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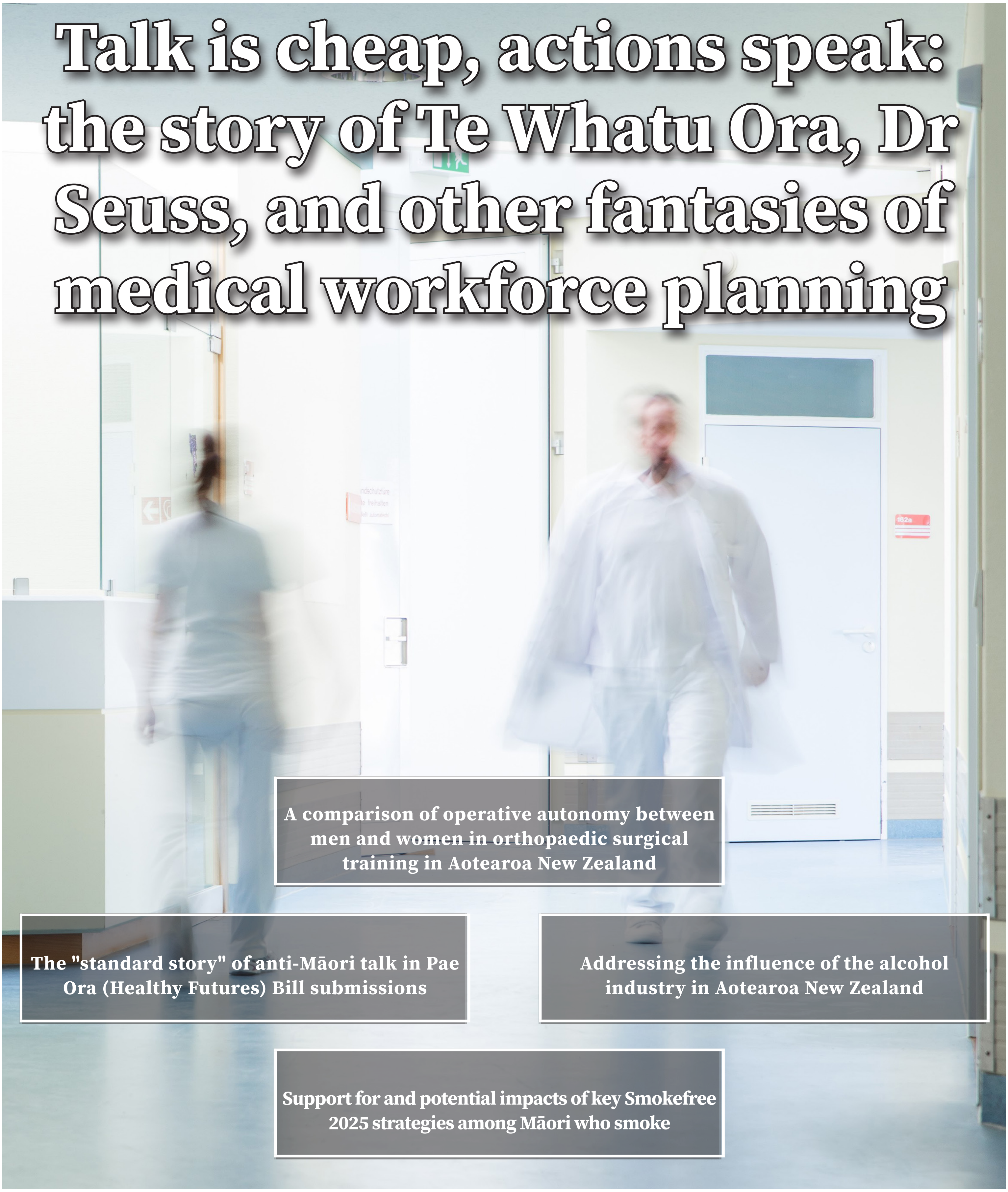

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Summaries

Incidence and predictors of new-onset atrial fibrillation after cardiac surgery at Auckland City Hospital

Jenna Keepa, Cynthia Wensley, Andrew Jull

Atrial fibrillation occurred in almost a third of patients after heart surgery at Auckland City Hospital. The risk of developing postoperative atrial fibrillation increased with advancing age, a higher body mass index, a history of heart failure and any heart valve surgery. However, efforts to predict which patients would develop atrial fibrillation were not accurate enough to justify the use of different prevention approaches in high- and low-risk groups.

Dental and oro-facial features of Foetal Anticonvulsant Syndrome

Hetal Shukla, Alison Meldrum, Dorothy Boyd

It is known that children with Foetal Anticonvulsant Syndrome (FACS) present with abnormalities in the face structure, delayed mental development, and/or malformations of the organs/limbs. This study surveyed 65 families with FACS-affected children in Aotearoa New Zealand and found that dental and oro-facial abnormalities are also prevalent in the FACS patient group. 81% reported dental abnormalities, the most common of which was crowded teeth, discoloured teeth, and teeth smaller in size than normal and 70.4% reported abnormalities in speech, swallowing and eating (oro-facial functions) in their FACS-affected child. The study also found that some mothers were unaware of the foetal risks of anticonvulsant drugs during their pregnancies—thus identifying a need for greater education about these drugs to women of childbearing age. This study is the first on FACS in Aotearoa New Zealand and, as dental and oro-facial abnormalities can affect the quality of an individual’s life, it lays the necessary foundations for further research on this syndrome.

A comparison of operative autonomy between men and women in orthopaedic surgical training in Aotearoa New Zealand

Elizabeth C Bond, Frances H Whiting, Peter D Larsen, Georgina Chan

This paper looks at the experience of doctors training in orthopaedic surgery in Aotearoa New Zealand. The results show that women receive significantly less operative autonomy than men at every level of training despite performing more cases annually. We are unable to draw conclusions as to the reason or impact of these differences, but the paper adds to a growing body of literature showing similar findings in other procedural specialties in Aotearoa New Zealand—namely general surgery and ophthalmology.

Support for and potential impacts of key Smokefree 2025 strategies among Māori who smoke

Andrew Waa, Ellie Johnson, James Stanley, Bridget Robson, Anania Kerehoma Cook, Erana Peita, Anne CK Quah, Geoffrey T Fong, Richard Edwards

Our study explored the behaviours and beliefs of 700 Māori who smoked about Aotearoa's Smokefree Goal. We explored their support for this goal and three key measures: making cigarettes non-addictive; markedly reducing access to tobacco retail outlets; and not allowing people born after a certain date to purchase cigarettes, thereby creating a smokefree generation. Our study found good support for these measures, in particular very low nicotine tobacco. Our findings suggest these measures would prompt quitting. Support was greater among those who had made more quit attempts or who felt less control over their lives. These results provide further evidence in support of the New Zealand Government's world leading smokefree legislation passed in 2022.

The “standard story” of anti-Māori talk in Pae Ora (Healthy Futures) Bill submissions

Rose Black, Ngaire Rae, Kyle Tan, Waikaremoana Waitoki, Leah Waipuka-Bain

The Pae Ora (Healthy Futures) Bill is the first step in health system reforms to address equitable services to Māori through the creation of the Māori Health Authority and the inclusion of Iwi partnership boards. The majority of the 4,500 submissions expressed a range of “anti-Māori” views. Many of the views repeated longstanding patterns of talk by Pākehā/non-Māori in Aotearoa, which are traced back to the very early British/European settlers. This paper examines three of these patterns of talk, how they operate to perpetuate racism, and offers some positive ways of understanding Māori/Pākehā relationships.

Ethnic variation in hospitalisation due to treatment injury and complications of healthcare in older adults residing in New Zealand

Georgina Svensen, Joanna Hikaka, Alana Cavadino, Bridget Kool

When you receive health care and treatments, there is always the potential for adverse outcomes to occur. Our research showed that people's risk of experiencing an adverse outcome from medical or surgical care increased with age and varied by ethnicity. Māori were more likely to experience adverse outcomes than non-Māori. We believe it is important for the New Zealand health system to routinely report adverse outcomes resulting for healthcare and respond to when there are differences in outcomes between different groups in the population.

Informed consent for medical student involvement in patient care: an updated consensus statement

Simon Walker, Papaarangi Reid, Lynley Anderson, Susan Bull, Monique Jonas, Joanna Manning, Alan Merry, Suzanne Pitama, Sarah Rennie, Jeanne Snelling, Tim Wilkinson, Warwick Bagg

In almost all aspects of medical student education, it is an ethical and legal requirement that consent is obtained from patients before students are involved in their care. There is some evidence of confusion about how and when this should be done, particularly given the wide variety of ways in which students can be involved in a patient's care, and of an ongoing need to improve practices in some learning environments. In an effort to address these shortcomings, in 2015 a consensus statement on this topic was jointly produced by faculty from New Zealand's two medical schools and Chief Medical Officers. This paper is an update of that statement. It links the requirement for consent to student involvement with institutional commitments to honour Te Tiriti o Waitangi, incorporates aspects of cultural safety, clarifies the levels of responsibility, how and when consent should be obtained, the amount of information that is required, and offers practical suggestions for certain areas of clinical learning.

It’s a family affair: Confucian familist philosophy’s potential to improve mental health care for ethnic Chinese in Aotearoa New Zealand

Denzel WK Chung, Jing-Bao Nie, Katherine H Hall, Chrystal Jaye

Aotearoa New Zealand’s health system is largely individual-oriented, with a strong focus on individual autonomy. Whānau-centred care is inconsistently implemented in practice, and this can form a barrier to seeking mental health care for ethnic Chinese, who traditionally have a collectivist, familist culture (valuing interdependence and the extended family unit). We propose a moderate Confucian familist approach, which encourages family involvement in individual patients’ care with their consent, as a potential method of balancing the cultural importance of family involvement with protections of patient autonomy. We see Whānau Ora as a potential exemplar, showing that a culturally-grounded, family-centred approach to mental health care can be feasibly implemented, with potential to improve mental health service utilisation, engagement and outcomes.

Addressing the influence of the alcohol industry in Aotearoa New Zealand

June YY Leung, Stephen Randerson, Georgia McLellan, Sally Casswell

Alcohol legislation in Aotearoa New Zealand has not been sufficient to minimise the harm and inequities caused by alcohol use, and a comprehensive review of alcohol policies has been postponed. Because of the alcohol industry's vested interests, the World Health Organization notes that industry involvement in public health policy has potential risks that should be minimised. In this paper we illustrate the significant extent of alcohol industry penetration in Aotearoa and how such influence undermines equity by amplifying the harms of colonisation. The government lacks policies that limit interactions with the alcohol industry, such as political donations and lobbying. We recommend what can be done to limit alcohol industry influence in policymaking, including using experiences in tobacco control to manage conflicts of interest, strengthening rules over political donations and lobbying, enhancing transparency of interactions, promoting non-collaboration with the alcohol industry, and advocating for alcohol policies that give effect to Te Tiriti o Waitangi.

Talk is cheap, actions speak:
the story of Te Whatu Ora, Dr Seuss, and other fantasies of medical workforce planning

Frank Frizelle

It is important for those of us who work within and use the New Zealand health system to believe in its integrity, where actions should match the words, or, as Dr Seuss puts it: "we say what we mean, and we mean what we say". This may be what we all want, but in a chronically under-resourced health system, there have been repeated compromises, and actions have not always matched the words. One of the most important areas this has been in is the under-resourced medical staffing.

The recent report from Te Whatu Ora – Health New Zealand on workforce planning outlines the staff shortages and reflects the lived experience of those of us working in the health system. That is, we are short of staff. The report *Health Workforce Plan 2023/24* (July 2023)[1] is most welcome, as it puts some real numbers around the size of the defect in the health workforce, and, without some sort of data, it is next to impossible to plan and manage a way through this issue. The report points out that today we are short of about 1,700 doctors. To give an idea of what this number means, it is more than the collective output over three years from both the medical schools in Aotearoa New Zealand. The report also outlines the magnitude to which this problem will balloon to by 2032.

The report not only describes the size of the problem, but also outlines a framework for a plan that may help manage the problem. With regards to the medical workforce, it acknowledges that it takes a long time to train a doctor, let alone a specialist, and that the medical workforce is very much a commodity (which is in short supply) on the international market. The suggested plan may be briefly summarised as: 1) recruit more overseas graduates (international medical graduate [IMGs]), 2) train more doctors ourselves, and 3) retain who we have. All three of these are difficult.

Table 1: The gap today.[1]

We estimate the gap today is:	
4,800	Nurses
1,050	Midwives
1,700	Doctors (incl. GPs)
170	Pharmacists
120	Sonographers
200	Anaesthetic technicians
220	Dental/oral health therapists and hygienists
30	Radiation therapists
30	Clinical / cardiac physiologists

1) Recruit more overseas medical graduates

Last year there were 18,784 doctors registered to practice in New Zealand, an increase from 18,250 from the year before.[2] The New Zealand health system has always been dependent on overseas graduates, with 40% of practicing doctors in New Zealand being IMGs.[2] IMGs bring skill sets and differences in culture that add considerably to the New Zealand medical environment.

Last year, according to the Medical Council of New Zealand's annual report, there were 583 new registrations from New Zealand trained doctors and 942 new registrations from IMGs.[2] While these numbers reflect a growing workforce, they also outline the significance of the gap, as most of these new doctors are merely replacing retiring doctors (despite 1,525 new registrations, the actual workforce only increased by 534). This is even more apparent when we look at new specialists: there were 748 new registrations; however, there was a net increase of only 40 after accounting for those who retired. The gap of 1,700 doctors is in addition to those needed to replace those who stop practicing.

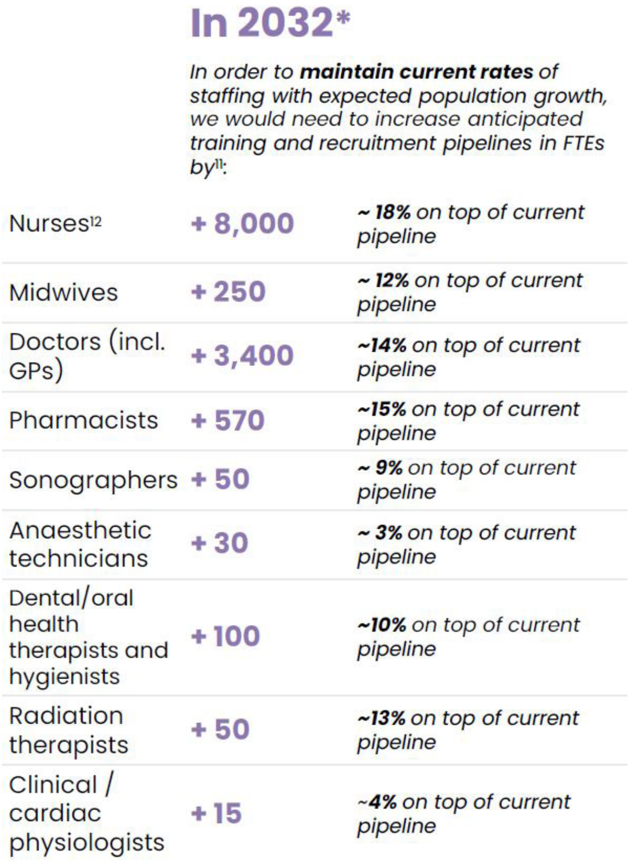
We all have heard repeatedly that there is a worldwide shortage of doctors. Aotearoa New Zealand recruits largely from the UK and Ireland. At the end of last year, however, there were around 124,000 health care vacancies in England; of these, nearly 9,000 were doctors.[3] The situation is thought to be getting worse in the UK due to Brexit, where it is estimated that greater than 4,000 European doctors are not going to the UK each year because of Brexit.[3] It is against this background that we are looking at recruiting the extra 1,700 doctors we need today.

2) Train more doctors ourselves

The Te Whatu Ora – Health New Zealand workforce report suggests that we increase the number of doctors we train by 50 a year.[1] Clearly this will not help in the short term, or even by 2032, given the length of time it takes to train doctors (>12 years for specialists). However, in the longer term, this will help reduce slightly the dependency we have on overseas graduates.

A third medical school has been explored repeatedly over the last 20 years, with suggested plans put forward over this period by Christchurch, Wellington, and most recently, Waikato. All have had the same issue, which is that the hospitals associated with the proposed medical schools are already committed to medical students from one of the two existing medical schools. It will be interesting to see if the proposed third medical school (to be located in Hamilton) recently suggested by the National party actually gets past the business case test. Waikato and surrounding hospitals are

Table 2: The gap *tomorrow* (2032).[1]



In 2032*

*In order to **maintain current rates** of staffing with expected population growth, we would need to increase anticipated training and recruitment pipelines in FTEs by[11]:*

Nurses[12]	**+ 8,000**	*~ **18%** on top of current pipeline*
Midwives	**+ 250**	*~ **12%** on top of current pipeline*
Doctors (incl. GPs)	**+ 3,400**	***~14%** on top of current pipeline*
Pharmacists	**+ 570**	***~15%** on top of current pipeline*
Sonographers	**+ 50**	*~ **9%** on top of current pipeline*
Anaesthetic technicians	**+ 30**	*~ **3%** on top of current pipeline*
Dental/oral health therapists and hygienists	**+ 100**	***~10%** on top of current pipeline*
Radiation therapists	**+ 50**	***~13%** on top of current pipeline*
Clinical / cardiac physiologists	**+ 15**	***~4%** on top of current pipeline*

already taking Auckland medical students, and their replacement with Waikato medical students is unlikely to increase the actual overall numbers of medical students in any significant way. It has the familiar ring of fantasy about it, along the lines of the number of new houses that were promised to be built by the present Labour government at the last election.

We may need to reconsider how we train doctors. In the north of Scotland where this was an issue, they now have medical schools that train doctors, mostly in general practice settings, with limited hospital rotations. An alternative, and possibly a more cost effective and faster way, may be to negotiate with some of the 21 Australian medical schools to take New Zealanders on some sort of bonded bursary system.

3) Retain who we have

The third arm of the plan is to retain doctors. The recent headlines in a Stuff article that "senior salaried doctors and dentists in New Zealand are set to shortly hold stop-work meetings to discuss potential strike action"[4] suggests that the actions do not match the words when it comes to trying to retain the present staff.

The development of the "fly in and fly out" doctor moving from New Zealand to provide care in Australia is increasingly popular, allowing doctors to avoid working in difficult and under-resourced New Zealand hospitals with poor pay rates.

The issue of retaining doctors in not new. A report with the interesting title *The Future of the Leaking Bucket: A commentary on the SMO Commission Report, Senior Doctors in New Zealand: Securing the Future*[5] from 2009 reported that there was a collective specialist pay gap of around 35% between New Zealand and Australia. Shortages in the district health board (DHB) specialist workforce have made the system "vulnerable," and retention is deteriorating (the gap was estimated to be about 10% of senior medical officer [SMO] posts at that point unfilled).[5] The last point it made is relevant still today, but perhaps for other reasons (post Covid stress), that there is serious disengagement of senior doctors and dentists from DHB management. The Commission attributes this disengagement to the "significant, detrimental influence" of managerialism that developed in the 1990s commercial business era.[5]

There has been much talk for many years about the importance of retaining the work force; in reality, little has been done about it. It will be interesting to see if Te Whatu Ora – Health New Zealand senior management are resourced and willing to walk the walk, not just talk the talk.

COMPETING INTERESTS

Frank Frizelle is the Editor in Chief of the *New Zealand Medical Journal*.

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Incidence and predictors of new-onset atrial fibrillation after cardiac surgery at Auckland City Hospital

Jenna Keepa, Cynthia Wensley, Andrew Jull

ABSTRACT

AIM: To describe the incidence, ethnic differences in incidence, and predictors of post-operative atrial fibrillation (POAF) after cardiac surgery in a New Zealand hospital.

METHOD: Analysis of registry data on 1,630 adults without previous atrial fibrillation having coronary artery bypass grafting and/or valve surgery was used to determine the incidence of POAF. Univariate analysis identified risk factors and stepwise logistic regression was used to create the most parsimonious model to predict POAF.

RESULTS: Overall POAF incidence was 29% (n=465) and differed by surgery type (25% after isolated coronary artery bypass surgery [CABG] vs 42% after combined CABG+valve). Incidence was highest in Māori (35%) and NZ/Other Europeans (32%). Māori and Pasifika with POAF were on average ten years younger than NZ/Other Europeans. Independent risk factors were age (OR 1.05, 95%CI 1.04–1.06), body mass index (OR 1.04, 95%CI 1.02–1.06), history of heart failure (OR 2.08, 95%CI 1.47–2.95), and valve surgeries (isolated valve OR 1.51, 95%CI 1.16–1.95; CABG+valve OR 1.59, 95%CI 1.11–2.28), but the model had poor discrimination (AUC 0.67).

CONCLUSION: POAF in a New Zealand hospital occurs at comparable rates to international settings. Risk models using routinely measured factors offer poor predictive accuracy, meaning risk stratification is unlikely to adequately inform targeted POAF prevention in clinical practice.

Atrial fibrillation (AF) is the most common complication after cardiac surgery, occurring in about 30% of patients who have no prior history of AF.[1] Although largely transient and self-limiting, the development of post-operative AF (POAF) increases use of hospital resources and is associated with prolonged hospital stay.[2] There is also increasing evidence that POAF is associated with poor perioperative outcomes, as well as higher rates of recurrent AF, stroke, and mortality in long-term studies.[3,4]

There are several strategies for POAF prevention, including pharmacological and surgical interventions. Prophylactic use of beta blockers or amiodarone show some reduction in POAF incidence.[5,6] However, the potential adverse effects of amiodarone may outweigh the benefits of reduced POAF incidence in some patients, and several guidelines recommend limiting amiodarone use to high-risk patients only.[7–9] The ongoing challenge is that there is currently no reliable framework to differentiate those at highest risk, and proposed risk models have not proven accurate enough for use in clinical practice or across different cardiac surgeries.[10] The use of targeted POAF prevention in clinical practice is therefore limited and prevention protocols vary widely between cardiothoracic centres in New Zealand and internationally.[9,11]

Little is known about POAF in New Zealand. The most recently published New Zealand Cardiac Surgery National Report describes a low national incidence of 23% but does not identify which patients are at highest risk in the New Zealand context.[12] Furthermore, it is not known at what rate POAF affects Māori and Pasifika populations. This research therefore aimed to describe the incidence of new-onset POAF following coronary artery bypass grafting (CABG) and/or valve surgery, explore differences in incidence by ethnic group, and to identify independent predictors of POAF in a New Zealand setting.

Methods

This study was an analysis of prospectively collected New Zealand Cardiac Surgical Registry (NZCSR) data from Auckland City Hospital, the largest cardiothoracic surgery centre in New Zealand. The study included consecutive patients aged 18 years and over who had undergone CABG and/or valve surgery between 1 January 2019, and 31 March 2021, and survived for at least 24 hours post-operatively. Patients with a documented history of any prior AF/flutter were excluded. The primary endpoint was the development of AF/flutter during the post-operative period until discharge from the operating hospital. Ethical approval was given by the Auckland Health Research Ethics Committee (Application AH2808).

Standard post-operative care after cardiac surgery at Auckland City Hospital included monitoring on telemetry for at least 72 hours post-operatively, and routine electrocardiogram (ECG) taken on post-operative days 1, 3 and 5 (with additional ECGs as clinically indicated). A post-operative course of oral amiodarone for POAF prophylaxis was routinely given in all patients unless contraindicated, including loading doses of 400mg tds on days 1 and 2, and maintenance doses of 200mg bd continued until hospital discharge. Patients were generally considered for discharge from 5 days after surgery.

Variable selection

All data was obtained from the registry and no additional data was collected. Candidate variables were selected based on variables that showed evidence of an association with AF from a systematic literature review of similar studies.[13] Predictors were limited to factors that can be measured prior to the post-operative period to support the use of study results in preoperative risk assessment. The NZCSR database dictionary provided definitions for all variables, including the primary endpoint (incident POAF), defined as new-onset AF or atrial flutter requiring treatment. Renal impairment was classified according to creatinine clearance using the Cockcroft-Gault Equation and categorically classed as moderate (50–85mL/min) or severe (<50 mL/min). CHA_2DS_2-VASc score and estimated glomerular filtration rate (eGFR) were manually calculated using values from available data.

Ethnicity was categorised according to key populations within the New Zealand population. Registry data used prioritised ethnicity classification, which assigns patients to a single ethnic group in the order of Māori, Pasifika, Asian, Other non-NZ European and NZ European. NZ and Other European populations were combined as they were expected to share similar demographics and clinical characteristics. Indian ethnicity was separated from other Asian populations due to the higher observed burden of CVD.[14] Fijian Indian ethnicity was included as Indian rather than Pasifika. All residual ethnicity groups were categorised collectively as 'Other'.

Statistical analysis

All analyses were performed using IBM SPSS Statistics for Windows, Version 27.0. Categorical data were expressed using frequency and proportions. Continuous variables were assessed for normality of distribution using graphic analysis and were expressed using mean + standard deviation, or median and quartiles if normality assumptions were not satisfied. To analyse potential predictor variables, the cohort was divided by those that developed POAF in accordance with the database definition and those that did not. Univariate analyses identified unadjusted, primary associations. Continuous variables that were normally distributed were analysed using Student's *t* test, and if non-normally distributed using the Mann–Whitney U test. Categorical variables were analysed with Chi-squared or Fisher's exact test as appropriate. For all tests, a two-tailed *p* value below 0.05 was considered statistically significant. Statistically significant variables from univariate analysis were assessed for correlation in a correlation matrix. If correlation was noted, the most clinically significant variable from the correlation was retained. There were rare instances of missing data for predictor variables and therefore missing data was excluded via pairwise deletion to preserve the study power. Multi-variable logistic regression was used to identify independent predictors of POAF, using backwards and forwards selection to obtain the most parsimonious model. Variables in the final model are presented with *p* value, odds ratio and 95% confidence interval. The Hosmer–Lemeshow test and R^2 value were used to assess goodness of fit. Model sensitivity and specificity were assessed using a Receiver operating characteristic (ROC) curve.

Results

A total of 1,988 patients were screened for inclusion. Patients with a history of paroxysmal, persistent, or permanent atrial fibrillation/flutter were excluded (n=368). The final study sample consisted of 1,630 participants. Patient ages ranged from 18 to 88 years, with a mean age of 63.5 years (SD 12.8) (Table 1). Isolated CABG was the most common type of surgery (60%), followed by isolated valve (31%) and combined CABG + valve surgeries (10%). In patients under 40 years of age, the majority of patients (81/91, 89%) had isolated valve surgery, of which approximately half (n=38) had rheumatic heart disease (RHD) aetiology. All but 23 procedures were performed using cardiopulmonary bypass.

From the 1,630 study participants, 465 developed POAF with an overall incidence rate of 28.5% (Table 1). POAF incidence increased progressively with age (18.5% in patients aged less than 60 years, 28.5% in those aged 60–69 years, 35.7% in those aged 70–79 years and 44.3% in those aged older than 80 years). The highest incidence of POAF was seen after combined CABG+valve surgery (42.1%), followed by isolated valve surgery (30.7%) then isolated CABG (25.2%).

Statistically significant differences were observed between the POAF and no AF groups for age, ethnicity, weight, body mass index (BMI), obesity, hypertension, CHF, renal impairment, previous myocardial infarction, EuroSCORE II, type of surgery, and any aortic valve surgery. BMI and type of surgery were retained for the multivariable analysis as BMI was correlated with weight and obesity, while type of surgery was correlated with any aortic valve procedure.

Multivariable analysis

Only age, BMI, history of CHF, and type of surgery were independent predictors of POAF (Table 3.). There was no significant difference in risk of POAF between ethnic groups, and although the risk in Māori was high, it did not reach statistical significance (p=0.053, OR 1.46, 95%CI 0.99–2.14). The final multivariable model had a Hosmer–Lemeshow test p value of 0.35 and Nagelkerke's R^2 value of 0.11. The area under the ROC curve was 0.67 (95%CI 0.64–0.70), indicating suboptimal prognostic validity.

Subgroup analysis by ethnicity

The incidence of POAF was highest in Māori (35%) and NZ/Other European (32%) (Table 2). Valve procedures (including both isolated valve and CABG+valve surgeries) were more common in Māori than other ethnic groups (51% valvular heart surgery in Māori and 45% in NZ/Other European). Māori and Pasifika were younger and had high rates of comorbidities, including at least twice the rate of CHF (20.1% in Māori, 16.8% in Pasifika, 8.2% NZ/Other European). Māori and Pasifika who did develop POAF were approximately 10 years younger than NZ/Other Europeans (59.2+12.5 years Māori, 60.9+11.5 years Pasifika and 70.6+9.4 years NZ/European). Māori and Pasifika represented 85% of patients having valve surgery for RHD, with a mean age of 39 and 34 years for Māori and Pasifika respectively, compared to 65 years in NZ/Other Europeans with RHD.

Discussion

About one in four patients developed POAF, with the highest incidence in Māori, followed by NZ/Other European, then Pasifika and Indian ethnicities. Advanced age, increased BMI, history of CHF, and any valve surgery were the strongest predictors of POAF, but the predictive accuracy of these factors was modest at best, with the model successfully predicting 67% of cases.

Previous studies describe variable rates of POAF between 10 and 60% depending on the type of cardiac surgery, the duration and type of monitoring and the definition of AF used.[15] For example, lower rates of POAF are reported after isolated CABG compared to valve surgery, and continuous monitoring has identified higher rates of POAF compared to intermittent ECG monitoring.[16] The 29% incidence of POAF after CABG and valve surgeries identified in this New Zealand-based study is consistent with inpatient studies of similar design conducted internationally.[1,17] Procedure-specific POAF rates in our study are also similar, with rates of 25%, 31%, and 42% after isolated CABG, isolated valve, and combined CABG+valve surgeries respectively, comparable to the rates of 27–37% for the same surgery types in the Society of Thoracic Surgeons database.[18]

There are major and persistent ethnic disparities across most aspects of cardiovascular disease for Māori and Pasifika populations in New Zealand, including higher prevalence of cardiovascular risk factors and poorer access to appropriate interventions.[19] These disparities were observed in this study cohort, in which Māori and Pasifika presented with a high comorbidity burden at a young age. Māori had the highest overall incidence of POAF, but this may have been influenced by a higher proportion of valve surgeries. After adjusting for key risk factors, the risk of POAF in Māori was high, albeit not significantly higher, possibly

Table 1: Patient characteristics with and without new-onset atrial fibrillation. Figures are mean + standard deviation or number (percentage).

	Total (N=1630)	**No AF (N=1165)**	**AF (N=465)**	***p* value**
Demographic				
Age, years	63.5+12.8	62.1+13.1	67.2+11.2	**<0.001**
Age categorical				**<0.001**
<60 years	507 (31.1)	413 (35.5)	94 (20.2)	
60–69 years	536 (32.9)	383 (32.9)	153 (32.9)	
70–79 years	490 (30.1)	315 (27.0)	175 (37.6)	
>80 years	97 (6.0)	54 (4.6)	43 (9.2)	
Gender				**0.61**
Male	1227 (75.3)	873 (74.9)	354 (76.1)	
Female	403 (24.7)	292 (25.1)	111 (23.9)	
Ethnicity				**<0.001**
NZ and Other European	841 (51.6)	572 (49.1)	269 (57.8)	
Māori	174 (10.7)	113 (9.7)	61 (13.1)	
Pasifika	285 (17.5)	214 (18.4)	71 (15.3)	
Indian	166 (10.2)	134 (11.5)	32 (6.9)	
Other Asian	134 (8.2)	109 (9.5)	25 (5.4)	
All other	30 (1.8)	23 (2.0)	7 (1.5)	
Clinical characteristics				
Weight, kg	86.6+19.8	85.7+19.6	88.9+20.1	**0.03**
Body mass index, kg/m^2	29.6+5.9	29.4+5.8)	30.2+6.2	**0.01**
Obesity (BMI >29.9 kg/m2 or >31.9 Māori/Pasifika)	617 (37.9)	416 (35.7)	195 (41.9)	**0.02**
Smoking				0.08
Never smoked	911 (55.9)	659 (56.6)	252 (54.2)	
Ex-smoker	522 (32.0)	356 (30.6)	166 (35.7)	
Current smoker	197 (12.1)	150 (12.9)	47 (10.1)	
Hypertension	1132 (69.4)	788 (67.6)	344 (74.0)	**0.01**
Hypercholesterolaemia	1162 (71.3)	827 (71.0)	335 (72.0)	0.72

Table 1 (continued): Patient characteristics with and without new-onset atrial fibrillation. Figures are mean + standard deviation or number (percentage).

