Townsville Hospital and Health Service

Health Service Plan

Activity and Capacity Requirement Projections

Queensland Government

Health Service Plan Activity and Capacity Requirement Projections

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1. Introduction

Carramar Consulting has been engaged to provide health service planning services for the Townsville Hospital and Health Service (THHS).

The purpose of the engagement is to support the Chief Executive and Board to make decisions regarding the development of services across the THHS, by exploring the implications of a number of alternative service options for The Townsville Hospital (TTH) and rural hospitals, in terms of health service activity and capacity requirements.

In accordance with Request for Proposal documentation, the second step in this process (following preparation of a background paper, previously submitted), is the production of a 'Scenario Modelling Assumptions Paper' describing the assumptions proposed for inclusion in projecting health service activity and capacity requirements for the THHS. Three scenario's including a base case/status quo scenario were proposed.

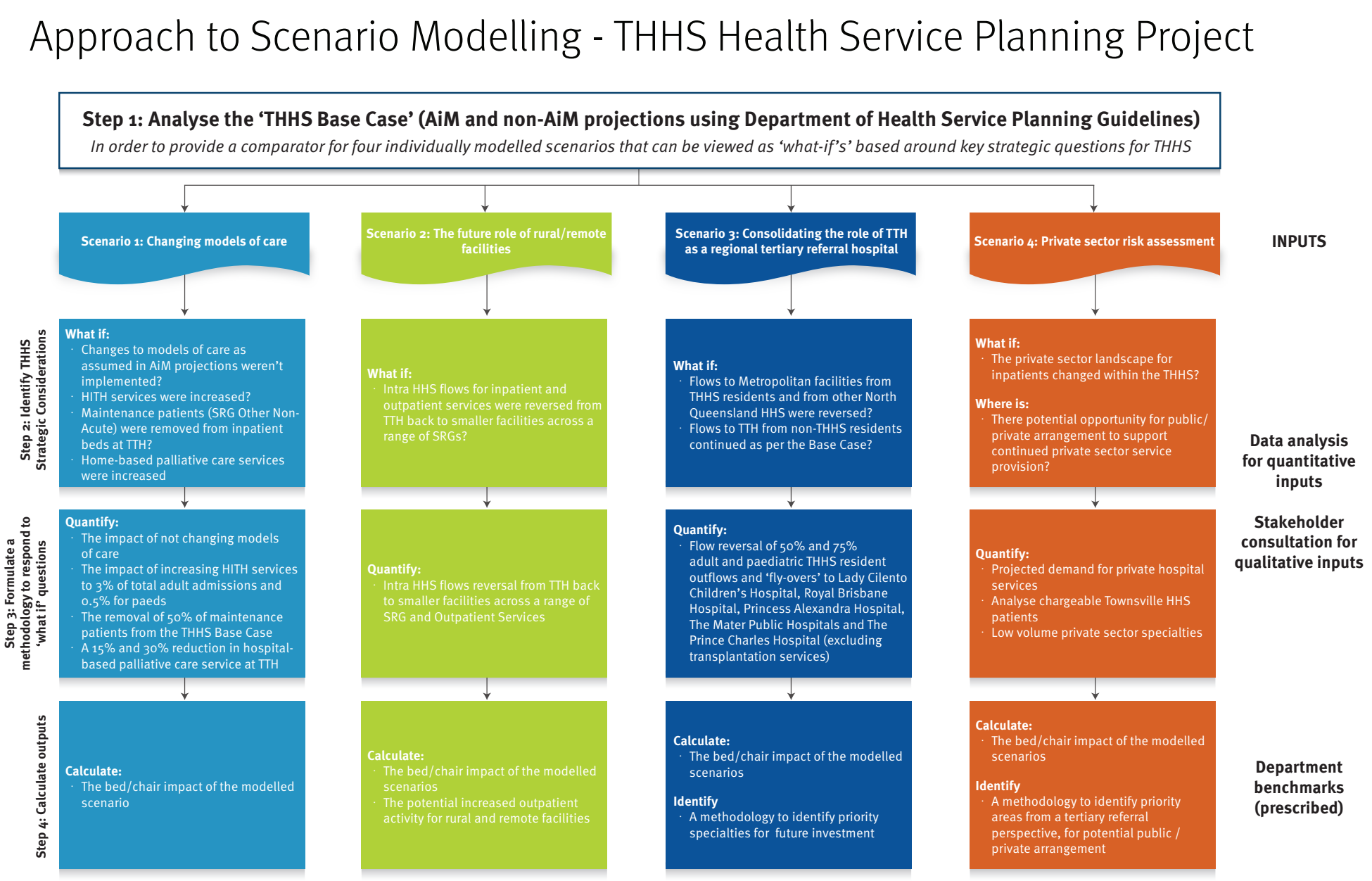
During a meeting on 31 May 2017 with Dr Peter Bristow, THHS Chief Executive, a proposal for modelling a 'base case' plus four scenarios was agreed. These scenarios can be viewed as 'what-if's' based around key strategic questions for THHS. That is, what would the impact be, in terms of health service activity and capacity requirements at TTH, if the THHS:

- Systematically implemented a series of targeted model of care changes aimed at reducing demand on acute inpatient beds? (Scenario 1)
- Pursued an altered future role for rural / remote facilities? (Scenario 2)
- Took steps to consolidate the role of TTH as a regional tertiary referral facility across a range of prioritised specialty services? (Scenario 3)
- Pursued public/private arrangements for future acute service delivery? (Scenario 4).

Information presented within this Paper has been structured around this approach to scenario modelling, and has involved the four step process and inclusion of inputs outlined in Figure 1 below.

Notes:
For ease of analysis and interpretation, services have been 'grouped' according to clinical specialty. A map of this grouping - ESRG › SRG › Specialty Grouping is provided at Appendix A.

Figure 1: Approach to Scenario Modelling for the THHS Health Service Planning Project



2. STEP 1: Analyse the 'THHS Base Case'

2.1. Introduction

Each year, the System Planning Branch, Department of Health provides annual projections of future health service activity to each Hospital and Health Service. The projections of future health service activity are a collection of medium term, health service planning projections that project anticipated healthcare demand by service type and location.

The Acute Inpatient Modelling (AIM) tool is the endorsed source of projected activity for a number of admitted health services. For the purposes of this report, the 'Base Case' refers to all activity projections sourced through the Department - including those sourced through the AIM tool (file titled 2014-15 Base Year Purchasing Scenario) and those sourced through an alternate projection methodology.

What is the 'THHS Base Case'?

How is it produced (overview of methodologies)?

What does it show and why are we looking at it?

The Queensland Department of Health, Health Service Planning Guidelines (previously referred to as service planning benchmarks) exist as standard methodologies to project future activity for a number of activity streams presented in this document. To access these specific projection methodologies go to:

http://qheps.health.qld.gov.au/ppb/html/ppb_plan_guidelines_home.htm

Alternately and for quick reference, a summary of methodologies for projecting health service activity is provided at Appendix B.

Importantly, the 'Base Case' does not reflect a 'status quo' scenario that makes no significant changes to models of care.

The 'Base Case' does not reflect a 'status quo' scenario that makes no significant changes to models of care

For example, while projection methodologies differ, the AIM tool provides projections based on the historical trend of separations, current utilisation of services and current referral patterns. The tool generates a model of projected activity which assumes that trends will change over time, for example, that the impact of technology will mean that Average Length of Stay (ALOS) across some specialties will continue to shorten, or that an admission rate for certain procedures will continue to fall.

Even so, for the purposes of this planning project the 'Base Case' is reviewed in order to provide a comparator for four individually modelled scenario's that can be viewed as 'what-if's' based around key strategic questions for THHS. That is, what would the impact be, in terms of health service activity and capacity requirements at TTH, if the THHS:

- Systematically implemented a series of targeted model of care changes aimed at reducing demand on acute inpatient beds?
- Pursued an altered future role for its rural / remote facilities?
- Took steps to consolidate the role of TTH as a regional tertiary referral facility across a range of prioritised specialty services?
- Pursued public/private arrangements for future acute service delivery?

These questions are explored within Sections 3 through to 6 of this report.

2.2. Population Projections Underpinning the Base Case

AIM and non-AIM projections are informed by a variety of inputs and one of the most important of these is population projections provided by the Australian Bureau of Statistics (ABS), applied with detail locally by the Queensland Government Statistician's Office (QGSO).

Population level 2016 Census data was released by the ABS at the end of June 2017 allowing a comparison of:

- The 2015 edition population projections for the year 2016. These are prepared by the Queensland Government Statistician's Office and underpin AIM and other non-AIM population-based projections (such as mental health) and
- The 2016 Census population data from the ABS.

Analysis of the total THHS population indicates that the 2015 edition projections overestimated population growth in the region with just over 15,000 people less counted in the 2016 Census than were predicted. When analysed by 5 year age group, the largest differences were in the younger age groups (persons aged 0-40 years). In contrast, actual population growth in the older age groups has been largely in line with that previously projected.

Comparison of the 2011 and 2016 Census figures show a reduction in the total THHS population aged under 55 years with increased numbers in each 5 year age group for people aged 55 and over.
(Note: For the purposes of this analysis and to address issues of geographic comparability between the two datasets, the Planning Regions in Townsville have been grouped together, and no adjustment has been made for Planning Regions that have partial geographies located in other HHSs.)

Table 1: Population by Age Group, THHS, 2011 vs. 2016 Projected vs. 2016 Census

Age Group	2011 Population	2016 Population (QGSO Projection)	2016 Population (Census 2016)	Difference (Census minus Projection)	Population Change - 2011 to 2016 Census
0–4	16,849	17,630	15,764	-1,866	-1,085
5–9	16,156	17,667	16,467	-1,200	311
10–14	16,549	17,273	15,930	-1,343	-619
15–19	17,898	18,788	16,724	-2,064	-1,174
20–24	18,773	20,071	18,641	-1,430	-132
25–29	17,951	18,660	16,947	-1,713	-1,004
30–34	15,895	18,249	16,394	-1,855	499
35–39	16,595	16,239	14,973	-1,266	-1,622
40–44	16,843	16,959	16,131	-828	-712
45–49	16,268	17,191	16,303	-888	35
50–54	16,050	16,422	15,832	-590	-218
55–59	13,779	15,850	15,351	-499	1,572
60–64	12,152	13,450	13,302	-148	1,150
65–69	9,133	11,665	11,940	275	2,807
70–74	6,726	8,614	8,463	-151	1,737
75–79	4,825	6,035	6,095	60	1,270
80–84	3,631	3,948	3,918	-30	287
85+	2,961	3,736	3,637	-99	676
Total THHS	**239,034**	**258,446**	**242,812**	**-15,634**	**3,778**

Sources: Queensland Government population projections, 2015 edition; Australian Bureau of Statistics, Population by age and sex, regions of Australia, 2014

*Australian Bureau of Statistics 2016 Quickstats (***http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/2016%20QuickStats***)*

Note: unadjusted for SA2s with a proportion outside of THHS so will slightly overestimate population totals

Analysis by Local Planning Region indicates that the 2016 ABS Census population is lower than the QGSO projection across all Local Planning Regions. The largest difference between the projected and 2016 Census population figures is in Townsville, the area with the largest proportion of the population in THHS. Local Planning Regions in Townsville were the only areas to record an increase in population between 2011 and 2016 according to the Census data. Refer to Table 2.

Table 2: Population by Local Planning Region, THHS, 2011 vs. 2016 Projected vs. 2016 Census

Local Planning Region	2011 Population	2016 Population (QGSO Projection)	2016 Population (Census 2016)	Difference (Census minus Projection)	Population Change - 2011 to 2016 Census
Townsville (City, North and South)	182,197	201,444	186,800	-14,644	4,603
Hinchinbrook	24,939	24,800	23,990	-810	-949
Burdekin	17,703	17,937	17,037	-900	-666
Charters Towers	12,434	12,551	11,875	-676	-559
Northern Highlands	3,772	3,730	3,110	-620	-662
Total THHS	**239,034**	**258,446**	**242,812**	**-15,634**	**3,778**

Sources: Queensland Government population projections, 2015 edition; Australian Bureau of Statistics, Population by age and sex, regions of Australia, 2014 Australian Bureau of Statistics 2016 Quickstats (**http://www.abs.gov.au/websitedbs/D3310114.nsf/Home/2016%20QuickStats**)
Note: unadjusted for SA2s with a proportion outside of THHS so will slightly overestimate population totals

In conclusion, as total population growth has not been as high as originally projected there is a risk that the Base Case will over-project future requirements for specific services, particularly in the short to medium term. This must be considered when undertaking detailed work including master planning and workforce planning. It is expected that the next version of AIM will include updated projections as informed by the 2016 census and it would therefore be important to update projections underpinning such work as and when the next version becomes available.

2.3. AIM Base Case Activity Projections

THHS admitted activity (projected using AIM as the endorsed projection methodology) is projected to increase from 49,160 separations in 2014/15 to 106,940 separations in 2036/37. This represents an annual growth rate (AGR) of 3.6%. Adult activity is projected to increase at a faster rate (3.7% per year) than paediatric activity (2.2% per year), and same day activity is projected to increase at a faster rate than overnight activity. Refer to Table 3.

Table 3: Total Activity, THHS by Adult / Child and Stay Type, 2014/15 to 2036/37

Adult/ Child	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Adult	**ON**	29,964	165,126	45,371	224,197	63,243	299,317	33,279	134,191	3.5%	2.7%
	SD	15,103	15,103	24,996	24,996	37,044	37,044	21,941	21,941	4.2%	4.2%
Adult Total		**45,067**	**180,229**	**70,367**	**249,193**	**100,286**	**336,361**	**55,219**	**156,132**	**3.7%**	**2.9%**
Child	**ON**	2,532	7,387	3,165	7,782	3,723	8,524	1,191	1,137	1.8%	0.7%
	SD	1,561	1,561	2,255	2,255	2,931	2,931	1,370	1,370	2.9%	2.9%
Child Total		**4,093**	**8,948**	**5,420**	**10,037**	**6,654**	**11,455**	**2,561**	**2,507**	**2.2%**	**1.1%**
TOTAL		**49,160**	**189,177**	**75,787**	**259,230**	**106,940**	**347,816**	**57,780**	**158,639**	**3.6%**	**2.8%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The majority of separations in 2014/15 were for general medical and surgical / procedural services. Adult separations are projected to grow at 3.7% per year across THHS from 2014/15 to 2036/37. The highest growth rates are projected to be for subacute services (palliative care, rehab, other non-acute, GEM) and neurosciences. Same day services are projected to grow at a higher rate (4.2% annually) than overnight services (3.5% annually) across all specialty groupings. Refer to Table 4.

Table 4: Adult Activity, THHS by Stay Type and Specialty Grouping, 2014/15 to 2036/37

Stay Type	Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Medical**	10,505	43,413	16,372	62,356	23,336	83,891	12,831	40,478	3.7%	3.0%
	Surgical/ Procedural	9,786	44,107	14,622	61,085	20,230	79,333	10,444	35,226	3.4%	2.7%
	Cardiothoracic	1,796	10,096	2,469	11,143	3,162	12,902	1,366	2,806	2.6%	1.1%
	Neurosciences	2,258	14,500	3,765	20,301	5,619	27,797	3,361	13,297	4.2%	3.0%
	Obstetrics and Gynaecology	3,889	10,491	4,484	11,011	5,017	11,471	1,128	980	1.2%	0.4%
	Subacute	1,730	42,519	3,659	58,301	5,878	83,924	4,148	41,405	5.7%	3.1%
ON Total		**29,964**	**165,126**	**45,371**	**224,197**	**63,243**	**299,317**	**33,279**	**134,191**	**3.5%**	**2.7%**
SD	**Medical**	4,829	4,829	8,900	8,900	13,906	13,906	9,077	9,077	4.9%	4.9%
	Surgical / Procedural	7,560	7,560	11,598	11,598	16,600	16,600	9,040	9,040	3.6%	3.6%
	Cardiothoracic	60	60	78	78	101	101	41	41	2.4%	2.4%
	Neurosciences	1,074	1,074	2,344	2,344	3,927	3,927	2,853	2,853	6.1%	6.1%
	Obstetrics and Gynaecology	1,539	1,539	1,986	1,986	2,367	2,367	828	828	2.0%	2.0%
	Subacute	41	41	89	89	142	142	101	101	5.8%	5.8%
SD Total		**15,103**	**15,103**	**24,996**	**24,996**	**37,044**	**37,044**	**21,941**	**21,941**	**4.2%**	**4.2%**
Grand Total		**45,067**	**180,229**	**70,367**	**249,193**	**100,286**	**336,361**	**55,219**	**156,132**	**3.7%**	**2.9%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Paediatric separations are projected to grow at 2.2% per year across THHS from 2014/15 to 2036/37. The highest growth rates are projected for same day medical services and neurosciences, along with subacute overnight separations. Same day services are projected to grow at a higher rate (2.9% annually) than overnight services (1.8% annually) across all specialty groupings. Refer to Table 5.

Table 5: Paediatric Activity, THHS by Stay Type and Specialty Grouping, 2014/15 to 2036/37

Stay Type	Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Medical**	1,132	2,840	1,416	3,274	1,711	3,748	579	908	1.9%	1.3%
	Surgical / Procedural	1,166	3,562	1,401	3,314	1,587	3,466	421	-96	1.4%	-0.1%
	Cardiothoracic	47	208	71	315	82	367	35	159	2.6%	2.6%
	Neurosciences	167	680	249	729	306	762	139	82	2.8%	0.5%
	Obstetrics and Gynaecology	11	22	13	24	16	29	5	7	1.8%	1.3%
	Subacute	9	75	15	126	21	151	12	76	3.9%	3.2%
ON Total		**2,532**	**7,387**	**3,165**	**7,782**	**3,723**	**8,524**	**1,191**	**1,137**	**1.8%**	**0.7%**
SD	**Medical**	406	406	675	675	972	972	566	566	4.0%	4.0%
	Surgical / Procedural	1,017	1,017	1,338	1,338	1,593	1,593	576	576	2.1%	2.1%
	Cardiothoracic	0	0	0	0	0	0	0	0	-	-
	Neurosciences	130	130	224	224	329	329	199	199	4.3%	4.3%
	Obstetrics and Gynaecology	8	8	10	10	13	13	5	5	2.2%	2.2%
	Subacute	0	0	7	7	25	25	25	25	-	-
SD Total		**1,561**	**1,561**	**2,255**	**2,255**	**2,931**	**2,931**	**1,370**	**1,370**	**2.9%**	**2.9%**
Grand Total		**4,093**	**8,948**	**5,420**	**10,037**	**6,654**	**11,455**	**2,561**	**2,507**	**2.2%**	**1.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

2.3.1. Medical

Adult medical services are projected to increase from 15,334 separations in 2014/15 to 37,242 in 2036/37; a growth rate of 4.1% per year. The highest volume specialties are projected to be respiratory medicine, non-subspecialty medicine, immunology and infections, cardiology and gastroenterology. Refer to Table 6.

Table 6: Adult Medical Activity, THHS by Stay Type and SRG, 2014/15 to 2036/37

Stay Type	Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Cardiology**	2,010	5,925	2,972	8,566	3,932	10,808	1,922	4,883	3.1%	2.8%
	Dermatology	101	422	157	652	220	812	119	390	3.6%	3.0%
	Drug & Alcohol	494	968	666	1,260	758	1,327	264	359	2.0%	1.4%
	Endocrinology	718	2,791	962	3,554	1,262	4,388	544	1,597	2.6%	2.1%
	Gastroenterology	682	2,367	1,228	3,927	1,870	5,532	1,188	3,165	4.7%	3.9%
	Haematology	401	3,009	574	2,757	702	2,681	301	-328	2.6%	-0.5%
	Immunology & Infections	1,505	7,134	2,425	10,947	3,595	15,540	2,090	8,406	4.0%	3.6%
	Medical Oncology	392	2,221	411	2,066	418	1,922	26	-299	0.3%	-0.7%
	Non-Subspecialty Medicine	1,588	6,596	2,917	10,775	4,689	16,301	3,101	9,705	5.0%	4.2%
	Renal Medicine	279	1,502	449	2,032	672	2,977	393	1,475	4.1%	3.2%
	Respiratory Medicine	2,086	9,447	3,211	14,281	4,628	19,449	2,542	10,002	3.7%	3.3%
	Rheumatology	249	1,031	401	1,538	589	2,153	340	1,122	4.0%	3.4%
ON Total		**10,505**	**43,413**	**16,372**	**62,356**	**23,336**	**83,891**	**12,831**	**40,478**	**3.7%**	**3.0%**
SD	**Cardiology**	1,469	1,469	2,890	2,890	4,580	4,580	3,111	3,111	5.3%	5.3%
	Dermatology	215	215	232	232	292	292	77	77	1.4%	1.4%
	Drug & Alcohol	445	445	727	727	849	849	404	404	3.0%	3.0%
	Endocrinology	470	470	603	603	808	808	338	338	2.5%	2.5%
	Gastroenterology	361	361	726	726	1,161	1,161	800	800	5.5%	5.5%
	Haematology	184	184	295	295	438	438	254	254	4.0%	4.0%
	Immunology & Infections	161	161	466	466	862	862	701	701	7.9%	7.9%
	Medical Oncology	196	196	224	224	236	236	40	40	0.8%	0.8%
	Non-Subspecialty Medicine	759	759	1,507	1,507	2,521	2,521	1,762	1,762	5.6%	5.6%
	Renal Medicine	194	194	379	379	669	669	475	475	5.8%	5.8%
	Respiratory Medicine	375	375	851	851	1,491	1,491	1,116	1,116	6.5%	6.5%
SD Total		**4,829**	**4,829**	**8,900**	**8,900**	**13,906**	**13,906**	**9,077**	**9,077**	**4.9%**	**4.9%**
Grand Total		**15,334**	**48,242**	**25,273**	**71,256**	**37,242**	**97,797**	**21,908**	**49,555**	**4.1%**	**3.3%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Adult medical services are projected to increase at the highest growth rate (4.4% annually) at TTH. In 2036/37, TTH is projected to account for 30,694 of 37,242 total adult medical separations across THHS. Refer to Table 7.

Table 7: Adult Medical Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**ON**	7,911	33,265	12,847	48,776	18,801	67,055	10,890	33,790	4.0%	3.2%
	SD	4,072	4,072	7,541	7,541	11,893	11,893	7,821	7,821	5.0%	5.0%
Townsville Total		**11,983**	**37,337**	**20,388**	**56,317**	**30,694**	**78,948**	**18,711**	**41,611**	**4.4%**	**3.5%**
Ayr	**ON**	737	2,852	1,062	4,197	1,410	5,355	673	2,503	3.0%	2.9%
	SD	169	169	311	311	453	453	284	284	4.6%	4.6%
Ayr Total		**906**	**3,021**	**1,373**	**4,508**	**1,863**	**5,808**	**957**	**2,787**	**3.3%**	**3.0%**
Charters Towers	**ON**	604	2,200	821	3,092	1,060	3,875	456	1,675	2.6%	2.6%
	SD	241	241	394	394	557	557	316	316	3.9%	3.9%
Charters Towers Total		**845**	**2,441**	**1,215**	**3,486**	**1,617**	**4,432**	**772**	**1,991**	**3.0%**	**2.7%**
Home Hill	**ON**	30	197	39	310	54	422	24	225	2.7%	3.5%
	SD	32	32	53	53	78	78	46	46	4.1%	4.1%
Home Hill Total		**62**	**229**	**92**	**363**	**132**	**500**	**70**	**271**	**3.5%**	**3.6%**
Hughenden	**ON**	109	467	127	479	145	500	36	33	1.3%	0.3%
	SD	30	30	46	46	67	67	37	37	3.7%	3.7%
Hughenden Total		**139**	**497**	**174**	**526**	**212**	**567**	**73**	**70**	**1.9%**	**0.6%**
Ingham	**ON**	765	3,142	1,085	4,165	1,444	5,312	679	2,170	2.9%	2.4%
	SD	208	208	435	435	703	703	495	495	5.7%	5.7%
Ingham Total		**973**	**3,350**	**1,521**	**4,601**	**2,147**	**6,015**	**1,174**	**2,665**	**3.7%**	**2.7%**
Joyce Palmer Health Service	**ON**	277	978	304	1,040	325	1,041	48	63	0.7%	0.3%
	SD	60	60	90	90	115	115	55	55	3.0%	3.0%
Joyce Palmer Health Service Total		**337**	**1,038**	**394**	**1,130**	**439**	**1,156**	**102**	**118**	**1.2%**	**0.5%**
Richmond	**ON**	72	312	85	294	97	332	25	20	1.4%	0.3%
	SD	17	17	30	30	41	41	24	24	4.0%	4.0%
Richmond Total		**89**	**329**	**115**	**324**	**138**	**372**	**49**	**43**	**2.0%**	**0.6%**
Grand Total		**15,334**	**48,242**	**25,273**	**71,256**	**37,242**	**97,797**	**21,908**	**49,555**	**4.1%**	**3.3%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: The tables include ICU/CCU bed days at TTH (332 ICU and 509 CCU bed days in 2014/15)

2.3.2. Surgical / Procedural

Adult surgical / procedural services are projected to increase from 17,346 separations in 2014/15 to 36,830 in 2036/37; a growth rate of 3.5% per year. The highest volume specialties are projected to be non-subspecialty surgery and orthopaedic services. Refer to Table 8.

Note: Endoscopy services are projected utilising a non-AIM methodology. However, they have been included in this AIM projection to ensure bed days are accounted for and included when calculating treatment spaces.

Table 8: Adult Surgical / Procedural Activity, THHS by Stay Type and SRG, 2014/15 to 2036/37

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Breast Surgery**	79	189	115	272	153	356	74	167	3.1%	2.9%
	Colorectal Surgery	330	2,284	450	2,980	572	3,553	242	1,269	2.5%	2.0%
	Dentistry	126	271	161	339	204	420	78	149	2.2%	2.0%
	Diagnostic GI Endoscopy	285	1,608	509	2,091	751	2,868	466	1,260	4.5%	2.7%
	Ear, Nose & Throat	573	1,291	742	1,515	976	1,937	403	646	2.4%	1.9%
	Extensive Burns	25	75	27	159	30	166	5	91	0.9%	3.7%
	Haematological Surgery	95	1,433	120	1,595	147	1,835	52	402	2.0%	1.1%
	Head & Neck Surgery	160	312	246	448	336	576	176	264	3.4%	2.8%
	Maxillo Surgery	136	298	116	230	89	172	-47	-126	-1.9%	-2.5%
	Non-Subspecialty Surgery	3,031	10,130	4,626	15,136	6,548	19,988	3,517	9,858	3.6%	3.1%
	Ophthalmology	186	481	251	609	329	770	143	289	2.6%	2.2%
	Orthopaedics	2,451	12,373	3,727	18,750	5,255	25,641	2,804	13,268	3.5%	3.4%
	Plastic & Reconstructive Surgery	256	1,504	392	2,028	554	2,661	298	1,157	3.6%	2.6%
	Prolonged Ventilation	144	3,460	164	3,367	195	3,582	51	122	1.4%	0.2%
	Upper GIT Surgery	686	2,544	995	3,615	1,308	4,558	622	2,014	3.0%	2.7%
	Urology	705	2,414	1,237	3,568	1,828	4,963	1,123	2,549	4.4%	3.3%
	Vascular Surgery	518	3,440	745	4,383	955	5,287	437	1,847	2.8%	2.0%
ON Total		**9,786**	**44,107**	**14,622**	**61,085**	**20,230**	**79,333**	**10,444**	**35,226**	**3.4%**	**2.7%**

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
SD	**Breast Surgery**	90	90	110	110	131	131	41	41	1.7%	1.7%
	Colorectal Surgery	73	73	114	114	157	157	84	84	3.6%	3.6%
	Dentistry	214	214	256	256	302	302	88	88	1.6%	1.6%
	Diagnostic GI Endoscopy	338	338	378	378	415	415	77	77	0.9%	0.9%
	Ear, Nose & Throat	330	330	393	393	512	512	182	182	2.0%	2.0%
	Extensive Burns	6	6	6	6	7	7	1	1	0.8%	0.8%
	Haematological Surgery	26	26	35	35	45	45	19	19	2.5%	2.5%
	Head & Neck Surgery	41	41	54	54	70	70	29	29	2.4%	2.4%
	Maxillo Surgery	3	3	4	4	5	5	2	2	1.9%	1.9%
	Non-Subspecialty Surgery	1,884	1,884	3,202	3,202	4,973	4,973	3,089	3,089	4.5%	4.5%
	Ophthalmology	1,165	1,165	1,999	1,999	2,970	2,970	1,805	1,805	4.3%	4.3%
	Orthopaedics	1,754	1,754	2,575	2,575	3,590	3,590	1,836	1,836	3.3%	3.3%
	Plastic & Reconstructive Surgery	498	498	741	741	952	952	454	454	3.0%	3.0%
	Prolonged Ventilation	0	0	0	0	0	0	0	0	-	-
	Upper GIT Surgery	160	160	293	293	444	444	284	284	4.7%	4.7%
	Urology	624	624	1,028	1,028	1,518	1,518	894	894	4.1%	4.1%
	Vascular Surgery	354	354	408	408	510	510	156	156	1.7%	1.7%
SD Total		**7,560**	**7,560**	**11,598**	**11,598**	**16,600**	**16,600**	**9,040**	**9,040**	**3.6%**	**3.6%**
Grand Total		**17,346**	**51,667**	**26,220**	**72,683**	**36,830**	**95,933**	**19,484**	**44,266**	**3.5%**	**2.9%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Adult surgical / procedural services are projected to increase at the highest growth rate (3.6% annually) at TTH. In 2036/37, TTH is projected to account for 33,401 of 36,830 total surgical / procedural separations across THHS. Refer to Table 9.

Table 9: Adult Surgical / Procedural Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**ON**	8,665	40,587	13,108	55,941	18,261	72,756	9,596	32,169	3.4%	2.7%
	SD	6,724	6,724	10,467	10,467	15,141	15,141	8,417	8,417	3.8%	3.8%
Townsville Total		**15,389**	**47,311**	**23,576**	**66,408**	**33,401**	**87,897**	**18,012**	**40,586**	**3.6%**	**2.9%**
Ayr	**ON**	331	957	476	1,556	642	2,042	311	1,085	3.1%	3.5%
	SD	206	206	270	270	341	341	135	135	2.3%	2.3%
Ayr Total		**537**	**1,163**	**746**	**1,826**	**984**	**2,384**	**447**	**1,221**	**2.8%**	**3.3%**
Charters Towers	**ON**	204	628	283	949	377	1,269	173	641	2.8%	3.3%
	SD	200	200	277	277	371	371	171	171	2.8%	2.8%
Charters Towers Total		**404**	**828**	**559**	**1,225**	**748**	**1,640**	**344**	**812**	**2.8%**	**3.2%**
Home Hill	**ON**	3	138	5	151	7	210	4	72	4.1%	1.9%
Home Hill Total		**3**	**138**	**5**	**151**	**7**	**210**	**4**	**72**	**4.1%**	**1.9%**
Hughenden	**ON**	53	204	63	200	71	211	18	7	1.3%	0.2%
	SD	22	22	24	24	28	28	6	6	1.1%	1.1%
Hughenden Total		**75**	**226**	**87**	**224**	**98**	**239**	**23**	**13**	**1.2%**	**0.3%**
Ingham	**ON**	358	1,103	499	1,769	663	2,305	305	1,202	2.8%	3.4%
	SD	340	340	471	471	610	610	270	270	2.7%	2.7%
Ingham Total		**698**	**1,443**	**970**	**2,241**	**1,273**	**2,915**	**575**	**1,472**	**2.8%**	**3.2%**
Joyce Palmer Health Service	**ON**	150	454	165	471	182	486	32	32	0.9%	0.3%
	SD	47	47	63	63	79	79	32	32	2.4%	2.4%
Joyce Palmer Health Service Total		**197**	**501**	**228**	**534**	**261**	**565**	**64**	**64**	**1.3%**	**0.5%**
Richmond	**ON**	22	36	24	48	28	52	6	16	1.1%	1.7%
	SD	21	21	25	25	30	30	9	9	1.6%	1.6%
Richmond Total		**43**	**57**	**49**	**73**	**57**	**82**	**14**	**25**	**1.3%**	**1.7%**
Grand Total		**17,346**	**51,667**	**26,220**	**72,683**	**36,830**	**95,933**	**19,484**	**44,266**	**3.5%**	**2.9%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: The tables include ICU/CCU bed days at TTH (1,808 ICU and 132 CCU bed days in 2014/15)

2.3.3. Cardiothoracic

Adult cardiothoracic services are projected to increase from 1,856 separations in 2014/15 to 3,264 in 2036/37; a growth rate of 2.6% per year. The highest volume specialty is projected to be interventional cardiology. Refer to Table 10.

Notes: Interventional cardiology services are projected utilising a non-AIM methodology. However, they have been included in this AIM projection to ensure bed days are accounted for and included when calculating treatment spaces. All cardiothoracic activity is undertaken at TTH.

