NEW ZEALAND
TE ARA TIKA O TE HAUORA HAPORI
MEDICAL JOURNAL

PUBLISHED BY:
PMA PASIFIKA MEDICAL ASSOCIATION Group

Vol. 138 | No. 1623 | 10 October 2025

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MEDICAL JOURNAL

PMA
PASIFIKA MEDICAL ASSOCIATION
Group

Publication information

published by the Pasifika Medical Association Group

The *New Zealand Medical Journal* (*NZMJ*) is the principal scientific journal for the medical profession in New Zealand. The *Journal* has become a fundamental resource for providing research and written pieces from the health and medical industry.

The *NZMJ*'s first edition was published in 1887.
It was a key asset of the New Zealand Medical Association (NZMA)
up until July 2022.

It is owned by the Pasifika Medical Association Group (PMAG).

The PMAG was formed in 1996 by a group of Pasifika health professionals who identified a need for an association with the purpose of "providing opportunities to enable Pasifika peoples to reach their aspirations".

ISSN (digital): 1175-8716

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Publication information

published by the Pasifika Medical Association Group

Further information

ISSN (digital): 1175-8716
Publication frequency: bimonthy
Pubication medium: digital only

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Subscription rates for 2025

Individual		Institute	
New Zealand	Free	New Zealand	$680
International	Free	International	$700

New Zealand rate includes GST. No GST is included in the international rate.

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Summaries

Band-Aids for broken bones: why people with severe mental disorders are still missing out

Matthew Tennant, Ben Beaglehole

In 2019, the Government invested NZ$455 million in an integrated primary mental health and addiction (IPMHA) service, which provides brief support and advice for those in psychological distress via primary care–based health improvement practitioners (HIP). It was hoped that providing non-specific supports in the community would reduce demand on specialist services and that longer-term funding for specialist services and specific psychiatric interventions could be reduced. However, there is little evidence to suggest introducing primary care interventions has reduced the demand for specialist mental health services. People with severe mental illnesses are still struggling to access appropriate care. The New Zealand Government's strategic approach to mental health imposes a sacrifice on those with the most severe mental disorders, so that those with mild to moderate psychological distress can be prioritised. For someone with schizophrenia, a brief period of support from a HIP is like providing a Band-Aid for someone who has broken bones. People with severe mental illness need specific evidence-based interventions. A just and effective strategic approach to mental health would focus mental health funding on evidence-based treatment for specific conditions, while also advocating for social and economic policies that reduce the risk factors for developing mental disorders.

Rheumatology services in Aotearoa New Zealand—do they meet Arthritis New Zealand/New Zealand Rheumatology Association-endorsed service standards?

Rebecca Grainger, Valerie Milne, Nicola Dalbeth

This study collected data from all 16 rheumatology services provided by Health New Zealand – Te Whatu Ora where specialist teams of rheumatologists and nurses provide assessment and management for people with inflammatory and autoimmune rheumatic conditions. Our data showed that these services do not meet minimum staffing recommendations for populations served and nursing staff shortages were both widespread and severe. Nursing understaffing affected ability to provide care to patients. While most services had access to conventional imaging services there was variation in access to advanced imaging techniques. Overall, there was considerable variation in services provided, and generally services did not meet service standards endorsed by Arthritis New Zealand and the New Zealand Rheumatology Association.

Eating disorder risk in transgender youth and its association with unmet need for gender-affirming hormone therapy in Aotearoa New Zealand: a cross-sectional study

Micah Davison, Jaimie F Veale, Jack L Byrne, Ryan M Bentham, Philip J Schluter

We believe that research into the risk of eating disorders in transgender youth and its association with unmet needs for gender-affirming hormone therapy is crucial for multiple reasons, especially in the current geopolitical climate. Transgender and gender-diverse (TGD) adolescents are at a higher risk of developing eating disorders compared with their cisgender peers. This increased risk is often linked to the chronic stress and minority stress they experience due to societal stigma and discrimination. Moreover, many TGD individuals experience gender dysphoria, which can lead to disordered eating behaviours as a way to alter their body to better align with their gender identity. For example, some may restrict food intake to achieve a more androgynous appearance. Also, access to gender-affirming hormone therapy (GAHT) can significantly reduce the distress associated with gender dysphoria. When TGD youth do not have access to GAHT, they may turn to harmful behaviours, including disordered eating, as a coping mechanism. However, many studies suffer from methodological weaknesses, and we found no Aotearoa New Zealand-specific empirical evidence for transgender youth. This study is squarely designed to provide such evidence. Using the Counting Ourselves survey (https://countingourselves.nz/), this study includes 1,401 participants aged 14–24 years. We present rates and factors associated with eating disorder risk in transgender youth. We also report on the association between eating disorder risk and unmet need for GAHT in transgender youth. We assert that research in this area can inform policies and advocacy efforts to ensure that TGD youth have access to comprehensive healthcare, including mental health support and gender-affirming treatments. This can help reduce the barriers they face and promote overall wellbeing.

