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We can determine our future health

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Summaries

We can determine our future health

Kevin Hague, Peter Crampton, Ruth Cunningham, Jason Gurney, Beverley Te Huia, Caroline McElnay, Fa'afetai Sopoaga and the Public Health Advisory Committee (PHAC) Secretariat

In the last 25 years, Aotearoa New Zealand has become increasingly prosperous, and we live longer overall, but these gains have not been evenly shared. Where we live, work, learn and connect with the environment all have a greater effect on our health and wellbeing than healthcare—these are known as the "determinants of health". We have learned much from the gains that have been made, but also from the failures to make progress in many key areas. Overall, it is clear that the unnecessary, costly and preventable differences we see today in the determinants of health, and in health and wellbeing outcomes, are not inevitable or fixed. They can be changed through the policies and actions that we choose to implement.

The one-hundred-women study: characteristics of New Zealand women with severe mental illness

Lillian Ng, Angela Fyfe, Zeke Wang, Jullian Carter, Emma Wong She, Michelle Chou, Jana Caramaschi, Tanya Wright

This study highlights that women with severe mental illness (SMI) have a complex array of needs that health professionals should take into consideration at all points of health service access. We highlight women's health issues, pregnancy, parenting and adverse childhood experiences. Māori and minority ethnic women have barriers in accessing healthcare due to the impact of trauma in forming trusting relationships with mainstream healthcare services. Women with SMI should be acknowledged as a strategic target for integrated, holistic, trauma-informed interventions with potential and significant positive intergenerational impact.

Why do women in health seek mentoring—a descriptive study of a mentorship programme for women in Aotearoa New Zealand

Rebecca Grainger, Rachel Roskvist, Alison Barrett, Carmen Chan, Sabrina Sapsford, Juliet Rumball-Smith, Charlotte Foley

Wāhine Connect, established in 2017, provides peer mentoring for women in Aotearoa New Zealand's health sector. This retrospective study describes the demographics of mentees, their motivations and satisfaction with the programme. Participants were mostly doctors with an average age of 34, mostly New Zealand European and Asian. Common reasons for seeking mentorship included lack of confidence, managing work-family balance, and burnout. Survey respondents overwhelmingly rated the programme and mentor matches positively, highlighting the ongoing need for mentoring as a strategy for health workforce retention.

Ambulatory sensitive hospitalisations among people accessing mental health and addiction services: a retrospective cross-sectional study using national population data

Isabel Foley, Maria Carmela Basabas, Angela Jury, Tracy Haitana, Debbie Peterson, Phil Hider, Ruth Cunningham

People who use mental health and addiction services in Aotearoa New Zealand are more than twice as

likely to be hospitalised for preventable physical health conditions compared to the general population. These hospitalisations were often due to heart and lung conditions, diabetes and epilepsy. Rates were especially high for Māori, Pacific peoples, older adults and those living in more deprived areas. The findings highlight major gaps in access to and quality of primary healthcare for this group. Better integration of mental and physical health services is needed to reduce these unfair health outcomes.

Evaluating Indigenous health workforce development interventions for Māori and Indigenous Pacific tertiary students: success at Waipapa Taumata Rau | The University of Auckland (2016–2023)

Annie Borland, Clair Mills, Claire Gooder, Sue Reddy, Anneka Anderson, Papaarangi Reid

The University of Auckland's Māori and Pacific Admissions Scheme (MAPAS), alongside other Vision 20:20 programmes, works to boost the number of Māori and Pacific health professionals in Aotearoa towards equitable workforce participation to uphold Te Tiriti o Waitangi. We need our doctors, nurses and other health professionals to reflect our communities, but long-standing barriers including systemic racism in education mean Māori and Pacific professionals are under-represented in our health workforce. MAPAS and Vision 20:20 provide comprehensive support both academically and culturally to set students up for success in their health careers. Our rights-based research shows that MAPAS students are passing their courses, advancing through their degrees and graduating at consistently higher rates than Māori and Pacific students in other faculties. The success of MAPAS and Vision 20:20 supports ongoing and increased investment—for our students, our communities and the future of healthcare in Aotearoa.

New Zealand 1986 Very Low Birthweight Follow-up Study: the third decade

Brian A Darlow, Sarah L Harris, L John Horwood, Lianne J Woodward

The New Zealand Very Low Birthweight Study has followed the health and progress of all individuals born prematurely in 1986 with very low birthweight (VLBW: <1,500g) across childhood into adulthood. This paper is a summary of the published findings of medical and psychological assessments at age 28 compared with same-aged peers who were born at the expected time at a healthy weight. Most VLBW adults are living healthy, productive lives similar to their term-born peers but do face some challenges. Mean values for biomedical measurements (e.g., blood pressure and lung function) and psychometric tests (e.g., IQ) were generally in the normal range for age but poorer than for controls. Very preterm birth is a lifetime condition and extra surveillance and monitoring is warranted, particularly for blood pressure, heart, lung and kidney function and blood sugar control.

From womb to world—is it time to revisit our current guidelines for treatment of antenatal depression? Supporting the next generation to have the best start to life

Julia J Rucklidge, Hayley A Bradley, Siobhan A Campbell, Jessica L Heaton, Elena Moltchanova, Lesley Dixon, Bryony Simcock, Roger T Mulder

Antenatal depression affects many pregnant women and can lead to complications for both mother and baby. While therapy and antidepressants can help, many women face barriers like cost and stigma, and worry about medication safety. Poor nutrition, especially a diet high in ultra-processed foods, can affect maternal and infant health. Studies show that taking vitamins and minerals during pregnancy can improve both maternal and infant outcomes. This commentary calls for an update to the guidelines to include better nutrition in maternal mental health care.

Pre-eclampsia in Aotearoa New Zealand: elevating clinical vigilance and equity—a viewpoint

Ankur Gupta, Sonia Sharma

Pre-eclampsia, a complex multisystem disorder characterised by new-onset hypertension after 20 weeks gestation, remains a significant public health challenge in Aotearoa New Zealand. Despite universal access to antenatal care, inequities in incidence and outcomes persist, with Māori and Pacific women experiencing higher rates of severe pre-eclampsia and perinatal complications. Culturally responsive maternity care models, such as Kaupapa Māori services and continuity of midwifery care, show promise in improving outcomes, but their availability is limited, and risk stratification models often fail to account for structural determinants of health. Effective management relies on early identification, timely delivery and equitable access to advanced diagnostics and interventions, yet disparities in access to care and preventive measures like low-dose aspirin highlight the need for systemic change to address health inequities.

Scedosporium and Cutibacterium skull base osteomyelitis complicated by blindeness from fulminant papilloedema

James Corbett, Nigel Raymond, Rebecca Garland, Andrew Parker, Jesse Gale

This rare skull bone infection was caused by a fungus and bacteria, and it required a lot of deep samples to identify the causative organisms. The most serious lasting consequence of this infection was blindness caused by a high intracranial pressure.

Osteoporotic sacral insufficiency fractures in a patient with alternating buttock pain: a case report

Rohil V Chauhan, Amanjeet Toor, Anand H Segar

This case report describes an older adult with an oncologic and fragility fracture who presented with recurrent buttock pain. Despite normal lumbar spine X-rays, further magnetic resonance imaging evaluation identified bilateral sacral insufficiency fractures, which are often underdiagnosed. The case illustrates the diagnostic challenges of sacral insufficiency fractures, which can mimic more common causes of lumbopelvic pain. It also reinforces the importance of considering fragility fractures and using appropriate imaging when evaluating non-specific lumbopelvic pain in high-risk populations.

The rising incidence and ethnic disparities in aortic dissection in Aotearoa New Zealand

Eric T A Lim, Andrew McCombie, Frank Frizelle, Adib Khanafer

Our study demonstrated a significant ethnic difference in the occurrence/detection of aortic dissection in Aotearoa New Zealand. An aortic dissection is a tear in the major blood vessel coming out of the heart and is considered a medical emergency associated with high rates of morbidity and death. Our sub-study extends from our previous publication and demonstrates, as we standardise the occurrence rate by age and ethnicity, that the occurrence rate in Māori patients were three times higher compared with their European counterparts. This occurrence rate was even higher in Pacific peoples, with it being four times higher in male and five times higher in female Pacific peoples compared with their European counterparts.

We can determine our future health

Kevin Hague, Peter Crampton, Ruth Cunningham, Jason Gurney, Beverley Te Huia, Caroline McElnay, Fa'afetai Sopoaga and the Public Health Advisory Committee (PHAC) Secretariat

> *"There comes a point where we need to stop just pulling people out of the river. We need to go upstream and find out why they're falling in."*
> – Archbishop Desmond Tutu

The environmental factors that drive our health and wellbeing are complex and inter-related. Consider tōtara trees in a forest: a tree's health and growth will depend on having fertile soil, stable bedrock and a healthy environment. If we are the trees, then the soil represents our access to resources—such as a secure home, access to healthy food and a steady income. Trees get stability from their roots and their root network; similarly, people do best when they have strong relationships and community connections. The bedrock under the soil represents our foundational human right to health, as well as the context provided by Te Tiriti o Waitangi. Scattered through the soil and bedrock are other elements like discrimination, racism, the ongoing impacts of colonisation and our economic system, which all create unequal access to good soil. People living in economically deprived communities are often exposed to multiple health-damaging factors like poor working conditions, low incomes, greater traffic and air pollution and lower-quality housing than people in affluent communities. Disabled people face discrimination in employment, earn lower incomes and have poorer access to suitable housing. These factors do not operate independently but together, often with compounding effects.

In 1998, New Zealand's National Advisory Committee on Health and Disability (National Health Committee) published a report titled *The Social, Cultural and Economic Determinants of Health in New Zealand: Action to Improve Health*.[1] The report made the case that the health and wellbeing of New Zealanders is mostly the result of factors that lie outside of our health system, and that in reality the "building blocks"—or determinants—of good health sit across multiple sectors of government policy and action. The upshot is that fiscal, environmental, housing and social policies are also invariably health policies, whether by accident or design.

More than 25 years later, the latest iteration of the Public Health Advisory Committee (PHAC) have updated this report for the twenty-first century.[2] The new report contextualises and defines the determinants of health and health equity and quantifies how they have changed since the previous report. It describes the progress we have (or haven't) made in these determinants and the new determinants that have emerged since the last report. Finally, it describes the levers we can use right now to improve access to the determinants of good health.

Trends in the determinants of health

Despite making overall gains across many determinants such as income and education since 1998, differences between groups persist for many indicators.[2] Housing affordability and household crowding are not improving for any population group, and Māori and Pacific peoples are faring the worst. Unemployment has dropped for all population groups since the last report, but has increased abruptly in recent years, and rates remain higher among Māori and Pacific peoples. In areas such as school attendance and attainment, social connection, trust in government, and environmental measures all the indicators examined in the new report are heading in the wrong direction for all population groups.[2]

Since the last report, trends in these determinants mirror trends in the health outcomes that they drive.[2] Overall, our health has improved since the last report, but more for some than others. A Pākehā baby boy born in Waikato today can expect to live 8.5 years longer than his Māori neighbour. Pākehā children can expect to live to 84 years in the northern region, 7 years longer than a Pacific child—a gap that has increased since the last report. We are living longer, and some causes of early death and disability like

cardiovascular disease, stroke and lung cancer have reduced, most likely due to reductions in tobacco use. However, disparities in many other health indicators remain entrenched. Infant and child mortality in Māori and Pacific peoples and in more socio-economically deprived communities are much higher than in other groups. Excess body weight has plateaued or increased depending on the population group. The prevalence of diabetes is rising, most starkly for Pacific peoples. Markers of our mental health like psychological distress are significantly worse, especially for young people. In essence, we may have improved our health in many areas, but there remain significant and persistent differences in health between population groups, much of which is preventable through sustained commitment to improving equitable access to the social determinants of good health.[3]

What is new?

The new report describes the changing face of commercial entities such as the food,[4] alcohol, tobacco and fossil fuel industries, and how their practices directly and indirectly influence our health. For example, the tobacco industry successfully lobbied for the repeal of aspects of the *Smokefree Environments Regulated Products (Smoked Tobacco) Amendment Act* in 2024, including the part of the act that would lead to a "smokefree generation".[5,6] This repeal represents a missed opportunity to reduce future preventable deaths from tobacco-related disease.

Two "megatrends" have evolved or emerged since the 1998 report: the climate crisis, and digital technology and artificial intelligence (AI). Our changing climate is already bringing new and increasing hazards to Aotearoa New Zealand in the form of flooding, extreme weather events, extreme heat, drought, fire danger and coastal inundation. These increasing hazards are felt across our society and impact our health in multiple direct and indirect ways.[2] Digital technology and AI have emerged and rapidly impacted the economy, employment, society and the environment—all determinants of our health. Whether we are able to harness the positive aspects of this megatrend while guarding against its adverse effects remains to be seen.[7]

How have we responded?

We have seen improvements in some key determinants of our health and subsequent improvement in several health indicators. However, we have also seen that the uneven distribution of resources and opportunities has largely persisted since 1998. There has been little progress on income equality: in the absence of a strong commitment to redistribution (via the tax and benefit system), our focus on economic growth has entrenched inequalities. Among the many indicators that our economy is working against rather than for many New Zealanders, almost two in five of us find it hard to meet the everyday costs of life.[8] As noted above, home ownership, household crowding and affordability, social connectedness and mental wellbeing are all moving in the wrong direction—with inevitable downstream impacts on health and wellbeing. We can, and must, do better.

In the new report we assess some of the areas of progress since 1998 and how positive change can be created. For example, we have achieved significant reductions in child poverty, supported by taxation levers and social policies (progressive taxation, Working for Families, and others).[9,10] Initially, there was strong multipartisan support to address the issue, resulting in the introduction of the *Child Poverty Reduction Act 2018*,[11] which established the framework for measuring and reporting on child poverty and agreed long-term targets. There is still a long way to go, and inequities persist between ethnic groups, but child poverty is an example of a health determinant that, with focus and concerted effort, can be successfully targeted and demonstrably improved.

How can we do better?

As can be seen for child poverty, the social determinants of our individual and collective health are not fixed or inevitable. We can modify them through the social and economic policies and programmes that we choose to implement. The concluding section of our new report makes many specific recommendations for how we can do better. We have broadly summarised these under key themes below, but encourage readers to engage with the full report for further detail:[2]

- **Invest in and empower communities, the root network of our forest.** Wellbeing, social cohesion, economic prosperity and health start with our whānau and communities. Their mana, aspirations for self-determination, capacity and strengths are fundamentals that can be built upon.

Early support for children and their families is vital to improving health equity and wellbeing across their lifecourse. Public services need to move out of siloes and work collectively across government to achieve agreed wellbeing goals with communities. This requires us to change the way public services work together, to enable and empower communities.

- **Strengthen our bedrock, the fundamental structures of our society.** Such strengthening will allow all New Zealanders equal access to the resources they need to thrive. We propose initiating a discussion on Te Tiriti o Waitangi as we move towards 2040, including how we want to govern our country. Human rights and the right to good health need to be embedded further into our laws, public policies and practice. The government needs to articulate an explicit approach to economic growth, societal wellbeing and equity. We need an economic system that is more equitable and redistributive by design. Further use of income and wealth tax levers is needed to reduce income and wealth inequities, and to support adequate investment in social and health services.
- **Invest in "win–win" solutions that nourish the soil and that have compounding benefits for health and other social outcomes.** Solutions for existential challenges like the climate crisis sit outside the health system but can be win–win, benefitting health outcomes (including equity), as well as driving positive social, economic and environmental outcomes. This is another example where de-siloed public service action is required to adequately drive meaningful change.
- While the focus of this new report is on the determinants of health outside the health system, we **recognise the important contribution healthcare makes to our health and wellbeing**. An equitable, accessible and non-discriminatory health system is core to realising a healthy future for us all and can be considered part of the bedrock and soil that underpin our collective health and wellbeing.

We invite all health workers and administrators in Aotearoa New Zealand's health system to make use of the frameworks and recommendations in this new report in their advocacy for better and fairer health outcomes for all. As a society we must address the determinants of health if we want our children and their children to grow into healthy and thriving adults capable of contributing positively to wider society.

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The one-hundred-women study: characteristics of New Zealand women with severe mental illness

Lillian Ng, Angela Fyfe, Zeke Wang, Jullian Carter, Emma Wong She, Michelle Chou, Jana Caramaschi, Tanya Wright

ABSTRACT

AIM: Severe mental illness (SMI) and adverse childhood experiences are associated with chronic physical illness and complex health and welfare needs. In this 100-women study, we aimed to identify health-related characteristics of women referred to community mental health clinics (CMHCs) to inform interventions in primary and specialist health services in supporting optimal health.

METHODS: Data were collected from healthcare records of a randomised sample of 100 women using a REDCap questionnaire, designed to collate information on psychiatric diagnoses, trauma experiences, treatment and healthcare use. Statistical analyses were performed to determine differences between ethnic groups.

RESULTS: One-third had two or more psychiatric diagnoses, one-third were under mental health legislation and 81% reported suicidal ideation. Traumatic experiences were documented in 90% and 32% reported four or more adverse childhood experiences. Fourteen percent of mothers in the study had children who were not in their care. More than one-quarter (27%) were migrants or refugees.

DISCUSSION: This research reveals adversity associated with women who are in the care of CMHCs, which confer substantial household vulnerability. The intergenerational effects of poor maternal mental health influence and shape the lives of children. The 100-women study presents compelling reasons to invest in women's health and early in their children's life-trajectory.

CONCLUSION: Clinicians need to consider women's complex array of needs at all points of health service access. We recommend routine enquiry and more precise documentation about women's health issues, pregnancy, parenting and adverse childhood experiences. Women with SMI are a strategic target for integrated, holistic, trauma-informed interventions with potential intergenerational impact.

People with severe mental illness (SMI) have high rates of chronic physical illness, complex health and welfare needs[1] and experience significant healthcare disparities.[2] Women have specific healthcare needs across the life trajectory,[3] and parents require explicit considerations.[4,5,6,7,8] Despite awareness of the significance of perinatal mental illness, the high rate of peripartum suicide and the significance of children's early years, their needs may not be adequately addressed, and health initiatives focus on high-prevalence conditions, primarily anxiety and depression. The subset of mental health conditions that constitute SMI remain poorly understood.

SMI affects 5% of the population over 18 years.[9] It is a non-diagnostic term, a subset of mental illnesses defined as resulting in functional impairment that substantially interferes with or limits one or more major life activities. While suboptimally defined, in New Zealand this serves as a proxy determination for who can access specialist mental health services. This includes, but is not limited to, schizophrenia, bipolar disorder and major depression (with or without psychosis) and other diagnoses.

Few studies describe the demographics, backgrounds and needs of women with SMI, and there is no New Zealand research of this type. Internationally, women with co-occurring mental health, substance use disorders and trauma experiences report varying symptom severity and use of support services.[10,11,12] Women with SMI experience higher rates of violence in adulthood, which, alongside socio-economic deprivation, has a compounding and detrimental impact on their lives, relationships and ability to access services.[13–15]

Abuse and household dysfunction in early life are associated with lifelong disadvantage including adult risk behaviours and poor health outcomes.[16] A description of 10 common early life adversities, which includes parental mental illness, are well characterised and researched. Known as Adverse Childhood Experiences (ACEs), they have a strong, cumulative impact, reflected in poor adult health outcomes,[17] wellbeing mea-

sures and life satisfaction.[13] ACEs are associated with adult health risk behaviours,[18] increased risk of poor obstetric, physical and psychological health, higher rates of hospitalisation and lower socio-economic status in the course of an individual's life.[16,17] In the first comprehensive study of childhood adversity in New Zealand, ACEs were more prevalent in those who were young, of lower socio-economic status and identifying as Māori.[19] Data sourced from the New Zealand Family Violence Survey revealed 55% had one ACE and 11% reported four ACEs before age 18.[19] Little is known about trauma or ACEs in women with SMI in New Zealand.[4,5,6,20]

Our research team of clinicians and researchers work in infant and maternal mental health services based at Health New Zealand – Te Whatu Ora Counties Manukau, a catchment area with a youthful, multi-ethnic population who live in low socio-economic environments.[21] Females comprise 46% of the population seen by mental health services. In this exploratory study, we aimed to identify the health characteristics of women with SMI referred to community mental health clinics (CMHCs). We proposed that women presenting to community mental health services had significant adverse childhood experiences. In this study, we describe aspects of their mental illness, trauma experiences, physical and sexual health, parenting role and service utilisation. The study was designed to emphasise the importance of identifying women's needs to inform interventions and the roles of primary and specialist health services in supporting optimal health. The delivery of efficient and effective services depends upon accurate information about service users and their social matrix. This paper attempts to define the problems faced by women who bear the concurrent load of responsibility for the next generation along with their own immediate physical and mental health needs.

Methods

Study design and methodology

In this cross-sectional retrospective study, data were collected from information contained in the clinical notes of women with SMI assessed by community mental health services from two hospital electronic databases (Health Care Community [HCC] and Concerto).

Sample

In our estimation of sample size, we chose 100 women to reflect the volume and in-depth nature of data collection in a qualitative format, as well as the number of variables, the time and resources available and the feasibility of statistical analysis.[22] A sample of 120 adult women between ages 18 to 65 were randomly selected by a data analyst to allow for a certain percentage of files to be discarded due to incomplete information. If data were less than 80% complete, the file was discarded. To obtain 100 cases, 115 were screened. A higher proportion of Māori (17%) and Pacific (8%) women were sampled. This was recommended in cultural consultation and prioritised to reflect the locality's demographic, in line with current utilisation of services.[21] Inclusion criteria were women who attended assessment during an episode of care at one of the five community mental health services clinics in the Counties Manukau catchment area within a 1-year timeframe from 1 December 2022 to 30 November 2023. The study involved the file review of health data contained in clinical files, approved by the New Zealand Health and Disability Ethics Committee. We did not seek informed consent or to re-interview women about information they had already provided to mental health services.

Data collection

RedCAP is a secure, web-based research data capture tool that enables the creation of a survey or data to track information. We constructed a RedCAP survey to compile qualitative data collected across the electronic databases (HCC and Concerto) within broad categories to encapsulate the large volume of information, where women's histories could be collated in a binary format to aid statistical analyses. Categories included demographic information, psychiatric diagnoses, use of mental health legislation, medical conditions, health screening (for example, cervical smears), medication, contact with sexual health services, social circumstances, parenting role, pregnancies and number of children, substance use, adverse childhood experiences, adult trauma, referrals to governmental and community agencies, registration with primary care and documented cultural concerns. The tool was tested and adjusted as it became apparent that some categories required expansion (for example, family relationships and making a distinction between adult and childhood trauma). The final iteration of the survey (version nine) was used to

draw data (see Appendix).

Data analysis

Data distributions were summarised using mean ± standard deviation (SD), median (interquartile range [IQR]) or n (%), as appropriate. Statistical analyses were performed (using R [version 4.4.0]) to determine differences between ethnic groups as categorised by Statistics New Zealand Level 1 codes: Māori, Pacific, European, Asian and Middle Eastern/Latin American/African (MELAA). Comparisons among ethnicity groups were performed using the Chi-squared test, Fisher's exact test, or analysis of variance (ANOVA), as appropriate. All analyses were conducted using a complete-case approach, with no imputation performed. The sample size for each variable is clearly reported in the results tables to ensure transparency about missing data. As this was a descriptive study with exploratory comparisons, we reported both unadjusted p-values and false discovery rate (FDR)–adjusted q-values using the Benjamini-Hochberg procedure to account for multiple testing.

Results

Demographics and psychiatric variables (Table 1)

This sample comprised 20 women who identified as Māori, 12 Pacific, 47 European, 17 Asian and four MELAA of mean age 34.8 years (±12.9). There were 98 who identified as cisgender and two as transgender. The median duration of contact with mental health services was 9 years. While 18% did not have an annotated psychiatric diagnosis, 32% had two or more, and these are described under broad categories (Table 1). The majority (56%) were taking two or more psychiatric medications; 13% were not taking any. Thirty percent had been placed under mental health legislation (MHA) on at least one occasion. Eighty-one percent had suicidal ideation across their lifetime and 38% had a documented attempted suicide. Thirteen percent had a forensic history. Sixty-six percent had a family history of mental illness. Ethnicity was not significantly different statistically for these variables.

Psychosocial variables (Table 2)

The majority (84%) of the women were living with other people, more commonly with family members (41%) than partners (30%). Pacific women were more likely to live with family (Pacific, 75% P=0.03). Twenty-four percent were living with children. Fifty-one percent were not in paid work and 82% had accessed supports from community agencies. Six percent had been adopted or were whāngai (an informal arrangement whereby a child is raised by a relative and birth parents retain legal guardianship) and 12% were raised by a caregiver who was not their parents. Twenty-seven percent were migrants or refugees (Asians 76.5%, P<0.001) and 14% had English as a second language (Asians 64.7%, P<0.001).

Health variables and service utilisation (Table 3)

The majority (97%) had a listed general practitioner on their file. Thirty-eight percent had one or more documented physical illnesses. Fifty-five percent reported cigarette smoking or vaping (Māori, 75%; Pacific, 83.3%; European, 48.9%; Asian, 23.5% P=0.004). Ninety percent reported alcohol use (Māori, 90% P=0.009) and 50% reported illicit substance use (Māori, 75% P=0.002). Cannabis use (42%) was statistically significant in Māori and MELAA (70% and 100%, P=0.001).

Forty-five percent had given birth, and 14% had three or more live births. Thirteen percent reported having terminations of pregnancy and this was higher in Pacific women (33.3%, P=0.046). Contraception was utilised by 24%, the majority of which were NZ Europeans (14/24), although Pacific women had a higher contraception-use rate (33%). Eighty-one percent had utilised services for sexual health (including primary care), 26% had utilised obstetric services, 56% had utilised gynaecology services and 79% attended cervical screening. Notably, 13% of eligible women (45+) attended mammogram screenings and none were Māori.

Traumatic experiences (Table 4)

Nearly 90% had documented trauma experiences. Eighty-four percent reported adverse childhood experiences and 32% reported four or more. Thirty-eight percent of women reported childhood sexual abuse and 30% reported domestic violence. In Māori, reported childhood sexual abuse (55%, P=0.05) and domestic violence (45%, P=0.04) were significantly higher. Nineteen percent experienced physical and/or emotional neglect, and 20% reported household substance abuse. Thirty-one percent had a parent with a mental illness. Homelessness (3%) was also statistically

significant for Māori (15%, P=0.04). Adult trauma experiences included sexual abuse (19%), domestic violence (28%) and emotional abuse (9%).

Children of the 100 women (Table 5)

Forty-five percent of the sample were parents. Twenty-four percent reportedly lived with children (0–18 years) in their care, including non-biological children. The category "biological children who were not in the person's care" were for reasons of uplift by welfare services, living with other family members, fostering, adoption or whāngai arrangements. Thirty-one percent evidently had children who were not in their care, and the rate was lower for Pacific people compared to other ethnic groups. We noted this information could not be deduced from looking at live births or children in care as there was no accounting for adult children or deceased children.

Discussion

The 100-women study yields clinically rich and relevant data about a vulnerable, hard-to-reach group with SMI. The analysis of their reported histories, collected at the time of initial assessment and contained in clinical files, is salient in revealing their diverse and varied health and psychosocial needs. There is considerable diagnostic variability within this group under CMHC care, but the severity of their mental illness is apparent in the high rates of suicidality, protracted periods of service involvement, involuntary treatment and high utilisation of community support agencies.

Broad categories of diagnosis are included. For example, the psychosis spectrum includes multiple diagnoses such as schizophrenia, schizoaffective disorder, brief psychotic disorder, psychosis due to a general medical condition, etc. An evaluation based on diagnosis would have been valuable; however, there was variability in diagnoses and a surprising lack of diagnoses for 13% of women. The high proportion of people without a listed primary diagnosis is indicative of the deficiencies in deriving data from mental health records; however, it is also clinically understandable. People may have differing aspects of their illness presenting across time, and the primary diagnosis may vary and overlap with other diagnoses, with particular regard to impaired function. Multiple diagnoses contribute to functional impairment in SMI, and the complexity brought on by traumatic life events further obfuscates statistical analysis of single variables.