	Total (N=1630)	**No AF (N=1165)**	**AF (N=465)**	***p* value**
Peripheral vascular disease/arteriopathy	67 (4.1)	48 (4.1)	19 (4.1)	1.00
Pre-existing respiratory disease	104 (6.4)	72 (6.2)	32 (6.9)	0.65
LVEF (%)	54.1+10.6	54.25+10.5	53.85+11.0	0.50
History of CHF	180 (11.0)	104 (8.9)	76 (16.3)	**<0.001**
CHF with normal LVEF (>50%)	98 (6.0)	58 (5.0)	40 (8.6)	**0.01**
CHF on operative admission	101 (6.2)	62 (59.6)	39 (51.3)	0.29
CHA2DS2-VASc score	2.5+1.4	2.4+1.4	2.7+1.4	**0.002**
Cerebrovascular disease	103 (6.3)	72 (6.2)	31 (6.7)	0.74
Diabetes	539 (33.1)	402 (34.5)	137 (29.5)	0.051
Renal impairment				**<0.001**
Moderate	595 (36.5)	390 (33.5)	205 (44.1)	
Severe	143 (8.8)	100 (8.6)	43 (9.2)	
Previous myocardial infarction	572 (35.1)	427 (36.7)	145 (31.2)	**0.04**
Rheumatic heart disease	67 (4.1)	52 (4.5)	15 (3.2)	0.34
Preoperative arrhythmia (not AF)	63 (3.9)	43 (3.7)	20 (4.3)	0.57
Surgical characteristics				
Previous surgery with CPB	86 (5.3)	63 (5.4)	23 (5.0)	0.72
Cardiopulmonary bypass time, minutes*	99.0 (78.0–126.0)	99 (79–125)	100 (77–132)	0.37
Cross clamp time, minutes	75.88+36.3	75.11+35.0	77.8+29.2	0.20
EuroSCORE II*	1.69 (1.07–2.97)	1.63 (1.04–2.74)	1.96 (1.13–3.50)	**<0.001**
Type of surgery				**<0.001**
CABG	973 (59.7)	728 (62.5)	245 (52.7)	
Valve surgery	498 (30.6)	345 (29.6)	153 (32.9)	
CABG + valve	159 (9.8)	92 (7.9)	67 (14.4)	
Any aortic valve surgery	462 (28.3)	297 (25.5)	165 (35.5)	**<0.001**

Table 1 (continued): Patient characteristics with and without new-onset atrial fibrillation. Figures are mean + standard deviation or number (percentage).

	Total (N=1630)	No AF (N=1165)	AF (N=465)	*p* value
Any mitral valve surgery	219 (13.4)	159 (13.6)	60 (12.9)	0.75
Multi-valve surgery	78 (4.8)	59 (5.1)	19 (4.1)	0.44

LVEF—left ventricular ejection fraction
CHF—congestive heart failure
CABG—coronary artery bypass grafting.
* Median and interquartile range.

Table 2: Univariate and multivariate logistic regression of factors associated with new-onset atrial fibrillation after CABG and/or valve surgery.

	Univariate analysis			Multivariate analysis		
	OR	95% CI	*p* value	OR	95% CI	*p* value
Age, per year	1.04	1.06–1.21	**<0.001**	1.05	1.04–1.06	**<0.001**
Body mass index, kg/m^2	1.02	1.0–1.94	**0.01**	1.04	1.02–1.06	**0.003**
History of CHF	1.99	1.45–2.74	**<0.001**	2.08	1.47–2.95	**<0.001**
Type of surgery—CABG (ref)			**<0.001**			**0.01**
Valve only	1.32	1.04–1.67	**0.02**	1.51	1.16–1.95	**0.002**
CABG + valve	2.16	1.53–3.06	**<0.001**	1.59	1.11–2.28	**0.01**
Ethnicity—NZ and Other European (ref)			**<0.001**			0.06
Māori	1.15	0.81–1.62	0.43	1.46	0.99–2.14	0.053
Pasifika	0.71	0.52–0.96	**0.03**	0.98	0.69–1.39	0.91
Indian	0.51	0.34–0.77	**0.01**	0.70	0.46–1.08	0.11
Other Asian	0.49	0.31–0.77	**0.01**	0.66	0.41–1.07	0.10
Other	0.65	0.27–1.53	0.32	0.76	0.32–1.83	0.54
Hypertension	1.36	1.07–1.73	**0.01**	1.21	0.92–1.58	0.17
Renal impairment—none (ref)			**<0.001**			0.16
Moderate	1.64	1.30–2.05	**<0.001**	1.30	0.99–1.70	0.06

Table 2 (continued): Univariate and multivariate logistic regression of factors associated with new-onset atrial fibrillation after CABG and/or valve surgery.

	Univariate analysis			**Multivariate analysis**		
	OR	**95% CI**	***p* value**	**OR**	**95% CI**	***p* value**
Renal impairment—none (ref)			**<0.001**			0.16
Severe	1.34	0.91–2.0	0.14	1.10	0.69–1.65	0.69
Previous myocardial infarction	0.78	0.62–0.99	**0.04**	0.90	0.68–1.12	0.48
EuroSCORE II	1.04	1.01–1.07	**<0.001**	1.02	0.99–1.05	0.16

CHF—congestive heart failure
CABG—coronary artery bypass grafting

Table 3: Comparison of atrial fibrillation incidence and descriptive statistics between ethnic subgroups. Figures are mean + standard deviation or number (percentage) unless otherwise stated.

	NZ/Other European	**Māori**	**Pasifika**	**Indian**	**Other Asian**	**Other**
n (%)	841 (51.6)	174 (10.7)	285 (17.5)	166 (10.2)	134 (8.2)	30 (1.8)
POAF incidence % (95% CI)	32.0 (28.8–35.3)	35.1 (28.0–42.6)	24.9 (20.0–30.4)	19.3 (13.6–26.1)	18.7 (12.5–26.3)	23.3 (9.9–42.3)
Type of surgery						
Isolated CABG	463 (55.1)	86 (49.4)	170 (59.6)	137 (82.5)	97 (73.5)	20 (66.7)
Isolated valve	267 (31.7)	71 (40.8)	101 (35.4)	23 (13.9)	30 (22.7)	6 (20.0)
CABG + valve	111 (13.2)	17 (9.8)	14 (4.9)	6 (3.6)	5 (3.8)	4 (13.3)
Age, years	67.7+10.3	56.9+13.5	55.4+15.1	63.6+9.9	63.3+12.5	64.3+11.8
Age categorical						
< 60 years	160 (19.0)	89 (51.1)	156 (54.7)	49 (29.5)	42 (31.3)	11 (36.7)
60–69 years	272 (32.3)	59 (33.9)	79 (27.7)	74 (44.6)	45 (33.6)	7 (23.3)
70–79 years	336 (40.0)	23 (13.2)	49 (17.2)	34 (20.5)	37 (27.6)	11 (36.7)
> 80 years	73 (8.7)	3 (1.7)	1 (0.4)	9 (5.4)	10 (7.5)	1 (3.3)
BMI	28.8+5.3	33.7+6.0	33.2+6.6	26.8+3.9	25.4+3.3	28.6+4.6
LVEF	55.8+9.5	50.4+12.5	50.8+10.9	54+10.8	56.7+10.4	52.1+11.8

Table 3 (continued): Comparison of atrial fibrillation incidence and descriptive statistics between ethnic subgroups. Figures are mean + standard deviation or number (percentage) unless otherwise stated.

	NZ/Other European	Māori	Pasifika	Indian	Other Asian	Other
CHA2DS2-VASc	2.5+1.4	2.2+1.4	2.4+1.4	2.9+1.3	2.7+1.6	2.4+1.4
CHF	69 (8.2)	35 (20.1)	48 (16.8)	14 (8.4)	11 (8.2)	3 (10.0)
Diabetes	182 (21.6)	57 (32.8)	122 (42.8)	118 (71.1)	50 (37.3)	10 (33.3)
RHD	6 (0.7)	18 (10.3)	39 (13.7)	2 (1.2)	2 (1.5)	0
eGFR, mL/min/1.73m^2	76+17	76+24	74+29	76+21	79+21	71+22
EuroSCORE II *	1.7 (1.1–2.9)	1.9 (1.2–3.6)	1.9 (1.2–3.7)	1.5 (0.9–2.5)	1.7 (1.0–2.8)	1.7 (0.9–4.3)

* Median and interquartile range.
POAF—post-operative atrial fibrillation
CABG—coronary artery bypass grafting
BMI—Body Mass Index
LVEF—left ventricular ejection fraction
CHF—congestive heart failure
RHD—rheumatic heart disease
eGFR—estimated glomerular filtration rate.

due to small numbers. Previously identified ethnic differences in POAF incidence have shown higher rates in Caucasian groups despite a higher prevalence of traditional risk factors in minority populations in the United States.[20,21] Ethnic differences in POAF susceptibility remain poorly understood, and exploration of genetic and other factors such as left atrial (LA) size may be useful.

The only consistently reported predictor of POAF is advanced age.[10] Ageing and age-related comorbidities are associated with progressive structural and electrical remodelling of the atrial substrate, and most studies show that the risk of POAF increases further per decade of life.[22] However, previous research has not agreed on definitive age thresholds to be used in risk stratification. A recently published clinical guideline for targeted POAF prevention includes patients over 75 years of age in a list of potential risk factors.[9] However, our results showed that Māori and Pasifika developed POAF approximately 10 years younger than NZ/Other Europeans, suggesting that guidelines need to consider different age structures for different ethnicities when making such recommendations.

The predictive accuracy of the presented risk model was only close to fair, a result shared with most studies attempting to identify patients at highest risk of POAF.[10] The only previous New Zealand study of POAF tested existing risk scores in patients after isolated CABG surgery and found that all models failed to accurately predict POAF (C-statistic <0.60).[23] Age, weight, and CHF were similarly identified as independent predictors, and our results suggest that these predictors may also be relevant after valve and combined CABG+valve procedures. However, these factors are unlikely to inform more targeted pharmacological prevention strategies due to their poor discrimination. While this study was not designed to examine the safest and most effective prevention strategy for POAF prevention, our results suggest that a blanket rather than targeted approach remains the most appropriate strategy despite recommendations for clinical risk stratification.[9] Risk assessment may be limited to informing monitoring protocols to quickly identify and respond to POAF and providing education to patients about what to expect in the early post-operative period. Further research should focus on establishing how POAF translates to clinical outcomes in the New Zealand setting and investigating strategies that can reduce the associated morbidity and mortality in the short and longer term.

The strengths of this study include being the first New Zealand study to examine the incidence of POAF by ethnicity and among the most common types of cardiac surgery. The sample size was reasonably large and sufficiently powered to examine the effects of multiple variables identified from previous studies. However, the study is subject to several limitations. First, variable selection was limited to those collected as part of the registry database. Better predictive models may be obtained using variables that were not available in our study, for example LA size and preoperative medications, but would require prospective data collection in a large study. Second, the definition of POAF used may have missed asymptomatic AF or symptomatic AF occurring after discharge, although our definition was equivalent to that used in other international registries and therefore offers an accurate comparison of incidence. Third, the small subsample proportion for Māori prevented a more precise estimate of incidence in comparison to the other ethnic groups. Finally, participants in this study were routinely treated with prophylactic amiodarone after surgery, meaning that the POAF rates may be higher in groups not treated prophylactically and that the accuracy of the risk prediction model should only be applied to groups treated with prophylactic amiodarone.

Conclusions

The incidence of new-onset POAF after CABG and/or valve surgery in a New Zealand hospital is similar to international settings. Factors that independently increased POAF risk were advanced age, high BMI, history of CHF, and any valve surgery. However, the limited accuracy of models based on routinely collected data means risk stratification is unlikely to provide sufficiently targeted POAF prevention strategies. At best, risk stratification might be used to provide information to patients on expected perioperative risks or support monitoring for early detection and treatment of POAF.

COMPETING INTERESTS

Nil.

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Dental and oro-facial features of Foetal Anticonvulsant Syndrome

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ABSTRACT

AIM: Emerging evidence suggests dental/oro-facial anomalies are features of Foetal Anticonvulsant Syndrome (FACS) and have an impact on quality of life. Currently there is limited research on these, and no Aotearoa New Zealand data on FACS overall. This study aimed to collect national data on the dental and oro-facial features of FACS.

METHODS: A participatory model was utilised; a questionnaire was developed and distributed to FACS-affected families via the Foetal Anticonvulsant Syndrome New Zealand (FACS NZ) organisation. Open-ended questions were asked about: socio-demographics, anticonvulsant drug regime at the time of pregnancy, characteristic features of the affected child, including oro-facial function, dental/oro-facial anomalies, and dental history.

RESULTS: Valproate was the most prescribed anticonvulsant during pregnancy. Oro-facial functional abnormalities in speech, swallowing, and eating were identified in 70.4% of the FACS population. Dental anomalies were reported by 81%, the most common being dental crowding, followed by tooth discolouration and microdontia.

CONCLUSION: Dental and oro-facial anomalies were reported commonly in the Aotearoa New Zealand FACS population, laying foundation for further research. Recognition of these features assists in FACS diagnosis, early referral, and improved management of FACS patients. The need for FACS education for women of reproductive age requiring anticonvulsant therapy, in Aotearoa New Zealand, was identified.

First introduced in the mid-1800s, anticonvulsant agents (also known as anti-epileptic or anti-seizure drugs) are among the most commonly prescribed medications for epilepsy, manic-depressive (bipolar) disorder, mood stabilisation, neuropathic pain, migraine prophylaxis and mental health conditions.[1] The teratogenicity of these drugs was first established when congenital malformations were seen in infants of mothers who had first-generation anticonvulsant drugs during pregnancy. Subsequent animal studies confirmed the increased risk of developmental anomalies in the offspring of treated females.[2] It is now known that the use of anticonvulsants during pregnancy increases the risk of foetal abnormalities by 2–3%, and this rises to 10% with the use of valproate (a second-generation anticonvulsant) in particular.[3] However, the chronic and complex nature of epileptic and psychiatric disorders pose clinical challenges in the management of women of child-bearing age, as treatment with single or multiple anticonvulsant agents is often required to decrease medical complications during pregnancy.[4]

Foetal Anticonvulsant Syndrome (FACS) is the overarching term for a pattern of multiple developmental anomalies associated with pre-natal exposure to one or more anticonvulsant agents.[5] FACS can be sub-categorised based on the specific attributing anticonvulsant; for example, valproate is known to cause "foetal valproate syndrome."[6]

There are three broad categories of the characteristic features of FACS—dysmorphic facial features, irregularities of the organs and limbs, and cognitive impairment/autism spectrum disorder (ASD).[7] Dysmorphic facial features such as trigonocephaly, medial eyebrow deficiency, epicanthic eyelid folds, flat nasal bridge, shallow philtrum, and lip irregularities have been reported in FACS cases, particularly with foetal exposure to phenytoin, valproate, and carbamazepine.[8] There is emerging evidence that dental and oro-facial anomalies may also be features of FACS. Three studies have investigated the incidence of dental agenesis of the permanent dentition,[9] and one case of an enamel defect on a mandibular incisor tooth has been reported.[10] One study explored phenytoin and valproate in mono- and polytherapy and found an association between in utero exposure and decreased maxillary and mandibular height and length, reduced posterior cranial base length and a decrease in the relative anteroposterior positions of the maxilla and mandible. This study also identified mild maxillary hypoplasia.[11] In a retrospective study of 91 children born to mothers who used anticonvulsant drugs during their pregnancies, dental anomalies were observed in 48.4% of all the children. The most frequent dental anomalies were enamel hypoplasia, delayed eruption, and malocclusion.[12]

Facial structures are vital for functions such as respiration, mastication, swallowing and speech, and have psychological and social impacts that can affect the quality of life. Investigating oro-facial problems associated with FACS could allow their recognition as part of the syndrome, facilitate diagnosis, and may also give grounds to support access to specialist dental care (such as paediatric dental and orthodontic care) for affected children.[13] The knowledge, expertise and resources of the community affected by a condition are often key to successful research, particularly in the study of medical problems with limited data.[14] To date, there is very limited knowledge on the dental and oro-facial features of FACS, and there has been no Aotearoa New Zealand research on FACS. This study aimed to collect Aotearoa New Zealand-based data on the dental and oro-facial features observed in individuals with FACS.

Methods

Ethical approval was granted by the Human Research Ethics Committee, University of Otago (reference H19/031).

Parents or caregivers with at least one child with FACS were invited to complete a simple, open-ended questionnaire to obtain information, opinions, and experiences on their child's dental and oro-facial features. The questionnaire was pre-tested with a family with two children diagnosed with FACS, and subsequently amended and made available to the wider FACS community for completion over a 4-week period between May 2019 and June 2019. A reminder email and link were sent 2 weeks after the initial notification.

The parents/caregivers were recruited via the FACS New Zealand (FACS NZ) organisation through a link directing them to the questionnaire on Qualtrics^{XM} (an online survey tool). The survey invitation was sent out by the president of FACS NZ via the closed Facebook page and email, reaching approximately 65 families with FACS-affected children. Responses were analysed using a Microsoft Excel spreadsheet.

The questionnaire (Table 1) was divided into six sections to gather information on socio-demographics, anticonvulsant drug regime, characteristic FACS features, oro-facial function, dental/oro-facial anomalies, and dental history. There was a combination of open-ended and tick-box questions, with free-text sections for elaboration. An additional section for further comments and/or concerns was also included.

Results

A total of 35 responses were received. Of these, seven responses were blank, and one had been repeated, leading to eight responses being disregarded. A total of 27 valid responses were included and analysed, representing a 41.5% response rate.

Socio-demographics

The responses were about individuals with FACS aged between 4–27 years at the time of the study. Twenty-four responses were from caregivers whose child had a confirmed FACS diagnosis, and three responses reported a provisional FACS diagnosis. Three responses did not specify the age at which the child was diagnosed with FACS. Among respondents with confirmed FACS, the mean age of FACS diagnosis was 8.5 years (range: 2 months–23 years). The sex ratio of FACS-affected children was evenly divided, with 13 females (48.2%), 12 males (44.4%) and 2 unspecified (7.4%). Four responses did not specify the child's ethnicity. Of the remaining 23 responses, 100% identified as being of NZ European descent.

Anticonvulsant drug regime

There was a 100% response rate to the question regarding the mother's anticonvulsant drug regime during pregnancy. Twenty-two mothers (81.5%) were on monotherapy (valproate, carbamazepine, or lamotrigine), and five (18.5%) were on polytherapy during their pregnancies (Table 2). Valproate was the most common anticonvulsant prescribed to mothers on a monotherapy regime and was present in all polytherapy regimes, followed by lamotrigine, which was reported in both mono- and polytherapy regimes.

Characteristic FACS features

The most commonly reported FACS characteristic was dysmorphic facial features (92.5%), followed by cognitive impairment (88.9%). The type of anticonvulsant regime (mono- or polytherapy) during the pregnancy did not influence the features reported in the child. Cognitive impairment/ASD, either alone or in combination with another established feature category, was reported in 19 of the 22 children with *in utero* exposure to a single anticonvulsant agent.

Oro-facial function assessment

Nineteen responses (70.4%) indicated an oro-facial functional problem with speaking, swallowing, or eating, or a combination of these. Seven reported no functional problems and one did not answer the question. All three problem areas were reported in one child exposed to valproate in monotherapy. In contrast, functional problems were not reported with prenatal exposure to carbamazepine. All children exposed to valproate, either in mono- or polytherapy regimes presented with one or more functional problem (Table 3).

A speech problem was the most common functional issue (16 cases). Of these, two responses stated that their child was non-verbal, one reported a severe stammer, and seven reported the need for ongoing speech and language therapy. All children with speech difficulties also had autism spectrum disorder.

Swallowing was the next most commonly reported functional concern (10/19). Parents/caregivers reported that their child "choked easily", had "uncoordinated swallowing" or "required food in small pieces". Five reported eating problems. In the free-text section, children were described as "messy" or "slow" eaters. Two reported the need for soft foods due to sensory processing disorders secondary to FACS. Seven responses stated the child had a tongue-tie at birth and had breastfeeding difficulties. Of these, two reported that feeding and swallowing improved following tongue-tie release.

Dental and oro-facial anomalies

One or more dental anomalies were reported in 22 responses (Table 4). Crowding, discolouration of the teeth and microdontia (teeth smaller than normal) were the most frequently reported concerns, respectively. Of those who reported dental discolouration, one reported diagnosis of dental hypomineralisation and two of dentinal sensitivity. Other less frequently reported anomalies included missing teeth, spacing between the teeth, abnormalities in the eruption of primary teeth and position of permanent teeth, and macrodontia (teeth larger than normal). Monotherapy or polytherapy anticonvulsant drug regimens during pregnancy did not affect the presence of dental anomalies.

In the free-text section, three cases stated a professional diagnosis of mid-facial hypoplasia, congenital micrognathia, and increased overbite and midline diastema, respectively. Orthodontic treatment needed for correction of jaw misalignment and malocclusion was reported in 30% of the responses. There were no reports of congenital cleft lip and/or palate; however, four responders mentioned that their child had an unusually high palatal vault, three of these children having problems with eating and swallowing.

Of the 27 responses, 22 provided an answer to the questions about dental history. Twelve caregivers (55%) reported that their child was unable to cope in the dental setting, including one who reported the need for general anaesthesia for all dental care. The reasons given included anxiety (n=7), autism spectrum disorder (n=3) and a severe gag reflex (n=1). Ten caregivers (45%) reported that their child could cope well in the dental setting. Of these, two stated their child required a support person in proximity. All of these children also had diagnosed autism spectrum disorder.

Discussion

This study was the first to collect Aotearoa New Zealand data on the FACS patient group. The results showed that the characteristic FACS features were rarely reported in isolation and that dysmorphic facial features and dental anomalies were commonly reported by parents/caregivers of children with FACS. The most common dental anomaly reported was dental crowding, followed by tooth discolouration and morphological variation in the size of the teeth. When parents/caregivers reported one or more oro-facial functional abnormalities, the most common problem was related to speech. Over half reported that their child could not cope well in the dental setting, indicating that dental specialist care may be needed for a large proportion of this group.

Dental anomalies in number, size, morphology, and position of the teeth in individuals with FACS may be explained by the effect of anticonvulsant agents in the first trimester, as dental development commences at week six *in utero.*[15,16] Missing or extra teeth, termed hypodontia or hyperdontia, respectively, can occur due to biological disturbances in the formation of the

Table 1: Questionnaire distributed to parents/caregivers of children with FACS in Aotearoa New Zealand.

Section	Question	Question type	Free-text section
Socio-demographics	Date of birth Gender Ethnicity	Write answer	No
	Age of FACS diagnosis	Write age in year/months	No
Anticonvulsant drug regime	Anticonvulsant drugs taken by mother during pregnancy	List medication(s)	No
Characteristic FACS features	1. Irregularities of the eyes, ears, lips, and nose 2. Irregularities of organs or limbs 3. Cognitive impairment/ autism spectrum disorder 4. Other	Tick relevant, explain if “other”	Yes
Oro-facial function assessment	Have you noticed any problems with the way your child eats, speaks, or swallows?	Open-ended	Yes
Dental/oro-facial anomalies	Have you noticed any problems with your child’s teeth?	Open-ended	Yes
	Have you noticed any differences in the appearance of your child’s face and/or teeth compared with other children of his/ her age?	Open-ended	Yes
	Does your child have a history of a cleft lip and/or palate?	Yes/No	No
Dental history	Does your child attend routine dental care?	Yes/No	No
	Does your child cope well in the dental setting?	Yes/No	Yes
	Additional comments	Open-ended	Yes

Table 2: Features of FACS reported and the mother's anticonvulsant drug regime during pregnancy.

FACS feature	Monotherapy			Polytherapy	
	Valproate	**Carbamazepine**	**Lamotrigine**	**Valproate, lamotrigine**	**Valproate, lamotrigine, levetiracetam**
DFF	2	-	-	-	-
IO/L	-	-	-	-	-
C/ASD	1	-	-	1	
DFF + IO/L	-	-	-	-	1
DFF + C/ASD	5	-	1	1	-
IO/L + C/ASD	1	-	-	-	-
DFF + IO/L + C/ASD	11	1	-	2	-

DFF: dysmorphic facial features
IO/L: irregular organs/limbs
C/ASD: cognitive/autism spectrum disorder

Table 3: Functional problems reported in FACS individuals and the mother's anticonvulsant drug regime during pregnancy.

Functional Problem	Monotherapy			Polytherapy	
	Valproate	**Carbamazepine**	**Lamotrigine**	**Valproate, lamotrigine**	**Valproate, lamotrigine, levetiracetam**
Eating	1	-	-		-
Speaking	3	-	1	1	-
Swallowing	1	-	-	-	-
Eating + speaking	2	-	-	1	-
Eating + swallowing		-	-	-	-
Speaking + swallowing	7	-	1	-	-
Eating + speaking + swallowing	1	-		-	-
No functional problem	4	1		1	1

Table 4: List and number of dental anomalies reported by parents/caregivers of children affected by FACS.

	Dental anomaly	Number of responses
Number of teeth	Supernumerary teeth	4
	Missing teeth	2
Size and form of teeth	Macrodontia	1
	Microdontia	5
	Morphological variation	4
Appearance of teeth	Discoloured teeth	7
	Hypomineralisation of teeth	1
Position of teeth	Crowding of teeth	8
	Spacing between teeth	3
No anomaly	No dental anomaly	5

dental lamina during the early weeks of the embryonic period.[15] Mutations of the MSX1 and PAX9 genes have also been associated with tooth agenesis in humans, and animal investigations have found an association between the absence of these genes due to environmental stimuli such as medications, and the presence of multiple craniofacial anomalies.[17] Furthermore, dental agenesis and morphological variations have been attributed to change in the Wingless/Integrated (Wnt) signaling (that is essential for tooth development) as a result of histone deacetylase inhibition by anticonvulsant drugs.[1,9,18] Tooth discolouration was commonly reported in our study (32%), which correlates with previous research, where enamel hypoplasia was frequently seen in children to mothers on anticonvulsant drugs. Morphological variation, supernumerary teeth and hypodontia were also identified, and in keeping with our findings.[12] Enamel hypoplasia presents clinically as white, yellow, or brown discolouration with surface roughness or pitting.[19]

Crowding and spacing of the dentition in FACS children has not been previously reported; however, it has been reported that the relative dimension of the maxilla and mandible may influence the positioning and eruption pattern of the dentition.[20] Micrognathia and mid-facial hypoplasia have been reported in FACS cases for a number of years alongside other dysmorphic facial features.[21–23] Deformities in the mid-face are attributed to aberrations in genes involved in signaling pathways, such as Wnt, fibroblast growth factor (FGF) and transforming growth factor-Beta (TGF *beta*), due to the teratogenic action of anticonvulsants.[24] A professional diagnosis of micrognathia and midfacial hypoplasia was reported by parents/caregivers in two questionnaire responses. In both cases, the child also had dental crowding. Furthermore, one-third of the responses mentioned that orthodontic treatment was required for management of malocclusion. As the questionnaire did not specifically ask about jaw position and orthodontic treatment, this figure is likely to be an underestimate.

Oro-facial functional abnormalities were common (70.4%), and these may present secondary to delayed development and cognitive function or may be due to anatomical variations of the tongue, palate, and lips. In this study, all children with speech difficulties also had diagnosed ASD—a possible primary cause for their functional problem. Concomitantly, a cleft palate or a high palatal vault may lead to problems in articulation of words and a hyper-nasal sound in the speech.[25] Ankyloglossia (tongue-tie) has been reported in approximately 27% of FACS cases and may affect speech, feeding and swallowing.[26] From the questionnaire, congenital ankyloglossia was reported in approximately 26% of the responses, all of whom stated they also had trouble feeding their child.

This study has allowed better understanding about the prescription of anticonvulsants in Aotearoa New Zealand over the last two decades. Valproate was the most prescribed anticonvulsant agent among the study group, despite extensive literature on its risk of foetal harm.[27] Among responses, the youngest child with FACS was four years of age; the eldest, 27 years. Both were prenatally exposed to valproate and reported oro-facial anomalies. The responses indicated valproate, carbamazepine, and lamotrigine were the three main anticonvulsants prescribed in pregnancy in this Aotearoa New Zealand group. The reported oro-facial features were consistent with the known teratogenic effects of valproate and carbamazepine previously cited in literature[28] and provide valuable information on lamotrigine, as children exposed to this drug also reported abnormalities of the facial features, congenital malformations, cognitive problems, and dental/oro-facial anomalies.

Two parents/caregivers stated that they were unaware of the foetal risks from valproate during pregnancy. As this question was not specifically asked, it is possible that more mothers were unaware, and that there may be a need for improved education and information on FACS when females of childbearing age are prescribed anticonvulsants. The current International League Against Epilepsy (ILAE) guideline for optimal management of women of childbearing age on anticonvulsant medication begins preconception and involves monitoring through all three trimesters, with follow-up assessments to approximately 6 weeks postpartum. Furthermore, clinical visits with the neurologist with open discussions, along with blood workups for anticonvulsant drug levels and communication between the mother's neurologist and obstetrician, are key elements to effective management of mothers on anticonvulsants.[29]

There are several strengths and limitations to consider in this study. This study utilised an online questionnaire, as this provided an efficient means of distribution and collection of information from the FACS patient group. A sampling bias is acknowledged as with any online means of distribution; only those with internet access, active Facebook accounts and regular access to email could partake in the study. Undercoverage of the target population is therefore possible. The questionnaire was comprised of open-ended questions using lay terminology and data was interpreted by grouping together similar responses. For example, parents/caregivers who described their child's teeth as "packed together, "overlapping" or "overcrowded" were all categorised in the "crowded dentition" category. While measurement and researcher errors can be introduced in qualitative research, a participatory approach from the outset was critical, as patients and their parents/caregivers are experts in their condition and there is very limited research currently available on the dental and oro-facial features of FACS. While a recall bias is plausible as many responses relied on the parents/caregivers' recollection of the past (for example the drug regime during pregnancy and age of FACS diagnosis), it is argued that such questions could be answered accurately with the aid of previous medical prescriptions or documentation. The fact that all responders identified as NZ European means further work is needed to reach and gain the experiences of Māori, Pasifika and families from other ethnicities affected by FACS. As this questionnaire targeted families with children affected by FACS and members of FACS NZ, the inferences from this study are relevant to all patients affected by FACS in Aotearoa New Zealand. Due to privacy, FACS NZ does not maintain a database of families involved in the organisation. While the exact number of those invited to participate in this study was unknown, an estimate of 65 families were sent the email and invited to take part, reflecting a response rate of approximately 42%.

In 2017, the House of Commons of the United Kingdom issued a debate pack report on FACS. While it acknowledged "facial and skull malformations" from anticonvulsant use during pregnancy, there was no mention of dental and oro-facial abnormalities.[3] Furthermore, the current FACS diagnostic criteria model is based on the characteristic features of FACS (dysmorphic facial features, congenital malformations, cognitive impairment/ASD) and does not include dental and oro-facial features.[30] Our study provides preliminary data on FACS in Aotearoa New Zealand, gives insight into the dental and oro-facial features in affected individuals, and indicates that there is a need to consider dental anomalies as well as oro-facial features, rather than facial features only, in FACS patients. Further research in this area is therefore encouraged.

The results from this study can be utilised in many ways. Firstly, they can assist in the development of an examination proforma or checklist that can enable recognition of dental and oro-facial anomalies in FACS individuals by dental and medical practitioners. This may be advantageous in FACS diagnosis or data collection for further research, and/or provide a basis for early referral and improved management for this patient group, especially as improved dental function can significantly improve quality of life. Secondly, the study draws attention to anticonvulsant drug prescription in Aotearoa New Zealand and suggests the need for better education for women of childbearing age regarding the foetal risks with anticonvulsant use during pregnancy. Finally, this study provides a foundation for research on FACS in Aotearoa New Zealand as, to date, there has been no national research with this patient group.

COMPETING INTERESTS

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Appendices

Original questionnaire distributed to parents/caregivers of children with FACS in Aotearoa New Zealand.

