck cancer

1.1 | Head and neck cancer incidence and mortality rate

1.1.1 | Trends in numbers and rates for all head and neck cancer incidence, Queensland, 1982-2019

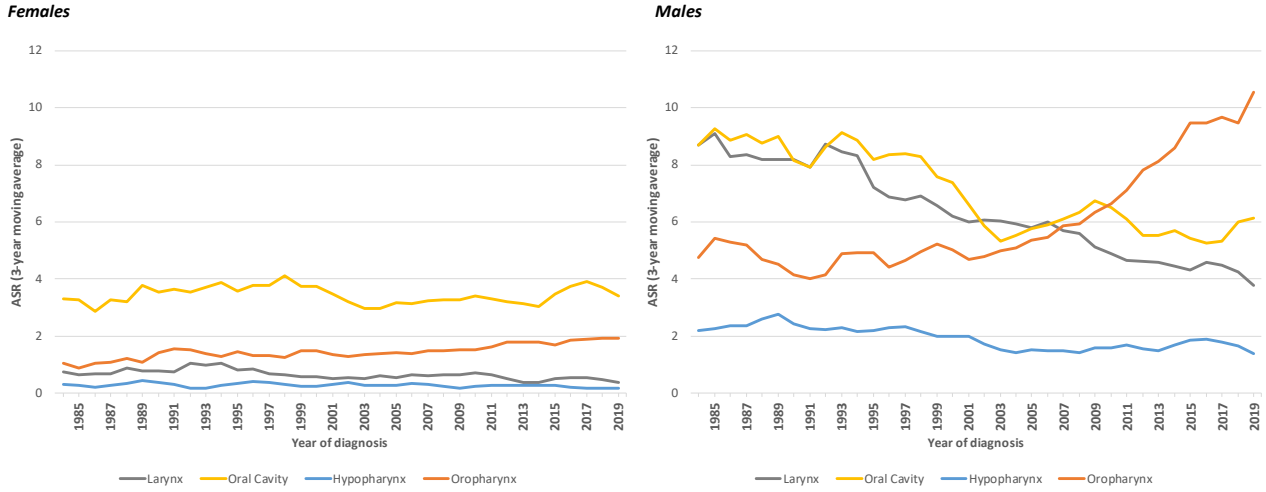


1.1.2 | Trends in numbers and rates for all head and neck cancer deaths, Queensland, 1982-2019

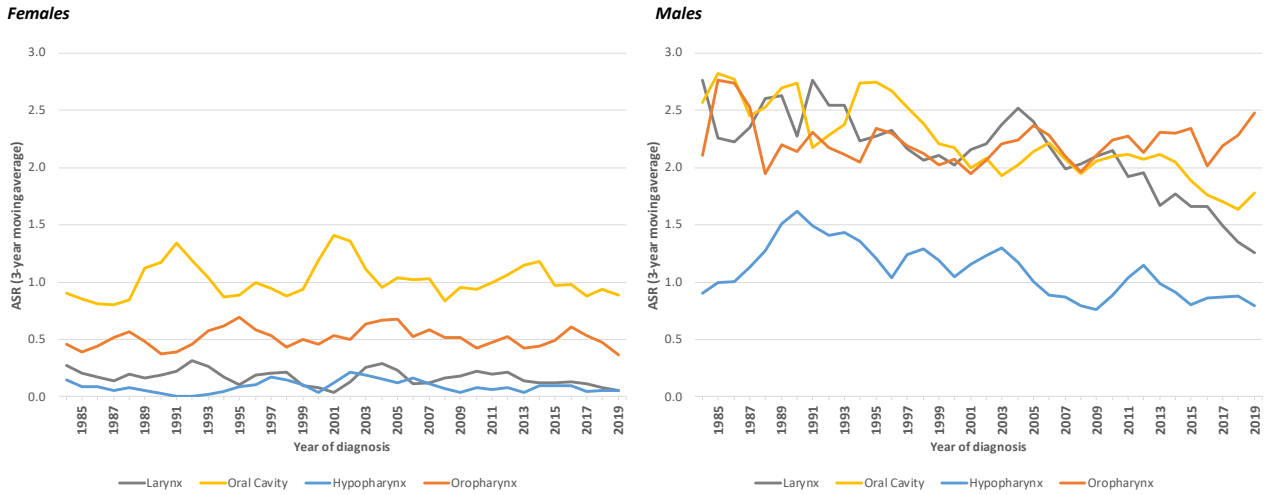


1.2 | Incidence and mortality trends in selected head and neck cancers

1.2.1 | Selected head and neck cancer age-standardised incidence rates (3-year moving average), Queensland, 1982-2019

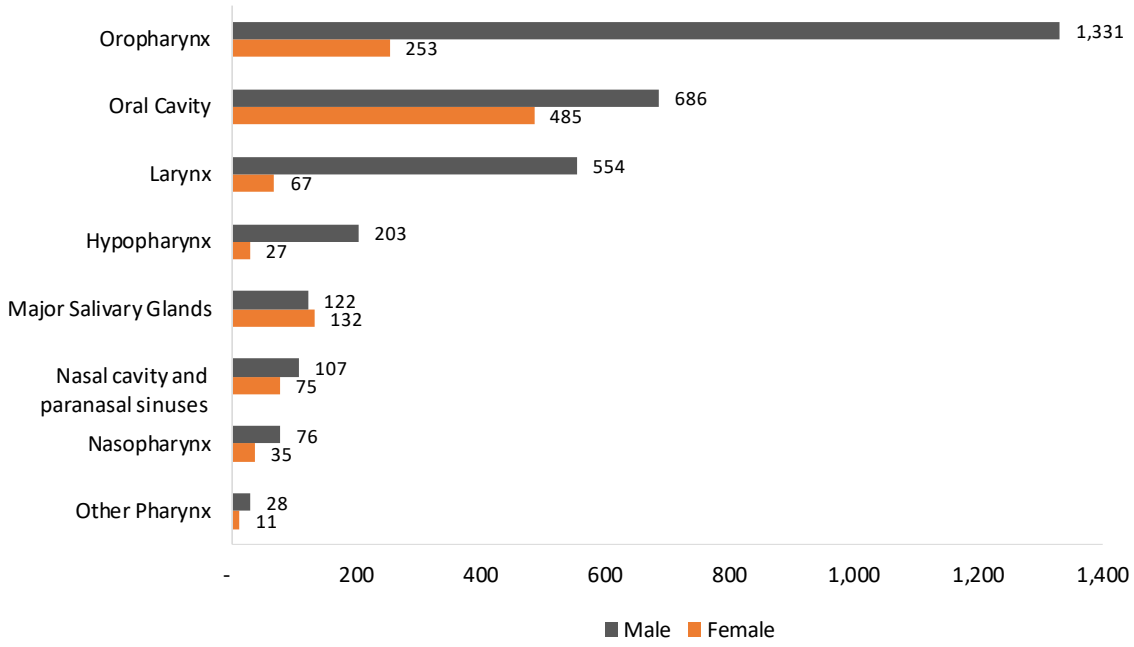


1.2.2 | Selected head and neck cancer age-standardised mortality rates (3-year moving average), Queensland, 1982-2019

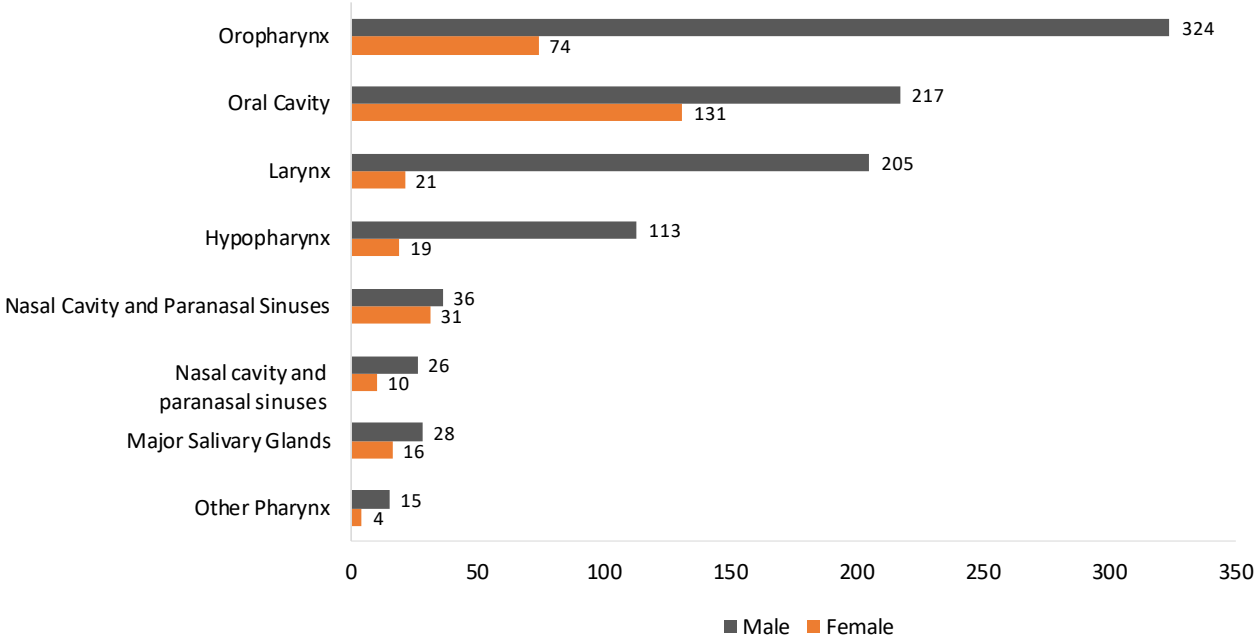


1.3 | Head and neck cancer incidence and mortality, by sex

1.3.1 | Incidence of head and neck cancer, by sex, 2015-2019

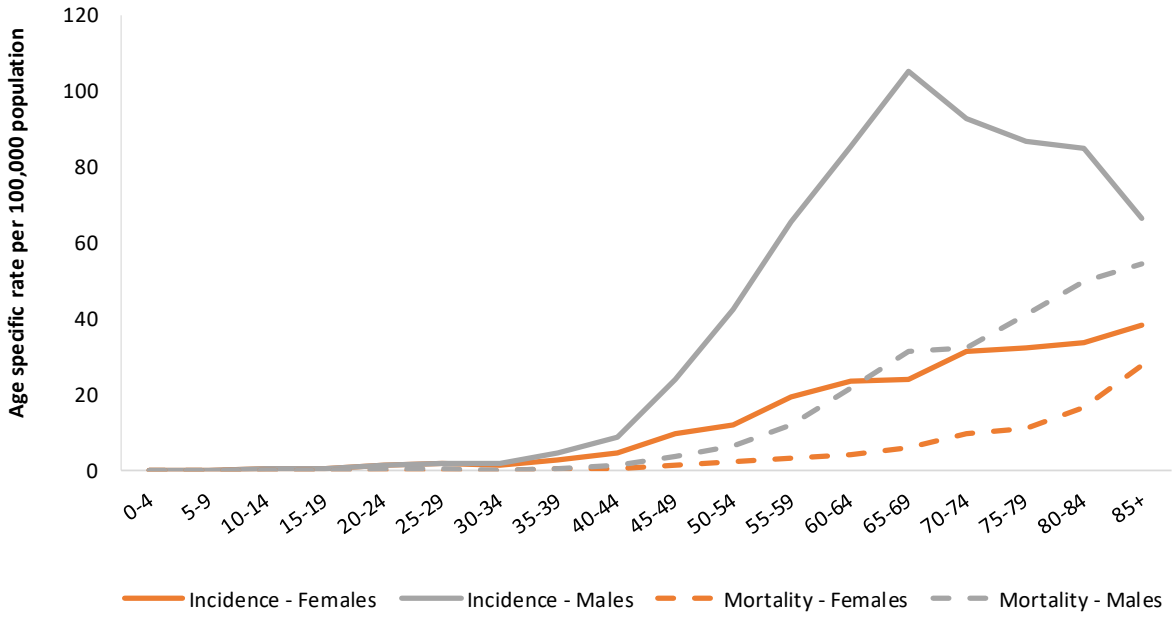


1.3.2 | Mortality of head and neck cancer, by sex, 2015-2019



1.4 | Age-specific incidence and mortality rates for all head and neck cancers

1.4.1 | Age-specific head and neck cancer incidence and mortality rates per 100,000, by age at diagnosis and sex, 2015-2019

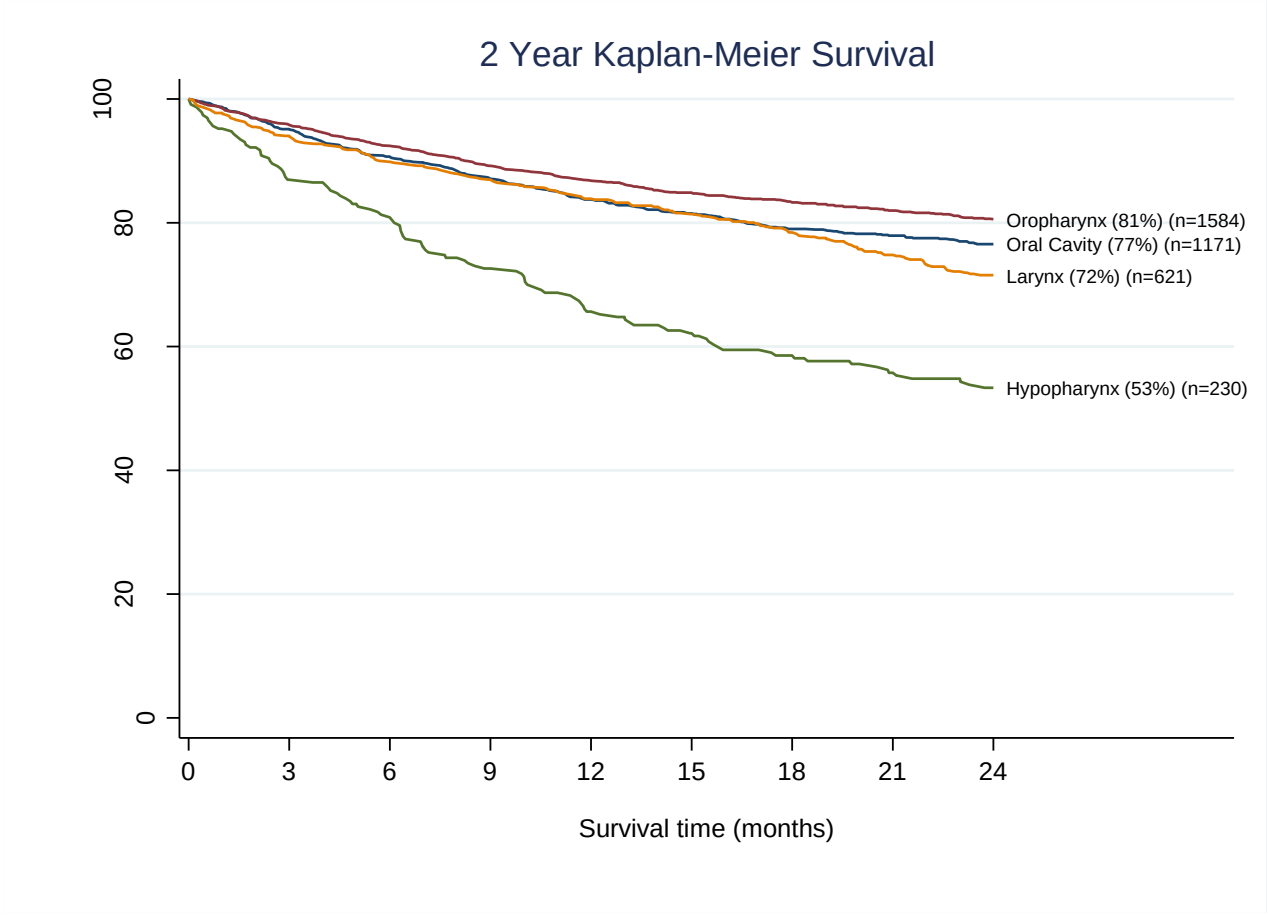


1.6 | Survival

1.6.1 | Proportion of Queenslanders diagnosed with head and neck cancer living 1, 2, and 5 years after their diagnosis, 2015-2019

Cancer	1-year survival	2-year survival	5-year survival
Oral cavity	84%	77%	62%
Oropharynx	87%	81%	69%
Major salivary glands	96%	91%	70%
Nasopharynx	86%	79%	56%
Hypopharynx	66%	54%	36%
Other pharynx	69%	58%	36%
Nasal cavity and paranasal sinuses	84%	72%	54%
Larynx	84%	72%	55%
Total head and neck	**85%**	**77%**	**62%**

1.6.2 | Survival curves for selected head and neck cancers, 2015-2019



Part 2 | Head and neck cancer quality index

The remainder of this report will focus on head and neck cancer treatment, 2015-2019.

Where a patient has two or more primary head and neck cancers, the earliest is reported.