There are a number of constraints in gathering information during the first comprehensive psychiatric assessment. As such, we acknowledge some areas are not explored in depth, particularly traumatic events, and may be under-reported. Equally, we acknowledge the inaccuracy of some data points; for example, we do not believe 97% are enrolled with and actively engaged with a general practitioner, despite having an organisation listed on their file. It was regrettable that data pertaining to dichotomous variables, such as pregnancy, miscarriage and children in their care, were poorly documented. A greater awareness of this would assist in providing quality information about the impact of treatments including psychiatric medications and enable consideration of the impacts on child raising.

There was relatively high utilisation of women's health services, yet notable differences between ethnicities pertaining to use of contraception, terminations and cervical and mammogram screening. Given the higher mortality rates from cancer in people with SMI,[23] these behavioural and provider risk factors warrant further specific consideration.

Ninety percent of women in this study reported trauma experiences and 32% reported four or more ACEs. This figure of 4+ ACEs is much higher than New Zealand's first comprehensive study of ACEs (11.6%).[19] Multiple ACEs are associated with an increased risk of physical and mental illness[13,24] and suicide attempts,[25] and is most strongly associated with intergenerational risks of violence, substance use and psychopathology.[26] Despite many years of specialist mental health care, there was limited documentation that considered the longer-term impact of traumatic experiences. Therefore, women's willingness to engage in therapeutic interventions with trauma as a focus remains unknown.

The life circumstances of our sample showed that most lived with other people, primarily family, and particularly so for Pacific women. One-quarter had children in their care and nearly half had caregiver responsibilities. More than half of the 100 women were not in paid work. There were high rates of suicidality, substance use, involuntary treatment and forensic issues. These substantial vulnerabilities as well as historic early life adversity and high ACE burden have far-reaching intergenerational impact.[27,28]

Parenting, fertility and sexual health are important[29,30] given the women's mean age of 34 years. We posit that these aspects of women's

health are not holistically considered or adequately addressed in the mental health care system.[5,27] Mothers with a severe mental illness carry additional burdens in negotiating the normative life stage of parenthood.[31] When ill, they risk undermining of their autonomy, to the extent that childcare and custody are disputed.[5] Hospital admissions are particularly disruptive for building attachment with children.[6,14] Poor maternal mental health has a long-term, significant effect upon child health[14] and contributes to intergenerational transmission of psychopathology.[15]

This study highlights challenges that women with SMI face and presents compelling evidence that this vulnerable population warrants substantive investment. This would benefit the women themselves and also have impacts on their children. The formative years of a child's life are influenced by responsive caregiving within a whānau/family environment,[27,28] and intergenerational effects of poor maternal mental health, with concomitant social adversity, reverberate during a child's lifecourse.[19] In the New Zealand government report *He Ara Oranga: Report of the Government Inquiry into Mental Health and Addiction*, intergenerational trauma was a repeated theme as were recommendations for whānau-centric approaches to healing for individuals and families.[32] Trauma and stigma further increase health inequity. There is a need to understand the difficulties and barriers women experience in accessing services, and mental health clinicians can assist with this through undertaking sensitive enquiries about traumatic experiences, sexual health and about their roles as caregivers.

However, there is inherent complexity in providing care to women who have trauma histories. Much more is required: intervening at critical timepoints in the lifecourse where basic schemas of self, others and the world are formed; tackling stigma;[2,33] and bolstering providers' understanding of complex trauma.[30] There needs to be improved access to trauma-informed care that is multi-disciplinary and multi-agency. The relational context of caregivers, children and the wider environment is highly relevant.[27] The 100-women study emphasises the need to screen for ACEs across services to mitigate the risk of poor health, develop policy that prioritises high need and conduct research that focusses on family, community and culturally protective factors.[19,34] Women seek help from a range of health services, but many are dissatisfied with the care they receive.[13] When women access mental health services, there are opportunities for a more holistic approach and to integrate support for their psychological health with general healthcare, family and social concerns.

We believe this exploratory study to be largely representative of women in our locality as data were drawn from original clinical files. However, there are limitations to report, primarily missing data contained in inconsistently completed forms. Missing data may reflect the constraints of a cross-sectional assessment, the acuity of risk and the quality of rapport formed in gathering histories. A further limitation is that broad psychiatric conditions may be arbitrarily assigned with a tentative formulation and not updated on the file. The study reflects imperfections of frontline contemporary clinical practice and ambiguous documentation prone to misinterpretation.

There are several practical implications for practice and policy. More precise data gathering is likely to improve service delivery. We emphasise care with assigning and recording diagnoses, with a rigorous approach as fundamental to effective treatment. Reasons for suboptimal practice reflects the reality of clinical work and/or the complexity of service users' presentation, as diagnoses may change over time. With many relevant and competing factors, it can be difficult to determine those of greatest importance. Record keeping should enable both the technical diagnosis and the social context to be made more explicit, and it should be provided by robust diagnostic formulations and their orderly review over time. This is fundamental to coherent service delivery.

Accurate records of the community supports accessed by women is another crucial element of coherent service delivery. Records were frequently imprecise, e.g., there were discrepancies between recorded and actual GP allocation. It would be beneficial to have an accurate depiction of "who's who", i.e., who has been involved in the overall care of women with recurring presentations. This could be generated and added to by case workers to guide subsequent clinical encounters.

The 100-women study raises concerns that health services provide care to patients without a clear understanding of women's specific needs and life circumstances. As such, there is limited accountability to referring agencies and a lack of ongoing responsibility for care as it is passed to these agencies. Remedies for these defects lie outside the scope of the paper. Scarcity of resources and workforce are not the only problems. Therefore, we explicitly recommend

research with a systems focus to better coordinate treatment of women's mental and physical health needs.

Conclusion

This study highlights that women with SMI have a complex array of needs that health professionals should take into consideration at all points of health service access. We recommend that routine enquiry is made about women's health issues, pregnancy, parenting and adverse childhood experiences, and that documentation is recorded more precisely. There are additional implications for Māori and minority-ethnic women due to the impact of trauma in forming trusting relationships with mainstream health-care services. Women with SMI should be acknowledged as a strategic target for integrated, holistic, trauma-informed interventions with potential and significant positive intergenerational impact.

Table 1: Demographic and psychiatric variables for the 100 women.

	Overall (n=100)	Māori (n=20)	Pacific (n=12)	European (n=47)	Asian (n=17)	MELAA (n=4)	p	q
Age (years), mean ± SD	34.8±12.9	31.0±9.6	34.3±14.0	37.3±14.1	34.8±11.9	25.3±6.1	0.22	0.47
Duration of contact with mental health services (years), median [IQR]	99 [4,16]	11 [5,11]	4 [2,12]	9 [4,19]	5 [2.5,10]	11.5 [7.15]	0.37	0.63
Psychiatric diagnoses							0.25	0.47
Psychotic spectrum, n (%)	12 (12.0)	2 (10.0)	1 (8.3)	6 (12.8)	3 (17.6)	0 (0.0)	0.95	0.95
Mood, anxiety and obsessive-compulsive disorder, n (%)	58 (58.0)	11 (55.0)	8 (66.7)	29 (61.7)	6 (35.3)	4 (100.0)	0.14	0.47
Trauma-related, n (%)	19 (19.0)	3 (15.0)	5 (41.7)	11 (23.4)	0 (0.0)	0 (0.0)	0.04	0.47
Personality, n (%)	6 (6.0)	1 (5.0)	0 (0.0)	5 (10.6)	0 (0.0)	0 (0.0)	0.62	0.88
Eating disorder, n (%)	2 (2.0)	0 (0.0)	0 (0.0)	1 (2.1)	0 (0.0)	1 (25.0)	0.12	0.47
Cognitive impairment, n (%)	3 (3.0)	0 (0.0)	0 (0.0)	3 (6.4)	0 (0.0)	0 (0.0)	0.75	0.91
Substance use disorder, n (%)	13 (13.0)	4 (20.0)	3 (25.0)	6 (12.8)	0 (0.0)	0 (0.0)	0.22	0.47
Other, n (%)	14 (14.0)	4 (20.0)	0 (0.0)	5 (10.6)	4 (23.5)	1 (25.0)	0.24	0.47
Psychiatric medications							0.85	0.95
Zero, n (%)	13 (13.0)	2 (10.0)	2 (16.7)	6 (12.8)	3 (17.6)	0 (0.0)		
One, n (%)	31 (31.0)	5 (25.0)	4 (33.3)	17 (36.2)	5 (29.4)	0 (0.0)		
Two or more, n (%)	56 (56.0)	13 (65.0)	6 (50.0)	24 (51.1)	9 (52.9)	4 (100.0)		
Involuntary treatment under mental health legislation, n (%)	30 (30.0)	6 (30.0)	4 (33.3)	13 (27.7)	5 (29.4)	2 (50.0)	0.92	0.95
Suicidal ideation, n (%)	81 (81.0)	19 (95.0)	8 (66.7)	38 (80.9)	13 (76.5)	3 (75.0)	0.24	0.47
Suicide attempt, n (%)	38 (38.0)	10 (50.0)	6 (50.0)	16 (34.0)	5 (29.4)	1 (25.0)	0.57	0.88
History of imprisonment or forensic history, n (%)	13 (13.0)	4 (20.0)	2 (16.7)	6 (12.8)	1 (5.9)	0 (0.0)	0.75	0.91
Family history of mental illness, n (%)	66 (66.0)	15 (75.0)	7 (58.3)	32 (68.1)	8 (47.1)	4 (100.0)	0.23	0.47

Table 2: Psychosocial variables for the 100 women.

	Overall (n=100)	Māori (n=20)	Pacific (n=12)	European (n=47)	Asian (n=17)	MELAA (n=4)	p	q
Living with others							0.45	0.68
Don't know, n (%)	1 (1.0)	0 (0.0)	0 (0.0)	1 (2.1)	0 (0.0)	0 (0.0)		
Lives alone, n (%)	15 (15.0)	2 (10.0)	0 (0.0)	11 (23.4)	2 (11.8)	0 (0.0)		
Lives with others, n (%)	84 (84.0)	18 (90.0)	12 (100.0)	35 (74.5)	15 (88.2)	4 (100.0)		
Living with partner, n (%)	30 (30.0)	6 (30.0)	2 (16.7)	16 (34.0)	5 (29.4)	1 (25.0)	0.90	0.90
Living with children, n (%)	24 (24.0)	4 (20.0)	3 (25.0)	11 (23.4)	4 (23.5)	2 (50.0)	0.80	0.87
Living with family members, n (%)	41 (41.0)	8 (40.0)	9 (75.0)	13 (27.7)	9 (52.9)	2 (50.0)	0.03	0.12
Living with 3 others, n (%)	13 (13.0)	4 (20.0)	0 (0.0)	6 (12.8)	2 (11.8)	1 (25.0)	0.45	0.68
Adopted, n (%)	4 (4.0)	0 (0.0)	1 (8.3)	3 (6.4)	0 (0.0)	0 (0.0)	0.58	0.77
Whāngai, n (%)	2 (2.0)	2 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0.16	0.48
Raised in the care of others (not parents), n (%)	12 (12.0)	5 (25.0)	2 (16.7)	4 (8.5)	1 (5.9)	0 (0.0)	0.31	0.68
Not in paid work, n (%)	51 (51.0)	8 (40.0)	8 (66.7)	24 (51.1)	9 (52.9)	2 (50.0)	0.71	0.85
Accessing care from community agencies, n (%)	82 (82.0)	19 (95.0)	9 (75.0)	37 (78.7)	13 (76.5)	4 (100.0)	0.37	0.68
English as a second language, n (%)	14 (14.0)	0 (0.0)	0 (0.0)	1 (2.1)	11 (64.7)	2 (50.0)	<0.001	0.006
Migrant or refugee, n (%)	27 (27.0)	1 (5.0)	3 (25.0)	7 (14.9)	13 (76.5)	3 (75.0)	<0.001	0.006

Table 3: Health variables and service utilisation for the 100 women.

	Overall (n=100)	Māori (n=20)	Pacific (n=12)	European (n=47)	Asian (n=17)	MELAA (n=4)	p	q
Registered with a GP, n (%)	97 (97.0)	20 (100.0)	10 (83.3)	46 (97.9)	17 (100.0)	4 (100.0)	0.14	0.32
Substance use								
Smoked or vaped, n (%)	55 (55.0)	15 (75.0)	10 (83.3)	23 (48.9)	4 (23.5)	3 (75.0)	0.003	0.02
Alcohol, n (%)	72 (72.0)	18 (90.0)	5 (41.7)	36 76.6)	9 (52.9)	4 (100.0)	0.009	0.04
Illicit substance use, n (%)	50 (50.0)	15 (75.0)	7 (58.3)	21 (44.7)	3 (17.6)	4 (100.0)	0.001	0.008
Methamphetamine, n (%)	20 (20.0)	8 (40.0)	2 (16.7)	9 (19.1)	0 (0.0)	1 (25.0)	0.03	0.10
Cannabis, n (%)	42 (42.0)	14 (70.0)	6 (50.0)	15 (31.9)	3 (17.6)	4 (100.0)	0.001	0.008
Other substance use, n (%)	20 (20.0)	4 (20.0)	1 (8.3)	12 (25.5)	1 (5.9)	2 (50.0)	0.17	0.32
Comorbid physical illness (one or more), n (%)	38 (38)	9 (45)	6 (50)	17 (36)	5 (29)	1 (25)	0.97	0.97
Use of contraception (past or present), n (%)	24 (24.0)	3 (15.0)	4 (33.3)	14 (29.8)	3 (17.6)	0 (0.0)	0.50	0.69
Live births							0.78	0.83
Zero, n (%)	55 (55.0)	12 (60.0)	7 (58.3)	24 (51.1)	10 (58.8)	2 (50.0)		
One to two, n (%)	31 (31.0)	7 (35.0)	4 (33.3)	16 (34.0)	3 (17.6)	1 (25.0)		
Three or more, n (%)	14 (14.0)	1 (5.0)	1 (8.3)	7 (14.9)	4 (23.5)	1 (25.0)		
Terminations							0.06	0.16
Zero, n (%)	87 (87.0)	17 (85.0)	8 (66.7)	44 (93.6)	14 (82.4)	4 (100.0)		
One to two, n (%)	10 (10.0)	3 (15.0)	4 (33.3)	2 (4.3)	1 (5.9)	0 (0.0)		
Three or more, n (%)	3 (3.0)	0 (0.0)	0 (0.0)	1 (2.1)	2 (11.8)	0 (0.0)		
Use of women's sexual health services, n (%)	81 (81.0)	18 (90.0)	9 (75.0)	38 (80.9)	13 (76.5)	3 (75.0)	0.70	0.83
Use of obstetric health services, n (%)	26 (26.0)	5 (25.0)	2 (16.7)	13 (27.7)	5 (29.4)	1 (25.0)	0.97	0.97

Table 3 (continued): Health variables and service utilisation for the 100 women.

Use of gynaecological health services, n (%)	56 (56.0)	12 (60.0)	6 (50.0)	28 (59.6)	9 (52.9)	1 (25.0)	0.73	0.83
Any woman's health screening, n (%)	20 (20.0)	2 (10.0)	5 (41.7)	9 (19.1)	3 (17.6)	1 (25.0)	0.28	0.45
Cervical smear/swab, n (%)	79 (79.0)	18 (90.0)	8 (66.7)	36 (76.6)	14 (82.4)	3 (75.0)	0.52	0.70
Mammogram, n (%)	13 (13.0)	0 (0.0)	3 (25.0)	7 (14.9)	3 (17.6)	0 (0.0)	0.18	0.32

Table 4: Traumatic experiences (as adults and in childhood) of the 100 women.

	Overall (n=100)	Māori (n=20)	Pacific (n=12)	European (n=47)	Asian (n=17)	MELAA (n=4)	p	q
Adult trauma								
Severe emotional abuse, n (%)	9 (9.0)	4 (20.0)	1 (8.3)	2 (4.3)	1 (5.9)	1 (25.0)	0.14	0.23
Sexual abuse, n (%)	19 (19.0)	4 (20.0)	1 (8.3)	12 (25.5)	2 (11.8)	0 (0.0)	0.60	0.69
Domestic violence, n (%)	28 (28.0)	7 (35.0)	3 (25.0)	12 (25.5)	5 (29.4)	1 (25.0)	0.95	0.95
Other, n (%)	32 (32.0)	4 (20.0)	5 (41.7)	15 (31.9)	4 (23.5)	4 (100.0)	0.04	0.12
Adverse childhood experiences								
Sexual abuse, n (%)	38 (38.0)	11 (55.0)	6 (50.0)	17 (36.2)	1 (5.9)	3 (75.0)	0.005	0.04
Domestic violence, n (%)	30 (30.0)	9 (45.0)	5 (41.7)	9 (19.1)	4 (23.5)	3 (75.0)	0.04	0.12
Physical and emotional neglect, n (%)	19 (19.0)	6 (30.0)	1 (8.3)	9 (19.1)	1 (5.9)	2 (50.0)	0.14	0.23
Parental alcoholism or drug abuse, n (%)	20 (20.0)	5 (25.0)	3 (25.0)	11 (23.4)	0 (0.0)	1 (25.0)	0.14	0.23
Incarcerated family member, n (%)	5 (5.0)	3 (15.0)	0 (0.0)	2 (4.3)	0 (0.0)	0 (0.0)	0.32	0.4
Bullying, n (%)	16 (16.0)	4 (20.0)	1 (8.3)	8 (17.0)	3 (17.6)	0 (0.0)	0.93	0.95
Parental mental illness, n (%)	31 (31.0)	7 (35.0)	3 (25.0)	18 (38.3)	2 (11.8)	1 (25.0)	0.32	0.4
Divorce, n (%)	37 (37.0)	12 (60.0)	4 (33.3)	15 (31.9)	4 (23.5)	2 (50.0)	0.15	0.23
Homelessness, n (%)	3 (3.0)	3 (15.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0.04	0.12
Emotional abuse, n (%)	16 (16.0)	6 (30.0)	2 (16.7)	7 (14.9)	0 (0.0)	1 (25.0)	0.10	0.23
ACEs 4 or more, n (%)	32 (32.0)	12 (60.0)	4 (33.3)	13 (27.7)	1 (5.9)	2 (50.0)	0.005	0.04

Table 5: Children associated with the 100 women.

	Overall (n=100)	Māori (n=20)	Pacific (n=12)	European (n=47)	Asian (n=17)	MELAA (n=4)	p	q
Live births							0.78	0.78
Zero, n (%)	55 (55.0)	12 (60.0)	7 (58.3)	24 (51.1)	10 (58.8)	2 (50.0)		
One to two, n (%)	31 (31.0)	7 (35.0)	4 (33.3)	16 (34.0)	3 (17.6)	1 (25.0)		
Three or more, n (%)	14 (14.0)	1 (5.0)	1 (8.3)	7 (14.9)	4 (23.5)	1 (25.0)		
Children in the person's care, n/N (%)	25/45 (55.6)	4/8 (50.0)	5/5 (100.0)	10/23 (43.5)	4/7 (57.1)	2/2 (100.0)	0.13	0.26
Number of children in the person's care							0.56	0.75
None, n/N (%)	4/25 (16.0)	0/4 (0.0)	2/5 (40.0)	2/10 (20.0)	0/4 (0.0)	0/2 (0.0)		
One, n/N (%)	8/25 (32.0)	3/4 (75.0)	0/5 (0.0)	2/10 (20.0)	2/4 (50.0)	1/2 (50.0)		
Two, n/N (%)	8/25 (32.0)	1/4 (25.0)	2/5 (40.0)	3/10 (30.0)	1/4 (25.0)	1/2 (50.0)		
Three or more, n/N (%)	5/25 (20.0)	0/4 (0.0)	1/5 (20.0)	3/10 (30.0)	1/4 (25.0)	0/2 (0.0)		
Biological children (0–18 years) not in the person's care, n/N (%)	14/45 (31.1)	3/8 (37.5)	1/5 (20)	7/23 (30.4)	2/7 (28.6)	1/2 (50)	0.003	0.012

All denominators related to the calculation of children's outcomes include the number of people with children, excluding those without children.

COMPETING INTERESTS
There are no conflicts of interest to declare.
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Appendix: RedCAP data collection tool.

100 women healthcare needs

Record ID	_____
NHI	_____
1. What is the documented date of birth?	_____
2. What is the documented gender?	◯ female ◯ other
3. What is the documented main ethnicity?	◯ European ◯ Māori ◯ Pacific peoples ◯ Asian ◯ Middle Eastern / Latin American / African ◯ Other ethnicity ◯ Don't know (NZ stats ethnicity level 1 codes)
4. What is the documented current marital status?	◯ Single never partnered ◯ Married or domestic partnership ◯ Separated ◯ Divorced ◯ Widowed ◯ Don't know
5. Are there any documented psychiatric diagnoses?	◯ Yes ◯ No
5a. What are the documented psychiatric diagnoses?	☐ Psychotic spectrum ☐ Mood and anxiety/OCD ☐ Trauma related ☐ Personality ☐ Eating disorder ☐ Cognitive impairment ☐ Substance use disorder ☐ Other
6. Is there documentation of age at first contact with mental health services?	◯ Yes ◯ No
6a. What is the documented age at first contact with mental health services?	_____
7. What is the documented duration of mental illness?	◯ Less than 1 year ◯ More than 1 year ◯ Don't know
7a. Documented duration of mental illness (in years)?	_____
41. Is there documentation of a family history of mental illness?	◯ Yes ◯ No

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Appendix (continued): RedCAP data collection tool.

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8. Is there any documentation of other/comorbid chronic health condition/s?	◯ Yes ◯ No
8a. What are the other documented other/comorbid health conditions?	_____
9. Is there any documentation of psychiatric medications prescribed?	◯ Yes ◯ No
9a. What are the prescribed psychiatric medications documented?	☐ Anti-psychotics ☐ Mood stabilisers ☐ Anti-depressants ☐ Benzodiazepine ☐ Other
10. Is there any documentation of suicidal ideation?	◯ Yes ◯ No
11. Is there any documentation of suicide attempt/s?	◯ Yes ◯ No
11a. When did the suicide attempt/s occur?	◯ Less than 1 year ◯ More than 1 year ◯ Don't know
12. Is there any documentation of trauma?	◯ Yes ◯ No
12a. What are the documented types of childhood trauma?	☐ Sexual abuse ☐ Domestic violence ☐ Physical and emotional neglect ☐ Alcoholism and drug abuse ☐ Incarcerated family member ☐ Bullying ☐ Maternal depression ☐ Parental mental illness ☐ Divorce ☐ Homelessness ☐ Other / unspecified ☐ Emotional Abuse (ACEs, 'other' includes loss/grief)
12b. What are the documented types of adult trauma?	☐ Sexual abuse ☐ Domestic violence ☐ Other / unspecified ☐ Emotional abuse ('other' includes loss/grief)
13. Is there any documentation of the use of contraception ?	◯ Yes ◯ No
14. How many documented pregnancies are there?	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six+ ◯ none

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Appendix (continued): RedCAP data collection tool.

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15. How many documented live births are there?	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six+ ◯ none
16. How many documented miscarriages?	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six+ ◯ none
17. How many documented pregnancy terminations?	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six+ ◯ none
18. Is there any documentation of the use of reproductive assistance?	◯ Yes ◯ No
19. Is there any documentation of utilisation of women's sexual health services?	◯ Yes ◯ No
19a. Type of women's health services utilised?	☐ sexual health ☐ obstetrics ☐ gynecology
20. Is there any documentation of women's health screening?	☐ No ☐ Yes Cervical smear/swab ☐ Yes Mammogram (45+)
21. Is there documentation of having ever smoked/vaped?	◯ Yes ◯ No
22. Is there any documentation of consuming alcohol?	◯ Yes ◯ No
23. Is there documentation of any other substance use?	◯ Yes ◯ No
23a. What other substance use is documented?	☐ Methamphetamine ☐ THC/cannabis ☐ Other
24. Is there documentation of being registered with a GP?	◯ Yes ◯ No
25. Is there documentation of accessing types of care from community agencies?	◯ Yes ◯ No

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Appendix (continued): RedCAP data collection tool.

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25a. What types of community agency care are documented as being accessed?	☐ Housing ☐ Vocation ☐ Psychosocial ☐ Legal ☐ Finances ☐ Family ☐ Trauma ☐ Medical ☐ Other ('Trauma' includes violence, abuse & sexual abuse/harm support, refuge, counselling. 'Other' includes spiritual/religious support.)
26. Is there any documentation of involuntary interventions?	◯ Yes ◯ No (MH Act)
26a. Are the involuntary interventions current or past?	◯ current ◯ past
28. Is there documentation of currently living with others?	◯ Lives with others ◯ Lives alone ◯ Don't know
28a. What relationship to the person are the others currently living at the same address?	☐ Partner ☐ Children ☐ Family members ☐ Others
29. Is there any documentation of having been adopted?	◯ Yes ◯ No
29a. What is the documented age at adoption?	_____ (age in years)
30. Is there any documentation of this person having been in a whangai arrangement?	◯ Yes ◯ No
30a. Age at whangai	_____ (age in years)
31. Other than 'adoption' or 'whangai', is there any other documentation of being raised in the care of others/non parental?	◯ Yes ◯ No
31a. Age when entered care of others/ non parental	_____ (age in years)
32. Is there any documentation of source of income?	◯ In paid work ◯ Not in paid work
33. Is there a documented history of imprisonment/forensic history?	◯ Yes ◯ No
34. Is there documentation of disability or functional impairment?	◯ Yes ◯ No

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Appendix (continued): RedCAP data collection tool.

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35. Is there documentation of any children in the persons care?	◯ Yes ◯ No
35a. Number of children in the persons care	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six ◯ none (choose 6 if 6 or more)
35b. Date of birth of child one in the persons care	_____ (approx birth year based on data collection date)
Gender of child one	◯ Male ◯ Female ◯ Other ◯ Don't know
Date of birth of child two in the persons care	_____
Gender of child two	◯ Male ◯ Female ◯ Other ◯ Don't know
Date of birth of child three in the persons care	_____
Gender of child three	◯ Male ◯ Female ◯ Other ◯ Don't know
Date of birth of child four in the persons care	_____
Gender of child four	◯ Male ◯ Female ◯ Other ◯ Don't know
Date of birth of child five in the persons care	_____
Gender of child five	◯ Male ◯ Female ◯ Other ◯ Don't know
Date of birth of child 6 in the persons care	_____

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Appendix (continued): RedCAP data collection tool.

Gender of child six	◯ Male ◯ Female ◯ Other ◯ Don't know
40. Is there documentation of biological children (0-18 years) NOT in the persons care?	◯ one ◯ two ◯ three ◯ four ◯ five ◯ six ◯ none (removed OR in care of other person/ family member OR adopted, whangai, foster etc)
36. Is there any documentation of aspects of culture arising?	◯ Yes ◯ No
37. Is there any documentation of English as a second language?	◯ Yes ◯ No
38. Is there any documentation of being a migrant/refugee?	◯ Yes ◯ No
39. Is there any documentation of active family/social support?	◯ Yes ◯ No

Why do women in health seek mentoring—a descriptive study of a mentorship programme for women in Aotearoa New Zealand

Rebecca Grainger, Rachel Roskvist, Alison Barrett, Carmen Chan, Sabrina Sapsford, Juliet Rumball-Smith, Charlotte Foley

ABSTRACT

AIM: Wāhine Connect is a peer-mentoring organisation established in 2017 by a medical clinician to address an unmet need by enabling peer-to-peer wāhine mentorship in medicine and health in Aotearoa New Zealand. This retrospective descriptive study reports the demographic and work profiles of women seeking mentoring, their reasons for seeking mentoring and satisfaction with their experience of the programme.

METHODS: Mentees' registration data were analysed to describe demographic characteristics of women seeking mentorship and the reasons women chose to seek mentorship. The survey data on mentorship experience were analysed to describe mentee satisfaction with the Wāhine Connect programme and their mentors.

RESULTS: From October 2017 to December 2023, 642 women participated in the Wāhine Connect mentorship programme. The mean age of mentees was 34 years. The most frequent ethnicities were NZ European (59.8%) and Asian (19.2%). Over 85% of participants were doctors (n=546), with 100 working in primary care and 387 pre-vocationally registered. Of the 39 reasons for accessing mentoring, the three most highly rated were "lack of confidence" (41.6%), "juggling training/work with raising a family" (35.8%) and "balancing your work/career needs with those of your partner" (30.8%). Of 208 respondents to the post-programme evaluation survey, 97.6% rated the value of the mentoring programme as excellent/very good/good, and the quality of the match between mentee and mentor was rated excellent/very good/good by 96.6%.

