

Investigating the distribution of primary and secondary care referrals for public-funded bariatric surgery at Counties Manukau Health (CMH)

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ABSTRACT:

AIMS: This study investigated variations in referral rates for bariatric surgery from primary and secondary care providers across the Counties Manukau district health board (CMDHB), with the aim of identifying “hot spots” for referrals so that intervention to help achieve equitable access to bariatric surgery can be implemented.

METHODS: Referral data was gathered from hospital referral records from January 2017 to January 2019 (n=1,440). Referral rate per geographical location within the CMDHB catchment was calculated using 2018 census figures.

RESULTS: Of the 1,195 referrals included, 1040 (87%) referrals were from primary care. The referrals came from 328 general practitioners (GPs) across 158 practices. There was considerable regional variation in referral rates per 1000 people, from a peak of 71.5/1000 to a low of 0.2/1000. Eighty-six percent of secondary care referrals were received from the public system and the remainder from private practice. The most common referral specialty was diabetes, followed by general surgery and orthopaedics. Out of these referrals, 434 (36%) proceeded to bariatric surgery. Pākehā (50%) were more likely to proceed to surgery than Māori (31%) and Pasifika (22%), despite similar referral numbers.

CONCLUSION: There is significant variation in referrals for bariatric surgery across CMDHB. Systematic discussion of bariatric surgery with every patient who is likely to benefit is not occurring, given relatively low referral volumes.

Obesity is a significant health issue, with nearly a third of the Aotearoa New Zealand adult population classified as obese.¹ In adults, Māori are almost twice as likely to be obese as non-Māori, and Pasifika adults are 2.5 times as likely to be obese as non-Pasifika adults.¹ Adults living in the most socio-economically deprived areas are significantly more likely to be obese than those living in the least deprived areas.² Bariatric surgery has been shown to be the most effective intervention for weight loss and remission of type 2 diabetes mellitus (T2DM).³⁻⁵ Additionally, bariatric surgery reduces mortality due to cardiovascular disease and cancer, improves management of diabetes, hypertension and obstructive sleep apnoea, and benefits overall quality of life.³⁻⁵ Despite this, access to bariatric surgery for Māori and Pasifika peoples in Aotearoa New Zealand is much lower when compared with New Zealand Europeans.^{6,7}

Manatū Hauora – Ministry of Health developed criteria to identify people suitable for publicly funded bariatric surgery.⁸ Approximately 400 bariatric surgeries are carried out through the pub-

lic system nationally each year, predominantly sleeve gastrectomy and Roux-en-Y gastric bypass surgeries.⁶ Referrals for surgery may be made from primary care (i.e., general practitioners) or secondary care (i.e., hospital-based specialists). Following referral, a bariatric surgical team within each district health board (DHB) is responsible for reviewing each referral and selecting those who are most likely to derive the greatest benefit from the surgery to proceed through the programme. While a national scoring system has been developed,⁸ irrespective of the prioritisation tool used by each DHB for patient selection, resource constraints mean that only a minority of patients that are eligible and likely to benefit actually receive this treatment.⁶

The inclusion criteria for bariatric surgery specific to Counties Manukau district health board (CMDHB) include:

1. BMI >40 or >35 with comorbidities.
2. Obesity for >5 years.
3. Weight <200kg or BMI <55.

4. Non-smoker (for at least 6 months).
5. Failed non-surgical attempts at weight loss for >2 years.
6. Understanding of and motivation for surgery.
7. Acceptance of long term follow up.

In the Auckland Region, New Zealand Europeans with a higher socio-economic status are more likely to be referred for bariatric surgery than other groups.^{9,10} An equitable referral funnel for bariatric surgery requires sound, evidence-based understanding and positive attitudes towards bariatric surgery across all primary and secondary care health providers in order to start the process of consideration for bariatric surgery.^{11–14}

Few studies have reviewed the distribution of referrals for publicly funded bariatric surgery in Aotearoa New Zealand with most of these being performed within individual DHBs.^{6,9} This study sought to review all referrals made for bariatric surgery in the Counties Manukau Health (CMH) Region in order to understand whether referrals are evenly distributed across providers and geographic regions or whether the limited numbers of referrals come from a small number of “high volume referrers” located in certain practices or specialist groups.