Table 10: Adult Cardiothoracic Activity, THHS by Stay Type and SRG, 2014/15 to 2036/37

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	Cardiac Surgery	353	3,663	423	3,413	472	3,451	119	-212	1.3%	-0.3%
	Interventional Cardiology	1,291	5,188	1,838	6,351	2,431	7,851	1,140	2,663	2.9%	1.9%
	Thoracic Surgery	152	1,245	209	1,378	259	1,600	107	355	2.5%	1.1%
ON Total		**1,796**	**10,096**	**2,469**	**11,143**	**3,162**	**12,902**	**1,366**	**2,806**	**2.6%**	**1.1%**
SD	Cardiac Surgery	1	1	0	0	0	0	-1	-1	-7.0%	-7.0%
	Interventional Cardiology	57	57	74	74	97	97	40	40	2.4%	2.4%
	Thoracic Surgery	2	2	3	3	4	4	2	2	3.7%	3.7%
SD Total		**60**	**60**	**78**	**78**	**101**	**101**	**41**	**41**	**2.4%**	**2.4%**
Grand Total		**1,856**	**10,156**	**2,547**	**11,220**	**3,264**	**13,003**	**1,408**	**2,847**	**2.6%**	**1.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: Table include ICU/CCU bed days at TTH (645 ICU and 2,476 CCU bed days in 2014/15)

Table 11: Adult Cardiothoracic Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	ON	1,795	10,091	2,468	11,138	3,161	12,899	1,366	2,808	2.6%	1.1%
	SD	60	60	78	78	101	101	41	41	2.4%	2.4%
Townsville Total		**1,855**	**10,151**	**2,546**	**11,216**	**3,263**	**13,001**	**1,408**	**2,850**	**2.6%**	**1.1%**
Ayr	ON	1	5	1	4	1	2	0	-3	0.9%	-3.7%
Ayr Total		**1**	**5**	**1**	**4**	**1**	**2**	**0**	**-3**	**0.9%**	**-3.7%**
Grand Total		**1,856**	**10,156**	**2,547**	**11,220**	**3,264**	**13,003**	**1,408**	**2,847**	**2.6%**	**1.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: Table include ICU/CCU bed days at TTH (645 ICU and 2,476 CCU bed days in 2014/15)

2.3.4. Neurosciences

Adult neurosciences services are projected to increase from 3,332 separations in 2014/15 to 9,546 separations in 2036/37; a growth rate of 4.9% per year. The highest volume specialty is projected to be neurology. Refer to Table 12.

Table 12: Adult Neurosciences Activity, THHS by Stay Type and SRG, 2014/15 to 2036/37

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Neurology**	1,650	9,263	2,849	13,514	4,339	19,173	2,689	9,910	4.5%	3.4%
	Neurosurgery	608	5,237	916	6,787	1,280	8,624	672	3,387	3.4%	2.3%
ON Total		**2,258**	**14,500**	**3,765**	**20,301**	**5,619**	**27,797**	**3,361**	**13,297**	**4.2%**	**3.0%**
SD	**Neurology**	924	924	2,084	2,084	3,486	3,486	2,562	2,562	6.2%	6.2%
	Neurosurgery	150	150	260	260	441	441	291	291	5.0%	5.0%
SD Total		**1,074**	**1,074**	**2,344**	**2,344**	**3,927**	**3,927**	**2,853**	**2,853**	**6.1%**	**6.1%**
Grand Total		**3,332**	**15,574**	**6,109**	**22,645**	**9,546**	**31,724**	**6,214**	**16,150**	**4.9%**	**3.3%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: The tables include ICU/CCU bed days at TTH (542 ICU and 7 CCU bed days in 2014/15)

Adult neurosciences services are projected to increase at the highest growth rate (5.9% annually) at Home Hill Hospital. The largest increase (5,511 separations) is projected to be at TTH. In 2036/37, TTH is projected to account for 8,314 of 9,546 total neurosciences separations across THHS. Refer to Table 13.

Table 13: Adult Neurosciences Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**ON**	1,927	12,600	3,258	17,962	4,906	24,650	2,979	12,050	4.3%	3.1%
	SD	876	876	1,986	1,986	3,409	3,409	2,533	2,533	6.4%	6.4%
Townsville Total		**2,803**	**13,476**	**5,244**	**19,948**	**8,314**	**28,059**	**5,511**	**14,583**	**5.1%**	**3.4%**
Ayr	**ON**	97	458	158	605	228	860	131	402	4.0%	2.9%
	SD	41	41	84	84	125	125	84	84	5.2%	5.2%
Ayr Total		**138**	**499**	**241**	**688**	**353**	**985**	**215**	**486**	**4.4%**	**3.1%**
Charters Towers	**ON**	70	217	106	363	148	479	78	262	3.5%	3.7%
	SD	23	23	57	57	91	91	68	68	6.4%	6.4%
Charters Towers Total		**93**	**240**	**163**	**420**	**239**	**570**	**146**	**330**	**4.4%**	**4.0%**
Home Hill	**ON**	14	465	28	522	49	719	35	254	5.9%	2.0%
Home Hill Total		**14**	**465**	**28**	**522**	**49**	**719**	**35**	**254**	**5.9%**	**2.0%**
Hughenden	**ON**	17	83	20	91	24	101	7	18	1.7%	0.9%
	SD	9	9	11	11	13	13	4	4	1.7%	1.7%
Hughenden Total		**26**	**92**	**31**	**102**	**38**	**114**	**12**	**22**	**1.7%**	**1.0%**
Ingham	**ON**	91	489	148	601	211	805	120	316	3.9%	2.3%
	SD	30	30	97	97	163	163	133	133	8.0%	8.0%
Ingham Total		**121**	**519**	**245**	**697**	**374**	**968**	**253**	**449**	**5.3%**	**2.9%**
Joyce Palmer Health Service	**ON**	34	93	38	112	43	133	9	40	1.1%	1.6%
	SD	89	89	101	101	114	114	25	25	1.1%	1.1%
Joyce Palmer Health Service Total		**123**	**182**	**139**	**213**	**158**	**247**	**35**	**65**	**1.1%**	**1.4%**
Richmond	**ON**	8	95	9	46	10	51	2	-44	0.9%	-2.8%
	SD	6	6	9	9	12	12	6	6	3.3%	3.3%
Richmond Total		**14**	**101**	**18**	**55**	**22**	**63**	**8**	**-38**	**2.1%**	**-2.1%**
Grand Total		**3,332**	**15,574**	**6,109**	**22,645**	**9,546**	**31,724**	**6,214**	**16,150**	**4.9%**	**3.3%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
Note: The tables include ICU/CCU bed days at TTH (542 ICU and 7 CCU bed days in 2014/15)

2.3.5. Obstetrics and Gynaecology

Adult obstetrics and gynaecology services are projected to increase from 5,428 separations in 2014/15 to 7,384 in 2036/37; a growth rate of 1.4% per year. Over 3,600 vaginal and caesarean deliveries are projected in THHS in the year 2036/37.

Table 14: Obstetrics and Gynaecology Activity, THHS by Stay Type and SRG/ESRG, 2014/15 to 2036/37

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Gynaecology**	593	1,305	789	1,561	977	1,775	384	470	2.3%	1.4%
	Vaginal Delivery	1,737	3,860	2,003	4,122	2,231	4,301	494	441	1.1%	0.5%
	Caesarean Delivery	794	3,285	910	3,482	1,014	3,653	220	368	1.1%	0.5%
	Ante-natal Admission	622	1,716	606	1,499	585	1,359	-37	-357	-0.3%	-1.1%
	Post-natal Admission	143	325	176	346	210	382	67	57	1.8%	0.7%
ON Total		**3,889**	**10,491**	**4,484**	**11,011**	**5,017**	**11,471**	**1,128**	**980**	**1.2%**	**0.4%**
SD	**Gynaecology**	923	923	1,055	1,055	1,175	1,175	252	252	1.1%	1.1%
	Vaginal Delivery	201	201	287	287	366	366	165	165	2.8%	2.8%
	Ante-natal Admission	371	371	564	564	708	708	337	337	3.0%	3.0%
	Post-natal Admission	44	44	80	80	118	118	74	74	4.6%	4.6%
SD Total		**1,539**	**1,539**	**1,986**	**1,986**	**2,367**	**2,367**	**828**	**828**	**2.0%**	**2.0%**
Grand Total		**5,428**	**12,030**	**6,470**	**12,998**	**7,384**	**13,838**	**1,956**	**1,808**	**1.4%**	**0.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The majority of obstetrics and gynaecology services are provided at TTH and Ayr Hospital. In 2036/37, TTH is projected to account for 7,102 of 7,384 total obstetrics and gynaecology separations across THHS. Refer to Table 15.

Table 15: Obstetrics and Gynaecology Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**ON**	3,668	10,003	4,275	10,579	4,813	11,073	1,145	1,070	1.2%	0.5%
	SD	1,484	1,484	1,919	1,919	2,289	2,289	805	805	2.0%	2.0%
Townsville Total		**5,152**	**11,487**	**6,193**	**12,497**	**7,102**	**13,363**	**1,950**	**1,876**	**1.5%**	**0.7%**
Ayr	**ON**	164	405	156	359	152	329	-12	-76	-0.3%	-0.9%
	SD	33	33	37	37	40	40	7	7	0.8%	0.8%
Ayr Total		**197**	**438**	**194**	**396**	**192**	**369**	**-5**	**-69**	**-0.1%**	**-0.8%**
Charters Towers	**ON**	7	8	6	8	6	7	-1	-1	-0.7%	-0.5%
	SD	7	7	10	10	14	14	7	7	3.3%	3.3%
Charters Towers Total		**14**	**15**	**17**	**18**	**20**	**21**	**6**	**6**	**1.7%**	**1.6%**
Hughenden	**ON**	6	11	6	9	5	8	-1	-3	-0.5%	-1.2%
	SD	3	3	4	4	4	4	1	1	1.0%	1.0%
Hughenden Total		**9**	**14**	**9**	**13**	**9**	**12**	**0**	**-2**	**0.0%**	**-0.7%**
Ingham	**ON**	16	29	16	27	17	26	1	-3	0.2%	-0.5%
	SD	5	5	8	8	10	10	5	5	3.2%	3.2%
Ingham Total		**21**	**34**	**24**	**35**	**27**	**36**	**6**	**2**	**1.1%**	**0.3%**
Joyce Palmer Health Service	**ON**	27	34	24	28	22	25	-5	-9	-0.9%	-1.3%
	SD	6	6	8	8	9	9	3	3	1.8%	1.8%
Joyce Palmer Health Service Total		**33**	**40**	**32**	**36**	**31**	**34**	**-2**	**-6**	**-0.3%**	**-0.7%**
Richmond	**ON**	1	1	1	1	1	1	0	0	1.6%	1.6%
	SD	1	1	1	1	1	1	0	0	1.2%	1.2%
Richmond Total		**2**	**2**	**2**	**2**	**3**	**3**	**1**	**1**	**1.4%**	**1.4%**
Grand Total		**5,428**	**12,030**	**6,470**	**12,998**	**7,384**	**13,838**	**1,956**	**1,808**	**1.4%**	**0.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Of the 7,102 total obstetrics and gynaecology separations from TTH in 2036/37, vaginal deliveries will account for the greatest number of separations at TTH (2,513 separations), and also for the greatest number of beddays (4,510 beddays). Refer to Table 16.

Table 16: Obstetrics and Gynaecology Separations and Beddays, THHS by Place of Treatment and SRG/ESRG

Place of Treatment	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**Gynaecology**	1,464	2,161	1,787	2,541	2,089	2,872	625	711	1.6%	1.3%
	Vaginal Delivery	1,855	3,878	2,206	4,241	2,513	4,510	658	632	1.4%	0.7%
	Caesarean Delivery	745	3,113	863	3,329	969	3,513	224	400	1.2%	0.6%
	Ante-natal Admission	919	1,996	1,099	1,985	1,223	1,993	304	-3	1.3%	0.0%
	Post-natal Admission	169	339	238	401	308	474	139	135	2.8%	1.5%
Townsville Total		**5,152**	**11,487**	**6,193**	**12,497**	**7,102**	**13,363**	**1,950**	**1,876**	**1.5%**	**0.7%**
Ayr	**Gynaecology**	26	29	25	29	25	28	-1	-1	-0.1%	-0.1%
	Vaginal Delivery	71	171	70	154	69	142	-2	-29	-0.1%	-0.8%
	Caesarean Delivery	49	172	46	153	45	140	-4	-32	-0.4%	-0.9%
	Ante-natal Admission	43	56	44	50	44	48	1	-8	0.1%	-0.7%
	Post-natal Admission	8	10	8	10	9	10	1	0	0.4%	0.2%
Ayr Total		**197**	**438**	**194**	**396**	**192**	**369**	**-5**	**-69**	**-0.1%**	**-0.8%**
Charters Towers	**Gynaecology**	3	3	5	5	8	8	5	5	4.8%	4.8%
	Vaginal Delivery	6	6	7	7	8	8	2	2	1.1%	1.1%
	Ante-natal Admission	3	3	2	2	2	2	-1	-1	-2.0%	-1.9%
	Post-natal Admission	2	3	2	3	2	3	0	0	0.4%	0.4%
Charters Towers Total		**14**	**15**	**17**	**18**	**20**	**21**	**6**	**6**	**1.7%**	**1.6%**
Hughenden	**Gynaecology**	3	3	3	6	3	5	0	2	0.3%	2.7%
	Ante-natal Admission	5	6	5	6	5	6	0	0	0.0%	-0.4%
	Post-natal Admission	1	5	1	1	1	1	0	-4	-0.8%	-6.4%
Hughenden Total		**9**	**14**	**9**	**13**	**9**	**12**	**0**	**-2**	**0.0%**	**-0.7%**

Place of Treatment	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Ingham	**Gynaecology**	12	21	14	23	16	23	4	2	1.3%	0.4%
	Vaginal Delivery	2	2	2	2	3	3	1	1	1.3%	1.3%
	Ante-natal Admission	4	5	4	4	3	4	-1	-1	-0.7%	-1.6%
	Post-natal Admission	3	6	4	6	5	7	2	1	2.2%	0.5%
Ingham Total		**21**	**34**	**24**	**35**	**27**	**36**	**6**	**2**	**1.1%**	**0.3%**
Joyce Palmer	**Gynaecology**	7	10	8	11	8	11	1	1	0.8%	0.5%
	Vaginal Delivery	4	4	5	5	5	5	1	1	1.0%	1.0%
	Ante-natal Admission	18	20	16	16	14	14	-4	-6	-1.1%	-1.6%
	Post-natal Admission	4	6	4	5	4	4	0	-2	-0.4%	-1.6%
Joyce Palmer Total		**33**	**40**	**32**	**36**	**31**	**34**	**-2**	**-6**	**-0.3%**	**-0.7%**
Richmond	**Gynaecology**	1	1	1	1	1	1	0	0	1.6%	1.6%
	Ante-natal Admission	1	1	1	1	1	1	0	0	1.2%	1.2%
Richmond Total		**2**	**2**	**2**	**2**	**3**	**3**	**1**	**1**	**1.4%**	**1.4%**
Grand Total		**5,428**	**12,030**	**6,470**	**12,998**	**7,384**	**13,838**	**1,956**	**1,808**	**1.4%**	**0.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

2.3.6. Subacute

Adult subacute activity is projected to increase from 1,771 separations in 2014/15 to 6,020 in 2036/37; a growth rate of 5.7% per year. The highest volume specialty (in terms of separations) is projected to be rehabilitation. Refer to Table 17.

Table 17: Adult Subacute Activity, THHS by Stay Type and SRG/ESRG, 2014/15 to 2036/37

Stay Type	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Geriatric Mgmt (non-acute)**	266	6,285	702	10,244	1,173	15,009	907	8,724	7.0%	4.0%
	Other Non-Acute	435	18,866	629	17,269	813	20,944	378	2,078	2.9%	0.5%
	Palliative (non-acute)	481	4,504	991	8,652	1,673	13,460	1,192	8,956	5.8%	5.1%
	Rehabilitation	548	12,864	1,336	22,136	2,219	34,511	1,671	21,647	6.6%	4.6%
ON Total		**1,730**	**42,519**	**3,659**	**58,301**	**5,878**	**83,924**	**4,148**	**41,405**	**5.7%**	**3.1%**
SD	**Geriatric Mgmt (non-acute)**	0	0	4	4	8	8	8	8	-	-
	Other Non-Acute	6	6	15	15	21	21	15	15	5.9%	5.9%
	Palliative (non-acute)	35	35	70	70	113	113	78	78	5.5%	5.5%
SD Total		**41**	**41**	**89**	**89**	**142**	**142**	**101**	**101**	**5.8%**	**5.8%**
Grand Total		**1,771**	**42,560**	**3,748**	**58,390**	**6,020**	**84,066**	**4,249**	**41,506**	**5.7%**	**3.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Adult subacute services are projected to increase at the highest growth rates at Ayr Hospital (6.7% annually) and at TTH (5.9% annually). In 2036/37, TTH is projected to account for 5,399 of 6,020 total subacute separations across THHS. Refer to Table 18.

Table 18: Adult Subacute Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	SRG	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**Geriatric Mgmt (non-acute)**	265	6,127	704	10,155	1,179	14,918	914	8,791	7.0%	4.1%
	Other Non-Acute	274	9,660	431	9,872	588	12,533	314	2,873	3.5%	1.2%
	Palliative	458	3,863	932	7,412	1,572	11,575	1,114	7,712	5.8%	5.1%
	Rehabilitation	526	12,310	1,253	20,884	2,060	32,171	1,534	19,861	6.4%	4.5%
Townsville Total		**1,523**	**31,960**	**3,321**	**48,323**	**5,399**	**71,196**	**3,876**	**39,236**	**5.9%**	**3.7%**
Ayr	**Other Non-Acute**	8	194	11	97	13	108	5	-86	2.2%	-2.6%
	Palliative	42	295	81	606	124	854	82	559	5.1%	4.9%
	Rehabilitation	14	347	62	1,002	128	2,016	114	1,669	10.6%	8.3%
Ayr Total		**64**	**836**	**153**	**1,706**	**265**	**2,977**	**201**	**2,141**	**6.7%**	**5.9%**
Charters Towers	**Other Non-Acute**	41	2,303	52	1,508	60	1,715	19	-588	1.7%	-1.3%
	Palliative	7	165	17	223	29	378	22	213	6.7%	3.8%
	Rehabilitation	2	71	5	85	7	104	5	33	5.5%	1.8%
Charters Towers Total		**50**	**2,539**	**74**	**1,816**	**96**	**2,198**	**46**	**-341**	**3.0%**	**-0.7%**
Home Hill	Other Non-Acute	54	3,525	69	3,238	79	3,730	25	205	1.8%	0.3%
	Palliative	3	112	6	130	9	186	6	74	4.9%	2.3%
	Rehabilitation	2	42	6	83	9	108	7	66	6.9%	4.4%
Home Hill Total		**59**	**3,679**	**81**	**3,451**	**97**	**4,024**	**38**	**345**	**2.3%**	**0.4%**
Hughenden	Other Non-Acute	11	246	13	256	14	306	3	60	1.2%	1.0%
	Palliative	2	14	4	50	5	63	3	49	4.6%	7.0%
Hughenden Total		**13**	**260**	**17**	**306**	**20**	**369**	**7**	**109**	**1.9%**	**1.6%**
Ingham	Other Non-Acute	45	2,127	59	1,666	69	1,878	24	-249	2.0%	-0.6%
	Palliative	3	88	20	294	41	506	38	418	12.6%	8.3%
	Rehabilitation	4	94	9	82	15	113	11	19	6.3%	0.8%
Ingham Total		**52**	**2,309**	**88**	**2,043**	**125**	**2,497**	**73**	**188**	**4.1%**	**0.4%**
Joyce Palmer	Geriatric Mgmt (non-acute)	1	158	2	93	2	99	1	-59	3.6%	-2.1%
Joyce Palmer Total		**1**	**158**	**2**	**93**	**2**	**99**	**1**	**-59**	**3.6%**	**-2.1%**
Richmond	Other Non-Acute	8	817	9	647	10	694	2	-123	1.0%	-0.7%
	Palliative	1	2	3	7	6	12	5	10	8.3%	8.4%
Richmond Total		**9**	**819**	**12**	**654**	**16**	**706**	**7**	**-113**	**2.5%**	**-0.7%**
Grand Total		**1,771**	**42,560**	**3,748**	**58,390**	**6,020**	**84,066**	**4,249**	**41,506**	**5.7%**	**3.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

2.3.7. Critical Care (ICU/CCU)

Adult intensive care (ICU) and coronary care unit (CCU) services are provided from TTH in THHS. Only bed days are identifiable in the AIM dataset, and therefore no separations are provided. The specialty grouping with the greatest growth in adult ICU bed days between 2014/15 and 2036/37, is medical services (3.35% AGR). Refer to Table 19.

ICU and CCU activity is also included in the tables in the previous chapters. Appropriate adjustments are made when treatment spaces are calculated.

Table 19: Adult ICU Bed days, THHS by Specialty Grouping, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Medical	332	431	507	590	678	347	3.3%
Surgical / Procedural	1,808	1,895	2,083	2,281	2,477	668	1.4%
Cardiothoracic	645	710	748	785	814	168	1.1%
Neurosciences	542	630	706	791	879	337	2.2%
Obstetrics and Gynaecology	16	18	19	21	23	6	1.5%
TOTAL	**3,344**	**3,685**	**4,064**	**4,467**	**4,870**	**1,527**	**1.7%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Note: 1,335 of the 1,808 Surgical / Procedural bed days are for the SRG Prolonged Ventilation which is classified as a surgical SRG in the AIM dataset.

Table 20: Adult CCU Bed days, THHS by Specialty Grouping, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Medical	509	640	717	796	863	354	2.4%
Surgical / Procedural	132	158	184	211	238	106	2.7%
Cardiothoracic	2,476	2,965	3,392	3,881	4,389	1,914	2.6%
Neurosciences	7	9	10	12	14	6	2.9%
Mental Health	6	12	16	19	23	16	5.9%
TOTAL	**3,131**	**3,785**	**4,319**	**4,920**	**5,527**	**2,396**	**2.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

2.3.8. Paediatric

Paediatric services are projected to grow at 2.2% per year from 2014/15 to 2036/37. The highest growth rate in separations is projected in same day neurosciences (4.3%) and medical specialties (4.0%), followed by overnight subacute (3.9%). Same day services are projected to grow at a higher rate than overnight services. Refer to Table 21.

Table 21: Paediatric Activity, THHS by Stay Type and Specialty Grouping, 2014/15 to 2036/37

Stay Type	Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
ON	**Medical**	1,132	2,840	1,416	3,274	1,711	3,748	579	908	1.9%	1.3%
	Surgical / Procedural	1,166	3,562	1,401	3,314	1,587	3,466	421	-96	1.4%	-0.1%
	Cardiothoracic	47	208	71	315	82	367	35	159	2.6%	2.6%
	Neurosciences	167	680	249	729	306	762	139	82	2.8%	0.5%
	Obstetrics & Gynaecology	11	22	13	24	16	29	5	7	1.8%	1.3%
	Subacute	9	75	15	126	21	151	12	76	3.9%	3.2%
ON Total		**2,532**	**7,387**	**3,165**	**7,782**	**3,723**	**8,524**	**1,191**	**1,137**	**1.8%**	**0.7%**
SD	**Medical**	406	406	675	675	972	972	566	566	4.0%	4.0%
	Surgical / Procedural	1,017	1,017	1,338	1,338	1,593	1,593	576	576	2.1%	2.1%
	Cardiothoracic	0	0	0	0	0	0	0	0	-	-
	Neurosciences	130	130	224	224	329	329	199	199	4.3%	4.3%
	Obstetrics & Gynaecology	8	8	10	10	13	13	5	5	2.2%	2.2%
	Subacute	0	0	7	7	25	25	25	25	-	-
SD Total		**1,561**	**1,561**	**2,255**	**2,255**	**2,931**	**2,931**	**1,370**	**1,370**	**2.9%**	**2.9%**
Grand Total		**4,093**	**8,948**	**5,420**	**10,037**	**6,654**	**11,455**	**2,561**	**2,507**	**2.2%**	**1.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The top overnight SRGs with greater than 30 separations in 2014/15 across THHS are summarised below. The top specialties in 2014/15 were respiratory medicine, non-subspecialty surgery and orthopaedics. The highest projected growth rate in separations is projected to be in non-subspecialty medicine (3.9% annually), neurosurgery (3.2% annually), immunology and infections (2.6% annually) and thoracic surgery (also 2.6% annually). Refer to Table 22.

Table 22: Paediatric Activity, THHS Top Overnight SRGs (›30 Seps) by SRG, 2014/15 to 2036/37

Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Respiratory Medicine	506	1,383	577	1,507	668	1,699	162	316	1.3%	0.9%
Non-Subspecialty Surgery	344	869	461	966	556	1,098	212	229	2.2%	1.1%
Orthopaedics	283	812	308	655	326	644	43	-168	0.6%	-1.1%
Ear, Nose & Throat	283	410	309	431	351	467	68	57	1.0%	0.6%
Immunology & Infections	184	479	260	582	322	654	138	175	2.6%	1.4%
Non-Subspecialty Medicine	177	308	291	511	412	674	235	366	3.9%	3.6%
Gastroenterology	113	221	94	159	75	123	-38	-98	-1.9%	-2.6%
Neurology	90	298	125	342	151	407	61	109	2.4%	1.4%
Neurosurgery	77	382	124	386	154	355	77	-27	3.2%	-0.3%
Urology	71	213	103	204	113	207	42	-6	2.1%	-0.1%
Thoracic Surgery	47	208	71	315	82	367	35	159	2.6%	2.6%
Endocrinology	47	175	57	187	68	213	21	38	1.7%	0.9%
Plastic & Reconstructive Surgery	39	162	51	151	55	143	16	-19	1.6%	-0.6%
Other SRGs	271	1,467	334	1,386	389	1,471	118	4	1.7%	0.0%
TOTAL	**2,532**	**7,387**	**3,165**	**7,782**	**3,723**	**8,524**	**1,191**	**1,137**	**1.8%**	**0.7%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The top same day SRGs with greater than 30 separations in 2014/15 across THHS are summarised below. The top specialties in 2014/15 were non-subspecialty surgery, ear nose and throat, and orthopaedics. The highest projected growth rate is projected to be in neurosurgery (6.1% annually), gastroenterology (5.0% annually) and respiratory medicine (4.7% annually). Refer to Table 23.

Table 23: Paediatric Activity, THHS Top Same Day SRGs (›30 Seps) by SRG, 2014/15 to 2036/37

Specialty Grouping	2014/15		2026/27		2036/37		Change		AGR	
	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Non-Subspecialty Surgery	273	273	338	338	407	407	134	134	1.8%	1.8%
Ear, Nose & Throat	184	184	274	274	350	350	166	166	3.0%	3.0%
Orthopaedics	182	182	224	224	277	277	95	95	1.9%	1.9%
Dentistry	157	157	221	221	253	253	96	96	2.2%	2.2%
Respiratory Medicine	157	157	282	282	435	435	278	278	4.7%	4.7%
Urology	120	120	184	184	216	216	96	96	2.7%	2.7%
Neurology	85	85	124	124	162	162	77	77	3.0%	3.0%
Non-Subspecialty Medicine	77	77	106	106	140	140	63	63	2.8%	2.8%
Gastroenterology	50	50	96	96	147	147	97	97	5.0%	5.0%
Drug & Alcohol	46	46	53	53	58	58	12	12	1.1%	1.1%
Neurosurgery	45	45	100	100	167	167	122	122	6.1%	6.1%
Ophthalmology	36	36	34	34	26	26	-10	-10	-1.5%	-1.5%
Plastic & Reconstructive Surgery	32	32	28	28	24	24	-8	-8	-1.3%	-1.3%
Other SRGs	117	117	193	193	268	268	151	151	3.8%	3.8%
TOTAL	**1,561**	**1,561**	**2,255**	**2,255**	**2,931**	**2,931**	**1,370**	**1,370**	**2.9%**	**2.9%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Paediatric services are projected to increase at the highest growth rates at TTH (2.4% annually). In 2036/37, TTH is projected to account for 6,130 of 6,654 total paediatric separations across THHS. Refer to Table 24.

Table 24: Paediatric Activity, THHS by Place of Treatment and Stay Type, 2014/15 to 2036/37

Place of Treatment	Stay Type	2014/15		2026/27		2036/37		Change		AGR	
		Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days	Seps	Bed days
Townsville	**ON**	2,222	6,873	2,846	7,250	3,400	8,018	1,178	1,145	2.0%	0.7%
	SD	1,420	1,420	2,083	2,083	2,730	2,730	1,310	1,310	3.0%	3.0%
Townsville Total		**3,642**	**8,293**	**4,929**	**9,334**	**6,130**	**10,747**	**2,488**	**2,454**	**2.4%**	**1.2%**
Ayr	**ON**	93	134	96	147	96	140	3	6	0.2%	0.2%
	SD	40	40	54	54	65	65	25	25	2.2%	2.2%
Ayr Total		**133**	**174**	**149**	**200**	**161**	**205**	**28**	**31**	**0.9%**	**0.7%**
Charters Towers	**ON**	31	57	34	57	37	57	6	0	0.8%	0.0%
	SD	17	17	22	22	29	29	12	12	2.5%	2.5%
Charters Towers Total		**48**	**74**	**56**	**79**	**66**	**86**	**18**	**12**	**1.5%**	**0.7%**
Hughenden	**ON**	**13**	**15**	**11**	**19**	**11**	**17**	**-2**	**2**	**-0.8%**	**0.5%**
	SD	11	11	10	10	10	10	-1	-1	-0.3%	-0.3%
Hughenden Total		**24**	**26**	**21**	**29**	**21**	**27**	**-3**	**1**	**-0.6%**	**0.2%**
Ingham	**ON**	35	45	37	60	37	59	2	14	0.3%	1.2%
	SD	15	15	23	23	31	31	16	16	3.4%	3.4%
Ingham Total		**50**	**60**	**60**	**83**	**68**	**90**	**18**	**30**	**1.4%**	**1.8%**
Joyce Palmer Health Service	**ON**	131	252	137	241	137	228	6	-24	0.2%	-0.5%
	SD	47	47	53	53	55	55	8	8	0.7%	0.7%
Joyce Palmer Health Service Total		**178**	**299**	**189**	**294**	**193**	**283**	**15**	**-16**	**0.4%**	**-0.2%**
Richmond	**ON**	7	11	5	8	4	6	-3	-5	-2.5%	-2.8%
	SD	11	11	10	10	11	11	0	0	-0.2%	-0.2%
Richmond Total		**18**	**22**	**15**	**18**	**15**	**17**	**-3**	**-5**	**-0.9%**	**-1.3%**
Grand Total		**4,093**	**8,948**	**5,420**	**10,037**	**6,654**	**11,455**	**2,561**	**2,507**	**2.2%**	**1.1%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

2.4. Non-AIM Activity Projections

2.4.1. Mental Health

Mental health services are projected utilising a population-based methodology, with flows applied. Projections have been sourced from the Department of Health. Flows from other HHSs to THHS are summarised in the table below. Flows from a number of other HHSs to Townsville across a range of services is built into the projections. Refer to Table 25.

It is noted that the Naming "Primary Classification" is not in line with local naming conventions for services in THHS.

Table 25: Mental Health Patient Flow Assumptions to THHS

HHS of Residence	Primary Classification	Percentage to THHS
Cairns and Hinterland	Acquired Brain Injury	100%
	Child and Adolescent Acute Inpatient	90%
	Medium Secure Mental Health	100%
	Older Persons Extended Treatment	100%
Central West	Child and Adolescent Acute Inpatient	90%
Mackay	Acquired Brain Injury	100%
	Child and Adolescent Acute Inpatient	90%
	Medium Secure Mental Health	100%
	Older Persons Extended Treatment	100%
North West	Acquired Brain Injury	100%
	Adult & Older Persons Acute	100%
	Child and Adolescent Acute Inpatient	90%
	Community Care Unit	100%
	Medium Secure Mental Health	100%
	Older Persons Extended Treatment	100%
Torres and Cape	Acquired Brain Injury	100%
	Child and Adolescent Acute Inpatient	90%
	Medium Secure Mental Health	100%
	Older Persons Extended Treatment	100%
Townsville	Acquired Brain Injury	100%
	Adult & Older Persons Acute	100%
	Child and Adolescent Acute Inpatient	90%
	Community Care Unit	100%
	Medium Secure Mental Health	100%
	Older Persons Extended Treatment	100%

Source: Mental Health projections provided by the Department of Health

Departmental projections for mental health activity are based on an old planning guideline, and the labelling of 'facility of treatment' and 'primary classification' within the file provided do not align with the service delivery model in THHS. Consequently, the location and naming of bed types (but not the total number of projected beds) has been modified to reflect actual practice.

Designated mental health services across THHS are projected to grow from 50,905 bed days in 2021/22 to 64,671 bed days in 2036/37. This level of activity would equate to 159 total designated beds in 2021/22 increasing to just over 200 beds by 2036/37. Stakeholders however emphasised that priority investment would be best directed to alternatives to admission programs and community based care rather than solely focussing on additional bed capacity.