2.1 | Demographics: Understanding the characteristics of head and neck cancer patients and where patients receive treatment

2.1.1 | Characteristics of patients diagnosed with a head and neck cancer, 2015-2019

	Diagnosis		ASRa per 100,000 population	Had treatment[b]	
	N	col %		n	row %
Queensland	**4,192**	**100%**	**16**	**3,821**	**91%**
Sex					
Male	3,107	74%	24	2,845	92%
Female	1,085	26%	8	976	90%
Age group[c]					
< 35	90	2.1%	0.8	86	96%
35 - 44	163	3.9%	5.1	153	94%
45 - 54	672	16%	22	647	96%
55 - 64	1,273	30%	48	1,195	94%
65 - 74	1,246	30%	64	1,133	91%
75 - 84	560	13%	58	477	85%
85 +	188	4.5%	49	130	69%
Median age at diagnosis					
Males	64			63	
Female	64			63	
First Nations status					
First Nations	163	3.9%	27	135	83%
Not First Nations	4,019	96%	16	3,685	92%
Not stated	10	0.2%	n.a	1	10%
Socioeconomic status					
Affluent	367	8.8%	12	342	93%
Middle	2,683	64%	16	2,465	92%
Disadvantaged	1,142	27%	19	1,014	89%
Remotenessd					
Major city	2,513	60%	15	2,298	91%
Inner regional	951	23%	16	878	92%
Outer regional	606	14%	21	544	90%
Remote & very remote	122	2.9%	22	101	83%
MDT data reported to CAQ[e]					
MDT review	3,689	88%	n.a	3,468	94%
No MDT review	503	12%	n.a	353	70%
Comorbidities					
0 Comorbidities	2,874	69%	n.a	2,639	92%
1 Comorbidities	823	20%	n.a	736	89%
2+ Comorbidities	495	12%	n.a	446	90%

a ASR: age-standardised rates per 100,000 population.
b Had treatment includes IV systemic therapy, radiation therapy, and/or surgery.
c Age specific rates per 100,000 population have been calculated for each age group.
d Metropolitan Townsville is included in Major City because of the availability of tertiary level cancer services.
e MDT rate includes facilities that use QOOL to capture MDT review and The Townsivlle Hospital from December 2017.
n.a Not applicable.

2.2 | Effectiveness: Achieving the best outcomes for Queenslanders with head and neck cancer

2.2.1 | Head and neck cancer treatment rates

2.2.1.1 | Definitive treatment received by head and neck cancer patients[a,b,c], 2015-2019

Cancer	Diagnosis	Treatment		Surgery		Radiation therapy (RT)		Concurrent IVST & RT		IV systemic therapy (IVST)	
	N	n	%	n	%	n	%	n	%	n	%
Oral cavity	1,171	1,049	90%	920	88%	74	7.1%	34	3.2%	21	2%
Oropharynx	1,584	1,473	93%	379	26%	176	12%	847	58%	71	4.8%
Major salivary glands	254	241	95%	223	93%	15	6.2%	1	0.4%	2	0.8%
Nasopharynx	111	98	88%	8	8.2%	19	19%	52	53%	19	19%
Hypopharynx	230	192	83%	72	38%	36	19%	68	35%	16	8.3%
Other pharynx	39	32	82%	6	19%	9	28%	17	53%		
Nasal cavity and paranasal sinuses	182	161	88%	109	68%	32	20%	12	7.5%	8	5%
Larynx	621	575	93%	321	56%	167	29%	73	13%	14	2.4%
Total head and neck	**4,192**	**3,821**	**91%**	**2,038**	**53%**	**528**	**14%**	**1,104**	**29%**	**151**	**4%**

a A patient can only have one definitive treatment.
b A patient is counted as having concurrent chemoradiotherapy where they receive radiation (RT) therapy while receiving IV systemic therapy (IVST) or vice versa, where the second treatment starts before the end of the first.
c For all cancer groups, except oropharynx, definitive treatment is the first treatment received by a patient. For oropharynx cancer, curative intent radiation therapy is considered definitive treatment if admininstered within 30 days of surgery.

2.2.1.2 | All treatments received by head and neck cancer patients[a], 2015-2019

Cancer	Diagnosis	Surgery		Radiation therapy (RT)		IV systemic therapy (IVST)	
	N	n	%	n	%	n	%
Oral cavity	1,171	935	80%	503	43%	211	18%
Oropharynx	1,584	480	30%	1,349	85%	1,104	70%
Major salivary glands	254	227	89%	160	63%	16	6.3%
Nasopharynx	111	8	7.2%	93	84%	78	70%
Hypopharynx	230	83	36%	178	77%	122	53%
Other pharynx	39	8	21%	31	79%	19	49%
Nasal cavity and paranasal sinuses	182	110	60%	131	72%	53	29%
Larynx	621	335	54%	440	71%	159	26%
Total head and neck	**4,192**	**2,186**	**52%**	**2,885**	**69%**	**1,762**	**42%**

a A patient can have more than one type of treatment.

2.2.1.3 | Annual trends in treatment rates by head and neck cancer, 2015-2019

Cancer	Diagnosis year					
	2015	2016	2017	2018	2019	Total
	n (N)	n (N)	n (N)	n (N)	n (N)	n (N)
Oral cavity	87%	94%	88%	88%	91%	**90%**
	176 (203)	216 (230)	209 (238)	213 (243)	235 (257)	**1,049 (1,171)**
Oropharynx	93%	92%	95%	91%	94%	**93%**
	298 (321)	231 (250)	294 (310)	308 (339)	342 (364)	**1,473 (1,584)**
Major salivary glands	93%	94%	95%	98%	95%	**95%**
	43 (46)	44 (47)	55 (58)	45 (46)	54 (57)	**241 (254)**
Nasopharynx	94%	89%	90%	83%	90%	**88%**
	15 (16)	17 (19)	18 (20)	29 (35)	19 (21)	**98 (111)**
Hypopharynx	81%	86%	90%	82%	78%	**83%**
	42 (52)	42 (49)	43 (48)	40 (49)	25 (32)	**192 (230)**
Other pharynx	75%	89%	63%	88%	100%	**82%**
	6 (8)	8 (9)	5 (8)	7 (8)	6 (6)	**32 (39)**
Nasal cavity and paranasal sinuses	86%	86%	86%	94%	89%	**88%**
	32 (37)	24 (28)	36 (42)	45 (48)	24 (27)	**161 (182)**
Larynx	93%	95%	92%	87%	95%	**93%**
	122 (131)	140 (147)	97 (106)	103 (118)	113 (119)	**575 (621)**
Total head and neck	**90%**	**93%**	**91%**	**89%**	**93%**	**91%**
	734 (814)	**722 (779)**	**757 (830)**	**790 (886)**	**818 (883)**	**3,821 (4,192)**

2.2.2 | Head and neck cancer treatment rates by facility type

2.2.2.1 | Head and neck cancer surgery, radiation therapy, and IV systemic therapy treatment rates by facility type[a], 2015-2019

Cancer	Diagnosis	Surgery						Radiation therapy (RT)						IV systemic therapy (IVST)					
		Total		Public		Private		Total		Public		Private		Total		Public		Private	
	N	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Oral cavity	1,171	935	80%	628	67%	305	33%	503	43%	349	69%	153	30%	211	18%	182	86%	29	14%
Oropharynx	1,584	480	30%	236	49%	244	51%	1,349	85%	1,027	76%	322	24%	1,104	70%	983	89%	121	11%
Major salivary glands	254	227	89%	113	50%	114	50%	160	63%	96	60%	64	40%	16	6.3%	11	69%	5	31%
Nasopharynx	111	8	7.2%	5	63%	3	38%	93	84%	76	82%	17	18%	78	70%	65	83%	13	17%
Hypopharynx	230	83	36%	76	92%	7	8.4%	178	77%	139	78%	39	22%	122	53%	115	94%	7	5.7%
Other pharynx	39	8	21%	5	63%	3	38%	31	79%	19	61%	12	39%	19	49%	17	89%	2	11%
Nasal cavity and paranasal sinuses	182	110	60%	76	69%	34	31%	131	72%	94	72%	37	28%	53	29%	41	77%	12	23%
Larynx	621	335	54%	226	67%	109	33%	440	71%	283	64%	157	36%	159	26%	150	94%	9	5.7%
Total head and neck	4,192	2,186	**52%**	1,365	**62%**	819	**37%**	2,885	**69%**	2,083	**72%**	801	**28%**	1,762	**42%**	1,564	**89%**	198	**11%**

a Facility type refers to the public and private facility status and not patient status.

2.3 | Efficient: Optimally using resources to achieve desired outcomes

2.3.1 | Length of stay

2.3.1.1 | Length of stay for head and neck cancer surgery, 2015-2019

Length of stay (days) (Median time between admission and discharge date of surgery)	**Surgery**	**Median days**	**IQR**
Oral cavity	935	6	(1-12)
Oropharynx	480	1	(1-3)
Major salivary glands	227	3	(2-4)
Nasopharynx	8	1	(1-1)
Hypopharynx	83	15	(3-27)
Other pharynx	8	1	(1-9)
Nasal cavity and paranasal sinuses	110	3	(1-8)
Larynx	335	1	(1-13)
Total head and neck	**2,186**	**3**	**(1-10)**

2.4 | Safe: Avoiding and preventing adverse outcomes or injuries by healthcare management

2.4.1 | 90-day mortality

2.4.1.1 | Proportion of patients who die within 90 days of surgery, 2015-2019

Cancer	**Surgery**	**90-day mortality**	
	N	**n**	**%**
Oral cavity	935	20	2.1%
Oropharynx	480	6	1.3%
Major salivary glands	227		
Nasopharynx	8		
Hypopharynx	83	4	4.8%
Other pharynx	8		
Nasal cavity and paranasal sinuses	110		
Larynx	335	12	3.6%
Total head and neck	**2,186**	**42**	**1.9%**

2.4.1.2 | Proportion of patients who die within 90 days of surgery by AIHW peer group and facility type[a,b], 2015-2019

	Surgery		90-day mortality	
	N	%	n	%
AIHW peer Group				
Principal referral hospitals	1,138	52%	27	2.4%
Group A hospitals	638	29%	9	1.4%
Group B hospitals	166	8%	2	1.2%
Other hospitals	242	11%	4	1.7%
Facility type				
Public	1,365	63%	33	2.4%
Private	819	38%	9	1.1%
Queensland	2,184	**100%**	42	**1.9%**

a Patients can have surgery at an unknown facility causing the AIHW Peer Group to have a lower total N.
b Refer to Appendix 5 for AIHW peer group definitions.

2.5 | Surgical survival: Understanding the outcomes of surgery

2.5.1 | 2-year surgical survival

2.5.1.1 | Proportion of patients alive two-years following surgery, 2015-2019

Cancer	Surgery	2-year surgical survival
	N	%
Oral cavity	935	81%
Oropharynx	480	83%
Major salivary glands	227	93%
Nasopharynx	8	77%
Hypopharynx	83	62%
Other pharynx	8	63%
Nasal cavity and paranasal sinuses	110	81%
Larynx	335	74%
Total head and neck	2,186	**81%**

2.5.1.2 | Proportion of patients alive two-years following surgery, by AIHW peer group and facility type[a,b], 2015-2019

	Surgery		2-year surgical survival
	N	%	%
AIHW peer Group			
Principal referral hospitals	1,138	52%	77%
Group A hospitals	638	29%	83%
Group B hospitals	166	7.6%	88%
Other hospitals	242	11%	90%
Facility type			
Public	1,365	63%	76%
Private	819	38%	90%
Queensland	2,184	**100%**	**81%**

a Patients can have surgery at an unknown facility causing the AIHW Peer Group to have a lower total N.
b Refer to Appendix 5 for AIHW peer group definitions.

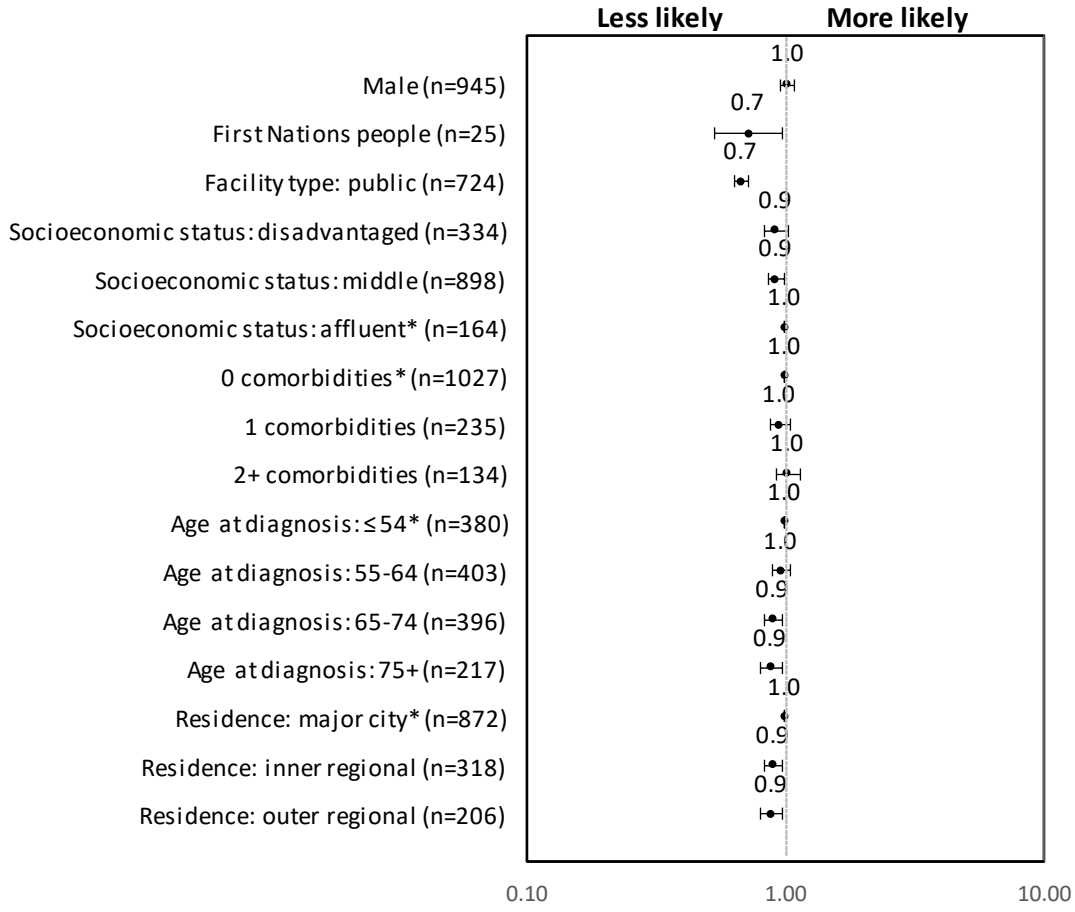
2.6 | Accessible: Making health services available to patients

2.6.1 | Timeliness: Time to first surgery within 30 days

2.6.1.1 | Timeliness: proportion of patients who receive first surgery within 30 days of pathological diagnosis, 2015-2019

Cancer	Surgery			Received surgery as first treatment within 30 days of diagnosis		
	Public	Private	All	Public	Private	All
Oral cavity	616	304	920	46%	78%	57%
Oropharynx	226	242	468	57%	84%	71%
Major salivary glands	110	113	223	61%	85%	73%
Nasopharynx	5	3	8	80%	100%	88%
Hypopharynx	65	7	72	58%	100%	63%
Other pharynx	4	2	6	50%	100%	67%
Nasal cavity and paranasal sinuses	76	33	109	54%	73%	60%
Larynx	215	106	321	73%	94%	80%
Total head and neck	**1,317**	**810**	**2,127**	**55%**	**83%**	**66%**

2.6.1.2 | Factors accosiated with receiving surgery as first treatment within 30 days of diagnosis for head and neck cancer, 2015-2019



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, Remote areas are compared with Major Cities. Patients with comorbidities are compared to those with no comorbidities. Binary variables such as Male, First Nations people and public are compared to the remainder of the cohort. Multivariat groupus use * to signify the reference group.

2.6.2 | Timeliness: Time to first radiation therapy, concurrent IV systemic therapy and radiation therapy, and IV systemic therapy within 45 days

2.6.2.1 | Timeliness: proportion of patients who receive first radiation therapy within 45 days of pathological diagnosis, 2015-2019

Cancer	Radiation therapy (RT) as first treatment	Received RT as first treatment within 45 days of diagnosis	
	N	n	%
Oral cavity	74	22	30%
Oropharynx	160	94	59%
Major salivary glands	15	6	40%
Nasopharynx	19	9	47%
Hypopharynx	36	18	50%
Other pharynx	9	8	89%
Nasal cavity and paranasal sinuses	32	18	56%
Larynx	167	103	62%
Total head and neck	**512**	**278**	**54%**

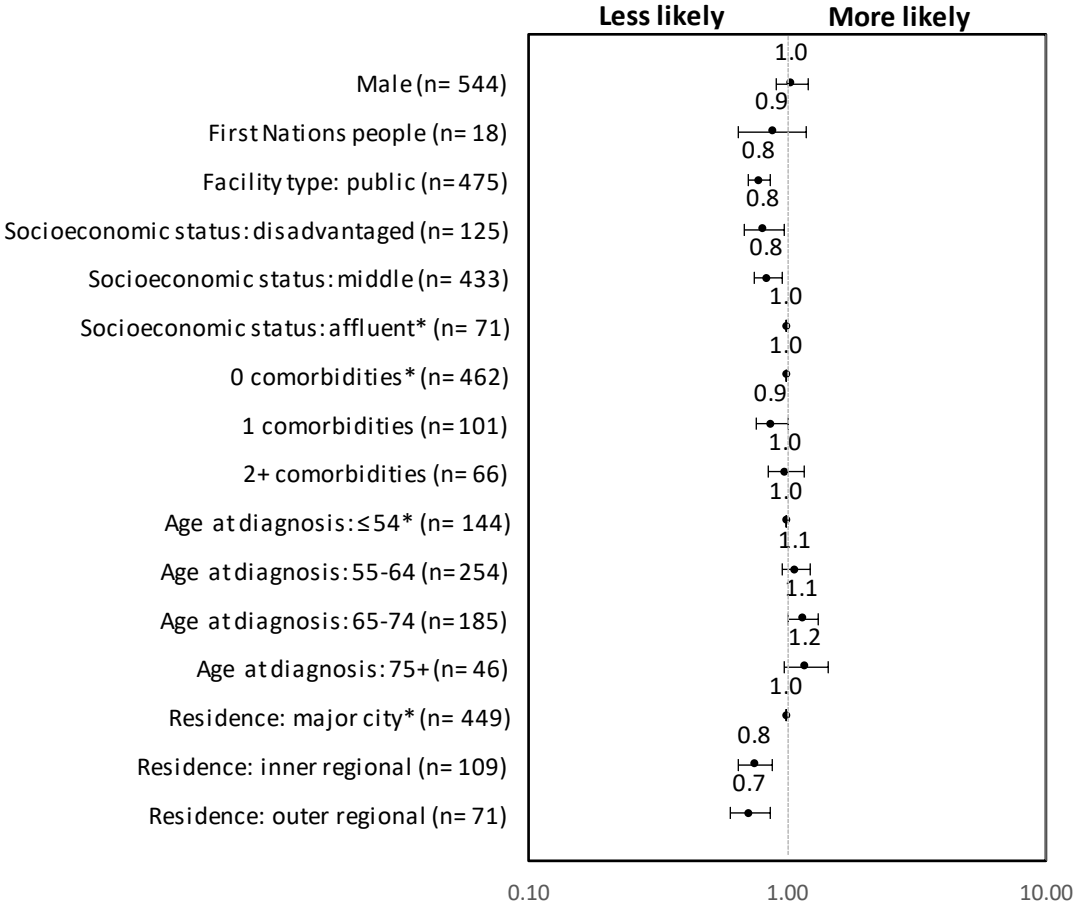
2.6.2.2 | Factors accosiated with receiving radiation therapy as first treatment within 45 days of diagnosis for head and neck cancer, 2015-2019

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, Remote areas are compared with Major Cities. Patients with comorbidities are compared to those with no comorbidities. Binary variables such as Male, First Nations people and public are compared to the remainder of the cohort. Multivariat groupus use * to signify the reference group.