Methods

A retrospective review of all referrals to the bariatric service was performed in line with Strengthening the reporting of observational studies in epidemiology (STROBE) guidelines. All patients’ national health identifier (NHI) numbers were retrieved by a data analyst at CMH. Most referrals were sent electronically with a small minority sent by fax.

Inclusion and exclusion criteria

Patients aged 16 years and over who were referred electronically to CMDHB for bariatric surgery in the period 1 January 2017 to 1 January 2019 were included in the study. Referrals for complications of bariatric surgery and faxed referrals were excluded from the data collection.

Variables

Patient demographics were extracted for each patient referred. The source of referral was extracted and classified as primary care or secondary care. For those referred from primary care, the electronic record was reviewed for evidence of patient contact with a secondary care service in the

12 months prior to referral. For referrals received from primary care, the location of the practice and the identity of the referring doctor were also recorded. Comparisons of referral patterns from primary care were made on geographical terms on the basis of suburbs defined in the 2018 New Zealand census, and by broader localities as used for healthcare delivery planning by CMH. For referrals received from secondary care, the DHB, specialty and name of referrer were recorded. The outcome of each referral was recorded in terms of either proceeding to surgery or being discharged from the pathway. Reasons for why patients were discharged from the pathway were recorded where available.

Ethical approvals

This study was conducted in full conformance with principles of the Declaration of Helsinki, Good Clinical Practice and the Health Research Council of New Zealand. This study received ethical approval from the Auckland Health Research Ethics Committee (AHREC) and locality approval from CMH. Referrals from suburbs outside of CMH were also excluded.

Results

A total of 1,440 referrals were initially assessed, with 245 referrals excluded for reasons including being outside the study period and referrals received that were for a complication of bariatric surgery or unrelated to bariatric surgery. Of the remaining 1,195 referrals, 616 were referred in 2017 and 579 were referred in 2018. 549 of the 616 (89%) referrals from 2017 were from primary care, and 67 (11%) were from secondary care. In 2018, 491 referrals were from primary care (85%) and 88 from secondary care (15%, Figure 1).

Patient characteristics were similar across the two years of study (Table 1). The majority of patients referred were aged between 40–49 years and were female (67% female, 33% male). Referrals were mostly received for Pasifika (33%), Māori (27%) and New Zealand Europeans (27%). Patients were mostly referred with a BMI between 40–49kg/m.²

Primary care referrals

Of the 549 primary care referrals from 2017, 237 (43%) of the referrals did not have contact with secondary care in the 12 months prior to referral. A total of 311 (57%) patients had contact with secondary care through one or more specialties. In

2018, of the 491 primary care referrals, 298 (60%) had contact with secondary care in the 12 months prior to referral and 191 (39%) did not have any secondary care input in the 12 months prior. Primary care referrals were received from 328 general practitioners (GPs) from 158 GP practices. On average, GPs made three referrals across the two-year period, with the largest number of referrals sent by one GP being 19. The top ten referring GPs sent an average of 10 referrals each.

Across the two-year period, 609 of the 1,040 (59%) primary care referrals had contact with at least one secondary care service. The most common hospital specialties to be involved in the care of patients prior to primary care referral for bariatric surgery were from respiratory (n=164), emergency department (ED) (n=106), ophthalmology (n=84) and the diabetes team (Diabetes Clinical Nurse Specialist and Endocrinology) (n=71). A total of 407 patients had contact with one specialty, 322 with two specialties, 111 with three specialties and four had contact with >four specialties. The top 10 specialties engaged with patients prior to primary care referral are presented in Table 2.

