

Supplementary Material

Improving equitable access to publicly funded bariatric surgery in Queensland, Australia

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Improving access to publicly funded surgery in QLD

Improving access to publicly funded metabolic bariatric surgery in Queensland, Australia Supplementary file

Table S1. Distribution of adults with obesity and BSI referrals across Indigenous and non-Indigenous populations, stratified by HHS

HHS	QLD population [^] , N (%)	% Indig.	PHN T2D (%) [#]	HHS Obesity (%)	Distribution of adults with obesity, N (%)			Distribution of referrals, N (%)			Referral rate per 100,000 adults with obesity		
					Non-Indig.	Indig.	Total	Non-Indig.	Indig.	Total	Non-Indig.	Indig.	Total
Metropolitan	2,187,962 (43.7%)	3	4.2	23.2	490,981 (41.1%)	15,185 (23.2%)	506,166 (40.2%)	119 (51.1%)	36 (56.3%)	155 (52.2%)	24.2	237.1	30.6
Metro North	1,024,627 (20.4%)	3	3.9	23.4	232,570 (19.5%)	7,193 (11.0%)	239,763 (19.0%)	79 (33.9%)	14 (21.9%)	93 (31.3%)	34.0	194.6	38.8
Metro South	1,163,335 (23.2%)	3	4.4	22.9	258,412 (21.7%)	7,992 (12.2%)	266,404 (21.2%)	40 (17.2%)	22 (34.4%)	62 (20.9%)	15.5	275.3	23.3
Regional	2,823,256 (56.3%)	13.7	4.9	29.8	702,546 (58.9%)	50,359 (76.8%)	752,905 (59.8%)	114 (48.9%)	28 (43.8%)	142 (47.8%)	16.2	55.6	18.9
Cairns & Hinterland	257,242 (5.1%)	12	4.9	22.6	51,160 (4.3%)	6,976 (10.6%)	58,137 (4.6%)	17 (7.3%)	9 (14.1%)	26 (8.8%)	33.2	129.0	44.7
Central Queensland	218,421 (4.4%)	7	5.0	30.0	60,940 (5.1%)	4,587 (7%)	65,526 (5.2%)	13 (5.6%)	4 (6.3%)	17 (5.7%)	21.3	87.2	25.9
Central West	10,391 (0.2%)	8	5.7	30.7	2,935 (0.2%)	255 (0.4%)	3,190 (0.3%)	3 (1.3%)	0 (0.0%)	3 (1.0%)	102.2	0.0	94.0
Darling Downs	283,305 (5.7%)	6	5.4	32.9	87,615 (7.3%)	5,592 (8.5%)	93,207 (7.4%)	7 (3.0%)	3 (4.7%)	10 (3.4%)	8.0	53.6	10.7
Gold Coast	622,048 (12.4%)	2	3.6	20.0	121,921 (10.2%)	2,488 (3.8%)	124,410 (9.9%)	9 (3.9%)	1 (1.6%)	10 (3.4%)	7.4	40.2	8.0
Mackay	172,523 (3.4%)	9	4.9	28.3	45,895 (3.8%)	2,929 (4.5%)	48,824 (3.9%)	3 (1.3%)	0 (0.0%)	3 (1.0%)	6.5	0.0	6.1
North West	27,800 (0.6%)	31	5.7	37.9	7,270 (0.6%)	3,266 (5.0%)	10,536 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.0	0.0	0.0
South West	24,175 (0.5%)	13	5.7	35.5	7,466 (0.6%)	1,116 (1.7%)	8,582 (0.7%)	0 (0.0%)	1 (1.6%)	1 (0.3%)	0.0	89.6	11.7
Sunshine Coast	426,782 (8.5%)	2	5.0	20.2	84,486 (7.1%)	1,724 (2.6%)	86,210 (6.8%)	13 (5.6%)	0 (0.0%)	13 (4.4%)	15.4	0.0	15.1
Torres & Cape	27,455 (0.5%)	69	4.9	32.3	2,749 (0.2%)	6,119 (9.3%)	8,868 (0.7%)	0 (0.0%)	1 (1.6%)	1 (0.3%)	0.0	16.3	11.3
Townsville	240,883 (4.8%)	9	4.9	31.5	69,049 (5.8%)	6,829 (10.4%)	75,878 (6%)	11 (4.7%)	3 (4.7%)	14 (4.7%)	15.9	43.9	18.5
West Moreton	294,572 (5.9%)	5	5.4	34.5	96,546 (8.1%)	5,082 (7.8%)	101,627 (8.1%)	23 (9.9%)	5 (7.8%)	28 (9.4%)	23.8	98.4	27.6
Wide Bay	217,659 (4.3%)	5	5.0	31.2	64,514 (5.4%)	3,395 (5.2%)	67,910 (5.4%)	15 (6.4%)	1 (1.6%)	16 (5.4%)	23.3	29.5	23.6
Total, N (%) or Mean	5,011,218 (100%)		4.7	28.9	1,193,528 (100%)	65,544 (100%)	1,259,072 (100%)	233 (100%)	64 (100%)	297 (100%)	19.5	97.6	23.6