Table 26: Mental Health Bed Days, THHS by Facility of Treatment and Primary Classification, 2021/22 to 2036/37

Location	Primary Classification	2021/22	2026/27	2031/32	2036/37	Change
The Townsville Hospital	Adult Acute Inpatient	9,815	10,376	10,981	11,595	1,781
	Older Acute Inpatient (65+)	6,282	7,605	8,887	10,155	3,873
	Acute Total	**16,097**	**17,981**	**19,867**	**21,751**	**5,654**
The Townsville Hospital	Medium Secure Mental Health Rehabilitation	8,941	9,676	10,441	11,206	2,264
Kirwan (satellite of TTH)	Child and Adolescent Acute Inpatient and Day Service	4,491	4,788	5,033	5,283	792
Kirwan	Acquired Brain Injury	3,940	4,235	4,546	4,861	921
Kirwan	Community Care	9,557	10,300	11,070	11,850	2,292
Charters Towers	Extended Treatment and Rehabilitation	7,879	8,471	9,091	9,722	1,842
Grand Total		**50,905**	**55,451**	**60,048**	**64,671**	**13,766**

Source: Mental Health projections provided by the Department of Health
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

Table 27: Bed Projections (@ 90% occupancy for adults, 70% occupancy for children)

Location	Primary Classification	2015/16	2021/22	2026/27	2031/32	2036/37
The Townsville Hospital	Adult Acute Inpatient		29.9	31.6	33.4	35.3
	Older Acute Inpatient (65+)		19.1	23.2	27.1	30.9
	Acute Total	**36.0**	**49**	**54.7**	**60.5**	**66.2**
The Townsville Hospital	Medium Secure Mental Health Rehabilitation	25.0	27.2	29.5	31.8	34.1
Kirwan (satellite of TTH)	Child and Adolescent Acute Inpatient and Day Service	8.0	17.6	18.7	19.7	20.7
Kirwan	Acquired Brain Injury	10.0	12.0	12.9	13.8	14.8
Kirwan	Community Care	24.0	29.1	31.4	33.7	36.1
Charters Towers	Extended Treatment and Rehabilitation	27.0	24.0	25.8	27.7	29.6
Grand Total		**130.0**	**158.9**	**173.0**	**187.2**	**201.5**

Source: Mental Health projections provided by the Department of Health
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

Notes:

Investment in alternatives to admission programs and community based care will require additional community based staff and may require a physical space for delivering these services. The current physical capacity of the Adult Acute Unit at TTH is 43 beds and is considered adequate for the medium term. The capital bed stock in the Charters Towers for residential long stay rehabilitation for north Queensland meets the needs of the future.

There will be a need for capital investment/rebuild/refurbishment of the Townsville Community Care Unit within the planning period.

According to the Queensland Health planning framework, requirements for high secure beds for North Queensland are allocated to The Park facility in West Moreton HHS. Demand for forensic mental health services and access to high secure beds is an ongoing issue and is related to the presence of two large correctional centres in North Queensland (Townsville and Mareeba) which require ongoing support.

Lastly, Queensland Health planning benchmarks are outdated and the projected bed requirements for THHS will need to be revised in line with work underway within Mental Health Branch and National Mental Health Framework.

2.4.2. Renal Dialysis

Renal dialysis services are projected utilising a projected prevalence rate across different regions in Queensland, adjusted for Aboriginal and Torres Strait Islander population. The endorsed planning guidelines apply a 40% home renal dialysis target for THHS (therefore 60% chair-based). Projections have been sourced from the Department of Health.

Patient flow assumptions underpinning the projections for THHS are summarised in Table 28.

Table 28: Renal Dialysis Patient Flow Assumptions to THHS

HHS of Residence	Percentage to THHS
Central West	77%
North West	100%
Townsville	100%

Source: Renal Dialysis Projections provided by the Department of Health

Renal dialysis projections are provided by the Department of Health for the whole of THHS, but are not broken down by facility. In THHS, there are renal services currently provided at:

- Townsville Hospital (17 in-centre chairs)
- North Ward (11 chairs)
- Palm Island (4 chairs)
- Home Hill (8 chairs)
- Mt Isa (8 chairs) - in North West HHS under the clinical governance of THHS.

In order to define requirements for renal dialysis at a facility level within THHS, an analysis of projected demand by Planning Region in THHS has been calculated based on estimates of the total Aboriginal and non-Aboriginal populations in each area. (Note: the population figure for Palm Island was provided by THHS and is consistent with the population estimate used for the purposes of the Palm Island Health Action Plan 2017-2027. This figure has been subtracted from the total population of the Hinchinbrook SA3 to obtain the population for Hinchinbrook - Other). Refer to Table 29.

Table 29: THHS TOTAL (Home and Chair-based) Renal Dialysis Separations / Occasions of Service Projections by Place of Residence, 2021/22 to 2036/37

Place of Residence	2021/22	2026/27	2031/32	2036/37
Central West HHS	915	1,034	1,141	1,248
North West HHS	7,246	8,153	9,018	9,855
THHS	**29,797**	**35,749**	**42,184**	**48,987**
Burdekin	1,772	2,125	2,508	2,913
Charters Towers	1,541	1,848	2,181	2,533
Hinchinbrook - Other	2,286	2,742	3,236	3,757
Palm Island	2,404	2,884	3,404	3,952
Northern Highlands	331	397	469	545
Townsville	21,464	25,751	30,387	35,287
TOTAL	**38,231**	**45,244**	**52,685**	**60,462**

Source: Renal Dialysis Projections provided by the Department of Health (with internal THHS population split manually)
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

Chair-Based Activity at 40% Home-Based Dialysis

The projected chair-based activity applying the 40% home-based dialysis target (as per the endorsed Queensland Health guidelines) for THHS is outlined below.

Note:
The 2014/15 admitted renal dialysis activity in THHS from the AIM tool was 22,583 separations. This is very close to the 2021/22 projected figure from the Department of Health (applying the 40% in-home target).

Table 30: THHS Chair-Based (Assuming 40% In-Home Target) Renal Dialysis Separations / Occasions of Service Projections by Place of Residence, 2021/22 to 2036/37

Place of Residence	2021/22	2026/27	2031/32	2036/37
Central West HHS	713	806	889	972
North West HHS	4,347	4,892	5,411	5,913
THHS	**17,878**	**21,449**	**25,311**	**29,392**
Burdekin	1,063	1,275	1,505	1,748
Charters Towers	924	1,109	1,309	1,520
Hinchinbrook - Other	1,371	1,645	1,941	2,254
Palm Island	1,443	1,731	2,042	2,371
Northern Highlands	199	238	281	327
Townsville	12,878	15,451	18,232	21,172
TOTAL	**22,939**	**27,146**	**31,611**	**36,277**

Chair-Based Activity at 30% Home-Based Dialysis

The projected chair-based activity applying a 30% home-based dialysis target (close to what has been achieved historically in THHS) is outlined below.

Table 31: THHS Chair-Based (Assuming 30% In-Home) Renal Dialysis Separations / Occasions of Service Projections by Place of Residence, 2021/22 to 2036/37

Place of Residence	2021/22	2026/27	2031/32	2036/37
Central West HHS	832	940	1,038	1,134
North West HHS	5,072	5,707	6,313	6,899
THHS	**20,858**	**25,024**	**29,529**	**34,291**
Burdekin	1,240	1,488	1,756	2,039
Charters Towers	1,078	1,294	1,527	1,773
Hinchinbrook - Other	1,600	1,919	2,265	2,630
Palm Island	1,683	2,019	2,383	2,767
Northern Highlands	232	278	328	381
Townsville	15,025	18,026	21,271	24,701
TOTAL	**26,762**	**31,671**	**36,880**	**42,324**

Source: Renal Dialysis Projections provided by the Department of Health (with home-based target applied and internal THHS population split manually) Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

2.4.3. Cancer Services

2.4.3.1. Chemotherapy

Chemotherapy services are projected utilising a projected incidence rate across different regions in Queensland and treatment rate assumptions. Projections have been sourced from the Department of Health.

Patient flow assumptions underpinning the projections for THHS are summarised in Table 32.

Note:
Chemotherapy projections are provided by the Department for the whole of THHS, but are not broken down by facility.

Table 32: Chemotherapy Patient Flow Assumptions to THHS

HHS of Residence	Adults (15+) % of THHS	Children (0-14) % of THHS
Townsville	98%	75%
Cairns and Hinterland	0%	75%
Central Queensland	0%	75%
Central West	0%	75%
Mackay	0%	75%
North West	0%	75%
Torres and Cape	0%	75%

Source: Cancer Projections provided by the Department of Health

Table 33: THHS Chemotherapy Separations / Occasions of Service Projections, 2021/22 to 2036/37

Chemotherapy	2021	2026	2031	2036	Change	AGR
Adults	10,918	12,698	14,532	16,414	5,496	2.8%
Children	139	148	157	165	26	1.2%
TOTAL	**13,078**	**14,872**	**16,720**	**18,615**	**5,537**	**2.4%**

Source: Cancer Projections provided by the Department of Health
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

2.4.3.2. Radiation Oncology

Radiation oncology services are projected utilising a projected incidence rate across different regions in Queensland and treatment rate assumptions. The projections for radiation oncology services are outlined below, separated by adults and children.

Patient flow assumptions underpinning the radiation oncology projections for THHS are summarised in Table 34.

Note:
All radiation oncology services in THHS are provided from TTH.

Table 34: Radiation Oncology Patient Flow Assumptions to THHS

HHS of Residence	% of THHS
Cairns and Hinterland	10%
Central West	60%
Mackay	13%
North West	95%
Torres and Cape	10%
Townsville	99%

Source: Cancer Projections provided by the Department of Health

Table 35: TTH Radiation Oncology Separations / Occasions of Service Projections, 2021/22 to 2036/37

Radiation Oncology		2021	2026	2031	2036	Change	AGR
Adults	**Treatment**	19,681	22,773	25,946	29,182	9,501	2.7%
	Simulation and Planning	1,036	1,199	1,366	1,536	500	2.7%
Children	**Treatment**	80	85	90	95	15	1.2%
	Simulation and Planning	4	4	5	5	1	1.2%

Source: Cancer Projections provided by the Department of Health
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

2.4.4. Endoscopy

Endoscopy services are projected utilising historical activity (applying a linear trend) and patient flow data from inpatient and outpatient data sources. Projections have been sourced from the Department of Health.

It is noted that the Department of Health compared access rates to endoscopy services across HHSs in Queensland. THHS endoscopy rate per 100,000 persons is approximately 15% higher than the Queensland average across the public and private sector, and 28% higher than the Queensland average just in the public sector (unadjusted for age). However, Department of Health projection data includes all activity performed in an endoscopy suite i.e. gastroscopy, colonoscopy, other GI endoscopy, urological, gynaecological, orthopaedic, respiratory and ENT).

A large volume of procedures, particularly urological, gynaecological, and ENT are unlikely to be performed in a dedicated endoscopy suite in the future. Therefore, the Department of Health projections have been adjusted to ensure that procedure room projections are not overstated at The Townsville Hospital. The projection in Table 36 includes only Colonoscopy and Other Endoscopy defined as all other GI endoscopy plus bronchoscopy.

Table 36: THHS Endoscopy Separations / Occasions of Service Projections, 2015/16 to 2036/37

Facility of Treatment	Sub Classification	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Townsville Hospital	Colonoscopy	2,023	2,406	2,862	3,404	4,049	1,643	3.4%
	Other Endoscopy	1,379	1,632	1,932	2,287	2,707	1,075	3.3%
Townsville Hospital Total		**3,402**	**4,039**	**4,794**	**5,691**	**6,756**	**2,718**	**3.3%**
Ayr Hospital	Colonoscopy	239	405	541	552	565	160	4.2%
	Other Endoscopy	113	174	226	234	242	67	3.7%
Ayr Hospital Total		**352**	**580**	**767**	**786**	**807**	**227**	**4.0%**
Charters Towers Hospital	Colonoscopy	85	148	198	201	205	57	4.3%
	Other Endoscopy	58	89	115	115	116	28	3.4%
Charters Towers Hospital Total		**143**	**236**	**312**	**316**	**321**	**85**	**3.9%**
Ingham Hospital	Colonoscopy	283	476	634	657	681	205	4.3%
	Other Endoscopy	140	218	282	291	299	81	3.7%
Ingham Hospital Total		**423**	**693**	**916**	**947**	**980**	**286**	**4.1%**
Mater Hospital Pimlico	Colonoscopy	71	126	171	190	211	85	5.3%
	Other Endoscopy	104	175	237	260	284	110	4.9%
Mater Hospital Pimlico Total		**175**	**300**	**408**	**450**	**495**	**195**	**5.1%**
Townsville Day Surgery	Colonoscopy	160	278	376	405	436	158	4.9%
	Other Endoscopy	222	365	491	532	576	211	4.6%
Townsville Day Surgery Total		**382**	**644**	**867**	**937**	**1,013**	**369**	**4.8%**
Grand Total		**4,877**	**6,492**	**8,066**	**9,129**	**10,372**	**3,880**	**3.7%**

Source: Endoscopy POR Projections provided by the Department of Health with adjustments made to remove out of scope urological, genealogical and ENT procedures
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

2.4.5. Interventional Cardiology

Interventional Cardiology services are projected utilising historical activity (applying a linear trend) and patient flow data from inpatient and outpatient data sources. Projections have been sourced from the Department of Health.

All interventional cardiology services in THHS are provided at TTH.

Patient flow assumptions underpinning the projections for THHS are summarised in the table below.

Table 37: Interventional Cardiology Flow Assumptions to THHS

HHS of Residence	% of THHS
Cairns and Hinterland	4%
Central West	17%
Mackay	16%
North West	96%
Torres and Cape	4%
Townsville	96%

Source: Interventional Cardiology Projections provided by the Department of Health

Table 38: TTH Radiation Oncology Separations / Occasions of Service Projections, 2021/22 to 2036/37

Sub Classification	Sub Classification (Description)	2021/22	2026/27	2031/32	2036/37	Change	AGR
Group 1	**Angiography**	1,318	1,465	1,619	1,772	454	2.0%
Group 2	**PCI (non-complex)**	395	483	571	659	265	3.5%
Group 3	**PCI (complex)**	234	266	301	336	103	2.5%
Group 4	**Other (pericardiocentesis, balloon pumps)**	32	38	45	52	20	3.4%
Group 5	**Pacemakers**	110	119	128	137	27	1.5%
Group 6	**ICD's**	62	66	71	75	13	1.3%
Group 7	**Lead/ revision/ replacement**	26	29	31	33	7	1.6%
Group 8	**EPS and ablations**	90	98	107	115	25	1.6%
Group 9	**Loop recorders**	26	28	30	32	6	1.4%
TOTAL		2,291	2,592	2,902	3,211	920	2.3%

Source: Interventional Cardiology Projections provided by the Department of Health
Note: 2014/15 equivalent figures are not available as were not provided in the Department of Health projections

2.4.6. Qualified Neonates

Neonatal services are projected utilising projected births and the application of a cots per 1,000 births benchmark (1.2 per 1,000 for NICU, 5.6 per 1,000 for SCN). These projections are adjusted (increased) for areas with high percentages of Aboriginal and Torres Strait Islander populations. Projections have been sourced from the Department of Health.

Patient flow assumptions for Special Care Nursery services are outlined in Table 39.

Table 39: Special Care Nursery Patient Flow Assumptions to THHS

HHS of Residence	% Flow to THHS
Cairns and Hinterland	14%
Central Queensland	3%
Central West	9%
Mackay	21%
Metro North	1%
North West	97%
Other Interstate	10%
Torres and Cape	20%
Townsville	99%

Source: Qualified Neonate Projections provided by the Department of Health

Special Care Nursery services at TTH are projected to increase from 1,038 separations in 2014/15 to 1,355 separations in 2036/37; an annual growth rate of 1.2%. Refer to Table 40.

Table 40 TTH SCN Separations / Occasions of Service Projections, 2014/15 to 2036/37

Place of Treatment	2014/15		2026/27		2036/37		Change (Seps)	AGR
	Seps	Bed days	Seps	Bed days	Seps	Bed days		
TTH	1,038	10,191	1,206	11,812	1,355	13,291	316	1.2%

Source: Qualified Neonate Projections provided by the Department of Health

Patient flow assumptions for Neonatal Intensive Care services are outlined below.

Table 41: Neonatal Intensive Care Unit Patient Flow Assumptions to THHS

HHS of Residence	% Flow to THHS
Cairns and Hinterland	90%
Central Queensland	5%
Central West	1%
Mackay	89%
Metro South	1%
North West	92%
Other Interstate	3%
Torres and Cape	100%
Townsville	98%

Source: Qualified Neonate Projections provided by the Department of Health

Neonatal Intensive Care services at TTH are projected to increase from 834 separations in 2014/15 to 1,027 separations in 2036/37; an annual growth rate of 1.0%.

Table 42: TTH NICU Separations / Occasions of Service Projections, 2014/15 to 2036/37

Place of Treatment	2014/15		2026/27		2036/37		Change (Seps)	AGR
	Seps	Bed days	Seps	Bed days	Seps	Bed days		
TTH	834	4,829	946	5,393	1,027	5,968	193	1.0%

Source: Qualified Neonate Projections provided by the Department of Health

2.4.7. Paediatric Intensive Care Unit

Data provided by THHS shows a steady increase in PICU beddays over an extended period. This activity equates to approximately 3 PICU beds @ 70% occupancy in 2016.

Table 43: PICU Beddays, TTH, 2005 - 2016

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Occupied Bed Days	127	188	204	192	179	192	158	216	435	545	725	748
Beds @ 70% occupancy	0.5	0.7	0.8	0.8	0.7	0.8	0.6	0.8	1.7	2.1	2.8	2.9

Source: THHS

Data from AIM is not able to be used for projecting the future requirements for PICU at TTH. The base year for the AIM projection modelling is 2014/15 and the dataset does not specifically identify PICU beddays. Projected ICU beddays from AIM for children aged 0-14 years are shown in the table below and significantly underestimate future requirements.

Table 44: PICU Beddays, TTH, 2014/15 - 2036/37

The Townsville Hospital	2014/15	2021/22	2026/27	2031/32	2036/37
Intensive Care Beddays – Children 0-14 years	208	253	272	292	316

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The PICU at TTH services the whole of North Queensland. Consultation with the other NQ HHS's has indicated that none have plans to establish a PICU in the foreseeable future and will remain reliant on TTH. For comparison purposes, a weighted population based calculation of PICU bed requirements for the whole of North Queensland has been done based on a previous Queensland Health planning benchmark of 5.5 PICU beds per 100,000 weighted population for children aged 0-14 years. It should be noted that this benchmark is for a Level 6 service. Based on this methodology, the projected bed requirements would be approximately 5 beds.

Table 45: PICU Beds, TTH, 2011 - 2036

The Townsville Hospital	2011	2016	2021	2026	2031	2036
PICU Beds Required	3.9	4.1	4.3	4.5	4.7	5

Source: Queensland Health, Children's Services Intensive Care Beds for Children benchmark (December 2011); and Queensland Government population projections, 2015 edition; Australian Bureau of Statistics, Population by age and sex, regions of Australia, 2014

There are a range of factors that will increase the PICU bed requirement at TTH over and above this population benchmark. These factors are:

- The preferred model of care is for the PICU to cater for both intubated patients and also those patients previously termed "HDU" type patients. For the purposes of planning, "HDU" patients are those children who require a nursing ratio of 1 nurse to 2 patients, are not requiring organ support and are at a lower risk of sudden deterioration than an ICU type patient.
- With further subspecialisation of paediatric services, there are increasing numbers of children with highly complex conditions being admitted to PICU's resulting in longer lengths of stay. The increasing service capability of TTH for both medical and surgical paediatric services will continue. Discussions are being progressed with LCCH currently to further reduce outflows of children from North Queensland and redirect these flows to TTH.
- Following a recent review by the Queensland Department of Health, additional funding has been allocated to enhance and ensure a coordinated and sustainable paediatric retrieval system in North Queensland hosted by TTH. The enhanced role of TTH in the statewide retrieval service is likely to have an impact of at least 1 bed on future requirements.

Based on the above and expert clinical advice, it is proposed that the PICU will require a capacity of 8 beds over the next 10 years. This would be achievable within the existing physical footprint of the unit. However, it is important to note that the projection will need to be reviewed annually given the evolving role of both the PICU and paediatric services at TTH.

2.4.8. Emergency Department

Emergency Department projections have been provided by the Department of Health, calculated utilising the endorsed projection methodology and are outlined by THHS facility in this section.

Note:
The endorsed methodology utilises historical trends, adjusted for population growth. They therefore pick up any unusual trends that may be in the data (e.g. in specific triage categories) from recent years. For this reason, the projections provided must be interpreted and applied with extreme caution.

Table 46: TTH Emergency Department Presentation Projections by Age Group and Triage Category, 2015/16 to 2036/37

Age Group	Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Adult	Triage 1	944	1,359	1,696	2,050	2,407	1,463	4.6%
	Triage 2	9,289	12,997	16,085	19,370	22,696	13,407	4.3%
	Triage 3	27,775	37,054	45,271	53,850	62,540	34,765	3.9%
	Triage 4	24,057	26,495	28,936	31,515	34,134	10,077	1.7%
	Triage 5	1,953	1,996	2,054	2,107	2,158	205	0.5%
Adult Total		**64,018**	**79,902**	**94,042**	**108,892**	**123,936**	**59,918**	**3.2%**
Child	Triage 1	134	193	238	284	330	196	4.4%
	Triage 2	891	1,175	1,477	1,781	2,088	1,197	4.1%
	Triage 3	5,794	6,517	7,317	8,129	8,961	3,167	2.1%
	Triage 4	8,026	8,879	9,601	10,345	11,121	3,094	1.6%
	Triage 5	427	421	421	422	425	-3	0.0%
Child Total		**15,273**	**17,185**	**19,055**	**20,961**	**22,925**	**7,652**	**2.0%**
Total		**79,291**	**97,087**	**113,097**	**129,854**	**146,861**	**67,570**	**3.0%**

Source: Emergency Department Projections provided by the Department of Health

Table 47: Ayr Hospital Emergency Department Presentation Projections by Age Group and Triage Category, 2015/16 to 2036/37

Age Group	Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Adult	Triage 1	47	64	81	97	110	64	4.2%
	Triage 2	347	504	629	746	853	506	4.4%
	Triage 3	1,795	2,080	2,342	2,607	2,859	1,065	2.2%
	Triage 4	4,220	4,721	5,175	5,603	5,993	1,773	1.7%
	Triage 5	2,079	2,885	3,397	3,866	4,273	2,194	3.5%
Adult Total		**8,488**	**10,254**	**11,624**	**12,919**	**14,089**	**5,601**	**2.4%**
Child	Triage 1	7	9	10	10	11	4	1.9%
	Triage 2	68	72	83	94	106	38	2.1%
	Triage 3	348	371	385	401	419	71	0.9%
	Triage 4	1,394	1,983	2,432	2,919	3,451	2,057	4.4%
	Triage 5	469	508	525	545	569	99	0.9%
Child Total		**2,287**	**2,943**	**3,435**	**3,969**	**4,556**	**2,268**	**3.3%**
Total		**10,775**	**13,197**	**15,059**	**16,888**	**18,644**	**7,869**	**2.6%**

Source: Emergency Department Projections provided by the Department of Health

Table 48: Charters Towers Hospital Emergency Department Presentation Projections by Age Group and Triage Category, 2015/16 to 2036/37

Age Group	Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Adult	Triage 1	26	36	46	55	64	38	4.4%
	Triage 2	226	328	410	489	561	335	4.4%
	Triage 3	1,569	1,789	2,000	2,206	2,404	835	2.1%
	Triage 4	2,734	3,071	3,385	3,696	3,997	1,263	1.8%
	Triage 5	3,022	4,389	5,283	6,154	6,940	3,918	4.0%
Adult Total		**7,578**	**9,614**	**11,124**	**12,601**	**13,965**	**6,388**	**3.0%**
Child	Triage 1	2	3	3	3	3	1	1.9%
	Triage 2	50	55	63	73	83	33	2.4%
	Triage 3	342	368	385	403	424	82	1.0%
	Triage 4	1,012	1,431	1,751	2,098	2,478	1,466	4.4%
	Triage 5	460	498	517	539	564	104	1.0%
Child Total		**1,866**	**2,354**	**2,719**	**3,115**	**3,552**	**1,686**	**3.1%**
Total		**9,444**	**11,968**	**13,843**	**15,717**	**17,517**	**8,073**	**3.0%**

Source: Emergency Department Projections provided by the Department of Health

Table 49: Ingham Hospital Emergency Department Presentation Projections by Age Group and Triage Category, 2015/16 to 2036/37

Age Group	Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Adult	Triage 1	37	48	59	70	79	42	3.7%
	Triage 2	485	718	906	1,089	1,260	774	4.6%
	Triage 3	1,587	1,865	2,140	2,434	2,731	1,144	2.6%
	Triage 4	1,605	1,834	2,049	2,275	2,498	893	2.1%
	Triage 5	2,497	3,542	4,205	4,829	5,377	2,880	3.7%
Adult Total		**6,211**	**8,006**	**9,359**	**10,696**	**11,945**	**5,734**	**3.2%**
Child	Triage 1	3	4	4	4	4	1	1.9%
	Triage 2	56	64	76	88	102	46	2.9%
	Triage 3	272	301	323	347	375	103	1.5%
	Triage 4	360	505	616	737	869	510	4.3%
	Triage 5	342	370	383	397	414	72	0.9%
Child Total		**1,033**	**1,244**	**1,402**	**1,574**	**1,764**	**732**	**2.6%**
Total		**7,244**	**9,251**	**10,762**	**12,270**	**13,709**	**6,465**	**3.1%**

Source: Emergency Department Projections provided by the Department of Health

Table 50: Joyce Palmer Health Service Emergency Department Presentation Projections by Age Group and Triage Category, 2015/16 to 2036/37

Age Group	Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Adult	Triage 1	8	12	14	17	19	11	4.3%
	Triage 2	145	191	225	260	296	151	3.4%
	Triage 3	505	668	805	942	1,082	577	3.7%
	Triage 4	1,257	1,340	1,422	1,501	1,582	325	1.1%
	Triage 5	4,785	4,770	4,781	4,797	4,823	38	0.0%
Adult Total		**6,700**	**6,981**	**7,246**	**7,516**	**7,802**	**1,102**	**0.7%**
Child	Triage 1	4	6	7	9	11	7	4.8%
	Triage 2	19	26	33	39	46	27	4.2%
	Triage 3	193	217	244	271	299	106	2.1%
	Triage 4	715	786	848	911	976	261	1.5%
	Triage 5	790	772	768	765	765	-25	-0.2%
Child Total		**1,721**	**1,807**	**1,899**	**1,995**	**2,097**	**376**	**0.9%**
Total		**8,421**	**8,788**	**9,146**	**9,512**	**9,899**	**1,478**	**0.8%**

Source: Emergency Department Projections provided by the Department of Health

Table 51: Home Hill Hospital Emergency Department Presentation Projections by Triage Category, 2015/16 to 2036/37

Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Triage 1	3	4	5	7	8	5	4.6%
Triage 2	6	7	7	7	7	1	0.9%
Triage 3	34	56	72	89	105	71	5.5%
Triage 4	31	31	31	31	31	0	-0.1%
Triage 5	326	323	323	322	321	-5	-0.1%
TOTAL	**400**	**421**	**439**	**456**	**472**	**72**	**0.8%**

Source: Emergency Department Projections provided by the Department of Health

Table 52: Hughenden Hospital Emergency Department Presentation Projections by Triage Category, 2015/16 to 2036/37

Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Triage 1	3	3	4	4	4	1	1.4%
Triage 2	42	41	40	40	39	-3	-0.3%
Triage 3	214	280	331	380	428	214	3.4%
Triage 4	393	390	402	415	427	34	0.4%
Triage 5	391	381	375	369	363	-28	-0.3%
TOTAL	**1,043**	**1,096**	**1,152**	**1,207**	**1,262**	**219**	**0.9%**

Source: Emergency Department Projections provided by the Department of Health

Table 53: Richmond Hospital Emergency Department Presentation Projections by Triage Category, 2015/16 to 2036/37

Triage	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Triage 1	9	10	11	11	12	3	1.4%
Triage 2	32	31	31	30	30	-2	-0.3%
Triage 3	106	139	164	188	212	106	3.4%
Triage 4	204	202	209	215	222	18	0.4%
Triage 5	260	254	249	245	242	-18	-0.3%
TOTAL	**611**	**636**	**664**	**690**	**717**	**106**	**0.8%**

Source: Emergency Department Projections provided by the Department of Health

2.4.9. Outpatients

Projections for outpatient occasions of service are provided by the Department of Health calculated utilising a methodology that firstly establishes outpatient growth rates (by reviewing inpatient projections from the AIM tool), then assigning the inpatient growth rates to one year of historical outpatient data (DSS) by facility of treatment and Tier 2. Patient flows from other HHS's to THHS are established and assigned.

Note:
In order to stabilise fluctuations in activity of smaller (non-ABF) facilities, these facilities are aggregated by HHS and assigned an aggregated non-ABF growth rate by HHS. Consequently, outpatient projections are not provided by the Department of Health at facility level for rural facilities across THHS.

Table 54: Projected Occasions of Service, TTH and Other THHS Facilities, by Primary Classification, 2016/17 - 2036/37

Facility	Primary Classification	2016/17	2026/27	2036/37
TTH	Other Services	84,038	130,509	184,096
	Allied Health	55,889	84,494	119,463
	Medical	52,438	79,768	117,373
	Maternity	42,346	49,527	56,117
	Oncology	32,710	37,664	37,691
	Clinical Measurement	21,283	32,177	45,493
	Surgical	20,971	29,721	38,975
	Orthopaedics	17,306	25,058	34,234
	Subacute	10,961	16,573	23,432
	Paediatric	10,279	12,822	15,436
	Ophthalmology	8,551	15,114	21,932
	Pre-Admission	8,270	12,085	15,346
	Ear Nose and throat (ENT)	5,950	7,683	9,828
	Other Outpatient Treatments	4,774	7,342	10,365
	Gastroenterology	4,207	6,979	10,787
	Psychiatry	3,727	7,599	12,252
	Urology	3,142	5,213	7,473
	Nursing	1,961	2,954	4,032
	Plastic and Reconstructive Surgery	938	1,527	2,039
	Primary Health Care	434	675	952
	Transplants	17	18	21
	Genetics	0	0	0
Sub Total TTH		**390,192**	**565,502**	**767,335**

Facility	Primary Classification	2016/17	2026/27	2036/37
Other THHS Facilities	Primary Health Care	87,490	135,869	191,656
	Subacute	15,862	21,436	28,323
	Psychiatry	11,486	19,730	27,453
	Other Services	10,932	16,977	23,948
	Allied Health	8,186	11,064	14,620
	Nursing	7,169	8,908	10,490
	Maternity	6,103	6,182	6,162
	Clinical Measurement	1,034	1,398	1,847
	Pre-Admission	881	1,078	1,180
	Surgical	468	621	818
	Medical	271	358	431
	Oncology	264	410	578
	Other Outpatient Treatments	242	376	531
	Gastroenterology	26	38	53
	Orthopaedics	7	11	16
	Paediatric	0	0	0
Sub Total Other THHS Facilities		**150,422**	**224,456**	**308,105**
Grand Total		**540,614**	**789,958**	**1,075,440**

Source: Outpatient projections supplied by the Department of Health. Version 1 (11/11/2016) - Preliminary Version - Produced using AIM Status Quo Projection (Base Year 2014-15)

Notes:

1. 2016/17 occasions of service are calculated (not actual)
2. Primary classification is a grouping of Tier 2 Non-Admitted Services (Tier 2 Class) as per the classification Tier 2 Non-Admitted Services National Index. This data is provided by Tier 2 Class as an appendix to this document.

Telehealth

The number of occasions of service delivered by telehealth has increased by 77% between 2014/15 and 2016/17. A total of 5,635 telehealth occasions of service were provided across THHS in 2016/17. However, the number of telehealth occasions of service remains low comparative to the total number of outpatient occasions of service provided across THHS as a whole.

Table 55: Non-Admitted Telehealth Occasions of Service, THHS, by Facility, 2014/15 to 2016/17

Facility	2014/15	2015/16	2016/17	Change 2014/15 to 2016/17	% Change 2014/15 to 2016/17
Townsville	3,013	3,853	5,055	2,042	68%
Charters Towers	1	67	148	147	-
Ingham	81	92	137	56	69%
Hughenden	28	33	74	46	164%
Richmond	13	59	42	29	223%
Ayr	38	8	23	-15	-39%
Home Hill	10	17	16	6	60%
Other	4	4	140	136	-
TOTAL	**3,188**	**4,133**	**5,635**	**2,447**	**77%**

Source: Townsville Hospital and Health Service Non-Admitted Telehealth Service Events provided by THHS. 2016/17 figures are preliminary only

The highest volumes of telehealth services provided in THHS 2016/17 were related to cancer services - medical oncology, haematology and radiation therapy consultations. With the exception of neurology, all other specialty clinics each provided less than 300 occasions of service in 2016/17.