Dear Parent/Caregiver

As you may be aware, there are many known features associated with the Foetal Anticonvulsant Syndrome (FACS). Although limited, there is current evidence in literature that suggests that abnormalities related to the face, mouth and teeth may also be associated with FACS. At the University of Otago, we are conducting research of these associations and would like to know about your observations and first-hand experience. Please fill in the questionnaire below relating to any features of the face, mouth and teeth that you have observed in your child. If you have more than one child with FACS, please complete a separate questionnaire for each child. Your answers are valuable to our research and will be used solely for the purpose of directing further research.

1) Personal information (child):
Date of birth:..............................
Gender:.......................................
Ethnicity:...................................
2) When was your child diagnosed with Foetal Anticonvulsant Syndrome?
Child's age:................................
3) Please state the name(s) of the anticonvulsant medications that you were taking during the pregnancy:
....
....
....
....
4) Please tick the relevant features of FACS currently seen in your child:
Irregularities of the eyes, ears, lips and nose
Irregularities of organs or limbs
Cognitive disabilities/Autism spectrum disorder
Other
Please explain if you have ticked Other:
....
....
5) Have you noticed any problems with the way your child eats, speaks or swallows? Please explain what you have noticed:
....
....
....
6) Have you noticed any problems with your child's teeth? Please explain what you have noticed:
....
....
....
7) Have you noticed any differences in the appearance of your child's face and/or teeth compared with other children of his/her age?
Please explain what you have noticed:
....
....
....

8) Does your child attend routine dental care?
Yes
No

9) Does your child cope well in the dental setting?
Yes
No
If you have answered no, please briefly explain the problems encountered during your child's dental visit:
....
....
....

10) Does your child have a history of a cleft lip and/or palate?
Yes
Please explain:
....
....
No

11) Additional comments or concerns relating to your child's dental and facial features:
....
....
....
....
....
....

Thank you for participating in this questionnaire.
We appreciate your time and your responses are very valuable to our research.

A comparison of operative autonomy between men and women in orthopaedic surgical training in Aotearoa New Zealand

Elizabeth C Bond, Frances H Whiting, Peter D Larsen, Georgina Chan

ABSTRACT

AIM: Recent studies have shown that women training in surgical and procedural specialties achieve less operative autonomy during training than men do. The aim of this study was to discern if there is a disparity in surgical autonomy for orthopaedic trainees by gender.

METHODS: This was a retrospective study of operative procedures performed by 53 orthopaedic trainees (43 men, 10 women) in Aotearoa New Zealand over 10 years. The main outcome measure was the amount of surgical autonomy afforded to individual trainees as recorded in the training logbook, categorised as assisting a: primary surgeon with consultant scrubbed or present; or, primary surgeon unsupervised and teaching a colleague the procedure.

RESULTS: Data was obtained for 41,622 procedures in total. Eighty point seven percent were performed by men and 19.3% by women. On average men performed 229 cases per year and women performed 251 cases per year. There was an overall significant difference in autonomy between men and women ($p < 0.001$), with men performing more procedures unsupervised than women (45% of all cases versus 39% of all cases). This difference remained significant when trainee year group was accounted for.

CONCLUSIONS: We conclude that women orthopaedic trainees in Aotearoa New Zealand perform fewer cases with meaningful autonomy than men. This disparity may have implications for the quality of training received by men versus women.

Achieving operative autonomy is essential for surgical trainees to progress their skills and become confident and competent consultants.[1] Exposure to a wide range of trauma and elective cases during training enables the development of autonomy. This should be equal irrespective of gender or other demographics. Currently the Aotearoa New Zealand orthopaedic training scheme, administered by the New Zealand Orthopaedic Association (NZOA) under the jurisdiction of the Royal Australasian College of Surgeons (RACS), has 24.2% women trainees, compared to 5.4% 10 years ago. Six percent of consultant orthopaedic surgeons in Aotearoa New Zealand are women.[2] This increasing diversity, in a specialty that tends to have the lowest rates of women world-wide,[3] should be celebrated. It is well established that there are significant positives to having women in leadership roles,[4,5,6] and women surgeons have been shown to have equal or better short-term outcomes post-operatively.[7,8]

However, recent studies have shown that women in surgical and procedural specialties achieve less operative autonomy during training than men. In Aotearoa New Zealand, women general surgery trainees performed significantly fewer operative cases independently,[9] and women ophthalmology trainees completed almost 41% fewer independent cataract cases by the end of their training.[10] This finding has potentially significant repercussions for the quality of training received by women.

Our study aimed to identify differences in operative autonomy between women and men in orthopaedic surgical training in Aotearoa New Zealand. We also performed a scenario-based survey asking trainees to rate operative autonomy, to explore if any difference could be subjective.

Methods

Logbook data

This was a retrospective longitudinal cohort study. Informed consent was sought from all NZOA trainees over a total of 10 years (2011–2020 inclusive) for the use of their data. There was a total of 96 trainees during this time, consisting of 82 men and 14 women. Data for all 53 consenting trainees (overall response rate 55%; 43 men (52%) and 10 women (71%)) were retrieved from two logbook databases: MALT (Morbidity Audit and Logbook Tool) and TIMS (Training Information Management System). The MALT logbook was a RACS-mandated tool used by all trainees until the new TIMS logbook administered by NZOA was phased in in 2019. There was no duplication of data between the two logbooks. All retrieved data were de-identified. The study was exempt from ethics approval, as per the Health and Disability Ethics Committee of Aotearoa New Zealand criteria.

Data retrieved for each operative procedure included trainee gender (man or woman), hospital type (secondary or tertiary), year the procedure was performed, Surgical Education and Training (SET) level at time of procedure (Year 1–5), type of procedure (trauma or elective), free text noting the description of the procedure and level of autonomy. Datasets were all complete except for the "hospital type" data from the MALT logbook. Key procedures were assessed as a subgroup analysis. Primary total arthroplasty procedures (combined total hip and total knee replacements, due to log book coding as "arthroplasty: primary, total") were assessed.

Autonomy level was ranked as 1 (assisting the primary surgeon), 2 (performing the procedure supervised), 3 (performing the procedure unsupervised) or 4 (teaching a colleague the procedure). These data were recorded and saved after each procedure by the trainee. The logbook is reviewed by the trainee supervisor four times per year, although there is no formal system for entries to be approved by the supervising surgeon. No demographic data regarding the responsible consultant surgeon was collected.

The NZOA/RACS training scheme is 5 years in duration (SET 1–5) and trainees are distributed between 17 training hospitals. Data regarding trainees who took time out of the programme during the study period were also collected. Placements are decided by trainee ballot on an annual basis. The majority of SET 4 and SET 5 trainees work in tertiary centres in preparation for their final exams.

Survey responses

The survey was distributed to all current trainees (for the 2020 training year) using the Survey Monkey platform (Momentive, San Mateo, California): a total of 60 trainees (49 men, 11 women). Twenty-eight of 60 current trainees completed the survey (response rate 47%) (21 men, 7 women). Respondents were asked to complete demographic data including gender, SET level, type of hospital (secondary or tertiary), case numbers achieved and number of years working as an orthopaedic registrar (recorded separately to SET level, as registrars work for variable amounts of time prior to being selected for training). They were asked to respond to a scenario assessing self-evaluation of autonomy. All five scenarios were prefaced with the question "*Would you consider yourself the primary/lead surgeon for logbook purposes in the following scenario?*" Answers were a binary choice between yes and no (Appendix 1: survey scenarios/questions).

Statistical analysis

All data were analysed using SPSS 27 (IBM, New York). Data are presented as a percentage. Categorical variables were compared using Chi-squared tests. A multinomial logistic regression was used to analyse the relationship between gender, SET level and trauma vs elective related surgery. Hospital type was not included in this model due to missing data. A p-value <0.05 was considered statistically significant. For the survey response data, statistical power was limited by the small sample size. Data were treated as categorical variables and analysed using Chi-squared tests.

Results

The logbook dataset included 53 trainees in total; 43 men (81%) and 10 women (19%). The gender balance changed over time, with only 5.4% women trainees in 2011 and 18.3% in 2020. Data were available for a total equivalent to 179 training years; 147 (82%) men training years and 32 (17.8%) women training years. Overall, there were data for 41,622 cases, with all procedures performed over a 10-year period (2011 to 2020 inclusive). Overall, men performed 33,593 (80.7%) of the cases, and women performed 8,029 (19.3%). Women trainees averaged 251 cases per year and men trainees averaged 229 cases per year. Two women had two 6-month interruptions and another three women had one 6-month interruption during the study period, for parental leave. One man had a 12-month interruption for research. They did not input data into the logbook system during their time out and returned to the same SET level as when they began their interruption. Time taken out from training was required to be made up, so total training time remained at 5 years; however, the interruptions may have resulted in some data from these trainees being recorded after the completion of data collection.

Overall autonomy

There was a statistically significant difference in level of autonomy between men and women overall (p<0.001). Table 1 shows cases by autonomy level. Taking all training years into account, case numbers were equal at autonomy level 2 (primary surgeon supervised) and 4 (teaching a colleague). Women performed more cases at autonomy level 1 (assistant surgeon) than men. Men performed more cases at level 3 (primary surgeon unsupervised) than women. Figure 1 shows the distribution across autonomy levels of cases that all trainees completed. There was a progressive increase in the number of level 4 cases (teaching a colleague) and decrease in the number of cases at level 1 (assistant) as the SET level increased.

Autonomy by training year

This statistically significant difference remained when data were divided into training years. Every year demonstrated a similar pattern, with women performing more cases at autonomy level 1 and level 2, and men performing more cases at autonomy level 3 and level 4. The only exception was women in the SET 4 year performing more cases at level 3. Table 2 shows data for each training year. Figure 2 shows the proportion of cases completed at level 1 by gender and year level. Figure 3 shows the proportion of cases completed at level 3 by gender and year level.

Multinomial logistic regression modelling showed that after correction for SET level and trauma surgery, odds ratios for men trainees operating at levels 2, 3 and 4 compared to women trainees were 1.29 (95% CI 1.21–1.38), 1.72 (1.60–1.84) and 1.93 (1.61–2.34) respectively.

Changes over time

Examining the first 5 years of the dataset (2011–2015) against the last 5 years of the dataset (2016–2020) in a multinomial logistic regression, trainee autonomy levels were significantly influenced by gender (p<0.001) and SET level (p<0.001) but not by time period (p=0.41).

Trauma versus elective

Of the cases, 24,490 (58.8%) were trauma and 17,132 (41.2%) were elective. There was no significant statistical difference in the proportion of trauma versus elective cases between men and women, with each performing 59% of their cases as trauma cases (p=0.4). There was a significant difference in autonomy level between elective and trauma cases overall (p<0.001) (Table 3).

Secondary versus tertiary hospital

Data for hospital type were incomplete, with missing data for 24,892 cases. Of the available data, 8,181 cases were performed in a secondary hospital and 8,556 in a tertiary hospital. Men performed more of their cases at a tertiary hospital (54%) than women (39%) (p<0.001). Figure 4 shows cases divided by autonomy level between secondary and tertiary hospitals. More unsupervised cases were performed in secondary hospitals compared to tertiary (p<0.001).

Key procedures: primary total hip and knee arthroplasty

4,876 total hip and knee arthroplasty cases were recorded: 3,879 performed by men and 997 performed by women. Another 2,319 (47.6%) were performed at level 1, with 45% of cases done by men and 57% of cases done by women. A further 2,417 (49.6%) were performed at level 2, with 52% for men and 41% for women. One hundred and thirty-nine (2.9%) cases were performed at level 3; 3% for men and 2% for women. One case was recorded at level 4.

In a multinomial logistic regression model, there was a statistically significant difference in trainee autonomy levels by gender (p<0.001) and SET level (p<0.001). SET 5 women performed 53% of these operations at level 1, compared to men in 42% of cases. Women performed 35% of operations at level 2 compared to 53% in men. Statistical differences in autonomy levels were observed at every level of training. Figure 5 depicts these differences.

Survey data

Twenty-eight of 60 current trainees completed the survey (response rate 47%). Of the respondents, 20 (71%) were men and 7 (24%) were women; one respondent did not state their gender. Fifteen trainees (54%) were in tertiary centres and 13 (46%) were in secondary centres. Seven (24%) were SET 1, 11 (39%) were SET 2, three (11%) were SET 3, two (7%) were SET 4 and four (15%) were SET 5. One (4%) respondent did not give their SET level. Three scenarios showed high concordance between all trainees (scenario 1, 3 and 5), whereas two scenarios (scenario 2 and 4) demonstrated a more mixed response. No statistical relationship was found between the answer and the variables of gender, training year or hospital type. Complete survey answers are provided in Appendix 2.

Discussion

Our study demonstrates a significant difference in operative autonomy between women and men in orthopaedic training in Aotearoa New Zealand. In every training year, women performed fewer cases at higher autonomy levels, despite performing a higher number of cases annually. We don't have a definitive explanation for the higher volume of procedures performed by women, but one potential reason is that case complexity is not accounted for in the data. Women may have been performing cases of lower complexity or shorter duration compared with the men: one trainee may have performed four ankle open reduction internal fixations (ORIFs) compared to another who did one hip revision for periprosthetic fracture on a given trauma day. Another finding was that trainees have significantly less supervision in secondary hospitals than tertiary ones. There were more women trainees in secondary centres, so even in a more unsupervised environment, women were still not afforded comparable levels of autonomy to men. The differences in autonomy also remain

Table 1: Cases by autonomy level.

Service contribution	Men	Women
Assistant surgeon 1	8,957 (27%)	**2,658 (33%)**
Primary surgeon supervised 2	9,323 (28%)	2,279 (28%)
Primary surgeon unsupervised 3	**14,486 (43%)**	2,936 (37%)
Teaching a colleague 4	832 (2%)	157 (2%)

Figure 1: Autonomy level of cases completed by all trainees according to SET level.

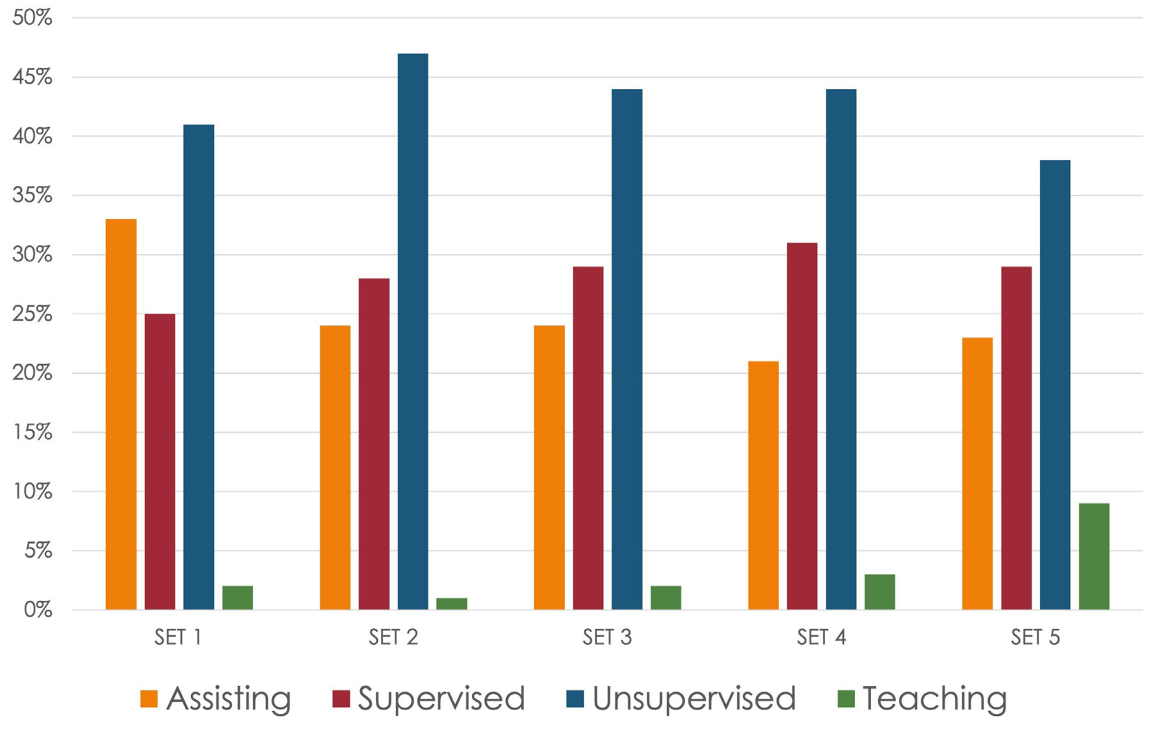


Table 2: Data by training year.

SET 1		
Autonomy level	Men	Women
1	3,922(33%)	**902 (39%)**
2	**2,990 (25%)**	505 (22%)
3	**4,898 (41%)**	883 (38%)
4	215 (2%)	29 (1%)
SET 2		
Autonomy level	Men	Women
1	1,817 (24%)	**946 (34%)**
2	2,176 (28%)	**828 (30%)**
3	**3,625 (47%)**	935 (34%)
4	92 (1%)	**54 (2%)**
SET 3		
Autonomy level	Men	Women
1	1,730 (24%)	**388 (25%)**
2	2,114 (29%)	**560 (36%)**
3	**3,153 (44%)**	604 (38%)
4	**143 (2%)**	20 (1%)
SET 4		
Autonomy level	Men	Women
1	789 (21%)	**121 (30%)**
2	**1,164 (31%)**	91 (23%)
3	1,653 (44%)	**189 (47%)**
4	**127 (3%)**	0 (0%)
SET 5		
Autonomy level	Men	Women
1	699 (23%)	**301 (31%)**
2	879 (29%)	**295 (30%)**
3	**1,157 (38%)**	325 (33%)
4	**255 (9%)**	54 (6%)

Figure 2: Proportion of cases performed by men and women trainees as assistant surgeons.

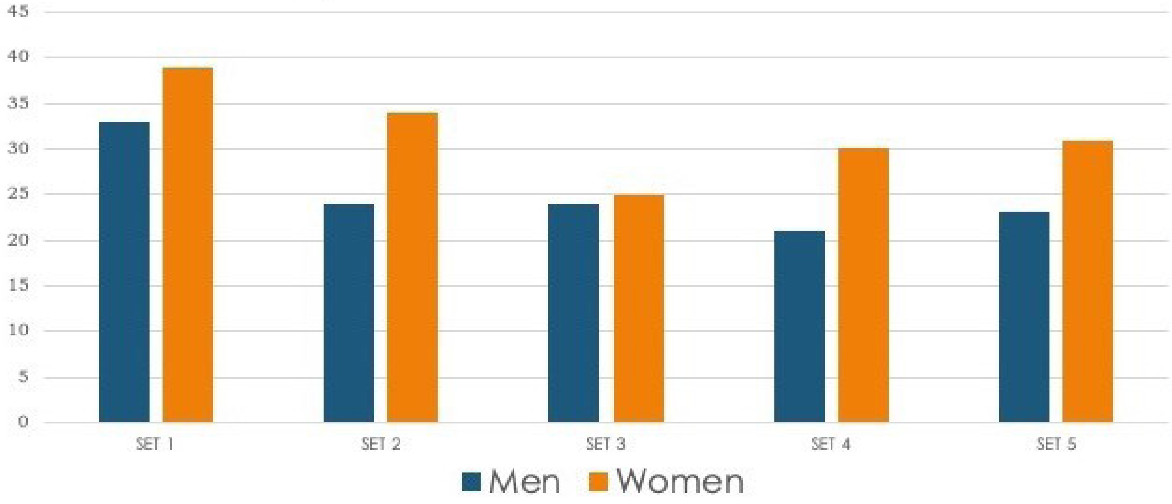


Figure 3: Proportion of cases performed by men and women trainees unsupervised.

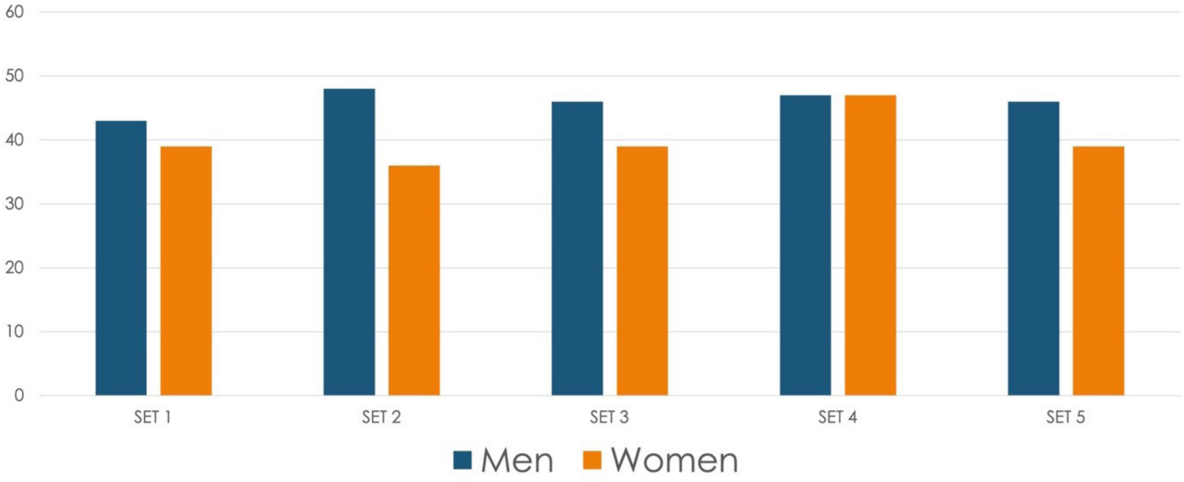


Table 3: Overall autonomy level between trauma and elective cases.

Autonomy level	Trauma	Elective
1	3,410 (14%)	**8,201 (48%)**
2	5,283 (22%)	**6,317 (36%)**
3	**14,846 (61%)**	2,576 (15%)
4	**951 (4%)**	38 (0.2%)

Figure 4: Autonomy level by hospital type.

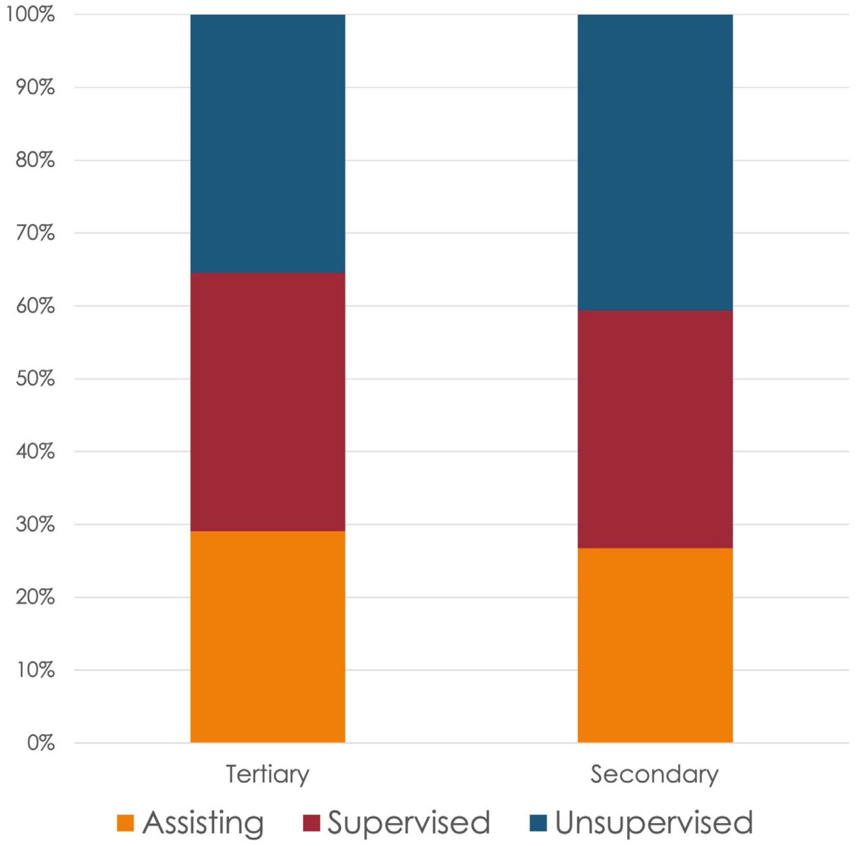
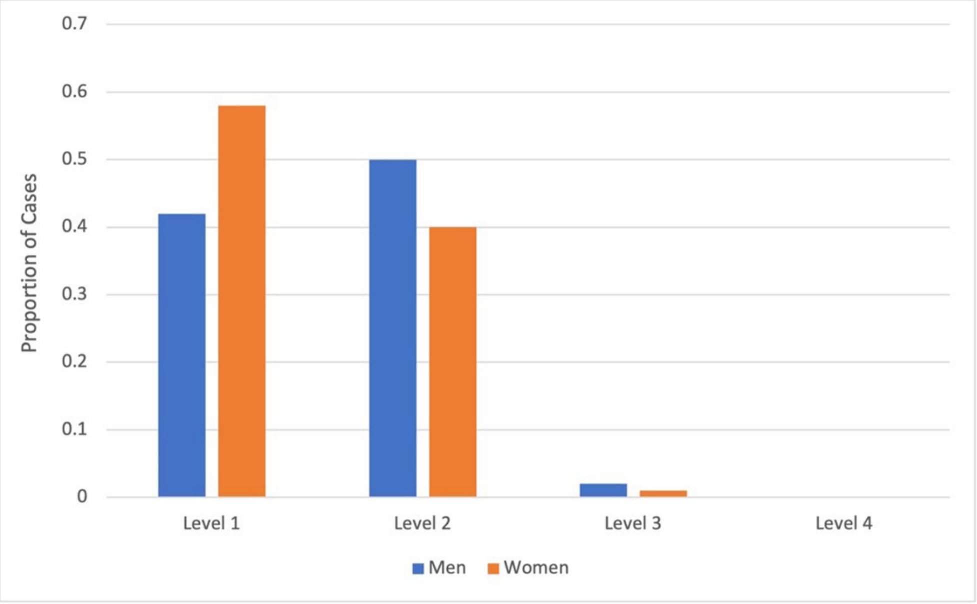


Figure 5: Autonomy for key procedures: primary total hip and knee arthroplasty.



apparent when looking specifically at core procedures—hip and knee arthroplasty.

The results are consistent with those of two other retrospective logbook data studies performed in Aotearoa New Zealand. A 2020 study found that women in general surgery training performed fewer cases as the primary surgeon with the consultant available but unscrubbed than men.[9] A 2021 review of ophthalmology trainees found that women performed fewer cases per year than men (21.1% fewer by the fourth year), and 41.7% fewer autonomous cataract cases by the end of training.[10] In a similar United States (US) logbook study, women general surgery residents received less operative autonomy than men, who progressed more rapidly.[11]

Overall, the results support the emerging objective evidence demonstrating a phenomenon of women achieving lower levels of operative autonomy in procedural specialties, persisting throughout training. The findings raise two main questions—why does this difference exist, and what is the impact? There is widespread evidence that women underrate and underestimate their own abilities in many professional fields including surgery,[12,13] which is likely to affect how women advocate for their autonomy. In a retrospective review, US women orthopaedic residents consistently gave themselves scores that were lower than their faculty evaluations, whereas men tended to rate themselves at the same level or even above the level their faculty had rated them.[14] Two other studies show women scoring themselves lower than men.[15,16] We attempted to objectively assess this with a scenario-based survey to see if the differences could be attributed to men and women rating autonomy differently. Statistical analysis did not demonstrate any significant discordance, but this was limited by small sample size. In addition, societal pressures influence women's behaviour, with pervasive cultural norms dictating that assertiveness and competitiveness are favourable traits in men.[17,18,19,20] These factors can add up to an outward appearance of low "confidence", which is still used a barometer of ability.

Men and women also have different learning styles. Evidence from the domains of finance and sports suggest that women "*find negative feedback more aversive and make them more inclined to doubt their abilities*".[12] A systematic review concluded that men and women differed in their development of surgical skills and their responses to different training methods, with women preferring mentorship and one-on-one instructor feedback.[21] Implicit bias (an unconscious underrating of women persisting despite one's conscious beliefs[24]) still exists. Studies show a perception from supervisors of more intra-operative guidance being required for women than men;[22] and giving men significantly more autonomy than women with all other factors controlled for.[11,16] Social experiments have shown that both genders are susceptible to implicit bias, with women perceived as being less competent by both women and men.[23]

Should we therefore change our training methodology to optimise the experience and outcome of orthopaedic training for women? A 2019 article stated that "*we should be mindful of psychological differences between genders, including in confidence and self-assessment*" [24,] while Ali et al. concluded that the surgical training of women should include more mentorship and feedback, and that "*gender issues should be considered when designing surgical training to better accommodate the needs of future surgeons*".[21]

The second question regarding the impact of this difference led us to consider the value of operative autonomy during training. The optimal timeline to operative autonomy has not been defined in any specialty and likely differs between individuals. It is possible that increased supervision would lead to an increase in teaching moments and therefore faster attainment of surgical skills. The existence of an autonomy gap at the end of training is a concern,[22] as it might seem disadvantageous for women to have significantly less autonomous operating experience. However, studies that have compared the outcomes of men and women surgeons have found that women actually tend to have better results,[7,8] despite this discrepancy. This may indicate that achieving high levels of autonomy during training is not as crucial as may be imagined, and that supervised operating may confer more benefits. Anecdotally, there is an international trend towards more consultant involvement and supervision. New Zealand is fairly unique in that significant case numbers are still performed unsupervised; however, these changes are likely to affect trainee autonomy here going forward. We consider a 10-year period an appropriate length of time for this study, but there were only 5.4% women trainees at the beginning. It would be worthwhile considering a repeat analysis in a few years to capture the experiences of the current 24% women trainee cohort.

The impact of the autonomy gap on trainee surgeons is unknown, but it indicates an underlying inequality between men and women throughout training. The increase in diversity and number of women selected for orthopaedic training in Aotearoa New Zealand should be celebrated. However, the format and nature of the training scheme remains unchanged. We should use increasing diversity as an opportunity to develop and enhance our surgical training. As the number of women orthopaedic consultants grows, this will inherently improve mentorship, women leadership and role modelling. Formalisation of personal coaching and mentorship outside of the operating room will help trainees with personal growth. We should remain responsive to trainees and accommodate their learning needs while being clear on overall learning objectives. Leadership training could be incorporated into the curriculum, allowing trainees and supervisors alike to gain insight into how people respond to criticism and organisational culture. Supervisors need to be mindful of the necessary communication styles that result in the optimal improvement from their trainees and acknowledge that this will differ between individuals regardless of gender. Making a conscious effort to network and socialise with peers enables discussion of common issues, and groups such as Ladies in Orthopaedics New Zealand (LIONZ) provide a formal pathway for communicating the needs of a minority.

Limitations of this study include all data being self-reported and open to subjective bias. Although we performed an objective survey to account for this, sample size was small (due to a lack of trainees opting in) and from a different population of trainees. The dataset included 55% of all possible trainees but, of note, data were included for 71% of women over this time. We had missing data for hospital type, although still had sufficient data for analysis. We did not collect data concerning experience of trainees prior to training, which may have an impact on time taken to achieve autonomy. With regards to trainees taking time out, ultimately, they do complete 5 years of training. We anticipate that an interruption to training could result in some of that trainees' logbook data being entered outside of the study period and therefore not included in this study. We do not think that it would otherwise affect the results, as training level and surgical skill level are unchanged. Similarly, Gill et al. did not find any statistical association between interrupted training and performance of independent cases.[5]

Conclusion

Our study adds to a growing body of objective evidence that there is a difference in the experience of surgical training according to gender. Women experience less meaningful operative autonomy than men at all year levels during orthopaedic training. As diversity increases in surgical training, we must identify different learning styles and account for this in the design of our surgical training programmes by accommodating individual trainees in order to optimise their personal and professional development.

COMPETING INTERESTS

Nil.

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Appendix 1: survey scenarios/ questions

All five scenarios were prefaced with the question "*Would you consider yourself the primary/ lead surgeon for logbook purposes in the following scenario*?"