Locations of primary care referrers

Suburbs within CMH are grouped into four broader localities for health delivery purposes. The locality with the highest number of referrals was Manukau (n=439, 40%), followed by Mangere-Ōtara (n=262, 22%), Eastern (n=239, 20%) and Franklin (n=99, 9%) (Figure 2). Details outlining the location of referrers are described in table three. Suburbs were defined according to the 2018 census classification.¹⁵ The suburb with the highest total number of referrals was Manurewa (n=131, 12.71%). Manurewa also had one of the highest number of referrals per 1,000 people. There were 93 referrals from suburbs outside of the CMH catchment area that were excluded from our analyses. Papatoetoe had the highest number of individual practices from which the referrals were received (n=12), but one of the lowest referrals per 1,000 people rates at 1.17/1,000.

Secondary care referrals

There were a total of 155 referrals received from secondary care, of which 126 (81%) were from CMH, eight (5%) from Auckland DHB and 21 (14%) from private practice. The number of referrals from public hospital specialists increased in 2018 compared to 2017 (Table 4). Of the 21 referrals from private practice, 20 were from general

surgeons. The highest referring hospital-based specialties were diabetes (n=33), general surgery (n=29), orthopaedics (n=18) and respiratory (n=18) services. Of the 33 referrals from the diabetes service, 11 were from individual team members, including senior medical officers, registrars and clinical nurse specialists. The two top referring team members referred 23 of the 33 patients.

Progression to surgery

Of the 1,195 patients referred for surgery, 434 (36%) proceeded to bariatric surgery. Of these, 166 (38%) were New Zealand European, 101 (23%) Māori, 86 (20%) Pasifika, 21 (5%) Indian, 3 (0.7%) Asian and 57 (13%) Other ethnicities. The highest proportion of patients who proceeded to surgery after referral identified as New Zealand European (n=162, 50%) compared with 31% Māori and 22% Pasifika. A total of 761 patients did not have surgery, with 32 patients still being worked up for surgery at the end of the study period. A total of 410 (54%) patients were discharged from the bariatric pathway due to repeated missed appointments and 32 (4%) patients were discharged due to rescheduling of appointments. A total of 82 (11%) patients were unable to meet the required weight loss goal and the remaining patients did not have surgery due to miscellaneous reasons. Of those who missed appointments, 177 (43%) were Pasifika, 124 (30%) Māori, 71 (17%) New Zealand European and 22 (5%) Indian.

Discussion

Referrals to the CMH bariatric service over a two-year period showed marked heterogeneity in referral rates, with over a hundred-fold difference between the suburbs with the highest rates and those with the lowest rates. The differences were mainly driven by individual general practitioners who referred at much higher rates.¹⁰ Although 328 individual GPs referred at least one patient to the bariatric surgery programme, approximately 10% of the referrals were received from 10 individuals. This inter-individual variation is striking and suggests that efforts to improve equitable bariatric surgery referral rates would lead to a large increase in referral numbers.

The total number of referrals over the two-year study period represents only a small fraction of patients who would likely be eligible for and benefit from bariatric surgery. The number who proceed to bariatric surgery each year is limited by the limited funding and bariatric surgeon/

theatre time allocated. While currently, approximately a third of those referred within the study period proceed to bariatric surgery,¹⁸ efforts to promote systematic discussion of bariatric surgery with every patient who is likely to benefit from bariatric surgery could massively increase referrals and likely reduce the fraction who proceed to surgery unless further funding is allocated to this service.

A previous study at CMH presented data outlining referrals over six years showing that 83% of referrals were received from primary care, similar to 89% in this study; however, the earlier study did not specify the location distribution of referrers or specialist care contact of those referred.⁶ This study found that of the referrals received from primary care, 59% had evidence of secondary care contact in the 12 months prior to referral. Interaction with secondary care specialists reflects both the presence of co-morbidity and, potentially, missed opportunities for referral to bariatric services by hospital specialists. Very few patients were referred from primary care on the explicit advice of secondary care services, suggesting that there were missed opportunities for referral from secondary care services. This is especially notable given that only 13% of the referrals received came directly from secondary care services.