Climate change impacts on health in Aotearoa New Zealand: a scoping review

Isabella Lenihan-Ikin, Chit Su Tinn, Caesar Atuire, Susan Bull, Summer Rangimaarie Wright, Proochista Ariana

This paper uses a scoping methodology that seeks to map all the evidence (in this case within academic and grey literature, such as policy documents) on the health impacts of climate change in Aotearoa New Zealand. The review paid particular attention to the climate processes of concern to health and who, where and what activities (e.g., occupations, tasks) are most vulnerable. In addition to consolidating the academic and grey literature, a scoping review methodology also serves to identify gaps and future research priorities. The review—conducted from February to October 2024—included 61 papers from 2,265 initially screened. In conclusion, the review underscores the importance of responses to climate change–induced health addressing the underlying and intersectional risk factors, which the review surfaced.

Work satisfaction, stress and burnout in New Zealand ophthalmologists: a comparison of public hospital and private practice

Theodore A Sutedja, Verona E Botha, Elizabeth A Insull

This study explored the wellbeing of eye doctors (ophthalmologists) in New Zealand, comparing experiences in public hospitals and private clinics. Doctors working in public hospitals reported higher stress, lower job satisfaction and more burnout than those in private practice. Much of this stemmed from heavy paperwork and having little control over their work. In contrast, private doctors enjoyed greater autonomy and described their work as more rewarding. These findings suggest that easing the administrative load and giving doctors more say in their schedules could make public hospital roles more sustainable and help safeguard access to quality eye care for patients.

Eating disorders on medical wards: breaching clinical standards, patient rights and scopes of practice

Cindy Towns, Vuk Sekicki, Kay Hodgetts, Phillipa Shirtcliffe, Chris Cameron, Cathal McCloy, Chris Giedt, Nicolien Lourens, Sonya Burgess

There is a lack of eating disorder units in New Zealand. Medical wards and physicians are being pressured to take these complex psychiatric disorders for prolonged admissions despite medical care not being required. Appropriate care cannot be provided on medical wards and using them for this purpose further delays the care of medical patients waiting for beds. Current practice violates the right of eating disorder patients, delays the care of medical patients and puts physicians at medico-legal risk.

How should New Zealand health professionals respond to Trump 2.0?

Alistair Woodward

In his second presidential term, Trump proceeds to destroy public health and comprehensive healthcare in the United States. There will be knock-on effects everywhere. Health professionals in New Zealand must speak up, support colleagues who are directly affected, act where we can to reduce the damage to global health and oppose toxic Trump-thinking that washes up on our shores.

A novel theory of trauma offers new treatment possibilities

Robin Youngson

Havening Techniques® is a psycho-sensory therapy that allows traumatic memories to be erased from the brain within minutes, based on a detailed theory of how trauma is stored in the brain and how the molecular mechanism can be reversed. Havening offers a potential breakthrough in mental health care because emotional trauma is the leading cause of conditions such as chronic anxiety, panic disorder, PTSD, chronic depression, phobias and even addictions. If the trauma can be erased, then the mental health condition can potentially be rapidly relieved. The same mechanism is the cause of many stress-related physical illnesses, which might also be relieved. This paper describes the scientific theory in detail, the practical application of the therapy and the implication for both mental and physical health care. In New Zealand, there is a rapidly growing network of counsellors, psychologists, therapists and other health professionals training in Havening Techniques.

Caecal volvulus in third trimester of pregnancy

Maria Nonis, Jay Maloney

A case report outlining the presentation and management of a 31-year-old pregnant woman diagnosed with caecal volvulus. This report outlines the presentation, diagnostic work-up and subsequent operative management for what is a rare condition encountered during pregnancy.