2.6.2.3 | Timeliness: proportion of patients who receive first concurrent IV systemic therapy and radiation therapy within 45 days of pathological diagnosis, 2015-2019

Cancer	Concurrent IV systemic therapy & radiation therapy (CRT) as first treatment	Received CRT as first treatment within 45 days of diagnosis	
	N	n	%
Oral cavity	34	21	62%
Oropharynx	774	467	60%
Major salivary glands	1		
Nasopharynx	52	36	69%
Hypopharynx	68	37	54%
Other pharynx	17	12	71%
Nasal cavity and paranasal sinuses	12	8	67%
Larynx	73	48	66%
Total head and neck	**1,031**	**629**	**61%**

2.6.2.4 | Factors accosiated with receiving concurrent IV systemic therapy and radiation therapy as first treatment within 45 days of diagnosis for head and neck cancer, 2015-2019



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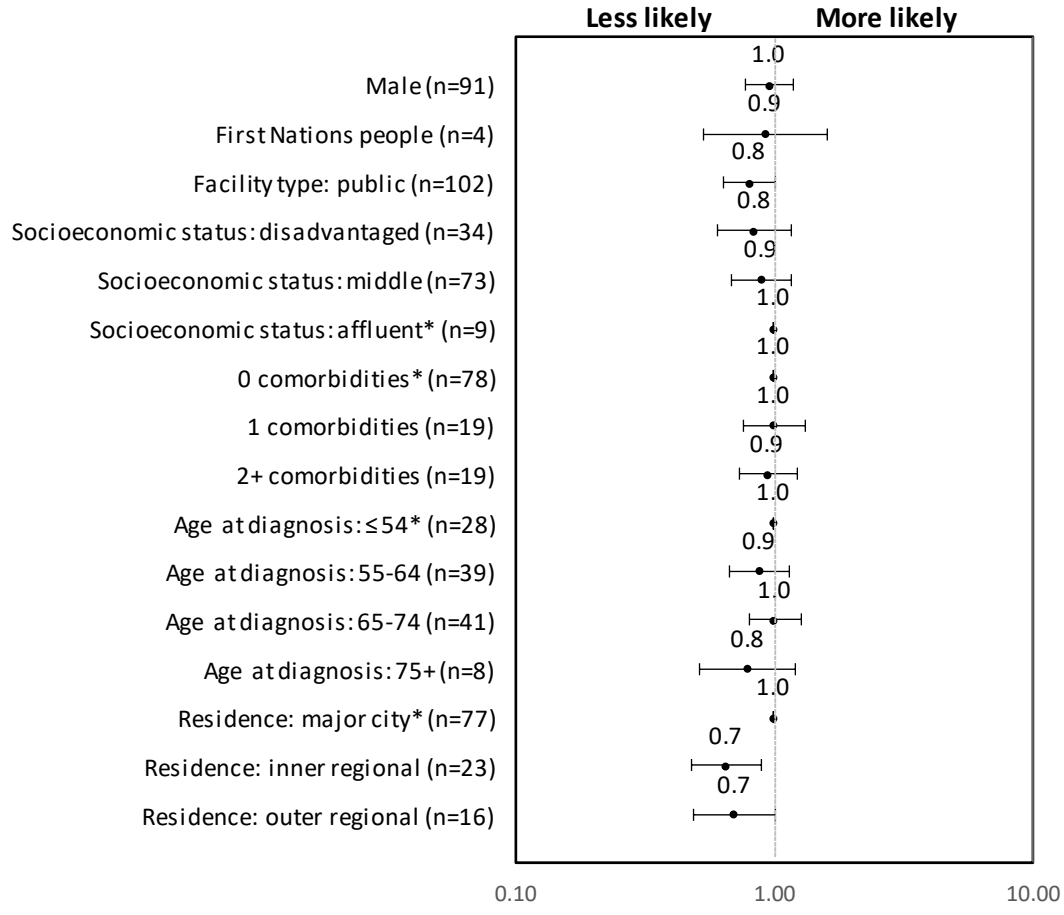
2.6.2.5 | Timeliness: proportion of patients who receive first IV systemic therapy within 45 days of pathological diagnosis, 2015-2019

Cancer	Intravenous Systemic Therapy (IVST) as first treatment	IVST as first treatment within 45 days of diagnosis	
	N	n	%
Oral cavity	21	16	76%
Oropharynx	71	46	65%
Major salivary glands	2	1	50%
Nasopharynx	19	15	79%
Hypopharynx	16	12	75%
Other pharynx			
Nasal cavity and paranasal sinuses	8	8	100%
Larynx	14	9	64%
Total head and neck	**151**	**107**	**71%**

2.6.2.6 | Factors accosiated with receiving IV systemic therapy as first treatment within 45 days of diagnosis for head and neck cancer, 2015-2019



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, Remote areas are compared with Major Cities. Patients with comorbidities are compared to those with no comorbidities. Binary variables such as Male, First Nations people and public are compared to the remainder of the cohort. Multivariat groupus use * to signify the reference group.

2.6.2.7 | Timeliness: proportion of patients who receive first surgery, IVST, RT and concurrent IVST and radiation therapy within 30-45 days of pathological diagnosis, 2015-2019[a, b]

Treatment type	All HNC	Surgery		Radiation therapy		Concurrent IV systemic therapy and radiation therapy		IV systemic therapy	
		≤30 days	>30 days	≤45 days	>45 days	≤45 days	>45 days	≤45 days	>45 days
Queensland	4,192	**1,396**	731	**278**	234	**629**	402	**107**	44
%	100%	**66%**	34%	**54%**	46%	**61%**	39%	**71%**	29%
Median age at diagnosis	64	**62**	65	**71**	68	**61**	60	**61**	61.5
% Male	74%	**68%**	68%	**83%**	73%	**86%**	84%	**77%**	84%
% ≥75 Age	18%	**16%**	18%	**36%**	31%	**7.3%**	6%	**7%**	9%
% First Nations status	3.9%	**1.8%**	4.8%	**5.0%**	7.3%	**2.9%**	5%	**3.7%**	4.5%
% Socioeconomically disadvantaged	27%	**24%**	31%	**24%**	40%	**20%**	29%	**30%**	45%
% Live rural	40%	**38%**	48%	**30%**	56%	**29%**	49%	**28%**	57%
% With = 1 comorbidity	20%	**17%**	22%	**26%**	25%	**16%**	21%	**18%**	14%
% With ≥ 2 comorbidity	12%	**10%**	11%	**18%**	18%	**10%**	11%	**18%**	18%
% Discussed at QOOL MDT	88%	**87%**	95%	**90%**	88%	**95%**	95%	**88%**	89%
1 year survival from diagnosis	84%	**93%**	93%	**70%**	71%	**92%**	90%	**77%**	77%
2 year survival from diagnosis	60%	**72%**	62%	**45%**	43%	**68%**	66%	**45%**	55%

a Rural includes outer regional, remote and very remote areas.

b MDT rate includes facilities that use QOOL to capture MDT review and The Townsivlle Hospital from December 2017.

2.7 | Equitable: Providing care and ensuring health status does not vary in quality because of personal characteristics

2.7.1 | Treatment rates by HHS of residence

2.7.1.1 | Trends in head and neck cancer treatment rates, by year and by HHS of residence, 2015-2019

HHS of residence	Diagnosis year					
	2015 n (N)	2016 n (N)	2017 n (N)	2018 n (N)	2019 n (N)	Total n (N)
Cairns and Hinterland	84% 54 (64)	89% 57 (64)	91% 60 (66)	88% 69 (78)	95% 62 (65)	**90%** **302 (337)**
North West	100% 6 (6)	88% 7 (8)	83% 5 (6)	67% 2 (3)	67% 2 (3)	**85%** **22 (26)**
Central Queensland	86% 36 (42)	90% 27 (30)	89% 33 (37)	87% 40 (46)	91% 32 (35)	**88%** **168 (190)**
Central West	100% 3 (3)	100% 4 (4)	50% 2 (4)		50% 1 (2)	**77%** **10 (13)**
Darling Downs	98% 42 (43)	93% 41 (44)	98% 44 (45)	94% 50 (53)	91% 48 (53)	**95%** **225 (238)**
Gold Coast	94% 82 (87)	94% 102 (108)	88% 81 (92)	89% 115 (129)	94% 105 (112)	**92%** **485 (528)**
Mackay	88% 29 (33)	94% 29 (31)	89% 39 (44)	91% 30 (33)	78% 21 (27)	**88%** **148 (168)**
Metro North	89% 125 (141)	94% 116 (124)	92% 130 (142)	90% 130 (145)	93% 146 (157)	**91%** **647 (709)**
Metro South	91% 151 (166)	92% 133 (145)	92% 145 (157)	91% 137 (151)	91% 154 (170)	**91%** **720 (789)**
North West	100% 6 (6)	88% 7 (8)	83% 5 (6)	67% 2 (3)	67% 2 (3)	**85%** **22 (26)**
South West	67% 2 (3)	100% 3 (3)	71% 5 (7)	71% 5 (7)	100% 6 (6)	**81%** **21 (26)**
Sunshine Coast	94% 73 (78)	92% 79 (86)	95% 70 (74)	95% 81 (85)	97% 85 (88)	**94%** **388 (411)**
Torres and Cape	78% 7 (9)	100% 3 (3)	100% 5 (5)	50% 3 (6)	100% 5 (5)	**82%** **23 (28)**
Townsville	92% 45 (49)	91% 42 (46)	89% 42 (47)	84% 42 (50)	95% 52 (55)	**90%** **223 (247)**
West Moreton	97% 31 (32)	100% 34 (34)	89% 42 (47)	83% 35 (42)	98% 45 (46)	**93%** **187 (201)**
Wide Bay	83% 48 (58)	92% 45 (49)	95% 54 (57)	88% 51 (58)	92% 54 (59)	**90%** **252 (281)**
Queensland	**90%** **734 (814)**	**93%** **722 (779)**	**91%** **757 (830)**	**89%** **790 (886)**	**93%** **818 (883)**	**91%** **3,821 (4,192)**

2.7.2 | In-flows for surgery, IV systemic therapy and radiation therapy

2.7.2.1 | What percentage of patients travelled from outside of my HHS to receive surgery in my HHS, Diagnosis years 2015-2019.

HHS of surgery	# of facilities providing surgery	% surgical cases who travelled from outside of my HHS to receive surgery in my HHS n (N)
Cairns and Hinterland	3	10% 9 (87)
Central Queensland	3	 (32)
Central West	1	 (1)
Darling Downs	4	11% 14 (127)
Gold Coast	7	8.3% 21 (253)
Mackay	1	 (15)
Metro North	11	60% 497 (829)
South West	1	 (1)
Metro South	7	43% 201 (472)
Sunshine Coast	8	3.1% 4 (129)
Townsville	3	33% 51 (154)
West Moreton	3	8.3% 5 (60)
Wide Bay	5	8.7% 2 (23)
Children's Health Queensland	1	100% 1 (1)
Queensland	**58**	**37%** **805 (2,184)**

2 pateints had surgery at an unknown HHS

2.7.2.2 | What percentage of patients travelled from outside of my HHS to receive intravenioous systemic therapy (IVST) in my HHS, Diagnosis years 2015-2019.

HHS of IVST	# of facilities providing IVST	% IVST cases who travelled from outside of my HHS to receive IVST in my HHS n (N)
Cairns and Hinterland	2	(11)
Central Queensland	2	(6)
Darling Downs	2	13% 11 (82)
Gold Coast	5	5% 12 (238)
Mackay	2	(10)
Metro North	7	58% 345 (595)
Metro South	7	45% 223 (501)
Sunshine Coast	5	2.6% 2 (76)
Townsville	1	54% 117 (216)
West Moreton	2	(4)
Wide Bay	3	(20)
Children's Health Queensland	1	100% 3 (3)
Queensland	**39**	**40% 713 (1,762)**

2.7.2.3 | What percentage of patients travelled from outside of my HHS to receive radiation therapy (RT) in my HHS, Diagnosis years 2015-2019

HHS of RT	# of facilities providing RT	% RT cases who travelled from outside of my HHS to receive RT in my HHS n (N)
Cairns and Hinterland	1	7% 6 (86)
Central Queensland	1	5% 1 (20)
Darling Downs	1	15% 24 (164)
Gold Coast	4	4.8% 18 (378)
Mackay	1	 (2)
Metro North	4	54% 480 (888)
Metro South	4	42% 330 (785)
Sunshine Coast	4	4.6% 7 (152)
Townsville	1	52% 177 (339)
West Moreton	1	33% 2 (6)
Wide Bay	4	3.1% 2 (64)
Queensland	**26**	**36%** **1,047 (2,884)**

1 patient had RT at an unknown HHS

2.7.3 | Out-flows for surgery, IV systemic therapy and radiation therapy

2.7.3.1 | What percentage of patients underwent surgery, radiation therapy (RT) and IV systemic therapy (IVST) outside of the HHS in which they live? Diagnosis years 2015-2019[a]

HHS of residence	Had surgery	Had IVST	Had RT
	% cases leaving their HHS of residence for treatment		
	n (N)	n (N)	n (N)
Cairns and Hinterland	54% 92 (170)	92% 130 (141)	66% 156 (236)
Central Queensland	69% 71 (103)	93% 84 (90)	86% 114 (133)
Central West	50% 1 (2)	100% 7 (7)	100% 10 (10)
Darling Downs	23% 33 (146)	10% 8 (79)	17% 28 (168)
Gold Coast	6.5% 16 (248)	5% 12 (238)	4% 15 (375)
Mackay	80% 65 (81)	86% 61 (71)	98% 110 (112)
Metro North	13% 49 (382)	15% 44 (294)	13% 61 (469)
Metro South	32% 125 (396)	14% 45 (323)	15% 81 (536)
North West	100% 11 (11)	100% 13 (13)	100% 19 (19)
South West	90% 9 (10)	100% 10 (10)	100% 16 (16)
Sunshine Coast	45% 101 (226)	61% 116 (190)	51% 150 (295)
Townsville	23% 30 (133)	2.9% 3 (102)	3% 5 (167)
Torres and Cape	100% 12 (12)	100% 9 (9)	100% 17 (17)
West Moreton	54% 64 (119)	95% 75 (79)	97% 131 (135)
Wide Bay	86% 126 (147)	83% 96 (116)	69% 135 (197)
Queensland	**37%** **805 (2,186)**	**40%** **713 (1,762)**	**36%** **1,048 (2,885)**

Part 3 | Spotlight on oropharangeal cancer

3.1 | Oropharayngeal overview

2.1.1 | Oropharayngeal porition of head and neck cancer

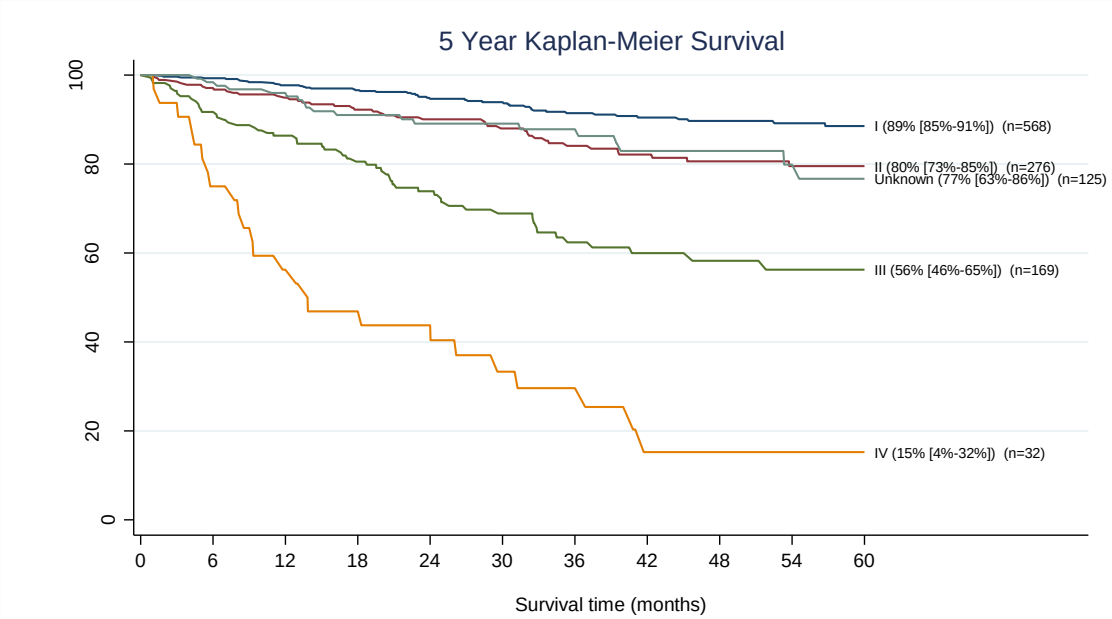
Group	Count	Rate	
All cancers in Qld	135,576		
All HNC in Qld	4,192	3%	Of All cancers in Qld
Oropharynx cancer (OPC)	1,584	38%	Of All HNC in Qld
Oropharyngeal squamous cell carcinoma (OPCSCC)	1,527	96%	Of Oropharynx cancer (OPC)