CONCLUSIONS: Women in Aotearoa New Zealand seek mentoring for many reasons and a mentoring service is needed. This need is likely to persist and should be supported by our healthcare system.

In 1896, Dr Emily Siedeberg was the first woman to graduate from an Aotearoa New Zealand medical school.[1] For the next 20 years only one or two women per year joined her.[1] Today, women in medicine make up more than 50% of graduates.[2] However, wāhine (women) doctors are under-represented in some postgraduate training programmes, where the structure and requisites may require an assumption of "*putting one's life on hold*".[3] Later in their careers, wāhine doctors do not achieve equitable pay[4] or achieve proportionality in leadership positions that hold budget and/or decision-making power.[5] Failure to support wāhine doctors to flourish in medicine may also be contributing to issues of burnout and workforce retention in Aotearoa New Zealand.[2] Despite these differences, there seems to have been no systematic implementation of structures or supports to address the career and workplace inequities experienced by women doctors.[6,7]

Women in medicine frequently manage numerous obstacles in their training and career, which may not be experienced by men.[8,9] Balancing family commitments, work life and personal life can limit networking opportunities.[4,8] Wāhine may choose to delay childbearing for training due to perceived career threats.[10] Furthermore, discrimination, bullying[11] and implicit gender bias[5] may hinder the progress and success of women doctors in postgraduate training. Women may also experience barriers to career advancement,[4] leadership positions[12] and research opportunities.[13] Additional challenges are faced by healthcare workers recruited from overseas to meet workforce demands[14] and who also belong to minoritised groups.[5,15] While ultimately removing these obstacles at a systems level seems a moral imperative, in the interim processes, supporting women to navigate these barriers has the potential to benefit individual women, improve healthcare

for New Zealanders and enhance research.[13,16]

Mentorship, defined as a "*partnership in personal and professional growth and development*",[16] may be one mechanism to support women's careers. Through mentoring, they may be empowered to better manage their progress by focussing on development of their skills[13] and by receiving support through difficult stages of their career. Mentoring programmes potentially improve training and retention of doctors at risk of burnout,[17] and there may be reciprocal benefits for both the mentor and mentee.[13]

Despite these potential benefits of mentoring, women perceive greater difficulty in finding mentors than their male colleagues.[6] A lack of mentorship and sponsorship may contribute to structural barriers hindering women's representation and achievement in medicine.[4,6,13,18] Wāhine Connect, a grass roots peer-mentoring organisation created in 2017 by a medical clinician, aimed to address an unmet need, enabling peer-to-peer wāhine mentorship in medicine and health in Aotearoa New Zealand. The primary aims of this research were to describe the women in the healthcare sector engaging with Wāhine Connect as mentees since 2017 in terms of demographics, career stage and location, and the concerns driving their participation in a mentoring programme.

Methods

This retrospective descriptive study analysed routinely collected registration and evaluation data from mentees in the Wāhine Connect programme from October 2017 to December 2023. Wāhine Connect was piloted initially with female doctors and then extended to other women health professionals from 2018.

The mentoring match process and the programme

Wāhine Connect offers two types of mentoring programmes: "Jump" is a short, focussed option in which a mentee has a single mentoring session with three different mentors; "Journey" is a longer option in which a mentee engages with a single mentor multiple times over 6 months.

During the study period, women seeking mentorship registered as a mentee via an online form. Mentee applications were considered by a matching committee convened by the Wāhine Connect administrative team consisting of women in the health sector. This included doctors from multiple specialties, allied health and non-clinical roles. They made recommendations regarding mentors and the mentoring programme based on mentee demographics, their stated issues and preferences. If there were no suitable mentors on the database, the committee used their networks or asked mentors for referrals to other women in the health sector who may be willing to support a mentee. After both mentor and mentee accepted the match, they were connected and provided resources for the Jump or Journey programme. Both programmes have an overview document, goal templates and a contract to guide mentors and mentees. These resources were developed by the Wāhine Connect team, with peer review by external academics, members of the NZ Women in Medicine community and legal review where relevant. Those in the longer Journey programme received monthly reminders about the month's tasks. All mentees were sent an evaluation survey at the completion of their programme.

Data collection

At the registration website, mentees provided their demographic information (age, domicile region, ethnicity), profession (medical, nursing, allied health, dentistry, physiotherapy, pharmacy, other), employer and place of work, career stage and specialty. While the ethnicity question at registration was not collected entirely in line with the Statistics New Zealand census question, we used Ethnicity New Zealand Standard Classification (2005v2.1.0) to create prioritised ethnicity from the data collected.

Wāhine Connect does not deliver a clinical service and is not considered within the scope of the HISO 10001:2017 Ethnicity Data Protocols, which was published after the data collection began. Ethnicity data and results breakdown by ethnicity within this paper should be considered within these limitations.

Mentees also rated each item on a list of 39 reasons for seeking mentorship as being "very relevant or important to me right now", "somewhat relevant" or "not relevant to me right now". The 39 reasons were selected based on a thematic analysis of mentee submissions during the pilot phase programme. Registration questions are provided in Appendix A.

The programme completion evaluation survey includes five questions: two open-ended (free-text) questions, two using a five-point Likert scale and one question that asks participants to rate four separate aspects individually. Two scales were used: Strongly agree, agree, somewhat agree, disagree, strongly disagree; or Excellent, very good,

good, fair, poor. Evaluation survey questions are provided in Appendix B.

Analysis

Mentee and programme data held on matches from the programme's inception (October 2017) to December 2023 were analysed using Microsoft Excel 2022. This included an initial pilot, a period of organisational establishment without registrations (2018), and from 2019 onwards when regular mentorship matches were made.

No identifying data are reported and cells with fewer than five individuals have not been reported separately to reduce risk of identifying an individual. Consequently, Māori and Pacific mentee data on relevant issues were combined.

For medical mentees, career stage was defined as based on self-reported work status as follows: "Junior doctor", if qualified with a medical degree and working as a house officer or senior house officer; "Registrar", if working in a training or non-training position as a registrar; "Specialist", if a vocationally registered medical specialist, such as a consultant in hospital or private practice, or a specialist general practitioner (GP); "Fellow", if indicated they worked in a specific position as a Fellow to develop sub-specialty skills or expertise; "Other", if they were a Medical Officer of Specialist Scale (MOSS), or if none of the options applied. Where medical registrants were between these stages (such as coming to the end of registrar years but not yet in a specialist position), they were categorised by their most recent previous career stage. Analysis included descriptive summary statistics and frequencies.

Ethical considerations

This manuscript reports data provided to an independent charitable entity in a manner where every attempt has been made to remove all identifying details. At registration, prospective mentees consented to the use of their information for a variety of purposes including research (see Appendix A). Wāhine Connect committed to reporting data without identifying details and preserving anonymity.

Results

Mentee demographics and reasons for seeking mentoring

From 1 October 2017 to 31 December 2023, 670 women registered with Wāhine Connect for mentorship. After 28 women withdrew or were referred on to appropriate schemes such as employee assistance programmes, 642 women participated in mentorship programmes. These study participants (called mentees for further reporting) had a mean age of 34 years (range 23–64 years), with most frequent ethnicities being Pākehā/NZ European (59.8%) and Asian (19.2%) (Table 1). The majority lived in Aotearoa New Zealand with nine mentees located overseas. Of the 633 Aotearoa New Zealand-based participants, most were located in or around large cities, most frequently in the North Island (Auckland [28.2%], Wellington [18.7%], Hamilton [7.7%], Christchurch [12.9%]). Most mentees were doctors (85%, n=546). Of these, 100 (18.3%) were working in primary care, either as GPs or GP registrars. Three hundred and eighty-seven (70.9%) were pre-vocationally registered doctors (junior doctors or registrars). The majority of women participated in the Jump (short) programme (n=394, 61.4%) and the rest in the Journey (longer) programme (n=247, 38.5%). One mentee participated in both Jump and Journey programmes concurrently.

All 39 reasons offered for seeking mentorship were selected by at least three participants. In the early phase, a small number of mentees did not rate all 39 reasons. These were subsequently made mandatory. As mentees were asked to identify their most relevant reasons for accessing mentoring, it is likely that mentees would skip items less relevant to them resulting in minimal impact on rankings reported in this paper. The top three were "lack of confidence" (266/639, 41.6%), "juggling training/work with raising a family" (229/639, 35.8%) and "balancing your work/career needs with those of your partner" (197/639, 30.8%), with the remaining 17 most frequent reasons included in Figure 1.

Forty-six point two percent (30/65) Māori and Pacific participants chose "burnout due to work stress" compared with 25.5% (147/577) for non-Māori, non-Pacific mentees (Figure 2). Of Māori, Pacific and Asian participants about one-third nominated "identifying as an ethnic minority" as a mentorship reason being "very relevant or important for me right now".

Mentee post-programme evaluations

There were 208 evaluations returned by 31 December 2023, a response rate of 40.8% (208/510). Overall, 97.6% (203/208) of respondents rated the value of the mentoring programme as excellent/very good/good (Figure 3). The quality of the match between mentee and mentor was rated excellent/very good/good by 96.6% (201/208).

Table 1: Demographic characteristics of mentees.

Characteristic	Mean (range) or n (%)
Age (years)	
	34 (23–64)
Ethnicity	
Māori	57 (8.9)
Pacific	8 (1.2)
Asian	123 (19.2)
MELAA	15 (2.3)
Pākehā/NZ European	384 (59.8)
Other or not specified	55 (8.6)
Profession	
Medical	546 (85.0)
Nursing	20 (3.1)
Allied health	43 (6.8)
Pharmacy	9 (1.4)
Other	24 (3.7)
Medical professionals (total medical = 546)	
Junior doctor	155 (28.4)
Registrar	232 (42.5)
Specialist	130 (23.8)
Fellow	20 (3.7)
Other	9 (1.6)

MELAA = Middle Eastern, Latin American and African.

Figure 1: Twenty most frequent reasons for requesting mentoring selected by mentees.

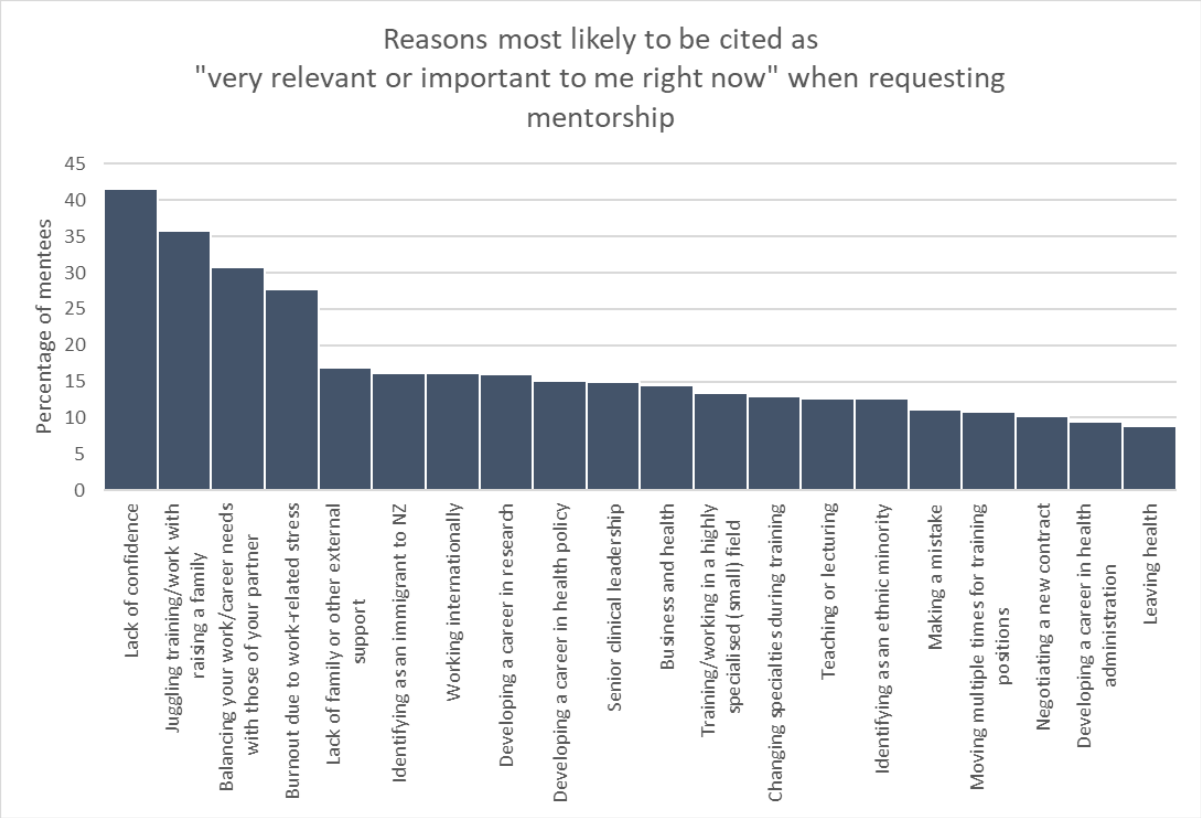


Figure 2: Six most frequent reasons for seeking mentorship nominated as “highly relevant or important to me right now” by ethnicity.

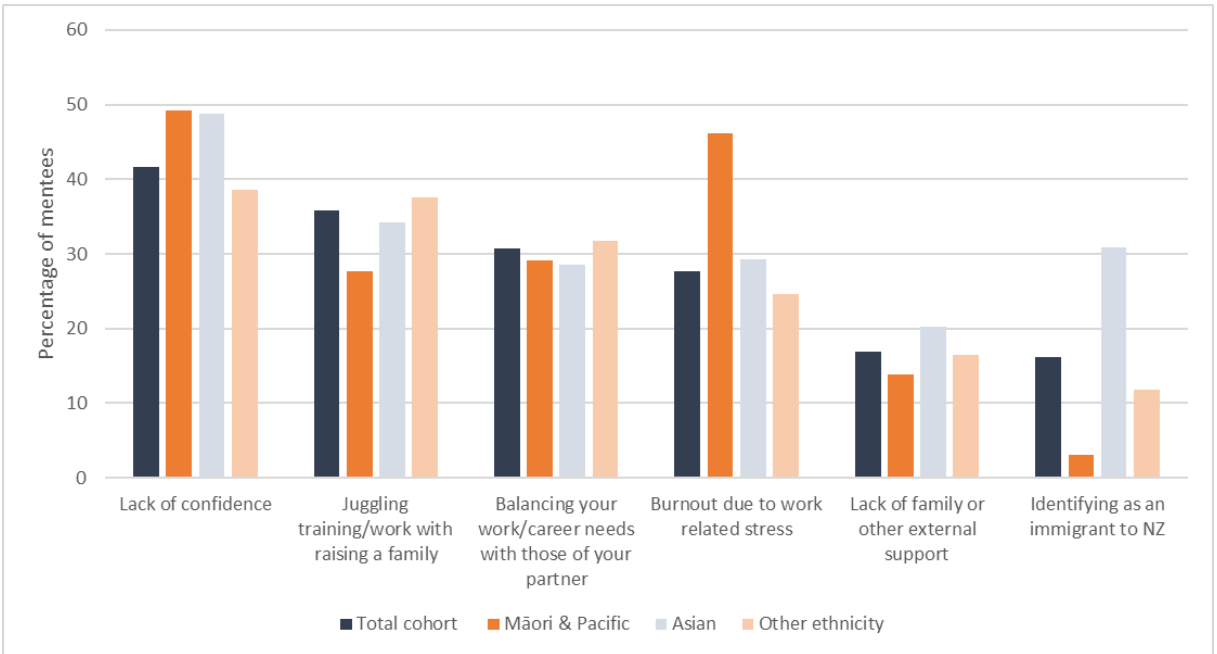
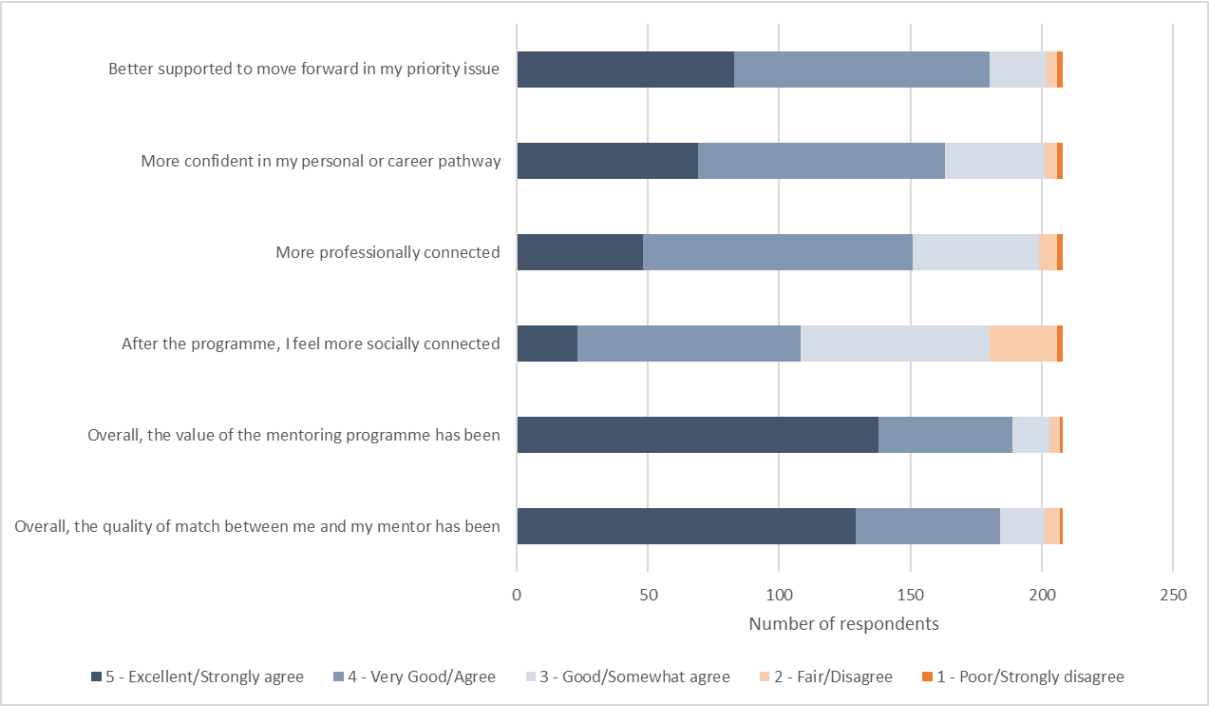


Figure 3: Mentee responses to evaluation statements.



Discussion

This manuscript describes over 600 women healthcare professionals in Aotearoa New Zealand, the majority doctors, accessing mentorship via Wāhine Connect over the last 5 years for a wide range of reasons with the most frequent including lack of confidence, juggling work with the needs of parenting or a partner and burnout due to work-related stress. Most mentees were in pre-vocationally registered roles (registrar and house officer). Interestingly, Māori and Pacific mentees nominated burnout and lack of confidence as reasons for seeking mentoring at higher rates than the overall cohort rates. The post-mentoring evaluation data suggest the mentoring was highly valued and mentoring matches were excellent for almost all mentees. These data evaluate what we believe to be the first pan-health mentoring programme for women in health professions in Aotearoa New Zealand. Most mentees in the study were in the early stages of their careers, a time when balancing work demands and social roles can be especially challenging, or when work-related burnout is more likely to occur. The preponderance of doctor mentees (85%) likely reflects the origins of Wāhine Connect from the medical profession, early targeted advertising to this group and word-of-mouth references from early participants in the programme. The wide range of ages of mentees (23–64) illustrates the need for mentorship at all career stages; however, 42% doctors seeking mentoring were registrars. These women will be at a time of high training demands and potentially limited flexibility of employment and are also often parenting younger children. The substantial number of senior medical officers seeking mentoring (130) indicates that the need for mentoring persists throughout a career but may have a different focus.

Our finding of lack of confidence being the most frequent reason for seeking mentoring across all mentees is consistent with the literature and suggests a predictable need for mentoring support at this career stage.[19] Lack of confidence (sometimes called “imposter syndrome”) among women in medicine is well described[20] and may begin in medical school.[21] It has been suggested that this is related to and reinforced by implicit gender biases and stereotypes experienced by women doctors,[22] which also contributes to a gender gap and lack of women in leadership and senior positions.[12] Lack of confidence is heightened at career transitions,[23] which may explain the substantial proportion of doctor mentees who

were in post-graduate vocational training. Seeking mentoring as a strategy to address a lack of confidence has been promoted in the scholarly literature,[24] with some empirical evidence showing mentorship for women doctors helped increase professional confidence.[25] Any future mentoring programmes in Aotearoa New Zealand should anticipate lack of confidence as common in mentees, particularly at earlier career stages and transitions. Mentoring could also be signposted in post-graduate training as a useful support during a period of transition.

Our finding that the second most frequent reason women cited for seeking mentoring was the difficulty of juggling family with work and training is also consistent with previous research.[26] Women in employment can experience discrimination related to being a mother, dubbed the "motherhood penalty".[27] Women in medicine have reported discrimination due to pregnancy, maternity leave and breastfeeding, with employed mothers perceived as having less commitment to their work.[28] In addition to the self-reported experience of discrimination due to motherhood there is objective evidence of a motherhood penalty in medicine: women experience reduced earnings, slower career progression and increased domestic workload in relation to male counterparts.[29] Time spent on domestic labour has been shown to directly negatively impact on research outputs crucial for academic promotion.[26] While all organisations in Aotearoa New Zealand are legally obliged to avoid discrimination based on gender in the workplace, our data suggest women in healthcare frequently seek support to balance work with parenting roles, suggesting that more work needs to be done to systematically dismantle discriminatory workplace practices, and provision of mentoring may support women in the interim.

Burnout was one of the top five reasons for seeking mentoring, with the first three reasons being potential antecedents to burnout. Several studies have found that women are more likely than men to experience burnout[30] including women doctors in Australia and Aotearoa New Zealand.[31] It is likely that factors external to their employment, such as juggling family responsibilities and relationships with work, moving multiple times during training and a lack of family support, contribute to the burnout experienced by women in health. Though nearly 30% of mentees identified burnout due to work-related stress as a motivation for seeking a mentor, the work-related stress may not be felt as significantly if personal factors were not also at play. The higher burnout rate among women could be attributed to the unequal burden of work outside the workplace experienced by women (mental load, second shift of childcare and household duties).[32] In addition, women are often disproportionately disadvantaged by both organisational and relational aspects within the workplace itself. For example, female GPs see a higher number of complex patients who often require longer consults and attract less remuneration,[33] and women surgeons experience disproportionate sexual harassment and disrespect from their colleagues in the workplace.[3] Again, our health system employment and funding mechanisms have the potential to address some of the antecedents of burnout where women experience additional workplace burdens.

Of note, three of the top 20 reasons that women sought mentorship related to a career transition to a non-clinical career. This may reflect dissatisfaction with their original choice, or the inflexibility of clinical work, but may indicate a lack of visibility of patient-facing medical careers including research, education, technology, informatics, administration, or health policy. Internationally, non-clinical careers are increasingly visible through conferences (e.g., Non-Clinical Careers for Physicians), coaching and support services (e.g., The Doctor's Crossing) and social media offerings including podcasts and networks (e.g., Creative Careers in Medicine).[34] Increasing numbers of women seeking non-clinical career pathways have implications for health workforce planning, particularly if clinical specialties with greater on-call requirements become less attractive.[34] It is of concern for clinical workforce planning that potentially, in a significant number of cases, a lack of support may result in women seeking non-clinical career pathways. It is possible that earlier contact with a mentor could have helped women "stay in the game". As such, exploration of the reasons women in healthcare in Aotearoa New Zealand might be seeking these roles is needed.

Māori and Pacific women frequently ranked "burnout due to work-related stress" as a reason for seeking mentorship. They were less likely to identify a "lack of family or external support", possibly due to strong whānau- and aiga-based cultures. More exploration of this hypothesis is an area for future research. In contrast, Asian women were noted to rank "identifying as an immigrant", and the likely inter-related "lack of

family or external support" as reasons for seeking mentorship compared to other ethnic groups.

Mentee numbers in minority ethnicity groups are small, and it is likely further qualitative research into the particular challenges they experience may provide a valuable contribution towards supporting and addressing the needs of an increasingly multi-ethnic society. This is especially given that Aotearoa New Zealand is heavily reliant on overseas-trained healthcare professionals to meet national staffing shortages.[2]

The evaluation data suggest Wāhine Connect is a successful mentoring intervention. Well-matched mentors with shared experience can provide practical guidance on time management, setting priorities and making choices that align with the mentees' values and goals. Our study contributes novel insights in the Aotearoa New Zealand context that confirm that issues facing our women in health are consistent with overseas trends. One strength of our study is the systematic collection of demographic information and motivation for mentoring. A key limitation is that the data on mentee demographics and reasons for seeking mentoring come from a self-selected group who were made up primarily of doctors. As such, the issues they reported may not reflect the experiences of all women working in healthcare in Aotearoa New Zealand. Limitations of the post-programme evaluation are the modest response rate to evaluation surveys and a potential positive bias, which may both relate to the identifiability of responses at submission.

Conclusion

Our cohort of women in healthcare in Aotearoa New Zealand were seeking mentoring for reasons that have been previously reported and are predictable in our wāhine workforce. While mentoring experiences were generally positive, a future where predictable negative impacts are avoided by improved workplace and societal structures would be desirable. Until this gender discrimination is eliminated and supportive workplace practices are established, a need for mentoring specific to women is very likely to persist and should be supported by our healthcare system.

COMPETING INTERESTS
Juliet Rumball-Smith is the Founder and Chairperson of the Board Wāhine Connect.
Alison Barrett is a former Board Member of Wāhine Connect.
Charlotte Foley is a current Board Member of Wāhine Connect.

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Appendices

Appendix A: Mentee registration form.

wāhine +connect

Mentee Registration

Cohort 25

Wāhine Connect is a registered charitable trust that operates entirely from donations. We ask that you pay a small registration fee of $50.75 to contribute towards the costs of running the programme. Full details at bottom of form.

Personal Information

Name *

First Name Last Name

Other surname, if applicable

Year of birth *

Institutional email (to confirm your identity as someone working in health, please provide a work or institutional email address e.g. @cdhb.health.nz, @auckland.ac.nz)

example@example.com

Primary email for correspondence *

If you do not have an institutional email address, please complete above and we will contact you for further information.

Ethnicity (select all that apply)

- ☐ NZ Māori
- ☐ Pakeha/NZ European

☐ 1

Appendix A (continued): Mentee registration form.

Samoan
- ☐ Cook Island Māori
- ☐ Tongan
- ☐ Niuean
- ☐ Chinese
- ☐ Indian
- ☐ Other

Phone number - mobile *

Other ethnicity - please specify

Do you know the name(s) of your iwi? If so, please specify.

How did you hear about Wāhine Connect?
- ☐ NZ Women in Medicine Facebook page
- ☐ Nomination email/message from Wāhine Connect
- ☐ Word of mouth
- ☐ Wāhine Connect Twitter
- ☐ Wāhine Connect Facebook
- ☐ DHB communications
- ☐ Other

If other, please specify

Employment Information

2

Appendix A (continued): Mentee registration form.

Profession *

- ○ Dentistry
- ○ Allied Health
- ○ Nursing
- ○ Physiotherapy
- ○ Pharmacy
- ○ Medical
- ○ Other

Please specify your Allied Health profession

Current position *

Primary specialty *

Secondary specialty

Clinical/special interests (please specify)

Workplace (e.g. Middlemore Hospital) *

Employer (e.g. CMDHB)

City *

3

Appendix A (continued): Mentee registration form.

Region

Country

Mentoring Stream

There are two broad types of mentorship you may wish to be involved in:
1. **Wāhine Connect JUMP.** This is for women who want jump in to a ready-made network. It is designed to help women at a decision-point in their careers or personal lives (e.g. considering changing specialties or direction, family planning, negotiating a contract).
It is likely to consist of one meeting or phone call with 1 - 3 mentors, with these mentors acting as 'key informants' to answer your questions or talk you through their experiences.
2. **Wāhine Connect JOURNEY**. This is for mentees who are seeking a one-on-one relationship with a mentor. You will be supported for around 6-months to help you and your mentor focus on a number of specific issues, concerns or questions. You can meet in person or virtually.
You will be the driver in the mentoring relationship, but with support and resources from us. Please note - we cannot provide a collegial relationship for the purposes of a professional body, and are not able to offer formal therapeutic or coaching services - our mentors are all volunteers and are not trained counsellors. If you are after this type of support, you may be able to access it through your employer (EAP), Medical Assurance Society or Medical Protection Society (if you are a member), or the Ministry of Health. Feel free to ask us for further details.
Not sure what stream is best for you? Our rule of thumb is that if you're not sure - go for JUMP. Chatting it out with a few different women can really help clarify the situation and you to prioritise your concerns.
More information on the Wāhine Connect mentoring streams is available in our LOWDOWN document here, and here is a handy table that outlines the time commitments of each stream.