Source: [^] Population, % Indigenous and HHS obesity rate data were obtained from 2020 Report of the Chief Health Officer of Queensland ¹. The number and distribution of people with obesity across Queensland was calculated by the authors utilising these data. [#] Type 2 diabetes (T2DM) data for each Primary Health Network (PHN) were obtained from the 2019 National Diabetes Services Scheme dataset (Australian Diabetes Map, ¹⁸). Prevalence in each HHS was calculated as the number of patients with type 2 diabetes divided by the number of patients in the PHN in which each HHS resides. The distribution of referrals was calculated from data collected as part of the BSI.

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Table S2. Progression from referral to surgery and 12-month follow-up by HHS

HHS	Total	Excluded	Under review	Had surgery	12-month follow-up
Metropolitan	155 (52.3)	19	22	114	65
Metro North	94 (31.7%)	11	16	67	42
Metro South	61 (20.5%)	8	6	47	23
Regional	142 (47.7)	23	21	98	65
Cairns & Hinterland	26 (8.8%)	3	2	21	14
Central Queensland	17 (5.7%)	3	2	12	8
Central West	3 (1%)	1	0	2	0
Darling Downs	10 (3.4%)	2	2	6	4
Gold Coast	10 (3.4%)	2	0	8	5
Mackay	3 (1.0%)	2	0	1	0
North West	0 (0%)	0	0	0	0
South West	1 (0.3%)	0	0	1	0
Sunshine Coast	13 (4.4%)	2	5	6	5
Torres & Cape	1 (0.3%)	0	0	1	1
Townsville	13 (4.4%)	3	3	7	6
West Moreton	28 (9.4%)	4	4	20	14
Wide Bay	17 (5.7%)	1	3	13	8
Total	297 (100%)	42	43	212	130

Source: Authors' analysis of data collected by the Bariatric Surgery Initiative¹⁷.

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Table S3. Body mass index and HbA1c pre-surgery and at 12 months, stratified by patient HHS