Scenario One: "*You begin a total hip replacement but have difficulty with the acetabular component and the consultant needs to take over and complete the case?*"

Scenario Two: "*You are performing a total hip replacement and require assistance from the consultant to ream and impact the acetabular component but once this is done you complete the femoral side and finish the rest of the operation?*"

Scenarios Three: "*You are fixing a complex tibial plateau fracture with the consultant scrubbed; you do the lateral side, and they do the medial side?*"

Scenario Four: "*You scope a knee and perform a partial meniscectomy—once you are done the consultant looks around the joint and tidies up the meniscal rim?*"

Scenario Five: "*You are teaching a junior how to ORIF a Weber B ankle fracture; you are scrubbed with them, help them do the approach. You need to reduce the fracture and help aim the drill for all screws?*"

Appendix 2: survey responses

	Men	Women	Total	Concordance
Respondents	**20**	**7**	**27** **1 no response**	
SET level				
1	5	2	7	
2	8	3	11	
3	2	1	3	
4	2	0	2	
5	3	1	4	
			1 no reponse	
Years as orthopaedic registrar	Mean 5.6 Median 5 Range 2–10	Mean 5.3 Median 5 Range 3–7	Mean 5.5 Median 5 Range 2–10	
Scenario 1	Yes 4 No 16	Yes 0 No 7	Yes 4 No 23	High
Scenario 2	Yes 18 No 2	Yes 6 No 1	Yes 24 No 3	High
Scenario 3	Yes 12 No 8	Yes 2 No 5	Yes 14 No 13	Low/mixed responses
Scenario 4	Yes 0 No 20	Yes 0 No 7	Yes 0 No 27	High
Scenario 5	Yes 10 No 10	Yes 6 No 1	Yes 16 No 11	Low/mixed responses

Support for and potential impacts of key Smokefree 2025 strategies on Māori who smoke

Andrew Waa, Ellie Johnson, James Stanley, Bridget Robson, Anania Kerehoma Cook, Erana Peita, Anne CK Quah, Geoffrey T Fong, Richard Edwards

ABSTRACT

AIM: The recently passed *Smokefree Environments and Regulated Products (Smoked Tobacco) Amendment Act* has the potential to profoundly reduce smoking prevalence and related health inequities experienced among Māori. This study examined support for, and potential impacts of, key measures included within the legislation.

METHOD: Data came from Wave 1 (2017–2019) of the Te Ara Auahi Kore longitudinal study, which was conducted in partnership with five primary health organisations serving Māori communities. Participants were 701 Māori who smoked. Analysis included both descriptive analysis and logistic regression.

RESULTS: More Māori participants supported than did not support the Smokefree 2025 (SF2025) goal of reducing smoking prevalence to below 5%, and the key associated measures. Support was greatest for mandating very low nicotine cigarettes (VLNCs). Participants also believed VLNCs would prompt high rates of quitting. Participants who had made more quit attempts or reported less control over their life were more likely to support VLNCs.

CONCLUSION: There was support for the SF2025 goal and for key measures that could achieve it. In particular, VLNCs may have significant potential to reduce smoking prevalence among Māori. As part of developing and implementing these measures it will be important to engage with Māori who smoke and their communities.

Despite ongoing declines in smoking prevalence in Aotearoa (New Zealand), particularly among Māori, marked disparities persist between Māori and non-Māori. In 2020/2021, 26% of Māori adults smoked at least monthly, almost three times greater than people of European descent (9%).[1] Smoking is a significant modifiable risk factor that continues to contribute to health inequities and lower life expectancy for Māori.[2]

Recognising the harm caused by tobacco, Māori leaders first advocated for a Tupeka Kore (Tobacco Free) goal for Aotearoa in the mid-2000s. This goal sought to end tobacco use in Aotearoa (a tobacco endgame) and by so doing also eliminate smoking-related inequities.[3] Following a Māori Affairs Select Committee inquiry in 2011, the Government committed to achieving “an essentially Smokefree Aotearoa by 2025”[4,5] (the SF2025 goal).

However, over the decade that followed, Aotearoa’s tobacco control programme continued to be delivered in a largely business-as-usual (BAU) approach. The most substantive changes in tobacco control activity during this period were an increased focus on smoking cessation services, annual increases in tobacco tax, prohibiting retail displays of tobacco products and introducing standardised tobacco packaging.[6,7] This period also saw the proliferation of electronic cigarettes in Aotearoa that may have encouraged some people who smoked to switch to less harmful alternatives.

Individual-focussed BAU tobacco control interventions—such as smoking cessation services—often advantage those individuals with better support in their local networks (e.g., money, time, social support) and personal agency to quit.[8] This support and agency can be inequitably distributed across population groups. This means that BAU interventions may benefit some sectors of society more than others, thus contributing to the persistence or even widening of disparities in smoking. Tobacco tax has been a key element of Aotearoa’s BAU approach. Studies suggest this can be an effective measure for reducing smoking prevalence.[9,10] However, there has been ongoing debate about the potentially regressive nature of tobacco tax for Māori.[11,12]

Modelling of Aotearoa’s BAU tobacco control programme (as it stood in 2014) showed little hope of achieving the SF2025 goal (<5% smoking prevalence) by 2025, particularly for Māori.[13] This suggested a need to move beyond traditional BAU approaches and consider measures that had the potential to bring about precipitous reductions in smoking prevalence, do so equitably across the whole population and within a relatively short timeframe.

In December 2021, the Government released a *Smokefree Action Plan*[14] and in December 2022 passed the *Smokefree Environments and Regulated Products (Smoked Tobacco) Amendment Bill*. Key measures in the legislation are: mandating very low nicotine cigarettes (VLNCs); markedly reducing the number of places where tobacco can be bought; and creating a "Smokefree Generation" by annually raising by 1 year the age at which people could be legally sold tobacco. While no countries have implemented these measures to date, recent modelling of their potential impacts for Māori predicted they could greatly contribute to achieving the SF2025 goal, in particular mandated VLNCs.[15] An international review reported that while the evidence base for VLNCs was still developing, they have the potential to reduce tobacco use among populations described by the authors as "vulnerable" with little to no negative indirect consequences.[16] The legislation also notes Crown obligations under Te Tiriti o Waitangi and actions it will take to meet these obligations (e.g., engaging with Māori in developing tobacco retail regulations).

An important feature of the key measures included in the *Act* is that they do not rely on individual resources to achieve the desired changes. Instead, they focus on reducing supply and changing the nature of smoked tobacco products so that they are minimally addictive and less appealing. All people who smoke would be similarly exposed to these strategies (e.g., only being able to purchase cigarettes containing very low nicotine) and their impact on smoking would be much less dependent on individual agency. As such these types of population-level interventions have great potential for eliminating smoking disparities.[8] However, some have raised concerns that these measures may be unfair and lead to undesirable indirect impacts.[17]

Māori who smoke were identified as a priority group in the *Action Plan* and subsequent legislation. It is therefore important to understand their views and experiences so they are taken into account in the implementation of the legislation. The aims of this study were to assess the perspectives of Māori who smoke on: 1) support for the SF2025 goal and key strategies identified in the Government's *Smokefree Action Plan*; 2) the perceived impact, if any, these strategies could have on their smoking behaviour; and 3) associated factors that may influence support for the SF2025 goal and VLNCs.

Methods

Sample

Data were sourced from the Wave 1 of the Te Ara Auahi Kore (TAKe) longitudinal study, which was conducted from late 2017 to early 2019. The Wave 1 sampling frame drew from clients enrolled with six Māori health organisations who were research partners for this project. These organisations delivered primary healthcare (and social) services to Māori communities in five North Island regions: Te Tai Tokerau (Northland), Tāmaki Makaurau (Auckland), Te Moana a Toi (Bay of Plenty), Tairāwhiti (Gisborne) and Te Whanganui ā Tara (Wellington). Eligibility criteria for the study were: participants identified as Māori; smoked tobacco at least daily; and were aged 18 and older.

Out of 5,995 people invited to participate in the study, 701 completed interviews were included in this study after data cleaning, yielding an overall response rate of 12%. This is likely an underestimate since some potential participants who were invited to participate but were not interviewed may have been ineligible (e.g., they were not smokers). The characteristics of the final sample are presented in Appendix Table 1.

Research tools

Interviews were conducted over the phone and responses were uploaded to a secure online storage facility. The survey consisted of about 200 items and took about 1 hour to complete. Items were drawn from the International Tobacco Control (ITC) Policy Evaluation Survey (New Zealand arm),[18] the New Zealand Health Survey,[19] the Australian "Talking about the smokes" study[20] and Statistics New Zealand's Te Kupenga survey.[21] Additional items were developed specifically to meet TAKe project aims. Although the survey pre-dated the release of the *2025 Action Plan* and the associated *Smokefree Bill* we had pre-emptively selected potential strategies that would likely be included in a tobacco endgame based on earlier work.[22]

Measures relevant to the *Action Plan* and *Act* in the survey included support/opposition to the overall SF2025 goal and for key strategies; smokefree generation; mandated VLNCs; and markedly reducing retail access to tobacco (Appendix Table 2). “Support” was defined as either a “strongly support” or “support” response and “opposition” as either “oppose” or “strongly oppose”.

We asked participants what they would do if mandated VLNCs or marked reductions in tobacco retailer strategies were introduced. For VLNCs, response options were continuing to smoke VLNCs, using both VLNCs and e-cigarettes, switching completely to e-cigarettes and quitting completely. For reduced tobacco retail, the response options were giving up smoking, no change in smoking, and smoke less. Switching to e-cigarettes was not offered as an option for this question as it focussed on settings rather than products and adding an e-cigarette option would have made the question overly complex. We were particularly interested in variables associated with support for or anticipated impacts of VLNCs, as modelling studies have suggested this measure is likely to have the most substantial impact on reducing smoking prevalence.[15] We did not assess anticipated changes in smoking behaviours if a smokefree generation policy was introduced as we expected this would have limited impact on behaviours of existing smokers aged 18 and older.

Variables used to explore associations with support for the SF2025 goal or VLNCs were: age (18–24, 25+), sex (male, female), quit attempts in the past year (0, 1–2, 3+), confidence in being able to quit in the next 6 months (not at all sure, slight/moderate, very/extremely), perceived control over life (0 = no control, 10 = complete control), and trust in government (0 = never trusted, 10 = always trusted) (Appendix Table 2). Perceived smoking-related discrimination may have been a barrier to supporting SF2025 goal measures.[23] We measured this through agreement on a five-point scale (from strongly agree to strongly disagree) to the statements: “*smokers are second class citizens*”; “*people look down on you when they know you are a smoker*”; and “*you feel ashamed when people see you smoking*” as having been exposed to smoking-related discrimination. We then created a dichotomous derived variable for reported experiences of smoking-related discrimination. For this we counted people who indicated they agreed or strongly agreed with any of the smoking-related discrimination measures (second class citizens, people look down on you and feeling ashamed) as having been exposed to anti-smoking discrimination. All others (neither/disagree/strongly disagree) were counted as not being exposed. To maximise sample size, only participants who indicated “refused” or “don’t know” for two or more of the smoking-related discrimination statements were excluded from the analysis.

Procedure

The study was approved by the New Zealand Multi-Regional Health and Disability Ethics Committee (reference: 17/NTB/136/AM04). In addition, Māori health providers who were partner organisations for this study engaged in internal consultation for approval to take part in the study.

Interviewers followed a strict recruitment protocol that included guidelines for sample list selection from research partner databases, how participants should be contacted from sample lists, number of contact attempts before being counted as a “non-contact”, ensuring participants were able to give informed consent to participate and sending out gift vouchers following interviews.

Data were analysed using R 4.0[24] (R Institute, Vienna, Austria). Initial weightings for people who smoked daily by age and sex were applied according to the Māori population characteristics derived from 2013 New Zealand Census data[25] for the district health board regions corresponding to each participating location. The samples were then combined to provide a cross-location data set. The location weightings were retained for the combined dataset and no further weighting adjustments were made.

Weighted descriptive data were calculated with 95% confidence intervals using the survey package in R[26] to account for post-stratification weighting and stratification by participating location. We also conducted logistic regression analysis to identify factors that may be associated with overall support for the SF2025 goal and VLNCs. Each factor in the model was adjusted for age, sex and the other variables included in the model. Participants with missing data for any adjustment variables were excluded from the regression analyses (SF2025 analysis n=543; VLNC analysis n=526) to ensure consistency between adjusted and unadjusted models. For interval variables with more than three response categories (age, life control, trust in government), we analysed the distribution of responses and used the median value to create a dichotomous variable.

Results

Unless otherwise stated, levels of support between males and females were similar for all variables included in our results. Most (80%) had heard of the SF2025 goal. After being informed about the SF2025 goal (reducing the number of people smoking tobacco to less than 5% by 2025) just over two fifths (42%) supported this goal (Figure 1). However, a third (33%) did not support the goal and a fifth (20%) were ambivalent (Figure 1).

Of the three key strategies set out in the *Smokefree Plan* (creating a smokefree generation, only allowing VLNCs to be sold, and reducing access to tobacco retail outlets by 95%) support was greatest for VLNCs (59%) and lowest for markedly reducing retail access to tobacco (42%). Across the three strategies, support was more common than opposition: major retail reduction 42% support compared to 34% oppose; smokefree generation 49% support compared to 26% oppose; and for VLNC 59% support compared to 17% oppose.

Participants were asked what they would do if VLNCs were the only available smoked tobacco product (Table 1). Findings indicated two fifths of the sample would quit smoking altogether and a further 14% would switch to using e-cigarettes only. Together this equates to over half (54%) of the sample reporting they would stop smoking cigarettes compared to under a third (30%) who said they would continue to smoke (16%) or smoke as well as use e-cigarettes (14%). Under a fifth (16%) reported they were unsure what they would do if VLNCs were introduced.

One in five reported they would give up smoking if tobacco retail access was substantially reduced (Table 1), while over a third said they would smoke less (36%) or make no changes to their smoking behaviour (37%).

We explored whether demographic factors (age, sex), smoking experiences (quit attempts, experience of smoking-related discrimination, quitting confidence), or agency and trust (control over life, trust in government) were associated with support of the SF2025 goal and for the introduction of mandated VLNCs (Tables 2 and 3). Making at least one quit attempt in the past year was associated with with higher odds of support for the SF2025 goal (1–2 quit attempts aOR 1.60: CI, 3+ quit attempts aOR 3.33; p<0.001). Making 1–2 quit attempts in the past year (aOR 1.82), having greater trust in government (aOR 1.83)

Figure 1: Support for Smokefree 2025 goal and key strategies.

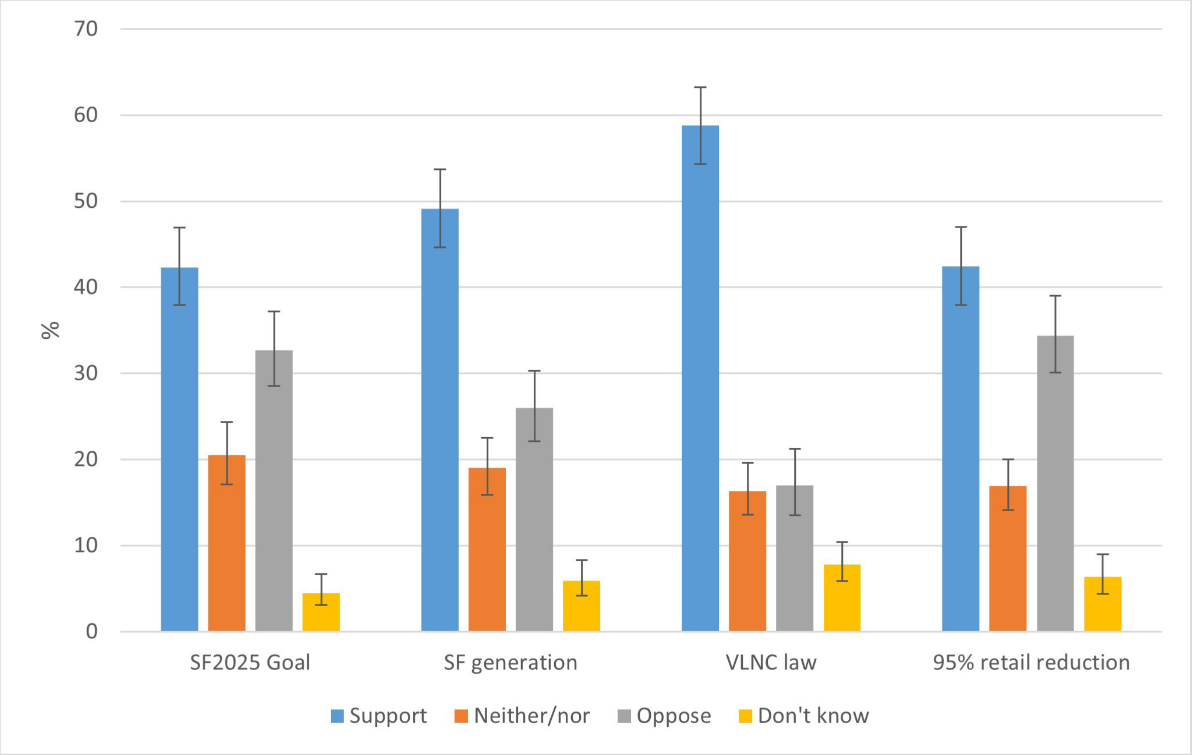

Table 1: Responses to endgame strategies.

Strategy	Response	N	%	CI (95%)
Only VLNCs available	Only smoke VLNCs	108	16.1	(13.0–19.8)
	Smoke both VLNCs and e-cigarettes/vapes	96	14.3	(11.4–17.7)
	Swap to only e-cigarettes/vapes	76	13.6	(10.5–17.5)
	Quit smoking or vaping	262	40.2	(35.7–44.8)
	Don’t know	107	15.8	(12.8–19.3)
Tobacco retail outlets reduced by 95%	Give up smoking	131	18.5	(15.4–22.2)
	No change	222	36.6	(32.1–41.4)
	Smoke less	230	36.4	(32.1–40.9)
	Don’t know	63	8.4	(6.6–10.7)

Table 2: Factors associated with support support for the Smokefree 2025 goal.

			Unadjusted			Adjusted*		
Variable	Level	N	OR	P-value	CI (95%)	aOR	P-value	CI (95%)
Age	18–24	52	1.00	0.863	(Reference)	1.00	0.681	(Reference)
	25+	491	1.07		(0.52–2.21)	1.16		(0.58–2.37)
Sex	Male	162	1.00	0.630	(Reference)	1.00	0.504	(Reference)
	Female	381	1.11		(0.72–1.73)	1.16		(0.75–1.81)
Quit attempts	None	277	1.00	<0.001	(Reference)	1.00	<0.001	(Reference)
	1–2	180	1.67**		(1.05–2.65)	1.60**		(1.01–2.55)
	3+	86	3.36**		(1.86–6.22)	3.33**		(1.84–6.17)
Smoking discrimination	None	123	1.00	0.615	(Reference)	1.00	0.841	(Reference)
	At least one agree	420	1.14		(0.69–1.90)	0.95		(0.58–1.57)
Confidence can quit	Not at all sure	204	1.00	0.193	(Reference)	1.00	0.329	(Reference)
	Slight/moderate	247	1.50		(0.96–2.37)	1.40		(0.88–2.24)
	Very/extremely	92	1.41		(0.76–2.63)	1.35		(0.73–2.50)
Life control	Higher control (8+)	330	1.00	0.523	(Reference)	1.00	0.461	(Reference)
	Lower control (0–7)	213	1.15		(0.75–1.75)	1.17		(0.77–1.80)
Trust in government	Lower trust (0–4)	277	1.00	0.208	(Reference)	1.00	0.218	(Reference)
	Higher trust (5+)	266	1.30		(0.86–1.96)	1.29		(0.86–1.95)

Table 3: Factors associated with support support for very low nicotine content tobacco.

			Unadjusted			Adjusted*		
Variable	**Level**	**N**	**OR**	**P-value**	**CI (95%)**	**aOR**	**P-value**	**CI (95%)**
Age	18–24	50	1.00	0.702	(Reference)	1.00	0.434	(Reference)
	25+	476	1.16		(0.53–2.43)	1.34		(0.63–2.80)
Sex	Male	158	1.00	0.149	(Reference)	1.00	0.151	(Reference)
	Female	368	1.40		(0.88–2.22)	1.41		(0.88–2.25)
Quit attempts	None	266	1.00	0.073	(Reference)	1.00	0.042	(Reference)
	1–2	176	1.66**		(1.01–2.77)	1.82**		(1.10–3.05)
	3+	84	1.67		(0.92–3.12)	1.64		(0.89–3.11)
Smoking discrimination	None	116	1.00	0.078	(Reference)	1.00	0.242	(Reference)
	At least one agree	410	1.60		(0.94–2.71)	1.36		(0.81–2.29)
Confidence can quit	Not at all sure	192	1.00	0.325	(Reference)	1.00	0.439	(Reference)
	Slight/moderate	242	1.18		(0.73–1.90)	1.06		(0.65–1.72)
	Very/extremely	92	0.73		(0.38–1.41)	0.71		(0.37–1.36)
Life control	Higher control (8+)	319	1.00	0.015	(Reference)	1.00	0.009	(Reference)
	Lower control (0–7)	207	1.77**		(1.12–2.84)	1.86**		(1.17–2.99)
Trust in government	Lower trust (0–4)	268	1.00	0.013	(Reference)	1.00	0.006	(Reference)
	Higher trust (5+)	258	1.76**		(1.13–2.75)	1.83**		(1.19–2.84)

and having a lower sense of control over your life (aOR 1.86) were all associated with higher odds of supporting the introduction of VLNCs.

Discussion

There was high prompted awareness of the SF2025 goal, and more study participants supported the goal than opposed it. We found support for the goal was associated with having made quit attempts in the past year. This suggests an association between motivation to quit and support for tobacco endgames. Employing strategies such as raising awareness of the importance of ending tobacco or increasing motivation to quit among those who are ambivalent or opposed to the SF2025 goal could increase overall support for the goal and the related measures.

Over half of the participants reported that if VLNCs were mandated they would either quit using nicotine-containing products altogether or switch to vaping products. Fewer study participants reported they would give up smoking if retail access was reduced by 95%. However, in absolute terms our findings suggest the potential impact of these measures combined could still represent a large number of smokers quitting or switching to less harmful alternatives. In particular, mandated VLNCs may have a profound impact on smoking prevalence among Māori who smoke. Caution should be taken when interpreting these results as at the time of the study the introduction of reduced tobacco retail access and mandated VLNC policies were hypothetical and had not been widely discussed. Participants may not have been fully aware of the implications of these policies for them and hence may have overestimated or underestimated their impact on behaviour. However, we note that our findings are consistent with other studies on the potential impacts of these measures on smoking behaviour within the New Zealand population.[15,27]

Understanding the factors associated with support or opposition to the SF2025 goal and associated strategies will provide critical insights into how support for the goal can be increased. It will also help ensure the needs and expectations of those who do support the goal are addressed. This reduces the potential for marginalising people who smoke and are unable or not motivated to quit. Of the variables included in our study, only an increased number of quit attempts was associated with greater odds of supporting both the SF2025 goal and the introduction of VLNCs. Those who thought they had less control over how their life turned out or who had higher trust in government were associated with greater odds of supporting VLNCs only.

The association between more quit attempts or lower control over life and support for VLNCs may reflect a greater willingness of these participants to have government intervene on their behalf to help them to quit smoking. This may be particularly so for those who do not feel they have sufficient resources to quit on their own. Lower trust in government may reflect personal experiences or political ideologies about the role of government in health policy. Communicating a balanced representation of evidence and ensuring that endgame policies are directly linked to endgame goals that are in turn seen as relevant and meaningful may help overcome these barriers.[28] In the case of Māori, trust in government may reflect a general distrust as a result of their ongoing experiences of colonisation and consequent marginalisation from political, health and social systems in Aotearoa.[29] The SF2025 *Plan* and *Act* highlights the importance of Māori governance in its development and implementation. To this end, a Māori taskforce has been established to oversee the development and implementation of the *Plan* and *Act*. Ongoing transparent communication from this taskforce and associated groups that reflect Māori community needs and values is likely to help build trust in the Government's action towards achieving the SF2025 goal.

Cross-sectional studies are useful for understanding the extent of support for an issue but are limited in being able to determine cause and effect. For many of the potential determinants used in our regression analysis, there is a plausible rationale for their preceding outcomes of interest (e.g., perceived control over life preceding support for VLNCs). However, reverse causality may be present for some factors that we have suggested as potential determinants. For example, it is possible that support for the SF2025 goal may have influenced people to make more quit attempts. Longitudinal studies would help to better understand the direction of causality of any associations.

The sample for this study was one of the largest to date exploring the experiences and perceptions of tobacco control policies among Māori who smoke. Nevertheless, our ability to use more complex weighting procedures, conduct more detailed analysis and the precision of some of our estimates could be improved with a larger sample. The modest response rate may have also introduced selection bias to the study. Edwards et al.[30] measured support for the Smokefree goal, 95% retail reduction and VLNCs among a sample of people who smoke or who had recently quit (recruited based on earlier participation in the New Zealand Health Survey). Estimates for these variables in our study were lower, for example 59% Maori who smoked supported VLNCs in our study compared to 70% in Edwards et al. Part of this difference may be attributed to the different recruitment methods in the two studies. Participants who were recent quitters in Edwards et al.'s study may have been more favourably predisposed towards tobacco endgame measures compared to the present study.

Conclusions

Understanding barriers and enablers for supporting the SF2025 goal among Māori who smoke will help develop strategies that ensure they are engaged with the goal and prevent them from becoming marginalised. Our study found higher support than opposition for the SF2025 goal and key measures that could achieve it. Our study also supported findings from previous research that mandated VLNCs have significant potential to reduce smoking prevalence among Māori.

COMPETING INTERESTS

Geoffrey T Fong has served as an expert witness or a consultant for governments defending their country's policies or regulations in litigation. All other authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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Appendices

Appendix Table 1: Sample characteristics.

Variable	Category	N (%)
Age (n=701)	18–24	79 (11%)
	25+	622 (89%)
Sex (n=701)	Male	213 (30%)
	Female	488 (70%)
Quit attempts (n=660)	None	341 (52%)
	1–2	221 (33%)
	3+	98 (15%)
Anti-smoker discrimination (n=657)	None	155 (24%)
	At least one agree	502 (76%)
Confidence can quit (n=677)	Not at all sure	255 (38%)
	Slight/moderate	302 (45%)
	Very/extremely	120 (18%)
Life control (n=633)	8+	374 (59%)
	0–7	259 (41%)
Trust in government (n=634)	0–4	339 (53%)
	5+	295 (47%)

Appendix Table 2: *Smokefree Action Plan*-related items included in the TAKe survey.

Question	Response options
Awareness of the Smokefree 2025 Goal Have you heard that the Government of New Zealand has a goal of becoming a smokefree country by 2025?	○Yes ○No ○Refused ○Don't know
Prompted support for Smokefree 2025 Goal The aim of the 2025 goal has been described as reducing the number of people smoking tobacco to fewer than 5% by December 2025. This goal would only apply to smoked tobacco but not alternatives such as e-cigarettes. Do you support or oppose this Smokefree 2025 policy goal?	○Strongly support ○Support ○Neither support or oppose ○Oppose ○Strongly oppose ○Refused ○Don't know
Support for smokefree generation policy Would you support or oppose a law that effectively means only people over 18 who smoke now would be allowed to continue purchasing cigarettes or tobacco?	○Strongly support ○Support ○Neither support or oppose ○Oppose ○Strongly oppose ○Refused ○Don't know
Support for very low nicotine cigarettes With the availability of alternative nicotine products such as e-cigarettes and vapes, would you support or oppose a law that reduces the amount of nicotine in cigarettes and tobacco, to make them less addictive?	○Strongly support ○Support ○Neither support or oppose ○Oppose ○Strongly oppose ○Refused ○Don't know
Support for marked reductions in tobacco retail outlets Would you support or oppose a law that reduced the number of places allowed to sell tobacco products by 95%?	○Strongly support ○Support ○Neither support or oppose ○Oppose ○Strongly oppose ○Refused ○Don't know

Appendix Table 2 (continued): *Smokefree Action Plan*-related items included in the TAKe survey.

Predicted impact of very low nicotine cigarettes on smoking behaviour If the only options you could buy were virtually nicotine-free tobacco and e-cigarettes or vaping devices that could contain nicotine, would you:	○Only smoke virtually nicotine-free tobacco ○Smoke both virtually nicotine-free tobacco and use some e-cigarettes or vaping devices ○Swap to only using ony using e-cigarettes or vaping devices ○Not use either option and quit smoking altogether ○Refused ○Don’t know
Predicted impact of marked reductions in tobacco retail outlets on smoking behaviour Currently there are almost 6,000 places you can buy tobacco in New Zealand. If the number of places that could sell tobacco was reduced by 95%, that is, only one out of every 20 shops now selling tobacco in your community could continue selling tobacco, would you:	○Give up smoking ○Not change how much you smoke ○Smoke less ○Refused ○Don’t know

Appendix Table 3: Items included in multivariable analysis.

Question	Response options
Questions used to assess exprience s of smoking related discrimination: Smokefree policies have turned smokers into second class citizens Some people look down on you when they know you are a smoker Sometimes you feel ashamed when people see you smoking	○Strongly disagree ○Disagree ○Neither disagree nor agree ○Agree ○Strongly agree ○Refused ○Don't know
Confidence in being able to quit If you decided to give up smoking completely in the next 6 months, how sure are you that you would succeed?	○Not at all sure ○Slightly sure ○Moderately sure ○Very sure ○Extremely sure ○Refused ○Don't know
Perceived control over life Some people feel that they have complete control over their lives, while other people feel that what they do has no real effect on what happens to them. Where zero is "no control at all" and 10 is "complete control", how much control do you feel you have over the way your life turns out?	○[Enter number 0–10] ○Refused ○Don't know
Trust in government Where 0 is the public institution can never be trusted, and 10 is the public institution can always be trusted… How much do you trust the system of government to treat people fairly?	○[Enter number 0–10] ○Refused ○Don't know

The "standard story" of anti-Māori talk in Pae Ora (Healthy Futures) Bill submissions

Rose Black, Ngaire Rae, Kyle Tan, Waikaremoana Waitoki, Leah Waipuka-Bain

ABSTRACT

AIM: To review some common patterns of race talk in a sample of submissions made to the *Pae Ora (Healthy Futures) Bill.* This bill proposed a structural reform of the health system in Aotearoa New Zealand to address long-standing health inequities experienced by Māori, the Indigenous peoples, and other priority populations.

METHOD: In a sample of 3,000 individual submissions made in late 2021, we found 2,536 explicit references to race. Utilising the "standard story" frame of Pākehā/non-Maori race talk, five longer submissions that inferred that the *Pae Ora* bill was "racist" were analysed in detail.

RESULTS: Many "standard story" race discourses were identified in the *Pae Ora* submissions. Three derived discourses included in this paper are: Pākehā as norm (monoculturalism or not seeing Pākehā as a culture), equality and the "Treaty" (equality for all to access healthcare), and one people (we are all New Zealanders). Sources such as the Waitangi Tribunal Wai 2575 Hauora report were drawn on to provide alternative discourses.

CONCLUSION: Identifying Pākehā standard story discourses enables learning about language patterns systems draw on, and the development of tools and procedures to improve equity for Māori and eliminate institutional racism.