Please indicate the mentoring stream you think would be best for you *

- Wāhine Connect JUMP
- Wāhine Connect JOURNEY

Please specify why you are seeking Wāhine Connect JUMP at this time *

Please be as specific as you can! The more defined you can be about your needs, the better your mentoring experience will be. Being explicit helps you to be clear about your issue and your goal, and really helps us get the best match for you.

Please specify why you are seeking Wāhine Connect JOURNEY at this time *

4

Appendix A (continued): Mentee registration form.

Do you already have a mentor sorted, and just want our resources and support? *

- Yes
- No

Please be as specific as you can! The more defined you can be about your needs, the better your mentoring experience will be. Being explicit helps you to be clear about your issue and your goal, and really helps us get the best match for you.

What is your mentor's name? *

First Name Last Name

What is her email address? *

example@example.com

That's great you are already pre-matched! Please complete the rest of this survey, ensure that your mentor is also registered, and we will get back to you with next steps.

Issues

The sections below ask you to rate the **importance and relevance** of the following issues to you. The purpose of these questions is to allow you to be matched with a community or mentor that best suits your needs and priorities. **Your responses will not be shared with potential mentors.**
However, if there are details that you are comfortable being passed on to potential mentors, please document them in the text box at the end of the survey.

Training

	Very relevant to me right now	Somewhat relevant	Not relevant to me right now
Moving multiple times for training positions	○	○	○
Changing specialty during training	○	○	○
Difficulty passing training exams	○	○	○

5

Appendix A (continued): Mentee registration form.

Training in multiple specialties	○	○	○
Training/working in a highly specialized (small) field	○	○	○

Workplace

	Very relevant to me right now	Somewhat relevant	Not relevant to me right now
Bullying	○	○	○
Loss of a colleague	○	○	○
Burnout due to work-related stress	○	○	○
Sexual harrassment	○	○	○
Lack of confidence	○	○	○
Making a mistake	○	○	○
Complaint against you	○	○	○
Negotiating a new contract	○	○	○
Making a formal complaint	○	○	○
Discrimination or bias	○	○	○
Emotionally traumatic caseload	○	○	○
Working in rural or isolated setting	○	○	○

Career Development

	Very relevant to me right now	Somewhat relevant	Not relevant to me right now
Developing a career in research	○	○	○
Teaching or lecturing	○	○	○
Developing a career in health administration	○	○	○
Senior clinical leadership	○	○	○
Business and health	○	○	○
Developing a career in health policy	○	○	○

6

Appendix A (continued): Mentee registration form.

Working internationally	○	○	○
Leaving health	○	○	○

Family and Relationships

	Very relevant to me right now	Somewhat relevant	Not relevant to me right now
Divorce or separation	○	○	○
Balancing your work/career needs with those of your partner	○	○	○
Being a single parent	○	○	○
Deciding not to have children	○	○	○
Juggling training/work with raising a family	○	○	○
Lack of family or other external support	○	○	○
Infertility	○	○	○
Loss of a partner or child	○	○	○

Personal

	Very relevant to me right now	Somewhat relevant	Not relevant to me right now
Rural background	○	○	○
Disadvantaged background	○	○	○
Identifying as an ethnic minority	○	○	○
Identifying as a member of the LGBTIQ community	○	○	○
Mental health or addiction	○	○	○
Identifying as an immigrant to NZ	○	○	○

Please detail your priority issue for mentoring at this time (eg. burnout, leaving your job, moving into research or leadership etc). Please give us as much detail as possible. This issue will be shared with potential mentors. *

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Appendix A (continued): Mentee registration form.

Anything more you would like to mention about yourself? (E.g. personal details etc). *

Have you been a mentee with Wāhine Connect before? *

- Yes
- No

Are you also registered as a Wāhine Connect mentor? *

- Yes
- No

Virtual or face-to-face

Some mentees are clear that they want to be able to **meet face-to-face** with their mentor, or have a mentor in the same organisation.
Others might have a workplace-based issue, or prefer a mentor **in another city or organization.**
Finally, others **prioritise the 'issue' match** between themselves and the mentor, and are happy to make the logistics work and meet virtually.

What is important for you? *

- Meeting face-to-face is a priority; I will accept a lower-quality match with mentors for this.
- My priority is a high-quality match; I'm happy to have meetings using Skype/zoom/phone.
- I would prefer a mentor outside of my home organization
- I have no major restrictions!
- Not applicable - I'm already pre-matched!

Expectations

8

Appendix A (continued): Mentee registration form.

This network relies on the mutual respect of the mentees and the mentors. By registering as a mentee, and ultimately accepting a match, **there is an expectation that you will be engaged in the relationship and in the programme**. i.e. answer emails in a timely way, drive the contact with the mentor, communicate with Wāhine Connect.
Please familiarize yourself with the resources on this website to guide your expectations and understand your obligations. Our overview document 'The Lowdown' is found here, and here is a handy table that outlines the time commitments of each stream. Also please understand that the mentors are volunteers who perform this role without compensation.
Finally, we encourage mentees to consider giving back by being mentors themselves: if you are willing, please complete the equivalent survey using this link Wāhine Connect Mentor form.

Consent

Wāhine Connect is collecting your information to be used to assist in providing services for mentors and mentees, improving and expanding the Wāhine Connect programme, and for any other use that you authorise. Wāhine Connect will keep this information within the confines of the Wāhine Connect programme, and will not reveal personal information publicly or to a third party (unless required or permitted to by law) except for those persons that are involved in running the Wāhine Connect programme, including mentees and mentors (as appropriate). All who have access to the personal information that you provide will be required to sign a confidentiality undertaking. Wāhine Connect will take all reasonable steps to ensure the personal information it holds is protected against loss, access, use or modification other than with the authority of Wāhine Connect. Wāhine Connect may aggregate data and information in a way that does not personally identify you, and use this to inform mentor/mentee needs, for research or for outreach purposes. Under the Privacy Act 1993, you have rights of access to and to request correction of the personal information held by us. As no data transmission over the internet can be guaranteed to be completely secure, we cannot ensure or warrant the security of any information you transmit or receive through this site. These activities are conducted at your own risk.

I have read and understood the paragraph above. *

☐ I agree to providing my information to Wāhine Connect.

I agree to answer communications (emails, texts) from Wāhine Connect in a timely manner *

☐ Yes, I agree

Once matched to a mentor, I agree to contact them in a timely manner, and arrange and prepare for our meetings. *

☐ Yes, I agree

Submit

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Appendix B: Post-programme mentee evaluation form.

Wāhine Connect JOURNEY evaluation

Congratulations on completing Wāhine Connect JOURNEY! Thanks very much for filling out the survey below to tell us how you found the programme.

Name *

First Name Last Name

1. Overall, the value of this mentoring programme for me has been... *

- Excellent
- Very good
- Good
- Fair
- Poor

2. Overall, the quality of the match between me and my mentor/s has been... *

- Excellent
- Very good
- Good
- Fair
- Poor

3. What is good and worked well about the Wāhine Connect JOURNEY programme? Note: this might be used as a testimonial on our website/FB/twitter (anonymous) or provided as feedback to your mentor (not anonymous) *

1

Appendix B (continued): Post-programme mentee evaluation form.

4. After this programme, I feel...

	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
More socially connected	○	○	○	○	○
More professionally connected	○	○	○	○	○
More confident in my personal or career pathway	○	○	○	○	○
Better supported to move forward on my priority issue	○	○	○	○	○

5. Is there anything else you would like to tell us? For example: what didn't work so well or what could we do improve? How were our communications with you, our materials and our support?

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2

Ambulatory sensitive hospitalisations among people accessing mental health and addiction services: a retrospective cross-sectional study using national population data

Isabel Foley, Maria Carmela Basabas, Angela Jury, Tracy Haitana, Debbie Peterson, Phil Hider, Ruth Cunningham

ABSTRACT

AIM: Ambulatory sensitive hospitalisations (ASHs) are hospital admissions for conditions potentially avoidable through timely and effective primary healthcare. ASH rates can indicate healthcare quality and access. This study examines ASH rates among people accessing mental health and addiction (MHA) services in Aotearoa New Zealand.

METHOD: Retrospective analyses of national MHA service use linked to hospital admission records, compared to total population between 1 July 2012 and 30 June 2018, were conducted. The MHA cohort includes people aged 45–64 with at least one MHA service contact during the study period or 2 years prior.

RESULTS: MHA service users were most commonly hospitalised for angina (26.0%) and chronic obstructive pulmonary disease (COPD; 11.6%). Adjusting for age and ethnicity, the MHA cohort's ASH rate was 2.38 times that of the total population, with higher rates for epilepsy (adjusted rate ratio [ARR]=5.96), COPD (ARR=4.32), diabetes (ARR=3.47) and angina (ARR=2.40).

CONCLUSION: Findings indicate potentially preventable physical health disparities within and between people accessing MHA services, highlighting the need to improve primary care access. Practice implications include integrated care, prevention and workforce development to reduce ASH and health disparities for people using MHA services.

People experiencing mental health and substance use conditions have a higher likelihood of physical health problems and mortality than the general population.[1,2] This disparity arises from multiple interlinking factors including healthcare access and quality, stigma and discrimination and wider socio-economic determinants of health.[1,2] Research shows lower rates of access to screening, prevention and treatment for non-communicable diseases such as cardiovascular, metabolic and respiratory conditions for people with diagnosed mental health and addiction (MHA) conditions.[1,3] Siloed physical and mental health services may also impede people's access to appropriate support.[1] Such barriers can lead to complications and hospitalisations for otherwise preventable conditions.

Ambulatory sensitive hospitalisations (ASHs) are hospital admissions for conditions potentially preventable via timely and effective routine or preventative primary (ambulatory) care.[4] In Aotearoa New Zealand, there are 28 ambulatory care–sensitive conditions defined for adults based on the International Classification of Diseases 11th revision (ICD-11) including hypertension, myocardial infarction and complications of established conditions like diabetes.[5]

High ASH rates are linked with poor primary healthcare access and quality, even when controlling for socio-demographic factors and health status.[4,6] This supports the use of ASH rates as a broad indicator of healthcare access (i.e., the adequate supply of appropriate, timely services). Understanding the conditions underlying these hospitalisations is also important for preventative actions.

In Aotearoa, ASH rates are reported annually for people aged 0–4 and 45–64 to monitor primary care access and quality.[5] To date, no research has examined ASH rates among MHA service users in Aotearoa. Given evidence of higher ASH rates and psychological distress among Māori and Pacific peoples, a focus on ethnic disparities among MHA service users is warranted.[7,8]

This study aims to better understand and describe ASH rates for people accessing specialist MHA services in Aotearoa. It aims to:

1. identify common ASH conditions for people accessing MHA services, and
2. compare ASH rates for MHA service users to the total population.

Method

Data

This study uses routinely collected data from the Programme for Integration of Mental Health Data (PRIMHD) for specialist MHA service use and the National Minimum Dataset (NMDS) for hospital admissions provided by the Ministry of Health – Manatū Hauora. PRIMHD and NMDS datasets were linked using an encrypted version of the National Health Index (NHI) database to create an anonymised dataset with unique study identifiers.

Published ASH data for the whole population aged 45–64 by ethnic group reported by the Ministry of Health were used for the comparison group.[5]

Analyses follow a repeated cross-sectional design across 1 July 2012–30 June 2018.

MHA cohort

Service use is a proxy to identify people experiencing MHA issues. The MHA cohort was drawn from a larger predefined cohort of people who had at least three in-person contacts with MHA services between 1 July 2001 and 30 June 2018. People with primary diagnoses of non-MHA conditions (e.g., dementia, intellectual disabilities, developmental disorders), with no other MHA diagnosis and people with gender recorded as "other" (n=18) or "unknown" (n=76) were excluded from this cohort.

For this study, MHA cohorts were created for each year of whole-population hospitalisation ASH data between 1 July 2012 and 30 June 2018 to enable comparison to whole-population data. Individuals were included if they:

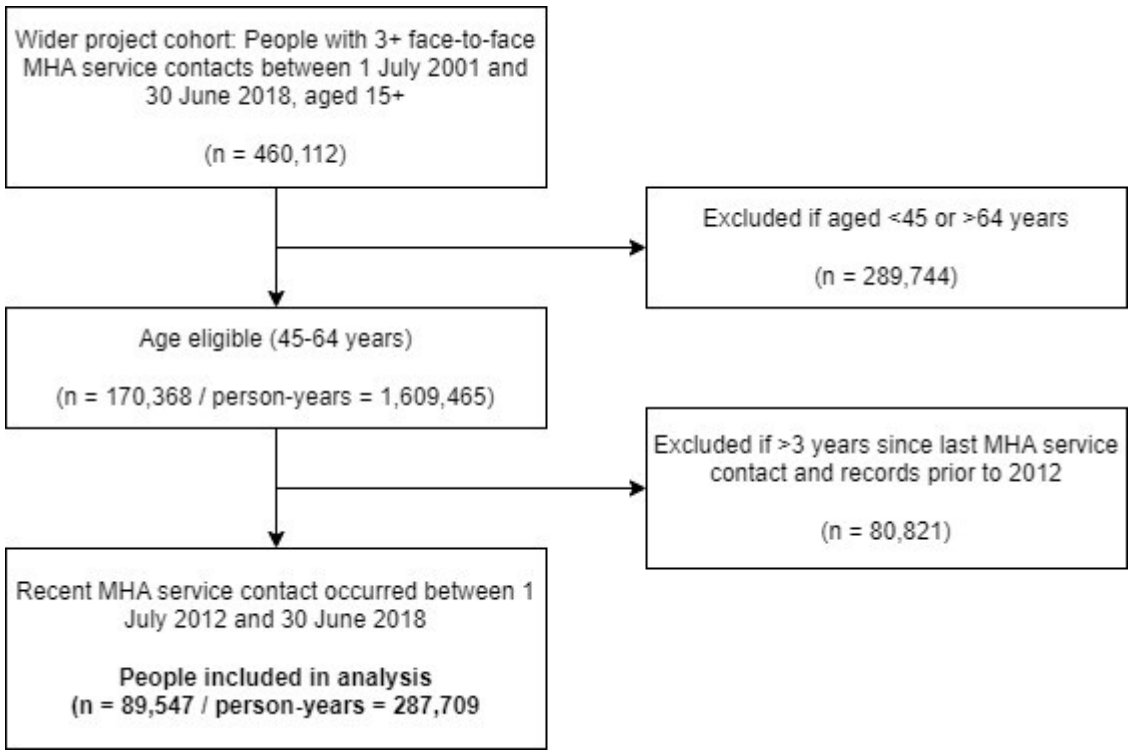
- were aged 45–64 within the study period, and
- had at least one in-person specialist MHA service contact in the prior 3 years.

Figure 1 illustrates how the MHA cohort was selected.

Comparison population

The total Aotearoa population is the comparison group, retrieved from published ASH data for people aged 45–64 for each financial year (July–June) in the study period, stratified by 5-year

Figure 1: Mental health and addiction cohort inclusion process.



age groups and prioritised ethnicity. Stratified reported numbers for each year were pooled over the 6-year study period. Rates were calculated and pooled using annual Statistics New Zealand population projections.

Outcome variable

The main outcome variable is ASH rate per 100,000 person-years. ASH events for the MHA cohort are defined as:

- primary hospital diagnosis matching ICD-11 ambulatory sensitive condition codes;[5]
- occurring within 2 calendar years of MHA service contact; and
- occurring between 1 July 2012 and 30 June 2018.

For example, an individual with MHA service contact in July 2012 would have any ASH event between then and 2015 included.

Person-years were calculated using the total number of participants multiplied by the number of study years each person met inclusion criteria. This reflects the number of at-risk years each person contributes data for. For example, one individual aged 60 in July 2012 with ongoing MHA contact within the study period contributes 5 person-years (until they turn 65).

Rates of ASH admissions for specific conditions were also examined and categorised using ICD-11 chapters.[5]

Other variables

Gender, age and ethnicity were sourced from NHI data on 14 September 2021.

Age at 31 December for each fiscal year was categorised into groups: 45–49, 50–54, 55–59 and 60–64.

Gender was categorised as male or female based on NHI data.

Ethnic group as recorded on the NHI database was used. Only prioritised ethnicity was available (prioritised in order of Māori, Pacific, and non-Māori non-Pacific [nMnP]), where each person is allocated to a single group even if they identify with multiple. People with missing ethnicity data are included in "nMnP". This method for analysis purposes does not assume the allocated ethnic group is the one people identify most strongly with.

The New Zealand Index of Deprivation 2018 (NZDep18) was used to categorise area-level deprivation, based on matching of address data in the NHI database to the national deprivation index for classification based on the 2018 Census.

Data analysis

Descriptive analyses

ASH rates are calculated for each sub-group (e.g., age, ethnicity) using total ASH events as the numerator and total person-years as the denominator.

$$\text{ASH rate per 100,000 person-years} = \frac{\text{Total n ASH events}}{\text{Total person-years}} \times 100{,}000$$

Regression analyses

Negative binomial regression was used to examine the associations between MHA service use and ASH rates compared to the total population.

Adjusted rate ratios (ARR; 95% confidence interval [CI]) adjust for the potentially confounding effects of age and ethnicity. ARRs greater than 1 indicate an increased relative likelihood. It was not possible to adjust for deprivation as published ASH rate data were not available broken down by NZDep2018.

Analyses were performed in R version 4.0.3, using RStudio version 1.4.1103 with MASS, tidyverse, Hmisc and sjPlot packages.

Ethical approval

Ethical approval was obtained from the University of Otago Human Ethics Committee as part of a wider project entitled "Meeting physical health care needs of people with mental illness or addiction", ethics committee reference number HD20/080.

Results

Participants

The MHA cohort (Table 1) comprised 89,547 people, reflecting 287,709 person-years.

There were 33,570 ASH events recorded for the MHA cohort between 2012 and 2018. One-sixth (16.5%) had at least one recorded ASH within this period; among them, 41.0% had at least two. The number of ASH events per individual ranged between zero and 80.

ASH rates for non-nMnP ethnic groups (predominantly New Zealand European) were lower compared to Māori and Pacific peoples. ASH rates were higher for older people and

Table 1: MHA cohort demographics and ASH rates.

Participants	Group	Total person-years	ASH events	ASH rate (100,000 person-years)
All		287,709	33,570	11,668
Gender	Female	134,023 (46.6%)	15,986	11,928
	Male	153,686 (53.4%)	17,584	11,442
Age group	45–49	99,395 (34.5%)	8,656	8,709
	50–54	83,590 (29.1%)	8,874	10,616
	55–59	62,400 (21.7%)	8,459	13,556
	60–64	42,324 (14.7%)	7,581	17,912
Ethnicity	Māori	67,137 (23.3%)	9,317	13,878
	Pacific	13,504 (4.7%)	1,934	14,322
	nMnP	207,068 (72.0%)	22,319	10,779
NZDep quintile	1 (least)	29,273 (10.2%)	2,371	8,100
	2	38,521 (13.4%)	3,698	9,600
	3	50,149 (17.4%)	5,060	10,090
	4	75,461 (26.2%)	9,180	12,165
	5	93,218 (32.4%)	13,148	14,105
	Unknown	1,087 (0.4%)	113	10,396

MHA = mental health and addiction; ASH = ambulatory sensitive hospitalisations; nMnP = non-Māori non-Pacific; NZDep = New Zealand Index of Deprivation.

people living in more deprived areas.

Common ASH conditions

Table 2 presents primary diagnoses recorded for the MHA cohort's ASH events. Over half were attributed to cardiometabolic and respiratory conditions: primarily chronic obstructive pulmonary disease (COPD), angina and chest pain.

Comparing MHA cohort and total population ASH rates

Table 3 shows pooled total population ASH rates alongside MHA cohort rates. In total, 268,871 ASH admissions occurred in Aotearoa between July 2012 and June 2018. Across both groups, ASH rates were lower for nMnP ethnic groups and increased with age. After adjusting for age and ethnicity, the MHA cohort's overall ASH rate was 2.38 times higher than the total population's.

Table 4 compares condition-specific ASH rates between the MHA cohort and total population. For all common ASH conditions except cellulitis, ASH rates were higher in the MHA cohort. After adjusting for age and ethnicity, people accessing MHA services were six times more likely to be hospitalised for epilepsy (ARR=5.96), four times for COPD (ARR=4.32) and over three times for diabetes (ARR=3.47).

Table 2: MHA cohort primary diagnosis at ASH admission.

Category	Condition	ASH events	% total ASHs
Cardiometabolic 11,645 (34.7%)	Angina and chest pain	8,714	26.0
	Myocardial infarction	1,504	4.5
	Congestive heart failure	1,081	3.2
	Hypertensive disease	230	0.7
	Other ischaemic heart disease	58	0.2
	Rheumatic fever/heart disease	58	0.2
Respiratory 7,669 (22.8%)	COPD	3,879	11.6
	Pneumonia	2,080	6.2
	Asthma	1,150	3.4
	Upper and ENT respiratory infections	401	1.2
	Bronchiectasis	159	0.5
Other 6,879 (20.5%)	Epilepsy	2,464	7.3
	Diabetes	1,903	5.7
	Kidney/urinary infection	1,610	4.8
	Stroke	840	2.5
	Cervical cancer	38	0.1
	Sexually transmitted infections	24	0.1
Gastroenteritis 5,194 (15.5%)	Gastroenteritis/dehydration	2,532	7.6
	Constipation	1,219	3.6
	Nutrition deficiency and anaemia	755	2.3
	Gastro-oesophageal reflux disease	423	1.3
	Peptic ulcer	265	0.8
Dermatological 1,398 (4.2%)	Cellulitis	1,188	3.6
	Dermatitis and eczema	210	0.6
Dental 785 (2.3%)	Dental conditions	785	2.3
Total		33,570	

MHA = mental health and addiction; ASH = ambulatory sensitive hospitalisations; COPD = chronic obstructive pulmonary disease; ENT = ear, nose and throat.

Table 3: Negative binomial regression of ASH events and rates for MHA cohort and general population.

Demographic	Group	MHA cohort			Total population			ARR^ (95% CI)
		n (person-years)	*n* ASHs	ASH rate*	*n* (person-years)	*n* ASHs	ASH rate*	
Age group	45–49	99,395	8,656	8,709	1,894,928	54,276	2,864	
	50–54	83,590	8,874	10,616	1,887,370	65,167	3,453	
	55–59	62,400	8,459	13,556	1,726,295	71,304	4,130	
	60–64	42,324	7,581	17,912	1,513,158	78,124	5,163	
Ethnicity	Māori	67,137	9,317	13,878	806,610	57,982	7,188	
	Pacific	13,504	1,934	14,322	300,975	26,024	8,647	
	nMnP	207,068	22,319	10,779	5,914,166	184,865	3,126	
Total		287,709	33,570	11,668	7,021,751	268,871	3,829	2.38 (2.10–2.70)

*Per 100,000 person-years.
^Adjusted for age and ethnicity.
ASH = ambulatory sensitive hospitalisations; MHA = mental health and addiction; ARR = adjusted rate ratio; CI = confidence interval; nMnP = non-Māori non-Pacific.

Table 4: Negative binomial regression of common ASH conditions for MHA cohort and total population.

		n ASHs		ASH rate (100,000 person-years)		
Category	Condition	MHA	Total population	MHA	Total population	ARR* (95% CI)
Cardiometabolic	Diabetes	1,903	10,016	661	143	3.47 (2.79–4.32)
	Congestive heart failure	1,081	8,893	376	127	2.61 (2.19–3.10)
	Angina	8,714	76,397	3,029	1,088	2.40 (2.17–2.64)
	Myocardial infarction	1,504	22,711	523	323	1.62 (1.51–1.73)
Respiratory	COPD	3,879	17,950	1,348	256	4.32 (3.46–5.39)
	Pneumonia	2,080	16,475	723	235	2.43 (2.08–2.84)

Table 4 (continued): Negative binomial regression of common ASH conditions for MHA cohort and total population.

Other	Epilepsy	2,464	8,579	856	122	5.96 (5.12–6.94)
	Gastro-enteritis/ dehydration	2,532	19,127	880	272	2.58 (2.23–2.98)
	Kidney/ urinary infection	1,610	12,467	560	178	2.46 (2.07–2.91)
	Cellulitis	1,188	23,515	413	335	0.88 (0.73–1.05)

*Adjusted for age and ethnicity.
ASH = ambulatory sensitive hospitalisations; MHA = mental health and addiction; ARR = adjusted rate ratio; CI = confidence interval; COPD = chronic obstructive pulmonary disease.

Discussion

This study is the first to examine ASH rates among people accessing MHA services in Aotearoa. The MHA cohort's ASH rates were more than twice those of the total population. Within the MHA cohort, ASH rates were higher for people aged 60–64 and living in high-deprivation areas, and lower for nMnP ethnic groups. Non-communicable diseases were the most common causes of ASH events for the MHA cohort, with angina and chest pain accounting for over one-quarter (26.0%) and COPD contributing over one-tenth (11.6%) of cases.

Alignment with previous research

Results align with international research demonstrating elevated ASH rates among people experiencing MHA issues.[9–11] For instance, an Australian study found ASH rates among people accessing mental health services were 3.6 times as high as the general population.[9] Similarly, a Veteran Health Administration services study observed an 11% increased likelihood of ASHs among people diagnosed with bipolar disorder or schizophrenia than those with no mental health diagnosis.[11] Despite methodological differences, ASH rates for people experiencing MHA issues are consistently elevated.

Findings also align with research indicating high co-existing rates of mental health conditions with cardiovascular, respiratory and other non-communicable diseases.[12] Such comorbidities are often exacerbated by inadequate access to primary and preventative care; studies demonstrate people with mental health diagnoses are less likely to receive screening, early diagnosis and treatment for non-communicable diseases.[12–14] These are closely intertwined with socio-economic disadvantages and may in part account for ethnic disparities.[15]

Finding disparities aligns with local research showing elevated ASH rates among Māori, Pacific people and people living in high-deprivation areas.[7,16,17] These are likely attributable to multiple interlinking factors including practical barriers to accessing healthcare (e.g., transport, financial costs), racial bias contributing to unsafe clinical environments, and poor communication.[7,16,18]

Clinical practice implications

Factors like diagnostic overshadowing (where symptoms are misattributed to MHA conditions rather than other co-existing issues), stigma, practitioner bias and communication difficulties with healthcare practitioners contribute to ASH rate disparities for people experiencing MHA issues.[3,19–21] Practitioner biases about people with MHA issues or diagnoses can influence recognition of physical health symptoms, screening, medication prescriptions and specialist care referrals.[19] In a local study, participants reported physical symptoms being misattributed as psychosomatic or caused by MHA issues, and their mental and physical health needs being seen as

competing rather than simultaneous priorities.[19] Such treatment can deter people from seeking healthcare and lead to missed opportunities for timely healthcare, and thereby exacerbate health issues.

For minoritised peoples in societies with histories of colonisation, socio-economic burdens and culturally unsafe services limit healthcare access and quality, and cause unfair, preventable patterns of adverse health outcomes.[20,22] A local study highlights this pattern of privilege whereby non-Māori experiencing MHA issues are less likely to experience unfair treatment and diagnostic overshadowing in primary care than Māori.[20] Another study highlights the importance of culturally appropriate treatment and therapeutic relationships for Pacific peoples.[22] National health strategies establish the need for tailored approaches to improve primary healthcare for Māori and Pacific peoples.[23]

Improvement and integration of mental health and primary care at provider, service and system levels are needed to sustainably address the disparities found. Initiatives like introducing free influenza immunisations for MHA service users reflect an important step towards reducing health inequities.[24] Workforce development in cultural safety, recovery-oriented practices and developing knowledge, skills and confidence in addressing MHA issues can mitigate biases and improve outcomes.[3,19]

System-level shifts are needed to enable cross-sectoral integration and support equitable health outcomes. Siloing of mental and physical healthcare, and of primary and specialist healthcare, are both drivers of inequitable health outcomes for MHA service users. Integrating primary care (screening, prevention and timely treatment) and MHA services is required to remove cross-sectoral siloing and reduce complications, hospitalisations and inequities in preventable health conditions.[1,12,25,26] Additionally, expanding availability and capacity of Kaupapa Māori and Pacific health services will enhance people's options and access to culturally safe and holistic care. These changes require system-level shifts in service funding and regulation, and investments to ensure the sustainable provision of effective, integrated services.[27]

Strengths and limitations

This study uses a nationally representative sample of MHA service users to examine physical health disparities over 6 years. The use of routinely collected health data demonstrates a replicable, low-cost approach to monitor changes and efficacy of interventions or policies.