Primary oesophageal melanoma—recognition and evolution of management

Kevin YY Chen, Grant A Crane, Chris YJ Kim, Ahmed WH Barazanchi, Jason Hill

Even though rare, melanoma can affect body organs other than the skin. The oesophagus is one of the organs melanoma can affect and is increasingly recognised around the world. Progressive difficulty in swallowing requires prompt endoscopic evaluation. Surgery remains the mainstay of treatment for early melanomas. New systemic treatments like immunotherapy are now available and potentially useful in treatment of advanced melanomas from non-skin organs.

Distant stoma chyme reinstallation—the first use of The Insides Channel

Louise Calder, Jevon Puckett

This is a case report explaining the first use of The Insides Channel device. It was used on a patient following a complex abdominal surgery that resulted in them having three stomas. It allowed the stoma output from one stoma to be reinstalled into another, in essence connecting the bowel outside the abdomen. This helped improved the patient's nutrition and recovery, and kept their bowel healthy while they recovered.

Band-Aids for broken bones: why people with severe mental disorders are still missing out

Matthew Tennant, Ben Beaglehole

> *Laws and institutions no matter how efficient and well arranged must be reformed or abolished if they are unjust … justice denies that the loss of freedom for some is made right by a greater good shared by others. It does not allow that the sacrifices imposed on a few are outweighed by the larger sum of advantages enjoyed by many.*
> – John Rawls, *A Theory of Justice*

The minister of health's strategic approach to mental health imposes a sacrifice on those with the most severe mental disorders, so that those with mild to moderate psychological distress can be prioritised. While this strategy might appeal to politicians, who rely on votes, it is based on a flawed understanding of mental illness and is ultimately unjust.

In 2018, He Ara Oranga was commissioned by the government in response to widespread dissatisfaction with New Zealand's mental health services. The report recognised difficulties accessing appropriate mental health care; people with mental illness "*having to fight and beg for services, not meeting the threshold for treatment, and the cruelty of being encouraged to seek help from unavailable or severely rationed services*."[1] As well as public dissatisfaction with services, specialist mental health services were under immense pressure. The Auckland District Health Board reported that the number of crisis referrals received tripled from 2010 to 2015.[2]

Attempting to manage this problem, in 2019 the government invested NZ$455 million in an integrated primary mental health and addiction (IPMHA) service, which provides brief support and advice for those in psychological distress via primary care–based health improvement practitioners (HIP). It was hoped that providing non-specific supports in the community would reduce the demand on specialist services and hospitals and that longer-term funding for specialist services and specific psychiatric interventions could be reduced. The *New Zealand Health Strategy* (2023) stated "*Plans for new preventive services will need to be combined with plans to disinvest in old services … to deliver more preventive care, we expect to see changes to the distribution of funding, including towards community-based services.*"[3]

The specialist psychiatric services to be downsized were already small by international standards. In 2016, New Zealand's 31 psychiatric beds per 100,000 population was less than half of the OECD average (69 beds per 100,000 population)[4] and well below the minimum of 50 beds per 100,000 population recommended by the Treatment Advocacy Center.[5] Consequences of inadequately resourced psychiatric inpatient units are: incomplete assessment, partial treatment and premature discharges.[6] Between 2012 and 2019 the risk of imprisonment following psychiatric admission increased by 50%, particularly impacting males, Māori and those with psychotic disorders. This suggests that poorly resourced mental health services may be increasingly reliant on the criminal justice system to contain those with major mental illness.[7]

Evaluating the investment

In 2025, Te Hiringa Mahara – the New Zealand Mental Health and Wellbeing Commission evaluated the impact of the IPMHA service. The commission applauded the increased services for mild to moderate mental illness but also acknowledged persisting difficulties accessing specialist care for those with severe mental illness.[8,9] More than 200,000 people received support for mild to moderate mental illness in 2023/2024.[9] The most common reasons for seeking support were anxiety, low mood, chronic stress and diabetes.[9] When surveyed, 500 psychiatrists believed the system was moving in the wrong direction and that the IPMHA service had led to increased referrals to specialist services rather than the reduction anticipated by Health New Zealand – Te Whatu Ora.[10] Meanwhile, 16,000 fewer people were able to access specialist mental health services in 2023/2024 compared with 2020/2021. This reduced access was reported to be due to workforce shortages.[8] Over 200 psychiatrists have left permanent jobs in the public system over the past 5 years.[11] A major reason given by psychiatrists for leaving was that the system is significantly under-resourced.[11] Insufficient funding for specialist services, increasing waiting lists and a lack of person-centred care continued to be observed by non-medical staff as well.[12]

Is mental illness a simple lack of "mental wellbeing needs"?