Table 56: Non-Admitted Telehealth Occasions of Service, THHS, by Tier 2 Clinic Name, 2014/15 to 2016/17

Tier 2 Clinic Name	2014/15	2015/16	2016/17	Change 2014/15 to 2016/17	% Change 2014/15 to 2016/17
Medical oncology (consultation)	1,119	1,197	1,276	157	14%
Haematology	129	372	569	440	341%
Radiation therapy - consultation	494	551	492	-2	0%
Neurology	323	341	435	112	35%
Cardiothoracic	0	37	290	290	-
Neurosurgery	0	60	283	283	-
Oncology	98	205	267	169	172%
Rheumatology	224	262	257	33	15%
Nephrology	60	141	221	161	268%
Geriatric evaluation and management (GEM)	18	55	169	151	839%
Obstetrics - management of pregnancy without complications	8	132	161	153	-
Cardiology	67	65	115	48	72%
Pain management	94	133	112	18	19%
Paediatric medicine	32	51	102	70	219%
Orthopaedics	1	7	100	99	-
Other Clinics	521	524	786	265	51%
TOTAL	**3,188**	**4,133**	**5,635**	**2,447**	**77%**

Source: Townsville Hospital and Health Service Non-Admitted Telehealth Service Events provided by THHS. 2016/17 figures are preliminary only

Taking a closer look at outpatient services

Stakeholders in rural areas consistently expressed a desire for service models that enabled local service access, including to outpatient services. To this end, telehealth service models (for inpatients and outpatients) are generally well received. For this reason, a request was made to identify the total volume of patients attending TTH from rural areas for outpatient appointments by new appointment and review appointment, reflecting volumes of telehealth service provision.

Data limitations involving the current rate of telehealth appointments appearing low, the ability to identify patient place of residence at an SA2 level (which maps to THHS planning regions), and several other queries within the data require resolution prior to undertaking any further analysis.

Additionally, there are strategic questions regarding those clinics that may not need to be delivered in future and outpatient service models that change the way clinics are held (e.g. multidisciplinary) all impact future demand.

2.5. Base Case Treatment Space Projections

Base Case treatment space projections have been developed for THHS facilities on the basis of endorsed Queensland Health planning guidelines. The treatment space projections are based on the AIM and non-AIM activity projections provided in Chapters 2.2 and 2.4.

2.5.1. Townsville Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical	90	113	132	156	183	
ON Surgical / Proc	117	141	163	187	212	
ON Cardiothoracic	29	29	32	34	36	
ON Neurosciences	37	45	53	63	73	
ON Obstetrics and Gynaecology	35	36	37	39	39	
ICU	14	15	16	18	20	
CCU	10	12	14	16	18	
Subtotal Acute Adult Beds	**332**	**391**	**447**	**513**	**581**	
Adult Subacute ON Beds						
Rehabilitation	38	52	64	80	98	
Palliative Care	12	18	23	29	35	
GEM	19	26	31	38	46	
Other Non-Acute	30	27	31	35	39	
Subtotal Subacute Beds	**99**	**123**	**149**	**182**	**218**	
Mental Health Beds						
Adult Acute	36	30	32	34	36	
Older Persons Acute (65+)	-	20	24	28	31	Included in Adult Acute for base year
Medium Secure	25	27	29	32	34	
Paediatric ON Beds						
Paediatric Beds	22	21	19	20	22	Adjusted for PICU to avoid double counting
PICU	3	5	8	8	8	Out-year requirements will need to be revised (see note in Chapter 2.2)
NICU	19	20	21	22	23	
SCN	31	33	36	38	40	
Subtotal all ON acute/subacute	**567**	**671**	**766**	**877**	**994**	

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. 2014/15 mental health bed numbers reflect physical beds on-site at 2015/16 and were provided by THHS.

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Same Day/Bed Alternatives						
SD Medical	8	11	16	22	30	Assumes 5 days per week service in-hours. Requirements would be reduced with increased operating days / hours
SD Obstetrics	2	2	3	3	3	
Paeds SD Medical	0	0	0	0	0	Zeroed out - ED short stay adjustment eliminates SD medical spaces for paeds. Local decision RE model.
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatement. Not projected as per client advice
Emergency Department						
Adult Treatment Spaces						
Cat 2 and 3	27	36	43	52	60	ED projections apply a linear trend based on historical activity. Therefore, any significant fluctuations in previous years affect the projections. They must be interpreted with caution.
Cat 4 and 5	10	11	12	13	14	
Resuscitation	8	11	14	16	19	
Isolation	5	6	7	8	9	
TOTAL	**50**	**64**	**76**	**89**	**102**	
Paediatric Treatment Spaces						
Cat 2 and 3	6	6	7	8	9	
Cat 4 and 5	4	4	4	5	5	
Resuscitation	1	1	1	1	1	
Isolation	1	2	2	2	2	
TOTAL	**12**	**13**	**14**	**16**	**17**	
ED Short Stay Beds						
Adult	19	25	30	35	40	
Paediatric	4	4	5	5	5	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Perioperative/Interventional Spaces						
Overnight Theatres	7	8	10	11	12	
Same Day Theatres	2	3	3	4	4	
Total No. Theatres	**10**	**12**	**13**	**15**	**16**	
Endoscopy Suites	2	2	2	3	3	
Cardiac Catheter Lab	-	2.3	2.6	2.9	3.2	Would be affected by inclusion of hybrid theatre
Stage 1 Recovery Spaces	-	34	36	42	46	Inc. theatres, endoscopy, cath lab recovery spaces
Stage 2 Recovery Spaces	-	22	23	29	31	Inc. theatres, endoscopy, cath lab recovery spaces
Birthing Suites	8	9	10	10	11	
Linear Accelerators	-	2.4	2.7	3.1	3.5	Assumes the following patient flows to Townsville HHS: Cairns (10%), Central West (60%), Mackay (13%), North West (95%), Torres and Cape (10%), Townsville (99%)

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.2. Ayr Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	11	14	16	18	21	
ON Surgical /Proc Beds	4	5	6	6	7	
ON Obstetrics and Gynaecology Beds	3	3	3	3	3	
Subtotal Acute Adult Beds	**18**	**22**	**25**	**27**	**31**	
Adult Subacute ON Beds						
Rehabilitation	2	2	4	5	7	
Palliative Care	1	2	2	3	3	
GEM	0	0	0	0	0	
Other Non-Acute	1	1	1	1	1	
Subtotal Subacute Beds	**4**	**5**	**7**	**9**	**11**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal all ON acute/ subacute	**23**	**28**	**33**	**37**	**43**	
Same Day/Bed Alternatives						
SD Medical	1	2	2	2	2	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 2 and 3	2	3	3	3	4	
Cat 4 and 5	4	4	5	5	6	
Resuscitation	1	1	1	1	1	Very low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
TOTAL	**8**	**9**	**10**	**10**	**12**	Incl. approx 2-3 paediatric spaces

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Perioperative/Interventional Spaces						
Overnight Theatres	0.1	0.1	0.1	0.01	0.1	
Same Day Theatres	0.0	0.3	0.4	0.4	0.5	Incl. endoscopy projection
Total No. Theatres (Rounded up)	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	
Stage 1 Recovery Spaces	3	3	3	3	3	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Stage 2 Recovery Spaces	2	2	2	2	2	Potentially 3 spaces (high volume, lower complexity procedures)
Birthing Suites	1	1	1	1	1	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.3. Charters Towers Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	8	11	12	13	15	
ON Surgical /Proc Beds	3	3	4	4	5	
ON Obstetrics and Gynaecology Beds	1	1	1	1	1	
Subtotal Acute Adult Beds	**12**	**1**	**17**	**18**	**21**	
Adult Subacute ON Beds						
Rehabilitation	1	1	1	1	1	
Palliative Care	1	1	1	1	2	
GEM	0	0	0	0	0	
Other Non-Acute	8	5	5	5	6	
Subtotal Subacute Beds	**10**	**7**	**7**	**7**	**9**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal all ON acute/ subacute	**23**	**23**	**25**	**26**	**31**	
Mental Health (Charters Towers Rehab Unit)						
Extended Treatment and Rehabilitation	0	24	26	28	30	
Same Day/Bed Alternatives						
SD Medical	1	2	2	2	2	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Emergency Department						
Treatment Spaces						
Cat 2 and 3	2	2	3	3	3	
Cat 4 and 5	3	4	5	5	6	
Resuscitation	1	1	1	1	1	Very low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
TOTAL	**7**	**8**	**10**	**10**	**11**	Incl. approx 2 paediatric spaces
Perioperative/Interventional Spaces						
Overnight Theatres	0.0	0.0	0.0	0.0	0.0	
Same Day Theatres	0.1	0.2	0.2	0.2	0.2	Incl. endoscopy projection
Total No. Theatres (Rounded up)	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	
Stage 1 Recovery Spaces	3	3	3	3	3	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Stage 2 Recovery Spaces	2	2	2	2	2	Potentially 3 spaces (high volume, lower complexity procedures)
Birthing Suites	1	1	1	1	1	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.4. Ingham Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	12	14	15	18	20	
ON Surgical /Proc Beds	4	5	6	7	8	
ON Obstetrics and Gynaecology Beds	2	2	2	2	2	
Subtotal Acute Adult Beds	**18**	**21**	**24**	**27**	**30**	
Adult Subacute ON Beds						
Rehabilitation	1	1	1	1	1	
Palliative Care	1	1	1	2	2	
GEM	0	0	0	0	0	
Other Non-Acute	7	5	6	6	6	
Subtotal Subacute Beds	**9**	**7**	**8**	**9**	**9**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal all ON acute/ subacute	**28**	**29**	**33**	**37**	**40**	
Same Day/Bed Alternatives						
SD Medical	1	2	2	3	3	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 2 and 3	2	3	3	3	4	
Cat 4 and 5	2	3	3	4	4	
Resuscitation	1	1	1	1	1	Very low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
TOTAL	**6**	**8**	**8**	**9**	**10**	Inc. approx 1 paediatric space

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Perioperative/Interventional Spaces						
Overnight Theatres	0.0	0.0	0.0	0.0	0.0	
Same Day Theatres	0.0	0.4	0.5	0.5	0.6	Incl. endoscopy projection
Total No. Theatres (Rounded up)	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	
Stage 1 Recovery Spaces	3	3	3	3	3	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Stage 2 Recovery Spaces	1	1	1	1	1	Potentially 2-3 spaces (high volume, lower complexity procedures)
Birthing Suites	1	1	1	1	1	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.5. Hughenden Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical/ Surgical/ Obs Beds	3	3	3	3	3	Incl. medical, surgical, obstetrics, paeds (low)
Adult Subacute ON Beds						
Subacute	1	1	1	2	2	Incl. rehab, pall care, other non-acute
Subtotal all ON acute/ subacute	**4**	**4**	**4**	**5**	**5**	
Same Day/Bed Alternatives						
SD Medical	1	1	1	1	1	Low volume
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 1 to 3	1	1	1	1	1	
Cat 4 and 5	1	1	1	1	1	
TOTAL	**2**	**2**	**2**	**2**	**2**	Less than 1 treatment space projected overall, but assumed two required

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.6. Richmond Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Acute ON Beds						
ON Medical/ Surgical/ Obs Beds	3	3	3	3	3	Incl. all medical, obstetrics, paeds (low volume)
Subacute ON Beds						
Subacute	3	2	2	3	3	Incl. rehab, pall care, other non-acute
Subtotal all ON acute/ subacute	**6**	**5**	**5**	**6**	**6**	
Same Day/Bed Alternatives						
SD Medical	1	1	1	1	1	Low volume
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 1 to 3	1	1	1	1	1	
Cat 4 and 5	1	1	1	1	1	
TOTAL	**2**	**2**	**2**	**2**	**2**	Less than 1 treatment space projected overall, but assumed two required

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.7. Home Hill Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical/ Surgical/ Obs Beds	4	4	4	5	5	Primarily neurology/ dementia
Adult Subacute ON Beds						
Subacute	12	10	11	12	13	Incl. rehab, pall care, other non-acute (majority other non-acute)
Subtotal all ON acute/ subacute	**16**	**14**	**15**	**17**	**18**	
Same Day/Bed Alternatives						
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 1 to 3	1	1	1	1	1	
Cat 4 and 5	1	1	1	1	1	
TOTAL	**2**	**2**	**2**	**2**	**2**	Less than 1 treatment space projected overall, but assumed two required

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.8. Joyce Palmer Health Service

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Acute ON Beds						
ON Medical/ Surgical/ Obs Beds	6	7	7	7	7	Incl. all medical, obstetrics. Paeds also incl (1 bed)
Subacute ON Beds						
Subacute	1	1	1	1	1	Primarily GEM
Subtotal all ON acute/ subacute	**7**	**8**	**8**	**8**	**8**	
Same Day/Bed Alternatives						
SD Medical	1	1	1	1	1	
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department						
Treatment Spaces						
Cat 1 to 3	1	1	1	2	2	
Cat 4 and 5	3	3	3	4	4	
TOTAL	**4**	**4**	**4**	**6**	**6**	Incl. 1 paediatric space

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.9. Kirwan Mental Health

Name	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Child and Adolescent Acute Inpatient and Day Service		18	19	20	21	
Acquired Brain Injury		12	13	14	15	
Community Care		30	32	34	37	
Total Beds		**60**	**64**	**68**	**73**	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

2.5.10. Renal Dialysis

Renal dialysis projections were only available for the whole of THHS, it was not possible to identify place of treatment. Further work was therefore required to identify where renal dialysis services will be provided in the future.

In THHS, there is currently a total of 48 chairs. Renal dialysis services are provided at:

- TTH (17 in-centre chairs)
- North Ward (11 chairs)
- Palm Island (4 chairs)
- Home Hill (8 chairs)
- Mt Isa (8 chairs).

It is noted that previous work was undertaken by KPMG in May on projections for renal dialysis services, focused on TTH. The report outlined a **preferred option of expanding TTH from 17 to 30 treatment spaces** (i.e. to a total of 61 chairs across THHS, including Mt Isa) to manage growth until 2020/21. This work is underpinning planning for the recently announced expansion of the renal unit at TTH.

Renal dialysis chair projections for THHS are provided below by patient Place of Residence / Planning Region based on the chair based activity projections detailed in Section 2.4.2. The activity projections identified requirements at both a 40% home-based dialysis (as per the Queensland Health guideline) and 30% home-based dialysis.

Analysis of historical activity indicated that the 40% home-based dialysis target has not historically been achieved by THHS - rates have been closer to 30% due to the unique characteristics of the community. Consequently, THHS already delivers a similar volume of renal dialysis services to the 2021/22 projected volume applying a 40% home-based dialysis rate. Therefore, for the purposes of informing decisions about future requirements, **the 30% home-based dialysis figure has been utilised to project chair requirements across THHS.**

Chair Requirements by Place of Residence

By 2036/37, 68 renal dialysis chairs would be required across THHS facilities (including Mt Isa) if chair requirements are calculated assuming a 30% home-based dialysis target and the Department of Health planning assumption of 6 days of service per week, with an average of 1.7 patients being treated per day. Refer to Table 57.

Table 57: Total Renal Dialysis Chair Projections (30% Home Dialysis), THHS by Patient Place of Residence / Planning Region, 2021/22 to 2036/37

Place of Residence / Planning Region	2021/22	2026/27	2031/32	2036/37
Central West HHS	**1.3**	**1.5**	**1.7**	**1.8**
North West HHS	**8.1**	**9.1**	**10.1**	**11.1**
THHS	**33.4**	**40.1**	**47.3**	**55**
Burdekin	2.0	2.4	2.8	3.3
Charters Towers	1.7	2.1	2.4	2.8
Hinchinbrook - Other	2.6	3.1	3.6	4.2
Palm Island	2.7	3.2	3.8	4.4
Northern Highlands	0.4	0.4	0.5	0.6
Townsville	24.1	28.9	34.1	39.6
TOTAL	**43.0**	**51.0**	**59.0**	**68.0**

Chairs calculated as per the Queensland Health guideline - 6 days per week, 1.7 patients per day

To identify the potentially "ideal" distribution of these chairs both clinically and geographically for patients to be treated as close as possible to home, these projections need to be further refined with the following considerations:

- % of patients clinically requiring in-centre vs. satellite care
- Viability of local operating models (i.e. days / shifts per week).

Several adjustments have been made to the methodology for calculating renal dialysis chairs, based on feedback from THHS stakeholders

Based on consultation with the renal dialysis service, an estimated 25% of patients receiving chair-based dialysis require in-centre dialysis (and therefore 75% can be appropriately treated in satellite services).

Using the 25% / 75% in-centre vs. satellite split, the following table outlines projected demand for renal chairs by the patient's place of residence and takes account of local factors that would potentially impact on occupancy. The projected population level chair requirements for residents of each Planning region apply the following assumptions:

- TTH will treat all in-centre dialysis patients from THHS, CWHHS and Mt Isa HHS. Dialysis chairs at TTH will be utilised 6 days per week 3 shifts per day i.e. an average of 2.5 patients per day
- Satellite services for Townsville residents will be provided 6 days per week, 1.7 patients per day as per the Queensland Health benchmark. It is noted that this would overestimate satellite requirements for Townsville slightly if a number of patients suitable for satellite dialysis continue to be treated at TTH which operates for 3 shifts per day.

- Satellite service requirements for residents of Central West HHS and North West HHS have been calculated at 6 days per week, 1.7 patients per day as per the Queensland Health benchmark.
- Satellite service requirements for residents of Burdekin, Charters Towers, Palm Island and Hinchinbrook - Other have been calculated at 3 days per week, 1.7 patients per day to take account the most likely operating model scenario.

Analysis applying the assumptions above indicates that 14 in-centre chairs would be required by 2036/37 at TTH.

Table 58: In-Centre Renal Dialysis Chair Projections, THHS by Patient Place of Residence / Planning Region, 2021/22 to 2036/37

Place of Residence / Planning Region	2021/22	2026/27	2031/32	2036/37
Central West HHS	**0.3**	**0.3**	**0.3**	**0.4**
North West HHS	**1.6**	**1.8**	**2.0**	**2.2**
Townsville HHS	**6.7**	**8.0**	**9.5**	**11**
Burdekin	0.4	0.5	0.6	0.7
Charters Towers	0.3	0.4	0.5	0.6
Hinchinbrook - Other	0.5	0.6	0.7	0.8
Palm Island	0.5	0.6	0.8	0.9
Northern Highlands	0.1	0.1	0.1	0.1
Townsville	4.8	5.8	6.8	7.9
TOTAL	**8.6**	**10.2**	**11.8**	**13.6**

Note: Chairs calculated assuming 6 days per week, 2.5 patients per day on average

By 2036/37:

- **14 chairs will be required for in-centre renal dialysis**
- **74 chairs will be required for satellite renal dialysis**

The distribution of these chairs will need to be based on agreement of a sustainable local service model

It is noted that the projections for in-centre are lower than the number of chairs currently located at TTH. Consultation indicated that this is because many of the patients accessing the service at TTH are clinically satellite type patients who come to TTH due to where they live, access to transport or historical issues relating to lack of satellite capacity in other locations.

A further 74 satellite chairs would be required to meet the needs of the current catchment population based on the assumptions outlined previously.

Table 59: Satellite Renal Dialysis Chair Projections, THHS by Patient Place of Residence / Planning Region, 2021/22 to 2036/37

Place of Residence / Planning Region	2021/22	2026/27	2031/32	2036/37
Central West HHS	**1.2**	**1.3**	**1.5**	**1.6**
North West HHS	**7.2**	**8.1**	**8.9**	**9.8**
THHS	**37.7**	**45.3**	**53.4**	**62.0**
Burdekin	3.5	4.2	5.0	5.8
Charters Towers	3.1	3.7	4.3	5.0
Hinchinbrook - Other	4.5	5.4	6.4	7.4
Palm Island	4.8	5.7	6.7	7.8
Northern Highlands	0.7	0.8	0.9	1.1
Townsville	21.2	25.5	30.1	34.9
TOTAL	**46.1**	**54.7**	**63.8**	**73.4**

Note: Chairs calculated as per assumptions on previous page (different operating models applied for different regions).

The information in the table above is provided to inform further discussion as to the actual physical distribution of these chairs in the future. It is based on an "ideal" scenario of treating as many people as possible as close as possible to home. The feasibility of doing that will depend largely on the ability to recruit and retain a suitably qualified workforce in each location.

2.5.11. Chemotherapy

Chemotherapy projections were only made available for the whole of THHS, it was not possible to identify place of treatment.

THHS-wide chemotherapy chair projections are summarised in the table below. They have been included against TTH in the treatment space projections at this point in time.

Table 60: Chemotherapy Chair Projections, THHS, 2021/22 to 2036/37

	2021	2026	2031	2036
THHS Chemotherapy Chairs	22	26	29	33

3. SCENARIO 1: Changing Models of Care

3.1. Introduction

Models of care in health services are changing and will continue to change in the future, enabled by new technologies and clinical approaches. For the THHS, there are a number of key changes to models of care identified through consultation that have the potential to either:

a. Enable the in-built trends (e.g. length of stay/relative utilisation) in the Base Case AIM projection to be achieved

b. Affect the Base Case AIM projection (e.g. reduced activity and/or beds).

Changing models of care will either:

- **Account for changes'built into' projection modelling; or**
- **Affect the projection further**

Stakeholders consulted considered there to be several opportunities for changes to models of care that should be pursued for LOS reduction, hospital avoidance / hospital diversion. These include:

- **Increasing Hospital in the Home Services (HITH) / Hospital in the Nursing Home (HINH) for Adults**

  Stakeholders considered a target of 3% of all adult separations to be achievable in future, with the development of clinician 'buy-in', and the implementation of an 'absolute hospital avoidance' model supported by streamlined and facilitative access mechanisms. Orthopaedics was identified as a priority area to target for growth in HITH services, and medical governance of a HITH service was noted as a key factor to improve the rate of referral and broaden the conditions able to be treated as it allows deviation from guideline based therapy. A key opportunity would be to increase the focus on a hospital in the nursing home model (HINH).

  Further analysis has been undertaken on the potential impact of this model of care change within Section 3.3.

- **Introducing HITH for Paediatric patients (12 - 14 years only)**

  Stakeholders discussed a proposal for paediatric HITH consisting of a 'two-pronged' approach:

  - To provide 'tune-up' care to Cystic Fibrosis (CF) children, with 60% of CF children likely suitable (current 14-21 day LOS equating to 1-2 CF children admitted per month / 15-20 per year); and
  - Decrease the HITH service age restriction for admission to 12 years. NB there are no metrics on this however in the short term the aim/assumption would be an overall 0.5% of Paediatric admissions to HITH.

- **Expansion of the Acute Medical Unit (AMU) model**

  A key model of care proposal from stakeholders to shorten overnight length of stay for adult medical patients is to reconfigure medical inpatient services within TTH and establish an AMU. The AMU would take adult medical admissions from ED and directly from GP's. Referrals to the AMU could include acute presentations for Respiratory, Cardiology, Gastroenterology, Infectious Diseases, Endocrinology and suspected stroke patients as well as non-life -threatening

problems such as where referral to hospital is the result of a simple fall (or series of falls), or physical decline associated with the ageing process.

The AMU would be led by a multidisciplinary team. The model of care is that once initial assessment is completed, a plan is developed which may include a short period of time under observation/receiving treatment in the AMU, admission into the wider hospital under the care of another speciality team if necessary, or home to continue care in the community.

Further analysis has been undertaken on the potential impact of removing Other Non-Acute patients from TTH acute beds within Section 3.4.

- **Expanding the Same Day Geriatric Management Unit**

  A proposal to expand the same day geriatric management unit was discussed by stakeholders, involving the establishment of a "day hospital" service for GEM patients. The new subacute care unit is suitable for GEM day rehabilitation. The unit interface would be to outside of the hospital (GP's and community based services) to reduce some bed stays and admissions (model would also include a daily "sweep" from the ED). Other similar models were noted as having been implemented elsewhere, (for example, the Geriatric Rapid Acute Care Evaluation (GRACE) model of care), but these models are dependent on effective links with GP's for referring and sufficient access to community based nursing and allied health. At present, community rehabilitation is currently brokered to a community organisation or provided through Transition Care, and there is limited capacity in community allied health teams (to treat and assess).

- **Reducing admission rates for Aboriginal and Torres Strait Islander People**

  The Queensland Health Closing the Gap Performance Report 2016 identified that, for the period 2011/12 to 2015/16, THHS had the highest age standardised rate per 1,000 persons for all cause hospital separations (1,581 per 1000 persons) in Queensland. According to this publication, the State average is 790 per 100 persons.

  Consultation with key stakeholders in THHS identified the vision for Indigenous Health is to support holistic / wrap-around primary care services in order to address chronic disease within the population as early as possible. The overarching goal is to take a proactive approach to avoid hospitalisation, and for chronic disease conditions to be managed as much as possible in the community primary care space.

- **Increasing access to community-based services**

  Improving access to community-based services via "many front doors" was a hospital avoidance/diversion strategy frequently discussed by stakeholders. Key enablers identified by Allied Health included a greater presence in the community setting, heightening awareness of services available, and streamlined referral pathways for easier access. Stakeholders discussed opportunities for community health services to be the central entry point for patients requiring treatment of a wide range of health conditions, particularly chronic illnesses, leaving hospital services to focus on high acuity work only done in a hospital. This requires a multidisciplinary approach with the Emergency Department, hospital discharge planners, community health services, and GPs.

- **Hospital avoidance / hospital diversion from the Emergency Department**

  Stakeholders considered there to be several opportunities that should be pursued for hospital avoidance / hospital diversion out of the Emergency Department. These include implementing a 'JEDI' Nurse in the Emergency Department for geriatric patients (model out of Nambour). Other opportunities include implementing primary contact allied health models in the Emergency

Department. For example, primary contact physiotherapists for agreed musculoskeletal presentations and social work for patients presenting with primary psychosocial needs. Several other well documented allied health initiatives that improve patient flow, support NEAT and NEST, and improve health services are also available.

- **Make better use of palliative care services to divert patients and reduce admissions**

  With a higher than desirable rate of palliative patients dying in hospital across THHS, coupled with a large number of admissions for patients in the last year of life, palliative care was discussed by stakeholders as an area providing significant opportunity to better utilise services to divert patients and reduce admissions. The vision is for TTH to take the lead for Palliative Care, providing support to the Emergency Department in order to reduce admissions and identify / plan the care of palliative patients, and to provide support for ownership by other parties (for example, providing assistance to nursing homes to plan patient care from here).

  Further analysis has been undertaken on the potential impact of this model of care change within Section 3.5.

- **Increase Day of Surgery Admission Rates**

  Some stakeholders consulted discussed a practice of electively keeping patients from outside Townsville a few extra days for work up. This would result in increased average lengths of stay within these areas.

- **Increasing Interventional Radiology**

  Using the least invasive techniques to provide a wide range of therapeutic procedures under imaging guidance, will mean that many conditions that once required surgery may be treated laparoscopically, using catheters and miniature instruments, and resulting in significantly lower length of stay for patients.

  The range of disease processes and organs amenable to interventional radiology is extensive and includes vascular, genitourinary, gastrointestinal, hepatobiliary, musculoskeletal, pulmonary, and neurological conditions.

- **Implementing an Orthogeriatric Model of Care**

  An orthogeriatric model of care was described by stakeholders for the care of frail older orthopaedic patients. With reference to fall associated or fractures non-surgical, this model involved a comprehensive medical admission assessment with surgeons consulting in as required.

- **Model of Care Changes in Mental Health**

  A number of changes to models of care were been highlighted by stakeholders from mental health. These include:

  - Creation of a dedicated acute older persons unit within the additional bed allocation for adult acute mental health
  - Allocation of dedicated drug and alcohol detoxification beds within one of the medical units to address the current issue of these patients being distributed throughout the hospital (demand for withdrawal services is increasing)
  - Expansion of the Eating Disorders services to increase community alternatives to care and to support more children to transition to adult services once they are aged 18 (adolescents with eating disorders who require medical treatment are currently managed in the paediatric unit)

- Creation of a Family Unit for treatment of mothers and babies and for children aged 0-11 years. Stakeholders reported that occupancy levels of the current Child and Adolescent beds are relatively low and the projected bed requirements are likely to be in excess of demand for an inpatient service for 12-18 year olds. Children aged 0-11 years are currently managed within the paediatric unit and there is currently no dedicated mothers and babies unit. It is therefore proposed that the additional projected bed stock for child and adolescent beds be utilised to meet demand for the Family Unit.
- Building generalist capacity for rural and remote areas, including the use of telepsychiatry. There is an opportunity for THHS to take a lead in telepsychiatry for the whole of the North Queensland region.

3.2. Accounting for Changes to Models of Care Enabling AIM Trends

3.2.1. Methodology

As previously stated, the 'Base Case' does not reflect a 'status quo' scenario that makes no significant changes to models of care. For this reason the first crucial step in identifying risks and opportunities associated with changes to models of care is to understand the assumptions and trends within the AIM model that underpin the majority of general acute and subacute inpatient services. In doing so, THHS can be assured that the potential impact of identified opportunities are not already accounted for by in-built trends.

3.2.1.1. Length of Stay Trends in AIM

The AIM tool builds in clinical trends identified in historical data and through consultation. Although it is not possible to identify the exact inputs, the output can be analysed to identify trends in the projection. One important trend is to do with length of stay; the AIM tool decreases overnight length of stay across almost all clinical specialties. For THHS, length of stay for overnight inpatient services is projected to decrease from 5.5 to 4.7 days for adults and from 2.9 to 2.3 days for children. These trends will only be achieved through the changes to models of care that have been previously identified. Refer to Table 61. A more detailed analysis of the overnight ALOS reductions for medical and surgical SRG's is in Appendix D.

Table 61: THHS - Acute Inpatient Modelling Length of Stay Trends

Adult/ Child	Stay Type	Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change 2014/15 to 2036/37
Adult	**ON**	**Surgical / Procedural**	4.5	4.3	4.2	4.1	3.9	-0.6
		Cardiothoracic	5.6	4.8	4.5	4.3	4.1	-1.5
		Medical	4.1	3.9	3.8	3.7	3.6	-0.5
		Subacute	24.6	17.0	15.9	15.1	14.3	-10.3
		Obstetrics and Gynaecology	2.7	2.6	2.5	2.4	2.3	-0.4
		Neurosciences	6.4	5.6	5.4	5.2	4.9	-1.5
ON Total			**5.5**	**5.1**	**4.9**	**4.8**	**4.7**	**-0.8**
Child	**ON**	**Surgical / Procedural**	3.1	2.5	2.4	2.3	2.2	-0.9
		Cardiothoracic	4.4	4.4	4.4	4.5	4.5	0
		Medical	2.5	2.4	2.3	2.2	2.2	-0.3
		Subacute	8.3	9.5	8.5	7.8	7.2	-1.1
		Obstetrics and Gynaecology	2	2	1.9	1.8	1.8	-0.2
		Neurosciences	4.1	3.4	2.9	2.7	2.5	-1.6
ON Total			**2.9**	**2.6**	**2.5**	**2.4**	**2.3**	**-0.6**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

3.2.1.2. Projected Reductions in Relative Utilisation

In addition to reducing overnight average length of stay, the AIM process also reduces relative utilisation for some SRG's in line with statewide trends. Table 62 and 63 show those SRG's for which the public hospital relative utilisation was above the state average in 2014/15 and has been reduced over the period to 2036/37 indicating an expected decrease in inpatient admission rates for those services.

Table 62: Townsville Adult HHS Residents Relative Utilisation Public Hospitals - Surgical SRG's with RU › 105 in 2014/15

SRG - Surgical	2014/15		2036/37		RU Variance
	Separations	RU	Separations	RU	Separations
Vascular Surgery	627	162	1,037	140	-21
Interventional Cardiology	992	156	1,806	133	-24
Maxillo Surgery	71	145	51	110	-36
Cardiac Surgery	133	130	178	111	-19
Ophthalmology	1,168	124	2,845	122	-2
Head & Neck Surgery	168	120	334	104	-17
Dentistry	304	114	466	107	-7
Extensive Burns	31	105	39	93	-12
Orthopaedics	3,860	105	8,390	100	-5

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Table 63: Townsville Adult HHS Residents Relative Utilisation Public Hospitals - Medical SRG's with RU › 105 in 2014/15

SRG - Medical	2014/15		2036/37		RU Variance
	Separations	RU	Separations	RU	Separations
Endocrinology	1,049	151	1,929	126	-25
Haematological Surgery	71	129	117	125	-5
Immunology & Infections	1,624	119	4,413	113	-6
Respiratory Medicine	2,400	104	6,047	110	6

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

3.2.1.3. Built-in Assumptions relating to Aboriginal and Torres Strait Islander People

The Aboriginal and Torres Strait Islander population accounted for 7,294 out of 49,160 separations (AIM only) in THHS in 2014/15; approximately 15% of the total admitted activity. The annual growth rate in separations for Aboriginal and/or Torres Strait Islander People over the period to 2036/37 is projected to be 2.3%. 14% of all separations for Aboriginal and Torres Strait Islander people were provided to persons aged 0-14 in 2014/15, compared to 7% in the non-Aboriginal and Torres Strait Islander population.