This study is limited by its focus on specialist MHA service users, excluding people who may face additional barriers to accessing specialist services and those who receive mental health treatment in primary care. Findings are drawn from routine data not collected for research purposes, so potential inaccuracies in coding and clinical information are not accounted for. In particular, ethnicity data held in national health data collections are known to undercount Māori, which may impact the accuracy of ethnicity-specific rates.[28] Additionally, only data for MHA service use between July 2012 and June 2018 were available at the time of analyses. Examining more recent data is likely to demonstrate similar patterns but may reveal additional information. These analyses could be updated as part of routine ASH data monitoring.

Analyses focussed on people aged 45–64 with gender recorded as male or female, so findings may not be generalisable to other genders and ages. ASH data for people aged 5–44 is not reported nationally, so it was not possible to compare ASH rates at these ages, masking potentially important disparities for a significant proportion of the MHA service user population.[29]

Regression analyses only control for age and ethnicity, limited by available total population data. Other potential confounding factors not accounted for include area-level deprivation, specific mental health conditions, health behaviours (e.g., smoking, exercise) and symptom severity, and the compounding effects of such factors with ethnicity. Including MHA service users in the total-population group may underestimate disparities. Including people not accessing any health services in the total-population denominator may have resulted in a lower estimate of the inequities experienced by MHA service users than would be found if they were compared with others accessing health services.

Conclusion

This study demonstrates the use of routine health data to examine physical health outcomes for people accessing MHA services. System-level changes are required to enable integrated physical and mental healthcare, primary and preventative care and workforce development to address disparities and improve outcomes for MHA service users.

COMPETING INTERESTS
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DP notes salary support via University of Otago from the Health Research Council.
RC notes salary support via University of Otago from the Health Research Council and funding from Health New Zealand – Te Whatu Ora to attend conferences.

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Evaluating Indigenous health workforce development interventions for Māori and Indigenous Pacific tertiary students: success at Waipapa Taumata Rau | The University of Auckland (2016–2023)

Annie Borland, Clair Mills, Claire Gooder, Sue Reddy, Anneka Anderson, Papaarangi Reid

ABSTRACT

AIM: We aimed to quantitatively evaluate educational performance of Māori and Pacific Admission Scheme (MAPAS) interventions at Waipapa Taumata Rau | The University of Auckland (UoA) from 2016 to 2023.

METHOD: We measured the performance of student cohorts studying in MAPAS foundation and bachelor's degree programmes using standard Tertiary Education Commission (TEC) indicators. We compared MAPAS results with all Māori and Pacific student cohorts studying equivalent-level courses at UoA in the same period.

RESULTS: Students supported by MAPAS interventions surpassed results for all UoA Māori and Pacific students across all indicators. From 2016 to 2023, MAPAS foundation course pass and graduation rates were 15–23 percentage points higher, and MAPAS bachelor's course pass rates, retention and graduation rates were 8–18 percentage points higher than equivalent UoA Māori and Pacific student averages. From 2020 to 2023, 232 MAPAS students graduated with a bachelor's degree—at least 62 more than could be expected with standard support pathways.

CONCLUSION: The success of MAPAS interventions warrants sustained and enhanced investment. To align with population demographics, universities in Aotearoa should aspire for a minimum of 30% Māori and 15% Pacific graduates in health professional programmes. Pro-equity health workforce initiatives such as MAPAS are essential for transformation towards a culturally safe health system.

A key goal of health systems is to develop a workforce that reflects the communities they serve.[1–3] Aotearoa faces major health workforce gaps due to systemic under-investment and fragmented approaches, which have disproportionately impacted recruitment and retention of Māori and Pacific health professionals.[1,4] In addition to equity arguments, there are Crown obligations deriving from Te Tiriti o Waitangi to address inequities in the Māori health workforce.[4]

Notwithstanding recent increases, only 5.1% of registered medical practitioners in Aotearoa are Māori and 2.4% are Pacific peoples.[5] Seven percent of registered nurses are Māori and 4% Pacific peoples;[6] the proportions of Māori and Pacific pharmacists and other health professionals are even lower. Despite these significant and persistent disparities, pro-equity initiatives to increase the Māori and Pacific health workforce are currently facing scrutiny.

To produce an optimal health workforce, health professional programmes should recruit those with the most potential to contribute to the health and wellbeing of patients in Aotearoa, particularly members of under-served communities. Recruitment of students into health professional training programmes has relied predominantly on prior academic achievement as it is a predictor of tertiary academic success. However, prior secondary school and early tertiary achievement is highly patterned by socio-economic privilege and ethnicity in Aotearoa, and is not the best (nor only) predictor of health professional excellence and retention.[7,8] The education system in Aotearoa systematically advantages Pākehā students and fails to meet the educational aspirations of Māori and Pacific students.[9–11] Institutionalised privilege and discrimination (including streaming practices in schools, inequitable access to educational resources, lack of culturally responsive

teaching and learning, experiencing racism, and socio-economic inequities impacting on learning) result in inequitable secondary education outcomes by ethnicity.[9,10] This experience is mirrored internationally in other Indigenous and marginalised communities.[11,12]

Universities in Aotearoa have long-standing policies aiming to improve equity and diversity in their health professional programmes.[2,11] Given the entrenched socio-economic and ethnic inequities produced by the education system, attaining this goal requires comprehensive strategies to support the recruitment and retention of students.[12–14] The COVID-19 pandemic exposed and exacerbated existing educational inequities for Māori and Pacific students,[10] further heightening the need for supportive interventions.

The Faculty of Medical and Health Sciences (FMHS) at Waipapa Taumata Rau | The University of Auckland (UoA) offers clinical programmes in medicine, nursing, pharmacy, optometry and medical imaging, along with degrees in health sciences. Vision 20:20 is the Indigenous-led strategy within FMHS delivering evidence-based interventions to support the recruitment, admission, foundation education, retention and graduation of Māori and Indigenous Pacific students (Figure 1).[15,16] The Māori and Pacific Admission Scheme (MAPAS) and Hikitia Te Ora | Certificate in Health Sciences bridging/foundation programme are two Vision 20:20 interventions and are the focus of this evaluation. Interconnected interventions outside of the scope of this study include the Whakapiki Ake and Pacific Health Wayfinders programmes, which support secondary school recruitment and admission into tertiary health study.[16]

Overview of selected Vision 20:20 interventions for Hikitia Te Ora and MAPAS students

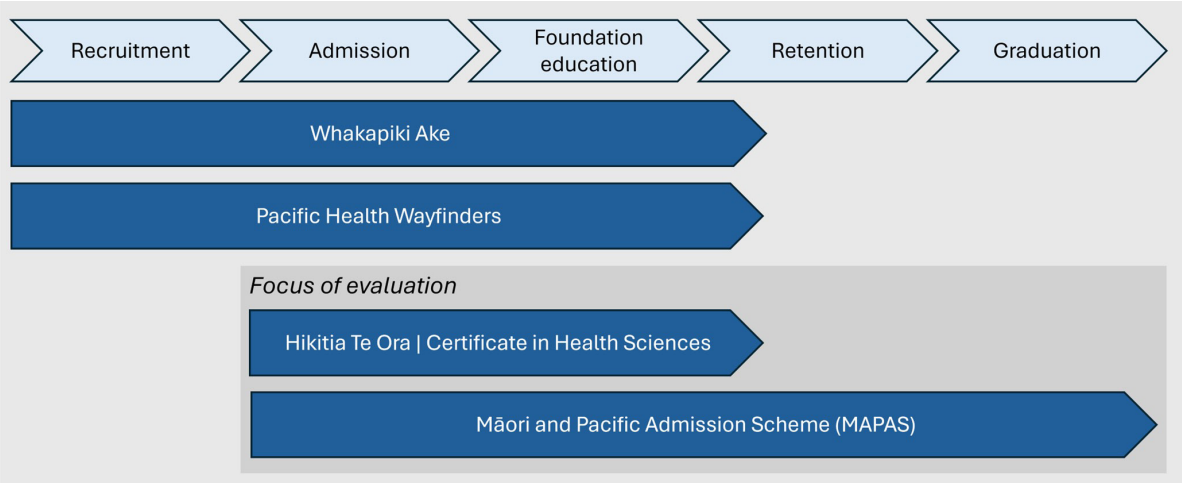
Admission

Students with Māori or Indigenous Pacific ancestry are eligible to apply for MAPAS. Comprehensive entry interviews are undertaken to assess aspirations, academic preparation and whānau supports in addition to academic literacy and numeracy testing. Following the review of prior academic results, students are recommended their best starting point for success: either direct entry to degree-level study, bridging/foundation study in Hikitia Te Ora or additional foundational study outside of FMHS.[17]

Foundation education

Hikitia Te Ora is a 1-year, Level 4 bridging/foundation education certificate offered to selected MAPAS applicants. Hikitia Te Ora applies Indigenous pedagogy and supports the development of academic and science literacy, with comprehensive academic, cultural and pastoral support provided across multiple levels to prepare students for success in first-year bachelor's degree study and subsequent clinical programmes.[18]

Figure 1: Vision 20:20 interventions across the tertiary health study pipeline.



Adapted from: Curtis ET. Kohi Maramara: the effect of tertiary recruitment, admission, bridging/foundation education and retention on indigenous health workforce development. Doctoral thesis, University of Auckland, 2016.

Retention and graduation

Following enrolment into the first-year Bachelor of Health Science or Biomedical Science (either directly from interview or in the year following Hikitia Te Ora), MAPAS continues to provide academic, cultural and pastoral support for students across their entire health degree. The interventions provided across the tertiary health study pipeline are comprehensive and evidence based.[11] Particular strengths (in addition to supporting academic success) include the provision of culturally safe spaces and the strengthening of students' Indigenous identities, confidence and leadership skills to prepare them for entry into and success within the health workforce.[15,19]

The aim of this study was to evaluate the impact of selected Vision 20:20 interventions on course pass rates, retention rates and graduation rates by comparing outcomes for Hikitia Te Ora and MAPAS students against routinely published results for all Māori and Pacific students at UoA using standard educational performance indicators developed by the Tertiary Education Commission (TEC).[20,21]

Methods

Positionality

This evaluation was undertaken by Māori and tauiwi researchers within Te Kupenga Hauora Māori at UoA. We acknowledge the Indigenous rights of Māori, reaffirmed in Te Tiriti o Waitangi. These rights have been, and continue to be, systematically breached by the Crown. We use a critical structural framing that recognises health and social inequities by ethnicity as outcomes of historical and contemporary processes of colonisation, racism and privilege,[22] and acknowledge the fundamental role of the education system in colonisation.[23] We also recognise the diverse cultures and histories of Pacific communities, who experience unacceptable health and social inequities in Aotearoa due to systemic discrimination and exclusion.[24] This study aims to support institutional change towards culturally safe[25] educational systems that uphold Te Tiriti o Waitangi and enable Māori and Pacific student success.

Data sources

A de-identified dataset of students who attended MAPAS interviews and were studying in their first year of Hikitia Te Ora or health bachelor's degree was extracted from the MAPAS programme database, with relevant socio-demographic details and academic records for each available year following enrolment. Data for first-year MAPAS and Hikitia Te Ora students were extracted from 2015 to 2023 to allow for calculation of indicator results for the reporting period 2016–2023. Aggregated indicator results for equivalent total Māori and Pacific student cohorts at UoA were recorded from the TEC website using relevant year, ethnicity and cohort filters.[20]

Socio-demographic variables

Ethnic categories in MAPAS data use whakapapa (ancestry), while TEC data use up to three self-identified ethnicities. We grouped ethnic categories by total response, meaning students with both Māori and Pacific identity are counted in both groups. Pacific MAPAS students all have Indigenous Pacific ancestry, while the total UoA Pacific category includes non-Indigenous Pacific groups such as Fijian Indian.

For MAPAS students, secondary school quintiles (based on census data for households with students residing within a school catchment area) were used as a proxy for socio-economic position (quintile 5 schools are those in the highest 20% of socio-economic privilege, equivalent to deciles 9–10).

Educational performance indicators

We measured MAPAS performance using three TEC educational performance indicators: course pass rates, retention rates and graduation rates (Table 1).[21] Two MAPAS analytical cohorts were created based on previous methods.[17] The "Hikitia Te Ora cohort" included all foundation Hikitia Te Ora students, and the "Bachelor cohort" included all students in first-year health bachelor's degrees, including students who had studied Hikitia Te Ora in the prior year. Indicators were calculated from subsets of each cohort using relevant starting year cohorts to align with TEC reporting years. Course pass and retention rates were reported from 2016 to 2023; graduation rates were reported for shorter periods due to the availability of MAPAS starting cohorts.

Analysis

Each indicator was calculated as a proportion for each MAPAS cohort as a whole and by total response ethnic categories. Hikitia Te Ora and MAPAS results for each ethnic category were compared with equivalent results for total UoA Māori and Pacific students by calculating

Table 1: Definition and methods for measuring educational performance indicators.

Indicator*	TEC definition[21]	Method of measurement for MAPAS cohorts	Reporting years	Equivalent starting year cohorts
Course pass rate	The proportion of equivalent full-time student course enrolments ending in a given year that have been successfully completed	Number of courses passed in reported year/total number of courses enrolled in same year	2016–2023	2016–2023
Retention rate	The proportion of students in a cohort who enrol in a qualification at the same level in the year after they enter the cohort	Number of students from the year prior who remain enrolled in current year/total first-year students enrolled in prior year	2016–2023	2015–2022
Graduation rate^	The proportion of students in a starting cohort who go on to complete a qualification at the same level—within 4 years for Level 4–7 non-degrees and 6 years for Level 7 degrees	*Hikitia Te Ora cohort:* Number of Hikitia graduates in current year/total Hikitia students enrolled in same year	2018–2023	2015–2020
		Bachelor cohort: Number of students from starting cohort who graduate by current year/total first-year bachelor's students enrolled 6 years prior	2020–2023	2015–2018

*Original TEC indicator names have been modified for clarity: course pass rate = "course completion rate" and graduation rate = "cohort-based qualification completion rate".
^Shorter reporting years due to availability of MAPAS starting cohort years.
TEC = Tertiary Education Commission; MAPAS = Māori and Pacific Admission Scheme.

differences in proportions. The Hikitia Te Ora cohort was compared to UoA certificate and diploma (Level 4–7 non-degree) results, and the Bachelor cohort was compared with UoA Bachelor (Level 7 degree) results by calculating differences in proportions. To estimate the effect of MAPAS interventions on graduation rates we calculated the difference from observed graduation numbers that would have occurred if MAPAS students had graduated at the same rate as all UoA Māori and Pacific students.

Ethics

Ethics approval was obtained from The University of Auckland Human Participants Ethics Committee (UAHPEC27023).

Results

Socio-demographic profile of total first-year Hikitia Te Ora and MAPAS students, 2015–2023

From 2015 to 2023 there were data available for 609 Hikitia Te Ora students (73% female, n=446) and 829 bachelor's students (70% female, n=582). Three hundred and twenty-three (39%) of the Bachelor cohort had undertaken Hikitia Te Ora study in the previous year. Twelve per-cent of the Hikitia Te Ora students and 8% of the Bachelor students had both Māori and Pacific ancestry. Approximately 15% of Hikitia Te Ora students and 20% of Bachelor students had attended schools with the highest socio-economic privilege (quintile 5) (Table 2).

MAPAS educational performance indicators, 2016–2023

From 2016 to 2023, the Hikitia Te Ora cohort made up approximately 35% of total Māori and 20% of the total Pacific certificate and undergraduate diploma students at UoA. The MAPAS Bachelor cohort made up approximately 9% of total Māori and 6% of the total Pacific students studying bachelor's degrees at UoA (Appendix Table 1). Hikitia Te Ora and MAPAS student numbers grew by 34% between 2016 and 2023, with 652 under-graduates supported in 2023.

Indicator results for each MAPAS cohort are detailed in Table 3. In the Hikitia Te Ora cohort, 94% of enrolled courses were passed, 79% of students graduated and 75% of students were retained into a second year of study, with the majority (n=401/407) entering bachelor's degree study. The Bachelor cohort course pass rate and first-year retention rate were both 89%, and the 6-year graduation rate was 66%. Of these graduates (n=232), 50% completed a clinical programme (n=82 medical, n=35 other clinical specialties), 28% (n=65) graduated with a Bachelor of Health Science (including conjoint degrees) and 22% (n=50) graduated with a degree outside of FMHS. An additional 15 students (including 10 in clinical programmes) graduated in 7 or more years.

Comparison of MAPAS and UoA total Māori and Pacific cohorts

The MAPAS programme out-performed total UoA Māori and Pacific student outcomes across all indicators (Table 4). Hikitia Te Ora course pass and graduation rates were between 15 and 23 percentage points higher compared with those of total UoA Māori and Pacific certificate and under-graduate diploma students. MAPAS bachelor's course pass, retention and graduation rates were between 8 and 18 percentage points higher than total UoA Māori and Pacific bachelor's degree students.

Estimating the effect of MAPAS support on bachelor's graduation outcomes

In the 2020–2023 reporting period, 140/202 (69%) Māori MAPAS bachelor's students and 117/186 (63%) Pacific MAPAS bachelor's students graduated within 6 years, with half graduating from clinical programmes. During this time,

Table 2: School socio-economic privilege of Hikitia Te Ora and MAPAS students by total response ethnic categories, 2015–2023.

	Hikitia Te Ora cohort (n=609)				**Bachelor cohort (n=829)**			
	Māori (n=306)		**Pacific (n=376)**		**Māori (n=449)**		**Pacific (n=446)**	
School quintile	n	*(%)*	n	*(%)*	n	*(%)*	n	*(%)*
5: highest privilege	45	*(14.7)*	53	*(14.1)*	95	*(21.2)*	106	*(22.8)*
4	44	*(14.4)*	38	*(10.1)*	69	*(15.4)*	80	*(17.2)*
3	57	*(18.6)*	21	*(5.6)*	85	*(18.9)*	33	*(7.1)*
2	92	*(30.1)*	114	*(30.3)*	120	*(26.7)*	114	*(24.5)*
1: lowest privilege	51	*(16.7)*	124	*(33.0)*	44	*(9.8)*	108	*(23.2)*
Missing	17	*(5.6)*	26	*(6.9)*	36	*(8.0)*	25	*(5.4)*

Table 3: Educational performance indicator results for total MAPAS cohorts.

Cohort and indicator	Reporting years	Denominator*	Numerator	Indicator result
Hikitia Te Ora cohort				
Course pass rate	2016–2023	5,122	4,830	94%
Retention rate^	2016–2023	546	407	75%
Graduation rate	2018–2023	402	308	77%
Bachelor cohort				
Course pass rate	2016–2023	6,019	5,361	89%
Retention rate	2016–2023	733	650	89%
Graduation rate	2020–2023	351	232	66%

*Denominators for course pass rate are total number of enrolled courses, and for all other indicators are total number of students.
^Hikitia Te Ora students who remained enrolled at The University of Auckland in any level of study in the following year, no equivalent Tertiary Education Commission indicator for comparison.
MAPAS = Māori and Pacific Admission Scheme.

Table 4: MAPAS indicators compared with equivalent total Māori and Pacific students at The University of Auckland, by total response ethnic category.

Indicator	Years reported	Ethnic category^	MAPAS denominator	MAPAS result	Total UoA result	Difference
Hikitia Te Ora cohort vs total UoA Level 4–7 certificates and diplomas						
Course pass rate*	2016–2023	Māori	2,621	95%	80%	*15%*
		Pacific	3,126	94%	71%	*23%*
Graduation rate	2018–2023	Māori	204	79%	59%	*20%*
		Pacific	250	77%	54%	*23%*
Bachelor cohort vs total UoA Level 7 degrees						
Course pass rate*	2016–2023	Māori	3,266	92%	84%	*8%*
		Pacific	3,400	86%	74%	*12%*
Retention rate	2016–2023	Māori	402	87%	77%	*10%*
		Pacific	404	90%	79%	*11%*
Graduation rate	2020–2023	Māori	202	69%	54%	*15%*
		Pacific	186	63%	45%	*18%*

*Denominators for course pass rates are total number of enrolled courses, and for all other indicators are total number of students.
^MAPAS data based on whakapapa; Tertiary Education Commission data based on self-identified ethnicity.
MAPAS = Māori and Pacific Admission Scheme; UoA = The University of Auckland.

the total UoA 6-year bachelor's graduation rate was 54% for Māori students and 46% for Pacific students. Applying UoA graduation rates to the MAPAS cohorts would have resulted in approximately 31 fewer Māori and 31 fewer Pacific graduates in this period, equivalent to approximately 16 fewer total graduates (including eight fewer clinical professionals) per year.

Discussion

MAPAS and Hikitia Te Ora interventions are supporting student success in foundation study, retention and graduation of Māori and Pacific health professionals, reflecting Vision 20:20 commitments to develop evidence-based initiatives to improve student outcomes.[11,17,18] Hikitia Te Ora and MAPAS student numbers grew by a third between 2016 and 2023, in contrast to declines in total numbers of Māori and Pacific students at the UoA.[26] Measured against standardised educational performance indicators, MAPAS and Hikitia Te Ora have achieved excellent results for Māori and Pacific health students, with achievement consistently above UoA Māori and Pacific averages.[20,26] MAPAS and Hikitia Te Ora performance is also similar to or higher than national tertiary and UoA 2023 results for non-Māori, non-Pacific students[20] and exceeded UoA 2023 targets for course completion and first-year retention for all ethnicities,[26] confirmation that Vision 20:20 plays a significant role in increasing equity of academic achievement. Notably, the Hikitia Te Ora foundation course achieved nearly equal course pass and graduation rates for Pacific as for Māori students, narrowing inequities observed across tertiary educational outcomes between Pacific and Māori student achievement[20] and further demonstrating the strengths of a culturally safe and responsive learning environment.

This success is even more notable when considering entrenched socio-economic and ethnic inequities within the education system. Fifty-eight percent of all university entrants in Aotearoa come from the most privileged (deciles 8–10) schools.[10] Recent studies have shown this extreme skew towards socio-economic privilege is even more marked in tertiary health programmes, with less than 5% of enrolled students coming from the least privileged (decile 1 and 2) schools.[2,27] In contrast, 10% of Māori and 23% of Pacific MAPAS bachelor's students came from decile 1 and 2 schools, with even higher proportions enrolled in the Hikitia Te Ora foundation course. Students attending less socio-economically privileged schools face multiple barriers to entering tertiary study, including cost.[10] They are also less likely to be offered the full range of science subjects at school, and more likely to have lower NCEA grades and a range of literacy, numeracy and learning needs as a result of systemic school failure to identify and support these needs.[10] Vision 20:20, particularly via Hikitia Te Ora, provides a successful example of culturally responsive interventions specifically designed to address these secondary education gaps. However, addressing and eliminating the barriers that lead to inequitable educational opportunities for students attending less privileged secondary schools will require much broader systemic transformation.

Tertiary institutions in Aotearoa perpetuate many of the same biases and culturally unsafe environments that are seen in the secondary school system, evidenced by persistent ethnic inequities in retention, course completion and qualification rates.[20] The holistic approach of Vision 20:20 that works across the whole student pipeline from recruitment to graduation is therefore critical to the success of students, and is reconfirmed by our evaluation results. Recruitment of Indigenous students in the absence of holistic support is unethical, ineffective and ignores the continuing system bias that labels unequal outcomes as student failure.[12,15] While Vision 20:20 provides a comprehensive set of initiatives to support successful academic outcomes and cultural safety for Māori and Pacific students within FMHS, it does not relieve the wider education system from its duty to protect the rights of all students from racial abuse and discrimination, and to continue to reform culturally unsafe learning environments.

The benefits of successful pro-equity programmes such as MAPAS are substantial and extend far beyond the indicators measured in our evaluation.[11,15] Students strengthen their cultural identity and enter professions that provide socio-economic security and opportunity, which can positively impact their whānau and future generations. The health workforce benefits as medical graduates from Aotearoa are retained at significantly higher rates than international graduates, with Māori and Pacific medical doctors' 10-year retention consistently as high or higher than Pākehā graduates.[5]

Māori and Pacific peoples experience racism and discrimination when accessing healthcare, and robust evidence demonstrates that culturally

safe practitioners who understand Māori and Pacific experience and acknowledge and respect Indigenous identity are highly valued.[28,29] As more Māori and Pacific health practitioners, researchers and leaders emerge, there is a "re-presenting" effect that may counter perceptions of Māori and Pacific peoples solely as passive recipients of care in a Pākehā-dominated health system.[11] A critical mass of Māori and Pacific health professionals in leadership, policy and decision-making roles can contribute to transforming the health system towards the elimination of Māori and Pacific health inequities.[25,30] However, recent research reveals Māori doctors experience high levels of racism and discrimination in their work and training environments, which negatively affects their health, career decisions and desire to remain in their profession.[31] Therefore, greater numbers and representation alone will not necessarily lead to a safe environment for staff or patients—institutionalised racism and power imbalances must also be addressed.[25]

Strengths and limitations

Strengths of this study include the critical framing of systems of power and privilege as drivers of ethnic inequities in secondary and tertiary education outcomes. The use of standardised indicators to evaluate MAPAS performance allows for evaluation of the programme along the whole undergraduate student pathway and has allowed comparison with publicly available and routinely reported results that can be monitored over time.

The use of aggregated TEC data was a limitation of this study as the comparator group included MAPAS students; therefore we were unable to test for statistical differences between groups or perform any more comprehensive analyses. Using TEC data was a pragmatic choice as we did not have access to disaggregated student data for non-MAPAS Māori and Pacific UoA students. Furthermore, comparison with total Māori and Pacific UoA students in equivalent courses was appropriate as most Māori and Pacific undergraduate students at FMHS are supported by MAPAS, so there was not an adequately sized comparator group within FMHS. On balance, our choice meant we were able to undertake simple comparisons to estimate the impact of the Vision 20:20 initiatives, although our results should be interpreted with the following considerations. We expect reported differences will be underestimates as UoA averages will be higher due to the inclusion of Vision 20:20 students, particularly for the Hikitia Te Ora cohort who make up a large proportion of total UoA certificate and diploma students. Similarly, the effect on MAPAS bachelor's graduation rates was a crude counterfactual calculation that will underestimate the true result as it does not account for the wider effects of MAPAS and Vision 20:20 on recruitment and baseline admission rates. Some selection bias is likely in our results due to the different definitions of ethnic category, particularly for the Pacific category where TEC data include non-Indigenous Pacific students. We were also unable to control for confounding by prior academic achievement, which is a predictor of tertiary success.[17] FMHS programmes have high academic requirements for entry, which could overestimate the MAPAS differences if FMHS students are at baseline more likely to succeed than students in other faculties. Acknowledging these limitations, the size and consistency of differences across all indicators for the MAPAS interventions compared with UoA averages suggest a true positive effect. Future research could confirm our results and address these limitations by obtaining a dataset of all Māori and Pacific UoA students to measure indicators that would allow for more comprehensive statistical analysis, including adjustment for potential confounders.

Conclusion

Realising a sustainable health workforce that reflects our society now and in the future is a significant challenge. In Aotearoa today, 25% of people under 25 years are Māori and 14% are Pacific peoples,[32] and population growth and ageing are placing increased demands on an already under-resourced health system. Pro-equity health workforce programmes are part of the solution to the health workforce challenge and need greater investment and consistent support; political and legal attacks may have long-term negative impacts.[33] Given current under-representation and future demographic trends, we recommend universities aspire for at least 30% Māori and 15% Pacific graduates in health professional programmes. In parallel, wider institutional strategies to reform entrenched racialised and culturally unsafe learning and working environments are critical to uphold Te Tiriti o Waitangi and protect the rights of all students and health professionals.