Kia Manawanui Aotearoa is a document published by the Ministry of Health – Manatū Hauora, which outlines the New Zealand Government's long-term strategic plan for New Zealand's mental health service provision.[13] *Kia Manawanui Aotearoa* discusses mental health services providing for "people's mental wellbeing needs" rather than treating mental illness or mental disorders. In the document, mental disorders are only mentioned twice, both times in an opening section on epidemiology. Schizophrenia and bipolar disorder are not mentioned at all. By equating mental illness with a lack of mental wellbeing needs the Ministry of Health – Manatū Hauora risks pathologising human experiences of suffering. On the surface this ideological position may seem more inclusive; however, it risks overlooking people with severe mental disorders for whom treatments are typically more effective.[2] *Kia Manawanui Aotearoa* perpetuates a conceptual misunderstanding that sees all mental illness as a continuum of psychological distress from mild to severe. If this misunderstanding was correct, then providing support for mild to moderate mental illness would reduce the number of people with severe mental illness. However, people with mild to moderate mental illness are typically presenting with different conditions to those presenting with severe mental illness. It should be no surprise that providing support for anxiety, low mood, stress and diabetes has little impact on the needs of those with schizophrenia, bipolar disorder, complex post-traumatic stress disorder (PTSD) and obsessive-compulsive disorder (OCD).

The prognosis

For someone with schizophrenia, a brief period of support from an HIP is like providing a Band-Aid for someone who has broken bones. People with severe mental illness need specific evidence-based interventions. These interventions should not be exclusively medical but sit within a biopsychosocial approach. This includes culturally appropriate psychiatric assessment and treatment, access to evidence-based psychotherapies, access to mental health rehabilitation services and sufficiently funded supported accommodation for those unable to live independently.

The current approach to mental health funding is unjust. The New Zealand Government's current strategic approach is leaving people with severe mental disorders squeezed out at the margins and, in some cases, untreated.[14] While Health New Zealand – Te Whatu Ora's intentions have been to create a more inclusive mental health service, the consequence could inadvertently be greater inequality. Furthermore, the current approach is ineffective. Since the introduction of the IPMHA service more than 200,000 people have received support and yet at a population level self-reported psychological distress has increased and self-reported mental wellbeing has reduced.[9] There is little evidence to suggest that non-specific mental health supports alter population distress or prevent mental illness.[2,4] In New Zealand, those with the lowest economic standard of living also express the highest psychological distress; 24.3% compared to 0.8% of those with the highest economic standard of living.[15] This suggests that programmes that support economic wellbeing and social cohesion might be a better focus for preventing psychological distress at a population level. A truly preventive approach would focus on modifiable social determinants that could lower rates of mental illness in New Zealand's future generations.[16]

A just and effective strategic approach to mental health would focus mental health funding on evidence-based treatment for specific conditions, while also advocating for social and economic policies that reduce the risk factors for developing mental disorders.

COMPETING INTERESTS

MT is a trustee of Stepping Stones Trust and is employed as a consultant psychiatrist by Health New Zealand – Te Whatu Ora, Waitaha Canterbury.

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URL

https://nzmj.org.nz/journal/vol-138-no-1623/band-aids-for-broken-bones-why-people-with-severe-mental-disorders-are-still-missing-out

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Rheumatology services in Aotearoa New Zealand—do they meet Arthritis New Zealand/New Zealand Rheumatology Association–endorsed service standards?

Rebecca Grainger, Valerie Milne, Nicola Dalbeth

ABSTRACT

AIMS: To describe Health New Zealand – Te Whatu Ora rheumatology services across Aotearoa New Zealand using the Arthritis New Zealand/New Zealand Rheumatology Association–endorsed rheumatology service standards.

METHODS: Descriptive study with data collection by survey from clinical service leads from all 16 Health New Zealand – Te Whatu Ora rheumatology services.

RESULTS: Response rate was 100%. No services met all the service standards. Staffing of rheumatologists approached the standards in only three services, and nursing staffing was well below the standards in all services, with two services not employing any nurses. Where nurses were employed, nursing services standards were largely met. Five services did not provide inpatient consultations. Almost all services had access to conventional imaging modalities, but less than half of services provided point-of-care ultrasounds or had access to fluorodeoxyglucose-positron emission tomography (FDG-PET). Most services were able to make referrals to physiotherapy, occupational therapy and hand therapy. Ability of services to meet care standards for the care of rheumatoid arthritis (RA) was variable. Between 2023 and 2025, two services had a substantive increase in rheumatologist staffing and two had a substantive increase in nursing staffing.