2.1.2 | Oropharyngeal squamous cell carcinoma (OPCSCC) morphologies

Morphology code	Morphology	Oropharyngeal carcinoma	Other Oropharyngeal
80003	Neoplasm, malignant		8
80103	Carcinoma		4
80133	Large cell neuroendocrine carcinoma		1
80323	Spindle cell carcinoma		1
80333	Pseudosarcomatous carcinoma		1
80413	Small cell carcinoma		2
80513	Verrucous carcinoma		1
80523	Papillary squamous cell carcinoma		4
80703	Squamous cell carcinoma	743	
80713	Squamous cell carcinoma, keratinising	238	
80723	Squamous cell carcinoma, large cell, nonkeratinising	419	
80733	Squamous cell carcinoma, small cell, nonkeratinising	1	
80743	Squamous cell carcinoma, spindle cell	1	
80823	Lymphoepithelial carcinoma		1
80833	Basaloid squamous cell carcinoma	125	
81403	Adenocarcinoma		4
82003	Adenoid cystic carcinoma		13
83103	Clear cell adenocarcinoma		1
84303	Mucoepidermoid carcinoma		9
85603	Adenosquamous carcinoma		4
85623	Epithelial-myoepithelial carcinoma		1
89003	Rhabdomyosarcoma		1
Total		1,527	56

3.2 | Oropharyngeal squamous cell carcinoma survival

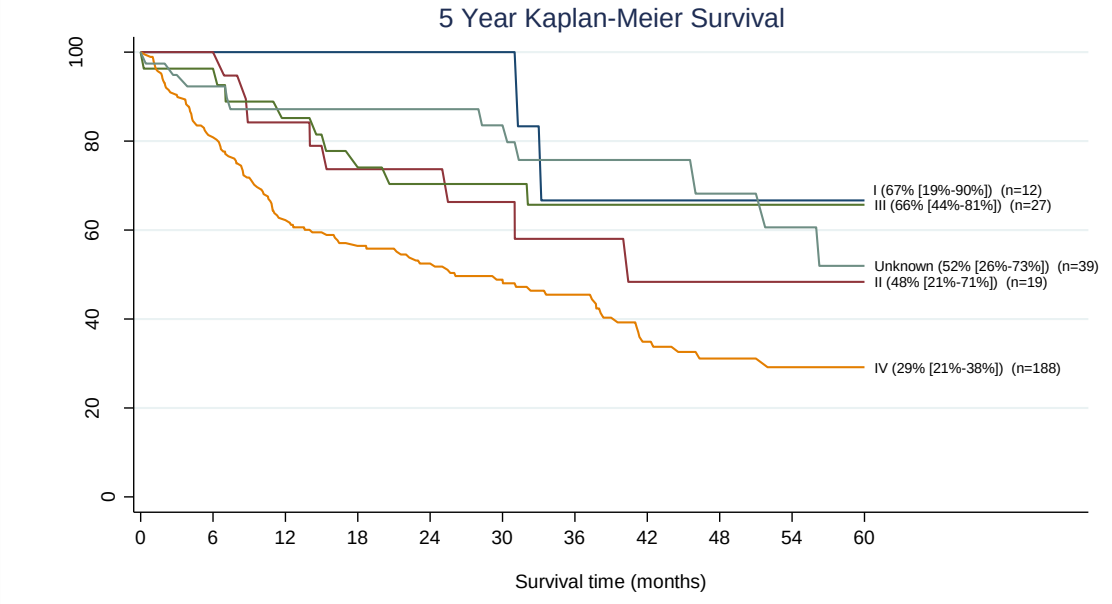
3.2.1 | Kaplan-Meier survival for p16+ Oropharyngeal squamous cell carcinoma patients by TNM stage at diagnosis



Test for equality of survivor functions across stage: p<0.001

Notes:
1. Survival is calculated as the date of diagnosis with follow up to 31 December 2020.

3.2.2 | Kaplan-Meier survival for p16- Oropharyngeal squamous cell carcinoma patients by TNM stage at diagnosis



Test for equality of survivor functions across stage: p<0.001

Notes:
1. p16- status also includes patients who have pending status
2. Survival is calculated as the date of diagnosis with follow up to 31 December 2020.

3.3 | Oropharyngeal squamous cell carcinoma patient demographics

3.3.1 | Oropharyngeal squamous cell carcinoma patient characteristics, by p16 status

	Oropharyngeal carcinoma patients		p16+			p16-			p16 unknown		
	N	Col%	n	Col%	Row%	n	Col%	Row%	n	Col%	Row%
Queensland	**1,527**	**100%**	**1,170**	**100%**	**77%**	**285**	**100%**	**19%**	**72**	**100%**	**4.7%**
Median age at diagnosis	61		60			65			67		
Age Standardised Rate (Aust per 100,000)	5.42		4.18			0.99			0.25		
8th edn TNM stage											
I	582	38%	568	49%	98%	12	4.2%	2.1%	2	2.8%	0.3%
II	297	19%	276	24%	93%	19	6.7%	6.4%	2	2.8%	0.7%
III	201	13%	169	14%	84%	27	9.5%	13%	5	6.9%	2.5%
IV	263	17%	32	2.7%	12%	188	66%	71%	43	60%	16%
Unknown	184	12%	125	11%	68%	39	14%	21%	20	28%	11%
Sex											
Male	1,298	85%	1,019	87%	79%	222	78%	17%	57	79%	4.4%
Female	229	15%	151	13%	66%	63	22%	28%	15	21%	6.6%
Age											
< 40	13	0.9%	13	1.1%	100%						
40 - 49	179	12%	159	14%	89%	18	6.3%	10%	2	2.8%	1.1%
50 - 59	475	31%	398	34%	84%	63	22%	13%	14	19%	2.9%
60 - 69	550	36%	414	35%	75%	113	40%	21%	23	32%	4.2%
70 - 79	251	16%	161	14%	64%	72	25%	29%	18	25%	7.2%
80 +	59	3.9%	25	2.1%	42%	19	6.7%	32%	15	21%	25%
Residence at diagnosis											
Major City	932	61%	748	64%	80%	149	52%	16%	35	49%	3.8%
Inner Regional	339	22%	249	21%	73%	69	24%	20%	21	29%	6.2%
Outer Regional	256	17%	173	15%	68%	67	24%	26%	16	22%	6.3%
Socioeconomic status											
Affluent	149	9.8%	129	11%	87%	17	6%	11%	3	4.2%	2%
Middle	1,019	67%	797	68%	78%	179	63%	18%	43	60%	4.2%
Disadvantaged	359	24%	244	21%	68%	89	31%	25%	26	36%	7.2%
First Nations status											
First Nations	72	4.7%	42	3.6%	58%	23	8.1%	32%	7	9.7%	9.7%
Not First Nations	1,455	95%	1,128	96%	78%	262	92%	18%	65	90%	4.5%
Comorbidity											
0	1,094	72%	881	75%	81%	180	63%	16%	33	46%	3%
1	277	18%	187	16%	68%	60	21%	22%	30	42%	11%
2+	156	10%	102	8.7%	65%	45	16%	29%	9	13%	5.8%
Had MDT review											
Yes	1,418	93%	1,107	95%	78%	266	93%	19%	45	63%	3.2%
No	109	7.1%	63	5.4%	58%	19	6.7%	17%	27	38%	25%
Overall survival from diagnosis											
1-Yr	88%		94%			71%			46%		
2-Yr	82%		89%			62%			40%		
3-Yr	76%		83%			54%			37%		
5-Yr	69%		79%			39%			37%		

Notes:

1. p16- status also includes patients who have pending status.
2. Overall survival is calculated as the date of diagnosis with follow up to 31 December 2020.
3. When considering 5-Yr survival rates, note that only a small subset of the patient cohort (only those diagnosed in 2015) will have the full five years of follow up data available

3.3.1 | Oropharyngeal squamous cell carcinoma patients with p16+ status by TNM stage at diagnosis

	p16+ patients		Stage I			Stage II			Stage III			Stage IV		
	N	Col%	n	Col%	Row%	n	Col%	Row%	n	Col%	Row%	n	Col%	Row%
Queensland	**1,170**	**100%**	**568**	**100%**	**49%**	**276**	**100%**	**24%**	**169**	**100%**	**14%**	**32**	**100%**	**2.7%**
Median age at diagnosis	**60**		**58**			**60**			**63**			**61**		
Sex														
Male	1,019	87%	485	85%	48%	257	93%	25%	146	86%	14%	25	78%	2.5%
Female	151	13%	83	15%	55%	19	6.9%	13%	23	14%	15%	7	22%	4.6%
Age														
< 40	13	1.1%	4	0.7%	31%	7	2.5%	54%	1	0.6%	7.7%			
40 - 49	159	14%	84	15%	53%	35	13%	22%	19	11%	12%	2	6.3%	1.3%
50 - 59	398	34%	211	37%	53%	94	34%	24%	46	27%	12%	14	44%	3.5%
60 - 69	414	35%	188	33%	45%	97	35%	23%	60	36%	14%	13	41%	3.1%
70 - 79	161	14%	73	13%	45%	37	13%	23%	34	20%	21%	3	9.4%	1.9%
80 +	25	2.1%	8	1.4%	32%	6	2.2%	24%	9	5.3%	36%			
Residence at diagnosis														
Major City	748	64%	363	64%	49%	180	65%	24%	96	57%	13%	18	56%	2.4%
Inner Regional	249	21%	121	21%	49%	58	21%	23%	44	26%	18%	9	28%	3.6%
Outer Regional	173	15%	84	15%	49%	38	14%	22%	29	17%	17%	5	16%	2.9%
Socioeconomic status														
Affluent	129	11%	64	11%	50%	31	11%	24%	12	7.1%	9.3%	2	6.3%	1.6%
Middle	797	68%	392	69%	49%	190	69%	24%	110	65%	14%	22	69%	2.8%
Disadvantaged	244	21%	112	20%	46%	55	20%	23%	47	28%	19%	8	25%	3.3%
First Nations status														
First Nations	42	3.6%	14	2.5%	33%	14	5.1%	33%	8	4.7%	19%	3	9.4%	7.1%
Not First Nations	1,128	96%	554	98%	49%	262	95%	23%	161	95%	14%	29	91%	2.6%
Comorbidity														
0	881	75%	446	79%	51%	208	75%	24%	115	68%	13%	17	53%	1.9%
1	187	16%	81	14%	43%	45	16%	24%	31	18%	17%	11	34%	5.9%
2+	102	8.7%	41	7.2%	40%	23	8.3%	23%	23	14%	23%	4	13%	3.9%
Had MDT review														
Yes	1,107	95%	534	94%	48%	262	95%	24%	160	95%	14%	30	94%	2.7%
No	63	5.4%	34	6%	54%	14	5.1%	22%	9	5.3%	14%	2	6.3%	3.2%
Overall survival from diagnosis														
1-Yr	94%		98%			95%			86%			56%		
2-Yr	89%		95%			90%			74%			44%		
3-Yr	83%		91%			84%			62%			30%		
5-Yr	79%		89%			80%			56%			15%		

3.3.1 | Oropharyngeal squamous cell carcinoma patients with p16- status by TNM stage at diagnosis

	p16- patients		Stage I			Stage II			Stage III			Stage IV		
	N	Col%	n	Col%	Row%	n	Col%	Row%	n	Col%	Row%	n	Col%	Row%
Queensland	**285**	**100%**	**12**	**100%**	**4.2%**	**19**	**100%**	**6.7%**	**27**	**100%**	**9.5%**	**188**	**100%**	**66%**
Median age at diagnosis	**65**		**66**			**67**			**64**			**65**		
Sex														
Male	222	78%	11	92%	5%	13	68%	5.9%	19	70%	8.6%	151	80%	68%
Female	63	22%	1	8.3%	1.6%	6	32%	9.5%	8	30%	13%	37	20%	59%
Age														
< 40														
40 - 49	18	6.3%							3	11%	17%	12	6.4%	67%
50 - 59	63	22%	1	8.3%	1.6%	3	16%	4.8%	8	30%	13%	43	23%	68%
60 - 69	113	40%	6	50%	5.3%	9	47%	8%	5	19%	4.4%	76	40%	67%
70 - 79	72	25%	5	42%	6.9%	6	32%	8.3%	9	33%	13%	44	23%	61%
80 +	19	6.7%				1	5.3%	5.3%	2	7.4%	11%	13	6.9%	68%
Residence at diagnosis														
Major City	149	52%	5	42%	3.4%	10	53%	6.7%	13	48%	8.7%	98	52%	66%
Inner Regional	69	24%	5	42%	7.2%	3	16%	4.3%	6	22%	8.7%	45	24%	65%
Outer Regional	67	24%	2	17%	3%	6	32%	9%	8	30%	12%	45	24%	67%
Socioeconomic status														
Affluent	17	6%	1	8.3%	5.9%	1	5.3%	5.9%	3	11%	18%	6	3.2%	35%
Middle	179	63%	9	75%	5%	13	68%	7.3%	18	67%	10%	119	63%	66%
Disadvantaged	89	31%	2	17%	2.2%	5	26%	5.6%	6	22%	6.7%	63	34%	71%
First Nations status														
First Nations	23	8.1%				2	11%	8.7%	2	7.4%	8.7%	17	9%	74%
Not First Nations	262	92%	12	100%	4.6%	17	89%	6.5%	25	93%	9.5%	171	91%	65%
Comorbidity														
0	180	63%	6	50%	3.3%	11	58%	6.1%	16	59%	8.9%	124	66%	69%
1	60	21%	4	33%	6.7%	3	16%	5%	9	33%	15%	32	17%	53%
2+	45	16%	2	17%	4.4%	5	26%	11%	2	7.4%	4.4%	32	17%	71%
Had MDT review														
Yes	266	93%	10	83%	3.8%	19	100%	7.1%	26	96%	9.8%	174	93%	65%
No	19	6.7%	2	17%	11%				1	3.7%	5.3%	14	7.4%	74%
Overall survival from diagnosis														
1-Yr	71%		100%			84%			85%			63%		
2-Yr	62%		100%			74%			70%			52%		
3-Yr	54%		67%			58%			66%			45%		
5-Yr	39%		67%			48%			66%			29%		

3.4 | Oropharyngeal squamous cell carcinoma patient treatment

3.4.1 | p16+ Oropharyngeal squamous cell carcinoma patient treatment trends by TNM stage at diagnosis

	p16+ patients		Stage I			Stage II			Stage III			Stage IV			Unknown		
	Count (N)	Col%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%
Queensland	**1,170**	**100%**	**568**	**100%**	**49%**	**276**	**100%**	**24%**	**169**	**100%**	**14%**	**32**	**100%**	**2.7%**	**125**	**100%**	**11%**
Treatment																	
Had treatment	1,136	97%	560	99%	49%	270	98%	24%	155	92%	14%	29	91%	2.6%	122	98%	11%
No anti-cancer treatment	34	2.9%	8	1.4%	24%	6	2.2%	18%	14	8.3%	41%	3	9.4%	8.8%	3	2.4%	8.8%
Surgery																	
Had surgery	362	31%	209	37%	58%	62	22%	17%	17	10%	4.7%	6	19%	1.7%	68	54%	19%
No surgery	808	69%	359	63%	44%	214	78%	26%	152	90%	19%	26	81%	3.2%	57	46%	7.1%
Radiation therapy (RT)																	
Had RT	1,063	91%	556	98%	52%	266	96%	25%	155	92%	15%	19	59%	1.8%	67	54%	6.3%
No RT	107	9.1%	12	2.1%	11%	10	3.6%	9.3%	14	8.3%	13%	13	41%	12%	58	46%	54%
IV systemic therapy																	
Had IVST	924	79%	442	78%	48%	254	92%	27%	141	83%	15%	20	63%	2.2%	67	54%	7.3%
No IVST	246	21%	126	22%	51%	22	8%	8.9%	28	17%	11%	12	38%	4.9%	58	46%	24%
Therapy																	
Concurrent chemoradiotherapy	888	76%	431	76%	76%	244	88%	88%	141	83%	83%	9	28%	28%	63	50%	50%
Non-concurrent RT IVST	22	1.9%	8	1.4%	1.4%	6	2.2%	2.2%				5	16%	16%	3	2.4%	2.4%
RT alone	153	13%	117	21%	21%	16	5.8%	5.8%	14	8.3%	8.3%	5	16%	16%	1	0.8%	0.8%
IVST alone	14	1.2%	3	0.5%	0.5%	4	1.4%	1.4%				6	19%	19%	1	0.8%	0.8%
No IVST or RT	93	7.9%	9	1.6%	1.6%	6	2.2%	2.2%	14	8.3%	8.3%	7	22%	22%	57	46%	46%
Overall survival from diagnosis																	
1-Yr	94%			98%			95%			86%			56%			96%	
2-Yr	89%			95%			90%			74%			44%			89%	
3-Yr	83%			91%			84%			62%			30%			88%	
5-Yr	79%			89%			80%			56%			15%			77%	

Notes

1. A patient is included in the Had surgery, radiation therapy, and intravenous (IV) systemic therapy groups when these treatments were received within 365 days of diagnosis. Concurrent chemoradiotherapy is defined as where the start date of the second therapy overlaps with the end date of the first.
2. Overall survival is calculated as the date of diagnosis with follow up to 31 December 2020.
3. When considering 5-Yr survival rates, note that only a small subset of the patient cohort (only those diagnosed in 2015) will have the full five years of follow up data available.