COMPETING INTERESTS
Nil.
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Appendix

Appendix Table 1: MAPAS students as a proportion of total UoA students for each indicator.

Cohorts and calculated indicators	Years reported	Total response ethnic category^	MAPAS students in analysis	Total UoA students in TEC results	MAPAS cohort as proportion of total UoA cohort
Hikitia Te Ora cohort/Level 4–7 certificates and diplomas					
Course pass rate*	2016–2023	Māori	272	675	40%
		Pacific	333	1,383	24%
Graduation rate	2018–2023	Māori	204	588	35%
		Pacific	250	1,300	19%
Bachelor cohort/Level 7 degrees					
Course pass rate*	2016–2023	Māori	422	13,584	3%
		Pacific	443	19,631	2%
Retention rate	2016–2023	Māori	402	4,498	9%
		Pacific	404	6,671	6%
Graduation rate	2020–2023	Māori	202	2,448	8%
		Pacific	186	3,631	5%

*TEC calculates course pass rate using "equivalent full-time students", where part-time students are counted as <1—therefore, proportions are a less reliable estimate compared with other indicators that are not adjusted for part-time students.
^MAPAS data based on whakapapa; TEC data based on self-identified ethnicity.
MAPAS = Māori and Pacific Admission Scheme; UoA = The University of Auckland; TEC = Tertiary Education Commission.

New Zealand 1986 Very Low Birthweight Follow-up Study: the third decade

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ABSTRACT

Exposures *in utero* and in early life have the potential to influence health across the lifespan through neurological, epigenetic and other physiological processes. Very low birthweight (VLBW; <1,500g) and very preterm (VP; <32 weeks gestation) births constitute around 2% of live births but have significant child, family and public health impacts neonatally and longer term. Parents/caregivers, funders and society want to know the quality of that survival across the lifecourse. The New Zealand 1986 Very Low Birthweight Follow-up Study is a population-based, longitudinal study that has followed a national cohort of individuals from birth in 1986 across childhood and into adulthood. At a mean 28.5 years, 250 VLBW adults (77% survivors; 25% Māori) and 100 term-born controls participated in follow-up, with 229 VLBW adults and all controls attending a 2-day medical and neurocognitive assessment. The aim of this report is to give an overview of the published major findings from the 28-year assessments. The majority of VLBW young adults were living healthy productive lives, similar to their term-born peers. Biomedical measurements were mostly in the normal range, although between-group mean differences tended to favour the controls, suggesting potential risk of premature organ function decline within the VLBW group. We compare our results with other emerging international data and discuss the implications for future research and possible interventions across the lifecourse to optimise outcomes for this vulnerable group.

Following advances in neonatal intensive care during the 1980s, there have been major improvements in the survival of infants born at very low birthweight (VLBW; <1,500g) and/or very preterm (VP; <32 weeks), such that currently over 90% of New Zealand infants go home following birth. VLBW/VP birth has the potential to impact development and later function of major organs as the third trimester of pregnancy is a time of maximum foetal growth and development; yet these infants spend much of this period *ex utero* and experience a wide range of health issues.[1,2] Although most research has focussed on childhood and early adolescent outcomes, there are a number of older[3,4] and more recent[5–9] overviews of the outcome of VLBW/VP infants as young adults. These reports suggest that while the majority of VLBW/VP graduates are doing well by their third decade, they do face several important challenges that adults born preterm and the health professionals caring for them should be aware of. Population-based New Zealand data, as provided by the New Zealand Very Low Birthweight longitudinal study (NZVLBW), are also vital to inform national health priorities and to identify and address inequities. There have been some 30 publications from the NZVLBW study on the adult outcomes at 28 years, but almost all have been in the international literature. The aim of this report, therefore, is to summarise the main published findings in one place and discuss the implications for these vulnerable individuals and for health service provision.

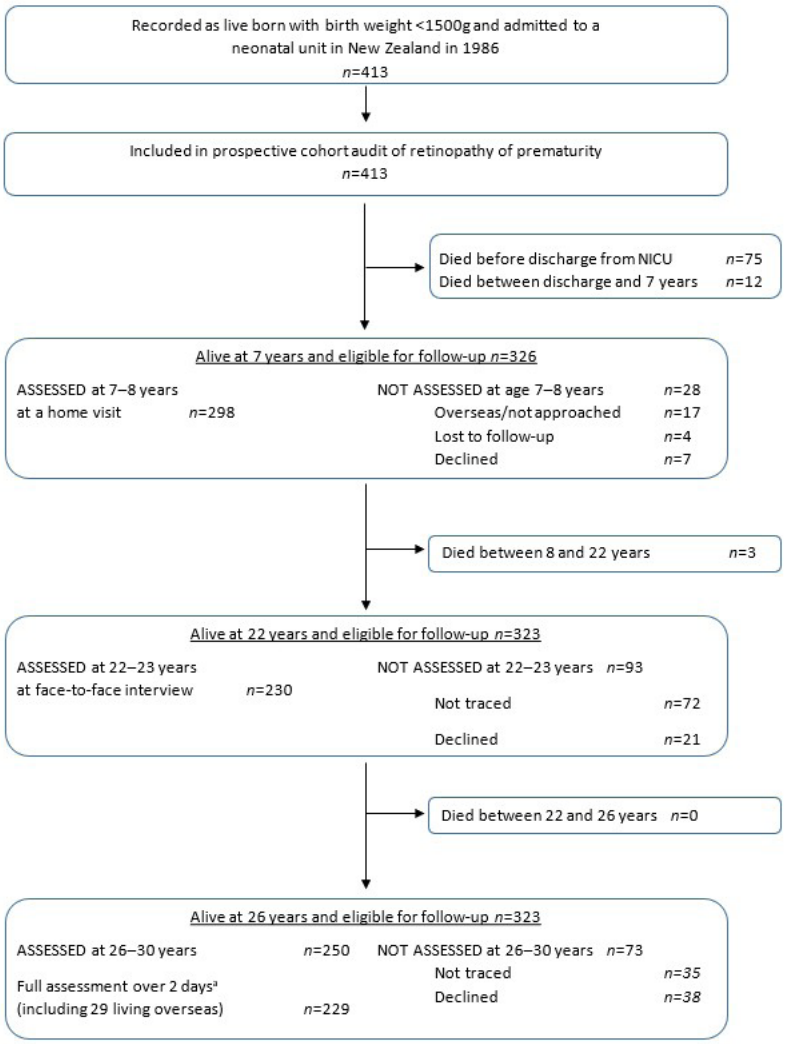
The NZVLBW study

The NZVLBW cohort had its genesis in 1986 when all 413 VLBW infants who were admitted to a newborn unit that year were enrolled in a prospective audit of retinopathy of prematurity (ROP), with 338 infants (82%) surviving to discharge home.[10,11] As shown in Figure 1, this cohort was subsequently retraced and followed up at ages 7–8 years,[12–14] 22–23 years[15] and at a mean (standard deviation [SD]) 28.5 (1.1) years. At the 28-year follow-up, 250 VLBW young adults (77% of survivors) participated; 229 VLBW adults and all 100 controls (see below) came to Christchurch for 2 days of medical and neurological assessments between February 2013 and November 2016, with the remaining 21 VLBW participants answering a questionnaire only. A comparison group of same-age controls, born healthy at term, were recruited

at the 22-year follow-up (n=69), either through peer nomination by a cohort member or random sampling from electoral rolls, aiming to ensure balance with respect to infant sex, ethnicity and region of birth. At 28 years, 39 of these controls were seen again together with 61 further recruits using the same methodology as before (n=100). With these numbers of participants, the study has 80% power at alpha=.05 to detect mean between-groups differences of .30 SD or greater on continuous outcomes, and odds ratios (OR) in the region of 2.0–3.5 for dichotomous outcomes (depending on the base rate). This suggests the study has adequate power to detect effect sizes in the small-to-moderate range. The study was approved by the Upper South B Regional Ethics Committee, superseded by the New Zealand Southern Health and Disability Ethics Committee (URB/12/05/015). All participants gave written informed consent.

Table 1 describes the socio-demographics and perinatal characteristics of the VLBW cohort participants and of the controls. There were no substantial differences between VLBW participants and non-participants, and between participants clinically assessed (n=229) and not

Figure 1: New Zealand 1986 Very Low Birthweight Follow-up Study—cohort flow chart.



[a]Between February 2013 and November 2016.
NICU = neonatal intensive care unit.
Modified, with permission from Darlow BA et al. Metabolic Syndrome in Very Low Birth Weight Young Adults and Controls: The New Zealand 1986 VLBW Study. J Pediatr. 2019;206:128–133.e5. doi: 10.1016/j.jpeds.2018.10.060.

Table 1: Demographic and perinatal characteristics of very low birthweight and controls at 28-year follow-up.

Measure	VLBW (n=250)	Controls (n=100)	Difference (95% CI)
Age at assessment, mean (SD), years	28.5 (1.1)	28.2 (0.9)	0.29 (0.04–0.53)
Male, %	42.8	37.0	5.8 (−5.5–17.1)
Māori/Pacific ethnicity, %	30.8	24.0	6.8 (−3.3–16.9)
Birthweight, mean (SD), g	1,134 (236)	3,377 (584)	−2,243.3 (−2,332.4–−2,154.1)
<1,000g, %	27.2	-	
Gestation, mean (SD) weeks	29.2 (2.5)	-	
<28 weeks gestation, %	26.0	-	
Small for gestational age (<10th centile), %	30.0	-	
Antenatal corticosteroids, %	56.4	-	
Respiratory distress syndrome, %	56.4	-	
Bronchopulmonary dysplasia,[a] %	20.4	-	
Retinopathy of prematurity, %	21.6	-	
Breastfed (any duration), %	76.4	88.0	−11.6 (−19.9–−3.3)
Maternal age at birth, mean (SD), years	25.9 (5.2)	27.1 (4.5)	−1.20 (−2.36–−0.04)
Parent with tertiary education, %	52.0	63.0	−11.0 (−27.3–0.3)
Family socio-economic status,[b] mean (SD)	3.3 (1.5)	3.1 (1.3)	0.27 (−0.08–0.62)

VLBW = very low birthweight; CI = confidence intervals; SD = standard deviation.
[a]Oxygen requirement at 36 weeks post-menstrual age.
[b]Scored using a 6-level classification ranging from 1 = professional to 6 = unskilled occupational status.

Table 2: New Zealand 1986 Very Low Birthweight Follow-up Study—summary of investigations undertaken at 28 years.[16]

Growth: Height, weight, waist circumference, body mass index, body fat (bioelectrical impedance)
Blood tests: Fasting insulin, glucose, glycated haemoglobin (HbA_{1c}), lipids, hormones; genetic tests
Renal: Early-morning urine—creatinine clearance, microalbuminuria
Cardiac: Blood pressure (BP), echocardiogram, electrocardiogram (ECG), peripheral artery tonometry
Lung function: Spirometry, diffusion capacity, lung volumes, cardiopulmonary exercise tests
Vision: Visual acuity, refraction, contrast sensitivity, retinal photographs
Dental: Oral health interview, dental examination
Cognitive and neuropsychological functioning assessments: IQ, working memory, cognitive flexibility, attention, visuo-spatial processing, information processing speed
Questionnaire: Health and social functioning
Cranial magnetic resonance imaging: Standard clinical data, T-1 weighted images, diffusion tensor imaging, arterial spin labelling

assessed (n=21), except that the assessed group included fewer children with a prior history of moderate/severe neurosensory impairment (5.9% vs 18.9%, p<0.001).

Table 2 lists the assessment measures, with full details of procedures available in our published protocol[16] and in the primary reference for each outcome (see below).

Key reported outcomes at 28 years

General health[17,18]

In the previous year, 70% of VLBW adults and 81% of term controls had seen their primary care physician.[17] Nevertheless, both unresolved and unrecognised physical health problems warranting medical attention were common in both groups (44% VLBW, 38% controls). These included body mass index (BMI) >30 plus a raised fasting insulin level, increased blood pressure (systolic >139mmHg or diastolic >90mmHg), abnormal echocardiogram or abnormal respiratory function tests. In the VLBW cohort, 31% were current smokers compared with 21% of controls. Although there were few differences in clinical oral health between the groups based on an oral health interview and standardised dental examination, proportionally fewer VLBW adults visited a dentist for check-ups or regularly cleaned between their teeth.[18]

Growth and metabolic markers[19]

Compared with term-born controls, VLBW young adults were 5cm shorter (mean difference, 95% confidence interval [CI]: males −4.9 [−7.3–−2.6]; females −5.3 [−7.2–−3.3]) and lighter (mean difference: males −4kg; females −10kg). BMI was no different for males but slightly lower for females. Waist-to-hip ratios were no different. These results are similar to international research, with some evidence BMI values follow societal trends.[19]

There were no differences in the fasting lipid profile of VLBW and control young adults. Most overseas studies have similar lipid measurement findings but some report higher low-density lipoprotein cholesterol (LDL-C) levels in preterm adults.[20] There were also no between-group differences in fasting glucose, fasting insulin, glycated haemoglobin (HbA_{1c}) or HOMA-IR levels (a measure combining both glucose and insulin levels to provide data on insulin resistance).[19] Previous reports on glucose homeostasis are conflicting with some showing increased fasting insulin and HOMA-IR levels in VLBW[21] and extremely low birthweight (ELBW; <1,000g)[22] young adults.

The metabolic syndrome, associated with an increased risk of cardiovascular disease, is defined as central obesity plus any two of elevated triglycerides, reduced high-density lipoprotein cholesterol (HDL-C), elevated fasting glucose or elevated blood pressure.[23] We found a modest but non-significant increase in the rate of metabolic syndrome between VLBW adults (17%) and controls (12%). On logistic regression, male sex, gestational age <28 weeks, Māori/Pacific ethnicity and a BMI >90th percentile at 7–8 years were all significant predictors for having metabolic syndrome at age 28 years with an OR close to 3.[19] A Finnish study reported an increased risk of metabolic syndrome (OR=3.7) in young adults born <34 weeks gestation.[24]

Cardiovascular health[19,25,26]

Systolic blood pressure (BP) was significantly higher in VLBW adults than in controls (mean difference, 95% CI: 4.6mmHg [1.8–7.5]), but there were no differences in diastolic BP. Systolic BP was significantly higher in males but not females.[19] Higher systolic BP has been consistently reported in VLBW/VP adults with a mean difference of 4.2mmHg in one meta-analysis, but diastolic BP results vary.[20,27]

Premature birth disrupts cardiac development with reduced cardiomyocyte endowment.[28] Among the NZVLBW cohort there were significant between-group differences in some aspects of cardiovascular structure and function and in epigenetic markers of cardiovascular development. In VLBW adults compared with controls, the left ventricular (LV) mass, volume and right ventricular (RV) dimensions were reduced.[25,26] In addition, minor decreases in ventricular function were noted in VLBW adults (decreased LV stroke volume, LV cardiac output, RV strain).[25,26] Several studies have now shown VLBW/VP adults to have smaller cardiac dimensions compared with term-born controls and reduced biventricular function (at rest and with exercise), but reports differ as to whether relative ventricular mass is decreased or increased.[25,29]

We investigated endothelial function using the EndoPAT system reporting a reactive hyperaemic index (RHI) score. VLBW adults had significantly higher RHI scores, indicating stiffer microvasculature.[25] Two other groups have also used EndoPAT: one in ELBW adults with similar results

to ours,[30] and one in extremely premature (EP; <28 weeks) adolescents when no differences were found.[31] Ultrasound of the brachial or carotid artery has been undertaken by other groups with one report of increased carotid intimal medial thickness in VLBW adults compared with controls.[32] In our study we also found increased LV and arterial elastance (measures of stiffness) on echocardiography, a change that is normally associated with ageing.[25]

Between-group epigenetic differences were evaluated in a sub-group of the cohort, comparing DNA methylation at birth (using archived newborn blood spots) and at 28 years.[33] VLBW infants had altered methylation that is predicted to lead to perturbations of underlying gene signalling pathways involved in cardiovascular development and hypertrophy.[33] The altered methylation profiles at birth showed associations with cardiovascular and respiratory health in adulthood and may identify infants at higher risk of future adverse health outcomes.

Although differences in cardiovascular structure and function were relatively minor at 28 years, registry studies of whole populations show decreasing gestation increases the risk of future heart failure, ischaemic heart disease and stroke.[8,34] There is also some evidence that even well VLBW adults who are non-smokers may have occult pulmonary vascular disease.[35]

Respiratory function[36,37]

Increased respiratory obstruction has been consistently shown in studies of VLBW/VP adults.[38] For the NZVLBW cohort, an obstructive respiratory pattern (forced expiratory volume in 1 second [FEV_1]/forced vital capacity [FVC] ratio [FEV_1/FVC] below lower limit of normal, the 5th centile of the predicted value) was demonstrated in 35% of VLBW adults and 14% of controls, being mild in the majority. On spirometry, expiratory flow variables were all significantly lower in VLBW adults compared with controls; those with a history of bronchopulmonary dysplasia were most affected.[36] Other tests showed that compared with controls, VLBW adults had evidence of increased gas trapping, reduced gas exchange efficiency and higher ventilatory inhomogeneity.[36]

Compared with controls, VLBW adults self-reported exercising less frequently and less vigorously. On cardiopulmonary exercise testing (CPET), although mean values were within the normal range, VLBW adults showed significantly reduced exercise capacity compared with control participants, characterised by an approximately 9% reduction in VO_2peak (the maximum oxygen consumption an individual can use in 1 minute per kilogram of body weight) with similar decreases in peak work rate, oxygen pulse (an indicator of cardiac output) and anaerobic threshold (reflecting cardiovascular fitness).[37] Our analysis suggested that both impaired lung function and altered cardiac structure and function contributed.[37] A meta-analysis of CPET studies in children and adults to age 21 reported a similar reduction in VO_2peak, but there are few studies in older VLBW/VP adults.[39]

Visual outcomes[40]

ROP is a potentially blinding condition in preterm infants resulting from abnormal development of retinal vessels in association with higher blood oxygen than experienced *in utero*. A unique feature of the NZVLBW cohort is the prospective documentation of ROP in the neonatal period and comprehensive assessment of vision in young adulthood. VLBW adults who had ROP had reduced visual acuity compared with VLBW adults without ROP and controls.[40] Moderate visual impairment (any of visual acuity >0.3 LogMAR [poorer than 20/40 Snellen], myopia >2 D, hypermetropia >2 D or astigmatism >2 D in the better eye) occurred in 33% VLBW participants with ROP, 20% VLBW participants without ROP and 14% controls. Fewer VLBW adults (79% vs 96%) drove a car, although factors other than vision contributed to this, including poorer visuospatial functioning.[40,41] These data demonstrate that VP birth has consequences for vision even in the absence of ROP. The NZVLBW study established the New Zealand protocol for routine retinal examination in VLBW/VP infants and, with treatment becoming available in 1987, severe visual impairment from ROP is now a rare occurrence.

Renal function[19]

Preterm birth disrupts kidney development with decreased nephron endowment.[42] We found no differences in serum creatinine, the estimated glomerular filtration rate or early-morning urinary albumin creatinine ratio.[19] There are few other data on renal function in VLBW/VP adults but a report from the Dutch POPS study showed VLBW/VP young adults had reduced renal growth.[43]

Biological ageing[44]

Although ageing is universal, the rate at which we

age may differ with adverse life experiences impacting an individual's "biological age" trajectory.[45] Biological age metrics have also been shown to better predict mortality than chronological age.[46] We assessed whether VLBW adults in the New Zealand cohort had a more advanced physiological age than controls by summing the z-scores for 10 physiological markers that alter with age, spanning metabolic, cardiac, respiratory and renal function.[44] The mean difference (95% CI) in the total z-scores was 1.73 (0.82–2.64, p<0.001). This represents a mean shift of 0.47 SD in the distribution of test scores for VLBW adults relative to controls; a moderate effect, with VLBW adults on average having a more advanced physiological age than their term-born peers.[44]

Cranial magnetic resonance imaging (MRI) scans[47]

Cranial MRI scans at 28 years were undertaken on a subsample of 150 VLBW adults and 50 term-born controls. All VLBW adults born <28 weeks (n=53; excluding three with contraindications and one unreadable scan) underwent an MRI alongside a random sample of the remaining VLBW cohort (total= 150). VLBW adults had significantly reduced mean global grey matter volume, and non-significantly reduced mean white matter volume.[47] Global brain volume was found to predict both perceptual and total IQ (see below).[48]

Cognitive outcomes[48–50]

IQ was assessed at 28 years using the Wechsler Abbreviated Scale of Intelligence (2nd edition).[51] There was a substantial gap in IQ with VLBW adults scoring on average 9.4 points lower than term-born controls, after adjustment for perinatal and socio-economic factors.[48] In the VLBW group, IQ scores at ages 7–8 and 28 years were highly correlated (r=0.78), suggesting stability of IQ over time, as also reported by others.[52] On regression analysis, parental education strongly predicted both verbal and total IQ and birthweight strongly predicted perceptual and total IQ, with a modest beneficial effect of longer duration of breastfeeding across all IQ domains.[48] A recent individual patient data meta-analysis of eight longitudinal population-based studies of VLBW/VP adults, including the NZVLBW study, similarly reported an unadjusted IQ difference of approximately 12 points between VLBW/VP adults and controls.[53]

Executive functions (EF) consist of higher-level cognitive regulatory skills that help an individual plan, solve problems and adapt flexibly to new situations. We examined participants' self-perceived EF abilities in their everyday lives using the Behaviour Rating Inventory of Executive Function (BRIEF-A) at ages 22 and 28 years. VLBW adults reported poorer EF than controls at both ages. However, between-group differences reduced with increasing age, suggesting that executive difficulties may be having less impact on their daily lives.[49] Formal testing of spatial working memory at age 28 showed that VLBW adults were less accurate, slower and less efficient than controls.[50] This is generally consistent with our IQ results and EF findings from other studies suggesting that cognitive and EF challenges persist into adulthood.[54] Importantly, we also found that VLBW individuals with poorer spatial working memory had lower levels of educational achievement and occupational/socio-economic success, even after accounting for the effects of their parents' socio-economic backgrounds.[49,50]

Mental health[55]

At age 28, VLBW adults reported more mental health problems than controls, although between-group differences were small.[55] Rates of agoraphobia, social phobia and suicidal ideation were all slightly elevated in the VLBW cohort compared with controls, but not depression. There were no differences in substance use or violent/property offending. Compared with same-sex controls, female VLBW adults had higher relative risks of anxiety disorders than VLBW males, while VLBW males had higher relative risks of depression. VLBW adults born <28 weeks had higher rates of most mental health disorders than more mature VLBW adults and controls, and might be at increased risk of depressive disorder/symptoms. We did not directly question participants about symptoms of attention-deficit/hyperactivity disorder (ADHD) at age 28, but data from our 22–23 year assessment[15] were included in an individual patient data meta-analysis involving eight adult preterm outcome studies. Results showed similar rates of self-reported ADHD symptoms in preterm adults and controls.[56]

Psychosocial outcomes[15]

Relative to controls, at age 22, VLBW adults had lower rates of tertiary education/training, were less likely to be in paid employment, more often living with their parents and had a closer relationship with them.[15] They also reported fewer

friends and less engagement in sexual partner relationships. Importantly, however, there were no differences in self-reported life satisfaction or self-esteem.[15] In previously unpublished data, we found that by 28 years the gaps in tertiary education (23% vs 33% attained a university degree), employment (72% vs 79% paid employment) and welfare dependence (20% vs 12%) were reduced, and living arrangements were similar for both groups. Differences in peer, sexual and partner relationships remained but there were no differences in the proportion who had become a parent (37% vs 32%). Both groups reported similar self-esteem but life satisfaction was now slightly reduced for VLBW adults overall, largely due to poorer quality of life (QoL) scores related to physical health issues. Health-related QoL outcomes have been reported to be no different between VLBW/VP young adults and controls in their late teens and early 20s in several studies.[57] However, with increasing age other studies have noted some decline in self-reported QoL, primarily resulting from physical issues.[58,59]

Table 3 summarises our main study findings.

Discussion and implications

The first 1,000 days (conception to age 2) of a child's life represents a sensitive period of development during which a child's experiences and exposures play a major role in shaping their future health and development.[60] Despite their difficult start in life, the majority of VLBW adults were generally living healthy, productive lives similar to their term-born peers. Biomedical measures for VLBW adults were mostly within the normal range, although group mean values favoured controls (Table 3). Our summation score of biomedical measurements that are known to change with age suggests that VLBW adults may have a more advanced "physiological age" towards the end of their third decade than term-born controls and may be more vulnerable to early organ decline and future health issues. In an overview of national Scandinavian registry data, Crump has shown that in their fourth and fifth decades preterm-born adults have increased risks of chronic disorders involving various organ systems, even though the absolute risk for most individuals is low.[8]

It is established that peak function for many physiological systems, for instance respiratory function, is attained by the third decade of life, followed by a decline.[2] Peak physiological function is influenced by genetic variation and modified by key exposures during critical windows of

Table 3: Summary of main findings from the New Zealand 1986 Very Low Birthweight Follow-up Study at 28 years.

- In the VLBW adult cohort, biomedical values were mostly in the normal range but group means were poorer than for term-born controls.
- VLBW adults were on average 5cm shorter and lighter than term-born controls, but with little difference in body mass index.
- Compared with term-born controls, VLBW adults had higher systolic blood pressure (mean 4.6mmHg), decreased peripheral artery distensibility and slightly smaller, stiffer hearts on echocardiograms.
- There were no significant differences in fasting lipid profiles, glucose or insulin, or in glycated haemoglobin or a measure of insulin resistance between VLBW adults and controls.
- VLBW adults had increased airways obstruction, reduced gas exchange efficiency and increased ventilatory inhomogeneity; they also tended to exercise less often and less vigorously than controls.
- Moderate vision impairment was more frequent in VLBW adults who had a history of retinopathy of prematurity (untreated) than in other VLBW adults, and least frequent in term-born controls.
- There was a gap of 9.4 points in adjusted mean IQ between VLBW adults and controls.
- Where similar assessments were undertaken at 22 years and 28 years, we observed a narrowing of the gap between the VLBW cohort and controls with increasing age, including in tertiary education, employment, welfare dependence and self-perceived executive functioning.
- VLBW adults did report more mental health problems than term-born controls, but this difference was small.
- VLBW adults reported similar levels of self-esteem as term-born controls but slightly poorer quality of life scores, mostly related to physical issues.

development, as well as by a range of social and environmental factors. Equally the rate of decline from peak function will be influenced by multiple factors including socio-economic status and lifestyle choices, such as eating habits and exercise. The current data show that peak function in VLBW/VP adults is reduced compared with term-born peers for many systems, although still within the normal range for most. What is less clear is whether the pace-of-ageing from that peak will match that of controls or be accelerated and whether appropriate preventative healthcare can modify the rate of function decline. Ongoing longitudinal research with VP-born cohorts is essential to answer these questions.

The New Zealand 1986 VLBW Follow-up Study is one of only two national longitudinal studies of VLBW/VP infants born in the 1980s—the other being from the Netherlands, which lacked a comparison group.[61] However, there are several regional population-based cohorts and others based around regional referral hospital(s). Two cohorts of infants <26 weeks gestation born in the United Kingdom in 1995 and 2006 have been followed in the EPICure studies.[62] These studies and a number of other trial-based cohorts contribute to the Adults Born Preterm International Collaboration (APIC),[63] which facilitates pooling of data and individual patient data meta-analyses resulting in increased statistical power. Saroj Saigal, who is a pioneer of longitudinal studies documenting outcomes following very premature birth, has also given space for ELBW young adults to voice their own perspectives on their life's journey, challenges and accomplishments.[64]

Strengths of our study include that it involves a prospectively enrolled, national population-based cohort with good retention to the third decade of life. We have used a comprehensive battery of tests and assessment undertaken at one centre. We have established international collaboration so that our data contribute to larger, often individual patient data, analyses.

Limitations include that there are some missing data, and our sample size means we are only powered to detect small-to-moderate between-group differences. The VLBW cohort was included in the original 1986 audit on the basis of birthweight (usual in the mid-1980s), so results are possibly affected by the increased proportion of small-for-gestational age (SGA; birthweight less than 10th centile) infants at higher gestations. However, results have also been reported for the sub-group born at <28 weeks gestation, although the smaller sample size for these analyses means reduced power to detect differences. Where differences or trends in outcome were noted for the total VLBW group compared with controls, these were often greater for those <28 weeks gestation or <1,000g birthweight. Since the VLBW cohort was born there have been many advances in neonatal intensive care. However, more than half of the cohort had been exposed to antenatal

Table 4: Implications and measures to prevent and mitigate adverse outcomes in very low birthweight (VLBW) adults.