CONCLUSION: This first national-level description of all Health New Zealand – Te Whatu Ora rheumatology services found considerable heterogeneity, and generally services did not meet all services standards.

Inflammatory and autoimmune rheumatic diseases (IARDs) are systemic diseases often manifesting with joint inflammation, systemic inflammation and organ dysfunction that can result in organ failure and long-term disability without optimal management. IARDs can seriously affect the social and economic wellbeing of a person with the disease.[1] Most IARDs have no cure, but best health outcomes are more likely to be achieved with specialist care, led by rheumatologists and supported by nurses and allied health professionals, along with access to advanced imaging and therapeutics.[2,3] Thus, a health system that aims to have excellent outcomes for people with IARDs needs appropriately staffed and organised rheumatology services, supported by appropriately and adequately resourced hospital infrastructure, and processes and access to an appropriate range of conventional and advanced therapeutics and allied health professionals.

In Aotearoa New Zealand the default access to specialist rheumatologist care is in Health New Zealand – Te Whatu Ora public hospitals. Health New Zealand – Te Whatu Ora does not yet have any stated expectations for what service levels and types of services New Zealanders can expect to get in public hospital rheumatology services. Arthritis New Zealand (representing people with IARDs) and the New Zealand Rheumatology Association (NZRA) (representing rheumatologists) have recently endorsed a set of rheumatology service components for public hospital service in Aotearoa New Zealand (Table 1).[4] These were informed by Aotearoa New Zealand rheumatologists' consensus on international standards from the literature[5] and the views of people with IARDs in Aotearoa New Zealand.[4,6] Previous work has consistently shown that there are insufficient physicians employed as rheumatologists in Aotearoa New Zealand hospitals to meet the estimated population needs[7,8] and that rheumatologists employed as a ratio to populations served is the one key factor associated with variation in the quality measure of care in rheumatoid arthritis.[9] The other service components of rheumatology services, such as nursing staff, imaging access and allied health access, have not been described. Since one goal of Health New Zealand – Te Whatu Ora was to reduce health inequities and ensure equitable access to health services regardless of geographic location in the country[10] it seems critical to describe the specialist services available in public hospitals across the country, with reference to a benchmark of service standards anticipated to be necessary to provide adequate healthcare for a population. We therefore undertook a survey of public hospital rheumatology services in Aotearoa New Zealand using the endorsed rheumatology services standards as a benchmark with the aim of describing the current services by geographic location and population served and how often these services standards were met.

Table 1: Statement set endorsed by the New Zealand Rheumatology Association and Arthritis New Zealand. This list of principles and statements of care is the recommended minimum service expectations for a publicly funded rheumatology secondary care service in Aotearoa New Zealand.

Principles
1. A rheumatology service should value individuals and their experiences through positive interpersonal interactions, supportive relationships and within a health system organised with the patient's needs at the centre.
2. Healthcare professionals in a rheumatology service should actively support patients to participate in decision making and self-management.
3. Healthcare professionals in a rheumatology service should ensure patients' education requirements about their rheumatic condition are met, including appropriate communication, content and framed to support patients' active involvement in shared decision-making.
Statements
Staffing
S1. Patients should have specific rheumatologist(s) responsible for their care and be provided with the names and roles of other medical, nursing, allied health and administrative staff who may be involved in their care.
S2. A public rheumatology service should involve at least one full-time equivalent (FTE) rheumatologist per 80,000–100,000 people within the served population.*
S3. A public rheumatology service should involve at least one full-time equivalent (FTE) rheumatologist nurse per FTE rheumatologist.
Nursing care
N1. Patients with chronic rheumatic disease should have access to a nurse for education.
N2. Patients with chronic rheumatic disease should have access to a nurse-led telephone service for ongoing support.
N3. Specialist rheumatology nurses should participate in comprehensive disease management of chronic rheumatic disease.
N4. Within an outpatient rheumatology clinic, a specialised rheumatology nurse should have their own consultations with chronic rheumatic disease patients, supervised by a rheumatologist as needed.
Care processes, delivery and services
C1. Patients with chronic rheumatic disease should have access to a rheumatology service to support coordinating their care (e.g., with a rheumatology nurse specialist or rheumatologist).
C2. Patients with chronic rheumatic disease and disease flares, or possible treatment-related side effects, should receive advice within 1 working day of contacting a rheumatology service.
C3. Patients under the care of a rheumatology service should be offered telephone or video follow-up consultations, providing it is clinically appropriate to do so.