The *Pae Ora (Healthy Futures) Bill 2022* was introduced into the New Zealand Parliament by the Honourable Minister of Health Andrew Little on 20 October 2021. This Bill (the *Bill*) proposed a new structure and accountability arrangements for the publicly funded health system in order to protect, promote and improve the health of all New Zealanders.[1] The *Bill* outlined a major restructure of the health system to address inequities in health outcomes experienced by Māori, Pacific peoples and tāngata whaikaha (people with disabilities), and to recognise the Crown's obligations to Māori under Te Tiriti o Waitangi (the founding document of Aotearoa New Zealand).[1] Te Tiriti outlines the relationship of kāwanatanga (the Crown's governance over British citizens) and tino rangatiratanga (Māori self-determination) between the Crown and Māori. Implementing Te Tiriti within the health sector would eradicate institutional racism, and achieve health equity for Māori.[2]

Pae Ora Bill opponents claimed the health reforms were separatist.[3] Moana Jackson responds to this "mythtake" of separatism, asserting that "*colonisation has always been a separatist process in which the colonising states imposed their own separate institutions in places that already had their own*".[4] In this statement, he names what others have also raised—that the reform agenda maintains the dominant colonial settler government health system and is not Te Tiriti compliant.[5] However, some Māori scholars were hopeful about the potential within the proposed health reforms as a move toward a Te Tiriti-based system[6] and Tiriti partnership as a means to tackle the inherent racism within the health system.[7]

The bill proposed the establishment of Te Whatu Ora – Health New Zealand (HNZ) as a Crown Agent, to work in partnership with an independent Māori Health Authority (MHA) or Te Aka Whai Ora.[1] MHA, an independent statutory authority, aspires to enhance tino rangatiratanga and strengthen mana motuhake (Māori sovereignty) to address intergenerational Māori health inequities highlighted in Wai 2575 Hauora Report: the Health Services and Outcomes Inquiry.[8]

The intention of the early 2000s health system reforms was to reduce inequalities in health status for Māori. Despite these intentions, health services in Aotearoa New Zealand continue to privilege Pākehā,[9] are more accessible for Pākehā and offer a differential, usually higher, quality of service to Pākehā.[10] The failure to progress health equity led to the lodging of Waitangi Tribunal claims by Māori primary health organisations (PHOs) and providers.[8] The Tribunal Wai 2575 initial report, released in June 2019, found the health system had failed to improve Māori health outcomes and further that institutional racism was a pervasive and core determinant of ill health for Māori.[8,11] The Minister of Health, in lieu of the Waitangi Tribunal hearings, commissioned a review into the health and disability system.[12] The review contained 86 recommendations to transform the health sector, which informed the *Pae Ora Bill*.

Objectives of the paper

This paper sought to identify evidence that undermines the intent of Pae Ora Bill in establishing MHA and bridging Māori health inequities. To do this, we examined some of the enduring patterns of ways in which Pākehā talk about Māori that were evident in the public submissions to the Pae Ora Bill.

When the health system changes were announced in mid-2022, Riana Manuel, Chief Executive of Te Aka Whai Ora, was hopeful:[7]

> *I nearly shed a few tears because, in my career, I hadn't ever seen a moment when a Treaty partnership was actually turned into a functional and operating reality. I know we've got a long way to go and these are just the beginnings, but I feel heartened that we may be able to make a difference this time. We may be able to create an enduring partnership.*

This view was a stark contrast to many of the public submissions to the *Pae Ora Bill* in late 2021. The vast majority were from individuals largely opposed to the *Bill*. Almost all were objecting in principle to the Hauora Māori provisions that included the appointment of a Hauora Māori Advisory Committee and the establishment of MHA. The language used in the submissions prompted the researchers to take a closer look.[13]

Words and language are an essential aspect of social relationships.[14] This paper provides insights into how a section of the New Zealand public reproduce views about Māori and Te Tiriti o Waitangi that echo racist narratives. These narratives have been intentionally cultivated via traditional media and social media.[14] *Pae Ora Bill* submissions highlight the need for greater understanding of entrenched racist views held about Māori that Pākehā draw on when Māori self-determination is up for discussion. Media narratives about Māori rights often portray Māori through a deficit framework, yet ignore Pākehā privilege, monoculturalism, colour blindness and who benefits from institutional racism.

Methodology

Positionality

Both Māori and Tauiwi (non-Māori) scholars working as anti-racist activists and allies in Aotearoa are involved in the writing of this paper. Our positionality is informed by Te Tiriti o Waitangi as an anti-racist praxis[15] to empower Māori as tangata whenua (Indigenous Peoples) and restore the balance between kāwanatanga and tino rangatiratanga that the Crown disrupted in its own favour.[16]

Analysis

Enduring negative patterns in Pākehā talk about Māori, with origins tracing back to early settlement of Aotearoa, have been identified through public documents[17] and media research.[14,18]

A "standard story" of Pākehā race talk works to justify and legitimise the colonial state while maintaining and reinforcing negative representations of Māori people and culture.[17] Standard story themes that function to uphold racism are frequently used in media, and everyday talk, were identified in many of these themes in the *Pae Ora* submissions.

From a first reading of this sample by hand and using nVivo a number of themes were identified, informed by both discourse and thematic analysis methods. Three of the authors did an initial coding separately and then shared and discussed the codes together. Five substantive submissions (long, repeated by other submitters) that represented the types of talk identified across the sample and that inferred the Pae Ora bill was "racist" were selected for further analysis. The coding phase was deductive and derived from previously identified "standard story" themes.[14,17] These five submissions were read in detail and coding was discussed and agreed to between the authors. To allow for traceability each submission has an allocated number from one to five.

Results

The anti-Māori views shared by many individual submitters across the submissions were described as "an avalanche of viciousness" towards Māori.[19] The majority of submitters do not identify their cultural/ethnic identity, and this absence gives a strong indication that they are from the Pākehā majority population group. The Pākehā talk shows a failure to recognise Māori as the Indigenous people of Aotearoa, and a refusal to acknowledge the ongoing impacts of colonisation that have led to the health equity gaps between Māori and Pākehā population groups.[8] In this paper, we describe three of these themes: Pākehā as the norm; equality and the "Treaty"; and one people.

Pākehā as the norm

This pattern of talk constructs Pākehā as the norm, the natural, the ordinary, the nation, although they are almost never named as Pākehā. Failing to name Pākehā as a cultural/ethnic/race group is problematic in two ways. First, it both hides the power, control and influence of the unidentified majority, making Pākehā dominance invisible while affirming the monocultural New Zealand systems. In this pattern the European/White majority are "we" or "our", while Māori are marked as outsiders by "you" or "they", "them" or "theirs".[14] Secondly, the pattern sets up a sense of cultural lacking expressed as either "I don't have a culture" or "as I am not named, I am not included".[20]

> *However I really do think we need to stop trying to portray the whole system as having failed just because some struggle to front up. (4)*

The quote above is a combination of powerful narratives: Pākehā as the norm and "one people", which shift attention from the system to individuals by pointing out the system works for the unnamed majority. The health system is not identified culturally as a Pākehā system; rather it is taken for granted that it follows the norms and standards of "New Zealand culture". Constantly omitting the identity or naming of the dominant group or their culture is a form of ex-nomination that "masks the cultural origins of the state" (p 157).[17]

> *If there is a publicly funded health system, it should operate fairly and justly for all. It is the Crown's responsibility to ensure this is the case. However, the way this Bill is drafted, our publicly funded health system will be subject to conditions that prioritise race over health. (1)*

Any naming of ethnic or cultural groups, such as Māori, is assumed to disadvantage the un-named majority. The quote above negates the evidence that Māori health inequities are mapped to the intergenerational impacts of colonisation and racism on Māori,[8,11] and implies that the Crown's efforts in prioritising Māori health are causing injustices for Pākehā. Māori are viewed as undeserving of access to Crown initiatives wherein submitters assume targeted assistance for Māori indicates less support for Pākehā.

> *This bill imposes, by law, a racially based structure on the whole community. Considerable weight has been given to providing for Māori governance, input and health outcomes, without the same consideration given to all New Zealanders. Health New Zealand (HNZ) has been established with a bias towards Māori. (1)*

The text above sees Māori as a race but does not acknowledge or name the cultural basis, or "norms" of the health system under the *New Zealand Health and Disability Act* (2000); therefore its cultural and by extension racist foundations are invisible. The excerpt above (1) was repeated in at least 45 other submissions, indicating a level of organised opposition to *Pae Ora*.

The following text from submission 2 illustrates how effectively the practice of not describing or identifying the Pākehā majoritarian New Zealand culture allows Pākehā culture to appear as the invisible "common sense".

> *The Bill runs counter to the underlying ethos of New Zealand culture—equality for all. (2)*

A response to the "Pākehā as the norm" pattern of talk is to recognise Pākehā as one culture among many in Aotearoa.[21] Further, to name the Pākehā group as the majority party in health system changes: the proposed change to the current Pākehā-dominated health system seeks to address the health needs of Māori that are determined by Māori.

Equality and the "Treaty"

The selective usage of the English language term "the Treaty of Waitangi" rather than Te Tiriti o Waitangi (the authoritative document)[16] contributes to establishing settler privilege. In the extract below, Article 3 of the draft English Treaty is interpreted as providing a firm foundation for demanding strict equality as a Crown obligation in healthcare. This was typical of the ways in which many submitters ignored or denied evidence that the health system privileges Pākehā individuals.[16]

> *The Crown's obligations are to govern for ALL New Zealanders. The importance of citizenship over race was recognised in article 3 of the Treaty of Waitangi in 1840. All New Zealanders were given the rights of British citizenship and protection of the Crown and to ensure equality of citizenship, with no discrimination. However, I have grave concerns that this bill fails to uphold this obligation and will not achieve its stated purpose. (1)*

This interpretation differs from the supposedly equivalent translation of mana ōrite (Article 3 in Te Tiriti) that accords Māori the equal rights and privileges of their Pākehā counterparts.[16]

Comparable mentions of equality in relation to Article 3 occurred across the submissions, without any reference to Te Tiriti as a whole document that includes Article 1—Kāwanatanga (the Crown governance over own settlers), Article 2—Tino Rangatiratanga (Māori self-determination) and the oral Article 4—Wairuatanga (spirituality).

A response to this "equality and the Treaty" pattern recognises that an equity approach to addressing Māori disparities in health outcomes and access to healthcare is informed by all articles of Te Tiriti o Waitangi. Indeed, the Waitangi Tribunal has put forward "equity" as a Te Tiriti principle to remind the Crown of its obligation to eliminate racism and barriers to care (such as cost and geography) that are more likely to disadvantage Māori.[8]

One people (rights and privileges)

A core feature of this pattern of talk is the importance of treating everyone the same, as one people: the public, taxpayers, New Zealanders.[14] The theme draws on the phrase "he iwi tahi tatou" used by Hobson to acknowledge the signature of each rangatira at Waitangi. This tribal idiom for "we are of one mind about this" has been transformed into a declaration that we will be a unified nation where multiculturalism is tolerated. The "one people" pattern, used in this way, rejects power-sharing models, representing such change as divisive and intolerable.[14,17]

> *The concept of ultimate treatment of all races as equal subjects as envisaged in the original Treaty seems totally ignored. (5)*

> *Giving priority to one race is abhorrent. This is amplified by saying the Crown and health consumers are twins for the purposes of the legislation. S18 provides "to achieve the best possible health outcomes for whānau, hapū, and Māori in general". There is no equivalent provision for non-Maori. And who determines best possible? The hospital that gives you second best, pharmac who gives you an unsatisfactory generic? The idea is fine if applicable to all—but what will the costs be? (2)*

A large number of comments within submissions highlighted "race", in this case with the identification of the Māori Health Authority as a named Māori service. This naming divides and disrupts the notion of the all-encompassing New Zealander. Almost without exception, the submitters remain ex-nominated; they fail to name or acknowledge their own race or cultural affiliations. Rather, they are the norm, "the New Zealander", whose health needs will be less well served by the proposed system:

> *Health New Zealand (HNZ) has been established with a bias towards Māori. This includes introducing a system where two competing organisations, one whose interests are based on race, are established to co-govern the health system. Each will have its objectives, functions and mechanisms, with only one having an obligation to act in the best interests of all New Zealanders. (1)*

> *NZ [New Zealand] is a small country by world standards and we have limited resources to fund public services such as health and education. We are already at the bottom of the OECD for access to new medicines—how is it that Maori and Pasifika healthcare will be prioritized with all the bureaucracy to manage that, without some diminishment of the service provided to all other New Zealanders? (4)*

Further, these submitters may well be assuming that Māori when in positions of authority will act in the same exclusive and monocultural way that

Pākehā have in providing healthcare. Illustrated below is the "very reasonable assertion" that people have different health needs and that health services should be provided on a "needs" basis rather than a "race" basis.

> *The purpose of such an authority can only be to give priority access to publicly funded health services to a section of society based on race rather than on health needs. Although there may be different health needs attributable to race, an effective focus on health needs would easily be able to deal with those differences without reference to race at all from a priority perspective. More generally I cannot support any kind of race based prioritisation or discrimination, whether negative or positive in a free and democratic society as this country has previously fought to become and remain. (3)*

These critiques of the proposed Māori Health Authority illustrate the tyranny of the majority. They do not acknowledge the irrefutable evidence that health services, while serving the needs of the Pākehā majority, have systematically failed to provide adequate healthcare for Māori peoples.[22]

An honest response by Pākehā to the "one people" theme is to understand their place in Aotearoa in relation to Te Tiriti o Waitangi; to acknowledge the tino rangatiratanga (self-determination) of tangata whenua as sovereign peoples; and to recognise the damage caused by colonisation. This response requires a shift from the colonial mindset that presumes the right to govern over Indigenous peoples and accepts a "sharing the sovereign" position.[23] This examination should make explicit the power and privilege that Pākehā people hold within Aotearoa society and actively work to dismantle this hegemonic position.[24]

Discussion and conclusion

The health system transformation aims to improve health outcomes for Māori to a standard that is defined by Māori. It also aims to increase Māori life expectancy to at the very least the same levels currently experienced by Pākehā (European) New Zealanders, leaving no one behind and ensuring we all flourish together.[25] Put simply, improving outcomes for Māori (levelling the floor) will increase the benefits for all (lift the ceiling).

Addressing racism is the challenge that will determine the success of proposed health reforms, according to Māori public health medicine specialist Dr Elana Curtis:[26]

> *Racism in how our systems operate, in how our health professionals engage with Māori patients and their whānau, and the management decisions they make, is an important determinant of health that must be addressed. If it isn't directly named and addressed, this racism will continue regardless of how many health authorities or health entities we create. We will need this detail sorted if we are to have the vision realised with these new health reforms.*

Our findings demonstrate the need to examine language and every day talk as an essential strategy in the anti-racism toolkit. They draw on the large body of work examining and revealing racist discourse within Aotearoa and a long history of negative patterns of talk by Pākehā settlers about Māori.[14,27] A "standard story" of Pākehā race talk uncovers the unexamined benefits and advantages accrued by Pākehā settlers through colonisation, and the power and privilege that Pākehā consequently hold within Aotearoa.[28]

The *Pae Ora* submissions reveal that "standard story" patterns of talk continue to be used to defend the colonial construct of the state of New Zealand where the dominant group is both the norm and culturally unmarked as a people. Several submissions utilised the "one people" pattern to argue that the proposed reforms were creating a race-based health system that favoured Māori to the disadvantage of other New Zealanders. There are other patterns of talk (e.g., Māori privilege and rights) that we hope to explore in future analyses.[14]

Thirty-four years after the release of the first government report into racism in the public service, the Ministry of Health has committed to an anti-racism kaupapa "Ao mai te ra" through Whakamaua: Māori health action plan 2020–2025.[29] "Ao mai te ra", translated as the dawn has come, is in reference to "Puao-te-ata-tu", a new dawn.[25]

To respond to and address racism as part of the vision to achieve *Pae Ora*—healthy futures for all New Zealanders—the Ministry of Health released the *Position Statement and Working Definitions for Racism and Anti-racism in Aotearoa* in August 2022.[30] Our findings demonstrate the types of race-based talk that both sustains opposition to and hinders implementation of health equity initiatives for Māori and all living in Aotearoa. Identifying these patterns will enable Te Whatu Ora – Health New Zealand to partner with Te Aka Whai Ora – Māori Health Authority to design and utilise anti-racism tools that challenge and change the "standard story" narratives making Pākehā power and privilege visible.

Footnote

Generally, in this paper we are referring to Pākehā as the non-Māori European/White majority of settlers in Aotearoa. Pākehā are the group with whom Māori understood they were working with and who have betrayed them since the signing of Te Tiriti o Waitangi. Tauiwi, rather than Pākehā, is the more inclusive term used to encompass all non-Māori peoples who have settled in Aotearoa.

COMPETING INTERESTS

The funders had no roles in study design and collection, analysis, and interpretation of data.

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Ethnic variation in hospitalisation due to treatment injury and complications of healthcare in older adults residing in New Zealand

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ABSTRACT

AIM: To describe the incidence, characteristics, and ethnic variation of hospitalisations for treatment injury and complications of medical or surgical care in older adults in two regions of Aotearoa New Zealand.

METHODS: This observational study analysed treatment-related hospital admissions (>24 hours; index injury from primary or secondary care) among older adults (>50 years) between 2014–2018 in Lakes and Bay of Plenty District Health Boards. Among all admissions due to a treatment injury (n=296) or a complication of healthcare (n=13,850), age-standardised incidence rates per 100,000 were determined by ethnicity and age group.

RESULTS: The rates of admissions for treatment injuries were 30% lower among non-Māori than among Māori (New Zealand's Indigenous population). Complications of healthcare admissions rates were 43% lower among non-Māori than in Māori. Medications were the most common cause (54%) of healthcare complications. Rates of treatment injury and healthcare complications increased with age for both Māori and non-Māori, until the age of 80 years.

CONCLUSION: Ethnic variation in treatment injuries and complications of healthcare between Māori and non-Māori provide further evidence of the existence of inequities in access to quality healthcare in New Zealand. Transparent, publicly available national monitoring of treatment injuries and complications, disaggregated by age and ethnicity, is recommended.

Despite efforts to optimise patient safety, the occurrence of treatment injuries and adverse events in healthcare are inevitable.[1–3] Aotearoa New Zealand has a national no-fault injury compensation scheme (the Accident Compensation Corporation [ACC]) that covers treatment injuries. ACC define treatment injury as an injury that is suffered by an individual during treatment from a health professional, in which the injury is not a necessary component or expected outcome of the medical care given.[4] This encompasses terms such as medical misadventure, medical mishap, patient safety incident, medical injury, and medical error that have led to the unintentional injury of a patient.[5,6] Treatment injury and other adverse events resulting from healthcare contribute to morbidity, mortality, hospitalisations, and workload in healthcare systems worldwide.[3]

A significant proportion of claims are related to treatment injuries, with a higher incidence of these among older populations.[7] There is a paucity of contemporary literature focusing on the rates and characteristics of hospital admissions due to treatment injury in New Zealand, particularly in older adults of different ethnic groups. The most extensive nationwide data analysis of adverse events in healthcare in New Zealand by Davis et al. demonstrated that up to 13% of hospital admissions were due to adverse events in healthcare treatment, with over one third deemed preventable.[1,8] Māori (New Zealand's Indigenous population) and older adults are over-represented in adverse events in New Zealand.[1,5,8–13] Ethnic disparities in the quality of healthcare in New Zealand are evident across multiple specialties and outcome measures.[9,12,14–16]

Discrepancies in treatment injuries between age and ethnic groups could suggest a lack of culturally safe care and the inequitable provision of quality healthcare.[12,14,16,17] Adequate reporting on the rates and characteristics of treatment injuries and the profile of patients experiencing these is essential to inform the provision of quality care provided by health professionals, and to guide potential strategies for mitigating the risks of healthcare treatment.

The aim of this study was to describe the incidence, characteristics, and ethnic variation of hospitalisations for treatment injury and complications of medical or surgical care in older adults in a region of New Zealand with a high proportion of Māori residents.

Method

This observational study was conducted as part of a larger research project involving an iwi-led, community-based injury prevention intervention for older Māori adults within Te Arawa rohe (tribal area), which spans Lakes and Bay of Plenty (BoP) District Health Boards (DHBs).[18]

Treatment-related hospital admissions (>24 hours; index treatment-related injury may have occurred in primary or secondary care) were examined among people aged 50 years and older, residing in and admitted to either of the two DHBs for the 5-year period from 2014–2018. Analysis used the Manatū Hauora – Ministry of Health's National Minimum Dataset (NMDS), which includes all New Zealand public inpatient hospital admissions. ACC use International Classification of Disease (ICD-10) codes to classify treatment injury by mapping these ICD-10 codes to read codes (coding system used in New Zealand primary care). ICD-10 codes were used in this study to identify treatment injury and complications of medical and surgical care (noting that the majority of complications of healthcare are not classified as treatment injuries by ACC). All records where the primary external cause code related to a medical or surgical care related injury (ICD codes Y40-Y84) were included. Cases of "treatment injury" and "complications of medical and surgical care" (Table 1) were described and analysed separately.

Variables of interest included patient demographics (age, gender, ethnicity, DHB location, New Zealand Deprivation Index) and admission characteristics (length of stay and primary cause of admission). Ethnicity was categorised as Māori or non-Māori based on self-identified ethnicity captured in the NMDS.[19] For records with multiple ethnicities, records were allocated to just one ethnic category using the prioritised ethnicity method, where Māori is the highest priority and European is the lowest.[20] This method is currently the New Zealand Ministry of Health's recommendation for managing analysis by ethnicity, and puts a focus on the Māori population.[21] NZDep2018, an area-level deprivation measure, was used to quantify socioeconomic deprivation status.[22]

Descriptive analyses presented include counts, percentages, rates per 100,000 and 95% confidence intervals for Māori and non-Māori, and overall. Chi-squared tests were used to compare demographic characteristics in Māori and non-Māori. Denominator data from the 2018 census came from Statistics New Zealand.[23] In 2018, there were 131,628 people aged 50 or older living in Lakes or BoP DHB, of whom 17.8% identified as Māori. Denominators for non-Māori were calculated as the difference between the total number of usual residents and the Māori usual resident population, so individuals identifying as both Māori and another ethnicity were only counted as Māori (i.e., prioritised, as for the numerator). For the calculation of age-standardised incidence rates, the Māori 2001 census population was used. This more accurately reflects the age structure of the Māori population in New Zealand compared to the World Health Organization's standard reference population, and enables a comparison of rates between ethnic groups while centring Māori in the analysis.[24–27] The use of data from the 2001 census aligns with Manatū Hauora – Ministry of Health recommendations, and notes that the age structure did not change significantly between 2001–2016.[24] In this document it is discussed that the 2018 census would provide an opportunity to review again whether it is still relevant to use 2001 data for standardisation. However, on expert review by a Statistics New Zealand-convened panel (Census External Data Quality panel 2018), the severe under-reporting for Māori was noted as a moderate-high risk for affecting the ability to interpret data in a meaningful way.[25] These aspects all informed the expert opinion and team decision on the use of 2001 census data for standardisation.

Hospitalisation Rate Ratios (RRs) comparing rates among non-Māori with Māori were calculated using Poisson regression, with population denominators as an offset, and adjustment for age, gender, and DHB. To evaluate group differences in rates of treatment injuries between non-Māori and Māori, an interaction term was tested between ethnicity and each of age group, gender, and DHB. Excel (Microsoft Excel, version 16.65) and Stata (StataCorp, version 17) were used for analyses. A p-value <0.05 was considered statistically significant, with no adjustments being made for comparisons that focus on admission characteristics.

Table 1: ICD-10 external cause codes used to identify eligible cases.

Treatment injury cases (ICD-10 codes Y60–Y69)	
ICD10 code group	**Definition**
Y60–Y69	*Misadventures to patients during surgical and medical care*
Y60	Unintentional cut, puncture, perforation, or haemorrhage during surgical and medical care
Y61	Foreign object accidentally left in body during surgical and medical care
Y62	Failure of sterile precautions during surgical and medical care
Y64	Contaminated medical or biological substances
Y65	Other misadventures during surgical and medical care
Y66	Non-administration of surgical and medical care
Y69	Unspecified misadventure during surgical and medical care
Complications of medical and surgical care cases (ICD codes Y40–Y84, excluding Y60–Y69)	
Y40–Y84	*Complications of medical and surgical care*
Y40–Y59	Drugs, medicaments, and biological substances causing adverse effects in therapeutic use
Y70–Y82	Medical devices associated with adverse incidents in diagnostic and therapeutic use
Y83	Surgical operation and other surgical procedures as the cause of abnormal reaction of the patient, or of later complication without misadventure at the time of the procedure
Y84	Other medical procedures as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure at the time of the procedure

Table 2: Demographic characteristics and incidence of treatment injury-related hospitalisations[1] in people aged 50 or older residing in Lakes and Bay of Plenty District Health Boards (2014–2018) (n=296).

	Demographic characteristics (column %)			**Age-standardised rate per 100,000 people[†] (95%CI)**		**Adjusted RR[3] for non-Māori compared to Māori (95%CI)**
	Total N=296	Māori N=53	Non-Māori N=243	Māori N=53	Non-Māori N=243	p-value
Number of admissions	296	53	243	46.6 (33.9, 59.3)	35.5 (30.1, 40.9)	0.70 (0.51, 0.95) **p=0.02**
Gender						
Female	137 (46.3%)	25 (47.2%)	112 (46.1%)	41.3 (24.9, 57.8)	29.8 (23.1, 36.5)	0.68 (0.43, 1.07) p=0.09
Male	159 (53.7%)	28 (52.8%)	131 (53.9%)	52.5 (32.9, 72.1)	41.7 (33.2, 50.2)	0.72 (0.47, 1.10) p=0.13
Age (in years)						
50–59	67 (22.6%)	19 (35.8%)	48 (19.8%)	34.9 (19, 50.7)	27.7 (19.7, 35.7)	0.80 (0.47, 1.37) p=0.42
60–69	79 (26.7%)	19 (35.8%)	60 (24.7%)	53.5 (29.4, 77.5)	34.1 (25.4, 42.9)	0.63 (0.37, 1.05) p=0.08
70–79	89 (30.1%)	13 (24.5%)	76 (31.3%)	82.2 (37.4, 127.0)	57.7 (44.6, 70.8)	0.66 (0.37, 1.20) p=0.17

Table 2 (continued): Demographic characteristics and incidence of treatment injury-related hospitalisations[1] in people aged 50 or older residing in Lakes and Bay of Plenty District Health Boards (2014–2018) (n=296).

	Demographic characteristics (column %)			**Age-standardised rate per 100,000 people[†] (95%CI)**		**Adjusted RR[3] for non-Māori compared to Māori (95%CI)**
Age (in years)						
80+	61 (20.6%)	+	59 (24.3%)	35.5 (0.0, 84.6)	92.3 (68.1, 116.4)	0.65 (0.15, 2.82) p=0.57
District health board						
Bay of Plenty	198 (66.9%)	31 (58.5%)	167 (68.7%)	45.0 (29.0, 60.1)	32.8 (26.8, 38.9)	0.67 (0.45, 1.00) p=0.05
Lakes	98 (33.1%)	22 (41.5%)	76 (31.3%)	49.5 (28.6, 70.4)	42.5 (31.4, 53.5)	0.72 (0.44, 1.18) p=0.19

1 Including hospitalisations where the primary external cause code was an ICD-10 code Y60–Y69.
2 Age-standardised to Māori 2001 census population.
3 Hospitalisation Rate Ratio (RR) has been calculated using Poisson regression, with population denominators as an offset and adjusted for age, gender, and DHB.

Table 3: Admission characteristics of treatment injury-related hospitalisations in Lakes/Bay of Plenty District Health Boards (2014–2018)—column % (n=296).

Variable	**Total**	**Māori**	**Non-Māori**
Number of admissions	296	53	243
Nature of complication (primary external cause code)			
*Unintentional event in surgical operation**	197 (66.6%)	31 (58.5%)	166 (68.3%)
Foreign object left in body during surgical or medical care	6 (2.0%)	+	6 (2.5%)
Blood or fluid transfusion error	4 (1.4%)	+	3 (1.2%)
Other specified misadventure during surgical/ medical care	84 (28.3%)	19 (38.5%)	65 (26.7%)
Unspecified misadventure in surgical/ medical care	5 (1.7%)	+	3 (1.2%)
Length of stay			
1 day	30 (10.1%)	3 (5.7%)	27 (11.1%)
2–3 days	50 (16.9%)	11 (20.8%)	39 (16.0%)
4–10 days	116 (39.2%)	22 (41.5%)	94 (38.7%)
11–20 days	70 (23.6%)	10 (18.9%)	60 (24.7%)
21+ days	30 (10.1%)	7 (13.2%)	23 (9.5%)

**Unintentional event in surgical operation = unintentional cut, puncture, haemorrhage, or perforation.*
+ n=<3, data suppressed.

Table 4: Demographic characteristics and incidence of hospitalisations involving a complication of medical and surgical care[1] in people aged 50 or older residing in Lakes and Bay of Plenty District Health Boards (2014–2018) (n=13,850).

	Demographic characteristics (column %)			**Age-standardised rate per 100,000 people[2] (95%CI)**		**Adjusted RR[3] for non-Māori compared to Māori (95%CI)**
	Total N=13,850	Māori N=2,991	Non-Māori N=10,859	Māori N=2,991	Non-Māori N=10,859	p-value
Number of admissions	13,850	2,991	10,859	2,485.3 (2,401.3, 2,569.3)	1,311.6 (1,282.1, 1,341.2)	0.57 (0.54, 0.59) **p<0.001**
Gender						
Female	6,621 (47.8%)	1,490 (49.8%)	5,131 (47.3%)	2,284.9 (2,174.0, 2,395.7)	1,170.0 (1,130.8, 1,209.3)	0.56 (0.53, 0.60) **p<0.001**
Male	7,229 (52.2%)	1,501 (50.2%)	5,728 (52.7%)	2,727.5 (2,599.5, 2,855.6)	1,470.9 (1,426.5, 1,515.4)	0.57 (0.54, 0.61) **p<0.001**
Age (in years)						
50–59	2,273 (16.4%)	908 (30.4%)	1,365 (12.6%)	1,636.5 (1,533.2, 1,739.8)	763.7 (723.1, 804.2)	0.48 (0.44, 0.53) **p<0.001**
60–69	3,448 (24.9%)	990 (33.1%)	2,458 (22.6%)	2,751.3 (2,592.2, 2,910.4)	1,409.3 (1,354.9, 1,463.7)	0.54 (0.50, 0.58) **p<0.001**
70–79	4,010 (29.0%)	752 (25.1%)	3,258 (30.0%)	4,581.6 (4,292.5, 4,870.8)	2,419.4 (2,340.4, 2,498.3)	0.54 (0.50, 0.59) **p<0.001**

Table 4 (continued): Demographic characteristics and incidence of hospitalisations involving a complication of medical and surgical care[1] in people aged 50 or older residing in Lakes and Bay of Plenty District Health Boards (2014–2018) (n=13,850).

	Demographic characteristics (column %)			**Age-standardised rate per 100,000 people[2] (95%CI)**		**Adjusted RR[3] for non-Māori compared to Māori (95%CI)**
Age (in years)						
80+	4,119 (29.7%)	341 (11.4%)	3,778 (34.8%)	5,860.9 (5,337.4, 6,384.3)	5,209.8 (5,060.7, 5,359)	0.92 (0.83, 1.03) p=0.16
District health board						
Bay of Plenty	9,322 (67.3%)	1,807 (60.4%)	7,515 (69.2%)	2,411.8 (2,306.6, 2,517.1)	1,203.2 (1,169.9, 1,236.5)	0.52 (0.50, 0.55) **p<0.001**
Lakes	4,528 (32.7%)	1,184 (39.6%)	3,344 (30.8%)	2,595.7 (2,457.2, 2,734.3)	1,601.8 (1,540.1, 1,663.4)	0.65 (0.61, 0.69) **p<0.001**

[1] Including hospitalisations where the primary external cause code was an ICD-10 code Y40–Y84, excluding treatment injuries (Y60–Y69).
[2] Age-standardised to Māori 2001 census population.
[3] Hospitalisation Rate Ratio (RR) has been calculated using Poisson regression, with population denominators as an offset and adjusted for age, gender, and DHB.

Table 5: Characteristics of complications of medical and surgical care-related hospitalisations in Lakes/Bay of Plenty District Health Boards (2014–2018)—column % (n=13,850).

Variable	Total	Māori	Non-Māori
Number of admissions	13,850	2,991	10,859
Nature of complication (primary external cause code)			
Medication related (Y40–Y59)	7,479 (54.0%)	1,679 (56.1%)	5,800 (53.4%)
Medical devices associated with adverse incident (Y70–Y82)	58 (0.4%)	13 (0.4%)	45 (0.4%)
Surgical operation with later* complication/ reaction (Y83)	4,142 (29.3%)	742 (24.8%)	3,400 (31.3%)
Medical procedures with later* complication/ reaction (Y84)	2,171 (15.7%)	557 (18.6%)	1,614 (14.9%)
Length of stay			
1 day	2,599 (18.8%)	514 (17.2%)	2,058 (19.2%)
2–3 days	3,672 (26.5%)	826 (27.6%)	2,846 (26.2%)
4–10 days	5,317 (38.4%)	1,201 (40.2%)	4,116 (37.9%)
11+ days	1,582 (11.4%)	325 (10.9%)	1,257 (11.6%)
21+ days	680 (4.9%)	125 (4.2%)	555 (5.1%)

*Later = abnormal reaction or complication occur ring after the operation/procedure, without mention of misadventure at the time of the procedure.