- The first 1,000 days after birth is recognised as laying the foundation for optimal growth, health and neurodevelopment: it is likely that this period of time may be even more crucial for VLBW/very preterm (VP) infants.
- There should be monitoring of developmental delay and provision of intervention services to support the cognitive needs of VLBW infants.
- VLBW/VP birth can impact health and brain development across the lifespan and should be recognised as a life-long risk factor for pulmonary, cardiovascular and metabolic disorders.
- General practitioners and other health professionals should routinely ask about birthweight and gestation at birth, and VLBW/VP graduates should be encouraged to volunteer this information, which should remain in the medical records.
- Routine general practice visits provide an opportunity to check for any relevant symptoms, and we recommend basic investigations (e.g., spirometry, blood pressure, blood glucose/glycated haemoglobin) at least twice through late childhood and adolescence, and earlier screening for cardiovascular disease risk in adulthood.
- As in the general population, adopting a healthy lifestyle, not smoking, following a healthy diet and taking regular exercise are the cornerstones for remaining fit and well. Annual influenza immunisation, and protection from other respiratory viruses when available, is recommended.

corticosteroids and routine care included assisted ventilation and parenteral nutrition, although surfactant therapy was not available and breast-milk feeding was lower than in contemporary cohorts.

In Table 4 we have listed a range of strategies we believe are important to maximise the health and wellbeing of VLBW/VP graduates throughout the lifespan. Early identification of developmental delay and provision of intervention services to support the cognitive needs of these children is critical. Educators within the school system need to be aware of the cognitive and learning needs of children born VLBW/VP so they can be proactively identified and addressed with timely remedial support to help optimise these children's educational and occupational lifecourse opportunities.

VP birth is a lifetime condition and extra surveillance and monitoring is warranted, particularly for respiratory, cardiovascular, kidney and metabolic health. Optimising future health and welfare will be aided by healthy nutritional choices, encouraging regular exercise from childhood onwards, avoidance of smoking/vaping/mould exposure/air pollution and uptake of immunisation including for influenza and respiratory viruses. We recommend birthweight and gestation history is maintained in the medical records, or if absent questioned about at all visits with a health provider. We also recommend regular health checks to detect problems at an early stage.

VP birth has been associated with increased prevalence of mental health disorders in childhood and adolescence in a number of studies and a common preterm phenotype characterised by increased shyness and social withdrawal, increased susceptibility to attention and anxiety problems but low levels of risk-taking and oppositional behaviour.[65,66] However, the extent to which these traits persist into adulthood has been less certain.[55,67,68] Our mental health and psychosocial findings suggest at least some continuity in several of the challenges experienced earlier in development. Recognition of these issues might proactively help VLBW individuals self-monitor and develop strategies to accommodate these challenges to minimise impacts on everyday life.

Conclusion

The majority of VLBW young adults born in 1986 are living healthy, productive lives similar to their term-born peers. Most measures of physical health and welfare have means in the normal range, although these are less favourable for VLBW compared with term adults. It is possible that VLBW adults might experience chronic diseases earlier than their term peers, emphasising the importance of continued follow-up of this cohort.

COMPETING INTERESTS
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Further information on the New Zealand 1986 Very Low Birthweight Study, including a full list of references, can be accessed at: https://www.otago.ac.nz/christchurch/departments/paediatrics/uoc-nz-1986-very-low-birth-weight-study

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From womb to world—is it time to revisit our current guidelines for treatment of antenatal depression? Supporting the next generation to have the best start to life

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ABSTRACT

Antenatal depression affects 15–21% of pregnant women globally, increasing the risk of pregnancy complications, postnatal depression and poor birth and infant outcomes. Psychotherapy is a recommended treatment, but access barriers like cost, time and stigma often prevent their use. For severe cases, antidepressants are advised; however, only 3% of pregnant women in New Zealand take antidepressants, with concerns about risks to their infant identified as a main reason for discontinuing medications. Poor nutrition during pregnancy, particularly ultra-processed foods, is associated with higher maternal depression and greater likelihood of mental health issues in the offspring. Increasing consumption of real whole foods improves outcomes for both mother and infant. As proof that the nutritional environment during pregnancy is inadequate, a randomised placebo-controlled trial in pregnancy for women with moderate depression is showcased to illustrate the importance of supplementing with vitamins and minerals (micronutrients) in recovery from antenatal depression. The additional micronutrients also mitigated the negative effects of depression on birth outcomes and improved early indicators of infant competencies, with more favourable birth and infant outcomes compared to antidepressants. The substantially enhanced birth outcomes emphasise the potential for significant healthcare savings. The breadth of data urges updates to the current guidelines from the Royal Australia and New Zealand College of Psychiatrists and the Royal Australia and New Zealand College of Obstetricians and Gynaecologists to include nutrition intervention as part of maternal care.

This viewpoint examines the significant impact of antenatal depression on maternal and infant health, highlighting the limitations of current treatment guidelines that primarily recommend psychotherapy and antidepressants. It argues for the inclusion of nutritional interventions based on both the growing literature demonstrating the risks of a nutrient-poor diet on maternal and infant health as well as the emerging evidence from the New Zealand-conducted NUTRIMUM trial, which demonstrated that supplementing with vitamins and minerals during pregnancy can significantly improve maternal mental health and birth outcomes. The intent of the paper is to advocate for an update to the guidelines from the Royal Australia and New Zealand College of Psychiatrists (RANZCP) and the Royal Australia and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) to incorporate nutrition as a key component in the treatment of antenatal depression, thereby enhancing the well-being of both mothers and their infants.

Antenatal depression in New Zealand

Antenatal depression affects between 15% and 21% of pregnant women worldwide[1] and increases the risk of pregnancy and birth complications, as well as postnatal depression.[2] In New Zealand, 11.9% of women experience antenatal depression in their third trimester based on scoring ≥13 on the Edinburgh Postnatal Depression Scale (EPDS), with higher rates reported in Māori, Pacific and Asian women compared with women of European ancestry.[3]

Current treatment options

The recommended psychological treatments for pregnant women with depression are typically psychological therapies,[4] with research showing

they can be effective in reducing perinatal depression.[5] However, women often cannot access these treatments due to cost, time constraints, stigma and childcare challenges.[6] There are also mixed findings on whether women at high risk for depression respond to these interventions sufficiently to prevent the development of postnatal depression.[7]

For those with more severe depression symptoms or where psychological interventions have failed or are unsuitable, antidepressant medication is advised, after discussion of the risks and benefits, based on clinical best practice guidelines set by RANZCP and RANZCOG.[4,8,9] Dispensing data, along with longitudinal observations, indicate about 3% of women in New Zealand take an antidepressant during pregnancy.[10]

While a recent umbrella meta-analysis reported that adverse health outcomes associated with psychotropic medications are suggestive at best,[11] there is no clear evidence antidepressants are reducing the risks associated with untreated depression down to levels observed in pregnancies of nondepressed individuals. Despite assurances on the absence of serious adverse effects and the low clinical significance of observed effects, pregnant women are often reluctant to use psychiatric medications. This reluctance persists even though the risks of stopping medication and inadequately treated maternal psychiatric illness are deemed higher for the infant than continuing the medications,[12] with dispensing rates dropping during the pregnancy period.[13] As such, the impact of antenatal depression on maternal and infant outcomes, coupled with implementation challenges with current treatments, underscores the need for research into alternative interventions.

Maternal nutrition has been overlooked

Over the past two decades, research has demonstrated poor nutrition during pregnancy is a risk factor linked to mental health challenges for both mothers and their offspring. Poor nutritional intake, including high consumption of ultra-processed foods in pregnancy, has been associated with higher risk of maternal anxiety, stress and depression during pregnancy.[14] In contrast, consumption of whole foods such as fruit, nuts and seafood has been associated with decreased rates of postpartum depression.[15] The risks are not confined to just maternal outcomes. For example, maternal high adherence to a "healthy dietary pattern" is significantly associated with lower rates of anxiety and depression symptom trajectories in children from 3 to 8 years[16] and lower likelihood of the offspring developing autism at 8 years.[17] In contrast, high consumption of a "Western diet" during pregnancy is associated with higher trajectories of inattention and hyperactivity from 3 to 10 years in offspring.[18,19]

Most pregnant women in New Zealand don't adhere to nutritional guidelines. The Growing Up in New Zealand cohort reported that 3% of pregnant women in New Zealand fully adhered to the Ministry of Health's *Food and Nutrition Guidelines in Pregnancy*, with 25% consuming the recommended daily number of servings of vegetables and fruit (≥6).[20] Changing diets in women during pregnancy, especially reducing consumption of ultra-processed foods, may have a positive effect on the mental health of the next generation. For example, overseas initiatives have shown mothers receiving adequate nutrition during pregnancy, especially from fish, leads to better mental health outcomes for their offspring.[21] Indeed, pregnancy is the most cost-effective time for any government to allocate its resources for prevention.

Pregnancy presents as an opportune time for dietary improvement and research shows this can be achieved;[22] however, food insecurity (limited access to nutritious food due to cost) and food deserts (areas in which access to nutritious foods are limited) are global health concerns that limit women's ability to improve their diet.[23,24] Further, multiple factors mean diet change alone may be insufficient to address existing mental health challenges, with data from high-income countries showing supplementation with multiple micronutrients (vitamins and minerals) may be necessary to prevent nutritional deficiencies during pregnancy.[25] However, single-nutrient studies have been largely disappointing in reducing the symptoms of perinatal depression.[26]

Women with antenatal depression may need more micronutrients than diet provides

The NUTRIMUM trial, which ran between 2017 and 2022, aimed to study whether providing additional micronutrients could be proof of principle that the nutritional environment during pregnancy may not be adequately meeting the mental health needs of the mothers. This study adopted a broad-spectrum micronutrient approach that ensured all essential vitamins and

minerals were provided in balance, recognising that no one single nutrient can address nutritional deficiencies that may be related to poor mental health. NUTRIMUM recruited 88 women, mostly from the Canterbury Region, in their second trimester of pregnancy and presenting with moderate depressive symptoms. They were randomly allocated to receive either 12 capsules (four pills, three times a day) of a broad-spectrum micronutrient supplement (Daily Essential Nutrients) or an active placebo containing iodine and riboflavin for a 12-week period.[27] Micronutrient doses were generally between the recommended dietary allowance (RDA) and the tolerable upper level. Retention in the study was good (81%) and compliance excellent (90%). After the randomised controlled trial (RCT) phase, all women were offered the micronutrients until the birth of their child.

The mental health outcomes from the RCT

Both groups reported similar reductions in symptoms of depression, with more than three-quarters of participants in remission at the end of the RCT. However, 69% of participants in the micronutrient group rated themselves as "much" or "very much" improved, compared with 39% in the placebo group. Also, based on clinician ratings, micronutrients significantly improved overall psychological functioning compared with the placebo. The clinician ratings considered all noted changes based on self-assessment and clinician observations, including sleep, anhedonia, mood regulation and side effects.[28]

There were no group differences in reported side effects, and reports of suicidal thoughts, stress and anxiety dropped over the course of the study for both groups. Blood tests confirmed increased vitamin levels (vitamin C, D, B_{12}) and fewer deficiencies in the micronutrient group.[29] Micronutrient treatment also appeared to support a more diverse (alpha diversity) and stable (beta diversity) microbiome during pregnancy.[30]

Naturalistic follow-up of the birth outcomes and early infant development

The infants of the mothers enrolled in the NUTRIMUM trial provided a naturalistic opportunity to investigate the effects of micronutrients on birth and infant outcomes. Due to the varying starting points in gestation of the RCT phase (12 to 24 weeks), the inclusion of an open-label phase and gestational age at birth, NUTRIMUM infants had varying days of exposure during pregnancy to the micronutrients that ranged from 0 to 6 months, although the mean was 113 days. To contextualise the outcomes, two other groups of women were monitored during pregnancy and post-birth: 1) a reference group: mothers not using the NUTRIMUM micronutrients or psychiatric medications, and 2) medication group: mothers using antidepressants during pregnancy to treat depression.

Mothers taking micronutrients had birth outcomes similar to the reference group, with no increased risks of preterm births, low birthweight or delivery complications, and on par or better than national averages in New Zealand.[31] The one significant group difference favoured a better outcome for the micronutrient-exposed mothers, with significantly less bleeding after delivery (post-partum haemorrhage) in vaginal births (7.7% versus 30%). Compared with the infants exposed to antidepressants, the micronutrient infants had significantly higher gestational age (about 1 week difference; 5.5% premature births in the NUTRIMUM group and 20% in the antidepressant group) and greater birth length (about 2.2cm difference), and lower rates of infant resuscitation (14.5% versus 45%). The longer the infant was exposed to the micronutrients during pregnancy, the heavier and the longer the child was at birth.[31] This means the risks conferred to the infant based on the mother's history of depression were possibly mitigated by the micronutrients.

The observational follow-ups of the infants post-birth showed positive effects of micronutrients on the infants' ability to regulate their behaviour. These results were on par with or better than the reference group, and better than those infants exposed to antidepressant treatment *in utero*.[32] Infants exposed to micronutrients during pregnancy were significantly better at attending to external stimuli and were also better able to block out external stimuli during sleep. They showed fewer signs of stress and had better muscle tone compared with infants not exposed to micronutrients. They were better at regulating their emotional state and had fewer abnormal muscle reflexes than infants exposed to antidepressant medication in pregnancy. Reassuringly, micronutrients had no negative impact on infant temperament. Finally, the mothers who took the micronutrients during pregnancy were

protected from the development of post-natal depression.[33]

These positive effects of micronutrients on birth and infant outcomes are consistent with documented benefits of following a Mediterranean diet during pregnancy on perinatal outcomes.[34] They are also consistent with extensive research in low- and middle-income countries, demonstrating the additional benefit of multiple multinutrient supplementation over iron–folic acid alone on key birth outcomes such as low birthweight and preterm birth,[35] raising the possibility that depression in pregnancy could also be linked to multiple nutrient deficiency. Further, the overall benefits observed for the micronutrient-exposed infants compared to standard care were achieved despite the micronutrient group having a greater number of risk factors associated with poorer birth outcomes, including past history of smoking, higher rates of depression at study entry and more unplanned pregnancies, suggesting the potentially beneficial effect of micronutrient exposure to bring risks down to those observed in nondepressed mothers. Additional micronutrients might compensate for an inadequate *in utero* nutritional environment relative to needs as well as mitigate the negative effects that depression can have on birth and infant outcomes.

Limitations of the research

There are limitations including small sample sizes, only singleton pregnancies were included and the results apply only to mild-to-moderate symptoms of depression. The EPDS is merely a screening tool and only indicates the presence or absence of symptoms of anxiety and/or depression, so future research could utilise standard clinical interviews. In addition, the effects of the micronutrients cannot be generalised to those taking medications during pregnancy alongside micronutrients, and there were varying days of exposure to the micronutrients during pregnancy, with no exposure during first trimester, in contrast to the medication group who received the antidepressants throughout the pregnancy. There was only a small percentage of Māori and Pacific participants in NUTRIMUM (9%), and all participants identified as female; therefore, we do not know whether these results would extend across different ethnic groups and gender. Nevertheless, it is one of the largest controlled studies in pregnancy for the treatment of symptoms of antenatal depression and, as such, is relevant to treatment guidelines. There are no controlled trials of antidepressants during pregnancy to compare these results to.

Updating guidelines to include nutrition would have gains beyond just maternal mental health

Nutrition advice and possibly nutritional supplementation could be added to the current best practice guidelines, notably missing from both RANZCP and RANZCOG guidelines for management of mood disorders in the pregnancy and postpartum period.[4,8,9] Further, these results suggest that doses of antenatal over-the-counter supplements may not be sufficient to confer the advantages on birth outcomes observed in the NUTRIMUM micronutrient group, challenging the suitability of the current RDA doses for a pregnant population. Indeed, other research has shown doses of micronutrients in antenatal supplements are well below what is recommended by the American College of Obstetricians and Gynaecologists nutritional guidelines.[36] It also encourages a revisit of the New Zealand Ministry of Health guidelines that only identify iodine and folic acid as essential micronutrients to prescribe during pregnancy.

Supplementation is not a replacement for nutritious food. Supporting mothers to eat nutrient-dense food should be the goal and research could evaluate the potential cost savings obtained through supporting mothers to eat more nutrient-dense foods during pregnancy on both mental and physical health issues. For example, New Zealand has one of the highest increasing rates of endometrial cancer in women under 50 in the world, the cancer most strongly associated with obesity. Educating women on the benefits of nutrition for her health and that of her offspring, provided in a culturally safe and responsive manner, could also be an opportunity to prevent later endometrial cancer.[37]

Reducing healthcare costs

The study also points to a way to potentially reduce healthcare costs. Although the cost of the supplement studied in NUTRIMUM is a barrier for some mothers (~NZ$200/month at full dose for up to 6 months, i.e., $1200), insurance companies and government agencies could consider the cost effectiveness of such an intervention for mitigating known negative impacts of poor nutrition and untreated depression on birth outcomes. For

example, the women treated with micronutrients had rates of preterm birth comparable to a typical low-risk birth (5.5%), offering an opportunity for cost savings. The incremental cost of a late preterm birth (32–36 weeks) relative to a term birth are AUD$25,417 (~NZ$28,000; birth, neonatal care, delivery costs, early intervention, schooling, primary and secondary care to 18 years).[38] The risk of a preterm birth of an untreated mother with depression is about 15%. Therefore, the cost savings per birth to a mother with antenatal depression treated with micronutrients: ((15%−5.5%) * $28,000) − $1200 = NZ$1,460.

With 60,000 live births in New Zealand per year, and about 12% of mothers in New Zealand experiencing antenatal depression,[3] potential cost savings per annual cohort using micronutrients for these mothers: 60,000 births * 12% * $1,460 = ~NZ$10.5 million. These potential cost savings on preterm birth alone should encourage replication in larger and more diverse samples as well as controlled studies using micronutrients consistently throughout the pregnancy compared with standard medication care. $10.5 million per annual cohort likely underestimates cost savings as benefits were also observed in other costly health issues, such as maternal depression, postpartum haemorrhaging and infant resuscitation. Combining micronutrients with 600mg/day of docosahexaenoic acid (DHA) omega 3 fatty acids could result in even better birth outcomes and even greater cost savings.[39]

Practical advice for clinical teams

1. Nutrition and diet

- **Increase whole foods:** Emphasise the consumption of whole foods such as fruits, vegetables, nuts and seafood. These foods are associated with better mental health outcomes for both mothers and their offspring. Recent guidelines indicate that during pregnancy eating at least two portions of fish a week, one of which should be oily, is advised.[40]
- **Reduce ultra-processed foods:** Limit the intake of ultra-processed foods, which are linked to higher risks of maternal depression and negative mental health outcomes in children.
- **Seek nutritional guidance:** Pregnant women could be supported within the maternity services with advice from nutritionists or dietitians to ensure they are meeting their nutritional needs. This is especially important if they have limited access to nutritious foods.

2. Micronutrient supplementation

- **Consider supplements:** For pregnant women with mild-to-moderate depressive symptoms, healthcare providers could consider a broad-spectrum micronutrient supplement. The NUTRIMUM trial showed significant improvements in maternal mental health and infant outcomes with such supplementation. Note that combining micronutrients with psychiatric medication should only be undertaken with careful physician monitoring.

3. Access to nutritional support

- **Government and insurance support:** Advocate for government and insurance support to cover the costs of nutritional supplements, as they can lead to significant healthcare savings by improving birth outcomes and reducing the need for medical interventions.

4. Mental health support

- **Psychotherapy and counselling:** While micronutrients can help, psychotherapy and counselling remain important. Cognitive behavioural therapy and interpersonal psychotherapy are effective treatments for antenatal depression.
- **Address barriers:** Work on overcoming barriers to accessing mental health care, such as cost, time constraints and stigma. Online therapy options might be a viable alternative.

5. Policy and guidelines

- **Update guidelines:** Support efforts to update clinical and legislative guidelines to include nutrition and micronutrient supplementation as part of standard care for antenatal depression.
- **Research and advocacy:** Encourage further research and advocacy to explore the benefits of micronutrients and improve access to nutritional support for pregnant women.

Conclusion

The research reviewed in this viewpoint provides an evidence-based alternative for women with associated cost savings for the public health system and could be included as part of informed consent. The prenatal environment, including nutrition, sets the foundation for a child's future. More nutritious foods and possibly additional micronutrients could provide future generations with a better start to life. Is it time to revisit current guidelines for the treatment of antenatal depression to include nutrition?

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Pre-eclampsia in Aotearoa New Zealand: elevating clinical vigilance and equity—a viewpoint

Ankur Gupta, Sonia Sharma

Pre-eclampsia is a leading global cause of maternal and perinatal morbidity and mortality. In Aotearoa New Zealand, pre-eclampsia, along with other hypertensive disorders of pregnancy such as white coat hypertension, gestational hypertension and chronic hypertension, continues to represent a significant public health challenge, with Māori and Pacific whānau disproportionately affected.[1] Despite universal access to antenatal care through a publicly funded health system, persistent inequities in both the incidence and outcomes of hypertensive disorders in pregnancy highlight ongoing systemic barriers and the urgent need for targeted, equity-focussed interventions. In recognition of its impact, the month of May is designated as pre-eclampsia awareness month, providing a platform to increase awareness, promote early detection and advocate for improved maternal health outcomes.

Pre-eclampsia, defined as new-onset hypertension after 20 weeks gestation accompanied by one or more signs of new-onset organ involvement, is a complex multisystem disorder with an unclear aetiology. Pathophysiological mechanisms include impaired placentation, systemic inflammation and widespread endothelial dysfunction.[2] It can arise suddenly and progress rapidly, often in women with no prior risk factors. While routine antenatal care offers an essential safety net for identifying early signs, Māori and Pacific women continue to experience systemic barriers to accessing consistent, high-quality care. These barriers include geographic isolation, experiences of institutional racism, lower rates of continuity of care and reduced access to culturally safe services.[3] Data from Health New Zealand – Te Whatu Ora consistently demonstrate higher rates of severe pre-eclampsia, preterm delivery and perinatal complications among wāhine Māori and Pacific compared with Pākehā women, even after adjusting for socio-economic status.[4]

Risk stratification models currently used in antenatal care can under-represent those most affected by inequity. While maternal history, comorbidities such as diabetes and hypertension and lifestyle factors are considered, these frameworks often fail to account for structural determinants of health. Consequently, many Māori and Pacific women may not be appropriately identified as high risk, despite facing compounding disadvantages that exacerbate vulnerability to hypertensive disorders.[3]

Culturally responsive models of maternity care are essential to improving outcomes.[5] Kaupapa Māori maternity services, continuity of midwifery care and co-designed interventions with Pacific communities have shown promise in enhancing trust, engagement and clinical outcomes. Yet the scale and availability of such models remain limited. Health inequities are perpetuated when care pathways are designed without partnership and when services are not adequately resourced to reflect Te Ao Māori or Pacific worldviews.[6]

The cornerstone of pre-eclampsia management remains early identification and timely delivery. Surveillance tools such as blood pressure monitoring, urinalysis, serum creatinine, liver enzymes and platelet counts are standard. Advanced diagnostic measures—like angiogenic biomarkers (e.g., soluble fms-like tyrosine kinase 1: placental growth factor, sFlt-1: PlGF ratio)—offer more predictive value but are not equitably accessible across all districts.[7,8] Likewise, digital health tools, including home blood pressure monitors and telehealth platforms, are increasingly used in urban centres, but digital inequity presents a barrier in remote and under-served communities. This could be minimised by incorporating technology with Māori health values.[9]

Management must be multidisciplinary and equity-focussed with people at the centre. Mild cases may be managed with antihypertensives and close monitoring, but severe pre-eclampsia often requires urgent delivery. The use of corticosteroids for foetal lung maturity and magnesium sulphate for seizure prophylaxis is well established.[8] However, access to secondary-

level and tertiary-level care can be delayed for patients in rural regions, where transport, referral and coordination barriers further amplify risk for Māori and Pacific mothers.[3]

In 2021, Health New Zealand – Te Whatu Ora outlined national priorities for reducing maternal health inequities. However, implementation has been inconsistent, and accountability mechanisms remain limited. Investment in equity must go beyond rhetoric to include dedicated funding for Māori- and Pacific-led services, systemic anti-racism training across the maternity workforce, and research into the lived experiences of under-served populations.[3,4] Prevention also plays a vital role. Low-dose aspirin, administered from early pregnancy in high-risk individuals, has been shown to significantly reduce the incidence of preterm pre-eclampsia and improve outcomes.[10] Yet, uptake remains uneven, with likely lower prescribing rates in clinics serving Māori and Pacific populations. This reflects a broader failure to integrate population health equity into routine obstetric practice.

Pre-eclampsia awareness month should not merely be a calendar observance but a call to action—both clinically and structurally. Awareness alone cannot resolve inequity; it must be coupled with cultural humility, data-driven investment and systemic change. As a clinical community, we must commit not only to reducing the burden of pre-eclampsia but to transforming the conditions that make it deadlier for some and more survivable for others. At the individual clinician level, success hinges on vigilance and screening, training with updated knowledge and guidelines, personalised care and meticulous documentation keeping principles of equity in mind. In a nation that aspires to equity in health, no mother should suffer preventable harm due to an unequal system. Let us recommit to ensure that pre-eclampsia and other hypertensive disorders of pregnancy are not only managed better, but understood through the lens of justice, partnership and respect for the aspirations of all whānau.

COMPETING INTERESTS
Nil.

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Scedosporium and Cutibacterium skull base osteomyelitis complicated by blindeness from fulminant papilloedema

James Corbett, Nigel Raymond, Rebecca Garland, Andrew Parker, Jesse Gale

A 48-year-old Pacific man with a background of diabetes developed chronic right otitis with mastoiditis in 2016 and underwent a modified radical mastoidectomy in 2018. Postoperatively he developed skull base osteomyelitis (SBO) and dural venous sinus thrombosis diagnosed with computed tomography (CT) with venogram. In 2020 his vision deteriorated with severe papilloedema and he was referred to our centre.

On review he had thick, green ear discharge and warm, non-tender swelling behind the right ear. Visual acuity was hand movements in right eye and no light perception in left eye. Ocular examination showed bilateral end-stage pallid optic disc swelling and bilateral retinal central retinal vein occlusions (Figure 1), without retinal ischaemia.

Full blood count showed mild neutrophilia. Glycated haemoglobin was 53mmol/mol (reference range <41mmol/mol) and C-reactive protein was 26mg/L (reference range <6mg/L). Superficial swabs from the right ear canal grew two yeasts identified as belonging to the *Candida parapsilosis* complex, thought to be commensal flora.

A follow-up CT with venogram showed the right mastoidectomy, mastoid air cell opacification, sclerotic and erosive changes affecting the right petrous temporal bone, sphenoid bone and clivus, and soft tissue inflammation including subgaleal collection. Right transverse and sigmoid sinus thrombosis was demonstrated.

Sterile subgaleal collection aspirate showed leukocytes but no organisms on Gram stain (no additional stains used), and grew environmental fungus *Scedosporium apiospermum*, sensitive to voriconazole with minimum inhibitory concentration 0.5mg/L.

Magnetic resonance imaging showed extra-axial enhancing soft tissue along the inner aspects of right occipital and temporal bones, extending into the posterior and middle cranial fossae. Soft tissues in the scalp and neck were oedematous and enhancing (Figure 2). Lumbar puncture opening pressure was >38cmH_2O. Cerebrospinal fluid analysis showed 48x10^6/L white cells (97% mononuclear) with raised protein and normal glucose. No organisms were isolated following extended incubation.

A multidisciplinary team including infectious disease, otorhinolaryngology, ophthalmology and neurosurgical specialists managed this case. Oral voriconazole 200mg BD and terbinafine 250mg daily were commenced with monitoring of serum levels and liver function. Oral acetazolamide 250mg TDS continued for 8 months to reduce intracranial pressure. Ventriculoperitoneal shunt was deemed inappropriate due to active extra-axial infection. Right optic nerve sheath fenestration was conducted to protect remaining vision: optic disc oedema resolved quickly but remaining light perception in the right eye was gradually lost.