HHS	HbA1c, %, mean \pm SD			BMI, kg/m ² , mean \pm SD		
	Pre-surgery	12 months	% change	Pre-surgery	12 months	% change
Metro	8.9 \pm 1.6	6.5 \pm 1.3	22.9 \pm 9.1	45.9 \pm 6.9	33.2 \pm 6.4	24.3 \pm 17.7
Metro North	8.8 \pm 1.5	6.7 \pm 1.4	22.5 \pm 9.6	45.7 \pm 7.2	32.4 \pm 6.1	21.8 \pm 17.8
Metro South	8.9 \pm 1.7	6.3 \pm 1.1	23.7 \pm 8.3	46.3 \pm 6.4	34.8 \pm 6.7	28.7 \pm 17
Regional	8.8 \pm 1.4	6.7 \pm 1.4	24.2 \pm 8.9	46.5 \pm 7.3	32.5 \pm 6.1	20.8 \pm 13.5
Cairns & Hinterland	9.1 \pm 1.6	6.8 \pm 1	21.5 \pm 9.1	44.3 \pm 7.9	32.2 \pm 7.4	19.3 \pm 15.5
Central Queensland	8.3 \pm 1.1	7.0 \pm 1.3	19 \pm 6.1	50 \pm 6.9	35.6 \pm 6.8	15.6 \pm 11
Central West [^]	8.3 \pm 0.8	n.d.	n.d.	46.4 \pm 5.4	n.d.	n.d.
Darling Downs	9.0 \pm 1.7	5.8 \pm 1	27.5 \pm 7.4	51.5 \pm 9.8	39.2 \pm 6.3	31.4 \pm 7.8
Gold Coast	8.3 \pm 0.9	6.5 \pm 0.9	18.8 \pm 9.7	40.3 \pm 4.9	32.1 \pm 6.6	15.9 \pm 11
Mackay [^]	8.1 \pm 1.1	n.d.	n.d.	43 \pm 3.8	n.d.	n.d.
South West [^]	8.0	n.d.	n.d.	41.3	n.d.	n.d.
Sunshine Coast	8.9 \pm 1.4	6.7 \pm 0.6	30.3 \pm 7.3	43.7 \pm 6	27.4 \pm 3.6	22.1 \pm 11.1
Torres & Cape [^]	7.2	7.	19	46.3	32.8 \pm 0	-1.4
Townsville	9.2 \pm 1.4	6.0 \pm 0.4	19.3 \pm 6.9	48 \pm 6.5	33.7 \pm 2.4	31.9 \pm 8
West Moreton	8.4 \pm 1.2	6.6 \pm 1.6	29.2 \pm 8.2	47.5 \pm 6.8	32 \pm 5.7	18.4 \pm 15.1
Wide Bay	9.4 \pm 1.7	6.8 \pm 2.4	28 \pm 8.6	46.8 \pm 6.2	29.9 \pm 3	23.2 \pm 11.7
p-value	0.46	0.20	0.26	0.031*	0.14	0.06

Source: Authors' analysis of data collected by the Bariatric Surgery Initiative ¹⁷.

Notes: Pre-surgery data are presented for all referrals (N=297); 12-month up data are for N=130 patients who have complete follow-up to that stage. * statistically significant: p < 0.05. ^ N=1 in the South West and Torres & Cape HHSs, and in the Mackay and Central West HHSs at 12 months post-surgery.

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Table S4. Reasons for patient exclusion from the BSI, stratified by HHS

HHS	Medical reasons	Patient cancellation	Mental health	Smoking	Total
Metropolitan	5	8	1	5	19
Metro North	2	5		4	11
Metro South	3	3	1	1	8
Regional	4	8	3	8	23
Cairns and Hinterland		2		1	3
Central Queensland	2	1			3
Central West			1		1
Darling Downs			1	1	2
Gold Coast		1	1		2
Mackay		1		1	2
South West					
Sunshine Coast	1			1	2
Torres and Cape					
Townsville		1		2	3
West Moreton	1	1		2	4
Wide Bay		1			1
Total	9	16	4	13	42

Source: Authors' analysis of patient clinical data collected by the Bariatric Surgery Initiative¹⁷.