3.4.2 | P16- Oropharyngeal squamous cell carcinoma patient treatment trends by TNM stage at diagnosis

	p16- patients		Stage I			Stage II			Stage III			Stage IV			Unknown		
	Count (N)	Col%	Count	Col%	Row%	Count		Row%	Count		Row%	Count		Row%	Count		Row%
Queensland	**285**	**100%**	**12**	**100%**	**4.2%**	**19**	**100%**	**6.7%**	**27**	**100%**	**9.5%**	**188**	**100%**	**66%**	**39**	**100%**	**14%**
Treatment																	
Had treatment	250	88%	9	75%	3.6%	19	100%	7.6%	25	93%	10%	158	84%	63%	39	100%	16%
No anti-cancer treatment	35	12%	3	25%	8.6%				2	7.4%	5.7%	30	16%	86%			
Surgery																	
Had surgery	74	26%	3	25%	4.1%	6	32%	8.1%	8	30%	11%	24	13%	32%	33	85%	45%
No surgery	211	74%	9	75%	4.3%	13	68%	6.2%	19	70%	9%	164	87%	78%	6	15%	2.8%
Radiation therapy (RT)																	
Had RT	221	78%	9	75%	4.1%	19	100%	8.6%	25	93%	11%	157	84%	71%	11	28%	5%
No RT	64	22%	3	25%	4.7%				2	7.4%	3.1%	31	16%	48%	28	72%	44%
IV systemic therapy																	
Had IVST	151	53%	2	17%	1.3%	3	16%	2%	16	59%	11%	123	65%	81%	7	18%	4.6%
No IVST	134	47%	10	83%	7.5%	16	84%	12%	11	41%	8.2%	65	35%	49%	32	82%	24%
Therapy																	
Concurrent chemoradiotherapy	138	48%	2	17%	17%	1	5.3%	5.3%	15	56%	56%	113	60%	60%	7	18%	18%
Non-concurrent RT IVST	12	4.2%				2	11%	11%	1	3.7%	3.7%	9	4.8%	4.8%			
RT alone	71	25%	7	58%	58%	16	84%	84%	9	33%	33%	35	19%	19%	4	10%	10%
IVST alone	1	0.4%										1	0.5%	0.5%			
No IVST or RT	63	22%	3	25%	25%				2	7.4%	7.4%	30	16%	16%	28	72%	72%
Overall survival from diagnosis																	
1-Yr	71%			100%			84%			85%			63%			87%	
2-Yr	62%			100%			74%			70%			52%			87%	
3-Yr	54%			67%			58%			66%			45%			76%	
5-Yr	39%			67%			48%			66%			29%			52%	

Notes

1. p16- status also includes patients who have pending status
2. A patient is included in the Had surgery, radiation therapy, and intravenous (IV) systemic therapy groups when these treatments were received within 365 days of diagnosis. Concurrent chemoradiotherapy is defined as where the start date of the second therapy overlaps with the end date of the first.
3. Overall survival is calculated as the date of diagnosis with follow up to 31 December 2020.
4. When considering 5-Yr survival rates, note that only a small subset of the patient cohort (only those diagnosed in 2015) will have the full five years of follow up data available.

3.4.3 | p16 unknown Oropharyngeal squamous cell carcinoma patient treatment trends by TNM stage at diagnosis

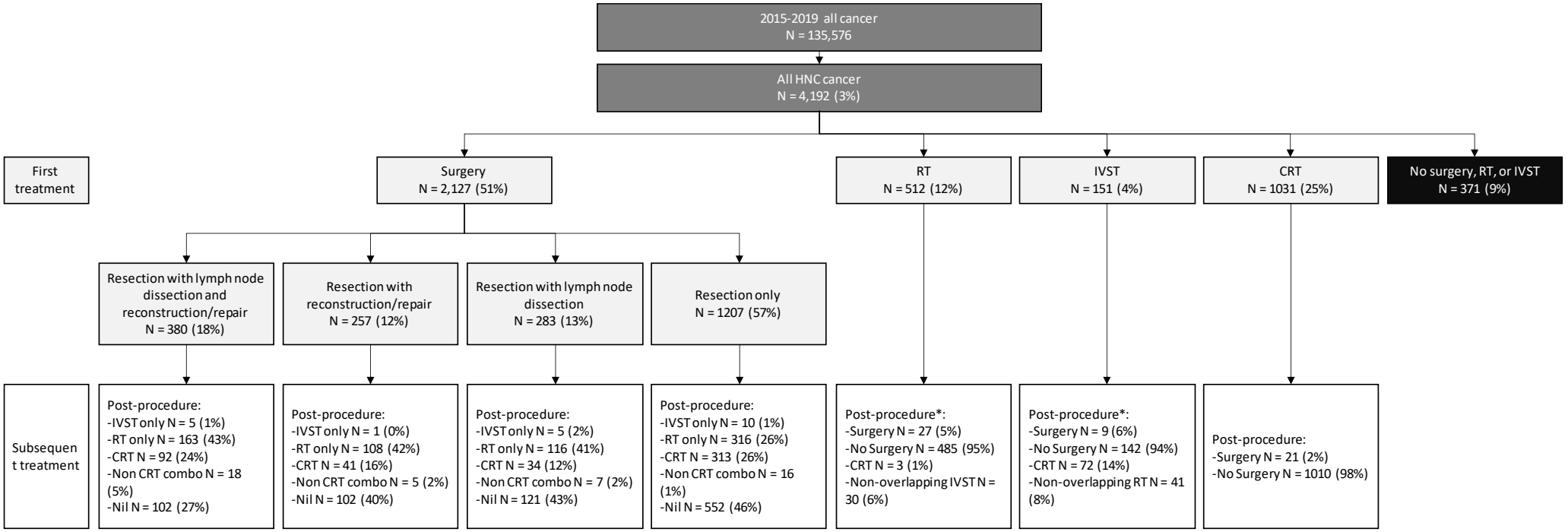
	p16 unknown patients		Stage I			Stage II			Stage III			Stage IV			Unknown		
	Count (N)	Col%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%	Count	Col%	Row%
Queensland	**72**	**100%**	**2**	**100%**	**2.8%**	**2**	**100%**	**2.8%**	**5**	**100%**	**6.9%**	**43**	**100%**	**60%**	**20**	**100%**	**28%**
Treatment																	
Had treatment	43	60%	1	50%	2.3%	2	100%	4.7%	4	80%	9.3%	24	56%	56%	12	60%	28%
No anti-cancer treatment	29	40%	1	50%	3.4%				1	20%	3.4%	19	44%	66%	8	40%	28%
Surgery																	
Had surgery	15	21%	1	50%	6.7%	2	100%	13%	1	20%	6.7%	2	4.7%	13%	9	45%	60%
No surgery	57	79%	1	50%	1.8%				4	80%	7%	41	95%	72%	11	55%	19%
Radiation therapy (RT)																	
Had RT	35	49%	1	50%	2.9%	2	100%	5.7%	4	80%	11%	24	56%	69%	4	20%	11%
No RT	37	51%	1	50%	2.7%				1	20%	2.7%	19	44%	51%	16	80%	43%
IV systemic therapy																	
Had IVST	16	22%	1	50%	6.3%							12	28%	75%	3	15%	19%
No IVST	56	78%	1	50%	1.8%	2	100%	3.6%	5	100%	8.9%	31	72%	55%	17	85%	30%
Therapy																	
Concurrent chemoradiotherapy	15	21%	1	50%	50%							11	26%	26%	3	15%	15%
Non-concurrent RT IVST	1	1.4%										1	2.3%	2.3%			
RT alone	19	26%				2	100%	100%	4	80%	80%	12	28%	28%	1	5%	5%
IVST alone																	
No IVST or RT	37	51%	1	50%	50%				1	20%	20%	19	44%	44%	16	80%	80%
Overall survival from diagnosis																	
1-Yr	46%			100%			100%			40%			40%			50%	
2-Yr	40%			100%			100%			20%			32%			50%	
3-Yr	37%			0%			100%			0%			29%			44%	
5-Yr	37%			0%			100%			0%			29%			0%	

Notes

1. p16- status also includes patients who have pending status
2. A patient is included in the Had surgery, radiation therapy, and intravenous (IV) systemic therapy groups when these treatments were received within 365 days of diagnosis. Concurrent chemoradiotherapy is defined as where the start date of the second therapy overlaps with the end date of the first.
3. Overall survival is calculated as the date of diagnosis with follow up to 31 December 2020.
4. When considering 5-Yr survival rates, note that only a small subset of the patient cohort (only those diagnosed in 2015) will have the full five years of follow up data available.

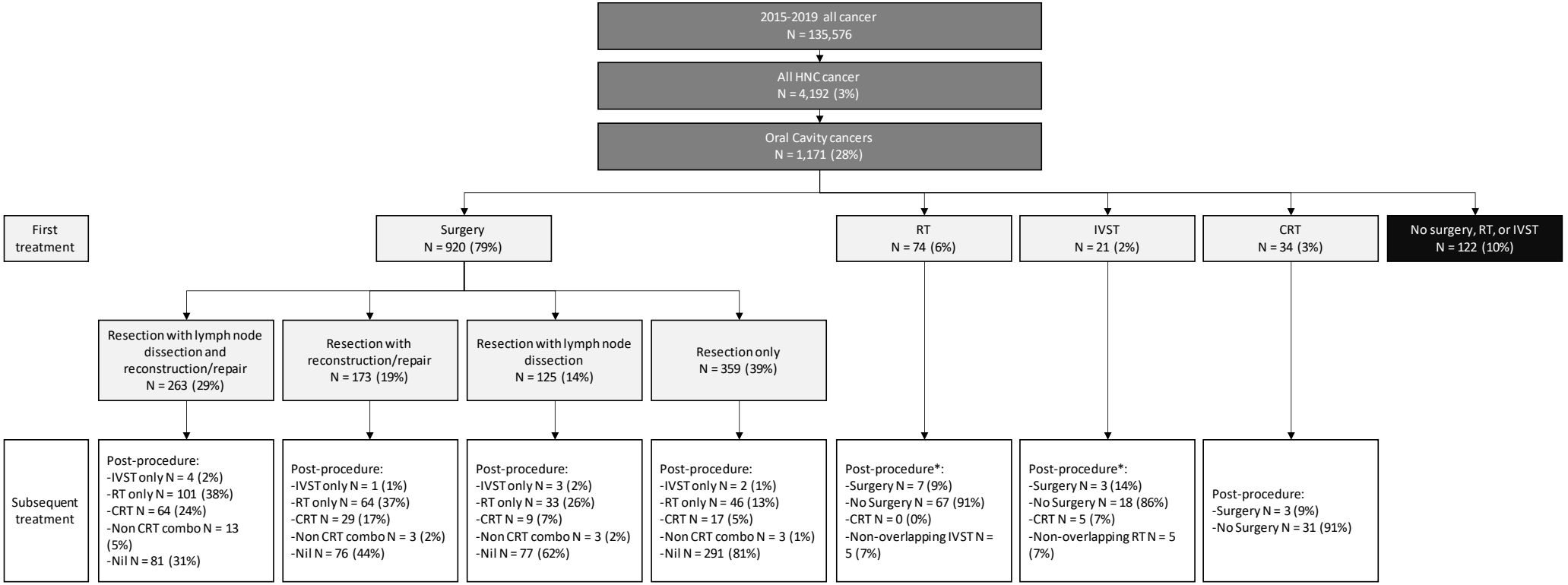
Appendix 1: Treatment cohort flow charts

All Head and Neck cancers



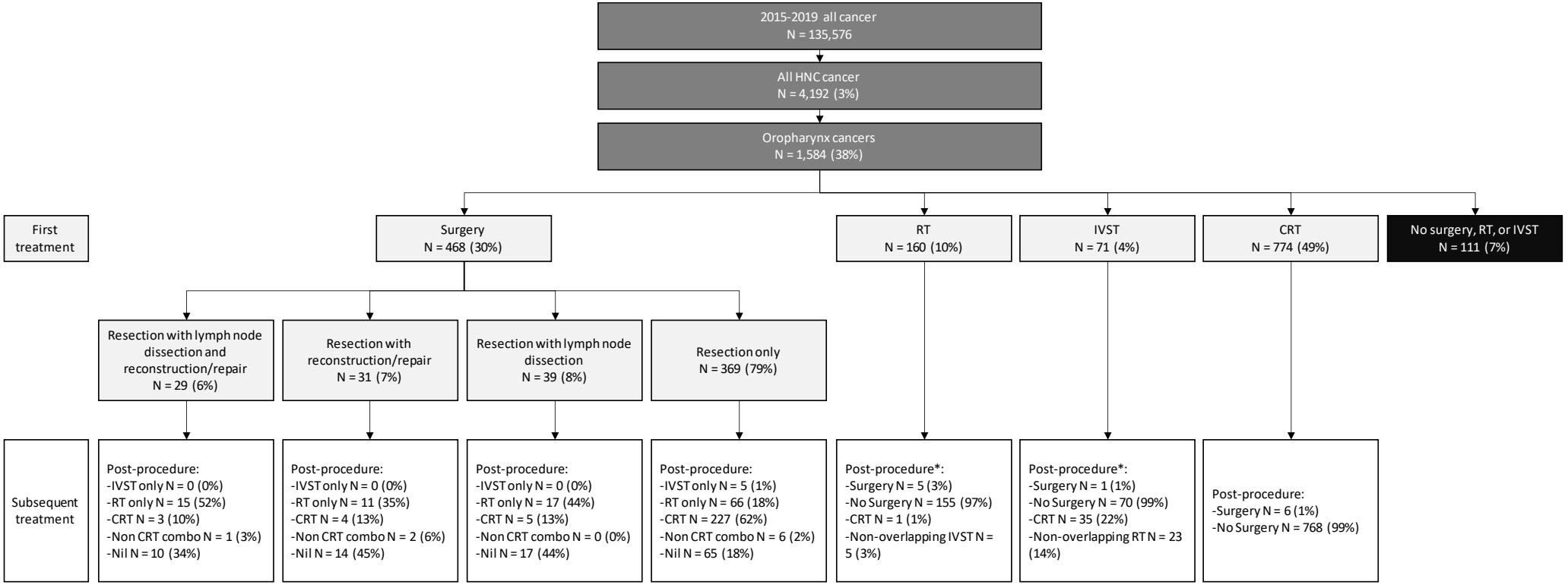
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Oral cavity



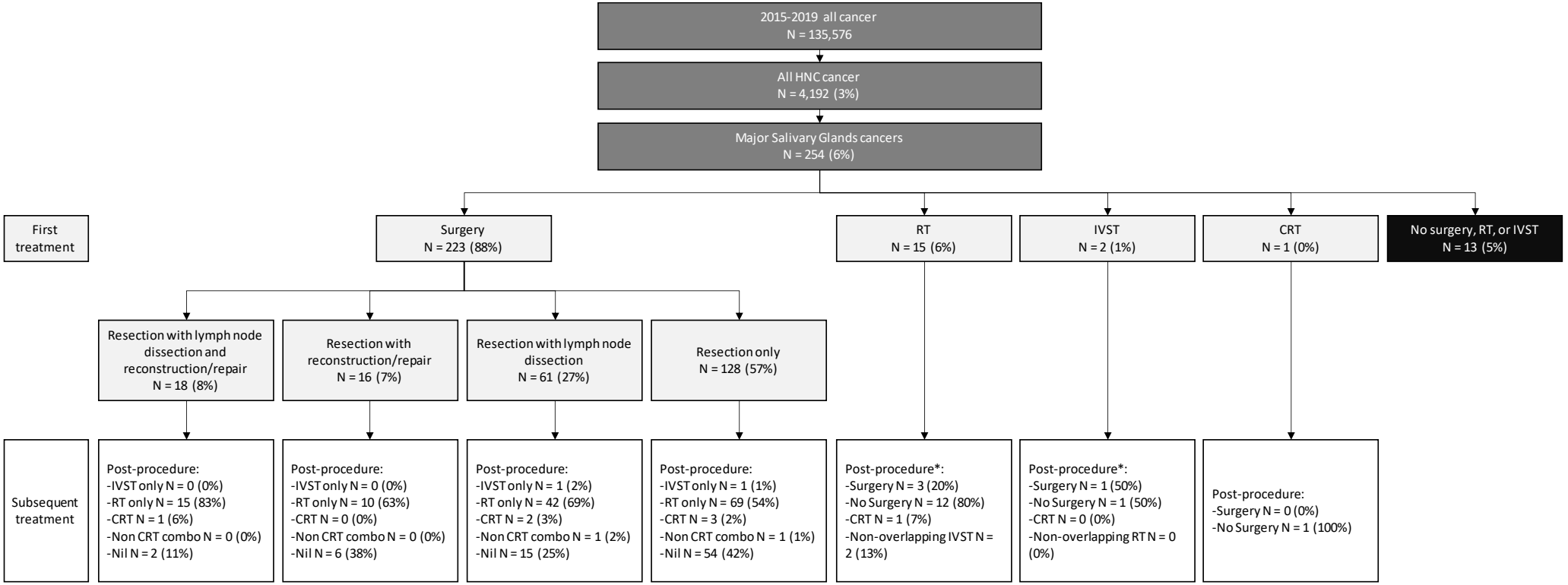
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Oropharynx