This study confirmed previously reported ethnic disparities in referral patterns, with Māori and Pasifika people being referred at around the same rates as New Zealand Europeans despite substantially higher rates of obesity, with significantly lower rates of progression to surgery.⁶ This study was not able to interrogate the reasons why this trend continues to be seen. There was also a disproportionate number of Pasifika and Māori attrition from the bariatric surgery pathway. Further studies are required to examine how individual patient and systemic factors may contribute to these findings. A change in the way we deliver our services, and engage with Māori and Pasifika,

may improve service delivery, and eliminate disparities in proportions referred and proceeding through to surgery.¹⁹

This study had several strengths. Access to a largely electronic referral system meant that referrals were able to be accessed readily and in real time. The two-year period of study contained a larger number of referrals and allowed us to better observe trends in referral patterns. There were also several limitations to this study. Firstly, as we excluded faxed referrals, we were unable to present a complete picture of all referrals, although there were only 39 faxed referrals. Investigating the reasons for inter-individual variability in referral practices observed lay outside the scope of this study; however, there is literature on the variation in knowledge and attitudes of referrers in the context of bariatric surgery.¹⁴ Lastly, the referral rates per 1,000 population did not account for patients who travelled outside of their suburb to their GP practice, yet still resided in CMDHB region.

This study presents a retrospective review of all referrals to the CMH bariatric service over two years. There was significant geographical and inter-individual variability in referral rates to the CMH bariatric service and consistent with previous studies, Māori and Pasifika were referred at similar rates as NZ Europeans but were less likely to proceed for surgery in comparison. Taken together, these findings suggest that referral practices of healthcare providers could be enhanced to ensure systematic discussion of bariatric surgery with all those likely to benefit from publicly funded bariatric surgery at CMH. However, such systematic and equitable discussions with all such patients would likely result in a huge increase in numbers referred, meaning a greater number would have to be declined if funding for this service remains the same. Further work is needed in this area to clarify the drivers behind the observed variability so that targeted initiatives can be designed and effected accordingly.

Figure 1: Referral distribution between primary and secondary referrers.

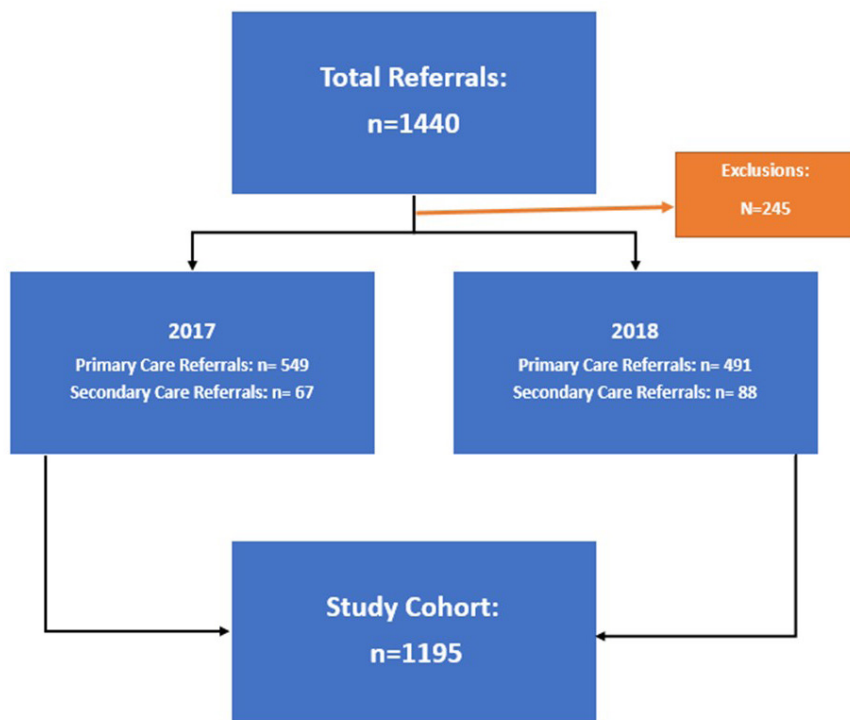


Figure 2: Map of wider Auckland region highlighting CMDHB localities and referrals per 1,000 people.