Ethics approval for the parent study was obtained from the Auckland Health Research Ethics Committee (Reference: AH22920).

All data was deidentified and stored in password protected files.

Results

During the five-year period reviewed, there were 28,123 injury-related acute admissions to hospitals in the Lakes or BoP DHB among people that were residents of these DHBs and aged 50 years and older. Of these, 296 cases had admissions that were related to a treatment injury (Y60–Y69) and a further 13,850 cases were admitted for complications of medical and surgical care (Y40–Y84).

Treatment injuries

Demographic characteristics

Of the 296 treatment injury cases, males accounted for over half (53.7%), and the median age was 70 years old. People identifying as NZ European (NZE) or European Other made up 79.1% of treatment injury hospitalisations over the period reviewed, followed by Māori (17.9%), Asian (2%), and Pacific People (1.0%). Māori were typically younger than their non-Māori counterparts (p=0.001), with 71.6% of Māori patients aged between 50–69 years compared with only 44.5% of non-Māori (Table 2). Māori patients admitted for treatment injury hospitalisations had high rates of deprivation, with over two thirds (n=37/53; 69.8%) residing in the most deprived quintile. A significantly lower proportion (24.3% [n=59/243]) of non-Māori patients were in the fifth quintile (p<0.001).

The rate of admission for treatment injuries was 30% (95% CI 5% to 49%) lower among non-Māori than among Māori (adjusted for gender, age group, and DHB) (Table 2) (p=0.02). There were no statistically significant interactions between ethnicity and gender (p=0.87), age group (p=0.92), or DHB (p=0.77) within the relatively small numbers of this dataset.

Admission characteristics

An “unintentional cut, puncture, perforation, or haemorrhage during surgical and medical care” was the most common nature of the complication for patients in the treatment injury group, accounting for 66.6% (n=197/296) of events (58.5% for Māori compared to 68.3% for non-Māori). Admissions as a result of “other specified misadventure during surgical or medical care” accounted for the majority of the remaining treatment injury cases (28.0%), with no further details of the type of misadventure available in the extracted data.

More than two thirds (n=216/296; 72.9%) of admissions due to treatment injury resulted in a length of hospital stay of 4 or more days. The median stay for both Māori and non-Māori was 7 days, with a mean of 10.3 days for Māori and 10.5 days for non-Māori.

Complications of medical and surgical care

Demographic characteristics

Of the 13,850 cases related to “other complications of medical and surgical care”, males accounted for 52.7% (n=7,229/13,850) and the median age of all cases was 73 years old (Table 4). People identifying as NZ European or European Other made up 76.0% of hospitalisations that were due to complications of healthcare, followed by Māori (21.6%), Pacific Islander (1.4%), Asian (0.4%), Indian (0.5%) and African (0.1%).

Māori patients with complications of healthcare were younger than non-Māori patients (p<0.001), with 63.5% (n=1,898/2,991) of Māori cases aged between 50–69 years compared with only 35.2% (n=3,823/10,859) of non-Māori cases in the same age group (Table 4). Māori hospitalisations due to a complication of healthcare were disproportionately represented by patients with a higher index of deprivation, with 62.7% (n=1,876/2,991) of Māori being in the most deprived area (quintile 5) compared with only 28.4% (n=2,085/10,859) of non-Māori (p<0.001).

The rate of admission for injuries related to a complication of medical and surgical care was 43% lower (95% CI 41% to 46% lower) in non-Māori than in Māori (adjusted for gender, age group, and DHB in Table 4) (p<0.001). There was no statistically significant interaction between ethnicity and gender (p=0.17), indicating that the difference between males and females did not vary by ethnicity. However, there were significant interactions between ethnicity and age group (p<0.001) and DHB (p<0.001), indicating that the difference between non-Māori and Māori did vary significantly by these two variables. Ethnic differences in rates were present in those aged under 80 (p<0.001); however, for those aged over 80, there was not a significant difference in hospitalisation rates for complications of care between non-Māori and Māori (p=0.16) (Table 4).

There was a significantly higher hospitalisation rate for non-Māori in Lakes DHB compared to non-Māori in BoP (p<0.001), but no significant difference in rates between these two areas for Māori (p=0.141).

Admission characteristics

Māori and non-Māori hospitalisations relating to a complication of medical or surgical care demonstrated similar trends in the following characteristics of their admissions. The most common nature of the complication was related to medications and "the adverse effects of their therapeutic use", accounting for 54.0% of these hospitalisations (n=7,479/13,850) (Table 5). This was followed by complications in surgical operations (n=4,124/13,850, 29.3%). Of the total number of hospitalisations related to a complication of healthcare, 83.7% of these had a length of stay in hospital of 10 days or less, with the median length of stay being 4 days for both Māori and non-Māori groups.

Discussion

This analysis of treatment-related hospital admissions among older adults in the Lakes and BoP DHBs has demonstrated significant ethnic differences, with non-Māori admission rates for both treatment injuries and complications of care being significantly lower than Māori rates. A greater proportion of Māori patients were from areas of higher deprivation compared to non-Māori for admissions related to both treatment injury and complications. Over half of all admissions due to a complication of medical or surgical care were medication related, followed by complications in surgical operations. Rates of admission for treatment injury and complications increased with age for both Māori and non-Māori, until the age of 80 years.

Ethnic disparities in the rates of admission due to treatment injury and complications of care evident in this study suggest inequities in the quality of healthcare for different ethnic groups in New Zealand. The recent study by Reid et al. showed that there are lower rates of primary care utilisation among Māori than non-Māori, revealing a $49 million annual government funding underspend associated with this ethnic gap.[28] Although Māori aged over 65 years in the Reid study were more likely to utilise primary care than non-Māori, they had higher rates of hospitalisations that were deemed potentially preventable through primary care interventions (ambulatory sensitive hospitalisations).[28] This suggests that older Māori health needs are not met by the availability and quality of primary care provided, which is consistent with the findings from the current study.

There is a strong body of literature demonstrating that Māori have greater barriers to accessing healthcare, have poorer health outcomes, and are more likely to have poorer experiences of care than non-Māori.[12,14,16] Evidence specific to the quality of healthcare for Māori is less extensive, particularly in the context of treatment injury. Although Māori were more likely than non-Māori to be hospitalised due to treatment-related care in our study, ACC information requested under the Official Information Act showed that Māori were less likely to have accepted ACC claims for treatment injuries.[29] The standardised accepted treatment injury claim rates per 10,000 population was 22.1 for Māori, 34.0 for Pacific, 10.0 for Asian and 34.6 for "Other". This data was for the same age groups, time period, and two regions as our study data, and suggests that there are likely inequities in access to ACC resourcing for treatment injuries for Māori. In a review of unplanned re-admission or deaths within a 30-day period following a defined set of inpatient surgical procedures, Rumball-Smith et al. found that Māori had 16% higher odds of an event compared to NZ Europeans.[15] Significant ethnic differences in rates of treatment injuries and complications of care identified in the current study align with the minimal existing literature; however, there is a need for further research in this area at a national scale. Adequate reporting of this data, and any disparities in rates by ethnicity, is key to estimating the impact of these issues for Māori and guiding strategies for how to reduce their frequency and to improve outcomes.[11,16] Given the ethnic variation between treatment-related hospitalisations and ACC claim acceptance between Māori and non-Māori, review of ACC process around treatment injury claims should be undertaken. This review should include clarity and transparency of data relating to ACC claims and whether this information is understandable and easy for Māori to access. In addition, further investigation of the small proportion of complications of medical and surgical care that are classified and accepted as treatment injuries by ACC is also warranted.

Socio-economic disparities in healthcare quality reflect how the wider determinants of health impact on health outcomes.[16] The current study shows that

Māori patients hospitalised due to a treatment injury or complication of healthcare were more likely to reside in more deprived areas compared to non-Māori. These findings demonstrate an association between the wider determinants of health and rates of treatment injury and complications of care, consistent with other New Zealand literature.[15,16,30] In addition to deprivation, the interaction between rural and urban living has also been explored with reference to inequitable health outcomes for Māori. Crengle et al. revealed higher rates of amenable mortality in rural Māori compared to urban Māori, indicating differences in access to and quality of care in the rural groups of Māori in New Zealand.[31] The interaction between rurality and treatment injuries/complications of care warrants further investigation.

The majority of hospitalisations due to complications of care were medication related, in which Māori were overrepresented. An earlier New Zealand study of ACC primary care treatment injury claims among the general population also found that the majority were medication-related.[2] Medication-related adverse events are the most common and most preventable harm associated with healthcare.[32,33] This study supports these findings and shows that while medicines are key causes of adverse outcomes, they also contribute towards an inequitable increase in hospitalisation rates for older Māori. The lack of robust evidence exploring the ethnic variation in the quality use of medicines for older adults in New Zealand has been highlighted as an issue, despite higher rates of chronic and comorbid diseases, and subsequent higher rates of medication use, in older age.[17,34,35] Older Māori have been shown to have reduced access to appropriate medications and have increased adverse medicine effects from inappropriate prescribing.[16,17,34] This supports a need for further research looking at strategies to facilitate optimal medicines use among older Māori adults, which balances therapeutic potential with risk of harm.

The incidence of both treatment injuries and complications of medical and surgical care resulting in hospital admission increased with age until the age of 80 for both Māori and non-Māori in the present study. Existing New Zealand and international literature shows older adults are disproportionately represented in rates of serious adverse events and treatment injury claims.[1,7,10,11,17,32] The current study adds to this picture, additionally revealing variation in treatment injury and complication rates *within* the older age group. This highlights the need for age-focused strategies to promote better outcomes for older patients, such as implementation of pharmacist-led medicine optimisation interventions, using "early rehabilitation after surgery" protocols, and having regular involvement of geriatricians and nurse specialists in older inpatient care.[32,36,37]

The utilisation of routinely collected population level data is a strength of this study, and the methods used provide an approach which could be replicated to explore ethnic trends in quality of care at a national level. Sources of selection bias and information bias were minimised using prespecified eligibility criteria and analysis methods. However, the study needs to be considered in light of several limitations. The relatively small number of treatment injury cases (n=296) limited our ability to investigate associated factors. For example, details of the location (i.e., hospital or community based) of the original health intervention leading to the hospital admission and further information of the complications (e.g., medication group or type of surgical misadventure) would be useful and could guide prevention strategies of such events in the future. The classification of treatment injuries and complications of care is reliant on correct coding by trained coders within the hospital system and is open to interpretation. As such, the possibility of misclassification in the coding of primary external cause codes cannot be ruled out. Although we were able to obtain ACC treatment injury claims data through an Official Information Act request, we were not able to cross reference our findings with ACC claims data, which is a potential weakness of this study. Due to the nature of the study relying on routinely collected data, there is an absence of information that could help with the interpretation of the study findings and the implications for prevention, such as the context in which the incident occurred, comprehensive comorbidity information, the severity of injury, and more detailed outcome data. A method has been developed to improve identification of chronic comorbidities from NMDS data, but this requires five years of data prior to the study period and was beyond the scope of this study.[38] The collection of this additional information should be considered in future research and may be most suited to a prospective study design. Our data is specific to older adults residing in Lakes and BoP DHBs, and while this limits the generalisability of these findings, similar trends are likely to be present in other parts of New Zealand.

This study highlights inadequacies in the provision of and access to quality and equitable healthcare for Māori.[9,12,16,28] Further investigation of the total incidence of treatment injury and complications that are responsible for hospital admissions in New Zealand is required to fully understand the impact of these on our healthcare system and on older Māori populations at a national level. Improved national reporting on these events, including disaggregation by age and ethnicity, can guide future healthcare improvement strategies to enhance the safety of older adults utilising primary and secondary healthcare services. The recent New Zealand health system reform and establishment of Te Pou Hauora Tūmatanui – the Public Health Agency, a unit to provide public health leadership and focus on enabling equity in health outcomes in New Zealand, provides an opportunity for this directorate to take responsibility for such monitoring, reporting, and subsequent action to improve inequities.

These novel findings regarding treatment injury and healthcare complications in a region of New Zealand with high numbers of Māori have highlighted significant ethnic disparities in treatment injury and complication hospitalisations which we posit as a marker of healthcare quality, likely to be evident in other parts of New Zealand, and internationally.

COMPETING INTERESTS

Nil.

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Informed consent for medical student involvement in patient care: an updated consensus statement

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ABSTRACT

Enabling patients to consent to or decline involvement of medical students in their care is an essential aspect of ethically sound, patient-centred, mana-enhancing healthcare. It is required by Aotearoa New Zealand law and Te Kaunihera Rata o Aotearoa Medical Council of New Zealand policy. This requirement was affirmed and explored in a 2015 Consensus Statement jointly authored by the Auckland and Otago Medical Schools. Student reporting through published studies, reflective assignments and anecdotal experiences of students and teachers indicate procedures for obtaining patient consent to student involvement in care remain substandard at times. Between 2020 and 2023 senior leaders of Aotearoa New Zealand's two medical schools, and faculty involved with teaching ethics and professionalism, met to discuss these challenges and reflect on ways they could be addressed. Key stakeholders were engaged to inform proposed responses. This updated consensus statement is the result. It does not establish new standards but outlines Aotearoa New Zealand's existing cultural, ethical, legal and regulatory requirements, and considers how these may be reasonably and feasibly met using some examples.

It is a moral requirement that health systems in Aotearoa New Zealand and healthcare professional training institutions uphold principles of equity and social accountability, give effect to Te Tiriti o Waitangi and support patients' rights. Medical students are expected to adopt these commitments. They are made aware of this during their sustained programme of medical ethics and law teaching and in clinical placements. Understanding and respecting the concept and process of consent is a central aspect of their professional development.[1]

The legal requirement for consent is set out in the Code of Health and Disability Services Consumers' Rights (hereafter "the Code").[2] The Code specifies 10 patient rights, including the right to be treated with respect (Right 1), the right to effective communication (Right 5), the right to be fully informed (Right 6) and the right to make an informed choice and give informed consent (Right 7). Consent is important for several reasons. It is an essential aspect of respecting patients and their autonomy, establishing rapport, building trust and promoting a positive doctor-patient relationship.[3,4] When managed well it empowers patients to actively engage with healthcare services and can increase patient participation in treatment.[5] It can also support cultural safety,[6,7] vital for good patient care and emphasised in two recent Te Kaunihera Rata o Aotearoa Medical Council of New Zealand (MCNZ) statements.[8,9]

Links between informed consent and Te Tiriti o Waitangi are evident in the Te Manatū Hauora – Ministry of Health's Whakamaua: Māori Health Action Plan, which reiterates the role of Te Tiriti o Waitangi within health service systems and delivery.[10] The positioning of article two of Te Tiriti o Waitangi within this document aligns with the concept of mana motuhake, the "*right for Māori to be Māori (Māori self-determination), to exercise authority over their lives and live on Māori terms and according to Māori philosophies, values and practices including tikanga Māori*" (p. 14).[10]

Involvement in patient care is essential in learning to be a doctor. The Code extends to circumstances when a patient is participating in the teaching and training of providers, including medical students. It specifies patients have the right to be notified of any proposed participation in teaching (Right 6[d]). The MCNZ statement on informed consent includes a requirement to obtain patients' consent if students attend consultations or participate in their care (see Box 1). Specific consent for student involvement in care is necessary because it is important for patients to know who will be involved in their care and why. This is particularly significant in the case of student involvement because students are not registered health professionals. Failing to obtain consent to student involvement could seriously undermine patient trust and confidence and cause considerable distress. An indicator of mana motuhake within the health system is Māori patients having relevant and appropriate information to support confidence in providing informed consent, including who is involved in their care and the purpose for which they are involved.

In response to concerns about the adequacy of informed consent to student involvement in patient care,[11] a National Consensus Statement on Informed Consent specifically for medical students and supervisors was published in 2015.[12] It aimed to promote and guide a pragmatic, appropriate and consistent approach to seeking patients' consent when medical students are to be involved in their treatment and care. Anecdotally, students find this consensus statement helpful and empowering. Nevertheless, some deficiencies persist in processes for obtaining consent for medical students' involvement in patient care.[13–16]

Addressing challenges

Medical students learning in clinical environments assume a range of roles and responsibilities, from passive observation through to directly providing care to an individual patient under supervision (in this statement "involvement in care" includes all such roles and responsibilities). As students transition from novice to senior, patient interaction becomes an increasingly important part of their learning. Senior students (trainee interns) are integral members of healthcare teams providing care in hospitals and general practices. Interactions between patients and medical students often occur in busy settings: clinical staff are under pressure, turnover of patients is rapid and opportunities to ask for consent are limited.

The variations in where and how students are involved in patient care affect how consent to their involvement can be obtained. Realising patient rights in such circumstances is not always straightforward. Policies to uphold patients' rights regarding student involvement need to be tailored to each kind of learning environment, the different ways students interact with patients, and their increasing participation in healthcare provision as their learning progresses. Policies should centre on positive and engaging experiences for patients and their whānau, and be proportional to their needs and priorities. Overstating the impact of student involvement can have the perverse consequence of adding unnecessarily to patient stress. Pragmatic solutions are needed to ensure the consent process is not unsettling or arduous for patients, or unworkable for staff.

During 2020–2023 senior leaders of Aotearoa New Zealand's medical schools, and faculty involved with teaching ethics and professionalism, met to discuss these issues. The aim was to gather expertise and reported experiences of peers working across a range of contexts, to identify factors influencing substandard practices and consider how these could be addressed. Various stakeholders were engaged at different stages to evaluate possible solutions and provide feedback on draft versions of the statement (these included chief medical officers, the Health and Disability Commissioner, the Medical Council of New Zealand, the New Zealand Medical Students' Association and the Council of Medical Colleges). This updated consensus statement is the outcome. It contains a list of key principles and considerations, including responsibilities for obtaining consent, the consent process and disclosure of information, documenting consent, sensitive examinations and procedures, patients who may not be able to consent, health information, care at home and remote care.

This statement does not establish new standards but outlines Aotearoa New Zealand's existing cultural, ethical, legal and regulatory requirements, and considers how these may reasonably be met in some selected practical ways. It affirms proper consent processes as essential for culturally safe and Tiriti-informed care, incorporates recent MCNZ guidance, describes responsibilities of institutions and individuals to ensure consent processes are adequate and clarifies the level of information that should be provided and the processes that should be followed across the range of contexts in which medical students learn.

Key principles and considerations for obtaining consent for student involvement in patient care

1. Responsibilities for obtaining consent

Ensuring that student participation in patient care always occurs with the necessary consent requires coordinated efforts in healthcare systems.

Box 1: Selected extracts from the 2021 Te Kaunihera Rata o Aotearoa I Medical Council of New Zealand (MCNZ) statement on informed consent.[6]

What is informed consent?

Every time treatment is provided, a doctor must have permission to provide that treatment. The process of obtaining that permission is called "informed consent". Without informed consent, the treatment may be unlawful. To help the patient decide whether they want a treatment, they first need to be given information, such as the risks and benefits of their treatment options.

In this statement, we use the words "treat" and "treatment" to refer not just to one-off or specific clinical encounters and procedures, but also to ongoing care.

When care is provided in a teaching environment

You must have a patient's permission in advance, if students or observers attend a consultation or participate in a patient's care. Pay particular attention when sensitive issues are discussed. You must obtain explicit consent for any intimate examination.

Explain to the patient:

a) the status and clinical experience of those attending;

b) the role and involvement of those attending (such as whether they will be observing, or participating in the care by taking a clinical history or examining the patient);

c) what is expected of those attending;

d) at any point in time, they have the right to refuse the involvement of those attending.

The levels of responsibility are outlined below.

1.1 The primary responsibility for ensuring consent is obtained for student involvement in a patient's care lies with the registered health professionals responsible for that patient at the time.

1.2 Organisations providing healthcare have a responsibility to ensure appropriate consent is obtained for all aspects of patient management, including the involvement of medical students in the care of patients. The workplace environment should facilitate the gaining of consent and promote awareness that the organisation participates in teaching and that medical students might be involved in patient care. Healthcare organisations have responsibility:

a. for the overall healthcare system and ensuring consent processes can be carried out and patients' rights to decide are respected;

b. for taking institution-wide measures to inform patients about teaching activities and their rights;

c. for ensuring processes for seeking consent are appropriate and proportionate; consent processes should be streamlined in so far as this supports patient rights, for example by including standard language in consent forms about proposed student involvement.

1.3 Students are classified as healthcare providers under the Code, and assume relevant obligations, including being accountable for ensuring consent has been given before they observe or become involved in a patient's care (see Boxes 2 and 3). While many patients are ready to support students in their learning and are willing for them to be involved in their care, most expect to be asked, and some are less comfortable.[4,17–19] Medical students should actively assess how patients and their whānau feel about their involvement (see Box 3). If they perceive discomfort, they should have a low threshold for disengaging. This is a matter of basic courtesy, sensitivity and good practice. As part of supporting cultural safety, staff and students need to be aware of how implicit or explicit biases, values or assumptions may hamper their ability to identify a patient's concerns.

2. The consent process and disclosure of information

The essential elements of consent are well established: patients who are competent must be given sufficient information and time to reach

Box 2: Patients on wards and the responsibility for obtaining consent.

Ward rounds: Patients should be made aware students are participating in ward rounds, and that they have a choice about whether or not students are present when a doctor attends them. Students should be introduced to patients unless it is inappropriate in the circumstances.

Teaching on wards: Permission should be obtained from patients at a convenient time (for example on a ward round) for students to seek consent to obtain histories or conduct examinations.

Before students approach patients, e.g., to take a history or measure blood pressure, students must seek permission from an appropriate member of that patient's healthcare team (doctor, charge nurse or nurse caring for the patient). Once permission has been obtained to approach the patient, the student should introduce themselves to the patient, explain they are a student, and re-gain verbal consent from that patient before proceeding further. Where reasonably practicable, the student should make a record in the patient notes e.g.: "Mr/s/x Smith, Year 4 medical student, examined Mr/s/x Jones—verbal consent obtained". An additional benefit of this approach is to indicate how many students have interacted with the patient, and ensure individual patients are not approached too often.

voluntary decisions regarding their healthcare. Patients whose competence is compromised must still be given information in a way they can understand and the opportunity to decide for themselves where possible. Here we lay out some ways these essential elements apply to consent to student participation in, and observation of, care.

2.1 Patient consent should be appropriately informed, i.e., the patient (or another person as legally appropriate) should understand what they are granting permission for. This requires conversation and communication, which includes listening to patients, appreciating how their cultural background may influence their decision making, as well as giving them information. It is important to be sensitive to and recognise perceived or real imbalances in power between patients and healthcare providers, and patients and others involved in their care, including whānau, friends, carers or employers. The most important element of obtaining consent is the two-way conversation between the doctor and the patient. Whānau may also need to be involved.

2.2 Consent from the patient should generally be obtained before a medical student is involved in any patient's care, including observation of consultations and clinical procedures.[4,20] In almost all circumstances, students should only undertake an examination, provide treatment or perform a procedure when the patient has explicitly consented to this. The exceptions to this are very limited, e.g., time-critical situations where a patient is unconscious and the student's involvement is urgently needed to provide or contribute to life-saving treatment. (See also 5.2 and 6.)

2.3 Where possible, patients (and those involved in their care) should be informed about the proposed extent and nature of student involvement. There are many ways in which student involvement might occur, ranging from reviewing notes and X-rays, observing on a ward round, taking histories and performing examinations, assisting in operations and conducting procedures under direct supervision or independently. Conducting a necessary procedure may be primarily for educational benefit if there is no shortage of trained clinicians to do the procedure. Conversely, students may contribute to care in ways that are primarily for the patient's benefit, and yet the student will still gain valuable learning.

2.4 Patient consent is not a one-off event or simply an exercise in "ticking boxes". Rather, it involves a process of building and maintaining a relationship, whether brief or sustained, based on communication and trust.[3] Those involved should always remain sensitive to changes in each patient's comfort with the presence of students and their involvement in care.

2.5 The consent process can and should be proportional to the involvement of the medical student, the nature of the interaction, and consequent risk or inconvenience to the patient. Proportionality entails assessing what a reasonable patient, in that patient's circumstances, would expect to be informed about, and how. Consent can usually be simple, verbal, informal and taken in the context of routine verbal interactions between practitioners and patients, particularly when student involvement is limited.

2.6 When student involvement will be limited to observation or carrying out routine, low-risk procedures under supervision, broad patient consent can be sought. When the risks are higher for patients, or where student involvement is more significant or invasive (e.g., performing a sensitive examination or procedure), specific consent is required. More information about the proposed student involvement must be given, and the patient should have more time to consider their response. Broad consent must not be taken as consent to conduct sensitive examinations while under anaesthesia or procedures with material risk (see Table 1 and Boxes 4 and 5).

2.7 Consent can be sought verbally or in written form depending on the context. For instance, surgical consent forms could indicate proposed student observation of a procedure and minor participation, and enable a patient to indicate their decision.

2.8 In order to consent to student involvement, patients must understand what a medical student is and how their involvement might differ from that of registered doctors. Many patients do not understand the term “medical student” or “student doctor” unless it is explained. The former is preferable, and a brief clarification should be included in general informational material provided to patients. This should be emphasised during conversations about medical students’ involvement in patients’ care. Name badges clearly indicating the wearer is a medical student are also important.

2.9 Patients need to know they have a choice about the involvement of medical students, and they are entitled to change their mind at any time. Patients should never feel coerced or pressured into providing consent. Supervisors and students need to be considerate of the ways a patient may feel pressured to consent (e.g., a supervisor asking in front of a student may make it harder for a patient to refuse).[20]

3. Documenting consent

3.1 Where reasonably practicable, verbal consent to (or refusal of) student involvement should be documented along with any limitations to the kinds of student involvement consented to. Written consent is required for student involvement in more substantive procedures performed under anaesthesia (including sensitive examinations).

3.2 Procedural consent forms should include a section to document broad patient consent to the involvement of medical students in observing or contributing to surgery, anaesthesia and other basic clinical activities undertaken in operating theatres, under direct supervision of an appropriate registered health professional (note Right 7.6 of the Code).

4. Sensitive examinations and procedures

4.1 Sensitive examinations bring students into contact with patients in ways that can make patients feel vulnerable. They require trust and attention to the patient’s responses to perform safely. If not performed with care, sensitive examinations can be experienced as violations. Examinations of certain areas of the body (breast,

Table 1: Examples of activities in surgery and anaesthesia (with direct supervision) typically included under broad consent for student involvement, and others requiring specific consent.

Broad consent can be used for basic clinical activities, e.g.: • Observation • Maintaining a patient’s airway • Bag mask ventilation • Holding a retractor • Cutting sutures • Examining surgical pathology or normal anatomy (excluding sensitive examinations)
Specific consent is needed for more substantive procedures, e.g.: • Sensitive examination • Catheterisation • Endotracheal intubation (because of the risk of damage to teeth or causing a sore throat) • Insertion of an IV line or arterial line

Box 3: Questions medical students can ask themselves or the patient to determine if appropriate consent has been sought.

- Does the patient understand my involvement in their medical treatment and care?
- Does the patient understand how long I will spend with them and the sorts of activities I will undertake?
- Does the patient know they can refuse to have me involved in their care?
- Has the patient had time to ask questions?
- Does the patient want whānau, a support person, or a chaperone involved in any discussions, examinations or procedures?

Box 4: Some practical points regarding intensive care and anaesthesia attachments.

It is important for intensive care units (ICU) to provide information in the form of signage and pamphlets explaining medical students may be present and involved in the care of patients. Most patients in ICU are very vulnerable. Except where it is possible and appropriate to obtain explicit consent for greater student involvement from the legal representative, the role of medical students in ICU should usually be restricted to observation.

Students allocated to an anaesthetic run may anticipate attending a particular list with a named anaesthetist/surgeon, and the anaesthetist/surgeon may obtain consent to student involvement from the relevant patients. However, schedule changes may mean the best utilisation of a student's time comes from moving between lists. Seeking broad consent from all patients for medical student participation at the time of consent to surgery facilitates this.

A core skill medical students need to learn under close supervision during their anaesthesia attachment is basic airway management and bag-mask ventilation. This carries little risk if well supervised and could reasonably be seen as integral to a broad consent for a student to be involved in anaesthesia care. In contrast, intubation is not a core competency for medical students, and carries risk to the patient. For a medical student to learn this skill, specific patient consent is appropriate.

A system is required to ensure patients who decline permission for students to be involved in their care are clearly identified, and students do not inadvertently transgress their wishes.1[6]

vagina, rectum, external genitalia) and procedures pertaining to those areas (e.g., catheterisation) are by their nature sensitive. Specific and documented consent is required for student involvement in such exams and procedures. However, sensitivity is not restricted to these areas of the body. Cultural groups and communities hold differing criteria for cultural safety, and with respect to what comprises a sensitive exam. For instance, the concept of tapu dictates within Te Ao Māori a person's comfort with and acceptance of physical examinations. For people who have experienced assault or abuse, contact with parts of the body that may not be widely regarded as sensitive (such as the upper arms or wrists) may be traumatising. Clinical supervisors and students should be aware of the cultural and experiential nature of sensitivity and approach each patient encounter with due care.

4.2 Consent for sensitive examinations (including breast, rectal, vaginal or external genitalia examinations) and procedures (e.g., catheterisation) in competent awake patients can be verbal, but should be documented in the patient's notes.[21,22] Extra care needs to be taken to avoid undue pressure (e.g., it may be harder for a patient to refuse if they are asked after undressing) (see Box 6).

4.3 Sensitive examinations under anaesthesia require written consent obtained in advance and signed by the patient. Without such consent, a student cannot undertake an examination or intervention on a patient under anaesthesia (see Box 5). In some instances where there are unexpected complications and a patient under anaesthesia needs more investigation or more extensive treatment than was anticipated, the student must consult their supervisor about whether to remain involved.[6]

4.4 In situations where patients or their whānau are particularly vulnerable, meticulous care is required in seeking and documenting consent for the involvement of medical students. These may include discussion of sensitive examinations

Box 5: Example of a student declining to perform a sensitive examination.

"A 53-year-old New Zealand European woman with abnormal uterine bleeding was in theatre for hysteroscopy and dilation and curettage to be performed under local anaesthetic and sedation. I had not met the patient prior to the procedure so the registrar on the team gained verbal consent for me to be present. I introduced myself as a medical student and read her medical notes to familiarise myself with her situation. Once she was prepped, sedated and ready to proceed the registrar began by performing a bimanual examination. He then asked me if I would like to perform a bimanual exam. I had not had the chance to confirm that the patient had given written consent for this, and the registrar didn't know, so I declined to perform the examination. The registrar continued with the procedure."

– Modified extract from 5th Year medical student's "Ethics Report"; used with the student's permission.

Box 6: Illustration of the need for students to assess how comfortable patients are with their involvement for teaching.

"During one clinic, both the consultant and I were seated in the consultation room. After the patient entered, the consultant then asked the patient, 'Are you happy for the medical student to be here?' Consent was given at that stage. The patient required a sensitive examination and was asked to get ready on the bed behind the curtain. The consultant then entered the examination space, bringing me, and asked the patient, 'Would you be happy for the medical student to look over my shoulder while I do the exam?' By now, the preparation for the clinical examination was already underway and the patient was partially exposed. In fact, it wasn't until the sheet was lifted exposing the woman's genital area that the consultant asked whether the patient would be happy for me to observe. Although the patient consented, she seemed to be in a vulnerable position. My presence in the clinical room both at the beginning of the consultation and at the bedside for the procedure may be considered an external pressure. This woman may have felt like she couldn't say no because I was already present in the room and may have been scared about the consequences of saying no."

– Extract from 5th Year medical student's "Ethics Report"; used with the student's permission.

(particularly under anaesthesia), withdrawal of life support, organ donation, catheterisation and the communication of bad news (which will be contextual for the patient).

5. Patients who may not be able to consent

5.1 Consent processes with children are complex and require judgement and expertise. In some situations, children can consent for themselves. Alternatively, the child's parent or guardian may need to provide consent. Where this occurs, the assent (agreement) of the child should also be obtained, where appropriate and possible. The principles remain the same, but in many cases, e.g., neonatal intensive care, there may be a parental perception their child is too vulnerable to be examined by anyone other than an expert.[19] This requires special sensitivity and reassurance. Often consent will be only for student observation of a staff member examining a child. It is important to invite the parents to be present if possible.