Table 1 (continued): Statement set endorsed by the New Zealand Rheumatology Association and Arthritis New Zealand. This list of principles and statements of care is the recommended minimum service expectations for a publicly funded rheumatology secondary care service in Aotearoa New Zealand.

C4. Healthcare professionals providing care to patients with chronic rheumatic disease, admitted to a public (district health board [DHB]) hospital, should be able to access inpatient review by a member of the rheumatology service that the patient's care falls under, if requested and clinically appropriate.
C5. Patients with chronic rheumatic disease who suffer from pain issues should have access to a qualified health professional who specialises in chronic pain management (e.g., specialist pain management physician or psychologist).
C6. A rheumatology service should aim to involve other specialists in "combined clinics", where the management of chronic disease spans across different specialties (e.g., combined clinics with dermatology or ophthalmology).
C7. Rheumatology services should actively provide information to patients with rheumatic diseases about outside services or providers that provide social, emotional or practical support.
C8. A rheumatology service should have timely access to musculoskeletal imaging, including ultrasounds and magnetic resonance imaging (MRI), to aid in the diagnosis and management of inflammatory arthritis.
C9. A rheumatology service should include an infusion unit for the delivery of specialist-prescribed intravenous medications (e.g., infliximab, tocilizumab, rituximab), which is supervised (directly, or at a distance) by a member of the rheumatology service.
Allied health services
A1. Patients with chronic rheumatic disease and difficulties with activities of daily living (ADLs), or hand function, should have access to specialist occupational therapy and/or hand therapy.
A2. Patients with chronic rheumatic disease and active foot problems should have access to a podiatry assessment and ongoing review.
A3. Patients with chronic rheumatic disease should have access to specialist physiotherapy, with periodic review.
Rheumatoid arthritis (RA)
RA1. Patients with active RA should be offered the opportunity to commence conventional disease-modifying anti-rheumatic drug (DMARD) therapy (e.g., methotrexate, sulfasalazine, hydroxychloroquine), within 6 weeks of referral to a rheumatology service.
RA2. Patients with active RA should be monitored 3-monthly, using a composite score such as DAS-28 CRP/ESR, until their treatment target is met.

EULAR = European Alliance of Associations for Rheumatology; NICE = National Institute of Health and Care Excellence; RCP = Royal College of Physicians.
*The New Zealand Rheumatology Association notes that "*The staffing ratio of 1:80,000 is aspirational and the NZRA has suggested that a pragmatic target of 1:100,000 is more achievable and adequate for the short to medium term*."[4]

Methods

Overview and sample

This was a descriptive study with data collected through an online survey and, when needed, clarified through an interview. The sample included all Health New Zealand – Te Whatu Ora entities providing rheumatology services, defined as having employment of a senior medical officer (SMO) in a role as a rheumatologist. To be considered a "rheumatologist" in New Zealand generally requires training in rheumatology endorsed by the Royal Australasian College of Physicians (or similar) with the physician providing clinics in rheumatology. Data were collected using an online survey form in Qualtrics. A link to the survey was emailed to all clinical service leads in May 2023, with reminders emailed as needed until the survey closed on 30 June 2023.

Survey instrument

The bespoke survey instrument (Appendix 1) was developed by the research team and collected data on the following: 1) department characteristics including staffing (rheumatologist, nurse and resident medical officer employment in the service and including number, full-time equivalent [FTE] employment, permanent or locum), and 2) how the service met, or did not meet, the 25 service standards endorsed by NZRA and Arthritis New Zealand. Responses were binary (yes/no) for the stem question addressing if a service was available (for example, “Are patients with chronic rheumatic disease and disease flares, or possible treatment-related side effects, able to receive advice within 1 working day of contacting the rheumatology service”). When the response to a stem question was no, a supplemental question with multiple options about the service provision standard was often provided (for example, “How long are patients likely to wait for contact from the rheumatology service if they have concerns about flares or treatment side-effects?” [select one of 2–3 days, 3–4 days, 5 days or more than 5 days]). Each service standard question also invited a free-text response to provide additional context if the respondent wished.

