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Racial disparity in an outreach pediatric surgical service☆,☆☆,★,★★,☆☆☆

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ABSTRACT

Aim: The aim of this study was to investigate whether racial disparities in healthcare exist within a New Zealand pediatric surgical outreach service in a high indigenous Māori population.
Methodology: This retrospective study assessed all pediatric surgical procedures performed within a secondary center in New Zealand between May 2014 and May 2016. The days between the date of surgery booking on the waiting list and actual date of surgery were calculated and compared to their corresponding elective surgery waiting target times set by the New Zealand Ministry of Health (MoH). Patient demographic data were collated to then identify any discrepancy between ethnic groups.
Results: A total of 203 pediatric surgical procedures were performed on 193 patients. Of the 194 (95%) procedures that were included in the study, 30 breached a maximum waiting time. Though this represented a small proportion of patients, Māori were significantly over represented in this group.
Conclusion: The majority of our patients with delayed elective surgery were of Māori ethnicity, for reasons not entirely accounted for by common socioeconomic determinants of health. Our study suggests the possibility of innate systemic causes not detected by standard models of health. However, further research with larger cohorts is needed.
Level of Evidence: III

Pediatric surgical services have long been a tertiary entity in New Zealand, with limitations existing predominantly because expertise, caseload, and resources needed for such a specialized service are few. As a consequence, tertiary centers throughout New Zealand provide multiple outreach services to smaller secondary centers in neighboring regions, catering to large rural populations of which indigenous Māori forms a significant majority. Māori comprise 15.4% of the national estimated resident population, with an above average proportion living rurally [1]. Ethnic disparity in healthcare provision particularly within New Zealand is not a new concept, and has been demonstrated within multiple services across the ethnicities that make up New Zealand's diverse population [2,3].

Māori as a people have long been the face of ethnic disparity in health outcomes within New Zealand, with Maori being less likely to seek medical attention, receive adequate care, specialty referral, receive pharmaceuticals, and surgical intervention compared to their European counterparts [2]. Although these areas are well explored in certain areas of health in New Zealand, there remains limited literature surrounding ethnic disparity in pediatric surgical services.

This study aims to describe differences in pediatric elective surgical wait times, under the hypothesis that Māori remain at the forefront of ethnic disparity in New Zealand. The study is set in single center, within a publicly funded health system, catering to a region with the fourth largest Māori population in New Zealand, 33.5% of which are under the age of 15 years [4]. The New Zealand Ministry of Health (MoH) introduced strict waiting time criteria for surgery and specialist assessment in 2000 and revised them in 2012 with an addendum to the original national strategy [5,6]. These criteria were used as the standard to measure time for delayed surgery.

Abbreviations: MoH, Ministry of Health; iPM, inpatient management system; ANOVA, analysis of variance.

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1. Methodology

Identification of all patients who underwent elective pediatric surgery provided by the surgical outreach service between May 2014 and May 2016 inclusive was performed via the iPatient Manager (iPM) Hospital data system, which tracks and logs each patient event over time. Those identified then had a calculation of days between date of surgery booking and actual date of surgery. This calculated number was then compared to the New Zealand MoH recommended wait list target times for elective surgery, according to the year of surgical booking to identify those who breached [6]. The maximum wait times were 168 days as of 1 July 2012, 140 days as of 1 July 2013, and 112 days as of 1 January 2015.

Additional data on patient age, sex, ethnicity, type of operation, and waiting list days were collated from eligible patients. All pediatric surgical patients serviced by the single center between May 2014 and May 2016 inclusive comprised the cohort for this study.

Exclusion criteria included patient cancellation or parental postponement of surgery, change of surgery date secondary to acute or inter-current illness, patient death, and unavailable or unclear dates of surgical booking or date of surgery.

All statistical data was entered into a Microsoft Excel® database and subsequently analyzed using IBM SPSS ® statistical package. Descriptive statistics were used to analyze the categorical variables with chi-square analysis used to test for statistical significance.

2. Results

During the period studied 203 pediatric surgical procedures were performed within the single center alone, consisting of 42 different surgical procedures, on 193 patients, by one primary pediatric surgeon. Sixty-eight and 105 procedures were performed in the years 2014 and 2015 respectively, while a further 30 procedures were completed by May 2016. The procedure categories, their respective wait times, and patient demographics are as shown in Tables 1 and 2.