5.2 Where a patient temporarily or permanently lacks decision-making competence, consent should be obtained from the patient's legal representative. If no legal representative exists, the patient's view should be sought to the extent possible in the circumstances, as well as the views of suitable others interested in the patient's welfare (this may include whānau members, a support person or carer). When there is no practical opportunity to obtain consent from a legal representative, the treating doctor should determine what, if any, student involvement is in the patient's best interests. If the patient indicates discomfort with the student's involvement, the student should immediately discontinue.

6. Health information

6.1 As part of the healthcare team, students will have access to patients' health information. In some contexts, it is most practicable for students to review the patient's health information prior to seeing the patient, and before the patient has had the opportunity to decide about student involvement. This could be required for educational reasons, but also as part of preparing students for a particular clinical situation. These factors must be weighed against potential harms relating to the patient's privacy, and this balance may depend on context. This should be made explicit to staff and students. If a patient declines students access to their health information this must be respected.

6.2 One way to mitigate risks is to ensure staff are aware of the possibility some patients may decline student involvement or access to their information because of particular sensitivities or privacy needs, and in those situations, students should not have access to the patient's information before receiving consent. Students must also be mindful of the need to treat health information as confidential and staff need to support them in meeting this responsibility.[20]

7. Care at home and remote care

7.1 In primary care settings, students might accompany registered health professionals on visits to patients' homes or residential aged care facilities. Verbal consent for the student to enter the house or room should be sought from the patient and/or whānau who might be present. Where possible, this should be done before the visit.

7.2 Students may have the opportunity to attend telehealth appointments. Verbal consent for the student to join the call should be sought prior to the student sitting in. Where possible, consent should be sought in advance of the appointment.

Conclusion

This statement outlines Aotearoa New Zealand's existing cultural, ethical, legal and regulatory requirements for consent to students' observation and involvement in patient care. It offers guidance about how these requirements can be appropriately met. The principles and considerations it contains are designed to guide policies, processes and practices of healthcare providers, clinicians and students to ensure patients' rights are respected in relation to student participation in healthcare. Ongoing attention, training and review is required to ensure Aotearoa New Zealand's legal and professional standards and societal expectations are consistently met. The authors call upon those involved in healthcare to work together to address the practical challenges in obtaining such consent for the betterment of patient care and medical training.

COMPETING INFORMATION

Nil.

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It's a family affair: Confucian familist philosophy's potential to improve mental health care for ethnic Chinese in Aotearoa New Zealand

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ABSTRACT

Many ethnic groups traditionally value familism, which emphasises interdependence and the extended family unit. However, Aotearoa New Zealand's health system remains largely individual-oriented, with the implementation of family-centred care remaining inconsistent. This is known to have negative effects on Māori healthcare experiences and outcomes. Our research, exploring the experiences of ethnic Chinese using mental health services in Aotearoa New Zealand, indicated that this could also be a barrier for ethnic Chinese, who have similarly strong cultural links to familism, accessing mental health care.

To balance the cultural importance of family involvement with the protection of individual patient autonomy, we propose a moderate Confucian familist approach, encouraging family involvement and participation in individual patients' care, with patients' consent. The approach acknowledges individual patients as interconnected members of a wider family unit, emphasising their reciprocal, mutual responsibility in maintaining a well-functioning, harmonious family.

We highlight Whānau Ora as a potential exemplar for a culturally grounded, family-centred approach to mental health care which could be feasibly implemented and deliver positive outcomes. Parallels between Māori and ethnic Chinese cultural views around whānau, community, and collectivism suggest a Kaupapa Māori approach could also be beneficial to Aotearoa New Zealand's ethnic Chinese populations.

However, ethnic Chinese lack the specific legal obligations empowering the implementation of interventions such as Whānau Ora. This is an obstacle which remains to be addressed before mental health services which are sensitive to the needs of ethnic Chinese or of other ethnicities can be effectively implemented.

The idea of familism, which "emphasises strong interpersonal relationships within the extended family, together with interdependence, collaboration, and the placing of [family] group interests ahead of individual interests,"[1] is by no means new to Aotearoa New Zealand. It is well-known that many ethnic groups traditionally value familism, including Māori, as well as many Pacific, Asian, African, Latin American, and European cultures. Even in Anglo-American cultures, which are generally considered to be highly individualistic, families still have a large socio-cultural role. Despite this, the implementation of family-centred care in Aotearoa New Zealand can be challenging due to a largely individualistic orientation in healthcare ethics. In this viewpoint article, we examine the impact of individualism versus family-centred care on accessing mental health services in Aotearoa New Zealand, particularly focusing upon ethnic Chinese. We then propose a potential, culturally appropriate solution, based on Confucian philosophy, for integrating family-centred care while still respecting individual autonomy.

Ethnic Chinese are Aotearoa New Zealand's third-largest ethnic group as of the 2018 census, numbering 247,770 nationwide.[2] The importance of familism in traditional and contemporary Chinese culture, similar to many other East and South-East Asian cultures, including Korean, Japanese and Vietnamese cultures, derives from the influence of Confucianism. Over 2,000 years old, the *Da Xue* ("The Great Learning"), one of the "Four Books" which make up the core Confucian canon, states that maintaining *qi* ("regulation"/"order") within families is the culmination of personal development, as well as the foundation for broader societal benefits at local, regional, and national governance levels:

> *Their families being regulated, their states were rightly governed. Their states being rightly governed, the whole kingdom was made tranquil and happy.*
>
> *Da Xue, The Text of Confucius, 5*[3]

Familial harmony, and minimising intra-familial conflict, also holds significant value in the Confucian worldview:

> *Meng Yi asked what filial piety was. The Master said: "It is not being disobedient."*
>
> *Analects II, 5*[3]

The Confucian ideal of familial harmony is built on a foundation of relational ethics. Familial harmony is not unilaterally imposed and enforced by an authority figure but relies on every member mutually fulfilling their distinct roles and responsibilities. For example, while children are expected to show obedience and *xiao* ("filial piety") to their parents, parents also have a duty to show *ci* ("kindness" or "benevolence") towards their children.

> *As a son, he rested in filial piety. As a father, he rested in kindness.*
>
> *Da Xue, The Text of Confucius, 9*[3]

Parallels may be drawn between the importance of family in Chinese culture and in Māori culture, which similarly emphasises the relational interdependence of individuals, particularly within hapū (extended family) units, and the importance of reciprocal rights and obligations in maintaining these relationships. In 2018, a survey of 1,400 Māori aged 15 and above[4] found that Māori perceived multiple similarities between aspects of Māori and Asian cultures. The strongest cultural connections were identified in their respective views of whānau and elders within that family unit (kaumātua), kinship connections (whanaungatanga) and hospitality towards guests (manaakitanga).

The influence of Māori culture has led to the inclusion of some familist elements within Aotearoa New Zealand's health system. The importance of family involvement, for example, has become well-recognised in health policy, with a need to further emphasise this repeatedly highlighted in successive health system reviews.[5,6] In the Government's most recent health reforms, introduced in 2021, whānau involvement has continued to be emphasised. In Te Pae Tata, the Interim New Zealand Health Plan, "valuing the voices of consumers and whānau" is listed as a key priority, with the two nationwide health service providers (Te Whatu Ora – Health New Zealand and Te Aka Whai Ora – Māori Health Authority) instructed to "implement people and whānau-centred [service] design."[7]

However, since the 1980s, Aotearoa New Zealand's health system has been largely individualistic in policy and practice. This transition, from a formerly paternalist system, began with a series of health reforms emerging from the 1988 Cartwright Inquiry into the National Women's Hospital ethical scandal.[8] These were modelled on similar reforms in the UK and USA, which in turn were influenced by other ethical scandals, as well as the emergent consumer-rights movement and, more broadly, a Western political paradigm shift towards neoliberalism.[9] In several respects, however, Aotearoa New Zealand's reforms actually went further than in other parts of the world. For instance, the Code of Health and Disability Services Consumers' Rights was introduced in 1992, which, similarly to the UK's Patient's Charter, established standards which service users should expect from their health providers. However, unlike in the UK, these standards were also codified into legislation under the Health and Disability Commissioner Act 1994 and were made legally enforceable by an independent Commissioner.[10,11]

These changes altered the nature of the practitioner–patient relationship. Whereas under the previous paternalistic system users were seen as passive recipients of care, they were now described as "service users" in a marketplace: autonomous, self-sufficient individuals acting as active, independent participants in decisions regarding their therapy. A strong emphasis on patients' autonomous decision-making and informed choice was thus enshrined as the foundation for medical ethics and medico-legal principles in Aotearoa New Zealand's modern health system.

From this neoliberalist shift in health policy, however, emerged a potential tendency towards over-individualism. Family involvement remains inconsistent, with a 2018 inquiry into Aotearoa New Zealand's mental health system finding family members still experienced "*marginalisation and frustration … [and] frequent exclusion* *from communication … despite their day-to-day role in providing support.*"[6,12]

Thus, a tension exists between the acknowledgement of family-centred care as an aspirational concept at policy levels, and the individualism that dominates everyday practice. This has been shown to have negative effects on Māori healthcare experiences and outcomes[13–15]. However, little is known about how this affects ethnic Chinese, who, as mentioned above, have similarly strong cultural links to familism.

In 2021 our research team conducted a series of interviews with providers of mental health services for ethnic Chinese in Aotearoa New Zealand: this was previously published in the *New Zealand Medical Journal*.[16] This viewpoint article presents previously unpublished data from these healthcare providers, as well as seven ethnic Chinese former mental health service users and one patient caregiver, who were subsequently interviewed.

Ethical approval for the healthcare providers' interviews was provided by the University of Otago Human Research Ethics Committee in January 2021 (reference number D21/012), while ethical approval for the interviews with former mental health service users and the patient caregiver was provided by the same committee in May 2021 (reference number H21/052). Consultation with Te Komiti Rakahau ki Kāi Tahu (the Ngāi Tahu Research Consultation Committee) was also undertaken.

These interviews found that Aotearoa New Zealand's individual-focused system is often a barrier for ethnic Chinese seeking mental health care. While protective of patient autonomy, this individualism can foster a negative perception of mental health therapy as divisive and ineffective. This could contribute to a general reluctance to access mental health services, which could in turn delay seeking help and leading to poorer outcomes.

As the following anonymised quotations from participants show, the continued dominance of individualism in practice occurs for a variety of reasons. Strong legislative protections of patient autonomy, for example, can make practitioners cautious regarding any actions which could be construed as threats to this, including encouraging family involvement in care:

> *Without patients' consent, they are not supposed to tell the family about what's happening … sometimes, the clinician, maybe they follow the rule very strict.*
>
> *Sam, nurse practitioner*

As a result, there is a perceived reluctance for practitioners to proactively encourage family involvement:

> *They [the health care workers] would feel like you were interfering … always use privacy to block you … They did not want [family members] to care so much.*
>
> *Colin, patient caregiver*

Previous studies have shown that mental health stigma, particularly shame derived from perceptions of "insanity," is still relatively common among ethnic Chinese.[17–19] Interviewees largely corroborated this, indicating that the traditionally family-centred nature of Chinese culture can intensify the impact of this shame:

> *If I am labelled as a psychiatric patient, I'm actually shaming my family. It's not just me, this label does not just affect me, it affects my family.*
>
> *Roman, nurse*

Particularly among younger patients, this stigma was linked to a reluctance to involve their family in their mental health care, potentially depriving them of an important support network:

> *I wouldn't be talking about a lot of things if my parents were in the room. Not even things like mental health, just things like sexuality, gender identity, sex in general.*
>
> *Fiona, patient*

Some new migrants, additionally, had particular fears around the perceived negative ramifications of a mental health diagnosis, especially on their own, or their families', residency and employment prospects:

> *They think that doctors are connected to Immigration [New Zealand] … if they diagnose me as depressed or schizophrenia, it's like, you know, having the red mark … finding job and studying might be more difficult.*

> *Cass, NGO social worker*

Others found this individualism counterproductive. For example, a lack of involvement can leave family members feeling isolated from the care process, leading to misconceptions of mental health therapy as merely being a place to "talk badly about" other family members. This perceived threat to family harmony can lead to familial discouragement of help-seeking:

> *The family members may not necessarily want to drop them off to see the doctor if their main concern is a mental health issue. They feel that maybe the [patient] will talk badly about them…*
>
> *George, general practitioner*

Practitioners told us there is already a preconception among the ethnic Chinese community that mental health therapies, especially talk therapies, are ineffective, superficial, and not sufficiently focused on practical solutions:

> *I've heard it a couple of times from people, saying, 'how is it going to help if I tell you my problems? … You can do nothing about it!'*
>
> *Leon, acupuncturist and herbalist*

An individual-focused mental health system risks validating that preconception, because individual acceptance of treatments, and maintaining adherence to them, can be difficult to sustain without family engagement:

> *A lot of Asian, I think, the patient might not be the decision-maker. You have to make sure that you engage with a family member who can make the decision to move forward. Otherwise, you just can't get things [to] move.*
>
> *Jenny, NGO manager*

Relative to other ethnic groups, ethnic Chinese already under-utilise mental health services in Aotearoa New Zealand.[16,20] These negative perceptions of the mental health care system can exacerbate existing systemic barriers to access. There is currently a general reluctance to seek help, often until a late-stage "breaking point" at which activities of daily living have become adversely affected. This puts significant strain on secondary mental health services, leading to poorer outcomes:

> *[Ethnic Chinese seek help at the] last moment … So what they are dealing is very significant, serious cases. So mainstream always say, 'Why Asian cases are always dramatic?'*
>
> *Sandy, hospital mental health services manager*

Our research is revealing that the importance of family to ethnic Chinese patients, in both its positive and negative aspects, is not sufficiently acknowledged and incorporated into Aotearoa New Zealand's mental health system. This can lead to poorer engagement and outcomes with mental health services. The cultural importance of family involvement, however, must also be balanced with the ethical and legal importance of protecting individual patient autonomy. Adopting a moderate Confucian familist approach to mental health care could provide an effective balance of these two competing interests.

The most important aspect of this moderate Confucian familist approach would support that, wherever possible, family members should be kept informed of, and participate in, individuals' mental health care. Rather than seeing individuals in isolation, their place as one member of a wider family unit, with its own dynamics, hierarchies, and obligations, needs to be meaningfully acknowledged:

> *Humanity is [the distinguishing characteristic of] man, and the greatest application of it is in being affectionate towards relatives.*
>
> *The Doctrine of the Mean, 20*[21]

This moderate approach clearly requires individual consent for any family involvement to occur, in contrast to the strong Confucian familist model (as seen in some East Asian countries, notably China), which allows family members to override individual autonomy. From an ethical and practical perspective, strong familist systems are untenable, as they are predicated upon a well-functioning family whose members will always seek to act in the best interests of other family members.[22,23] As participants in our study have pointed out, this will not always be the case. Thus, individuals must still maintain the right to autonomously seek or refuse help and the right to reject the involvement of their family, even if their family does not agree.

Moderate Confucian familism supports that where a well-functioning, harmonious family does exist, its ability to positively contribute to individual health and wellbeing, and its importance, in turn, to broader society should be recognised and upheld:

> *When the family is so maintained*
> *with rectitude, the entire world*
> *will be settled and be at peace.*
>
> *Yi Jing, Hexagram 37, Commentary*
> *on the Judgements*[21]

"Rectitude" is translated from the Mandarin *zheng*, literally "rightness," which describes "adherence to principle, decent behaviour and handling matters with fairness."[24] It is a term which is intricately connected in Confucianism with the concept of governance (a different character, also transliterated as *zheng*), with leaders or authority figures expected to play a central role in maintaining this rectitude. Thus, the concept of reciprocity, and mutual, combined responsibility for the upholding of family harmony, is emphasised.

For example, in the context of seeking mental health care, maintaining *zheng* could mean familial authority figures such as parents or grandparents adhering to the principle of familial harmony by encouraging mental health help-seeking, showing decent behaviour by expressing concern over the mental wellbeing of family members, and exhibiting fairness by not getting involved in family members' mental health care if it will be detrimental to their recovery. As a result, a system built on Confucian values, which promotes family involvement, can still be protective of individual autonomy and opposed to absolute paternalism.

In Aotearoa New Zealand, Whānau Ora provides a potential exemplar for a culturally grounded, family-centred approach to mental health care which could both be feasibly implemented in an individual-focused mental health system and deliver positive outcomes to individuals and families who may otherwise be disengaged from health services. In contrast to the standard individualistic approach, where each provider oversees a specific part of an individual's health, Whānau Ora is instead designed around meeting families' needs and aspirations, with practitioners coordinating different providers to meet that goal. Encouraging and strengthening family and cultural relationships is a key aspect of Whānau Ora, with practitioners ultimately aiming to encourage familial self-determination and improve longer-term outcomes.[25,26]

Being a marked departure from Aotearoa New Zealand's individualistic standard practice, Whānau Ora has undergone significant scrutiny since its launch in 2010, with stringent reporting requirements on the part of its commissioning agencies, as well as multiple reviews and evaluations.[26–28] These have returned positive findings, including improved patient and family outcomes, and increased health system engagement among a population with relatively low utilisation of, and trust in, government services. Similarly positive impacts on family engagement and outcomes have been observed across both Māori and Pacific populations using Whānau Ora services, with the flexibility of the Whānau Ora approach (being focused on positive outcomes for whānau, rather than the provision of specific services), the anchoring of such an approach in Māori and Pacific cultural values, and the closer connection that providers are seen to have with their local communities and whānau being highlighted as particular strengths that encourage user engagement among both Māori and Pacific populations.[26]

There have been suggestions that, with the above-described parallels in cultural views of whānau, community and collectivism, adopting a more holistic (Kaupapa Māori) approach to mental health care could also be beneficial to Aotearoa New Zealand's Asian populations.[29] Utilising a moderate interpretation of Confucian philosophy could enhance the acceptability of such an approach further, due to the significant influence that Confucian ideas have had on many East and South-East Asian cultures. These potential parallels could allow our moderate interpretation of Confucian philosophy to be integrated into the positive outcomes emerging from Whānau Ora, further supporting a framework that upholds both individual choice and family involvement.

While such integration presents some promise, there are also possible legal obstacles to this approach. Much of the impetus for the Government's actions regarding Māori health, including Whānau Ora, come from its specific, bilateral legal obligations to Māori, especially the legal obligations of Te Tiriti o Waitangi codified into the legislation underpinning Aotearoa New Zealand's public health system (currently the Pae Ora [Healthy Futures] Act 2022).[30] This means that specific interventions to promote Māori health equity are codified as legally binding core principles of Aotearoa New Zealand's health sector, including engagement with Māori to improve Māori health outcomes, inclusion of Māori in decision-making processes, and adequate resourcing of Kaupapa Māori and whānau-centred services. Such specific legal obligations do not exist in the case of ethnic Chinese.

The Government's legal obligations to Māori are understandably unique, based on their status as tangata whenua partners with the Crown. However, we believe that providing similar legal underpinnings for more specific, culturally sensitive involvement of families of other ethnic groups will be essential to equitably provide mental health services which are responsive to the needs of all patients and families, whether Chinese or other ethnicities. The persistent preoccupation and prioritisation of individualism embedded in the current system is causing active harms, in ways which were surely unintended when these reforms were first introduced. The moderate Confucian model we are proposing suggests a middle way, navigating between the extremes of paternalism and isolated individualism to maximise the benefits, and reduce the harms, from each. Understanding and systematically incorporating the role of the family in the ways moderate Confucian philosophy suggests may help reduce these harms, for all our benefit.

COMPETING INTERESTS

Nil.

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Addressing the influence of the alcohol industry in Aotearoa New Zealand

June YY Leung, Stephen Randerson, Georgia McLellan, Sally Casswell

ABSTRACT

Alcohol legislation in Aotearoa New Zealand has not been sufficient to minimise the harm and inequities caused by alcohol use, and a comprehensive review of alcohol policies has been postponed. Because of the alcohol industry's vested interests, the World Health Organization notes that industry involvement in public health policy has potential risks that should be minimised. Here we illustrate the significant extent of alcohol industry penetration in Aotearoa and how such influence undermines equity by amplifying the harms of colonisation. The government lacks policies that limit interactions with the alcohol industry, such as political donations and lobbying. We recommend what can be done to limit alcohol industry influence in policymaking, including using experiences in tobacco control to manage conflicts of interest, strengthening rules over political donations and lobbying, enhancing transparency of interactions, promoting non-collaboration with the alcohol industry and advocating for alcohol policies that give effect to Te Tiriti o Waitangi.

Alcohol use remains a leading cause of harm and inequities in Aotearoa New Zealand.[1] The Law Commission recommended a comprehensive set of reforms to reduce alcohol-related harm in 2010,[2] many of which were omitted in the subsequent *Sale and Supply of Alcohol Act* in 2012 (the *Act*). This has resulted in the *Act* having little effect on the alcohol policy environment, despite the widening of its objectives.[3,4] The most cost-effective public health interventions to reduce alcohol harm, namely reducing availability, restricting marketing and increasing prices are still in need of enhancement.[4] That the Crown's alcohol legislation has failed to give effect to Te Tiriti o Waitangi, including a failure to actively protect Māori interests and authority in both alcohol policy formation and licensing decisions, is the subject of a claim at the Waitangi Tribunal.[5]

The Government is now seeking to amend legislation that has allowed the alcohol industry, particularly retailers, to prevent local communities from limiting the sale of alcohol in their area.[6] A broader review of current alcohol policies has been postponed to 2024, which may include further changes to alcohol licensing structures and processes, marketing and pricing; however, the *Act*'s inconsistencies with Te Tiriti o Waitangi have not been mentioned.[6] The alcohol industry's discourse during this policy process will reflect its vested interests, and in particular, the reliance on heavy drinking for much of its profits.[7] Accordingly, the World Health Organization (WHO) notes that alcohol industry involvement in public health policy has potential risks that should be minimised.[8]

Here we draw on data collected as part of the International Alcohol Control (IAC) study[9] to illustrate the extent of alcohol industry penetration in Aotearoa, and given the extent of the conflict of interest, recommend what can be done to limit alcohol industry influence in policymaking. The IAC study uses an online tool, the Alcohol Environment Protocol (AEP), to assess the policy environment in which alcohol is sold and consumed across different jurisdictions.[10] Drawing reference from instruments in tobacco control and conceptual frameworks for the study of corporate practices and health,[11–13] we developed a new module in the AEP to document the presence of national-level policies that limit alcohol industry influence, as well as activities currently employed by the industry to exert influence. Our sources of data included publicly available information from websites, published reports, and news articles.

The alcohol industry is powerful and closely connected to the government

Alcohol production, sales and trade are a multi-billion-dollar industry in Aotearoa, giving the industry a powerful voice in shaping government policy. Key players in the alcohol industry include growers, manufacturers, distributors, retailers (off-licence outlets, where purchased drinks are taken away for consumption), the hospitality sector (on-licence outlets, where drinks are purchased and consumed) and contractors that supply products and services to the above, such as marketers, lobbyists and consultants.[14,15] The alcohol industry also uses trade associations, think tanks and social aspects or public relations organisations (SAPROs) to promote its interests.[16]

The domestic alcohol industry is dominated by several large producers, including Lion, DB Breweries and Independent Liquor.[17] These companies are owned by large transnational alcohol corporations that are major players in the global alcohol market; Lion is a subsidiary of Japanese conglomerate Kirin,[18] DB Breweries is owned by Heineken[19] and Independent Liquor by Asahi.[20] Similarly, many large wineries are owned by transnational alcohol corporations, including Pernod Ricard (France), Treasury Wine Estates (Australia) and Constellation Brands (United States of America [USA]).[21] Wine remains a major export good, with the Government supporting the wine industry through funding for research and development,[22,23] and international trade agreements.[24] The alcohol industry has benefited in other ways from preferential treatment. During the COVID-19 lockdowns, alcohol supply was treated as an essential service, with supermarkets and online alcohol retailers allowed to operate.[25] Special legislation has been introduced to extend trading hours for bars and clubs during the Rugby World Cup.[26] Most alcohol is sold at off-licence outlets, with alcohol-specific retailers and supermarkets, accounting for 76% of total alcohol sales by volume.[17] The supermarket sector is dominated by two major operators, Woolworths and Foodstuffs (who also owns the retail chain Liquorland).[15]

There have been ties between the industry and government agencies and politicians. In 2012, the head of industry lobby group the Food & Grocery Council was appointed to the board of the former Te Hiringa Hauora | Health Promotion Agency (now part of Te Whatu Ora – Health New Zealand). To support the implementation of the *Act*, this agency set up a number of working groups with sector representatives, including the alcohol industry.[27] This working group has been discontinued. However, the alcohol industry continues to exert its influence on political parties through donations and long-term relationships with politicians.[16] For instance, Lion made three donations totalling $148,500 to both the Labour and National political parties from 1996 to 2019,[28] while Stonyridge Vineyard made two donations totalling $41,945 to the National Party in 2015 and 2016.[29] Of note, only donations and the identity of donors over a certain threshold must be reported to the Electoral Commission.[30] Several Members of Parliament (MPs) from the Labour and National Parties have also declared financial interests in and gifts from the alcohol industry, such as tickets to sports events.[31]

The alcohol industry's corporate activities are everywhere

Meanwhile, the alcohol industry's corporate influence extends from politics to many other aspects of life, shaping social preferences through marketing and the knowledge environment through funding education and research.[12] These activities commonly aim to shift attention from appropriate policy responses at the population level to ineffective interventions that place responsibility on individual consumers.[16] For example, "Cheers" is a marketing initiative managed by the Tomorrow Project, a SAPRO set up by the alcohol industry, to "*create a healthier, safer and more responsible drinking culture in New Zealand*".[32] Its methods of providing educational information are used to influence the framing of alcohol use to the industry's interest and deflect attention from the sale and supply of a harmful product.[33] "Smashed" is another corporate social responsibility initiative used by the industry to promote "*responsible attitudes to alcohol consumption*" in schools, designed to whitewash the alcohol industry's image.[34]

The alcohol industry funds research to downplay the scale of alcohol harms and thus the need for effective policy interventions.[16] For instance, the New Zealand Alcohol Beverages Council conducts surveys that produce conclusions favouring the alcohol industry, such as measures targeting individuals' harmful drinking.[35] Another example is a study funded by Lion, which concluded that alcohol consumption was not responsible for night-time violence.[36] The alcohol industry also attempts to control the research process by funding scientific research programmes at universities. Examples include funding alcohol policy research at the University of Canterbury[37] and a postgraduate research fellowship programme in "*a subject of benefit to the New Zealand industry*".[38]

The use of legal challenges has been very effective for the alcohol industry in preventing the implementation of local alcohol policies (LAPs) that can limit the location, density and opening hours of licensed premises in a geographical area.[39] To date, only 41 of 67 (61%) of Councils in Aotearoa have successfully adopted LAPs, covering merely 35% of the population.[40] Auckland Council adopted its provisional LAP in 2015, but repeated appeals dominated by the supermarket chains Foodstuffs North Island and Woolworths New Zealand have meant that the LAP is yet to come into effect, costing ratepayers more than $1 million in legal fees.[41] Similar stories around the country have prompted the Government's current proposal to remove the ability to appeal LAPs and to give community members a greater voice in alcohol licensing processes.[6]

Alcohol industry influence undermines equity by amplifying the harms of colonisation

The alcohol industry in Aotearoa has its roots in colonisation. Alcohol was first introduced to Aotearoa by Pākehā settlers in the early 1800s—prior to this, Māori had never produced alcoholic beverages.[42] Many Māori initially rejected waipiro, which can be translated to "stinking water".[42] Early colonial legislation effectively granted Pākehā sole control over the distribution of alcohol, ignoring Māori autonomy to regulate alcohol use in their communities.[43] Today, institutional racism is still evident in the Crown's alcohol licensing system, which has discouraged Māori engagement and minimised Māori input.[44] Māori have also been excluded from meaningful engagement in the development of LAPs, which are intended to reflect local community needs, whereas the alcohol industry appeared to have easier access to local politicians.[45] Moreover, the potential of LAPs to mitigate inequitable harms to Māori has been significantly hampered by appeals from the alcohol industry, as discussed above.[4] These failures have resulted in persistent inequities in exposure to alcohol outlet density, marketing and cheap alcohol in deprived communities.[46–48]

Government policies have minimal protections against alcohol industry influence

Although our public sector has been rated as one of the least corrupt,[49] there are few protections against alcohol industry influence in policymaking. There is no policy explicitly limiting government interactions with or contributions from the alcohol industry, although standards for managing individual conflicts of interest exist. Public servants are required to decline gifts or benefits that place them under any obligation or perceived influence, while ministers and ministerial staff must declare and take reasonable steps to avoid any real or perceived conflicts of interest.[50,51] For transparency, the Government is required to publish ministerial diaries, MPs' personal, financial and business interests, and the identity of donors to political parties when the donation is greater than $5,000.[30] These rules have been circumvented, with a report showing political parties failing to disclose donations from industries with vested interests, such as the gambling industry, and openly selling access to politicians to large donors.[52] There is also no upper limit on donation amounts to political parties or politicians, except by foreign donors.[52]

Industry lobbyists have no requirements to be registered or to reveal their clients, which limits the value of publishing ministerial diaries, and there are no transparency measures around their frequent meetings with high-ranking government officials.[53] In addition, there are no rules governing lobbying or "cooling off" periods for politicians or government officials before they move into roles with potential conflicts of interest.[49] Recent media reports have provided multiple examples of "revolving doors" between government officials, lobbying firms and the alcohol industry. These include the Prime Minister's chief of staff, who had worked for a lobbying firm representing the alcohol corporations Asahi and Lion just prior to his current appointment;[53] and a former chief of staff to two prime ministers, who had also held a senior role at DB Breweries, joining a leading lobbying firm directly after leaving the Beehive.[54]

Better protections against alcohol industry interference are needed

We propose that first, experiences should be learnt from tobacco control to manage conflicts of interest in the development and implementation of alcohol policies.[55] The two industries use similar strategies to influence policy, such as positioning themselves as key stakeholders and framing policy debates to align with industry interests.[16] WHO's Framework Convention on Tobacco Control[56] provides a useful template for alcohol policies, requiring governments to protect public health policies from tobacco industry interference, and which includes:

- Establishing measures to limit interactions with the industry, particularly in policy formulation
- Rejecting any partnerships with the industry
- Avoiding preferential treatment to the industry
- Avoiding conflicts of interest for government officials and employees
- Denormalising and regulating the industry's corporate social responsibility activities

Similarly, WHO's Global Action Plan for Alcohol (2022–2030) advises governments to "*ensure that the development, implementation and evaluation of alcohol policy measures are based on public health goals and the best available evidence and are protected from the interference of commercial interests*".[57] New Zealand advocates have recently recommended this could include policies to ensure that all government officials, contractors and committee or board members must declare, and remove, any commercial interests that might influence their decisions.[58,59] Others in public health have proposed applying WHO's Framework of Engagement with non-State Actors to counteract conflicts of interest in government engagements with private entities.[60]

Within Aotearoa, rules on political donations and lobbying must be strengthened and appropriately enforced to minimise the influence of vested interests on policymaking. Canada, for example, has the following regulations in place for political donations:[61]

- Annual cap on donations to politicians and political parties
- Ban on donations from corporations and trade unions
- Lower disclosure threshold for donors

Canada and the USA also have much stricter rules than Aotearoa to ensure transparency of political lobbying,[49] which include:

- Legislation governing lobbying
- A register of lobbyists
- Lobbying guidelines or codes of conduct
- "Cooling off" periods for politicians-turned-lobbyists

To further support accountability and efforts to monitor alcohol industry influence, policies are needed to enhance transparency of any interactions between the alcohol industry and public servants, politicians and political parties. These may include requiring:

- Publication of meeting records, including the agenda, list of participants and minutes
- Participants of such engagements to disclose any conflicts of interest
- Proactive publication of advice provided to ministers[58,59]

It is crucial that the above measures be appropriately enforced and regularly examined for their effectiveness. As a case in point, lobbyist registers in Australia were found to lack detailed and accessible information, failing to meet their stated objective of making lobbying activity transparent to the public.[62]

We need strong collective action to reveal the alcohol industry's corporate practices and challenge their penetration across all walks of life. Internationally, civil society is working to raise awareness of corporate influence and promote non-collaboration with the alcohol industry, for example, through the i-Mark branding initiative, which encourages institutions to publicly promote their policy of non-engagement with the alcohol industry.[63]

Finally, we must continue to advocate for the development of alcohol policies that promote equity by giving effect to Te Tiriti o Waitangi, which should include ensuring Māori tino rangatiratanga (self-determination), active protection and partnership. A recent report on Te Tiriti o Waitangi and alcohol law provides detailed recommendations to this end, concluding that "*alcohol legislation, as currently structured, is completely inept for achieving equity*".[64] The alcohol industry has been found to target groups who are most vulnerable to alcohol-related harm, such as Māori.[47] This exacerbates the injustices of colonisation for Māori communities. Importantly, the Crown's active duty to protect Māori rights to health means ensuring that third parties, particularly those with vested interests, do not interfere with the attainment of this right.[65]

The tide of public opinion may be shifting on the fairness of corporations prioritising profits over health and wellbeing, which presents an opportunity for change. Increasing corporate profits amid the rising cost of living is prompting calls for fairer laws that protect consumers' interests over the interests of wealthy businesses.[66] The Prime Minister has also announced several initial steps to enhance transparency around lobbying at Parliament, including examining policy options to regulate lobbying activities.[67] This should provide some cause for optimism.