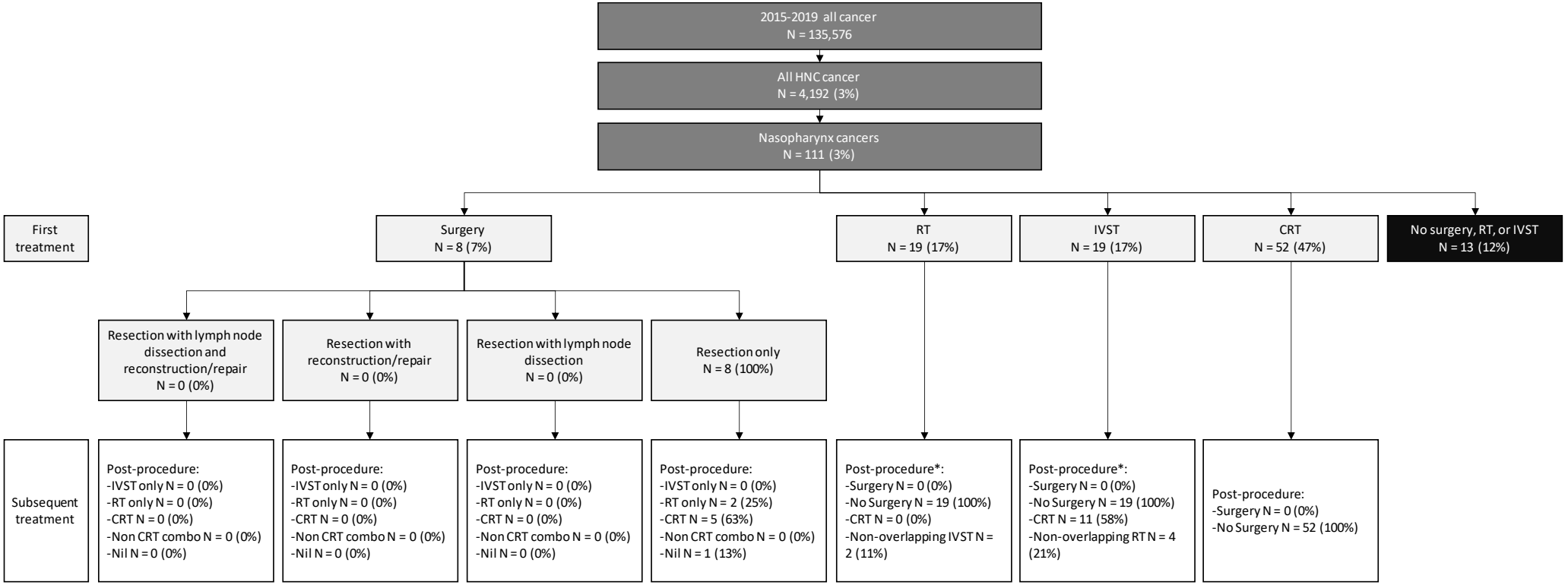
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Major salivary glands



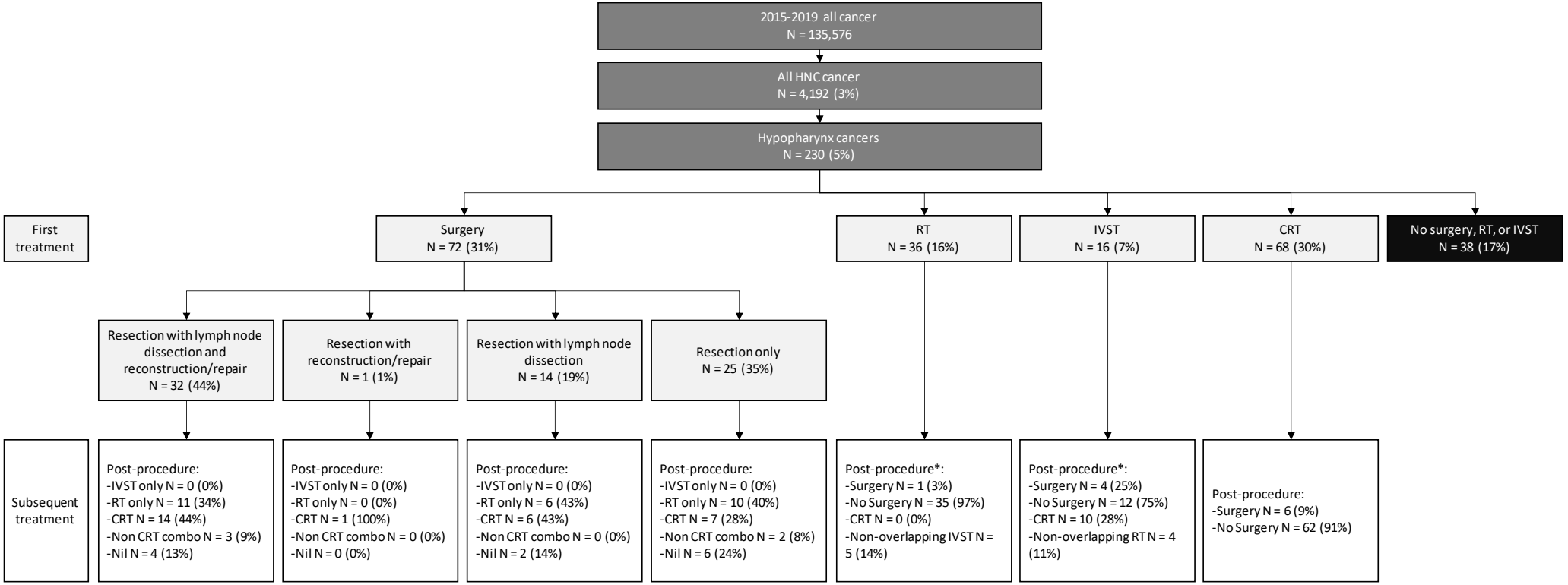
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Nasopharynx



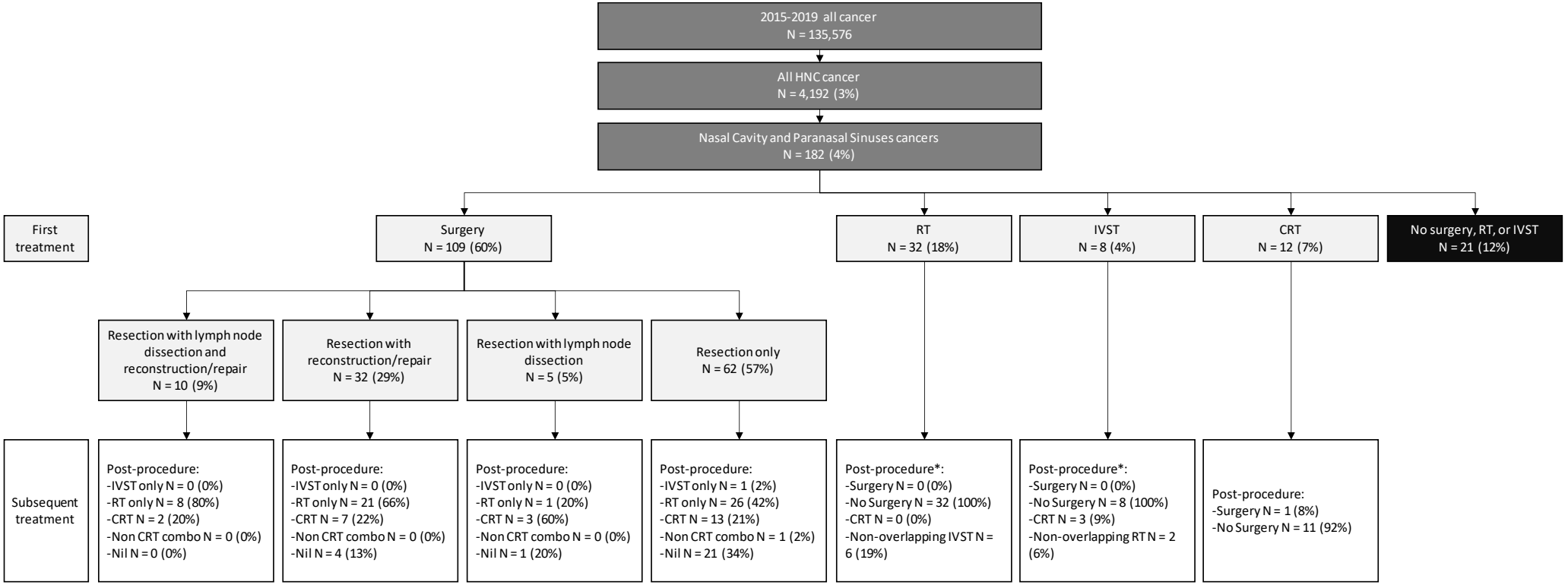
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Hypopharynx



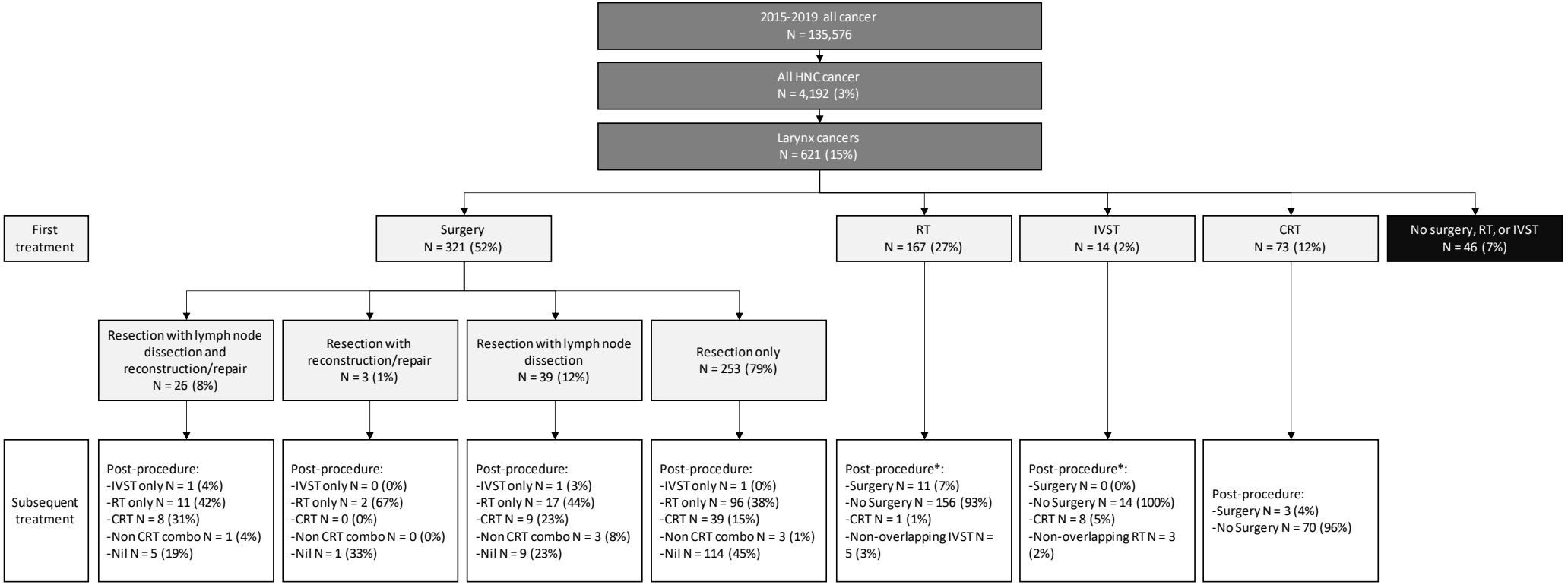
Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Nasal cavity and paranasal sinuses



Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Larynx



Notes
-Patients diagnosed with primary head and neck cancer, not of skin origin.
-Percentages may not add to 100 due to rounding.
-Radiation therapy (RT) and intravenous systemic therapy (IVST) needs to occur 30 days prior or 5 months following diagnosis.
-Post-procedure RT and IVST needs to occur within 3 months of surgery.
-Non CRT combo = RT and IVST start and end date do not overlap.
-*Not mutually exclusive, patients can have both surgery and therapy.

Appendix 2: Cancer groupings

Table A2.1 – Head and neck cancer groupings by ICD-10-AM 11th edition

HNC sub-site	Cancer	ICD-10-AM 11th edition		2015-2019 N
Oral Cavity	C00 Lip	C003	Upper lip, inner aspect	5
		C004	Lower lip, inner aspect	18
		C005	Lip, unspecified, inner aspect	4
		C006	Commissure of lip	5
		C008	Overlapping lesion of lip	-
		C009	Lip, unspecified	7
	C02 Other and unspecified parts of tongue	C020	Dorsal surface of tongue	14
		C021	Border of tongue	270
		C022	Ventral surface of tongue	63
		C023	Anterior two-thirds of tongue, part unspecified	27
		C028	Overlapping lesion of tongue	15
		C029	Tongue, unspecifed	158
	C03 Gum	C030	Upper gum	31
		C031	Lower gum	78
		C039	Gum, unspecified	16
	C04 Floor of mouth	C040	Anterior floor of mouth	62
		C041	Lateral floor of mouth	10
		C048	Overlapping of floor of mouth	7
		C049	Floor of mouth, unspecified	109
	C05 Palate	C050	Hard palate	39
		C058	Overlapping lesion of palate	4
		C059	Palate	15
	C06 Other and unspecified parts of mouth	C060	Cheek mucosa	99
		C061	Vestibule of mouth	4
		C062	Retromolar area	87
		C068	Overlapping lesion of other and unspecified parts of mouth	6
		C069	Mouth, unspecified	18
				1,171
Oropharynx	C01 Base of tongue	C01	Base of tongue	563
	C02 Other and unspecified parts of tongue	C024	Lingual tonsil	9
	C05 Palate	C051	Soft palate	75
		C052	Uvula	11
	C09 Tonsil	C090	Tonsillar fossa	67
		C091	Tonsillar pillar (anterior)(posterior)	22
		C098	Overlapping lesion of tonsil	17
		C099	Tonsil, unspecified	705
	C10 Oropharynx	C100	Vallecula	16
		C101	Anterior surface of epiglottis	2
		C102	Lateral wall of oropharynx	6
		C103	Posterior wall of oropharynx	6
		C104	Branchial cleft	1
		C108	Overlapping lesion of oropharynx	21
		C109	Oropharynx, unspecified	63
				1,584
Major Salivary Glands	C07 Parotid gland	C07	Malignant neoplasm of parotid gland	179
	C08 Other and unspecified major salivary glands	C080	Submandibular gland	45
		C081	Sublingual gland	3
		C088	Overlapping lesion of major salivary glands	-
		C089	Major salivary gland, unspecified	27
				254

Wet lip was included in oral cavity due to small numbers.
Melanoma morphologies were excluded for all head and neck sites: 87203, 87213, 87463, 87713.
Squamous cell carcinomas of the parotid were removed, reasoning these were likely of skin origin.

Table A2.2 – Head and neck cancer groupings by ICD-10-AM 11th edition

HNC sub-site	Cancer	ICD-10-AM 11th edition		2015-2019 N
Nasopharynx	C11 Nasopharynx	C110	Superior wall of nasopharynx	2
		C111	Posterior wall of nasopharynx	9
		C112	Lateral wall of nasopharynx	11
		C113	Anterior wall of nasopharynx	2
		C118	Overlapping malignant lesion of nasopharynx	3
		C119	Nasopharynx, unspecified	84
				111
Hypopharynx	C12 Pyriform sinus	C12	Malignant neoplasm of pyriform sinus	136
	C13 Hypopharynx	C130	Postcricoid region	11
		C131	Aryepiglottic fold, hypopharyngeal aspect	20
		C132	Posterior wall of hypopharynx	10
		C138	Overlapping malignant lesion of hypopharynx	8
		C139	Hypopharynx, unspecified	45
				230
Other pharynx	C14 Other and ill-defined sites in the lip, oral cavity and pharynx	C140	Pharynx, unspecified	30
		C142	Waldeyer's ring	-
		C148	Overlapping malignant lesion of lip, oral cavity and pharynx	9
				39
Nasal cavity and paranasal sinuses	C30 Nasal cavity and middle ear	C300	Nasal cavity	92
		C301	Middle ear	3
	C31 Accessory sinuses	C310	Maxillary sinus	53
		C311	Ethmoidal sinus	19
		C312	Frontal sinus	5
		C313	Sphenoidal sinus	7
		C319	Accessory sinus, unspecified	3
				182
Larynx	C32 Larynx	C320	Glottis	381
		C321	Supraglottis	174
		C322	Subglottis	13
		C323	Laryngeal cartilage	5
		C328	Overlapping malignant lesion of larynx	20
		C329	Larynx, unspecified	28
				621
Total head and neck				**4,192**

Wet lip was included in oral cavity due to small numbers.
Melanoma morphologies were excluded for all head and neck sites: 87203,87213,87463,87713.
Squamous cell carcinomas of the parotid were removed, reasoning these were likely of skin origin.