The survey instrument was developed in a Word document and then built in Qualtrics. The survey was piloted in Qualtrics by two of the authors (ND, RG) who are SMO rheumatologists in Health New Zealand – Te Whatu Ora rheumatology services, and improvements were made iteratively to improve the flow and accuracy of data collection.

Data analysis

Data from Qualtrics were exported into an Excel spreadsheet and analysed using descriptive statistics. Populations of each Health New Zealand – Te Whatu Ora entity population serviced were sourced from Stats NZ.[11] These data were used to calculate FTE rheumatology or rheumatology nurses per 100,000 population for each rheumatology service. Figures were produced using Microsoft Excel or Datawrapper.

Clinical service leads were invited to indicate if they wished to be interviewed to provide additional or clarifying information about their service. Interviews were undertaken on Zoom between 1 August 2023 and 30 August 2023. After interviews, survey data were checked and modified to ensure responses were consistent with each corresponding interview. A summary of service data with comparison to the national dataset were provided in individual reports to each service in January 2024 for checking, and after minor edits a final report was provided to services in March 2024. This manuscript was shared with clinical service leads in June 2025, with a request to provide information on any substantive changes in service since data collections.

Ethical and other approvals

The study protocol was approved by the University of Otago Human Ethics Committee (D23/018). Permission to undertake the survey of Health New Zealand – Te Whatu Ora clinical service leaders of rheumatology services was obtained in writing from the interim national director – medical, interim national people and culture lead and the interim director of hospital specialist services in November 2022 with need for locality approval waived. Consent was obtained electronically before participation in the survey.

Results

Survey responses were provided by all 16 Health New Zealand – Te Whatu Ora rheumatology services, a response rate of 100%. Interviews were undertaken with six of the 16 services for the purposes of clarifying survey data. None of the 16 services met all the 21 service standard statements. First, we report staffing standards both in absolute numbers (Table 2) and by population served (Figure 1, Figure 2 and Figure 3). We then we describe the self-reported service achievement of service standards for nursing care, care processes, allied health and rheumatoid arthritis (RA) care, with these data graphically represented in Figure 3.

Staffing

There are three service standard statements about staffing (Table 1). In 2023 there were 34.35 FTE rheumatologists in Health New Zealand – Te Whatu Ora services; with the current New Zealand population, meeting the 1.0 FTE rheumatologist per 100,000 population service statement would require 51.24 FTEs. Services employed from 0.40 to 4.60 FTE rheumatologists. The range of rheumatologist FTEs per 100,000 population as a proportion of target (i.e., proportion of FTEs employed to 1.0 FTE per 100,000 population of that service) was less than 0.4 in four services (Nelson, Wellington, MidCentral–Whanganui and Bay of Plenty) and more than 0.9 in three services (Southern, Hawke’s Bay and Auckland) (Table 2, Figure 1 and

Figure 2). In total there were 22.50 rheumatology nurse FTEs in Health New Zealand – Te Whatu Ora services, with two services not employing any rheumatology nurses and the range being 0.40 to 3.40 FTEs (Table 2). This gives a range of proportion of rheumatology nursing FTEs per 100,000 population of less than 0.4 in four services (Canterbury–West Coast, MidCentral–Whanganui, Waitematā and Auckland), with four services just over 0.6 (Southern, South Canterbury, Wellington and Waikato) (Figure 1 and Figure 2). FTE vacancies in permanent positions were reported by five services for a total of 1.90 FTE rheumatologists (from five services, range 0.20 to 1.30 FTE) and 1.40 nurse FTEs in two services (0.4 and 1.0 FTE). Thirteen of 16 services confirmed that patients always have a named rheumatologist responsible for their care, with the remaining three reporting that patients “mostly” had a named rheumatologist.

Table 2: Rheumatologist and rheumatology nurse full-time equivalents (FTEs) employed in the 16 services in 2023.