Table 64: THHS - Base Case Acute Inpatient Modelling Trends (Separations) by Indigenous Status, 2014/15 to 2036/37

Indigenous Status	Age Group	2014/15	2026/27	2036/37	Change	AGR ^
Aboriginal and/or Torres Strait Islander	0-14	1,006	1,242	1,435	429	1.6%
	15-44	3,395	4,129	4,912	1,517	1.7%
	45-69	2,451	3,297	4,108	1,657	2.4%
	70-84	413	882	1,318	905	5.4%
	85+	29	105	286	257	11.0%
	Total	**7,294**	**9,655**	**12,059**	**4,765**	**2.3%**
Non-Aboriginal and/or Torres Strait Islander	0-14	3,087	4,178	5,219	2,132	2.4%
	15-44	12,529	16,649	20,877	8,348	2.3%
	45-69	14,388	20,617	27,154	12,766	2.9%
	70-84	8,921	18,483	27,868	18,947	5.3%
	85+	2,941	6,205	13,763	10,822	7.3%
	Total	**41,866**	**66,132**	**94,881**	**53,015**	**3.8%**
TOTAL		**49,160**	**75,787**	**106,940**	**57,780**	**3.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Table 65: THHS - Base Case Acute Inpatient Modelling Trends (% of Separations) by Indigenous Status, 2014/15 to 2036/37

Indigenous Status	Age Group	2014/15	2026/27	2036/37	Change
Aboriginal and/or Torres Strait Islander	0-14	14%	13%	12%	-2%
	15-44	47%	43%	41%	-6%
	45-69	34%	34%	34%	0%
	70-84	6%	9%	11%	5%
	85+	0%	1%	2%	2%
	Total	**100%**	**100%**	**100%**	**0%**
Non-Aboriginal and/or Torres Strait Islander	0-14	7%	6%	6%	-2%
	15-44	30%	25%	22%	-8%
	45-69	34%	31%	29%	-6%
	70-84	21%	28%	29%	8%
	85+	7%	9%	15%	7%
	Total	**100%**	**100%**	**100%**	**0%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

3.2.2. The Potential Impact

This section is focused on a range of changes to models of care that will enable the trends in AIM to be achieved. Therefore, there is no impact quantified other than what is already built into the "Base Case". However, the impact of not changing models of care can be quantified, in terms of beds required if length of stay does not change.

The analysis indicates that the built-in length of stay trends in the Acute Inpatient Modelling tool have a significant impact on projected bed requirements. If the average lengths of stay remained at 2014/15 levels, over 300 additional beds would be required across THHS by 2036/37, comparative to the Base Case.

The impact of making no changes to models of care (thereby holding Length of Stay constant) is over 300 additional beds by 2036/37

Table 66: THHS - Additional Overnight Beds Required if Average Length of Stay Remains at 2014/15 Levels

Adult/ Child	Stay Type	Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37
Adult	**ON**	**Surgical / Procedural**	0	7	16	25	38
		Medical	0	8	17	28	40
		Cardiothoracic	0	6	9	12	16
		Neurosciences	0	8	12	19	27
		Obstetrics and Gynaecology	0	2	3	5	7
		Subacute	0	66	96	136	184
ON Total			**0**	**96**	**154**	**225**	**312**
Child	**ON**	**Surgical / Procedural**	0	2	3	4	4
		Medical	0	1	1	1	2
		Neurosciences	0	1	1	1	2
ON Total			**0**	**4**	**5**	**7**	**8**

Table 67: TTH - Additional Overnight Beds Required if Average Length of Stay Remains at 2014/15 Levels

Adult/ Child	Stay Type	Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37
Adult	**ON+**	**Surgical / Procedural**	0	9	18	28	41
		Cardiothoracic	0	6	9	12	16
		Medical	0	9	17	27	39
		Subacute	0	43	65	93	128
		Obstetrics and Gynaecology	0	2	3	5	7
		Neurosciences	0	6	11	17	24
ON+ Total			**0**	**75**	**123**	**181**	**254**
Child	**ON+**	**Surgical / Procedural**	0	2	3	4	5
		Medical	0	1	1	2	2
		Neurosciences	0	1	1	2	2
ON+ Total			**0**	**4**	**6**	**7**	**9**

3.3. Increasing Hospital in the Home Services

3.3.1. The Opportunity

Hospital in the Home (HITH) provides care in the community setting (at the patient's permanent or temporary residence), for acute conditions requiring medical governance, monitoring/input, that would otherwise require treatment in the traditional inpatient bed. The admission criteria are governed by the Queensland Health admission policy and as such the HITH program is focused exclusively on acute admitted care substitution.

In Townsville, the adult HITH service is currently outsourced to a non-government service provider, Blue Care, with clinical oversight provided by THHS. Consultation has indicated that there is the potential to grow the HITH service in the future. Furthermore, there is no paediatric HITH service currently in operation.

Consultation also indicated the potential to better coordinate a range of acute and subacute community-based services in the future including HITH, Community IV, Extended Acute Care (wound care) and Transition Care.

3.3.2. Methodology

In the 2014/15 financial year, there were a total of 777 Adult HITH separations at an average length of stay of 5.3 days. This was equivalent to 1.2% of total admissions at TTH. The HITH service is admitted, and therefore included in the AIM tool.

Table 68: TTH in the Home Services for Adults by SRG, 2014/15

SRG	Seps	Bed days	ALOS
Immunology & Infections	385	1,572	4.1
Non-Subspecialty Medicine	107	474	4.4
Non-Subspecialty Surgery	80	488	6.1
Respiratory Medicine	67	409	6.1
Obstetrics	31	109	3.5
Orthopaedics	12	136	11.3
Neurology	11	88	8.0
Rheumatology	10	54	5.4
Upper GIT Surgery	9	123	13.7
Other SRGs	65	653	10.0
Grand Total	**777**	**4,106**	**5.3**

Source: Data provided by the Department of Health

The Queensland Health Inpatient Improvement Team recommends targeting **3.0% of total admissions** for Hospital in the Home services. This was confirmed as an appropriate target for Townsville during the consultation process.

3.3.3. The Potential Impact

The Hospital in the Home service was modelled to increase to 3% from 2021/22 and maintained at this level in the out-years. Increasing HITH services to 3% would have a significant impact on on-site bed requirements at TTH; approximately 37 less beds would need to be built by 2036/37. Refer to Table 69.

Increasing the Adult HITH service to 3% of all admissions by 2021/22 would have a 37 bed impact by 2037/37

Table 69: Potential Impact of Increasing HITH Services at TTH

	2014/15	2021/22	2026/27	2031/32	2036/37
Base Case HITH Activity (Seps)	777	1,026	1,214	1,430	1,667
Base Case HITH Activity (Bed days)	4,106	5,235	5,948	6,723	7,668
Base Case HITH Equivalent Beds	**13.2**	**16.9**	**19.2**	**21.7**	**24.7**
Scenario HITH Activity (Seps)	777	2,566	3,034	3,576	4,167
Scenario HITH Activity (Bed Days)	4,106	13,087	14,869	16,807	19,169
Base Case HITH Equivalent Beds	**13.2**	**42.2**	**47.9**	**54.2**	**61.8**
Difference - Scenario vs. Base Case (Beds)	**-**	**25.3**	**28.8**	**32.5**	**37.1**

3.4. Removing Other Non-Acute Patients

3.4.1. The Opportunity

Consultation indicated that there are a significant number of non-acute patients (primarily maintenance) that are occupying beds at TTH. The vast majority of these patients do not need to be in an acute hospital environment. These patients are generally elderly, and awaiting placement in an appropriate residential aged care facility.

There is the potential to reduce the number of maintenance patients that are admitted to TTH, and to reduce their length of stay. Several suggestions for changes to existing models of care, provided by stakeholders, are outlined in Section 3.1.

It should be noted that many changes would be reliant on the availability of out-of-hospital services, potentially entering into partnerships with local aged care providers, or utilising existing HHS resources in new ways.

3.4.2. Methodology

The Base Case projection for Other Non-Acute SRG patients in TTH has been analysed. A 50%, 75% and 100% potential reduction in the number of maintenance patients has been modelled below.

3.4.3. The Potential Impact

If all maintenance patients were removed from TTH in the future, there would be the potential for up to 39 beds that would not be required at TTH comparative to the Base Case. If 50% of maintenance patients in the Base Case were removed, this would be up to 20 beds that would not be required at TTH.

Table 70: Removing "Other Non-Acute" Patients - Potential Impact on TTH

	2014/15	2021/22	2026/27	2031/32	2036/37
Base Case					
Seps	268	351	416	492	567
Bed days	9,654	8,687	9,857	11,243	12,512
Beds	30	27	31	35	39
50% Reduction in Activity					
Seps	134	175	208	246	283
Bed days	4,827	4,344	4,929	5,622	6,256
Beds	-	14	16	18	20
75% Reduction in Activity					
Seps	67	88	104	123	142
Bed days	2,414	2,172	2,464	2,811	3,128
Beds	-	7	8	9	10
Difference - Base Case vs. Scenarios (Beds)					
50% Reduction	-	**14**	**16**	**18**	**20**
75% Reduction	-	**20**	**23**	**26**	**29**
100% Reduction	-	**27**	**31**	**35**	**39**

The impact of removing all 'Other Non-Acute' patients from TTH by 2026/27 is 31 beds

3.5. Increasing Home-Based Palliative Care Services

3.5.1. The Opportunity

In recent years the philosophy and service models underpinning palliative and end of life care have changed. There has been an increased focus on providing more options for patients, particularly increasing the ability for people to palliate at home.

Currently, TTH has a 20 bed service, providing a hospital liaison and community service. According to a recent Grattan Institute report, surveys consistently show that between 60% and 70% of Australians would prefer to die at home. Stakeholders advised that in Townsville, only 14% of people die at home.

It is anticipated that investment in home-based palliative care services would have an impact on reducing the number of patients palliating in hospital.

3.5.2. Methodology

The potential impact of increasing support for home-based palliative care services has been modelled. As it is expected that the largest potential impact would be in Townsville, the potential reduction in terms of activity and beds at TTH has been modelled.

3.5.3. The Potential Impact

Reducing the percentage of hospital-based palliative care services in TTH by 15% would result in 6 less beds being required on-site by 2036/37. A reduction of 30% would result in 11 less beds being required by 2036/37.

Table 71: Increase in Palliative Care in the Home - Potential Impact on TTH

	2014/15	2021/22	2026/27	2031/32	2036/37
Base Case					
Seps	427	659	868	1,141	1,469
Bed days	3,832	5,810	7,348	9,278	11,472
Beds	12	18	23	29	35
15% Reduction in Activity					
Seps	64	99	130	171	220
Bed days	575	872	1,102	1,392	1,721
Beds	10	15	19	24	29
30% Reduction in Activity					
Seps	128	198	260	342	441
Bed days	1,150	1,743	2,204	2,783	3,442
Beds	8	12	16	20	24
Difference - Scenarios vs Base Case (Beds)					
15% Reduction	**2**	**3**	**4**	**5**	**6**
30% Reduction	**4**	**6**	**7**	**9**	**11**

The impact of reducing hospital-based palliative care services in TTH by 30% would be 11 less beds required by 2036/37

4. SCENARIO 2: The future role of rural/remote services within THHS

4.1. Introduction

Rural and remote facilities in THHS are currently located at Ayr, Ingham, Charters Towers, Home Hill, Hughenden, Richmond and Palm Island (Joyce Palmer Health Service).

Consultation has indicated that the rural primary hubs (CSCF Level 3 facilities) in THHS have the potential to increase their service capability and self-sufficiency for admitted and non-admitted services. These facilities are:

- Ayr Hospital (90km south of Townsville)
- Ingham Hospital (115km north of Townsville)
- Charters Towers Hospital (140km south-west of Townsville).

Consultation has indicated that the implementation of the Rural Generalist model has already been having a significant impact on the scope of services that can be provided at these facilities. However, further development of contemporary service models is required.

The *Charters Towers Hospital Gate 1 Preliminary Business Case* provides a valuable summary of what a contemporary model of care at a rural primary hub would look like:

A contemporary model of care for THHS rural facilities:

- **Providing core secondary services**
- **Rural primary hub with care closer to home**
- **Improved collaboration with partners**
- **Patient-centred pathways supported by clinically appropriate environments and technology**

- Restoring the focus on the core secondary health services (day surgery, endoscopy, emergency, inpatient, low-risk maternity, rehabilitation and palliative care)
- Delivering on expectations of a fully-functional rural primary hub that is Digital-hospital ready, and provides a range of Level 3 services closer to home
- Improved collaboration with primary and community-based healthcare providers, resulting in enhanced coordination of care for patients with chronic conditions and long-term needs
- Providing patient-centred pathways that improve accessibility to services; enable more efficient staff and patient flows; are supported by clinically appropriate and respectful treatment environments; and leverage the benefits of enhanced radiology and point of care technologies.

The development of this model of care would be facilitated by new technologies (e.g. imaging such as CT), support from higher services via telehealth (e.g. for palliative care), new workforce models, and changes to the way that clinical services do business in the broader network with TTH. The role of the Rural Generalist would be paramount in enabling changes to model of care, along with nursing staff and allied health staff working to full scope.

It is noted that consultation indicated that consideration of new workforce models at the CSCF Level 2 facilities of Hughenden and Richmond would improve the quality of service provision, and the sustainability of these remote services. This could potentially be via a rotation model with Charters Towers Hospital.

Notes:

No adjustment has been made to projections for the Joyce Palmer Health Service in anticipation of an outcome from the Palm Island Health Planning process (currently underway).

Although consultation revealed a desire to model reduced review appointments from rural place of residence (reduced by 50% and 70%), along with reduced primary care-type appointments at rural facilities (assuming status quo with regard to extra-HHS inpatient flows) further work as described earlier in this report (Section 2.3.8) is recommended prior to undertaking this analysis.

4.2. Medical Services

4.2.1. The Opportunity

The CSCF Level 3 facilities at Ayr, Ingham and Charters Towers have the potential to do a broader range of admitted inpatient medical activity. Rural Generalists would have an important role to play in achieving this, supported by higher level services in Townsville (linked via telehealth). Allied health and nursing staff would also need to be working to their full scope of practice to enable this opportunity.

Consultation indicated that the addition of CT services at the rural facilities would also reduce the need to transfer patients to Townsville for diagnostic services. This would also improve outcomes for a number of patients (e.g. in relation to stroke lysis).

4.2.2. Methodology

The current self-sufficiency of the relevant THHS Planning Regions is outlined below. Self-sufficiency was similar across all Planning Regions, between 77% and 79%.

Table 72: Medical Services Self-Sufficiency by Planning Region, 2014/15

Planning Region	Overnight	Same Day	Total
Burdekin (Ayr)	82%	72%	79%
Charters Towers	76%	80%	77%
Ingham	80%	76%	79%

An increase to a self-sufficiency level of 85% was modelled. This number was chosen on the basis of consultation, an understanding of current service profiles, and comparisons with other rural facilities in Queensland.

4.2.3. The Potential Impact

The impact of increasing self-sufficiency to 85% at the rural hospitals is summarised below in terms of activity (separations and beddays) and overnight beds. Increasing self-sufficiency leads to an increase in activity at the rural hospitals, comparative to the Base Case. The impact is approximately 1.5 additional beds across all the in-scope rural facilities.

Cumulatively, there are approximately 4.5 beds that would not need to be built at TTH by 2036/37, comparative to the Base Case treatment space projections.

Broading the scope and volume of medical services provided at THHS CSCF L3 facilities (increasing self-sufficiency to 85%) would result in 4.5 less beds being required at TTH by 2036/37

Table 73: Ayr Hospital - Additional Medical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	63	65	65	63	61
Same Day Separations	68	106	145	193	247
Overnight Beddays	430	492	496	498	501
Overnight Beds	**1.4**	**1.6**	**1.6**	**1.6**	**1.6**

Table 74: Charters Towers Hospital - Additional Medical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	71	85	94	101	104
Same Day Separations	15	30	44	62	80
Overnight Beddays	408	453	468	469	455
Overnight Beds	**1.3**	**1.5**	**1.5**	**1.5**	**1.5**

Table 75: Ingham Hospital - Additional Medical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	67	72	72	71	65
Same Day Separations	33	51	66	79	92
Overnight Beddays	510	429	433	430	413
Overnight Beds	**1.6**	**1.4**	**1.4**	**1.4**	**1.3**

4.3. Surgical Services

4.3.1. The Opportunity

Similar to medical services, consultation indicated that surgical services can also be increased at the CSCF Level 3 rural hospitals. The theatres at these hospitals are underutilised, and visiting surgical services are minimal. Furthermore, Rural Generalists can perform a range of low acuity surgery, as well as support inpatient recovery for surgeries undertaken by visiting specialists. Allied health and nursing staff would also need to be working to their full scope of practice to enable this opportunity.

4.3.2. Methodology

The current self-sufficiency for surgical services of the relevant THHS Planning Regions is outlined below. Self-sufficiency was similar across all Planning Regions, between 41% and 49%.

Table 76: Surgical Services Self-Sufficiency by Planning Region, 2014/15

Planning Region	Overnight	Same Day	Total
Burdekin (Ayr)	48%	48%	48%
Charters Towers	38%	44%	41%
Ingham	50%	47%	49%

An **increase to a self-sufficiency level of 65%** was modelled. This number was chosen on the basis of consultation, an understanding of current service profiles, and comparisons with other rural facilities in Queensland.

4.3.3. The Potential Impact

The impact of increasing self-sufficiency to 85% at the rural hospitals is summarised below in terms of activity (separations and beddays) and overnight beds. Increasing self-sufficiency leads to an increase in activity at the rural hospitals, comparative to the Base Case. The impact is approximately 3 additional beds across all the in-scope rural facilities.

Cumulatively, there are approximately 9 beds that would not need to be built at TTH by 2036/37, comparative to the Base Case treatment space projections.

Broading the scope and volume of surgical services provided at THHS CSCF L3 facilities (increasing self-sufficiency to 85%) would result in 9 less beds being required at TTH by 2036/37

Table 77: Ayr Hospital - Additional Surgical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	111	126	137	145	150
Same Day Separations	70	91	113	138	163
Overnight Beddays	691	768	814	849	870
Overnight Beds	**2.2**	**2.5**	**2.6**	**2.7**	**2.8**

Table 78: Charters Towers Hospital - Additional Surgical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	129	153	170	187	200
Same Day Separations	86	108	127	145	158
Overnight Beddays	735	825	870	920	939
Overnight Beds	**2.4**	**2.7**	**2.8**	**3**	**3**

Table 79: Ingham Hospital - Additional Surgical Activity and Beds at 85% Self-Sufficiency

	2014/15	2021/22	2026/27	2031/32	2036/37
Overnight Separations	138	159	171	180	186
Same Day Separations	130	154	172	192	211
Overnight Beddays	797	837	876	906	915
Overnight Beds	**2.6**	**2.7**	**2.8**	**2.9**	**2.9**

4.4. Endoscopy Services

4.4.1. The Opportunity

Consultation indicated that there are a number of patients accessing services at TTH for low-risk endoscopy services from the rural Planning Regions. Stakeholders considered there to be opportunity to provide more of these services from CSCF Level 3 facilities. Endoscopies would primarily be performed by the Rural Generalists, supported by nursing staff.

4.4.2. Methodology

Patient flows for endoscopy services were provided in the projections by the Department of Health. The percentage of endoscopy flows for THHS from the Charters Towers - Ayr - Ingham SA3 was quantified at approximately 25%. This was further broken down by Planning Region on the basis of population size.

Consultation indicated that the majority of endoscopy services are low risk. Therefore, 90% of the total endoscopy demand was assumed to be low risk and amenable to be treated at the CSCF Level 3 facilities.

Revised "scenario" projections for Ayr, Charters Towers and Ingham were calculated based on the assumption that 90% of the patients currently flowing from these areas to receive treatment at The Townville Hospital, could be treated locally. The impact on TTH was measured accordingly.

If 90% of Burdekin, Charters Towers and Hinchinbrook patients requiring endoscopy services accessed these services locally at Ayr, Charters Towers and Ingham Hospitals, over 400 less endoscopies would need to be conducted at TTH by 2036/37

4.4.3. The Potential Impact

The potential impact has been summarised in the table below, represented as the Base Case and Scenario projections for endoscopy services. The volume of endoscopy services has been projected to increase in the Scenario for all the rural hubs, comparative to the Base Case. The largest volume impact is on the projections at Charters Towers Hospital. There was negligible impact on Ingham Hospital so the Scenario is the same as the Base Case for this hospital. By 2036/37, it is projected that over 400 less endoscopies would need to be conducted at TTH, comparative to the Base Case.

Table 80: Base Case vs Scenario Projections - Townsville, Ayr, Charters Towers and Ingham Hospitals

Facility of Treatment	2015/16	2021/22	2026/27	2031/32	2036/37	Change	AGR
Townsville Hospital Base Case	3,402	4,039	4,794	5,691	6,756	3,354	4.7%
Townsville Hospital Scenario	**3,098**	**3,907**	**4,591**	**5,378**	**6,327**	**3,228**	**4.9%**
Ayr Hospital Base Case	352	580	767	786	807	455	5.7%
Ayr Hospital Scenario	**469**	**557**	**754**	**832**	**915**	**446**	**4.6%**
Charters Towers Hospital Base Case	143	236	312	316	321	178	5.5%
Charters Towers Scenario	**329**	**391**	**529**	**584**	**642**	**313**	**4.6%**
Ingham Hospital Base Case	423	693	916	947	980	557	5.8%
Ingham Hospital Scenario	**423**	**693**	**916**	**947**	**980**	**557**	**5.8%**

Base Case sourced from Endoscopy POR Projections provided by the Department of Health with manual adjustments applied

4.5. Obstetrics Services

4.5.1. The Opportunity

Consultation indicated that the self-sufficiency of obstetrics services (vaginal deliveries in particular) could be increased at Charters Towers and Ingham. These facilities are at the same broad capability level as Ayr Hospital that has had a low risk birthing service for a number of years. The majority of vaginal deliveries are low risk, and should therefore be able to be undertaken in these CSCF Level 3 facilities, supported by the appropriate workforce and support from higher level services at Townsville.

4.5.2. Methodology

The self-sufficiency for vaginal deliveries at Ayr Hospital (Burdekin Planning Region) was 80% in 2014/15. The same self-sufficiency was applied to Charters Towers and Ingham to project the impact of the introduction of low risk birthing services at these facilities.

4.5.3. The Potential Impact

At 80% self-sufficiency for vaginal deliveries, there would have been 66 deliveries at Charters Towers Hospital and 90 deliveries at Ingham Hospital in 2014/15. The volumes are projected to decrease slightly over the next 20 years. Based on the projections, less than one inpatient bed would be required at each facility to cater for this activity (although it is noted that due to fluctuations in demand it is likely that more than one woman would require access to an inpatient bed at different times throughout a year).

If obstetric services at Charters Towers and Ingham opened/expanded (to 80% self-sufficiency for vaginal deliveries), in 2014/15 there would have been 66 deliveries at Charters Towers Hospital and 90 deliveries at Ingham Hospital

Table 81: Charters Towers Hospital - Additional Obstetrics Activity and Beds at 80% Self-Sufficiency for Vaginal Deliveries

	2014/15	2021/22	2026/27	2031/32	2036/37
Seps	66	62	62	62	61
Beddays	114	121	115	110	106
Overnight Beds	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**

Table 82: Ingham Hospital - Additional Obstetrics Activity and Beds at 80% Self-Sufficiency for Vaginal Deliveries

	2014/15	2021/22	2026/27	2031/32	2036/37
Seps	90	84	82	80	79
Beddays	182	168	158	149	141
Overnight Beds	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**

5. SCENARIO 3: Consolidating the role of TTH as a regional tertiary referral hospital

5.1. Introduction

Consultation with key internal THHS stakeholders identified that one of the major strategic issues for TTH is the need to consolidate and strengthen its role as the major tertiary referral hospital for northern Queensland servicing Townsville, Mackay, North West, Cairns and Hinterland and Torres and Cape HHS residents.

TTH provides approximately 85% (38,097 separations in 2014/15) of the total THHS resident separations (refer Table 23 from the Health Service Plan Background Paper, May 2017). In addition to the services provided to THHS residents, a further 6,612 separations were provided by TTH for residents of other HHS's in 2014/15. (Refer Tables 2 and 53 from the Health Service Plan Background Paper, May 2017).

Overall, THHS is highly self-sufficient for the provision of public hospital services with just over 95% of all THHS resident separations occurring from hospitals within THHS (refer Table 22 from the Health Service Plan Background Paper, May 2017). In 2014/15, there were 950 total separations for residents of THHS provided from hospitals located in the Brisbane metropolitan area (refer Table 29 and Table 30 from the Health Service Plan Background Paper, May 2017).

In addition to outflows of THHS residents, consultation identified concerns in relation to the volume of "flyovers" of residents of other North Queensland HHS's travelling to Brisbane for services that were available in Townsville. In 2014/15, there was a total of 2,508 public hospital separations provided by metropolitan Brisbane HHS's to adult residents of Mackay, Cairns and Hinterland, North West and Torres and Cape HHS. A further 733 separations were provided to residents aged 0-14 years from those other North Queensland HHS's (refer Tables 60 and 61 from the Health Service Plan Background Paper, May 2017).

Furthermore, consultation also identified concerns with the projected volume of activity being provided to residents of other HHS's, particularly Mackay, Cairns and Hinterland and North West. Of all non-THHS residents, residents of the Mackay HHS accounted for the greatest volume of separations and beddays at TTH in 2014/15 (2,149 separations and 11,533 beddays). Residents of Cairns and Hinterland HHS and North West HHS used 4% (1,578) and 3% (1,369) of total TTH separations, and 6% (10,769) and 4% (7,292) beddays respectively. (Refer Table 53 from the Health Service Plan Background Paper, May 2017).

5.2. Opportunities

Consultation identified that there were key outflows of both adults and children to public hospitals in metropolitan Brisbane that would be both feasible and advantageous to reverse both from equity of access and workforce recruitment and retention perspectives. In addition, the key opportunity for the further development of an academic health research and teaching campus in

collaboration with JCU further supports the need for consolidating the role of TTH as the regional referral centre.

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The following specialty areas were identified by clinicians during consultation as priorities for reducing outflows and/or consolidating TTH tertiary level capability for the provision of services for adults:

- Maxillo-facial surgery (i.e. free-flap surgeon)
- Plastic Surgery
- Urology
- Vascular Surgery
- Neurosciences (including procedures for epilepsy)
- Ophthalmology
- Respiratory Medicine
- Palliative Care
- Interventional Radiology
- Accreditation of Trauma Service.

The capacity of clinical support services is a major constraint, in particular:

- **Medical Imaging**
- **Operating Theatres**
- **Anaesthetics**
- **Allied Health**
- **Critical Care**

Key specialty areas identified for reversal of paediatric outflows to Lady Cilento Children's Hospital include:

- Neurosurgery and neurology
- Cardiology
- Respiratory Medicine (including cystic fibrosis)
- Rehabilitation
- Specialty integrated services such as Spina Bifida, Cystic Fibrosis and Endocrine Diabetes.

In relation to paediatric services, detailed discussions are already occurring between THHS and LCCH to identify the levels of support required to increase the specialist paediatric role of TTH.
The following clinical support services were also identified as key constraints for the further development of tertiary level services:

- Medical Imaging services and in particular access to MRI/CT (noting that both medical imaging and nuclear medicine are CSCF Level 5 services at TTH)
- Access to theatres and, in particular, a hybrid theatre

- Capacity of anaesthetics, allied health services, ICU and PICU to manage the flow on impact of providing increased volumes of higher complexity services.

The longer term sustainability of tertiary level services is highly interlinked with the effectiveness of the networking and referral relationships with other North Queensland HHS's. TTH is dependent on flows from these other HHS's in order to retain critical mass for a range of specialties including in particular, neurosurgery, cancer services (including radiation oncology) and interventional cardiology. It is also noted that inflows to TTH from other North Queensland HHS can fluctuate significantly as a result of workforce recruitment and retention issues particularly in Cairns, Mackay and Mt Isa for particular specialties.

Importantly, during consultation no indication was provided by other North Queensland HHS of endorsed, short to medium-term plans to change their service profile and capability in a sustainable way, that would significantly influence inflows to TTH. However, consultation within THHS indicated that there are concerns with projected volumes of inflows from other North Queensland HHS's. A portion of this activity are tertiary referrals and will need to continue to be provided by TTH as the tertiary referral hospital of North Queensland. However, a significant volume of these flows would be for secondary level services that could be able to be provided locally in the other HHSs, reducing the pressure on TTH in the future. This would allow TTH to focus on meeting the growing demand for hospital services from local residents in THHS and for delivery of low volume and high complexity tertiary level services for North Queensland. There will need to be a continued focus on ensuring that secondary level services are provided locally to residents in other HHS's.

The extent to which specific flow reversals are achievable requires further detailed planning and expert clinical advice at an individual service level.

5.3. Methodology

5.3.1. Flow Reversal from Brisbane public hospitals

The THHS Base Case projection assumes that the volume of inflows to TTH from other North Queensland HHS's and the volume of THHS resident outflows plus "flyovers" to south east Queensland will continue to increase in line with population growth and trends.

To provide a broad level analysis of the potential impact of strengthening the specialist referral role of TTH on future activity and overnight bed requirements at TTH, the following assumptions have been made:

- **An overall reversal of adult and paediatric THHS resident outflows** to Lady Cilento Children's Hospital, Royal Brisbane Hospital, Princess Alexandra Hospital, The Mater Public Hospitals and The Prince Charles Hospital (excluding transplantation services) has been calculated at 2 levels of reversal (75% and 50%) noting that 100% reversal will not be feasible. Private hospital outflows have not been included at this stage on the basis that these referral patterns are historically difficult for the HHS to influence.
- **An overall reversal of adult and paediatric "flyovers" from other North Queensland HHS's** (Cairns and Hinterland, Torres and Cape, Mackay and North West HHS's) to Children's Health Services, Metro North, Metro South HHS's and Mater Public Hospitals (excluding transplantation services) has been calculated at 2 levels of reversal (75% and 50%). Private hospital "flyover" volumes have also not been included at this stage on the basis that these referral patterns are outside the ability of the THHS to influence.

5.3.2. Reversal of Inflows to TTH from Other North Queensland HHSs

The THHS Base Case projection assumes that the volume of inflows to TTH from other North Queensland HHS's will continue in line with population growth and trends.

A broad analysis has been undertaken on the volume of inflows from other HHSs, in particular Mackay, Cairns and Hinterland and North West HHS. Some further detailed analysis on surgical / procedural and subacute specialties has been further undertaken to inform future investment decisions and planning involving these HHSs.

5.3.3. Analysis of Priority Specialties

In addition, a range of variables have been further analysed to provide additional information for the identification of priority specialties for future investment:

1. Total public and private relative utilisation by residents of THHS in the base year (indicating levels of access currently lower than the average for Queensland)
2. Public relative utilisation by residents of THHS in the base year (indicating levels of access currently lower than the average for Queensland)

Relative Utilisation (RU) Recap

RU provides a single measure of the difference between the actual number of admissions and the expected number of admissions using a state average.

RU<100 = below average admission rates

RU>100 = above average admission rates

3. Projected increases in public relative utilisation by 2036/37 (indicating an underlying assumption in AIM that public sector access will be increased over time)
4. Top 10 outflows by volume of separations of THHS residents to RBWH, TPCH, PAH, Mater Adults, Mater Mothers and Lady Cilento Children's Hospitals
5. Top 10 inflows to THHS by volume of separations of residents of Cairns and Hinterland, Torres Strait and Cape York, Mackay and North West HHS's
6. Top 10 "flyovers" by volume of separations of residents of Cairns and Hinterland, Torres Strait and Cape York, Mackay and North West HHS residents to Children's Health Services, Metro North, Metro South HHS's and Mater Public Hospitals.

5.4. Potential impact

5.4.1. Impact of Flow Reversal from Brisbane Public Hospitals on Overnight Bed Requirements

The potential impact on infrastructure requirements has been analysed in terms of overnight bed requirements only due to issues of data availability and differences in projection methodology for same day services. Any increase in demand for overnight beds would also have major cost impacts both capital and recurrent. It is important to note though that any flow reversal would also have a significant associated impact on ambulatory (same day and outpatient) capacity.

5.4.1.1. Adult Services

Outflows

In 2014/15, outflows of adult Townsville residents occupied the equivalent of 9.6 overnight beds at RBWH, TPCH, PAH, Mater Adults and Mater Mother's Hospitals. Under the Base Case projection, the utilisation of these overnight beds would increase to 13.8 by 2036/37. Refer to Table 83.

Table 83: Projected Adult THHS Resident Separations and Overnight Beds by Specialty Grouping by Place of Treatment (RBWH, TPCH, PAH, Mater Adults and Mothers)

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	151	228	313	1,406	1,740	2,070	4.5	5.6	6.7
Cardiothoracic	30	47	64	269	297	393	0.9	1.0	1.3
Medical	107	162	223	488	657	824	1.6	2.1	2.7
Neurosciences	35	51	67	390	404	474	1.3	1.3	1.5
Obstetrics and Gynaecology	19	24	28	79	91	104	0.3	0.3	0.3
Subacute	18	36	48	371	381	427	1.1	1.2	1.3
TOTAL	**360**	**548**	**744**	**3,003**	**3,569**	**4,292**	**9.6**	**11.4**	**13.8**

Excluding Transplantation, Mental Health and Unallocated SRG's
Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Two broad scenarios have been considered in relation to potential flow reversal of Townsville resident outflows: an overall 75% reversal and an overall 50% reversal (noting that 100% reversal is very unlikely to be feasible). Table 84 details the potential additional overnight bed requirements at TTH should these flows be reversed.

At 2036/37, there is estimated to be an additional requirement of between 7 and 10 beds to cater for the potential additional demand from adult THHS residents as a result of reversing outflows.