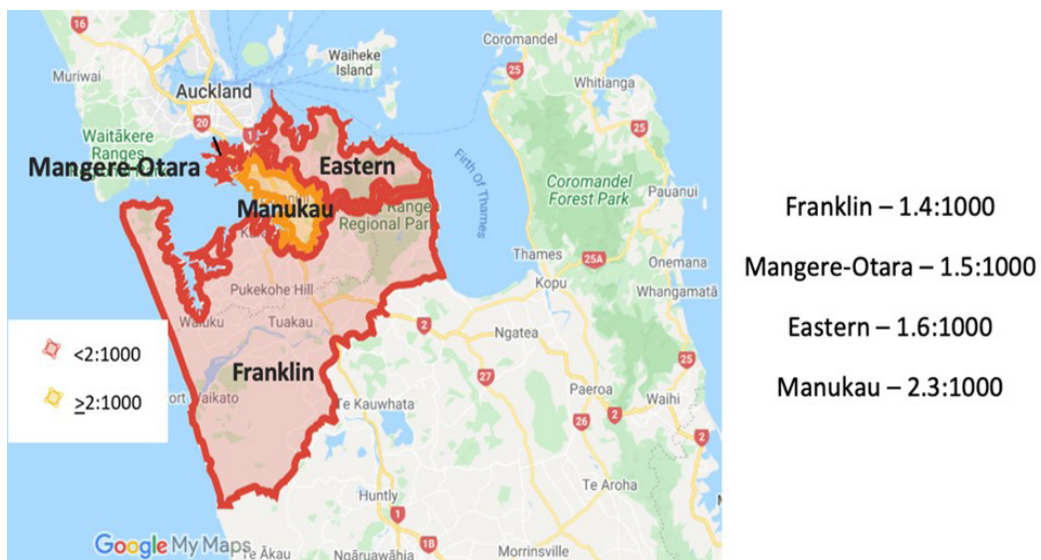


Table 1: Patient characteristics.

	2017 (n=616)	2018 (n=579)	Total (n=1,195)
Age			
15–19	6 (1%)	1 (0.2%)	7 (1%)
20–29	51 (8%)	55 (9%)	106 (9%)
30–39	160 (26%)	133 (23%)	293 (25%)
40–49	216 (35%)	194 (34%)	410 (34%)
50–59	139 (22.5%)	156 (27%)	295 (25%)
60–69	41 (6.6%)	39 (7%)	80 (7%)
70–79	3 (0.5%)	1 (0.2%)	4 (0.3%)
Gender			
Male	193 (31%)	197 (34%)	390 (33%)
Female	423 (69%)	382 (66%)	805 (67%)
Ethnicity			
Māori	162 (26%)	160 (28%)	322 (27%)
New Zealand European	200 (32%)	122 (21%)	322 (27%)
Pacific Islander	181 (29%)	214 (37%)	395 (33%)
Indian	23 (4%)	33 (6%)	56 (5%)
Asian	5 (1%)	4 (1%)	9 (1%)
Other	45 (7%)	46 (8%)	91 (8%)
BMI			
25–29	0	1 (0.2%)	1 (0.1%)
30–39	80 (13%)	75 (13%)	155 (13%)
40–49	277 (45%)	267 (46%)	544 (46%)
50–59	177 (29%)	179 (31%)	356 (30%)
60–69	66 (11%)	48 (8%)	114 (9.5%)
70–79	13 (2%)	7 (1%)	20 (1.6%)
>80	3 (0.5%)	2 (0.3%)	5 (0.4%)

Table 2: Top 10 specialties engaged with patients 12 months prior to primary care referral.