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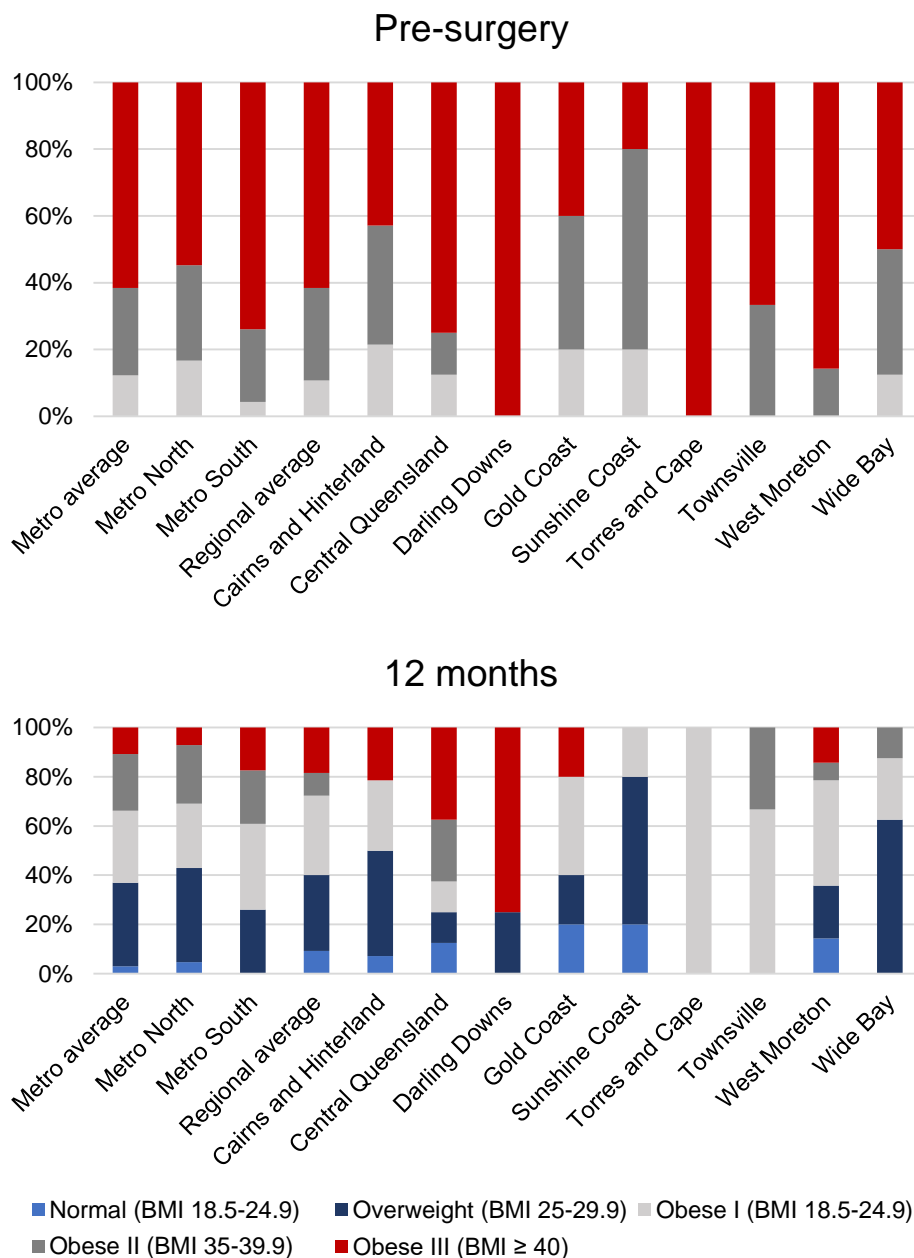


Figure S1. Obesity categories of patients before and after surgery, stratified by HHS

Source: Authors' analysis of patient clinical data collected by the Bariatric Surgery ¹⁷.

Notes: N=130 total (65 metropolitan, 65 regional). The number of patients from each HHS is: 42 Metro North, 23 Metro South, 14 Cairns & Hinterland, 8 Central Queensland, 4 Darling Downs, 5 Gold Coast, 5 Sunshine Coast, 1 Torres & Cape, 6 Townsville, 14 West Moreton, 8 Wide Bay.