There would only be a small impact on projected overnight adult bed requirements at TTHS by reversing outflows of THHS residents to Brisbane

Table 84: "Scenario" Impact on Overnight Bed Requirements of Flow Reversal of Adult THHS Resident Separations from RBWH, TPCH, PAH, Mater Adults and Mothers

What if?	75% Reversal			50% Reversal		
Overnight Beds	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	3.4	4.2	5.0	2.3	2.8	3.3
Cardiothoracic	0.7	0.7	1.0	0.4	0.5	0.6
Medical	1.2	1.6	2.0	0.8	1.1	1.3
Neurosciences	0.9	1.0	1.1	0.6	0.7	0.8
Obstetrics and Gynaecology	0.2	0.2	0.3	0.1	0.2	0.2
Subacute	0.8	0.9	1.0	0.6	0.6	0.6
TOTAL	**7.2**	**8.6**	**10.3**	**4.8**	**5.7**	**6.9**

Flyovers

"Flyovers" of adult residents of other North Queensland HHS's to hospitals in Metro North, Metro South HHS's and Mater Public Hospitals accounted for 39 overnight beds in 2014/15 and is projected to increase to 55 overnight beds by 2036/37 if the current trend is maintained. Refer to Table 85.

Table 85: Projected "Flyover" Adult Resident Separations and Overnight Beds from Other North Queensland HHS of Residence by Specialty Grouping to HHS of Treatment (Metro North, Metro South, Mater Public)

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	849	1,113	1,464	6,050	6,515	7,725	19.7	21.4	25.4
Cardiothoracic	35	61	77	439	568	676	1.4	1.8	2.2
Medical	417	633	831	1,856	2,504	3,007	5.9	7.9	9.5
Obstetrics and Gynaecology	136	204	241	622	740	795	2.1	2.5	2.7
Neurosciences	83	140	185	1,096	1,671	2,133	3.5	5.4	6.9
Subacute	78	151	217	2,119	2,198	2,906	6.5	6.7	8.8
TOTAL	**1,598**	**2,301**	**3,015**	**12,182**	**14,198**	**17,243**	**39.1**	**45.7**	**55.4**

Excluding Transplantation, Mental Health and Unallocated SRG's

Source: Queensland Department of Health Fly Over Data_grouped_1704_Townsville_Data_Request_updated.xls

Two broad scenarios have been considered in relation to potential flow reversal of "flyovers" of residents from other North Queensland HHS's: an overall 75% reversal and an overall 50% reversal (noting that 100% reversal is very unlikely to be feasible). The table below details the potential additional overnight bed requirements at TTH should these flows be reversed.

As at 2036/37 there is estimated to be between 42 and 28 beds for the additional demand from other North Queensland residents who would potentially no longer access services in Brisbane.

There is potential to reverse 'flyovers' of residents from other North Queensland HHS's to Brisbane. Depending on the extent that this is achieved, this would result in an increased adult bed requirement of between 28 and 42 beds at TTH.

Table 86: "Scenario" Impact on Overnight Bed Requirements of Flow Reversal of "Flyover" Adult Resident Separations from Other North Queensland HHS's from RBWH, TPCH, PAH, Mater Adults and Mothers

What if?	75% Reversal			50% Reversal		
Overnight Beds	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	14.8	16.0	19.0	9.9	10.7	12.7
Cardiothoracic	1.1	1.4	1.6	0.7	0.9	1.1
Medical	4.4	5.9	7.1	2.9	4.0	4.8
Neurosciences	1.6	1.9	2.0	1.0	1.2	1.3
Obstetrics and Gynaecology	2.6	4.0	5.2	1.8	2.7	3.4
Subacute	4.8	5.0	6.6	3.2	3.3	4.4
TOTAL	**29.3**	**34.3**	**41.6**	**19.6**	**22.8**	**27.7**

5.4.1.2. Paediatric Services

Outflows

In 2014/15, outflows of Townsville residents to Lady Cilento Children's Hospital occupied the equivalent of 3.8 overnight beds. Under the Base Case projection, the utilisation of these overnight beds would increase to 5.4 beds by 2036/37. Refer to Table 87.

Table 87: Projected THHS Resident Separations and Overnight Beds (All Ages) by Specialty Grouping by Place of Treatment LCCH

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	66	87	105	401	361	400	1.5	1.3	1.5
Cardiothoracic	14	23	26	71	185	223	0.3	0.7	0.8
Medical	66	98	122	351	509	599	1.3	1.9	2.2
Obstetrics and Gynaecology	1	1	1	5	2	2	0.0	0.0	0.0
Neurosciences	17	25	30	169	134	132	0.6	0.5	0.5
Qualified Neonate	4	6	8	45	89	115	0.2	0.3	0.4
Chemotherapy	0	0	0	0	0	0	0.0	0.0	0.0
TOTAL	**168**	**241**	**293**	**1,042**	**1,280**	**1,470**	**3.8**	**4.7**	**5.4**

Excludes Unqualified Neonates, Mental Health, Unallocated and Transplantation SRG's
Source: Acute Inpatient Model: THHS Scenario (14/15 Base)
(Note: Bed numbers based on 75% occupancy for all specialty groupings including qualified neonates)

Two broad scenarios have been considered in relation to potential flow reversal of both Townsville resident outflows: an overall 75% reversal and an overall 50% reversal (noting that 100% reversal is very unlikely to be feasible). Table 88 details the potential additional overnight bed requirements at TTH should these flows be reversed.

There would only be a small impact on projected overnight paediatric bed requirements at TTH by reversing outflows of THHS paediatric residents to Children's Health Services Queensland.

At 2036/37, there is estimated to be an additional requirement of between 3 and 4 beds to cater for the additional paediatric services demand from THHS residents.

It is critical, however, to note that contemporary models for paediatrics mean that the service is now largely ambulatory and the major impact will be on same day and outpatient services. Accurate projection modelling data is not available to estimate the additional demand for ambulatory services and therefore further specific detailed planning at an individual speciality level will be required.

Table 88: "Scenario" Impact on Overnight Bed Requirements of Flow Reversal of THHS Resident Separations (All ages) from LCCH

What if?	75% Reversal			50% Reversal		
Overnight Beds	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	1.1	1.0	1.1	0.7	0.7	0.7
Cardiothoracic	0.2	0.5	0.6	0.1	0.3	0.4
Medical	1.0	1.4	1.6	0.6	0.9	1.1
Obstetrics and Gynaecology	0.0	0.0	0.0	0.0	0.0	0.0
Neurosciences	0.5	0.4	0.4	0.3	0.2	0.2
Qualified Neonate	0.1	0.2	0.3	0.1	0.2	0.2
Chemotherapy	0.0	0.0	0.0	0.0	0.0	0.0
Total	**2.9**	**3.5**	**4.0**	**1.9**	**2.3**	**2.7**

Flyovers

"Flyovers" of residents aged 0-14 years from other North Queensland HHS's to Children's Health Services HHS accounted for 12 overnight beds in 2014/15 and is projected to increase to just under 15 overnight beds by 2036/37 if the current trend is maintained. Refer to Table 89.

Table 89: Projected "Flyover" Children aged 0-14 years Separations and Overnight Beds by Specialty Grouping by Other North Queensland HHS of Residence by HHS of Treatment (Children's Health Services)

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	168	201	226	988	740	755	3.6	2.7	2.8
Cardiothoracic	42	71	82	420	440	507	1.5	1.6	1.9
Qualified Neonate	13	18	23	283	458	587	1	1.7	2.1
Neurosciences	44	66	77	279	299	304	1	1.1	1.1
Medical	212	328	417	1,264	1,495	1,777	4.6	5.5	6.5
Subacute	9	12	14	174	126	125	0.6	0.5	0.5
TOTAL	**488**	**696**	**839**	**3,408**	**3,557**	**4,055**	**12.4**	**13**	**14.8**

Excludes Unqualified Neonates, Mental Health, Unallocated and Transplantation

Source: Queensland Department of Health Fly Over Data_grouped_1704_Townsville_Data_Request_updated.xls

(Note: Bed numbers based on 75% occupancy for all specialty groupings including qualified neonates)

Two broad scenarios have been considered in relation to potential flow reversal of "flyovers" of residents from other North Queensland HHS's: an overall 75% reversal and an overall 50% reversal (noting that 100% reversal is very unlikely to be feasible). The table below details the potential additional overnight bed requirements at TTH should these flows be reversed.

At 2036/37, there is estimated to be an additional requirement of between 7 and 11 beds for the additional demand from children from other North Queensland HHS's who would no longer be accessing services in Brisbane.

There is potential to reverse 'flyovers' of paediatric residents from other North Queensland HHS's to Children's Health Services Queensland. Depending on the extent that this is achieved, this would result in an increased paediatric bed requirement of between 7 and 11 beds at TTH.

Table 90: "Scenario" Impact on Overnight Bed Requirements of Flow Reversal of "Flyover" Children aged 0-14 years from Other North Queensland HHS of Residence from Children's Health Services

What if?	75% Reversal			50% Reversal		
Overnight Beds	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	2.7	2.0	2.1	1.8	1.4	1.4
Cardiothoracic	1.2	1.2	1.4	0.8	0.8	0.9
Qualified Neonate	0.8	1.3	1.6	0.5	0.8	1.1
Neurosciences	0.8	0.8	0.8	0.5	0.5	0.6
Medical	3.5	4.1	4.9	2.3	2.7	3.2
Subacute	0.5	0.3	0.3	0.3	0.2	0.2
TOTAL	9.3	9.7	11.1	6.2	6.5	7.4

5.4.2. Impact of Reversal of Inflows to TTH from Other North Queensland HHSs

The highest volumes of inflows were recorded by residents of Mackay HHS, Cairns and Hinterland HHS and North West HHS, cumulatively accounting for the use of approximately 74 adult and paediatric overnight beds in 2014/15. For this reason, flows from these North Queensland HHSs have been analysed in further detail in the following tables to identify any potential to reverse flow a proportion of this activity. The small volume of inflows from Torres and Cape HHS residents have been assumed to be predominantly tertiary and unlikely to change, therefore not been analysed in further detail.

5.4.2.1. Adult Services

In 2014/15, adult residents of Mackay, Cairns and Hinterland and North West HHS's occupied the equivalent of a total of 68.5 overnight beds in TTH. Under the Base Case projection, this would increase to just over 106 beds by 2036/37. The specialty groupings accounting for the highest volumes of these residents are projected to be surgical / procedural (31.4 beds by 2036/37) and subacute (25.7 beds by 2036/37). Refer to Table 91.

Table 91: Total Projected Mackay, Cairns and Hinterland and North West HHS Adult Resident Separations and Overnight Beds by Specialty Grouping, Townsville Hospital 2014/15-2036/37

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	1,179	1,522	1,918	7,277	8,326	9,750	23.5	26.8	31.4
Cardiothoracic	575	813	1,042	3,807	4,303	4,916	12.3	13.9	15.8
Medical	534	677	819	3,361	3,364	3,637	10.8	10.8	11.7
Subacute	110	420	673	2,163	5,616	7,986	7.0	18.1	25.7
Obstetrics and Gynaecology	302	315	332	1,288	1,163	1,150	4.2	3.8	3.7
Neurosciences	352	535	727	3,366	4,466	5,537	10.8	14.4	17.8
TOTAL	**3,052**	**4,281**	**5,512**	**21,262**	**27,238**	**32,976**	**68.5**	**87.8**	**106.3**

Excludes: Transplantation, Mental Health and Unallocated SRG's

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Table 92 shows a break-down of projections for services provided to Mackay, Cairns and Hinterland and North West HHS residents at TTH. The highest projected volume of in-flows are projected to be from Mackay HHS.

Table 92: Projected Adult Mackay, Cairns and Hinterland and North West HHS Adult Resident Separations and Overnight Beds by HHS of Residence in North Queensland by Specialty Grouping, Townsville Hospital 2014/15-2036/37

HHS of Residence	Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
		2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Mackay	**Surgical / Procedural**	538	698	907	3,251	4,076	4,902	10.5	13.1	15.8
	Cardiothoracic	246	368	499	1,411	1,801	2,175	4.5	5.8	7.0
	Medical	271	355	447	1,854	1,830	2,045	6.0	5.9	6.6
	Subacute	41	281	468	956	4,068	5,928	2.9	12.4	18.0
	Obstetrics and Gynaecology	114	121	129	524	455	452	1.7	1.5	1.5
	Neurosciences	149	228	317	1,227	1,759	2,241	4.0	5.7	7.2
Mackay Total		**1,359**	**2,051**	**2,767**	**9,223**	**13,989**	**17,742**	**29.6**	**44.4**	**56.1**
Cairns and Hinterland	**Surgical / Procedural**	214	264	330	1,977	1,823	2,049	6.4	5.9	6.6
	Cardiothoracic	218	293	355	1,560	1,739	1,886	5.0	5.6	6.1
	Medical	129	156	183	642	656	683	2.1	2.1	2.2
	Subacute	38	72	99	428	629	770	1.3	1.9	2.3
	Obstetrics and Gynaecology	131	139	149	508	503	512	1.6	1.6	1.7
	Neurosciences	154	238	324	1,631	2,157	2,659	5.3	7.0	8.6
Cairns and Hinterland Total		**884**	**1,162**	**1,440**	**6,746**	**7,507**	**8,560**	**21.7**	**24.1**	**27.5**
North West	**Surgical / Procedural**	427	560	682	2,049	2,426	2,799	6.6	7.8	9.0
	Cardiothoracic	111	152	188	836	764	855	2.7	2.5	2.8
	Medical	134	166	189	865	877	909	2.8	2.8	2.9
	Subacute	31	66	106	779	919	1,287	2.4	2.8	3.9
	Obstetrics and Gynaecology	57	55	54	256	206	186	0.8	0.7	0.6
	Neurosciences	49	69	86	508	550	638	1.6	1.8	2.1
North West Total		**809**	**1,068**	**1,305**	**5,293**	**5,742**	**6,674**	**16.9**	**18.3**	**21.3**
Grand Total		**3,052**	**4,281**	**5,512**	**21,262**	**27,238**	**32,976**	**68.1**	**86.8**	**104.9**

Excludes: Transplantation, Mental Health and Unallocated SRG's

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

For the purposes of further analysis, the inflows to TTH for cardiothoracic and neurosciences services have been assumed to primarily tertiary and will therefore continue as projected. Total projected inflow volumes for medical specialties and obstetrics and gynaecology are also comparatively small and therefore likely to significantly relate to tertiary services. However, the data indicates that there are significant inflows for other surgical / procedural services and subacute services. These have therefore been analysed in some further detail below.

Adult Surgical / Procedural Services

The largest projected volume of inflows to TTH for overnight beddays from residents of Mackay, Cairns and Hinterland and North West HHSs are for SRG's Orthopaedics, Vascular Surgery and Non-Subspecialty Surgery.

Table 93: Projected Adult Surgical / Procedural Mackay, Cairns and Hinterland and North West HHS Resident Separations and Overnight Beds, Townsville Hospital by SRG

SRG	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Orthopaedics	241	318	392	1,125	1,449	1,732	3.6	4.7	5.6
Vascular Surgery	176	241	308	967	1,329	1,577	3.1	4.3	5.1
Non-Subspecialty Surgery	170	236	307	995	1,304	1,566	3.2	4.2	5.0
Prolonged Ventilation	60	58	68	1,472	1,169	1,215	4.7	3.8	3.9
Haematological Surgery	43	49	58	664	720	787	2.1	2.3	2.5
Upper GIT Surgery	43	74	106	370	521	674	1.2	1.7	2.2
Colorectal Surgery	48	60	78	453	450	539	1.5	1.5	1.7
Urology	68	110	153	255	341	437	0.8	1.1	1.4
Plastic & Reconstructive Surgery	36	53	73	179	236	298	0.6	0.8	1.0
Diagnostic GI Endoscopy	31	45	59	238	229	283	0.8	0.7	0.9
Ear, Nose & Throat	98	98	119	183	174	209	0.6	0.6	0.7
Ophthalmology	50	61	73	144	164	194	0.5	0.5	0.6
Head & Neck Surgery	23	38	54	35	66	89	0.1	0.2	0.3
Maxillo Surgery	63	50	35	129	94	63	0.4	0.3	0.2
Dentistry	17	16	17	42	39	41	0.1	0.1	0.1
Extensive Burns	5	5	6	12	23	25	0.0	0.1	0.1
Breast Surgery	7	9	11	14	18	22	0.0	0.1	0.1
Total	**1,179**	**1,522**	**1,918**	**7,277**	**8,326**	**9,750**	**23.5**	**26.8**	**31.4**

Excludes: Transplantation and Unallocated SRG's

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Further analysis has been completed for surgical / procedural SRGs where the projected overnight bedday inflow to TTH equalled more than 1,500 beddays (5 beds) by 2036/37. These SRGs are Orthopaedics, Vascular Surgery and Non-Subspecialty Surgery. Table 94 shows that residents from North West HHS and Mackay HHS account for the highest projected volumes of these services at TTH. Although these services will be difficult to reverse flow to North West HHS due to service capability limitations, there may be some opportunities to reverse some flows to Mackay HHS in the future.

Table 94: Projected Selected High Volume Surgical / Procedural Mackay, Cairns and Hinterland and North West HHS Adult Resident Overnight Separations and Overnight Beds, by SRG and HHS of Residence Townsville Hospital 2014/15-2036/37

SRG	HHS of Residence	Overnight Separations			Overnight Beddays			Overnight Beds		
		2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Orthopaedics	**Cairns and Hinterland**	26	38	49	142	167	192	0.5	0.5	0.6
	Mackay	46	61	78	264	390	483	0.9	1.3	1.6
	North West	169	219	265	719	892	1,058	2.3	2.9	3.4
Orthopaedics Total		**241**	**318**	**392**	**1,125**	**1,449**	**1,732**	**3.6**	**4.7**	**5.6**
Vascular Surgery	**Cairns and Hinterland**	3	4	5	16	29	33	0.1	0.1	0.1
	Mackay	153	208	268	822	1,079	1,291	2.6	3.5	4.2
	North West	20	30	36	129	221	253	0.4	0.7	0.8
Vascular Surgery Total		**176**	**241**	**308**	**967**	**1,329**	**1,577**	**3.1**	**4.3**	**5.1**
Non-Subspecialty Surgery	**Cairns and Hinterland**	54	72	91	326	378	439	1.1	1.2	1.4
	Mackay	68	99	134	445	638	783	1.4	2.1	2.5
	North West	48	65	82	224	288	344	0.7	0.9	1.1
Non-Subspecialty Surgery Total		**170**	**236**	**307**	**995**	**1,304**	**1,566**	**3.2**	**4.2**	**5.0**
Grand Total		**587**	**795**	**1,008**	**3,087**	**4,082**	**4,875**	**10.0**	**13.2**	**15.7**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Subacute

A high proportion of subacute services should be able to be provided locally across HHSs in Queensland. Therefore, significant projected inflows from residents of other HHSs to TTH would be a potential focus for reverse flowing in the future.

Table 95 indicates that the AiM projection methodology underpinning the base case projections has directed significant volumes of subacute Geriatric Management and Rehabilitation separations and beddays for residents of Mackay HHS to Townsville Hospital, accounting for just under 12 overnight beds by 2036/37.

Table 95: Projected Subacute Mackay, Cairns and Hinterland and North West HHS Adult Resident Overnight Separations and Overnight Beds by SRG and HHS of Residence, Townsville Hospital 2014/15-2036/37

SRG	HHS of Residence	Overnight Separations			Overnight Beddays			Overnight Beds		
		2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Geriatric Management (non-acute)	**Mackay**	1	204	346	19	2,619	3,892	0.1	8.0	11.8
	Cairns and Hinterland	1	2	2	5	8	11	0.0	0.0	0.0
Geriatric Management (non-acute) Total		**2**	**205**	**349**	**24**	**2,627**	**3,903**	**0.1**	**8.0**	**11.9**
Other Non-Acute	**Mackay**	1	2	2	14	10	11	0.0	0.0	0.0
	Cairns and Hinterland	3	5	6	8	5	6	0	0	0
Other Non-Acute Total		**4**	**6**	**8**	**22**	**14**	**17**	**0.1**	**0**	**0.1**
Palliative (non-acute)	**Mackay**	6	14	28	39	100	187	0.1	0.3	0.6
	Cairns and Hinterland	7	16	24	35	103	146	0.1	0.3	0.4
	North West	1	2	2	33	33	40	0.1	0.1	0.1
Palliative (non-acute) Total		**14**	**32**	**55**	**107**	**236**	**372**	**0.3**	**0.7**	**1.1**
Rehabilitation (non-acute)	**Mackay**	33	61	92	884	1,339	1,838	2.7	4.1	5.6
	Cairns and Hinterland	27	50	67	380	513	608	1.2	1.6	1.9
	North West	30	65	103	746	886	1,247	2.3	2.7	3.8
Rehabilitation (non-acute) Total		**90**	**176**	**262**	**2,010**	**2,738**	**3,693**	**6.1**	**8.3**	**11.2**
Grand Total		**110**	**420**	**673**	**2,163**	**5,616**	**7,986**	**6.6**	**17.1**	**24.3**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Paediatric

In 2014/15, paediatric residents of Mackay, Cairns and Hinterland and North West HHS's occupied the equivalent of a total of 6.6 overnight beds in TTH. Under the Base Case projection, this would decrease to 6 beds by 2036/37. The specialty grouping accounting for the highest volumes of these residents is projected to be surgical / procedural (3.3 beds by 2036/37). The potential for reversing the relatively small volume of overnight paediatric inpatients is considered to be low. The majority of inflows have been assumed to be for more complex patients that exceed the service capability of the other regional services. Therefore, no further detailed analysis has been undertaken for paediatric services. Refer to Table 96.

Table 96: Total Projected Mackay, Cairns and Hinterland and North West HHS Paediatric Resident Separations and Overnight Beds by Specialty Grouping, Townsville Hospital 2014/15-2036/37

Specialty Grouping	Overnight Separations			Overnight Beddays			Overnight Beds		
	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37	2014/15	2026/27	2036/37
Surgical / Procedural	242	260	278	1,228	924	901	4.5	3.4	3.3
Cardiothoracic	21	32	37	123	223	262	0.4	0.8	1.0
Medical	60	69	79	222	223	243	0.8	0.8	0.9
Subacute	2	4	6	21	40	51	0.1	0.1	0.2
Obstetrics and Gynaecology	2	2	2	3	2	2	0.0	0.0	0.0
Neurosciences	36	50	57	210	210	197	0.8	0.8	0.7
TOTAL	**363**	**417**	**460**	**1,807**	**1,621**	**1,656**	**6.6**	**5.9**	**6.0**

Excludes: Qualified and Unqualified Neonates, Transplantation, Mental Health and Unallocated SRG's

Source: Acute Inpatient Model: THHS Scenario (14/15 Base) Paediatric Services

5.4.3. Analysis of Priority Specialties

In order to provide additional information to assist in the identification of priority specialties for future investment a range of variables have been further analysed as described under the Methodology section above. Based on the analysis of these variables, the following SRG's were identified under each of the six criteria (outlined in Chapter 5.3.3).

- Adult Medical SRG's: Non-subspecialty Medicine, Renal Medicine, Cardiology, Neurology, Gastroenterology
- Adult Surgical SRG's: Urology, ENT
- Paediatric Medical SRG's: Respiratory Medicine, Immunology and Infections
- Paediatric Surgical SRG's: ENT, Orthopaedics, Non-subspecialty Surgery.

The detailed analysis is described for both adult and paediatric services in the following sections.

Priority specialties for service consolidation are identified by:

- Levels of access that are lower than the State Average (RU<100)
- Increasing public sector access in AIM (increasing public RU)
- Significant inflows of North QLD residents
- Flyovers

5.4.3.1. Adult Services

Table 97 and 84 list those specialties in 2014/15 for which:

- Total relative utilisation of both public and private hospital services is below the state average
- Public hospital relative utilisation is below the state average
- The AIM projection methodology has increased the public relative utilisation between 2014/15 and 2036/37 i.e. has an in-built assumption that the public sector will increase access by THHS residents to those services.

Table 97: Adult THHS Resident Relative Utilisation - Medical SRG's

TOTAL RU < or = 95 IN 2014/15	PUBLIC RU < or = 95 IN 2014/15	Public RU < 95 in 2014/15 and projected to increase by 2036/37
Renal Medicine	Haematology	**Non-Subspeciality Medicine**
Medical Oncology	**Renal Medicine**	**Gastroenterology**
Neurology	**Non-Subspeciality Medicine**	Dermatology
Non-Subspeciality Medicine	**Gastroenterology**	**Renal Medicine**
Haematology	Medical Oncology	**Cardiology**
Gastroenterology	Dermatology	Medical Oncology
Dermatology	**Neurology**	**Neurology**
Cardiology	**Cardiology**	
Immunology & Infections		

Table 98: Adult THHS Resident Relative Utilisation - Surgical SRG's

TOTAL RU < or = 95 IN 2014/15	PUBLIC RU < or = 95 IN 2014/15	Public RU < 95 in 2014/15 and projected to increase by 2036/37
Plastic & Reconstructive Surgery	Breast Surgery	**Urology**
Neurosurgery	**Urology**	Plastic & Reconstructive Surgery
Breast Surgery	Plastic & Reconstructive Surgery	**Ear, Nose & Throat**
Thoracic Surgery	Thoracic Surgery	Gynaecology
Upper GIT Surgery	**Ear, Nose & Throat**	Upper GIT Surgery
Gynaecology	Gynaecology	
Urology	Upper GIT Surgery	
Ear, Nose & Throat		

It should also be noted that the public hospital relative utilisation was above the state average (i.e. >105) and is projected in AIM to decrease by 2036/37 for the following specialties:

- Vascular Surgery
- Cardiac Surgery
- Dentistry
- Maxillo Facial Surgery
- Head and Neck Surgery
- Immunology and Infections
- Interventional Cardiology
- Ophthalmology
- Endocrinology

Table 99 and 100 below show the Top 10 SRG's by volume of separations in 2014/15:

- Total Outflows of Townsville Residents - Adults To RBWH, TPCH, PAH, Mater Adults, Mater Mothers
- Total Inflows - Adult Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape
- Flyovers to Metro North Metro South and Mater Public from Adult Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape HHS's.

Table 99: Top 10 THHS Resident Outflows, Other North Queensland HHS Inflows to THHS and "Fly overs" to SEQ Hospitals 2014/15 - Medical SRG's

TOP 10 THHS outflows by volume	TOP 10 Inflows to THHS from other North Queensland HHS	TOP 10 Flyovers from other North Queensland HHS to SEQ HHS
Non-Subspecialty Medicine	**Non-Subspecialty Medicine**	Medical Oncology
Renal Medicine	**Neurology**	**Non-Subspecialty Medicine**
Respiratory Medicine	**Cardiology**	Respiratory Medicine
Cardiology	Respiratory Medicine	**Renal Medicine**
Endocrinology	Endocrinology	**Cardiology**
Neurology	Haematology	**Neurology**
Drug & Alcohol	Immunology & Infections	Immunology & Infections
Gastroenterology	**Gastroenterology**	**Gastroenterology**
Dermatology	Medical Oncology	Endocrinology
Medical Oncology	**Renal Medicine**	Dermatology

Table 100: Top 10 THHS Resident Outflows, Other North Queensland HHS Inflows to THHS and "Flyovers" to SEQ Hospitals 2014/15 - Surgical SRG's

TOP 10 THHS outflows by volume	TOP 10 Inflows to THHS from other North Queensland HHS	TOP 10 Flyovers from other North Queensland HHS to SEQ HHS
Orthopaedics	Interventional Cardiology	**Urology**
Non-Subspecialty Surgery	Orthopaedics	Non-Subspecialty Surgery
Interventional Cardiology	Non-Subspecialty Surgery	Orthopaedics
Plastic & Reconstructive Surgery	Neurosurgery	Ophthalmology
Neurosurgery	Ophthalmology	Gynaecology
Urology	Vascular Surgery	Plastic & Reconstructive Surgery
Gynaecology	Cardiac Surgery	Upper GIT Surgery
Ophthalmology	**Urology**	**Ear, Nose & Throat**
Upper GIT Surgery	**Ear, Nose & Throat**	Neurosurgery
Ear, Nose & Throat	Thoracic Surgery	Colorectal Surgery

5.4.3.2. Paediatric Services

Table 101 and 102 list those specialties in 2014/15 for which:

- Total relative utilisation of both public and private hospital services is below the state average for children aged 0-14 years
- Public hospital relative utilisation is below the state average for children aged 0-14 years
- The AIM projection methodology has increased the public relative utilisation between 2014/15 and 2036/37 i.e. AIM has an in-built assumption that the public sector will increase access by THHS child residents to paediatric services.

Note:

RU analysis has only been completed on SRGs with a total volume of separations greater than 100 in 2014/15 due to lack of validity of RU calculation on small volumes.

Table 101: THHS Resident Aged 0-14 years Relative Utilisation - Medical SRG's

Total RU ‹ or = 95 in 2014/15	Public RU ‹ or = 95 in 2014/15	Public RU ‹ 95 in 2014/15 and projected to increase by 2036/37
Gastroenterology	Gastroenterology	Gastroenterology
Immunology & Infections	**Immunology & Infections**	**Immunology & Infections**
Neurology	Neurology	Neurology
Non-Subspecialty Medicine	Non-Subspecialty Medicine	Non-Subspecialty Medicine
Respiratory Medicine	**Respiratory Medicine**	**Respiratory Medicine**

Table 102: THHS Resident Aged 0-14 years Relative Utilisation - Surgical SRG's

Total RU ‹ or = 95 in 2014/15	Public RU ‹ or = 95 in 2014/15	Public RU ‹ 95 in 2014/15 and projected to increase by 2036/37
Neurosurgery	Neurosurgery	Neurosurgery
Ear, Nose & Throat	**Ear, Nose & Throat**	**Ear, Nose & Throat**
Orthopaedics	**Non-Subspecialty Surgery**	**Non-Subspecialty Surgery**
Non-Subspecialty Surgery	**Orthopaedics**	**Orthopaedics**
Dentistry	Dentistry	Dentistry

It should also be noted that the public hospital relative utilisation was above the state average (i.e. ›105) and is projected in AIM to decrease by 2036/37 for Urology and Ophthalmology.

The tables below show the Top 10 SRG's by volume of separations in 2014/15:

- Total Outflows of Townsville Residents to Lady Cilento Children's Hospital
- Total Inflows to TTH - child residents of Mackay, North West, Cairns & Hinterland, Torres and Cape
- Flyovers to Children's Health Services from Child Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape HHS's.

Table 103: Top 10 THHS Resident Outflows, Other North Queensland HHS Inflows and "Flyovers" to Children's Health Services HHS 2014/15 - Medical SRG's

Top 5 THHS outflows by volume	TOP 5 inflows to TTH from other North Queensland HHS	TOP 5 flyovers from other North Queensland HHS to LCCH
Chemotherapy	Neurology	Non-Subspecialty Medicine
Haematology	**Respiratory Medicine**	Haematology
Medical Oncology	**Immunology & Infections**	**Respiratory Medicine**
Respiratory Medicine	Non-Subspecialty Medicine	**Immunology & Infections**
Immunology & Infections	Renal Medicine	Neurology

Note: Analysis of top 5 only as volumes very low.

Table 104: Top 10 THHS Residents Outflows, Other North Queensland HHS Child Inflows and "Fly overs" to Children's Health Services HHS 2014/15 - Surgical SRG's

Top 5 THHS outflows by volume	TOP 5 inflows to TTH from other North Queensland HHS	TOP 5 flyovers from other North Queensland HHS to LCCH
Orthopaedics	**Non-Subspecialty Surgery**	**Ear, Nose & Throat**
Ophthalmology	Urology	Orthopaedics
Ear, Nose & Throat	**Orthopaedics**	Ophthalmology
Non-Subspecialty Surgery	**Ear, Nose & Throat**	**Non-Subspecialty Surgery**
Neurosurgery	Extensive Burns	Thoracic Surgery

Note: Analysis of top 5 only as volumes very low.

Conclusion: The following SRG's were identified as under each of the six criteria as priority specialties:

- **Adult Medical SRG's: Non-subspecialty Medicine, Renal Medicine, Cardiology, Neurology, Gastroenterology**
- **Adult Surgical SRG's: Urology, ENT**
- **Paediatric Medical SRG's: Respiratory Medicine, Immunology and Infections**
- **Paediatric Surgical SRG's: ENT, Orthopaedics, Non-subspecialty Surgery**

6. SCENARIO 4: Private sector risk assessment

6.1. Introduction

There have been increasingly blurred lines between the public and private sector in Australia in recent years. This has been evidenced by higher volumes of private patients in public hospitals, and the public sector outsourcing an increasing volume of services to the private sector (e.g. through public private partnerships). Formal and informal relationships between public and private service providers are important, particularly in regional and rural areas.

Regional and rural areas have lower populations compared to the capital cities and these are often subject to booms and busts (e.g. in places with mining). Planning for health services is therefore difficult in these areas, and service sustainability is a key consideration.

Due to the nature of the health system in Australia there is also competition built into the way public and private hospitals do business. Public hospitals often aim to increase revenue through treating private patients, thereby competing (whether this be actively or passively) with the private sector.

Current private facilities in Townsville include:

- Mater Health Services North Queensland provides a range of services including acute medical, surgical, obstetrics and paediatric services across two sites at Pimlico and Hyde Park
- Townsville Day Surgery at West End provides orthopaedic, maxillofacial and general surgery (covering aspects of sporting injuries, carpal tunnel, hernia, vasectomy, arthroscopy, and removal of lesions) as well as endoscopy, dental surgery, women's urological and gynaecological care and IVF services
- North Queensland Day Surgical Centre at Pimlico which provides ophthalmology procedures including laser eye surgery, cataracts, glaucoma and retinal disorders.
- ICON Cancer Care Townsville at Hyde Park which is a specialised day hospital that provides a full range of treatments for people diagnosed with cancer or blood conditions.