Over the time period assessed there were 30 surgical waitlist time breaches, corresponding to the maximum wait time targets determined by the MoH.

The average breach days over the entire examined period was 41.1 days, with a median of 28 days according to each year's maximum limits. Nine surgeries over this entire time period were unable to be assessed for breach secondary to inaccurate or unclear surgical booking times and were therefore excluded from the data set. The breakdown of results by year of surgery is as shown in Table 3.

The average age at the time of surgery across all breach procedures was 4.2 ± 3.4 years, with a median age of 3 years. The relationship between patient age and wait time to surgery was not statistically significant, $p = 0.72$, using one-way analysis of variance (ANOVA).

Over 85% ($n = 26$) of breaches were male coinciding with the predominantly male population in the reviewed data and the suitability of day stay elective operations within a secondary hospital being more applicable to males (i.e. circumcision, orchidopexy), X^2 (1, $N = 194$) = 2.01, $p = 0.152$.

Of those who breached 64% ($n = 19$) were of Māori ethnicity, the next highest groups being NZ European 27% ($n = 8$), 1 Other European, 1 Indian, and 1 Chinese. Māori made up 60% of breached time over the entire period studied, accumulating 745 breach days over their respective yearly targets compared to a total of only 318 breach days in New Zealand Europeans. The median breach days for Māori was 1.3 times the median breach days for their New Zealand European counterparts. Despite these findings the relationship between ethnicity and breach was not statistically significant, X^2 (5, $N = 194$) = 7.34, $p = 0.19$.

Patients undergoing inguinal or scrotal surgery, had the greatest number of breaches ($n = 22$), median wait time (94.5 days) and were more likely to breach their target wait time compared to all other procedures X^2 (5, $N = 194$) = 10.95, $p = 0.052$. The average wait time for inguinal or scrotal surgery was 94.5 days, with the discrepancy between procedure and mean wait time being statistically significant, $p = 0.01$, using ANOVA.

Table 2
Patient demographics. $\bar{x}$, average; SD = Standard Deviation.

Sex		n =	%
	Male	150	77
	Female	44	33
Ethnicity			
	NZ European	83	42
	Maori	81	41
	Other European	13	7
	Asia/ Pacific	12	6
	Other	7	3
	Unidentified	3	1
Age			
	<1 years	2	1
	1–2 years	51	26
	3–5 years	72	37
	6–12 years	62	32
	> 12 years	7	4
	$\bar{x}$ Age Years ± SD	4.9 ± 3.47	
	Median Age Years	4	

3. Discussion

Over the studied period 14.7% of patients breached their waiting time as according to the New Zealand MoH elective surgery targets.

It is difficult to isolate the reason for the discrepancy of breached days between groups given the reviewed data, and equally so to assess whether this highlights a disparity amongst ethnicities. Understandably, this center and its surrounding regions have a high Māori population, however the disparity is not proportional to the study population of almost equal Māori and New Zealand Europeans. It also does not correspond to the ethnic distribution of the region with 67.5% of people in the district belonging to a European ethnic group [4]. Other ethnic minority groups had low numbers of breach procedures, reflective of their numbers in the study.

Although the relationship between ethnicity and breach status is demonstrated to not be of statistical significance, the small study

Table 1
Procedure categories and wait times. n = number; $\bar{x}$ = average; Md = Median.

Procedure type	n =	Total wait list days	$\bar{x}$ / Md wait days
Inguinal/scrotal	88	8317	94.5 / 91.5
Skin/subcutaneous	29	1968	67.9 / 49
Genitourinary	34	2890	85 / 77
Abdominal/bowel	27	1799	66.6 / 58
Endoscopy	11	349	31.7 / 32
Miscellaneous	5	542	108.4 / 64

Table 3
Overall data results of procedures by year 2014–2016. n = number; $\bar{x}$ = average; Md = Median.

Year	n = of Procedures	n = of breach	$\bar{x}$ / Md breach days	$\bar{x}$ / Md age years
2014	68	9	27 / 16	3.5 / 2
2015	105	12	45.1 / 28	4 / 2
2016	30	9	48.9 / 22	4.9 / 4
Overall Total	203	30	41.1 / 28	4.2 / 3