COMPETING INTERESTS

The authors declare no competing interests.

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Corporate boxing matches for charity: a personal point of view

Peter S Benny

ABSTRACT:

Boxing and other combat sports receive constant exposure and support in the media. Corporate boxing matches are a popular method of raising money for charity. However, charity fights are more dangerous for the contestants than other sanctioned bouts. In a world where head trauma and concussion in sports is under constant scrutiny, the ethics of raising funds by deliberate concussive forces to the head needs to be reassessed.

In November 2018, my son-in-law took part in a charity boxing bout. He was struck by a blow that fractured his orbit and rendered him unconscious, so when his head hit the floor, he received a severe cerebral injury from which he died four days later. The money he raised for a children's charity is small compensation for the family he left behind. No tragedy like this occurs in isolation and analysis of the associated issues is paramount to protect the participants in such fundraising events in the future.

Around 400 corporate/charity bouts have occurred in New Zealand in recent times and two of these have resulted in the death of a participant and other participants have had significant head trauma.[1] At each Olympic games about 450 bouts occur and no deaths have been recorded since 1936 when a fighter died mysteriously from blood poisoning.[2] So, fighting for charity appears to be more dangerous than other branches of the boxing industry. It is the role of the New Zealand Coronial Service to investigate such unexpected deaths, establish causation, identify avoidable factors, and then suggest potential changes that may prevent further tragedies. Unfortunately, like many parts of our legal and public services, the coroners are under resourced and overwhelmed. It is now more than four years since this event occurred and the Coronial Service is yet to decide when an inquest will be held.

Initially, following my son-in-law's death, corporate/charity boxing matches were stopped. However, after pressure from the stakeholders who benefit from such competitions, they were restarted after in-house changes were made to the rules regarding corporate/charity competitions.[3] The changes were to try and make the bouts safer and more accountable. They were made without the benefit that an outside inquiry by the coroner could have provided. If the coroner were to provide guidelines for the continuation of corporate/charity boxing on the basis of this accident, what would they be? To do this, there must first be an understanding of the social background in which these events occur and what happens in the lead up to the fight. There then needs to be an explicit evidence-based investigation of the risks the fighters are taking in boxing for charity.

In a compassionate society, charity and sharing have an import role in helping those of that society in greatest need.[4] All members of society are encouraged to give to charities to help the less fortunate. Charities receiving that income need to be aware where their funding comes from so as to set limits on the sources. Is it ethical for charities to benefit from two people purposely attempting to cause concussion in each other?

It is not illegal for two humans to mutually agree to try and strike the other's head in boxing or other martial arts. However, in most other contact sports—rugby union, rugby league, football, or AFL, etc—a player who accidentally or otherwise makes forceful contact with another player's head receives a severe sanction. It is illegal for someone to strike another person's head without his or her permission outside of sport, and the punishment will be dependent on the severity of the violence and its sequelae.

Chronic Traumatic Encephalopathy (CTE) was first described in boxers who presented with symptoms such as behaviour or personality change, or movement disorders such as ataxia or memory loss.[5,6] CTE is a neurodegenerative disorder that was originally referred to as "punch drunk" or "dementia pugilistica" and was associated with repetitive concussive or sub-concussive head impacts as mild traumatic brain injuries (mTBI). It has been found to also occur in those participating in contact sports such as rugby union, rugby league, football, and also in victims of domestic violence and members of the armed forces. This understanding has led to major changes in the management of mTBI in most contact sports. There has been an emphasis on real time identification of head contact and removal of the injured participant from play so a thorough head injury assessment (HIA) can be performed.[7]

In boxing and some other martial arts, because the purpose is to induce head impact, then it would be expected that regulations and refereeing would be aimed at minimalising the risks to participants. Olympic and amateur boxing stopped the use of head protection in 2016 because its use was associated with an increase in the incidence of concussion.[8] Amateur boxing regulations mandate the referee to stop the fight at a knockdown for a count of 10. If there is a knockdown and the boxer regains his or her feet, then there is a mandatory eight count to allow the referee to assess for concussion before restarting the fight.[9] In corporate/charity fights, if the referee believes either fighter may be concussed, he or she can stop the fight for a standing eight count to check the fighter's cerebral status before restarting. The fight must be stopped if there are three standing eight counts in one round of three minutes. The ring side medical practitioner can stop the fight if he or she believes a fighter has been concussed and can assess a fighter during the rest break or if requested by the boxer's corner attendants. The standing eight count does not apply to professional boxing.

The use of HIA is significantly different to the above in most other sports. This reflects the emphasis in most sport that the head is sacrosanct and head injury and its sequelae must be avoided. Take, for example, the regimen put in place for the Rugby Union elite matches.[7] All games have independent match-day doctors with access to video replays. If the match officials or doctors suspected there is an incident of head impact by a player or players, the players are notified, and videos are reviewed by the independent doctor. If head impact is confirmed, then an on-field assessment must occur, and if the player showed signs of concussion the player must be withdrawn permanently from the match. If there were no signs the player must be withdrawn for further assessment. These guidelines are similar to those in most contact sports and are based on the 2017 Berlin Concussion in Sport Group Consensus Statement.[10]

The off-field assessment is a clinical evaluation (HIA) by either the team or match-day doctor. The doctor is aided by screening tools (SCAT5) and video.[11] If concussion is confirmed, the player is withdrawn. If the player shows no signs of concussion, they can return to play after 10 minutes, but not before. Anyone having an HIA, whether they pass or otherwise, must be further reviewed within 3 hours. It is difficult to find many similarities between this regimen or others in similar sports and that used in boxing. In the 2019 Rugby World Cup, the proscriptive nature of the rules received criticism because they possibly affected the outcome of games. If these rules were used in charity boxing matches, they would most certainly affect the match outcome. In boxing there is also evidence that after a match some boxers show evidence of concussion that was not identified by any officials during the match.[12]

The management of mTBI or Sports Related Concussion (SRC) in contact sport and martial arts is currently based around accurately identifying and then carefully treating concussion. Since the reporting of the Berlin Guidelines there has been an exponential growth of publications regarding SRC. It is believed that reducing the incidence of concussion and dealing with it properly will probably reduce long-term sequelae such as CTE. Boxing should be at the forefront of this issue given that the purpose of boxing is to establish dominance by inducing concussion. The etiology and prevention of CTE is more complex than simply dealing well with concussion. Recently the Scottish Football Association banned the heading of the ball by 12 year olds and younger.[13] This was based in part on the findings of MacKay et al. that professional footballers had a significantly increased risk of mortality from neurodegenerative disorders.[14] Whether this is due to heading is not proven, although data does suggest that sub-concussive impacts of heading do result in an acute cerebral injury that would necessarily precede chronic damage.[15] The sub-concussive head contact that occurs with routine boxing sparring sessions results in the same acute brain response that occurs with heading.[16]

In amateur and professional boxing, boxers are graded on their weight and experience. Those new to the sport fight others of similar experience and skill. As they learn and develop their skills, they progress to fight boxers who also display better skills and success as they move up the competitive levels. This system protects fighters from unexpectedly meeting someone of dangerously better skills or power. The elite fighters at the top competitive levels have significantly advanced physical and mental characteristics despite having similar morphometrics. Elite fighters have greater self-efficacy and self-control. Chen et al. found that elite boxers were able to self-control their aggression better than novice boxers.[17] In 2013, the scoring system for amateur boxing changed from counting the number of blows to the target area, the abdomen and thorax above the belt and the head anterior to the ears, to the 10 point must system (TPMS). Under TPMS there are four criteria assessed by the judges to decide the winner of each three rounds. These criteria are the number and quality of blows to the target area, tactical and technical domination of the bout, fighter competitiveness, and lack of rule infringements. This is more subjective than the previous scoring, using the criteria of superiority, dominance, and competitiveness. In elite boxing competitions, review of outcomes using this system suggest the winner is the fighter who lands the highest percentage of blows to the target area compared with total blows thrown, and not the total number of blows landed on the target area.[17] These fighters have superior reflexes, and ability to defend and read their opponent's actions. Warnick and Warnick suggested that the best predictors of winners in boxing was their age, the total number of fights (win or lose), and the outcome of their most recent fight.[18]

Charity boxing has grown in popularity in our society. This growth reflects that there is a reward for all involved in this process. The reward will depend on whether the entity is the corporate event organiser, the benefitting charities, the audience, the boxing authorities, or the participants. That reward must be profitable to those groups if they are to maintain their involvement. The reward to the participants must be greater than the perceived risks of head injury and death, otherwise the events would not occur. What are those rewards?

The strong association of acts of generosity and happiness is well documented and therefore the contestants of charity boxing may thus be rewarded with improved happiness.[19] It is instinctual and ingrained in many primates, including humans, to fight for dominance in physical confrontation. An individual's status in their group's hierarchy is increased if more of the group witness that dominance.[20] As societies mature, the instinctual drive to physical dominance has been regulated by laws and given an outlet in sport, particularly contact sports. Boxing gives those desiring to challenge themselves against others an opportunity to demonstrate their dominance within their group.[21] This opportunity could be perceived as adequate reward for taking part in a charity boxing match and its inherent risks. The need for dominance versus generosity will vary from contestant to contestant.

In charity boxing most potential fighters are novices and have very limited documented experience on which to judge their status as a boxer. Without that information it is possible to mismatch fighters on morphometric factors and age alone. If in two morphometrically and age matched contestants, one is primarily driven by altruism and the other driven solely by the desire to dominate, potentially these differences would only be obvious during a mismatched match.

The increasing sanctity of the head in most contact sports has magnified the difference between combat sports and all other contact sports. Boxers get rewarded for hitting their opponent's head, whereas in other sports the team and player are penalised. In boxing, contestants are penalised for either purposeful or accidental blows to the genital region, below the belt, and fighters are all checked before the match to make sure they are wearing genital region protection.[9] In other sports, a purposeful fist to the genital region would be penalised, as would the use of the fist anywhere on the body. Why is the head not sacrosanct but the genital region is in boxing? Is a blow to the genitals more dangerous than the head; is reproduction more important than cognition? Someone is much more likely to die from a blow to the head than a blow to the genital region. This may make sense for committed, well-trained amateurs or professionals, but not novice charity boxers.

The changes that are occurring in contact sports due to the increasing incidence or publicity of CTE will continue.[22–24] With these changes, there will be progress in early, more accurate, and easier diagnosis and prevention of sub-concussive and concussive impacts and managing those to prevent long-term sequelae. These may be in part driven by litigation.[25] Bearing in mind this probable change, what should a forward-thinking coroner suggest after reviewing a boxing death from traumatic head injury? The coroner could suggest changes to the matching of contestants, and more careful medical assessment of fighters before the competition to identify risk factors of potential CTE if further concussion occurs. This may be genetic risk.[26] There is a need for a very real and fully informed consent process. The current risk of a 1-in-200 chance of death in New Zealand is certainly not spoken about. Neither are the potential risks of depression, suicide, and ocular changes.[27–29] The potential enforcement of head protection and better floor padding may prevent "king hit" mortality, but the elephant in the room is that in boxing the contestant's head is the target for trauma.

Unfortunately, it is not possible without a law change to ban corporate/charity boxing. Public Policy is the prerogative of an elected government, not the coroner. To introduce management for head trauma, as in other sports, would be difficult in a contest of three 3-minute rounds. If competitions are to continue to provide rewards to the stakeholders, then the only way they can continue into an era of enlightened brain protection is to make the head sacrosanct, as in other contact sports. The target area would then be above the belt and below the head. Being very much aware of the trauma of infertility, I cannot recommend allowing punches below the belt as suggested by others, although it would add to the gladiatorial nature of corporate boxing.[30]

The recommendations of a coronial inquiry are required to be specific to an individual person or agency. They are not generic or for the public at large. The author is not aware of position statements on corporate boxing from any medical organisations in Australasia. The presence of a reputable, widely accepted position statement on corporate boxing from medical authorities of our region would be a firm basis to move forward to avoid further deaths and morbidity.

COMPETING INTERESTS

The author has no competing interests apart from his relationship to the boxer who died, and the fact he took part in the annual school boxing tournament for 2 years before it was seen as inappropriate and stopped 60 years ago.

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Scaly erythematous eruptions of intertriginous locations

Tim Aung, Rowland Noakes

ABSTRACT

Intertriginous or flexural eruptions are common presenting problems in clinical practice, raising several differential diagnoses. A clinico-histopathological correlation is important to establish a correct diagnosis when a clinical diagnosis cannot be ascertained. We here present a case of flaky erythematous eruptions in a female adult, with a final diagnosis of granular parakeratosis, involving non-flexural area mid-back (under bra cover) in addition to flexural zones of the groin, gluteal fold, inframammary fold and axilla. It seems that mechanism of pressure and friction as well as occlusion all play a part. Management with potent topical steroid and avoidance of inciting triggers offered resolution in 4 weeks in this case.

Intertriginous eruptions are common presenting problems in clinical practice and include several diagnoses. A good history with a thorough evaluation of rash guides a proper management. A biopsy may be required in cases of clinical ambiguity. We here present a case of scaly erythematous eruptions in a female adult, leading a diagnosis of granular parakeratosis.

Case report

A female in her late twenties presented with a 6-week history of persistent erythematous

Figure 1: Erythematous eruption with desquamation, scales and wrinkles: Figure 1a: groins; Figure 1b: gluteal (red circle = wrinkled skin); Figure 1c: axilla; Figure 1d: inframammary; Figure 1e: mid-back of bra-covered area (red circle = wrinkled skin).

patches and plaques with desquamation, scales and wrinkled appearance, involving the intertriginous areas (Figure 1). She had no known allergies or significant medical history and was taking no medications. As a result of COVID-19 precautions she had recently begun using a laundry detergent containing benzalkonium chloride (BAC). She had been treated with mid-strength topical corticosteroid with a limited response. On examination, she was Fitzpatrick skin type 2, afebrile and systemically well, apart from symmetrical reddish-brown scaly papules, patches and plaques involving the groin, gluteal fold, axilla, inframammary fold, and mid-back (under bra) (Figure 1).

Discussion

The differential diagnoses of an intertriginous eruption are listed in Table 1, with related characteristic features.[1–3] In this case no fungal pathogens were found on microscopy; immunoglobulin E level was within normal range, and HIV and syphilis serology were negative. Histopathology from biopsy was reported as demonstrating hyperkeratosis, parakeratosis and hypergranulosis, typical of granular parakeratosis.

Granular parakeratosis, also known as hyperkeratotic flexural erythema, is an intermittently encountered reddish-brown intertriginous dermatosis with occasional involvement of non-intertriginous areas (e.g., mid-back under bra). It was first described in 1991 by Northcutt et al. in the axillary region.[4] Aetiopathogenesis of granular parakeratosis remains speculative with exposure to BAC (an antimicrobial preservative that is found in a number of household products including detergents, antiseptics and skincare products) or other irritants, in combination with occlusive, pressured and frictional locations of susceptible individuals.[1,3] There is no reported sex or age predilection; however, more adult female cases have been reported in the literature.[3,5,6] Although no standardised treatment for granular parakeratosis exists, management includes the avoidance of inciting triggers, general skincare and the use of topical and systemic agents such as corticosteroids, retinoids, vitamin D analogues, antibiotics and phototherapy or laser.[5,6] This case was treated with betamethasone dipropionate 0.05% ointment with emollients and avoidance of BAC, with resolution in 4 weeks. It has also been reported that spontaneous clearing of granular parakeratosis can also occur between months and year.[1,7]

Table 1: Differential diagnoses for erythematous eruptions of intertriginous zones.

Condition	Characteristics
Granular parakeratosis	Reddish-brown hyperkeratotic scaling rash involving the intertriginous zones with history of exposure to benzalkonium chloride in any age. Histologically: hyperkeratosis, parakeratosis and hypergranulosis.
Tinea (dermatophytosis)	Well-demarcated annular lesions with scales and central sparing, anywhere in body in any age. Confirmed by fungal microscopy, culture and sensitivity.
Atopic dermatitis/ eczema	A personal or family history of atopy. Papules, patches or plaques displaying spongiosis with lichenification in longer standing cases in any age. Pruritus is common.
Contact dermatitis (irritant or allergic)	Typically, localised dermatitis at contact sites; any age.
Inverse (flexural) psoriasis	Well-demarcated, shiny and smooth erythematous patches or plaques with fine scaling and fissuring involving the flexural sites. Seen in 20–30% of individuals with psoriasis.[8]
Erythrasma	Well-defined pink or brown patches with fine scaling involving axilla, groins and between toes, affecting mostly adults; coral-red fluorescence on Wood's lamp examination.
Candidiasis	Erythema, maceration, and satellite lesions in intertriginous sites of usually young children and the elderly.
Secondary syphilis	Non-itchy, reddish-brown papules on mostly the palms, soles and trunks of adults. Confirmed on serology.
Darier's disease, Dowling-Degos disease and Hailey–Hailey disease	Rare genetic (autosomal dominant) disorders that may appear in the flexural zones; usually present from young adult age onwards.

COMPETING INTERESTS
The authors have none.

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The rise and rise of specialist vape stores: will proposed changes protect rangatahi?

Bridget Rowse, Martin Witt, Janet Hoek

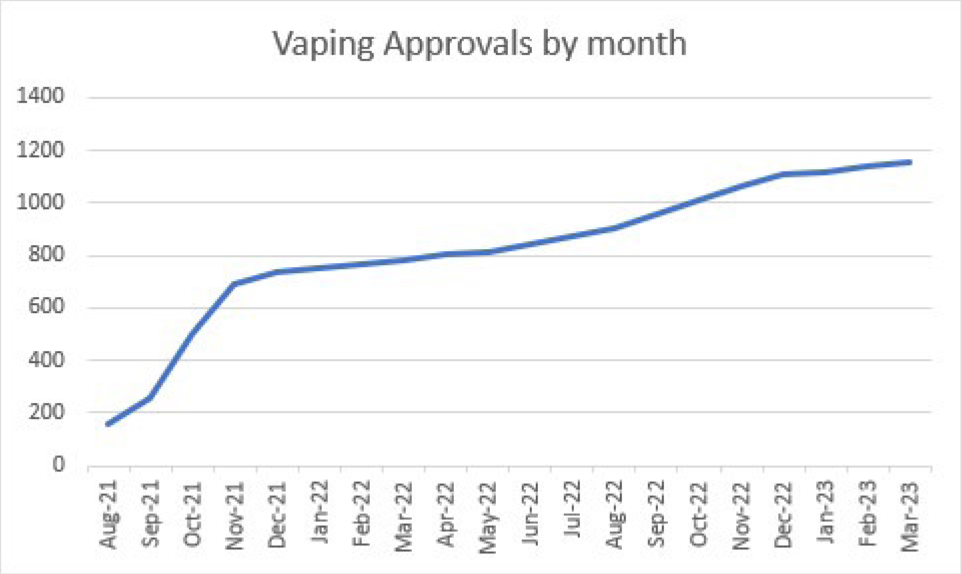
In 2020, the Government introduced the *Smokefree Environments and Regulated Products (Vaping) Amendment Act 2020* (the V*aping Act*),[1] which differentiated between generic retailers and specialist vape retailers (SVRs), and aimed to address rising youth vaping. The *Act* allows generic stores to sell vaping products featuring tobacco, menthol or mint flavours while the latter, operating as R18 stores, may sell a full flavour range.

Retailers wishing to operate as SVRs have to gain approval from the Vaping Regulatory Authority (VRA, based within the Ministry of Health). Approval criteria include operating from "*a fixed, permanent structure*" and providing evidence that vaping product sales from the proposed premises represent at least 70% of total store revenue (60% in some special circumstances).[1] SVRs may also sell vaping products online, but online-only businesses may not operate as SVRs that sell directly to the public.

Regulations implementing the *Vaping Act* came into effect on 11 August 2021, and from that date until 11 November 2021 retailers who already sold vaping products and wished to trade as SVRs had to gain VRA approval. By 11 November 2021, the VRA had approved 671 applications (568 retail stores [85% of approvals] and 103 websites). Figure 1 outlines the rapid growth in SVRs during this period. Growth in SVR approvals slowed post 11 November 2021; nonetheless, between 12 November 2021 and 20 March 2023, the VRA approved a further 534 applications (501 retail stores [94% of approvals] and 33 websites).

Analysis of applications before and after 11 November 2021 indicates a change in applicant type during these two periods. Up until 11 November 2021, 53% of the 671 approved applications related to a single store; between 12 November 2021 and March 2023, 92% of the 534 approved applications were for a single store.

Figure 1: Vaping approvals August 2021 to March 2023.



This change may indicate the rising number of small retailers, typically dairy owners, who have subdivided their premises to include a specialist vape store.[2] The evolution of these "stores-within-a-store" means specialist vape stores are now located adjacent to schools and playgrounds,[2] a development unlikely to support the legislation's aim of minimising harm to young people and children. Figure 2 contains an example of an SVR located within an existing retail outlet.

Figure 2: Specialist vaping retailer—a store-within-a-store. Source: Rowse, B. Personal photo.

Since the *Vaping Act* came into effect, vaping among young people has continued to rise.[3] The Government subsequently passed the *Smokefree Environments and Regulated Products (Smoked Tobacco) Amendment Act*,[4] and, in January 2023, proposed regulations that would include some restrictions on vaping outlet locations.[5] Measures announced in June 2023 reflect that consultation process and will not allow new specialist vape stores to begin operating within 300 metres of schools or marae;[6] however, the revised regulations will apply neither to existing outlets nor to generic retailers.

The new regulations attempt to address community concerns regarding SVRs' proximity to schools, but fail to address other calls to action. For example, the proposed proximity restrictions do not govern general vape retailers "*as there is currently no existing regulation-making power to do so*".[5] Nor will the new regulations apply retrospectively to address proximity problems that have caused community concern.[7] Finally, the June 2023 measures do not address rising outlet density, particularly the number of vaping product retailers in downtown areas, and fail to recognise that outlet concentration will increase young people's exposure to vaping products and facilitate vaping uptake.[8,9]

How effective will proposed proximity limits be?

A study mapping SVR locations in June 2022 found that, of the 645 SVRs operating nationally, 613 were within 1 kilometre of a school (i.e., only 32 were more than 1 kilometre from a school);[10] since that study concluded, SVR numbers have nearly doubled.[11] Regulating vaping products as though they were normal consumer products has allowed stores to proliferate, despite concerns some outlets may not meet the regulatory criteria.[12] By way of context, there are currently four times the number of SVRs than there are McDonald's and KFC stores (~1,200 cf. 267),[13,14] and SVR outlets now exceed community pharmacies, which number fewer than 1,000.[15]

Overall, while the proposed proximity measures announced afford young people some belated protection, the omission of outlet density measures, lack of retrospective authority and failure to cap overall store numbers leave troubling gaps.[8]

What further actions are required?

Proposed regulations must end the "store-within-a-store" practice, which does not align with the *Vaping Act*'s intention. Unless policies stipulate that no existing or future SVRs may operate within a given radius of schools, and also apply these boundaries to generic retailers, young people's exposure to vaping products will continue. Density limits are also required to address community concerns and end the proliferation of SVRs and generic retailers within CBD and suburban areas.[7,12,16,17]

Policies should also anticipate the need to support vaping cessation by creating a sinking lid mechanism that could reduce vaping retailer numbers in due course. Precedents exist in other fields, such as gambling, where a sinking lid applies to venues that either close or transfer ownership.[18] Furthermore, policies should explicitly include communities in SVR approval processes, a move that would help address the current disconnection between those making decisions and those affected.

As long as vape stores operate, measures should limit young people's exposure to vaping products; specifically, retail displays in generic outlets should be disallowed and no store should feature vaping product displays that may be seen from outside that store. We offer detailed suggestions that address all elements of the marketing mix elsewhere.[8]

Aotearoa New Zealand has treated vaping products as though these are normal consumer products, when in fact they are anything but. That approach has failed rangatahi, particularly rangatahi Māori. The new regulations will not go far enough to safeguard young people and fall short of the detailed, comprehensive protection they deserve.

COMPETING INTERESTS

The authors have no competing interests to declare.

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Chronic Diseases of the Colon

NZMJ, August 1923

Patients suffering from chronic diseases of the colon fall into two main groups:—(1) Those presenting local bowel symptoms only such as colic, diarrhœa, or constipation; (2) those in whom, in addition to local symptoms, general symptoms are also present, such as headaches, general malaise or joint pains.

PATHOLOGY

1. *Lane's* Bands.—While some cases undoubtedly are due to abnormalities producing mechanical obstruction such as *Lane* describes, the majority show no such lesion.
2. Undue Mobility of Splenic and Hepatic Flexures.—In these cases a certain amount of obstruction arises, dependent to a large extent on posture, being most marked in the recumbent position.
3. Inflammatory Pericolitis.—This may follow appendicitis, duodenal ulcer, etc., and, by leading to adhesions, produce a greater or lesser degree of obstruction.
4. Ulceration of the Colon.—Most patients who have had ulcerative lesions of the colon give a clear account of experiencing a delayed peristalsis or "stoppage in the passage of wind" at the site of the old ulceration—the common sites which are indicated are the hepatic and splenic flexures and in the mid-line about the umbilicus. Even when this history is clear and local tenderness exists at these points X-ray examination often reveals no particular delay or stenosis of the bowel. As these cases frequently recover quickly it is probable that there is local inhibition of peristalsis, not necessarily dependent on gross destruction of tissue, a mild degree of inflammation being sufficient to produce it. On the other hand many of these patients, on normal palpation, present an easily thickening of the bowel which tends to disappear more or less completely under treatment.
   Post-mortem examination in patients suffering from post-dysenteric ulceration of the colon reveals a tendency to heal with less thickening of the bowel than one would expect from the extent of the ulceration. In exceptional cases, however, where there has been great destruction of tissue, permanent narrowing of the lumen of the bowel results.
5. Disturbed Nervous Control.—Apart from local lesions peristalsis may be variously disturbed by interference with the nervous mechanism. The two most important types being (a) spastic contraction dependent on excessive vagus one, and (b) atony. Spastic contraction usually affects the descending colon and produces a form of constipation which is not associated with toxic symptoms. Atony of the bowel is much less common than formerly supposed, and is probably confined to cases or paralysis and old age. Atonic dilatation of the caecum which follows inflammation of the mucous membrane must be considered as distinct from primary atony.
6. Effect of Dehydration.—In considering the pathology underlying the symptoms in any given case it is important to distinguish between retention of the bowel contents in the different portions of the colon. The fact that by the time the bowel contents have reached the descending colon, dehydration has occurred, renders retention in this portion less serious than when it occurs in the caecum and ascending colon. Delay in the first part of colon is invariably associated with serious symptoms, as the contents of the bowel being still in a semi-fluid state, absorption is inevitable.
7. Source of Toxins.—Several distinct sources of poison must be recognised : Products of bacterial action, fermentation of carbohydrates, putrefaction of protein elements and products of incomplete metabolism.

LOCAL SYMPTOMS

Flatulence, a common local symptom is due usually to exaggerated peristalsis, and not to an excessive amount of gas in the bowel. In a minority of cases there is an excess of gas, which may arise either by putrefaction or fermentation.

Pain is usually present and varies in character from a dull ache to acute pain. A prickling sensation is often described as being present at sites corresponding to old standing ulceration, and often at the flexures and over the caecum. Pain in the back is troublesome, particularly in the lumbar region.

Colic is not usual in chronic disorder, but occurs from time to time from an exacerbation of an old inflammation.

Nausea, vomiting and gastric flatulence commonly occur and may be the only symptoms complained of.

Diarrhœa is a frequent symptom. It usually alternates with periods of constipation, and may last for a few hours or for several days. Patients who suffer from toxic symptoms frequently state that their worst symptoms follow on rapidly after a bout of diarrhœa.

Constipation of varying degree is the rule.

Nervous diarrhœa is practically always associated with some evidence of local damage to the bowel.

Intestinal sand is present in most cases of long-standing inflammation of the colon, though it often makes its appearance only after the colon has been irrigated for several days.

TOXIC AND GENERAL SYMPTOMS

The toxic symptoms vary greatly in intensity and character. In the mildest forms a slight degree of malaise, anorexia and headaches are present. The tongue is furred and there is some constipation. This group of symptoms is so universally recognised as being dependent on a disturbed bowel action, that the majority of patients recognise it at once and themselves apply a remedy in the form of a simple aperient, which often suffices to clear up the trouble. When, however, these symptoms occur frequently and do not respond to simple measures, there develop further symptoms of a more serious nature. The patients become irritable, sleep badly and lose weight ; the skin becomes pigmented, in prolonged cases as deeply as to make it difficult to exclude the pigmentation of *Addison's* disease. The patient passes into a state of chronic ill-health and is frequently branded a neurasthenic. It is now recognised that patients presenting aggravated toxic symptoms may owe their ill-health to defective motility of the caecum and ascending colon, a condition which is described as caecal stasis or caecal constipation.

Patients suffering from caecal stasis present certain well-defined symptoms. Their general health is usually below par and at frequent intervals thy have bouts, almost paroxysmal in character, of a special group of symptoms, differing in individuals. Circulatory disturbances are common. The patients feel comparatively well on rising in the morning when, more or less suddenly, sometimes, but not always, following an evacuation of the bowels, they experience a sensation of "goneness," palpitation becomes troublesome and they feel exhausted. The pulse rate varies from about 90 to 120, but the rhythm is normal and they rarely present any sign of organic heart disease. After lasting for a few minutes, or maybe for an hour or two, the attack passes off and the patient gradually recovers.

Severe headaches occur which may be unilateral or affect the whole of the head, with inability to read for long without inducing severe eye-strain and blurring of vision, followed by abnormal sensations, such as a burning feeling affecting the skin of the face and head.

The skin is variously affected. The muddy, unhealth skin of these patients is well recognised. There occur, however, in some cases more acute manifestations. The commonest is an urticarial eruption, sometimes affecting the whole body but more usually confined to face and the inner surfaces of the limbs. The irritation in these cases may be intense, and when the patients scratch the lesions, in attempts to get relief, the broken surface becomes infected and the condition is sometimes difficult to distinguish from scabies. Patients suffering from skin lesions often have no general symptoms and the bowel condition may be quiescent.

Chronic joint inflammation is so often associated with disordered colon that treatment of the bowel is most important. The nervous associations of arthritis (pain in the limbs, sensations of numbness, tingling and burning on the backs of the wrists and in the hands and fingers) are often dependent on the same toxic process.

PRESSURE SYMPTOMS

Patients in whom the caecum is large usually suffer from pain in the back, which is probably due to the dragging effect of the loaded caecum. Other pressure symptoms, however, occur and affect particularly the pelvic organs. Pressure on a cystic ovary may produce pelvic symptoms of such severity as to lead to laparotomy, when no adequate cause may be discovered for the pain.

During menstruation patients suffering from a loaded caecum frequently complain of intense pain which can be relieved only by appropriate treatment of the bowel condition.

Effect of Pregnancy.—Many patients definitely date the onset of their symptoms from pregnancy, especially when the onset of labour has been delayed and the birth a difficult one. Pressure by a pregnant uterus, leading to an increasing degree of constipation, especially in women who have previously suffered from dysentery or colitis, is a very important factor in producing serious inflammation of the colon, the results of which are both severe and prolonged. Similar results may be produced by pressure of a fibroid.