Neuroimaging over the following year showed gradual improvement. Terbinafine was discontinued after 12 months due to increasing cholestatic liver enzymes. Subsequently, right-sided headaches recurred with neutrophilia and increased C-reactive protein (39mg/L). A CT demonstrated increased temporoparietal lobe oedema and extracranial soft tissue inflammation. Another sterile deep tissue biopsy was taken, including deep fascia, occipital bone and extradural tissue. *Cutibacterium acnes* was grown from bone and fascia. Oral doxycycline 100mg BD was initiated for possible bacterial coinfection given excellent bony penetrance, with gradual clinical improvement. He received 26 months of antifungal treatment and 12 months of antibacterial treatment.

Skull base osteomyelitis is a rare and dangerous infection spreading from otological or sinus infections, typically caused by *Pseudomonas aeruginosa* with malignant otitis externa.[1,2,3] *S. apiospermium* is a ubiquitous fungus that most

Figure 1: a) Colour fundus photography at presentation showing pale, swollen optic discs, and bilateral central retinal vein occlusions with collateral vessel formation. b) Colour fundus photography 3 years later showing optic atrophy with gliosis. Some minor pigment irregularities in the mid-periphery represent panretinal photocoagulation treatment, which was not completed.

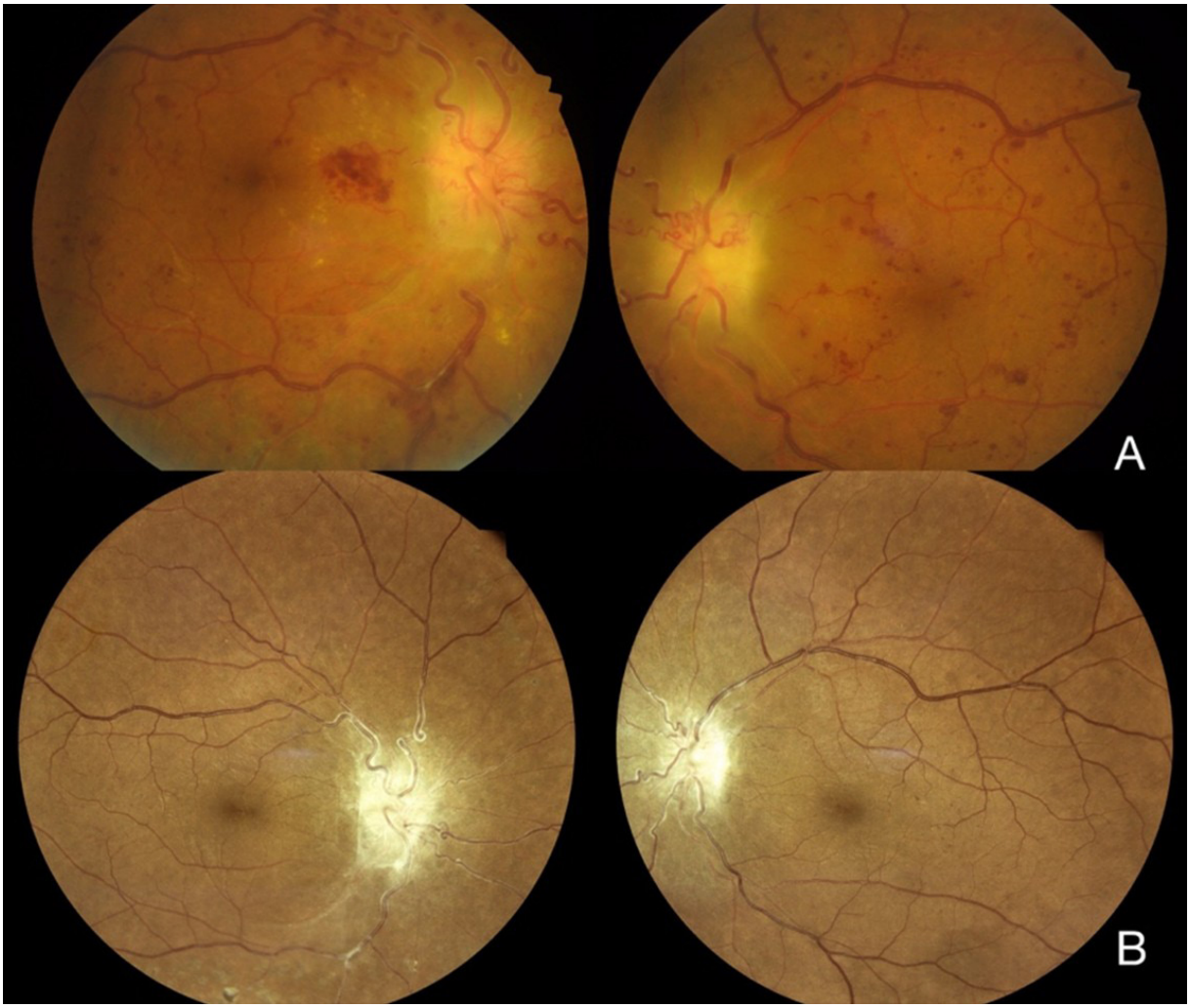
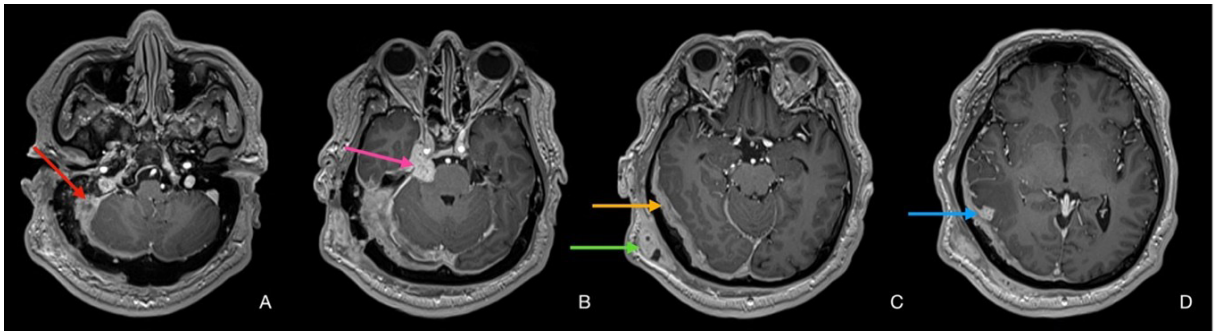


Figure 2: Axial T1-weighted gadolinium contrast-enhanced MRI sections. a) Section at ear canals showing enhancing inflammatory tissue extending from right periauricular soft tissue through abnormal modified right petrous temporal bone to posterior fossa (red arrow). b) Nodular deposit (pink arrow) extends into the right prepontine cistern, affecting right trigeminal nerve. c) Plaque-like enhancing dural thickening extending cranially to surround the right temporal lobe (orange arrow). Sub-galeal nodular enhancing soft tissue (green arrow) in the temporoparietal area. d) Temporal nodular dural focus with surrounding cerebral oedema and midline shift (blue arrow).



commonly causes infection in immune-compromised patients.[4] *C. acnes* has also been reported to be the causative organism in a small number of SBO cases complicated by cranial neuropathy.[5] The facial nerve is the most implicated cranial nerve in SBO due to its course through the stylomastoid foramen.[6] Optic nerve involvement is much less common, and in this case the involvement was indirect through intracranial hypertension. The case highlights important aspects of SBO, particularly 1) external ear swab results can be misleading, especially after antibiotic treatment;[7] 2) a prolonged relapsing course from treatment failure is well recognised;[8] thus 3) sterile-site microbiological samples should be prioritised in the workup of SBO, after 48 hours without antimicrobials; and finally 4) among the catastrophic complications of SBO, this is the first report of intractable blinding papilloedema despite optic nerve sheath fenestration.[9]

COMPETING INTERESTS
Nil.

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Osteoporotic sacral insufficiency fractures in a patient with alternating buttock pain: a case report

Rohil V Chauhan, Amanjeet Toor, Anand H Segar

Lower back and buttock pain in older adults is often attributed to lumbar or hip degenerative pathology.[1] However, in patients with multimorbidity, particularly those with malignancy or osteoporosis, broader causes must be considered.

We present a 71-year-old female with three episodes of intractable, alternating buttock pain over 12 months, diagnosed with bilateral sacral insufficiency fractures (SIFs) upon orthopaedic consultation. This case illustrates the diagnostic challenge of SIFs and the importance of multidisciplinary management in fragility fracture care.

Case presentation

A 71-year-old woman was referred to a secondary care orthopaedic spine clinic following three episodes of severe buttock pain over 12 months without an injury mechanism. The first two episodes involved the left buttock, and the most recent affected the right. Each episode lasted 3–5 weeks, significantly impairing mobility and function, but resolved without medical consultation. She was asymptomatic at the time of orthopaedic review; however, her general practitioner referred her due to a history of vertebral fragility fractures and multiple recurrences.

Her medical history included hypertension (managed by amlodipine), osteoporotic vertebral fractures at L3 (approximately 70% vertebral height loss) and T12 (approximately 30% loss) and early-stage rectal cancer treated with low anterior resection and ostomy reversal in 2020, with no recurrence to date. She also had essential thrombocythaemia and myelodysplastic syndrome, managed with a stem cell bone marrow transplant in 2023, and remained under haematology care.

On examination, lumbar range of motion was full and non-provocative. Tandem gait and Romberg's sign were unremarkable. There was mild focal tenderness over the superior left sacroiliac joint. Hip and sacroiliac joint provocation tests were negative bilaterally. Neurological assessment of the lower limbs revealed intact power and light touch sensation, with brisk (3+) deep tendon reflexes and no long tract signs.

Lumbar spine radiographs (Figure 1) confirmed chronic vertebral compression deformities at L3 and T12. Given her fragility fracture history, cancer background and symptom severity, lumbosacral magnetic resonance imaging (MRI) was arranged to assess for occult pathology.

MRI revealed multilevel lumbar spondylosis with left-sided L5 and S1 nerve root compression. Notably, MRI also demonstrated bilateral subchondral bone marrow oedema in the sacral alae, consistent with recent SIFs (Figure 2B).

Given the absence of pain, surgical or interventional management was not indicated. She was referred to endocrinology for osteoporosis evaluation and to physiotherapy for a rehabilitation programme focussed on gradual, low-intensity strength and balance training.

Discussion

This case highlights several considerations in the evaluation of lumbopelvic pain in older adults with multimorbidity. SIFs are frequently underdiagnosed, particularly when plain radiographs are unremarkable.[2] The sacrum is often inadequately visualised on standard lumbar radiographs, and clinical presentation may mimic more prevalent causes of axial or radicular pain.[1,3] MRI, particularly T2-weighted coronal lumbosacral and coronal oblique sacral sequences, offers high sensitivity (near 100%) in detecting SIF-associated early marrow oedema.[2]

The patient had multiple established risk factors for fragility fractures, including established osteoporosis, prior vertebral compression fractures, malignancy and recent stem cell transplantation.[1] Notably, a single fragility fracture increases the

Figure 1: Lateral lumbar extension radiographs demonstrate a chronic anterior wedge compression deformity of L3, with approximately 70% loss of vertebral body height. A similar but less severe compression deformity is noted at T12 (approximately 30% loss). There is also grade 1 anterolisthesis of L4 on L5 due to degenerative spondylolisthesis.

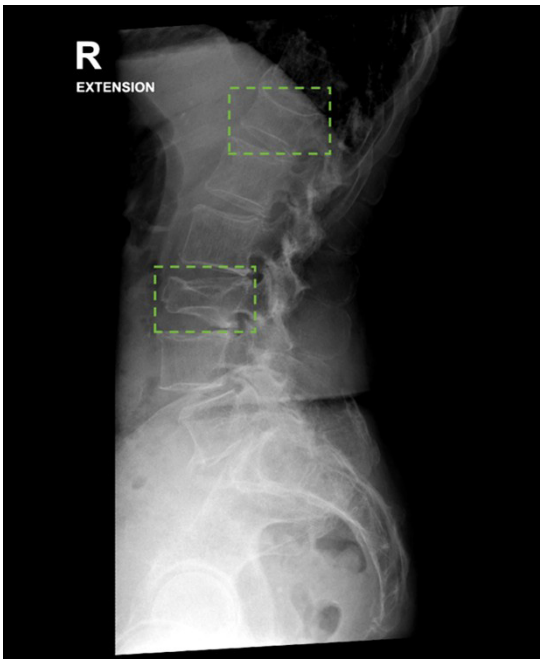
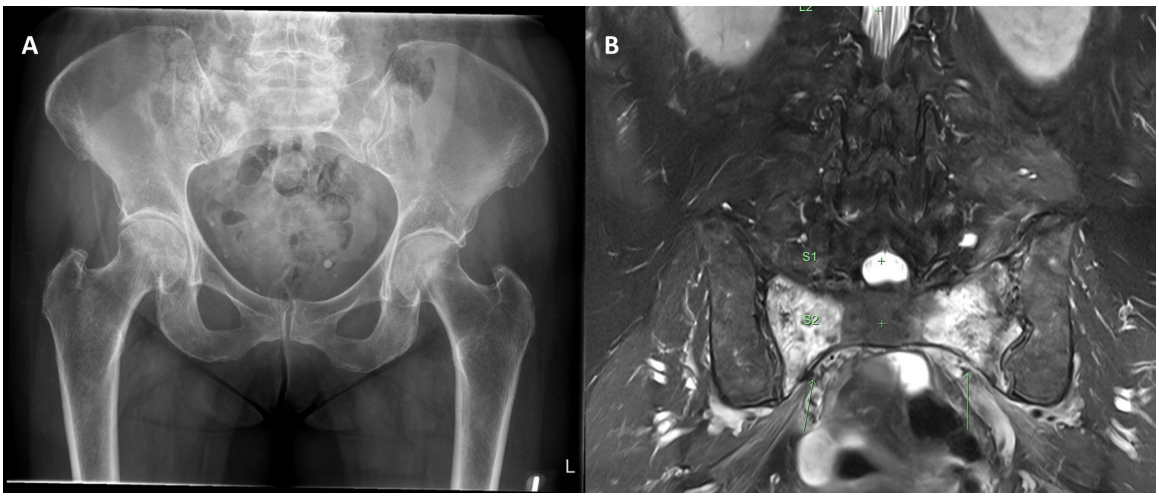


Figure 2: A) Largely unremarkable anteroposterior pelvic radiograph (left) with generalised reduced radiographic bone density and normal sacral appearances, and B) coronal T2-weighted lumbar magnetic resonance imaging (right) shows bilateral linear regions of subchondral hyperintensity within the sacral alae, consistent with bone marrow oedema secondary to bilateral sacral insufficiency fractures (green arrows).



likelihood of subsequent fractures two- to four-fold;[4] up to 80% of patients diagnosed with a sacral insufficiency fracture have evidence of prior fragility fractures.[5] Although asymptomatic at the time of orthopaedic review, the patient's prior disabling pain episodes, oncologic history and prior fractures warranted MRI investigation to consider occult pathology.

Management of SIFs extends beyond symptom control and requires a comprehensive, multidisciplinary approach to bone health.[1,2] Best practice involves addressing modifiable lifestyle factors, optimising nutrition and vitamin D status, initiating appropriate pharmacologic therapy (including bisphosphonates) and managing underlying medical comorbidities.[1,2]

Bisphosphonates, such as intravenous zoledronate, pamidronate and oral alendronate, are commonly recommended for at least 3–5 years, and may be reassessed based on fracture risk, bone turnover markers and bone mineral density response.[1,2] Evidence from a recent meta-analysis of 22 randomised controlled trials supports the use of bisphosphonates in improving bone mineral density, reducing the incidence of secondary fractures and improving quality of life in osteoporotic patients with fragility fractures.[6] In cases of ongoing fracture risk despite standard therapy, referral to endocrinology is appropriate for further evaluation and treatment.

Exercise-based rehabilitation presents an important opportunity for reducing falls risk and improving confidence and skeletal bone quality, even in older adults.[1,7] Low-intensity weight-bearing strength training and balance-focussed exercises guided by physiotherapists should complement multidisciplinary coordinated care alongside general practitioners and endocrinologists in addressing fracture risk and osteoporosis.[1,7]

Conclusion

SIFs should be considered in older adults with recurrent lumbopelvic pain, especially those with osteoporosis or cancer history. This case reinforces the limitations of plain radiography and the value of MRI in detecting occult fractures, and emphasises the role of timely, multidisciplinary care in reducing fracture-related morbidity.

COMPETING INTERESTS
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The rising incidence and ethnic disparities in aortic dissection in Aotearoa New Zealand

Eric T A Lim, Andrew McCombie, Frank Frizelle, Adib Khanafer

Acute aortic dissection (AD) is a lethal medical diagnosis, associated with a high morbidity and mortality if not recognised and treated promptly. In recent years there has been increasing awareness of this diagnosis, with both national and international studies demonstrating a rising incidence of AD worldwide.[1–3]

In Aotearoa New Zealand, our previous paper looked at all cases of AD and found that over the last two decades there has been a rising incidence of AD, with a current median incidence rate of 4.99 per 100,000 per annum.[2] This was further explored in a collaborative study carried out nationally, which demonstrated this rising incidence was mainly driven by increasing cases of acute type A AD with a calculated average of 3% increase per year after adjusting for age and gender.[3]

Ethnic-specific disparities have been documented in vascular disease in Aotearoa New Zealand, including in aortic conditions. This was explored in the Midland Region of Aotearoa New Zealand, looking at patients with a diagnosis of acute aortic syndromes (AAS) including AD.[4] The study demonstrated a statistically significant difference in age-standardised rates of AAS in Māori patients (6.9 per 100,000 person-years) compared with non-Māori patients (2.0 per 100,000 person-years).[4] The data show the significant ethnic disparity that exists in cases of AD, and following a further study that was performed on a national level a concordant result was found. The age-standardised incidence rates by ethnicity demonstrate that Māori and Pacific peoples have a significantly higher rate, almost three to six times more, respectively compared with their European counterparts.[3]

Methods

Patients diagnosed with AD based on the International Classification of Diseases (ICD-10) version 2 code were identified from the Aotearoa New Zealand Ministry of Health National Minimum Dataset (NMDS).[2] Data were analysed further by performing an age-adjusted incidence rate according to gender and prioritised ethnicity using census population data (estimated resident population) obtained from Statistics New Zealand. This was then grouped into four blocks based on the closest census year, and person-years were obtained from that census year. The age standardisation was performed using the World Health Organization standard population.[5] Case numbers and person-years were derived for the periods 2001–2003, 2004–2009, 2010–2015 and 2016–2020. Comparisons of age-standardised incidence rates were made using *z*-tests, where differences between rates were divided by Euclidean distance of their standard errors. "European and Other" was used as the reference group for comparisons between ethnicities within each time period, while 2001–2003 served as the reference period for comparisons of temporal trends within each ethnicity. A p-value of <0.05 (two-tailed) was considered statistically significant.

Results

There was a significant difference in age-standardised incidence rate of AD in patients who identify as Māori and Pacific peoples compared with their European counterparts ($p<0.001$) (Table 1). The findings were similar when stratified by both gender groups. However, the age-standardised incidence rate in female Māori and Pacific peoples was almost four to five times higher over the four census years compared with patients who identify as European and Other ($p<0.001$) (Figure 1 and 2).

Based on the 2018 census data, age-standardised incidence rates of AD in both male and female Māori patients were three times higher, with males being 11.3 per 100,000 person-years and females being 7.2 per 100,000 person-years compared with their European and Other counter-

parts (p<0.001). The age-standardised incidence rates of AD in male and female Pacific peoples were substantially higher, with males being four times higher at 13.9 per 100,000 person-years and females being five times higher at 10.1 per 100,000 person-years compared with their European and Other counterparts (p<0.001) (Table 1).

Discussion

The findings demonstrate an ongoing and significant disparity affecting the Māori and Pacific peoples in Aotearoa New Zealand. This was also addressed in a previous study that demonstrated that Māori patients are at a higher risk of AAS, showing that prompt identification and diagnosis is crucial to ensure optimal implementation of appropriate treatment.[6] From what has been shown in our study, this should also apply for patients who identify as Pacific peoples.

Outcomes following intervention for type A AD based on ethnicity also demonstrate a similar disparity in outcomes, with Pacific peoples having a higher rate of operative mortality compared with other ethnic groups.[7] This was also observed in other population-based studies looking at the outcome following AD—in the United States of America, Black and African Americans were shown to have a higher mortality rate from AD compared with non-Hispanic white Americans.[8] The cause of this disparity remains unknown, and it is likely to be multifactorial. It is well published that Māori and Pacific peoples have a higher prevalence of cardiovascular risk factors (i.e., hypertension, hyperlipidaemia and smoking), which would predispose them to developing AD.[3,4] Other factors include socio-economic barriers to accessing healthcare and inequalities that exist within the current healthcare system.[3,4]

With the ongoing rising incidence of AD affecting Māori and Pacific peoples as demonstrated, it is prudent to have a call for better awareness. Disparities affecting these ethnic groups need to be research priorities in reducing morbidity and mortality. A tailored approach needs to be devised to engage with the Māori community to improve patient awareness to seek prompt medical treatment in honour of Te Tiriti O Waitangi and how partnership and protection leads to improved outcomes for all.

Table 1: Age-standardised incidence rates of aortic dissection by gender and ethnicity based on census years.

Age-standardised incidence rate (per 100,000 person-years)				
Census year	2001	2006	2013	2018
Year group	2001–2003	2004–2009	2010–2015	2016–2020
Male				
European and Other	4.1 (3.8–4.4)	3.8 (3.7–4.0)	3.3 (3.2–3.4)	3.8 (3.6–3.9)
Asian	5.2 (3.5–7.9)	3.8 (3.3–4.5)	3.2 (2.9–3.7)	4.7 (4.3–5.2)
Māori	10.0 (8.4–12.1)	9.2 (8.4–10.0)	9.3 (8.7–9.9)	11.3 (10.6–12.0)
Pacific peoples	9.8 (7.6–13.2)	9.5 (8.4–10.8)	14.2 (13.0–15.5)	13.9 (12.8–15.2)
Female				
European and Other	2.0 (1.8–2.2)	1.8 (1.7–1.9)	1.8 (1.8–1.9)	2.2 (2.1–2.3)
Asian	2.5 (1.5–4.1)	2.2 (1.8–2.6)	2.4 (2.0–2.7)	2.4 (2.1–2.8)
Māori	8.7 (7.3–10.5)	5.9 (5.3–6.5)	6.3 (5.8 – 6.8)	7.2 (6.7 – 7.8)
Pacific peoples	7.2 (5.3–9.7)	7.2 (6.3–8.2)	7.5 (6.7–8.3)	10.1 (9.2–11.2)

Figure 1: Bar graph of age-standardised incidence rates of aortic dissection for male patients by gender and year group.

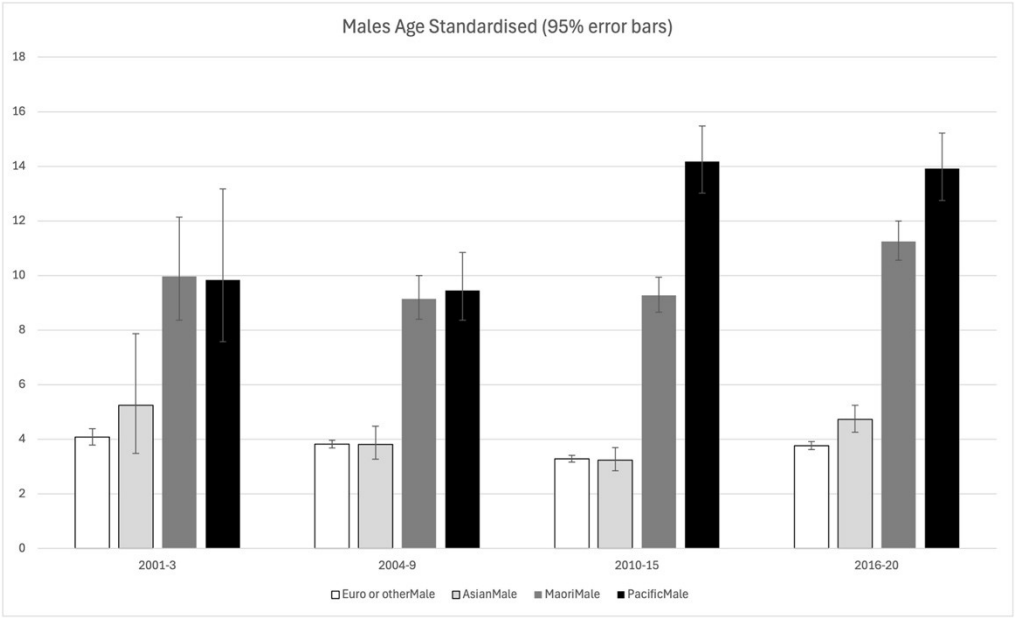
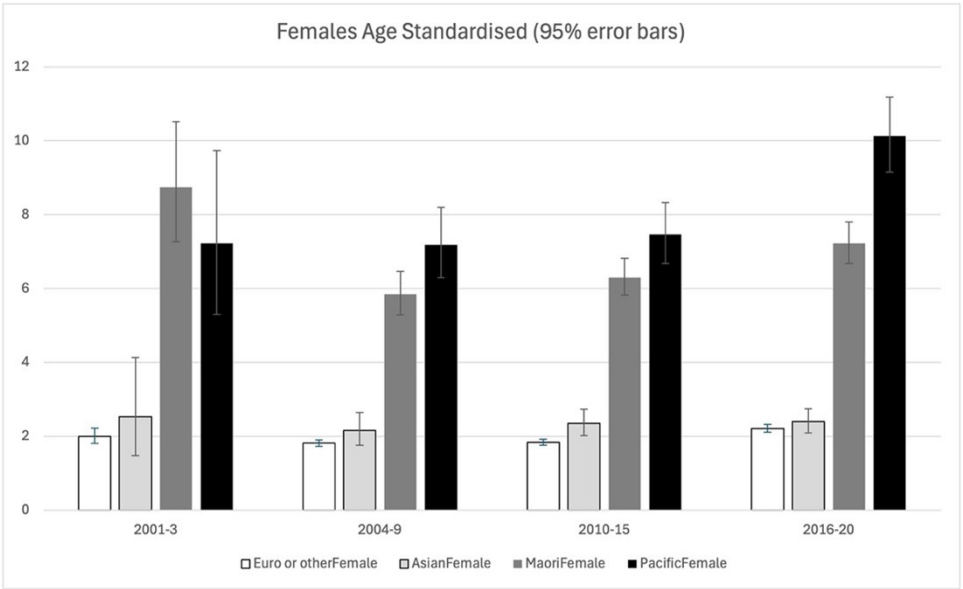


Figure 2: Bar graph of age-standardised incidence rates of aortic dissection for female patients by gender and year group.



COMPETING INTERESTS
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Hospital Policy

NZMJ, 1925

A letter written to the Wellington Hospital Board by the Wellington Labour Representation Committee no doubt fairly expresses the labour view on, or should it not be, against, hospital reform. The committee objects to serious cases being treated in open wards, which are obsolete and unsatisfactory, and holds that private wards should be provided for serious cases whether the patients are able to pay or not. No doubt this is very desirable, but, seeing that the difficulty of finance is not even mentioned, why stop here? It is also desirable that serious cases in public hospitals should, in addition, have a special day and a special night nurse, but who is going to pay for all this? At present the cost of hospitals is rising by leaps and bounds and the taxpayers and ratepayers who find the money have legally the right of use of the hospitals but they, unless "the gravity of their suffering requires it," will get no better accommodation from the labour dictators than is provided for the pauper and the derelict. This plan according to the Labour Representation Committee prevents "a very offensive introduction of class into a public institution." This is "class -consciousness" indeed. The New Zealand Railways are another public institution, and it is distressing to find that people cannot travel in the first-class carriages free or by paying a second-class fare. If the Labour Party has its way it will institute a State Medical Service for all classes of the community, those who are socialists and those who are not, and patients will have no right of choice of a doctor, and will be coerced into paying for doctors whose services they do not desire. We believe that Dr. Mayo was right when he said that our public hospitals must either provide suitable accommodation for all classes of the community or else cater only for the poor. The chief opposition to community hospitals appears to come from trades union officials. These gentlemen may have sound views in politics, with which we have no concern, but in regard to hospital policy they are very unbusinesslike and unpractical and the enemies of freedom.

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