There are also some early plans around the introduction of a new private hospital provider in Townsville in the near future.

In Townsville, from the perspective of THHS there is a level of risk presented by private sector competition (reducing the viability of public services), or the risk of the partial or full withdrawal of the private sector in areas where private services are not viable. Most stakeholders agreed that there is a decreasing private sector in Townsville, and considered that this is likely due to a number of factors including a contracting economy, public sector performance in relation to wait times, increases in the cost of private health insurance, reducing cover and increased excess payments.

Key risk areas (for the public sector) are identified where:

- Projected private demand may not be realised
- Social/policy/local changes may impact the volume of chargeable patients with TTH
- Services may become unviable in the private sector

This section aims to identify and quantify some of the key risks to public services in Townsville, as a consequence of current and projected private sector activity. The chapter outlines:

- Projected private hospital demand; how much the private sector needs to grow according to AIM. This is to identify the risk presented to the public sector if the private did not meet the projected demand locally (as some of these patients would access the public system)
- An analysis of chargeable THHS patients. This is to identify the risk in terms of potential changes to Commonwealth or State policy in regards to private patients, as well as the potential impact of the introduction of a private emergency department in Townsville
- An analysis of low volume specialty areas in the private sector. These would be most likely to be unviable, or alternatively provide potential opportunities for partnerships between the public and private sectors.

6.2. Projected Private Hospital Demand

Private hospital demand for THHS residents is projected to increase from 37,764 separations in 2014/15 to 84,951 separations in 2036/37; an annual growth rate of 3.8% per year. This increasing demand requires the private sector in Townsville to grow accordingly. Refer to Table 105.

Table 105: Projected Private Hospital Activity by Stay Type, THHS Residents, 2014/15 to 2036/37

Stay Type	Values	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Overnight	Seps	10,848	13,804	16,288	19,120	22,140	11,292	3.3%
	Bed Days	38,207	48,120	55,764	64,544	73,654	35,447	3.0%
Same Day	Seps	26,916	34,886	43,053	52,608	62,812	35,896	3.9%
	Bed Days	26,916	34,886	43,053	52,608	62,812	35,896	3.9%
TOTAL	Seps	37,764	48,690	59,341	71,728	84,951	47,187	3.8%
	Bed Days	65,123	83,007	98,817	117,152	136,465	71,342	3.4%

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

The private sector has a large volume of surgical / procedural work, projected to account for over 50% of total private activity generated by THHS residents by 2036/37. Medical specialties are projected to grow at a higher growth rate comparative to surgical. Refer to Table 106.

Table 106: Projected Private Hospital Separations by Specialty Grouping, THHS Residents, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR	% Total 2036/37
Surgical / Procedural	22,389	27,451	32,191	37,573	43,222	20,833	3.0%	51%
Medical	5,773	8,228	10,566	13,334	16,361	10,588	4.8%	19%
Chemotherapy	3,653	4,742	6,182	7,952	9,820	6,167	4.6%	12%
Subacute	184	1,552	2,846	4,418	6,171	5,987	17.3%	7%
Obstetrics and Gynaecology	3,421	3,587	3,742	3,856	3,943	522	0.6%	5%
Cardiothoracic	1,396	1,697	1,962	2,273	2,599	1,203	2.9%	3%
Neurosciences	628	923	1,182	1,479	1,804	1,176	4.9%	2%
Mental Health	156	311	445	593	752	596	7.4%	1%
Qualified Neonate	121	143	158	173	189	68	2.0%	0%
Renal Dialysis	42	55	65	76	88	46	3.4%	0%
Transplantation	1	2	2	2	3	2	4.9%	0%
TOTAL	37,764	48,690	59,341	71,728	84,951	47,187	3.8%	100%

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

In 2014/15, there were an equivalent of 125 overnight beds of private admitted activity generated by THHS residents, regardless of where they accessed services (approximately 88% of this was in North Queensland private hospitals).This is projected to increase by 114 beds to a total of 239 beds by 2036/37 (as per Table 107). Day spaces have not been projected for this exercise.

If local private sector providers cannot meet projected demand, patients requiring treatment would have limited access to local services and would be forced to either:

- Access private services outside Townsville (e.g. Brisbane)
- Wait to access private services locally (e.g. if non-urgent elective)
- Access services at TTH (either as a public or private patient).

Quantifying projected overnight demand for private services in terms of built infrastructure provides information to inform an understanding of the implications of market failure in the private sector.

The projection in beds provides some indication as to the potential impact on TTH. For example, if 5% of the projected volume of private hospital patients in THHS instead accessed services at TTH, this would be equivalent to an additional 12 beds that would need to be built to cater for this by 2036/37 (calculation based on Departmental benchmark for an acute medical bed).

Table 107: Projected Private Hospital Overnight Beds, THHS Residents, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change
Surgical / Procedural	53	69	80	93	106	53
Medical	25	32	38	46	54	29
Cardiothoracic	12	14	15	17	19	7
Obstetrics and Gynaecology	16	17	18	19	19	3
Neurosciences	6	7	9	11	12	7
Mental Health	9	12	14	16	18	9
Subacute	2	4	5	7	8	6
Qualified Neonate	2	2	2	3	3	0
TOTAL	125	157	182	210	239	114

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

6.3. Chargeable Patient Analysis

A private (chargeable) patient is a patient who elects to be treated in a public hospital by a doctor of their choice.

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Chargeable patients are those that elect to be treated as a private patient in a public hospital, or those that are private patients in private hospitals. Non-chargeable patients are true public patients, and those that are treated in private facilities through contracting / outsourcing arrangements with the public sector.

An analysis of projected total separations for THHS residents across public and private hospitals indicates a higher volume in the public sector comparative to the private sector (approximately 70% in public hospitals). Approximately 17.5% (11,583 of 66,143 separations) of separations by THHS residents in public hospitals was chargeable in 2014/15. This public chargeable activity is projected to increase at an annual growth rate of 3.9% per year over the next 20 years. Refer to Table 108.

Approximately 17.5% (11,583 of 66,143 separations) of separations by THHS residents in public hospitals was chargeable in 2014/15. This is expected to increase.

It is noted that a proportion of the chargeable activity would be for services that cannot be undertaken in the private sector locally due to limitations in service capability.

Table 108: Projected Private Hospital Activity by Stay Type, THHS Residents, 2014/15 to 2036/37

Hospital Type	Chargeable Status	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Private	Chargeable	37,764	48,690	59,341	71,728	84,951	47,187	3.8%
	Non-chargeable	543	645	746	858	969	426	2.7%
Private Total		**38,307**	**49,335**	**60,088**	**72,587**	**85,920**	**47,613**	**3.7%**
Public	Chargeable	11,583	15,208	18,491	22,479	26,949	15,366	3.9%
	Non-chargeable	54,560	69,680	82,475	97,110	113,004	58,444	3.4%
Public Total		**66,143**	**84,887**	**100,965**	**119,589**	**139,953**	**73,810**	**3.5%**
Grand Total		**104,450**	**134,223**	**161,053**	**192,175**	**225,873**	**121,423**	**3.6%**

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

NOTE: includes non-AIM activity for this exercise

The following table provides more information about public chargeable separations by Specialty Grouping. This is activity that could potentially be undertaken in the private sector. Public hospitals are at some risk of being forced to reduce the volume of chargeable activity if there are changes in government policy in the future (e.g. limiting the ability of public hospitals to treat private patients).

Table 109: Projected Public Chargeable Separations by Specialty Grouping, THHS Residents, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Renal Dialysis	4,106	5,012	5,798	6,715	7,699	3,593	2.9%
Medical	2,880	3,947	4,953	6,215	7,659	4,779	4.5%
Surgical / Procedural	2,820	3,605	4,350	5,253	6,260	3,440	3.7%
Neurosciences	629	942	1,228	1,576	1,978	1,349	5.3%
Subacute	476	804	1,069	1,414	1,820	1,344	6.3%
Mental Health	101	235	351	479	617	516	8.6%
Obstetrics and Gynaecology	294	329	361	391	420	126	1.6%
Cardiothoracic	158	197	228	265	303	145	3.0%
Chemotherapy	69	78	88	101	116	47	2.4%
Qualified Neonate	49	57	62	68	74	25	1.9%
Transplantation	1	1	1	2	2	1	2.6%
Total	11,583	15,208	18,491	22,479	26,949	15,366	3.9%

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Note: Includes non-AIM activity for this analysis

Considering the introduction of private emergency services

The Mater Townsville Pimlico Campus is opening a private emergency department in the near future. Currently, all patients access emergency services at Townsville Hospital. The introduction of a private ED means that less emergency patients with private insurance will access admitted services at TTH.

Table 110 outlines the volume of public chargeable emergency separations projected for THHS residents. There were over 4,500 of these patients separated from hospitals in 2014/15, and this is projected to increase to 12,546 by 2036/37.

Table 110: Projected Public Chargeable Emergency Separations by Specialty Grouping, THHS Residents, 2014/15 to 2036/37

Specialty Grouping	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
Medical	2,378	3,327	4,202	5,301	6,585	4,207	4.7%
Surgical / Procedural	1,337	1,829	2,306	2,905	3,601	2,264	4.6%
Neurosciences	512	754	982	1,259	1,583	1,071	5.3%
Cardiothoracic	116	145	169	197	226	110	3.1%
Mental Health	58	107	145	187	231	173	6.5%
Obstetrics and Gynaecology	86	100	113	126	139	53	2.2%
Subacute	30	62	91	131	176	146	8.4%
Qualified Neonate	4	5	5	6	6	2	2.1%
Grand Total	4,521	6,328	8,014	10,112	12,546	8,025	4.7%

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Table 111 provides a more detailed analysis of public chargeable emergency separations at TTH in 2014/15. There were 14,917 overnight bed days equivalent to approximately 48 beds of public chargeable emergency admitted activity in 2014/15.

Table 111: Public Chargeable Emergency Separations, TTH, 2014/15

Stay Type	Specialty Grouping	Seps	Bed days
Overnight	**Surgical / Procedural**	855	4,639
	Cardiothoracic	153	837
	Medical	1,340	6,127
	Subacute	6	151
	Obstetrics and Gynaecology	55	202
	Neurosciences	341	2,321
	Mental Health	40	560
	Qualified Neonate	11	80
Overnight Total		2,801	14,917
Same Day	**Surgical / Procedural**	204	204
	Medical	274	274
	Obstetrics and Gynaecology	18	18
	Neurosciences	61	61
	Mental Health	5	5
Same Day Total		562	562
Grand Total		3,363	15,479

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

An Emergency admission is an admission of a patient for care or treatment which, in the opinion of the treating clinician, is necessary and which should occur within 24 hours.

An Elective admission is an admission of a patient for care or treatment which, in the opinion of the treating clinician, is necessary and which can be delayed for at least 24 hours.

Projecting the activity above utilising AIM indicates that these public chargeable emergency services are projected to increase at TTH by 4.8% per year through to 2036/37. The beddays have also been converted to beds to give an indication of volume. There were approximately 50 beds of public chargeable emergency activity at TTH in 2014/15. This is projected to increase to 113 beds by 2036/37.

Table 112: Projected Public Chargeable Emergency Separations, TTH, 2014/15 to 2036/37

Place of Treatment	Values	2014/15	2021/22	2026/27	2031/32	2036/37	Change	AGR
TTH	Seps	3,363	4,721	6,003	7,615	9,515	6,152	4.8%
	Beddays	15,479	20,051	24,212	29,354	35,094	19,615	3.8%
	Beds	50	65	78	95	113	-	-

Beds calculated at 85% occupancy
Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

A sensitivity analysis can give some indication of the potential impact of the introduction of emergency services at Mater Townsville. This has been completed below and quantified in terms of potential bed reduction at TTH. If 50% of public chargeable emergency patients accessed services at Mater Townsville there would be 57 less beds required at TTH by 2036/37 comparative to the Base Case. Refer to Table 113.

What will be the impact of the opening of a private emergency department in Townsville? If 50% of public chargeable patients accessed services at Mater Townsville there would be 57 less beds required at Townsville Hospital by 2036/37.

Table 113: TTH - Potential Reduction in Beds Caused by Opening of Private Emergency Services

% Public Chargeable Emergency Inpatients to Mater Townsville	2014/15	2021/22	2026/27	2031/32	2036/37
25%	12	16	20	24	28
50%	25	32	39	47	57

Beds calculated at 85% occupancy

6.4. Low Volume Specialty Areas

There are low volume specialty areas where there may be potential opportunities to work more closely between the public and private sectors in Townsville. For example, this may include joint appointments, integrated planning or developing new sustainable service models.

Public and private sector stakeholders discussed potential opportunities to partner for joint appointments and integrated planning around low volume specialties.

Table 114 provides a summary of low volume specialty areas (by SRG) in the private sector in Townsville. This has been defined as services provided in all North Queensland private hospitals.

Note:

Mental Health, Renal Dialysis and Rehabilitation were increased by Mater Townsville in 2015/16 - not reflected in 2014/15 activity below.

Table 114: Selected Low Volume Specialty Areas in Townsville, 2014/15

SRG	Separations		Beddays	
	Public	Private (TTH)	Public	Private (TTH)
Rehabilitation (non-acute)	6	410	46	9,764
Rheumatology	22	191	99	684
Other Non-Acute	27	264	182	9,460
Renal Dialysis	29	19,215	29	19,215
Haematological Surgery	48	71	211	710
Mental Health	57	1,346	1,433	13,751
Dermatology	66	226	102	478
Thoracic Surgery	68	87	401	686
Cardiac Surgery	92	126	921	1,243
Maxillo Surgery	108	70	134	161
Renal Medicine	110	340	397	1,323
Qualified Neonate	121	569	599	6,559
Medical Oncology	140	396	520	1,342
Endocrinology	163	900	321	2,601
Neurosurgery	187	484	594	2,767
Gastroenterology	223	898	460	2,283
Vascular Surgery	236	593	829	2,545
Head & Neck Surgery	265	177	307	267
Breast Surgery	342	142	388	234
Neurology	353	2,003	1,115	6,997
Colorectal Surgery	360	340	1,336	1,888
Immunology & Infections	381	1,325	911	5,656

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

7. Projected capacity requirements summary - Base case and preferred scenario

7.1. Base Case Treatment Space Projections

According to the Base Case projections using the current Queensland Department of Health projection methodologies, the Townsville Hospital would require an additional 249 adult acute overnight beds, 19 paediatric and neonatal beds and 119 adult overnight subacute beds. There would also need to be significant increases in capacity for same day beds and bed alternatives.

Additional overnight beds are also projected to be required by 2036/37 under the Base Case for Ayr Hospital (an additional 20 beds) Charters Towers Hospital (an additional 8 beds) and Ingham Hospital (an additional 12 beds).

It must be noted that these increases have been calculated based on reported activity in 2014/15 and do not take account for the actual numbers of existing physical beds at each location at that time.

The Base Case projected numbers of treatment spaces are summarised in Table 115. Projected requirements for mental health beds and renal dialysis chairs have been provided in separate tables. The detailed breakdown of these projections are in Chapter 2.5.

Table 115: TTH Base Case Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical	90	132	183	93
ON Surgical / Proc	117	163	212	95
ON Cardiothoracic	29	32	36	7
ON Neurosciences	37	53	73	36
ON Obstetrics and Gynaecology	35	37	39	4
ICU	14	16	20	6
CCU	10	14	18	8
Subtotal Acute Adult Beds	**332**	**447**	**581**	**249**
Paediatric and Neonatal ON Beds				
Paediatric Beds	22	19	22	0
PICU	3	8	8	5
NICU	19	21	23	4
SCN	31	36	40	9
Subtotal Paediatric and Neonatal	**75**	**84**	**94**	**19**
Subtotal Adult and Paediatric Acute Beds	**407**	**531**	**675**	**268**
Adult Subacute ON Beds				
Subacute Beds	99	149	218	119
Subtotal ON Acute / Subacute Beds	**506**	**680**	**893**	**387**
Same Day / Bed Alternatives				
SD Medical	8	16	30	22
SD Obstetrics	2	3	3	1
SD Surgical	0	23	31	0
Chemotherapy	0	26	33	0
ED Short Stay Beds				
Adult	19	30	40	21
Paediatric	4	5	5	1

Notes - 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

Base year 14/15 not calculated for same day surgical or chemotherapy services due to data limitations

Renal dialysis and mental health services are shown in separate tables

7.1.2. Ayr Hospital

Table 116: Ayr Hospital Base Case Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical	11	16	21	10
ON Surgical / Proc	4	6	7	3
ON Obstetrics and Gynaecology	3	3	3	0
Subtotal Acute Adult Beds	**18**	**25**	**31**	**13**
Adult Subacute ON Beds				
Subacute Beds	**4**	**7**	**11**	**7**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**23**	**33**	**43**	**20**
Same Day / Bed Alternatives				
SD Medical	1	2	2	1
SD Surgical	2	2	2	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.1.3. Charters Towers Hospital

Table 117: Charters Towers Hospital Base Case Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical Beds	8	12	15	7
ON Surgical / Proc Beds	3	4	5	2
ON Obstetrics and Gynaecology Beds	1	1	1	0
Subtotal Acute Adult Beds	**12**	**17**	**21**	**9**
Adult Subacute ON Beds				
Subacute Beds	**10**	**7**	**9**	**-1**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**23**	**25**	**31**	**8**
Same Day / Bed Alternatives				
SD Medical	1	2	3	2
SD Surgical	2	2	2	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.1.4. Ingham Hospital

Table 118: Ingham Hospital Base Case Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical Beds	12	16	20	8
ON Surgical / Proc Beds	4	6	8	4
ON Obstetrics and Gynaecology Beds	2	2	2	0
Subtotal Acute Adult Beds	**18**	**24**	**30**	**12**
Adult Subacute ON Beds				
Subacute Beds	**9**	**8**	**9**	**0**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**28**	**33**	**40**	**12**
Same Day / Bed Alternatives				
SD Medical	1	2	3	2
SD Surgical	1	1	1	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.1.5. Other Rural Facilities

Table 119: Rural Facilities Base Case Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Hughenden Hospital				
ON Medical / Surgical / Obs Beds	3	3	3	0
Subacute	1	1	2	1
Subtotal Overnight Acute/ Subacute	**4**	**4**	**5**	**1**
SD Medical	1	1	1	0
Richmond Hospital				
On Medical / Surgical / Obs Beds	3	3	3	0
Subacute	3	2	3	0
Subtotal Overnight Acute/ Subacute	**6**	**5**	**6**	**0**
SD Medical	1	1	1	0
Home Hill Hospital				
On Medical / Surgical / Obs Beds	4	4	5	1
Subacute	12	11	13	1
Subtotal Overnight Acute/ Subacute	**16**	**15**	**18**	**2**
Joyce Palmer Health Service				
On Medical / Surgical / Obs Beds	6	7	7	1
Subacute	1	1	1	0
Subtotal Overnight Acute/ Subacute	**7**	**8**	**8**	**1**
SD Medical	1	1	1	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.1.6. Mental Health Services

Mental health projections are outlined below. These have been developed on the basis of Department of Health projections for mental health services, with the location and service type applied on the basis of local consultation. Analysis of mental health services flow assumptions and activity projections are outlined in Chapter 2.4.1.

Table 120: Mental Health Service Treatment Space Projections by Location and Service Type, 2015/16 to 2036/37

Location	Service Type	2015/16 Physical	2021/22	2026/27	2036/37	Change 2015/16 to 2036/37
The Townsville Hospital	**Adult Acute Inpatient**	-	30	32	36	-
	Older Acute Inpatient (65+)	-	20	24	31	-
	Acute Total	**36**	**50**	**56**	**67**	**31**
The Townsville Hospital	**Medium Secure Mental Health Rehabilitation**	25	28	30	35	10
Kirwan (satellite of TTH)	**Child and Adolescent Acute Inpatient and Day Service**	8	18	19	21	13
	Acquired Brain Injury	10	12	13	15	5
	Community Care	24	30	32	37	13
	Kirwan Total	**42**	**60**	**64**	**73**	**31**
Charters Towers	**Extended Treatment and Rehabilitation**	27	24	26	30	3
Grand Total		**130**	**162**	**176**	**205**	**75**

2015/16 mental health bed numbers reflect physical beds on-site at 2015/16 and were provided by THHS.

7.1.7. Renal Dialysis Services

Renal dialysis projections are outlined in Table 121 by location. They have been developed on the basis of the methodology and assumptions articulated in Chapter 2.5.10. The projections assume that the preferred option for TTH of expanding from 17 to 30 chairs will proceed. Furthermore, they assume that the rural CSCF level 3 facilities at Charters Towers and Ingham will provide a renal dialysis service in the future.

Table 121: Renal Dialysis Treatment Space Projections by Location

Location	Current Physical	2021/22	2026/27	2031/32	2036/37
TTH					
In-Centre	-	9	11	12	14
Satellite	-	21	19	18	16
TTH Total	**17**	**30**	**30**	**30**	**30**
Other Townsville Site(s) incl. North Ward	11	2	8	14	21
Subtotal Townsville	**28**	**32**	**38**	**44**	**51**
Home Hill Hospital	8	4	5	5	6
Charters Towers Hospital	0	4	5	6	7
Ingham Hospital	0	5	6	7	8
Joyce Palmer Health Service	4	5	6	7	8
Subtotal THHS	**40**	**50**	**60**	**69**	**80**
Mt Isa	8	8	9	9	10

Notes:

Chair requirements calculated on a 30% home dialysis rate across all locations.

TTH is assumed to increase to 30 chairs as per current planning.

Rural facility chair requirements at Home Hill, Charters Towers, Ingham and Joyce Palmer Health Service calculated on the basis of 3 days per week, 1.7 patients per day.

7.2. Projected Capacity Requirements - Preferred Scenario

As previously detailed in this report, a number of scenarios have been analysed in relation to changing models of care, the future role or rural hospitals, strengthening the role of TTH as a tertiary referral hospital and the future of private hospitals. On the basis of this analysis a number of modelling assumptions have been agreed and used to develop the preferred scenario.

The preferred option therefore builds in the following assumptions from 2021/22 onwards.

1. Length of stay reductions built in to the AiM tool for acute and subacute overnight services will be met by THHS.

2. Hospital in the Home services will increase from 1.2% of total admissions to 3.0% of total admissions at TTH.

3. The number of overnight inpatient maintenance patients projected at TTH will be reduced by 75%.
4. An increase in home-based palliative care services, leading to a reduction in hospital-based palliative care overnight separations by 30% at TTH.
5. An increase in self-sufficiency of CSCF Level 3 rural facilities at Ayr, Ingham and Charters Towers as follows:
    a. An increase in the self-sufficiency of medical services to 85%
    b. An increase in the self-sufficiency of surgical services to 65%
    c. An increase in the self-sufficiency of endoscopy services to 90%
    d. An increase in the self-sufficiency of vaginal deliveries to 80%.
6. A 50% reduction in the volume of overnight inpatient outflows to Brisbane by THHS residents.
7. A 50% reduction in the volume of overnight inpatient flyovers to Brisbane by other North Queensland HHS residents.
8. A reduction in all projected inflow from Mackay HHS for Geriatric Management by 100%.
9. It will be assumed that the projected demand for private hospital services as projected in the AiM tool will be met in Townsville.

The Impact of applying these assumptions affects only the overnight bed projections for Townsville Hospital, Ayr Hospital, Charters Towers Hospital and Ingham Hospital. These are summarised in the tables below. Additional detail has been included in Appendix F. The projected requirements for all other facilities / services are as per the Base Case.

According to the preferred scenario, the Townsville Hospital would require an additional 230 adult acute overnight beds, 29 paediatric and neonatal beds and 74 adult overnight subacute beds. Under the preferred option, the projected requirements for overnight beds for Ayr Hospital are for an additional 24 beds, Charters Towers Hospital an additional 12 beds and Ingham Hospital, an additional 17 beds.

Table 122: TTH Scenario Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical	90	113	160	70
ON Surgical / Proc	117	161	211	94
ON Cardiothoracic	29	32	37	8
ON Neurosciences	37	55	75	38
ON Obstetrics and Gynaecology	35	38	41	6
ICU	14	16	20	6
CCU	10	14	18	8
Subtotal Acute Adult Beds	**332**	**429**	**562**	**230**
Paediatric and Neonatal ON Beds				
Paediatric Beds	22	28	32	10
PICU	3	8	8	5
NICU	19	21	23	4
SCN	31	36	40	9
Subtotal Paediatric and Neonatal	**75**	**93**	**104**	**29**
Subtotal Adult and Paediatric Acute Beds	**407**	**522**	**666**	**259**
Adult Subacute ON Beds				
Subtotal Subacute Beds	99	115	173	74
Subtotal ON Acute / Subacute Beds	**506**	**637**	**839**	**333**
Same Day / Bed Alternatives				
SD Medical	8	16	30	22
SD Obstetrics	2	3	3	1
SD Surgical	-	23	31	-
Chemotherapy	-	26	33	-
ED Short Stay Beds				
Adult	19	30	40	21
Paediatric	4	5	5	1

Notes - 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

Base year 14/15 not calculated for same day surgical or chemotherapy services due to data limitations

Renal dialysis and mental health services are in separate tables (see Base Case projections)

7.2.3. Ayr Hospital

Table 123: Ayr Hospital Scenario Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical	11	18	22	11
ON Surgical / Proc	4	8	10	6
ON Obstetrics and Gynaecology	3	3	3	0
Subtotal Acute Adult Beds	**18**	**29**	**35**	**17**
Adult Subacute ON Beds				
Subacute Beds	**4**	**7**	**11**	**7**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**23**	**37**	**47**	**24**
Same Day / Bed Alternatives				
SD Medical	1	2	2	1
SD Surgical	2	2	2	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.2.4. Charters Towers Hospital

Table 124: Charters Towers Hospital Scenario Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical Beds	8	13	16	8
ON Surgical / Proc Beds	3	6	8	5
ON Obstetrics and Gynaecology Beds	1	1	1	0
Subtotal Acute Adult Beds	**12**	**20**	**25**	**13**
Adult Subacute ON Beds				
Subtotal Subacute Beds	**10**	**7**	**9**	**-1**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**23**	**28**	**35**	**12**
Same Day / Bed Alternatives				
SD Medical	1	2	3	2
SD Surgical	2	2	2	0

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

7.2.5. Ingham Hospital

Table 125: Ingham Hospital Scenario Treatment Space Projections Summary, 2014/15 to 2036/37

Treatment Space Type	2014/15	2026/27	2036/37	Change 2014/15 to 2036/37
Adult Acute ON Beds				
ON Medical Beds	12	17	22	10
ON Surgical / Proc Beds	4	9	11	7
ON Obstetrics and Gynaecology Beds	2	2	2	0
Subtotal Acute Adult Beds	**18**	**28**	**35**	**17**
Adult Subacute ON Beds				
Subacute Beds	**9**	**8**	**9**	**0**
Paediatric ON Beds				
Paediatric Beds	1	1	1	0
Subtotal Overnight Acute / Subacute	**28**	**37**	**45**	**17**
Same Day / Bed Alternatives				
SD Medical	1	2	3	2
SD Surgical	1	2	2	1

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied.

APPENDIX 1: Map of data grouping

Specialty Grouping	SRG
Medical	Cardiology
	Dermatology
	Drug & Alcohol
	Endocrinology
	Gastroenterology
	Haematology
	Immunology & Infections
	Medical Oncology
	Non-Subspecialty Medicine
	Renal Medicine
	Respiratory Medicine
	Rheumatology
Surgical / Procedural	Breast Surgery
	Colorectal Surgery
	Dentistry
	Diagnostic GI Endoscopy
	Ear, Nose & Throat
	Extensive Burns
	Haematological Surgery
	Head & Neck Surgery
	Maxillo Surgery
	Non-Subspecialty Surgery
	Ophthalmology
	Orthopaedics
	Plastic & Reconstructive Surgery
	Prolonged Ventilation
	Upper GIT Surgery
	Urology
	Vascular Surgery

Specialty Grouping	SRG
Cardiothoracic	Cardiac Surgery
	Interventional Cardiology
	Thoracic Surgery
Neurosciences	Neurology
	Neurosurgery
Obstetrics and Gynaecology	Gynaecology
	Obstetrics
Subacute	Geriatric Management (non-acute)
	Other Non-Acute
	Palliative (non-acute)
	Rehabilitation (non-acute)

APPENDIX B: Overview of methodologies for projecting health service activity

The following table has been sourced from Queensland Health (December 2016), and describes the standard methodologies used by the Department to project future activity.

Table 126: Summary of Methodologies

Activity Type	Projection Methodology	Output	Assumptions
Acute Inpatient Acute admitted activity, excluding activity associated with the Mental Health Service Related Group (SRG), which are included in the Mental Health stream; and activities which can be performed as either admitted patients or non-admitted outpatients, which are included in the Interventions and Procedures stream.			
All except transplants and qualified neonates.	AIM 2014-15	Separations	Patient flow changes are incorporated as per HHS advice and reflected in the Purchasing Scenario.
Transplants	Population based	Separations	Assumed organs per donor ratio applied to projected donor numbers. Transplant type and location estimated based on the five year average of 2011-12 to 2015-16 activity.
Qualified Neonates (Neonatal Intensive Care Unit)	Population based and flows	Beddays	1.2 cots per 1000 live births (or 2.5 cots per 1000 live Aboriginal and Torres Strait Islander births and 1.1 cots per 1000 non-Aboriginal and Torres Strait Islander births where proportions of Aboriginal and Torres Strait Islander births are greater than 10 per cent). Projected births are based on projected deliveries (AIM 2014-15). Patient flows applied based on AIM 2014-15 NICU beddays.
Qualified Neonates (Special Care Nursery)	Population based and flows	Beddays	5.6 cots per 1000 live births (or 10 cots per 1000 live Aboriginal and Torres Strait Islander births and 5.3 cots per 1000 non-Aboriginal and Torres Strait Islander births where proportions of Aboriginal and Torres Strait Islander births are greater than 8 per cent). Projected births based on projected deliveries (AIM). Patient flows applied based on AIM 2014-15 SCN beddays.

Activity Type	Projection Methodology	Output	Assumptions
Sub and Non-Acute Sub and non-acute admitted activity (excluding activity which would qualify as mental health activity). Patient flow changes are incorporated as per HHS advice and reflected in the Purchasing Scenario.			
Rehabilitation (Adult)	AIM 2014-15	Bed days/ Separations	Rehabilitation SRG/ESRG, 15+ years age group (includes bed days in excess of 90 days).
Rehabilitation (Children)	AIM 2014-15	Bed days/ Separations	Rehabilitation SRG/ESRG, 0–14 years age group (includes bed days in excess of 90 days).
Palliative Care (Adult)	AIM 2014-15	Bed days/ Separations	Palliative SRG/ESRG, 15+ years age group (includes bed days in excess of 90 days).
Palliative Care (Children)	AIM 2014-15	Bed days/ Separations	Palliative SRG/ESRG, 0–14 years age group (includes bed days in excess of 90 days).
GEM	AIM 2014-15	Bed days/ Separations	Geriatric Evaluation and Management SRG/ ESRG (includes bed days in excess of 90 days).
Other Non-Acute (Maintenance)	AIM 2014-15	Bed days/ Separations	Other Non-Acute SRG/ESRG (includes bed days in excess of 90 days).
Interventions and Procedures Activity which can be performed as either an acute admitted patient or a non-admitted outpatient.			
Chemotherapy	Incidence and treatment rates	Occasions of service/ separations	Projected incidence multiplied by expected treatment rate to determine total demand by place of residence. Public provision calculated on three years (2013-14 to 2015-16) composite data from QHAPDC and Panorama DSS. Patient flows based on three years of 2015-16 Panorama DSS data, with adjustments made for known service changes. Consultation activity is included in the Outpatients service stream.
Endoscopy	Linear projection	Occasions of service/ separations	Linear projection using six years (2010-11 to 2015-16) of historical admitted QHAPDC data and non-admitted DSS place of treatment activity. Patient flows based on 2015-16 QHAPDC and ESISS data with adjustments made for known service changes.
Interventional Cardiology	Linear projection	Occasions of service/ separations	Linear projection using five years of admitted and non-admitted procedural activity data (2011-12 to 2015-16) sourced from QHADPC and DSS. Patient flows based on average of 2012-13 to 2014-15 data, with adjustments made for known service changes.