Appendix 3: Head and neck cancers by histological type

Table A3.1 – Head and neck primary site group by histological type and morphology code

Head and neck sub-site	Morphology	Count
Oral Cavity	Squamous cell carcinoma 80703	571
	Squamous cell carcinoma, keratinising 80713	453
	Verrucous carcinoma 80513	31
	Mucoepidermoid carcinoma 84303	26
	Squamous cell carcinoma, large cell, nonkeratinising 80723	24
	Adenoid cystic carcinoma 82003	12
	Basaloid squamous cell carcinoma 80833	10
	Squamous cell carcinoma, spindle cell 80743	9
	Squamous cell carcinoma, microinvasive 80763	5
	Carcinoma 80103	5
	Adenosquamous carcinoma 85603	4
	Papillary squamous cell carcinoma 80523	4
	Adenocarcinoma 81403	4
	Neoplasm, malignant 80003	4
	Clear cell adenocarcinoma 83103	3
	Polymorphous low grade adenocarcinoma 85253	3
	Mixed tumour, malignant 89403	1
	Squamous cell carcinoma, adenoid 80753	1
	Carcinosarcoma 89803	1
Subtotal		**1,171**
Oropharynx	Squamous cell carcinoma 80703	743
	Squamous cell carcinoma, large cell, nonkeratinising 80723	419
	Squamous cell carcinoma, keratinising 80713	238
	Basaloid squamous cell carcinoma 80833	125
	Adenoid cystic carcinoma 82003	13
	Mucoepidermoid carcinoma 84303	9
	Neoplasm, malignant 80003	8
	Carcinoma 80103	4
	Adenocarcinoma 81403	4
	Adenosquamous carcinoma 85603	4
	Papillary squamous cell carcinoma 80523	4
	Small cell carcinoma 80413	2
	Spindle cell carcinoma 80323	1
	Clear cell adenocarcinoma 83103	1
	Epithelial-myoepithelial carcinoma 85623	1
	Liposarcoma, well differentiated 88513	1
	Squamous cell carcinoma, small cell, nonkeratinising 80733	1
	Lymphoepithelial carcinoma 80823	1
	Verrucous carcinoma 80513	1
	Squamous cell carcinoma, spindle cell 80743	1
	Pseudosarcomatous carcinoma 80333	1
	Large cell neuroendocrine carcinoma 80133	1
	Rhabdomyosarcoma 89003	1
Subtotal		**1,584**

Table A3.1 – Head and neck primary site group by histological type and morphplogy code

Head and neck sub-site	Morphology	Count
Major Salivary Glands	Acinar cell carcinoma 85503	45
	Mucoepidermoid carcinoma 84303	39
	Adenoid cystic carcinoma 82003	37
	Adenocarcinoma 81403	24
	Carcinoma in pleomorphic adenoma 89413	19
	Infiltrating duct carcinoma 85003	19
	Secretory carcinoma of breast 85023	11
	Basal cell adenocarcinoma 81473	9
	Epithelial-myoepithelial carcinoma 85623	9
	Polymorphous low grade adenocarcinoma 85253	7
	Small cell carcinoma 80413	6
	Squamous cell carcinoma 80703	4
	Malignant myoepithelioma 89823	4
	Cystadenocarcinoma 84403	3
	Clear cell adenocarcinoma 83103	3
	Carcinoma 80103	3
	Mixed tumour, malignant 89403	3
	Neoplasm, malignant 80003	3
	Lymphoepithelial carcinoma 80823	1
	Squamous cell carcinoma, keratinising 80713	1
	Oxyphilic adenocarcinoma 82903	1
	Giant cell sarcoma 88023	1
	Carcinoma, undifferentiated 80203	1
	Malignant tumour, spindle cell type 80043	1
Subtotal		**254**
Nasopharynx	Squamous cell carcinoma, large cell, nonkeratinising 80723	40
	Squamous cell carcinoma 80703	27
	Carcinoma, undifferentiated 80203	15
	Squamous cell carcinoma, keratinising 80713	9
	Carcinoma 80103	4
	Lymphoepithelial carcinoma 80823	4
	Basaloid squamous cell carcinoma 80833	3
	Adenoid cystic carcinoma 82003	3
	Adenocarcinoma 81403	2
	Neoplasm, malignant 80003	2
	Carcinoma, diffuse type 81453	1
	Embryonal rhabdomyosarcoma 89103	1
Subtotal		**111**
Hypopharynx	Squamous cell carcinoma 80703	119
	Squamous cell carcinoma, keratinising 80713	55
	Squamous cell carcinoma, large cell, nonkeratinising 80723	26
	Basaloid squamous cell carcinoma 80833	19
	Carcinoma 80103	2
	Lymphoepithelial carcinoma 80823	2
	Squamous cell carcinoma, spindle cell 80743	2
	Neoplasm, malignant 80003	2
	Mucoepidermoid carcinoma 84303	1
	Small cell carcinoma 80413	1
	Pseudosarcomatous carcinoma 80333	1
Subtotal		**230**

Table A3.1 – Head and neck primary site group by histological type and code

Head and neck sub-site	Morphology	Count
Other Pharynx	Squamous cell carcinoma 80703	26
	Squamous cell carcinoma, keratinising 80713	8
	Squamous cell carcinoma, large cell, nonkeratinising 80723	2
	Neoplasm, malignant 80003	1
	Carcinoma 80103	1
	Small cell carcinoma 80413	1
Subtotal		**39**
Nasal Cavity and Paranasal Sinuses	Squamous cell carcinoma 80703	50
	Squamous cell carcinoma, keratinising 80713	26
	Squamous cell carcinoma, large cell, nonkeratinising 80723	19
	Carcinoma, undifferentiated 80203	11
	Basaloid squamous cell carcinoma 80833	10
	Adenoid cystic carcinoma 82003	10
	Adenocarcinoma, intestinal type 81443	7
	Olfactory neuroblastoma 95223	6
	Alveolar rhabdomyosarcoma 89203	5
	Neoplasm, malignant 80003	5
	Neuroendocrine carcinoma 82463	4
	Adenocarcinoma 81403	4
	Rhabdomyosarcoma 89003	2
	Adenosquamous carcinoma 85603	2
	Small cell carcinoma 80413	2
	Malignant tumour, spindle cell type 80043	2
	Mucoepidermoid carcinoma 84303	2
	Chordoma 93703	1
	Squamous cell carcinoma, spindle cell 80743	1
	Carcinoma 80103	1
	Clear cell adenocarcinoma 83103	1
	Undifferentiated sarcoma 88053	1
	Papillary adenocarcinoma 82603	1
	Squamous cell carcinoma, adenoid 80753	1
	Pseudosarcomatous carcinoma 80333	1
	Chondroid chordoma 93713	1
	Embryonal rhabdomyosarcoma 89103	1
	Teratocarcinoma 90813	1
	Schneiderian carcinoma 81213	1
	Verrucous carcinoma 80513	1
	Epithelial-myoepithelial carcinoma 85623	1
	Carcinoma in pleomorphic adenoma 89413	1
Subtotal		**182**

Table A3.1 – Head and neck primary site group by histological type and code

Head and neck sub-site	Morphology	Count
Larynx	Squamous cell carcinoma 80703	362
	Squamous cell carcinoma, keratinising 80713	180
	Squamous cell carcinoma, large cell, nonkeratinising 80723	30
	Squamous cell carcinoma, spindle cell 80743	11
	Basaloid squamous cell carcinoma 80833	8
	Neoplasm, malignant 80003	7
	Carcinoma 80103	4
	Squamous cell carcinoma, microinvasive 80763	4
	Small cell carcinoma 80413	3
	Verrucous carcinoma 80513	2
	Lymphoepithelial carcinoma 80823	1
	Adenosquamous carcinoma 85603	1
	Adenoid cystic carcinoma 82003	1
	Papillary squamous cell carcinoma 80523	1
	Liposarcoma, well differentiated 88513	1
	Large cell neuroendocrine carcinoma 80133	1
	Neuroendocrine carcinoma 82463	1
	Carcinosarcoma 89803	1
	Atypical carcinoid tumour 82493	1
	Squamous cell carcinoma, adenoid 80753	1
Subtotal		**621**
Queensland		**621**

Appendix 4: Methodology

A4.1 | Assigning a treatment to a patient

In this report, surgery refers to treatment of the primary lesion. A patient is considered to have had surgery where a patient has had a primary resection specific to a head and neck site (note that for major salivary glands this also includes lymph node resection). Where a patient only had a nodal resection and/or reconstruction and repair procedure this is not considered surgery for the surgical indicators in this report. Note also that some surgery tables may not add to the Queensland total as there were patients for whom limited data about the surgery was available. For example, while we could allocate the patient as having had a surgical procedure to treat their head and neck cancer, we did not have specific information about the date and location of that surgery.

The following steps were taken to assign a treatment to a patient.

1. Locate patients with a diagnosis of primary head and neck cancer between 01 January 2015 and 31 December 2019 using the Queensland Oncology Repository.
2. Exclude malignant melanoma morphologies and squamous cell carcinomas of the parotid gland morphologies.
3. Assign treatments to each patient.
    1. IV systemic therapy (IVST) and radiation therapy (RT) were selected where the treatment start date occurred 30 days prior and up to 365 days following diagnosis.
    2. Cancer surgery identification and categorisation included the following steps:

    a. Any surgical procedures (using ICD-10-AM-11th edition procedure codes listed in tables A4.2) that occurred 30 days prior and any time after diagnosis were identified. Note that procedures were split into the following categories:
        - Major resections specific to each of the head and neck sub-sites: where a patient had a resection in the “major resection” list, that surgery was selected. Where this was not the case and the patient had a surgery in the “other related resection” list, then that surgery was selected as the patient’s resection.
        - Nodal resection: considered universal to all head and neck sub-sites
        - Reconstruction and repair: considered universal to all head and neck sub-sites.

    b. Where a primary resection occurred 30 days prior and up to 365 days following diagnosis it was retained. Major resections, nodal resections and reconstruction and repair procedures were recorded for each patient, where a patient had more than one type of procedure (for instance multiple reconstruction and repair procedures) the earliest was retained.

    c. Refined procedure codes were shared with members of the Head and Neck Cancer Sub-committee for comment. Appendix A Cohort summaries displays the first and subsequent treatments received for each head and neck cancer sub-site.

A4.2 | Surgery ACHI (ICD-10-AM) procedure codes for 2015-2019 patient cohort

Oral cavity[a]

ICD-10-AM 11th edition code and description			
Major Resection			
3024700	Total excision of parotid gland	4181001	Uvulectomy
3025000	Total excision of parotid gland with preservation of facial nerve	4559600	Total resection of 1 maxilla
3025300	Partial excision of parotid gland	4560200	Subtotal resection of mandible
3025500	Removal of submandibular ducts	4560201	Subtotal resection of maxilla
3025600	Excision of submandibular gland	4560500	Partial resection of mandible
3025900	Excision of sublingual gland	4560501	Partial resection of maxilla
3027200	Partial excision of tongue	4572000	Osteotomy of mandible, unilateral
3027500	Radical excision of intraoral lesion	5212000	Partial resection of mandible with condylectomy
3028300	Excision of cyst of mouth	9013500	Excision of lesion of tongue
4177901	Total excision of tongue	9014101	Excision of other lesion of mouth
4178900	Tonsillectomy without adenoidectomy	9014102	Excision or destruction of lesion of palate
Other related resection			
3120500	Excision of lesion of skin and subcutaneous tissue of other site	4185200	Laryngoscopy with removal of lesion
3123500	Excision of lesion of skin and subcutaneous tissue of other site of head	4186400	Microlaryngoscopy with removal of lesion
3134000	Excision of muscle, bone or cartilage involved with lesion of skin	4566500	Full thickness wedge excision of lip
3135000	Excision of lesion of soft tissue, not elsewhere classified	9013400	Destruction of lesion of tongue
3140000	Excision of lesion of upper aerodigestive tract	9014301	Other procedures on palate
3910600	Division of intracranial trigeminal nerve	9066501	Debridement of skin and subcutaneous tissue, not elsewhere classified
4178500	Partial pharyngectomy with partial glossectomy	9733100	Alveolectomy, per segment
4178501	Partial pharyngectomy with total glossectomy		

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Oropharynx

ICD-10-AM 11th edition code and description			
Major Resection			
3027200	Partial excision of tongue	4180400	Removal of lingual tonsil
3027500	Radical excision of intraoral lesion	4181001	Uvulectomy
3028300	Excision of cyst of mouth	4184000	Supraglottic laryngectomy
3029401	Laryngopharyngectomy and plastic reconstruction	4184300	Laryngopharyngectomy
3135000	Excision of lesion of soft tissue, not elsewhere classified	4185200	Laryngoscopy with removal of lesion
3140000	Excision of lesion of upper aerodigestive tract	4186100	Microlaryngoscopy with removal of lesion by laser
4176701	Excision of lesion of oropharynx	4186400	Microlaryngoscopy with removal of lesion
4177901	Total excision of tongue	4560201	Subtotal resection of maxilla
4178200	Partial pharyngectomy	4560500	Partial resection of mandible
4178500	Partial pharyngectomy with partial glossectomy	4560501	Partial resection of maxilla
4178601	Uvulopalatopharyngoplasty with tonsillectomy	9013500	Excision of lesion of tongue
4178700	Uvulectomy with partial palatectomy	9014101	Excision of other lesion of mouth
4178701	Uvulectomy with partial palatectomy and tonsillectomy	9014400	Excision of lesion of tonsils or adenoids
4178900	Tonsillectomy without adenoidectomy	9014900	Excision of other lesion of pharynx
4178901	Tonsillectomy with adenoidectomy		

Major salivary glands[a]

ICD-10-AM 11th edition code and description			
Major Resection			
3024700	Total excision of parotid gland	4559600	Total resection of 1 maxilla
3025000	Total excision of parotid gland with preservation of facial nerve	4560500	Partial resection of mandible
3025300	Partial excision of parotid gland	4560501	Partial resection of maxilla
3025600	Excision of submandibular gland	9013800	Excision of lesion of salivary gland
3025900	Excision of sublingual gland		
Other related resection			
3027200	Partial excision of tongue	3135000	Excision of lesion of soft tissue, not elsewhere classified
3123500	Excision of lesion of skin and subcutaneous tissue of other site of head	4178900	Tonsillectomy without adenoidectomy

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Nasopharynx[a]

ICD-10-AM 11th edition code and description			
Major Resection			
4173702	Ethmoidectomy, unilateral	4176700	Removal of lesion of nasopharynx
4173703	Ethmoidectomy, bilateral		
Other related resection			
4167100	Submucous resection of nasal septum		

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Hypopharynx[a]

ICD-10-AM 11th edition code and description			
Major Resection			
3029401	Laryngopharyngectomy and plastic reconstruction	4185200	Laryngoscopy with removal of lesion
4183400	Total laryngectomy	4186100	Microlaryngoscopy with removal of lesion by laser
4184000	Supraglottic laryngectomy	4186400	Microlaryngoscopy with removal of lesion
4184300	Laryngopharyngectomy		

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Nasal cavity and paranasal sinuses[a]

ICD-10-AM 11th edition code and description			
Major Resection			
3025600	Excision of submandibular gland	4173101	Ethmoidectomy with sphenoidectomy, frontonasal approach
3964000	Removal of lesion involving anterior cranial fossa	4173702	Ethmoidectomy, unilateral
3964200	Removal of lesion involving anterior cranial fossa with clearance of paranasal sinus extension	4173703	Ethmoidectomy, bilateral
3964600	Removal of lesion involving anterior cranial fossa with radical clearance of paranasal sinus and orbital fossa extensions	4559600	Total resection of 1 maxilla
4158100	Removal of lesion involving infratemporal fossa	4560201	Subtotal resection of maxilla
4166800	Removal of nasal polyp	4560501	Partial resection of maxilla
4171000	Radical maxillary antrostomy, unilateral	9013100	Local excision of other intranasal lesion
4171301	Radical maxillary antrostomy with transantral vidian neurectomy	9013101	Rhinectomy
4171606	Excision of lesion of maxillary antrum	9625701	Functional endoscopic sinus surgery [FESS]
4172800	Lateral rhinotomy with removal of intranasal lesion		
Other related resection			
3970000	Excision of lesion of skull	4167100	Submucous resection of nasal septum
4155700	Modified radical mastoidectomy	4168902	Total turbinectomy, unilateral

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Larynx

ICD-10-AM 11th edition code and description			
Major Resection			
3029401	Laryngopharyngectomy and plastic reconstruction	4185200	Laryngoscopy with removal of lesion
4183400	Total laryngectomy	4186100	Microlaryngoscopy with removal of lesion by laser
4183700	Hemilaryngectomy	4186400	Microlaryngoscopy with removal of lesion
4184000	Supraglottic laryngectomy	9016100	Excision of other lesion of larynx
4184300	Laryngopharyngectomy		

a Where a patient has a resection in the "major resection" list, that surgery is selected. Where this is not the case and the patient has a surgery in the "other related resection" list, then that surgery is selected as the patient's resection.

Lymph node resection

ICD-10-AM 11th edition code and description			
3031700	Re-exploration of lymph node of neck	9028202	Radical excision of lymph nodes of other site
3142300	Excision of lymph node of neck	9624401	Excision of lymphatic structure, neck/cervical
3142301	Regional excision of lymph nodes of neck	9624500	Radical excision of lymphatic structure, head region
3143500	Radical excision of lymph nodes of neck	9624501	Radical excision of lymphatic structure, neck/cervical
9028200	Excision of lymph node of other site	9624508	Radical excision of lymphatic structure, other and unspecified lymphatic sites

Reconstruction and repair

ICD-10-AM 11th edition code and description			
3002600	Repair of wound of skin and subcutaneous tissue of other site, superficial	4545109	Full thickness skin graft of other site
3002900	Repair of wound of skin and subcutaneous tissue of other site, involving soft tissue	4545124	Full thickness skin graft of other areas of face
3003200	Repair of wound of skin and subcutaneous tissue of face or neck, superficial	4549600	Open revision of free tissue flap
3003500	Repair of wound of skin and subcutaneous tissue of face or neck, involving soft tissue	4551201	Revision of scar of neck more than 3 cm in length
3005202	Repair of wound of lip	4556200	Noninnervated free flap
3005203	Repair of wound of nose	4556201	Innervated free flap
3005204	Closure of fistula of mouth	4556300	Island flap with vascular pedicle
3026900	Repair of fistula of salivary gland or duct	4557500	Fascia graft for facial nerve paralysis
3027800	Lingual fraenectomy	4558101	Excision of tissue for facial nerve paralysis with suspension
3027801	Lysis of adhesions of tongue	4559000	Reconstruction of orbital cavity
3038500	Postoperative reopening of laparotomy site	4559001	Reconstruction of orbital cavity with implant
3276000	Procurement of vein from limb for bypass or replacement graft	4559302	Reconstruction of orbital cavity with bone graft
3520200	Reoperation of arteries or veins, not elsewhere classified	4560801	Partial reconstruction of mandible
3930000	Primary repair of nerve	4560802	Subtotal reconstruction of mandible
3930600	Primary repair of nerve trunk	4560803	Total reconstruction of mandible
4151200	Reconstruction of external auditory canal	4561400	Reconstruction of eyelid
4156900	Intracranial decompression of facial nerve	4564100	Rhinoplasty using nasal or septal cartilage graft
4167200	Reconstruction of nasal septum	4564400	Rhinoplasty using cartilage graft from distant donor site
4171605	Biopsy of maxillary antrum	4565000	Revision of rhinoplasty
4172200	Closure of oro-antral fistula	4567100	Reconstruction of lip using flap, single or first stage
4178600	Uvulopalatopharyngoplasty	4567101	Reconstruction of eyelid using flap, single or first stage
4184301	Primary restoration of alimentary continuity following laryngopharyngectomy	4567400	Reconstruction of lip using flap, second stage
4187602	Laryngoplasty	4567600	Other repair of mouth
4187902	Closure of external fistula of trachea	4571600	Pharyngoplasty
4187903	Closure of other fistula of trachea	4571601	Pharyngeal flap
4187904	Repair of trachea, cervical approach	4572301	Osteotomy of maxilla with internal fixation, unilateral
4187906	Reconstruction of trachea and construction of artificial larynx	4572303	Ostectomy of maxilla with internal fixation, unilateral
4188102	Revision of tracheostomy	4583702	Vestibuloplasty
4286900	Insertion of implant into eyelid	4584500	Intraoral osseointegrated dental implant, first stage
4500301	Myocutaneous flap	4778900	Open reduction of fracture of mandible with internal fixation
4500901	Muscle flap	4824200	Bone graft with internal fixation, not elsewhere classified
4505100	Facial contour reconstruction with implant	5210200	Removal of pin, screw or wire from maxilla, mandible or zygoma
4520600	Local skin flap of eyelid	5212200	Partial reconstruction of maxilla
4520601	Local skin flap of nose	5212201	Subtotal reconstruction of maxilla
4520602	Local skin flap of lip	5212202	Total reconstruction of 1 maxilla
4520603	Local skin flap of ear	5232400	Reconstruction of mouth using direct tongue flap, single or first stage
4520604	Local skin flap of neck	9001102	Other repair on spinal canal or spinal cord structures
4520609	Local skin flap of other areas of face	9013200	Other repair of nose

ICD-10-AM 11th edition code and description			
4522101	Direct distant skin flap, first stage	9013900	Other repair of salivary gland or duct
4522401	Direct distant skin flap, second stage	9014201	Other repair of palate
4523000	Delay of direct distant skin flap	9028100	Incision of lymphatic structure
4523301	Indirect distant skin flap, preparation, transfer and attachment to final site	9066900	Excision of skin for graft
4523900	Revision of local skin flap	9068100	Other repair of facial bone
4544200	Extensive split skin graft of any site	9068300	Reconstruction of zygoma
4544802	Small split skin graft of lip	9738901	Surgery to isolate and preserve neurovascular tissue
4545100	Full thickness skin graft of eyelid	9766100	Fitting of implant abutment, per abutment
4545103	Full thickness skin graft of ear	9787100	Adjustment of fixed or removable orthodontic appliance
4545104	Full thickness skin graft of neck		

A4.3 | Quality Index indicator calculations

2.2 | Effectiveness

Surgery
n – The number of head and neck cancer patients who had a head and neck cancer surgery 30 days prior and up to 365 days following diagnosis.