Specialty service	Number of patients
Respiratory (sleep medicine)	164 (142)
Emergency medicine	106
Ophthalmology	84
Diabetes	71
General surgery	62
Gynaecology	60
Orthopaedics	54
Cardiology	53
General medicine	36
Plastics	29

Table 3: Location of primary care referrals.

Location of primary care providers	Percentage of total referrals (number)	Population (2018 census data)	Referral rate per 1,000	Number of GP practices within location
Manurewa	12.71% (131)	19,236	68/1,000	11
Māngere	10.96% (113)	21,363	5.3/1,000	5
Ōtara	8.34% (86)	22,872	3.7/1,000	10
Papakura	7.37% (76)	22,296	3.4/1,000	8
Manukau	6.79% (70)	3,450	20.3/1,000	5
Flat Bush	5.63% (58)	32,214	1.8/1,000	2
Clendon Park	4.75% (49)	8,871	5.5/1,000	3
Papatoetoe	4.95% (51)	43,599	1.17/1,000	12
Pukekohe	4.66% (48)	22,731	2/1,000	4
East Tāmaki	3.6% (35)	489	71.5/1,000	2
Howick	2.42% (25)	11,067	2.3/1,000	6
Waiuku	2.23% (23)	9,650	2.4/1,000	1
Takanini	2.23% (23)	12267	1.9/1,000	2
Dannemora	1.94% (20)	9,678	2/1,000	1
Burswood	1.36% (14)	1,695	8.3/1,000	1

Table 3 (continued): Location of primary care referrals.

Location of primary care providers	Percentage of total referrals (number)	Population (2018 census data)	Referral rate per 1,000	Number of GP practices within location
Highland Park	1.16% (12)	4512	2.7/1,000	1
Ōtāhuhu	1.16% (12)	15165	0.8/1,000	4
Pakuranga	1.36% (14)	7689	1.8/1,000	4
Tuakau	1.36% (14)	5013	2.8/1,000	1
Beachlands	0.97% (10)	6261	1.6/1,000	1
Drury	0.97% (10)	1197	8.4/1,000	1
Māngere East	0.97% (10)	27372	0.37/1,000	3
Clevedon	0.78% (8)	1515	5.3/1,000	1
Half Moon Bay	0.48% (5)	8106	0.62/1,000	2
Māngere Bridge	0.39% (4)	10296	0.39/1,000	2
Northpark	0.78% (8)	5094	1.6/1,000	1
Pōkeno	0.29% (3)	1668	1.8/1,000	1
Mellons Bay	0.19% (2)	4017	0.5/1,000	1
Golflands	0.10% (1)	2460	0.4/1,000	1
Karaka	0.10% (1)	2904	0.3/1,000	1
Rosehill	0.10% (1)	4071	0.25/1,000	1
Wiri	0.10% (1)	5355	0.2/1,000	1

Table 4: Secondary care referrals by specialty.

	2017	2018	Total
Diabetes	11	22	33
General surgery (including private)	22	7	29
Orthopaedics	10	8	18
Respiratory	3	15	18
Gastroenterology	9	8	17
Gynaecology	1	7	8
General Medicine	3	3	6
Renal	1	5	6
Anaesthetics	2	1	3
Cardiology	0	3	3
Spinal Unit	2	0	2
Urology	1	1	2
Chronic pain	0	1	1
Otolaryngology	1	0	1
Geriatrics	0	1	1
Haematology	0	1	1
Neurology	0	1	1
Oncology	0	1	1
Plastics	0	1	1
Radiation Oncology	0	1	1
Rheumatology	0	1	1
Vascular MMH	1	0	1
Total	67	88	155

COMPETING INTERESTS

Nil.

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