Activity Type	Projection Methodology	Output	Assumptions
Radiotherapy	Incidence and treatment rates	Occasions of service/ separations	Projected incidence multiplied by expected treatment rate to determine total demand. Assumption of 65–70 per cent public provision. 5 per cent of occasions of service assumed for simulation and planning. Patient flows based on three years of 2015-16 DSS data. Consultation activity is included in the Outpatients service stream.
Renal Dialysis (Adult)	Prevalence and modality targets	Individuals requiring public dialysis	Projected prevalence rate applied to projected population. It is assumed that the share of private activity for 2015-16 will be maintained (as indicated by private admitted activity and total individuals requiring dialysis). Adjustments are made for known service changes.
Renal Dialysis (Children)	Historical Activity	Individuals requiring public dialysis	The projection uses historical activity to determine the annualised number of dialyses. This is converted back to the equivalent of patients receiving full-time dialysis (i.e. 3 sessions x 52 weeks).
Outpatients Any non-admitted activity which is not considered in the intervention and procedures group.			
Tier 2 outpatient clinic	Annual rate of growth or based on AIM growth for related area	Occasions of service	Outpatient projected activity determined by applying growth rates from inpatient activity (matching inpatient activity to Tier 2 clinics). Patient flows determined at the level of purchasing lines and projection facilities.
Radiation oncology consultations	Radiation oncology—incidence and treatment rates	Occasions of service	Radiation oncology—incidence x proportion of patients requiring radiation oncology treatment (64.3 per cent) x consultations per patient (10) x public provision (65 per cent or 70 per cent).
Emergency Department Emergency department activity			
Emergency Department	Historical activity by SA3 of residence and adjustment for population change	Presentations	Linear projection based on historical activity (EDIS & MAC) by place of residence,, age and triage category, adjusted for population growth in place of residence (where available), and growth in Triage Categories 1-3 maintained. Adjustments to account for new services based on service planning activities.

Activity Type	Projection Methodology	Output	Assumptions
Mental Health Any activity that would qualify as mental health activity including: • Acute activity occurring in designated mental health beds; • Sub and non-acute activity occurring in designated mental health beds; and • Mental Health Related Group (SRG) in non-designated beds. Patient flows are advised by the mental health branch.			
Acquired Brain Injury	Population based	Beddays	1.5 beds per 100,000 population at 90 per cent occupancy for total population
Community Care/ Extended Treatment and Rehabilitation	Population based	Beddays	9.6 beds per 100,000 population at 90 per cent occupancy for total population
Extended Forensic Treatment and Rehabilitation	Population based	Beddays	0.4 beds per 100,000 population at 90 per cent occupancy for total population
Older Persons Extended Treatment	Population based	Beddays	3.0 beds per 100,000 population at 90 per cent occupancy for total population
Adult and Older Persons Acute	Population based	Beddays	15 beds per 100,000 population at 90 per cent occupancy for persons aged 15-64 years. 45 beds per 100,000 population at 90 per cent occupancy for persons aged 65+ years
Child and Adolescent Acute	Population based	Beddays	7 beds per 100,000 population at 70 per cent occupancy for persons aged 0-14 years. 15 beds per 100,000 population at 70 per cent occupancy for persons aged 15-19 years.
Medium Secure Mental Health Rehabilitation	Population based	Beddays	4.3 beds per 100,000 population at 90 per cent occupancy for persons aged 15+ years
High Secure Mental Health	Population based	Beddays	2.2 beds per 100,000 population at 90 per cent occupancy for persons aged 15+ years
Community ABF Activities (Other Activities) Any other non-admitted activity which is not considered in the outpatients or intervention and procedures group.			
Breast Screen	Population based	Breast Screens	One screen every two years for the female population aged 50 - 69 years.
Oral Health	In development	Appointments / WOOs	In development

Source: Projections of Future Health Service Activity - Methodology (Table 1: Summary of Methodologies), The State of Queensland (Queensland Health), December 2016

APPENDIX C: The THHS Base Case

Table 127: Projected Occasions of Service, TTH and Other THHS Facilities, by Tier 2 Class, 2016/17 - 2036/37

Facility	Tier 2 Class	2014/15	2026/27	2036/37
The Townsville Hospital	**Aids and Appliances**	4,661	7,046	9,962
	Anaesthetics	650	950	1,207
	Audiology	2,834	4,285	6,059
	Breast (Medical Consultation)	1,188	1,797	2,303
	Breast (Allied Health &/or Clinical Nurse Specialist Interventions)	1,610	2,436	3,122
	Cardiology	6,720	10,765	16,035
	Cardiothoracic	1,195	1,544	1,727
	Circulatory	991	1,411	1,801
	Clinical Measurement	21,283	32,177	45,493
	Clinical Pharmacy	1,006	1,520	2,150
	Computerised Tomography (CT)	14,822	23,019	32,470
	Continence	838	1,266	1,790
	Craniofacial	1,315	1,291	1,029
	Dermatology (Medical Consultation)	1,145	1,435	1,905
	Dermatology (Allied Health &/or Clinical Nurse Specialist Interventions)	379	475	631
	Developmental Disabilities	1,838	2,292	2,759
	Ear Nose and Throat (ENT)	5,950	7,683	9,828
	Endocrinology (Medical Consultation)	5,604	7,349	9,836
	Endocrinology (Allied Health &/or Clinical Nurse Specialist Interventions)	5,654	7,415	9,923
	Enteral Nutrition - Home Delivered	1,882	2,922	4,122
	Gastroenterology (Medical Consultation)	3,391	5,625	8,695
	Gastroenterology (Allied Health &/or Clinical Nurse Specialist Interventions)	816	1,354	2,092
	General Imaging	63,026	97,878	138,067
	General Medicine	768	1,347	2,217
	General Surgery (Medical Consultation)	7,171	10,855	15,809

Facility	Tier 2 Class	2014/15	2026/27	2036/37
The Townsville Hospital	**General Surgery (Allied Health &/or Clinical Nurse Specialist Interventions)**	91	138	201
	Geriatric Evaluation and Management (GEM) (Medical Consultation)	154	234	331
	Geriatric Medicine	775	1,172	1,657
	Gynaecology (Medical Consultation)	4,673	6,227	7,171
	Gynaecology (Allied Health &/or Clinical Nurse Specialist Interventions)	118	157	180
	Gynaecology Oncology	497	558	575
	Haematology	8,594	10,553	9,756
	Haematology and Immunology	391	574	726
	Hepatobiliary (Medical Consultation)	1,519	2,392	3,491
	Hepatobiliary (Allied Health &/or Clinical Nurse Specialist Interventions)	691	1,088	1,588
	Hyperbaric Medicine	1,298	1,963	2,775
	Infectious Diseases	662	1,131	1,829
	Maternal Fetal Medicine	1,740	2,035	2,306
	Medical Oncology (Consultation)	9,516	10,702	11,032
	Medical Resonance Imaging (MRI)	3,250	5,047	7,119
	Midwifery and Maternity	30,377	35,528	40,256
	Minor Medical Procedures	1,159	1,800	2,539
	Nephrology (Medical Consultation)	4,970	8,162	13,099
	Nephrology (Allied Health &/or Clinical Nurse Specialist Interventions)	3,096	5,086	8,170
	Neurology (Medical Consultation)	3,518	6,147	9,784
	Neurology (Allied Health &/or Clinical Nurse Specialist Interventions)	94	163	259
	Neuropsychology	1,937	3,949	6,367
	Neurosurgery	2,681	4,212	6,101
	Nuclear Medicine	1,932	3,000	4,232
	Nutrition/Dietetics	6,946	10,501	14,846
	Obstetrics - Management of Complex Pregnancy	3,305	3,865	4,380
	Obstetrics - management of pregnancy without complication	6,924	8,098	9,176

Facility	Tier 2 Class	2014/15	2026/27	2036/37
The Townsville Hospital	**Occupational Therapy**	8,520	12,881	18,212
	Oncology	4,733	5,320	5,480
	Ophthalmology	8,551	15,114	21,932
	Optometry	5,208	7,874	11,132
	Orthopaedics	17,306	25,058	34,234
	Orthotics	900	1,361	1,924
	Paediatric Medicine	4,620	5,765	6,943
	Paediatric Surgery	1,409	1,757	2,114
	Paediatrics	2,412	3,008	3,620
	Pain Management	1,608	2,431	3,437
	Pain Management Interventions	434	657	929
	Palliative Care (Medical Consultation)	607	918	1,298
	Palliative Care (Allied Health &/or Clinical Nurse Specialist Interventions)	6,864	10,377	14,672
	Physiotherapy	18,302	27,670	39,122
	Plastic and Reconstructive Surgery	938	1,527	2,039
	Podiatry	10	15	21
	Positron Emission Tomography (PET)	1,008	1,565	2,208
	Post Acute Care	1,358	2,054	2,904
	Pre-Admission and Pre-Anaesthesia	8,270	12,085	15,346
	Primary Health Care	434	675	952
	Psychiatry	158	323	521
	Psychology	1,632	3,328	5,365
	Radiation therapy - consultation	9,370	10,531	10,848
	Rehabilitation (Medical Consultation)	1,190	1,800	2,544
	Rehabilitation (Allied Health &/or Clinical Nurse Specialist Interventions)	2	4	5
	Respiratory (Medical Consultation)	5,659	8,655	13,033
	Respiratory (Allied Health &/or Clinical Nurse Specialist Interventions)	1,625	2,486	3,737
	Respiratory - Cystic Fibrosis	168	257	387
	Rheumatology	4,404	6,743	9,971
	Sleep Disorders	312	485	683
	Social Work	4,272	6,459	9,131

Facility	Tier 2 Class	2014/15	2026/27	2036/37
The Townsville Hospital	**Speech Pathology**	3,230	4,884	6,905
	Stomal Therapy	744	1,114	1,431
	Transplants	17	18	21
	Urology (Medical Consultation)	2,532	4,201	6,023
	Urology (Allied Health &/or Clinical Nurse Specialist Interventions)	610	1,012	1,450
	Vascular Surgery	2,736	3,888	4,954
	Ventilation - Home Delivered	10	15	21
	Wound Management	379	573	811
Sub Total TTH		**390,192**	**565,502**	**767,335**
Other THHS Facilities	**Addiction Medicine**	1,116	1,249	1,226
	Aids and Appliances	154	208	274
	Alcohol and Other Drugs	3,365	3,767	3,698
	Anaesthetics	192	235	257
	Clinical Measurement	1,034	1,398	1,847
	Endocrinology	5	7	11
	Falls Prevention	127	172	227
	Gastroenterology	26	38	53
	General Imaging	10,932	16,977	23,948
	General Practice and Primary Care	19,548	30,357	42,822
	General Surgery	446	596	789
	Geriatric Evaluation and Management (GEM)	10	15	21
	Gynaecology	22	25	28
	Hospital Avoidance Programs	2,717	3,671	4,851
	Medical Oncology (Consultation)	5	7	11
	Midwifery and Maternity	4,958	5,023	5,006
	Minor Medical Procedures	38	60	84
	Minor Surgical	204	317	447
	Neurology	72	112	158
	Neuropsychology	7	11	16
	Nutrition/Dietetics	355	480	634
	Obstetrics - management of pregnancy without complication	1,145	1,160	1,156

Facility	Tier 2 Class	2014/15	2026/27	2036/37
Other THHS Facilities	**Occupational Therapy**	1,692	2,287	3,023
	Oncology	259	403	568
	Orthopaedics	7	11	16
	Physiotherapy	3,943	5,329	7,040
	Post Acute Care	13,135	17,750	23,451
	Pre-Admission and Pre-Anaesthesia	881	1,078	1,180
	Primary Health Care	67,942	105,511	148,834
	Rheumatology	2	4	5
	Social Work	1,363	1,842	2,434
	Specialist Mental Health	10,363	18,470	26,211
	Speech Pathology	679	919	1,215
	Wound Management	3,677	4,969	6,565
Sub Total Other THHS Facilities		**150,422**	**224,456**	**308,105**
Grand Total		**540,614**	**789,958**	**1,075,440**

Source: Outpatient projections supplied by the Department of Health. Version 1 (11/11/2016) - Preliminary Version - Produced using AIM Status Quo Projection (Base Year 2014-15)

Notes:

1. 2016/17 occasions of service are calculated (not actual)
2. Tier 2 Class, as per the classification Tier 2 Non-Admitted Services National Index, is the most detailed level of Tier 2 and are formed to reflect the predominant specialisation of the clinic.
3. Feedback from Allied Health indicates that the 2016/17 OOS value for podiatry was significantly lower than expected. A reason for this is that OOS for multidisciplinary services e.g. high-risk foot clinic (involving nurse, podiatrist, and endocrinologist) are only considered a single occasion of service that is usually attributed to the medical specialist involved.

APPENDIX D: SCENARIO 1 - Changing models of care

Table 128: Projected reduction in Adult Overnight ALOS THHS Facilities 2014/15-2036/37 - Medical SRG's

Overnight ALOS	All Adults Aged 15+				Adults Aged 70+			
SRG	YEAR			Variance	YEAR			Variance
	2014/15	2026/27	2036/37	2014/15-2036/37	2014/15	2026/27	2036/37	2014/15-2036/37
Cardiology	3.0	2.9	3.0	0.0	4.0	3.5	3.0	-1.0
Dermatology	4.2	4.0	4.0	-1.0	5.5	5.0	4.2	-1.4
Endocrinology	3.9	3.7	3.5	-0.4	4.7	4.7	4.3	-0.4
Gastroenterology	3.5	3.2	3.0	-0.5	4.0	3.7	3.4	-0.6
Haematology	7.5	4.8	3.8	-3.7	12.4	5.8	5.8	-6.6
Haematological Surgery	15.1	13.3	12.5	-2.6	7.1	5.1	4.2	-2.9
Immunology & Infections	4.7	4.5	4.3	-0.4	6.3	5.9	5.5	-0.7
Medical Oncology	5.7	5.0	4.6	-1.1	6.6	5.5	5.0	-1.6
Neurology	5.5	4.7	4.3	-1.2	7.5	5.5	5.0	-2.5
Non-Subspecialty Medicine	4.2	3.7	3.5	-0.7	5.2	4.4	4.0	-1.1
Renal Medicine	5.4	4.5	4.4	-1.0	5.9	4.9	4.9	-1.0
Respiratory Medicine	4.5	4.4	4.2	-0.3	5.0	4.9	4.6	-0.4
Rheumatology	4.1	3.8	3.7	-0.5	5.4	4.9	4.7	-0.7

Table 129: Projected reduction in Adult Overnight ALOS THHS Facilities 2014/15-2036/37 - Surgical SRG's

Overnight ALOS	All Adults Aged 15+				Adults Aged 70+			
SRG	YEAR			Variance	YEAR			Variance
	2014/15	2026/27	2036/37	2014/15-2036/37	2014/15	2026/27	2036/37	2014/15-2036/37
Cardiac Surgery	10.4	8.1	7.3	-3.1	10.3	10.2	9.3	-1.0
Colorectal Surgery	6.9	6.6	6.2	-0.7	8.2	8.2	7.5	-0.7
Dentistry	2.2	2.1	2.1	-0.1	5.7	2.9	2.8	-2.9
Ear, Nose & Throat	2.3	2.0	2.0	-0.3	3.6	2.7	2.5	-1.1
Gynaecology	2.2	2.0	1.8	-0.4	2.1	2.5	2.3	0.2
Head & Neck Surgery	2.0	1.8	1.7	-0.2	4.2	2.3	2.1	-2.1
Interventional Cardiology	4.0	3.5	3.2	-0.8	4.5	3.8	3.5	-0.9
Maxillo Surgery	2.2	2.0	1.9	-0.3	3.0	2.6	2.4	-0.6
Neurosurgery	8.6	7.4	6.7	-1.9	9.9	8.0	6.9	-3.1
Non-Subspecialty Surgery	3.3	3.3	3.1	-0.3	3.9	4.0	3.7	-0.2
Ophthalmology	2.6	2.4	2.3	-0.2	2.6	2.3	2.3	-0.4
Orthopaedics	5.0	5.0	4.9	-0.2	7.6	7.1	6.6	-1.1
Plastic & Reconstructive Surgery	5.9	5.2	4.8	-1.1	5.9	5.0	4.7	-1.2
Thoracic Surgery	8.2	6.6	6.2	-2.0	6.6	6.5	6.1	-0.6
Upper GIT Surgery	3.7	3.6	3.5	-0.2	6.4	5.3	4.9	-1.5
Urology	3.4	2.8	2.6	-0.8	4.1	3.3	3.0	-1.1
Vascular Surgery	6.5	5.7	5.3	-1.1	5.8	6.1	5.7	0.0

APPENDIX E: SCENARIO 3 - Consolidating the role of TTH as a regional tertiary referral hospital

Table 130: Adult Surgical/Procedural Specialties by SRG - Summary of Relative Utilisation / THHS Resident Outflows / Other North Queensland HHS Inflows to THHS and "Flyovers" of Other North Queensland HHS Residents to SEQ Public Hospitals 2014/15

Adults aged 15+	Total RU [1]		Total Public RU [2]		Total Seps THHS Public outflows to RBWH /PAH/ TPCH/MATER[3]		Total Seps Public inflows from North Queensland[4]		Public flyovers to SEQ from other North Queensland HHS[5]	
SRG's - Surgical/ Procedural	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37
Breast Surgery	82	88	76	71	7	12	11	17	16	33
Cardiac Surgery	119	109	130	111	6	13	214	292	20	48
Colorectal Surgery	98	100	99	100	2	5	53	94	35	70
Dentistry	126	118	114	107	2	2	38	43	8	12
Ear, Nose & Throat	95	97	87	92	9	22	179	195	55	102
Extensive Burns	124	112	105	93	6	9	5	6	31	41
Gynaecology	94	96	91	92	15	28	81	90	122	233
Head & Neck Surgery	129	113	120	104	5	9	29	66	23	49
Interventional Cardiology	150	123	156	133	27	53	318	660	0	0
Maxillo Surgery	190	156	145	110	1	1	65	39	7	8
Neurosurgery	78	89	97	104	24	40	250	487	54	105
Non-Subspecialty Surgery	98	99	105	107	46	116	338	559	174	409
Ophthalmology	97	99	124	122	11	23	183	471	128	276
Orthopaedics	102	102	105	100	47	91	340	577	149	352
Plastic & Reconstructive Surgery	68	83	83	95	25	68	59	125	88	206
Thoracic Surgery	83	92	85	77	1	2	84	147	15	29
Upper GIT Surgery	90	95	92	97	11	28	49	119	80	244
Urology	94	99	82	86	16	37	109	260	377	466
Vascular Surgery	122	112	162	140	2	6	239	420	21	39

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Notes:

1. Total RU Same Day and Overnight Townsville Residents - Adults All Public +Private Hospitals
2. Total RU Same Day and Overnight Townsville Residents - Adults Public Hospitals Only
3. Total Outflows of Townsville Residents - Adults To RBWH, TPCH, PAH, Mater Adults, Mater Mothers
4. Total Inflows - Adult Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape
5. Flyovers to Metro North Metro South and Mater Public From Adult Residents of Mackay, North West, Cairns & Hinterland, Torres And Cape

Table 131: Adult Medical Specialties by SRG - Summary of Relative Utilisation / THHS Resident Outflows / Other North Queensland HHS Inflows to THHS and "Flyovers" of Other North Queensland HHS Residents to SEQ Public Hospitals 2014/15

Adults aged 15+	Total RU [1]		Total Public RU [2]		Total Seps THHS Public outflows to RBWH /PAH/ TPCH/MATER[3]		Total Seps Public inflows from North Queensland[4]		Public flyovers to SEQ from other North Queensland HHS[5]	
SRG's - Medical	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37
Cardiology	89	96	95	99	24	65	185	355	78	224
Dermatology	87	95	94	98	8	17	66	44	34	63
Drug & Alcohol	113	116	85	90	13	20	23	34	22	40
Endocrinology	125	110	151	126	24	53	145	172	42	104
Gastroenterology	86	95	88	96	9	32	37	94	47	136
Haematological Surgery	122	114	129	125	2	4	49	68	19	29
Haematology	84	96	55	46	5	6	108	165	27	48
Immunology & Infections	94	98	119	113	6	12	66	138	57	140
Medical Oncology	74	85	93	104	8	5	114	92	155	93
Neurology	82	94	94	106	14	33	164	408	57	201
Non-Subspecialty Medicine	83	94	82	93	29	87	163	411	123	323
Rehabilitation (non-acute)	17	68	38	51	16	42	92	267	62	174
Renal Medicine	68	90	77	98	27	85	93	72	78	130
Respiratory Medicine	98	99	104	110	25	49	96	189	82	218
Rheumatology	98	99	128	132	1	1	17	27	7	13

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Notes:

1. Total RU Same Day and Overnight Townsville Residents - Adults All Public +Private Hospitals
2. Total RU Same Day and Overnight Townsville Residents - Adults Public Hospitals Only
3. Total Outflows of Townsville Residents - Adults To RBWH, TPCH, PAH, Mater Adults, Mater Mothers
4. Total Inflows - Adult Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape
5. Flyovers to Metro North Metro South and Mater Public from Adult Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape.

Table 132: Paediatric Surgical/Procedural Specialties by SRG - Summary THHS Resident Outflows / Other North Queensland HHS Inflows to TTH and "Flyovers" of Other North Queensland HHS Residents to Children's Health Services HHS 2014/15

Children aged 0-14 yrs	Total Seps THHS Public outflows to LCCH		Total Child Seps Public inflows from North Queensland		Public flyovers to LCCH from other North Queensland HHS	
SRG's - Surgical	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37
Cardiac Surgery	7	16	0	0	16	35
Colorectal Surgery	0	0	14	18	1	1
Dentistry	3	6	16	30	5	9
Diagnostic GI Endoscopy	2	6	11	13	0	0
Ear, Nose & Throat	15	26	69	65	79	89
Extensive Burns	0	0	27	28	9	8
Gynaecology	1	1	3	4	0	0
Head & Neck Surgery	0	0	0	0	4	7
Interventional Cardiology	9	12	0	0	0	0
Maxillo Surgery	2	3	2	3	3	5
Neurosurgery	12	21	21	39	19	36
Non-Subspecialty Surgery	14	26	122	125	30	46
Ophthalmology	23	23	5	4	35	38
Orthopaedics	34	57	70	71	67	95
Plastic & Reconstructive Surgery	2	4	22	26	25	32
Thoracic Surgery	1	3	23	40	27	48
Upper GIT Surgery	3	3	10	7	5	5
Urology	3	5	91	148	9	17
Vascular Surgery	0	0	0	0	8	9

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Notes:

1. Total Outflows of Townsville Residents - All Ages to LCCH
2. Total Inflows - Child 0-14 years Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape to TTH
3. Flyovers Child 0-14 years residents of Mackay, North West, Cairns & Hinterland, Torres And Cape to Children's Health Services

Table 133: Paediatric Medical SRG's - Summary THHS Resident Outflows / Other North Queensland HHS Inflows to TTH and "Flyovers" of Other North Queensland HHS Residents to Children's Health Services HHS 2014/15

Children aged 0-14 yrs	Total Seps THHS Public outflows to LCCH		Total Child Seps Public inflows from North Queensland		Public flyovers to LCCH from other North Queensland HHS	
SRG's - Medical	2014/15	2036/37	2014/15	2036/37	2014/15	2036/37
Cardiology	6	10	6	7	18	31
Chemotherapy	75	110	0	0	0	0
Dermatology	0	0	1	1	5	5
Drug & Alcohol	0	0	3	3	0	0
Endocrinology	3	5	8	17	16	26
Gastroenterology	3	5	7	5	12	24
Haematological Surgery	1	1	5	6	10	11
Haematology	24	47	3	6	54	88
Immunology & Infections	13	22	16	23	35	44
Medical Oncology	21	39	1	1	31	54
Neurology	11	18	37	53	32	55
Non-Subspecialty Medicine	9	13	11	18	84	208
Prolonged Ventilation	2	3	7	9	2	3
Rehabilitation (non-acute)	0	0	2	6	20	172
Renal Medicine	11	19	9	11	4	6
Respiratory Medicine	14	26	24	34	50	106
Rheumatology	2	4	4	7	6	11

Source: Acute Inpatient Model: THHS Scenario (14/15 Base)

Notes:

1. Total Outflows of Townsville Residents - All Ages to LCCH
2. Total Inflows - Child 0-14 years Residents of Mackay, North West, Cairns & Hinterland, Torres and Cape to TTH
3. Flyovers Child 0-14 years residents of Mackay, North West, Cairns & Hinterland, Torres And Cape to Children's Health Services

APPENDIX F: PREFERRED SCENARIO - Detailed treatment space projections

Detailed treatment space projections for Townsville Hospital, Ayr Hospital, Charters Towers Hospital and Ingham Hospital are outlined in the tables in this Appendix.

Projections for other facilities and renal dialysis services are as per the Base Case and are outlined in Chapter 2.5.

F.1. The Townsville Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical	90	96	113	135	160	
ON Surgical / Proc	117	140	161	186	211	
ON Cardiothoracic	29	30	32	34	37	
ON Neurosciences	37	46	55	64	75	
ON Obstetrics and Gynaecology	35	37	38	40	41	
ICU	14	15	16	18	20	
CCU	10	12	14	16	18	
Subtotal Acute Adult Beds	**332**	**376**	**429**	**493**	**562**	
Adult Subacute ON Beds						
Rehabilitation	38	56	68	85	104	
Palliative Care	12	13	16	20	25	
GEM	19	20	23	28	34	
Other Non-Acute	30	7	8	9	10	
Subtotal Subacute Beds	**99**	**96**	**115**	**142**	**173**	
Mental Health Beds						
Adult Acute	36	30	32	34	36	
Older Persons Acute (+65)	-	20	24	28	31	Included in Adult Acute for base year
Medium Secure	25	27	29	32	34	
Paediatric ON Beds						
Paediatric Beds	22	29	28	30	32	Note: adjusted for PICU to avoid double counting
PICU	3	5	8	8	8	Note: out-year requirements will need to be revised
NICU	19	20	21	22	23	
SCN	31	33	36	38	40	
Subtotal all ON Acute / Subacute	567	637	723	827	940	

Note: 2014/15 treatment space numbers for acute / subacute services do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. 2014/15 mental health bed numbers reflect physical beds on-site at 2015/16 and were provided by THHS.

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Same Day/Bed Alternatives						
SD Medical	8	11	16	22	30	Note: Assumes 5 days per week service in-hours. Requirments would be reduced with increased operating days / hours
SD Obstetrics	2	2	3	3	3	
Paeds SD Medical	0	0	0	0	0	Zeroed out - ED short stay adjustment eliminates SD medical spaces for paeds. Local decision RE model.
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	Note: projections documented in separate chapter
Chemotherapy	-	22	26	29	33	Note: Total THHS projection included here. Will need to be reallocated over time to other facilities.
Emergency Department						
Adult Treatment Spaces						
Cat 2 and 3	27	36	43	52	60	ED projections apply a linear trend based on historical activity. Therefore, any significant fluctuations in previous years affect the projections. They must be interpreted with caution.
Cat 4 and 5	10	11	12	13	14	
Resuscitation	8	11	14	16	19	
Isolation	5	6	7	8	9	
Total	**50**	**64**	**76**	**89**	**102**	
Paediatric Treatment Spaces						
Cat 2 and 3	6	6	7	8	9	
Cat 4 and 5	4	4	4	5	5	
Resuscitation	1	1	1	1	1	
Isolation	1	2	2	2	2	
Total	12	13	14	16	17	
ED Short Stay Beds						
Adult	19	25	30	35	40	
Paediatric	4	4	5	5	5	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Perioperative/Interventional Spaces						
Overnight Theatres	7	8	9	10	11	
Same Day Theatres	2	3	3	3	4	
Total No. Theatres	10	11	12	14	16	
Endoscopy Suites	2	2	2	3	3	
Cardiac Catheter Lab	-	2.3	2.6	2.9	3.2	Would be affected by inclusion of hybrid theatre
Stage 1 Recovery Spaces	-	32	34	40	46	Inc. theatres, endoscopy, cath lab recovery spaces
Stage 2 Recovery Spaces	-	22	23	29	31	Inc. theatres, endoscopy, cath lab recovery spaces
Birthing Suites	8	8	9	10	11	
Linear Accelerators	-	2.4	2.7	3.1	3.5	Assumes the following patient flows to Townsville HHS: Cairns (10%), Central West (60%), Mackay (13%), North West (95%), Torres and Cape (10%), Townsville (99%)

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

F.2 Ayr Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	11	16	18	20	22	
ON Surgical / Proc Beds	4	7	8	9	10	
ON Obstetrics and Gynaecology Beds	3	3	3	3	3	
Subtotal Acute Adult Beds	18	26	29	32	35	
Adult Subacute ON Beds						
Rehabilitation	2	2	4	5	7	
Palliative Care	1	2	2	3	3	
GEM	0	0	0	0	0	
Other Non-Acute	1	1	1	1	1	
Subtotal Subacute Beds	**4**	**5**	**7**	**9**	**11**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal ON Acute/ Subacute	23	32	37	42	47	
Same Day/Bed Alternatives						
SD Medical	1	2	2	2	2	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department Treatment Spaces						
Cat 2 and 3	2	3	3	3	4	
Cat 4 and 5	4	4	5	5	6	
Resuscitation	1	1	1	1	1	Note: very low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
Total	**8**	**9**	**10**	**10**	**12**	**Incl. approx 2-3 paediatric spaces**
Perioperative/Interventional Spaces						
Overnight Theatres	0.1	0.2	0.2	0.2	0.2	
Same Day Theatres	0.3	0.4	0.5	0.5	0.6	Incl. endoscopy projection
Total No. Theatres	1.0	1.0	1.0	1.0	1.0	
Stage 1 Recovery Spaces	3	3	3	3	3	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Stage 2 Recovery Spaces	2	2	2	2	2	Potentially 3 spaces (high volume, lower complexity procedures)
Birthing Suites	1	1	1	1	1	

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

F.3 Charters Towers Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	8	12	13	15	16	
ON Surgical / Proc Beds	3	6	6	7	8	
ON Obstetrics and Gynaecology Beds	1	1	1	1	1	
Subtotal Acute Adult Beds	**12**	**19**	**20**	**23**	**25**	
Adult Subacute ON Beds						
Rehabilitation	1	1	1	1	1	
Palliative Care	1	1	1	1	2	
GEM	0	0	0	0	0	
Other Non-Acute	8	5	5	5	6	
Subtotal Subacute Beds	**10**	**7**	**7**	**7**	**9**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal ON Acute/ Subacute	**23**	**27**	**28**	**31**	**35**	
Mental Health (Charters Towers Rehab Unit)						
Extended Treatment and Rehabilitation	-	24	26	28	30	
Same Day/Bed Alternatives						
SD Medical	1	2	2	2	3	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	Projections documented in separate chapter
Chemotherapy	-	-	-	-	-	Projections were not available by place of treatment. Not projected as per client advice.
Emergency Department Treatment Spaces						
Cat 2 and 3	2	2	3	3	3	
Cat 4 and 5	3	4	5	5	6	
Resuscitation	1	1	1	1	1	very low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
Total	**7**	**8**	**10**	**10**	**11**	**Incl. approx 2 paediatric spaces**
Perioperative/Interventional Spaces						
Overnight Theatres	0.0	0.1	0.2	0.2	0.2	
Same Day Theatres	0.2	0.3	0.4	0.4	0.5	Incl. endoscopy projection
Total No. Theatres (Rounded Up)	1.0	1.0	1.0	1.0	1.0	
Stage 1 Recovery Spaces	3	3	3	3	3	
Stage 2 Recovery Spaces	2	2	2	2	2	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Birthing Suites	1	1	1	1	1	Potentially 3 spaces (high volume, lower complexity procedures)

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.

F.4 Ingham Hospital

Treatment Space Type	Base Year	Projected Years				Notes
	2014/15	2021/22	2026/27	2031/32	2036/37	
Adult Acute ON Beds						
ON Medical Beds	12	15	17	19	22	
ON Surgical / Proc Beds	4	8	9	10	11	
ON Obstetrics and Gynaecology Beds	2	2	2	2	2	
Subtotal Acute Adult Beds	18	25	28	31	35	
Adult Subacute ON Beds						
Rehabilitation	1	1	1	1	1	
Palliative Care	1	1	1	2	2	
GEM	0	0	0	0	0	
Other Non-Acute	7	5	6	6	6	
Subtotal Subacute Beds	**9**	**7**	**8**	**9**	**9**	
Paediatric ON Beds						
Paediatric Beds	1	1	1	1	1	
Subtotal ON Acute/ Subacute	28	33	37	41	45	
Same Day/Bed Alternatives						
SD Medical	1	2	2	3	3	
SD Surgical	-	-	-	-	-	See Stage 2 Recovery Spaces
Renal Dialysis	-	-	-	-	-	projections documented in separate chapter
Chemotherapy	-	-	-	-	-	projections were not available by place of treatment. Not projected as per client advice.
Emergency Department Treatment Spaces						
Cat 2 and 3	2	3	3	3	4	
Cat 4 and 5	2	3	3	4	4	
Resuscitation	1	1	1	1	1	Note: low numbers of Cat 1 presentations
Isolation	1	1	1	1	1	
Total	**6**	**8**	**8**	**9**	**10**	**Incl. approx 1 paediatric space**
Perioperative/Interventional Spaces						
Overnight Theatres	0.0	0.2	0.2	0.2	0.2	
Same Day Theatres	0.2	0.5	0.6	0.6	0.7	Incl. endoscopy projection
Total No. Theatres (Rounded Up)	1.0	1.0	1.0	1.0	1.0	
Stage 1 Recovery Spaces	3	3	3	3	3	
Stage 2 Recovery Spaces	1	2	2	2	2	2.5 spaces per theatre recommended in benchmark if less than 4 theatres
Birthing Suites	1	1	1	1	1	Potentially 3 spaces (high volume, lower complexity procedures)

Note: 2014/15 treatment space numbers do NOT reflect current physical capacity. They are calculated on the basis of activity with relevant benchmarks applied. Base year numbers were not available for all services.