N – The number of head and neck cancer patients.

Radiation therapy (RT)
n – The number of head and neck cancer patients who had definitive radiation therapy within 30 days prior and up to 365 days following diagnosis.

N – The number of head and neck cancer patients.

Concurrent IV systemic therapy and radiation therapy

n – The number of head and neck cancer patients who had definitive concurrent IV systemic therapy and radiation therapy 30 days prior and up to 365 days following diagnosis.

N – The number of head and neck cancer patients.

IV systemic therapy (IVST)
n – The number of head and neck cancer patients who had definitive IV systemic therapy within 30 days prior and up to 365 days following diagnosis.

N – The number of head and neck cancer patients.

A note on the use of the word "definitive".
For all cancer groups, except oropharynx, definitive treatment is the first treatment received by a patient. For oropharynx cancer, curative intent radiation therapy is considered definitive treatment if admininstered within 45 days of surgery. Under this rule, counts for radiation therapy as definitive treatment are higher than when selecting first treatment.

2.3 | Efficient

Median days from pathological diagnosis to surgery: the midpoint between the top half and bottom half of the observed length of stay, in days. Length of stay is for all surgery, not just where surgery is the first treatment received. Where a patient has multiple surgeries, the first is used.
Interquartile range (IQR): a measure of variability, based on dividing a data set into quartiles. Quartiles divide a rank-ordered data set into four equal parts. The values that separate these parts are called the first, second, and third quartiles; and they are denoted by Q_1, Q_2 (median), and Q_3, respectively. The IQR is the distance between the 75^{th} and 25^{th} percentiles, $IQR=Q_3 – Q_1$.

2.4 | Safe

90-day mortality
n – The number of head and neck cancer patients who had a head and neck cancer surgery, who died within 90 days of their last surgery.

N – The number of head and neck cancer patients who had a head and neck cancer surgery.

2.5 | Surgical survival

2-year surgical survival
n – The number of head and neck cancer patients who had a head and neck cancer surgery, still alive 2 years after their first head and neck cancer surgery.

N – The number of head and neck cancer patients who had a head and neck cancer surgery.

2.6 | Accessible

Time from diagnosis to first surgery within 30 days
n – The number of head and neck cancer patients who had surgery as their first treatment, who had the surgery within 30 days of physiological diagnosis.

N – The number of head and neck cancer patients who had surgery as their first treatment.

Time from diagnosis to first IV systemic therapy within 45 days

n – The number of head and neck cancer patients who had an IV systemic therapy as their first treatment, who had IV systemic therapy within 45 days of diagnosis.

N – The number of head and neck cancer patients who had IV systemic therapy as their first treatment.

Time from diagnosis to first radiation therapy within 45 days

n – The number of head and neck cancer patients who had a radiation therapy as their first treatment, who had the radiation therapy within 45 days of diagnosis.

N – The number of head and neck cancer patients who had radiation therapy as their first treatment.

Time from diagnosis to concurrent IV systemic therapy and radiation therapy within 45 days

n – The number of head and neck cancer patients who had a concurrent IV systemic therapy and radiation therapy as their first treatment, who had first concurrent IV systemic therapy radiation therapy treatment within 45 days of diagnosis.

N – The number of head and neck cancer patients who had a concurrent IV systemic therapy and RT as their first treatment.

Appendix 5: AIHW peer group definitions

The following definitions are sourced directly from Australian Institute of Health and Welfare (2015).

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.

Selection methodology:
The selection of Principal referral hospitals was guided by evidence of the following service units:

- 24-hour emergency department
- ICU
- all or most of the following specialised units: cardiac surgery, neurosurgery, infectious diseases, bone marrow transplant, organ (kidney, liver, heart, lung or pancreas) transplant and burns units.

Public acute group A hospitals

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.*

Selection methodology:
Public acute group A hospitals include those public acute hospitals that do not qualify as Principal referral hospitals, and possess all or most of the following characteristics:

- 24-hour emergency department
- ICU
- coronary care unit
- oncology unit
- more than 10% of acute weighted separations having a DRG with a cost weight greater than 4
- more than 200 DRGs with at least 5 separations

Private acute group A hospitals

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.

Selection methodology:
The selection of Private acute group A hospitals was guided by the presence of both of the following characteristics:

- 24-hour emergency department
- ICU

Selection was also guided by the presence of all or most of the following facilities:

- special care nursery unit
- coronary care unit
- cardiac surgery unit
- neurosurgery unit

Public acute 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.
Selection methodology:
Public acute group B hospitals do not have the high-end specialised service units that are in the Principal referral hospitals and the Public acute group A hospitals but have a 24-hour emergency department.

Private acute 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.

Selection methodology:
The selection of private acute hospitals for Group B hospitals was guided by the presence of an

ICU and all or most of the following characteristics:
• special care nursery unit
• coronary care unit
• cardiac surgery unit
• neurosurgery unit.
The selection process was essentially the same as for the Private acute group A hospitals except without the 24-hour emergency department component.

Public acute group C hospitals
Public acute group C hospitals include those public acute hospitals that provide a more limited range of services than *Principal referral hospitals* or *Public acute group A* and *B hospitals*, but do have an obstetric unit, provide surgical services and/or some form of emergency facility (emergency department, or accident and emergency service).

Selection methodology:
Public acute group C hospitals consist of public acute hospitals that do not meet the service characteristics of the Principal referral hospitals, Public acute group A hospitals and Public acute group B hospitals, but possess all or most of the following characteristics:
• proportion of separations with surgery greater than 4%
• obstetric unit
• emergency department, or accident and emergency service.

Hospitals with a high proportion of surgical separations with low cost weights are excluded from this group.

Private acute group C hospitals
Private acute group C hospitals are those private acute hospitals that do not provide emergency department services or have an intensive care unit but do provide specialised services in a range of clinical specialities.

Selection methodology:
The selection of Private acute group C hospitals was based on those private acute hospitals that:
• do not meet the service characteristics of Private acute group A hospitals and Private acute group B hospitals
• had at least 200 separations in 7 or more of the following 19 selected SRGs: Acute psychiatry; Breast surgery; Cardiology; Cardiothoracic surgery; Chemotherapy; Colorectal surgery; Ear, nose, throat, head and neck; Gastroenterology; Gynaecology; Neurology; Neurosurgery; Obstetrics; Oncology; Ophthalmology; Orthopaedics; Plastic and reconstructive surgery; Qualified neonate; Rehabilitation and Respiratory medicine.

Public acute group D hospitals
Public acute group D hospitals are acute public hospitals that offer a smaller range of services relative to other public acute hospitals and provide 200 or more separations per year. They are mostly situated in regional and remote areas.

Selection methodology:
Public acute group D hospitals consist of public acute hospitals that do not meet the service characteristics of the other public acute hospital groups, but have 200 or more separations per year. Hospitals with fewer than 200 separations were allocated to the Very small hospitals group.

Private acute group D hospitals
Private acute group D hospitals are those private acute hospitals that do not provide emergency department services or have an intensive care unit, do not provide specialised services in a range of clinical specialities, but had 200 or more separations

Queensland surgical facilities by AIHW peer group

AIHW peer group	Surgical facility
Principal referral hospitals	Gold Coast University Hospital
	Princess Alexandra Hospital
	Queensland Children's Hospital
	Royal Brisbane & Women's Hospital
	Sunshine Coast University Hospital
	The Prince Charles Hospital
	Townsville University Hospital

AIHW peer group	Surgical facility
Group A hospitals	Bundaberg Base Hospital
	Cairns Hospital
	Gold Coast Private Hospital
	Greenslopes Private Hospital
	Hervey Bay Hospital
	Ipswich Hospital
	John Flynn Private Hospital
	Logan Hospital
	Mater Hospital Brisbane
	Mater Private Hospital Brisbane
	Nambour General Hospital
	Noosa Hospital
	Pindara Private Hospital
	Rockhampton Hospital
	St Andrew's War Memorial Hospital
	St Vincent's Private Hospital Northside
	The Wesley Hospital
	Toowoomba Hospital
Group B hospitals	Buderim Private Hospital
	Caboolture Hospital
	Friendly Society Private Hospital
	Mater Private Hospital Townsville
	Robina Hospital
	St Andrew's Toowoomba Hospital
	St Vincent's Private Hospital Toowoomba
	Sunshine Coast University Private Hospital
Other hospitals	Brisbane Private Hospital
	Caboolture Private Hospital
	Cairns Day Surgery
	Cairns Private Hospital
	Chermside Day Hospital
	Gympie Private Hospital
	Ipswich Day Hospital
	Kawana Private Hospital
	Longreach Hospital
	Mater Private Hospital Bundaberg
	Mater Private Hospital Gladstone
	Mater Private Hospital Mackay
	Mater Private Hospital Rockhampton
	Mater Private Hospital Townsville (Hyde Park Campus)
	Nambour Selangor Private Hospital
	North West Private Hospital
	Pacific Private Day Hospital
	Peninsula Private Hospital
	Pindara Day Procedure Centre
	Roma Hospital
	South Bank Day Hospital
	St Andrew's Ipswich Private Hospital
	St Stephen's Hospital Hervey Bay
	Sunnybank Private Hospital
	Toowoomba Surgicentre

Definitions

1-year survival

The percentage of cancer cases still alive at one year or more from their earliest diagnosis with a given cancer.

2-year survival

The percentage of cancer cases still alive at two years or more from their earliest diagnosis with a given cancer.

5-year survival

The percentage of cancer cases still alive at five years or more from their earliest diagnosis with a given cancer.

2-year surgical survival

All-cause crude survival: the percentage of cases still alive two years after surgery.

Age-Standardised Rate (ASR)

The hypothetical rate, expressed as the number of cases per 100,000 persons, of cancer incidence or mortality in a group of people if their age distribution is the same as that in a standard or reference population.

ASR is used to compare cancer incidence or mortality between populations with different sizes and age structures. The different populations can represent different states or countries, as well as different time periods for the same geographic region.

ASR allows tracking of incidence and mortality trends that are not due to changes or differences in population size or age. Cancer incidence and mortality generally increases over time as a result of population growth and ageing. Similarly, cancer incidence will usually differ between two populations of similar sizes if one population is older than the other.

The standard populations used in calculation of ASR are listed below.

Age Group	Australia 2001	Australia 2001 (per 100,000)
0-4	1,282,357	6,600
5-9	1,351,664	7,000
10-14	1,353,177	7,000
15-19	1,352,745	7,000
20-24	1,302,412	6,700
25-29	1,407,081	7,200
30-34	1,466,615	7,500
35-39	1,492,204	7,700
40-44	1,479,257	7,600
45-49	1,358,594	7,000
50-54	1,300,777	6,700
55-59	1,008,799	5,200
60-64	822,024	4,200
65-69	682,513	3,500
70-74	638,380	3,300
75-79	519,356	2,700
80-84	330,050	1,700
85+	265,235	1,400
Total	19,413,240	100,000

ASR 3-year moving average

The average of the last 3 years of incidence or mortality ASRs per 100K. For example, Incidence ASR 3-year moving average of 2018 = ASR(2016 + 2017 + 2018)/3

Blank cells

Blank cells are used instead of 0% value, some results can have a denominator value '(N)' but not a numerator value 'n'. No rate can be calculated so it's left as blank.

Concurrent IVST and RT

A patient is counted as having concurrent chemoradiotherapy where they receive radiation (RT) therapy while receiving IV systemic therapy (IVST) or vice versa, where the second treatment starts before the end of the first. Methodology of assigning a concurrent IVST and RT therapy to a patient has been improved upon following the previous quality index.

Comorbidity

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

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.

Benign tumours were not considered comorbidities.

Co-morbidity list:		
AIDS	Acute myocardial infarction	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		

Confidence interval (CI)

The confidence interval represents the probability that a population parameter will fall between two set values. A very wide interval may indicate that more data should be collected before anything definite can be said about the parameter.

Diagnosis year

This report is structured around diagnosis years as recorded in the Queensland Cancer Register, the latest incident year being 2019. Only patients diagnosed between 2015 and 2019 will be included in this report. Patients who had surgery in 2015 but were diagnosed in an earlier year are excluded.

First Nations status

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

Flows

In-flows

In-flows show the proportion of patients treated in my HHS who reside outside of my HHS.

Out-flows

Out-flows show the proportion of patients residing in my HHS who travel to receive treatment in a different HHS.

Forest plots

The forest plot is a graphical display of the results from a regression model, illustrating the hazard ratio (HR) or relative risk (RR) for each covariate included in the regression model. The dot represents the estimate of the HR/RR with the confidence interval of the estimate represented by a horizontal line. A central vertical line representing no effect is also plotted, and if the confidence intervals for an estimate cross this line then the effect is considered not to be statistically significant.

Head and neck sub-site

Head and neck cancer has been disaggregated into 8 anatomical sub-sites based on the ICD-O 3rd edition WHO classification system – oral cavity, oropharynx, major salivary glands, nasopharynx, hypopharynx, other pharynx, nasal cavity and paranasal sinuses, and larynx (see Appendix 2 for more information).

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.

Hospital peer groups

The Australian Institute of Health and Welfare (AIHW) have published The Australian hospital peer groups report that groups public and private hospitals that share similar characteristics, providing a basis for meaningful comparisons. There are thirty peer groups, nine of which are relevant to this report. Peer group definitions and groupings used in this report are defined in Appendix 5.

Hospital stay

The median time between the admission and discharge date of a patient's cancer surgery.

Interquartile range (IQR)

The interquartile range is a measure of variability, based on dividing a data set into quartiles. Quartiles divide a rank-ordered data set into four equal parts. The values that separate these parts are called the first, second, and third quartiles; and they are denoted by Q1, Q2(median), and Q3, respectively. The IQR is the distance between the 75thand 25thpercentiles, IQR=Q3–Q1.

Intravenous systemic therapy (IVST)

Systemic therapy is the use of anti-cancer drugs to destroy cancer cells. A patient is counted as having IVST as treatment if they receive intravenous systemic therapy within 30 days prior and within 365 days of diagnosis. Note this report does not include oral chemotherapy.

QOOL MDT Review

Cancer patients are discussed by a Multidisciplinary Team to make sure that all available treatment options are considered.

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.

Median age (yrs)

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

Mortality

90-day mortality: The percentage of patients that die within 90 days following their surgery.

Pathological diagnosis

Confirmation of cancer through pathological tests.

Private facility

All other hospitals that are not Queensland Health hospitals.

Public facility

Queensland Health hospitals.

Radiation therapy (RT)

Radiation therapy (RT) uses X-rays to destroy or injure cancer cells so they cannot multiply. RT can be used to treat the primary cancer or advanced cancer. It can also be used to reduce the size of the cancer and relieve pain, discomfort or other symptoms. A patient is counted as having radiation therapy as treatment if they receive radiation therapy 30 days prior and within 365 days of diagnosis.

Remoteness

The relative remoteness of residence at time of diagnosis, based on the Australian Standard Geographical Classification (ASGC). In this report, remoteness is classified into three groups: Metropolitan, Regional and Rural & Remote.

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.

Socio-economic status

Socio-economic 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 socio-economic groups.

SEIFA Group	Decile	Percentage of population (approximate)
Disadvantaged	1-2	20%
Middle	3-8	60%
Affluent	9-10	20%

Surgery

Includes Queensland residents of all ages diagnosed with invasive cancer who had surgery 30 days prior and 365 days post diagnosis. In this report, surgery refers to treatment of the primary lesion. A patient is considered to have had surgery where a patient has had a primary resection specific to that site, note that for major salivary glands this also includes nodal resection (see Appenix 4 for more detail about the methodology and ICD-10-AM procedure codes used). Where a patient only had a nodal resection and/or reconstruction and repair procedure this is not considered surgery for the surgical indicators in this report.

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