			Rheumatologist		**Nursing**	
Service	**Population**	**Ratio of 1.0 FTE/100,000 population**	**Actual FTEs employed**	**Proportion of FTEs employed to target of 1.0 FTE/100 000**	**Actual FTEs employed**	**Proportion of FTEs employed to target of 1.0 FTE/100,000**
Northland	201,500	2.02	0.80	0.40	0.00	0.00
Auckland	481,600	4.82	4.60	0.96	1.70	0.35
Waitematā	633,500	6.34	3.80	0.60	1.70	0.27
Counties Manukau	605,100	6.05	4.60	0.76	2.40	0.40
Waikato	452,900	4.52	4.00	0.89	3.00	0.66
Bay of Plenty	274,700	2.75	1.00	0.36	1.60	0.58
Lakes	118,200	1.18	0.80	0.68	0.80	0.68
Tairāwhiti	52,100	0.52	0.40	0.77	0.00	0.00
Taranaki	127,500	1.28	0.60	0.47	0.60	0.47
Hawke’s Bay	182.600	1.83	1.80	0.99	0.90	0.49
MidCentral–Whanganui	259,800	2.60	1.00	0.38	0.90	0.35
Wellington	533,500	5.34	1.95	0.37	3.40	0.64
Nelson–Marlborough	165,000	1.65	0.60	0.36	0.90	0.55
Canterbury–West Coast	624,200	6.24	3.90	0.62	2.00	0.32
South Canterbury	62,300	0.62	0.40	0.64	0.40	0.64
Southern	350,500	3.51	3.30	0.94	2.20	0.63
TOTAL	5,124,100	51.24	34.35	-	28.74	-

Figure 1: Rheumatologist full-time equivalent (FTE) employed in each Health New Zealand – Te Whatu Ora rheumatology service as a proportion of total population in catchment of that service 2023.

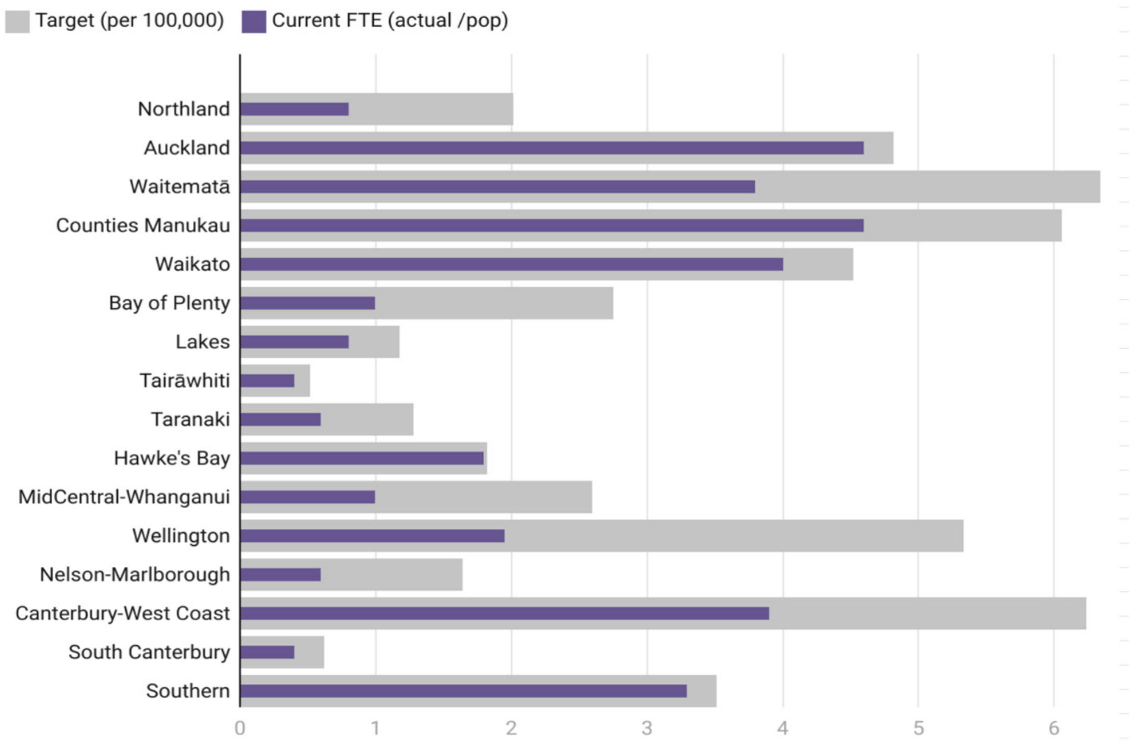


Figure 2: Nurse full-time equivalent (FTE) employed in each Health New Zealand – Te Whatu Ora rheumatology service as a proportion of total population in catchment of that service 2023.

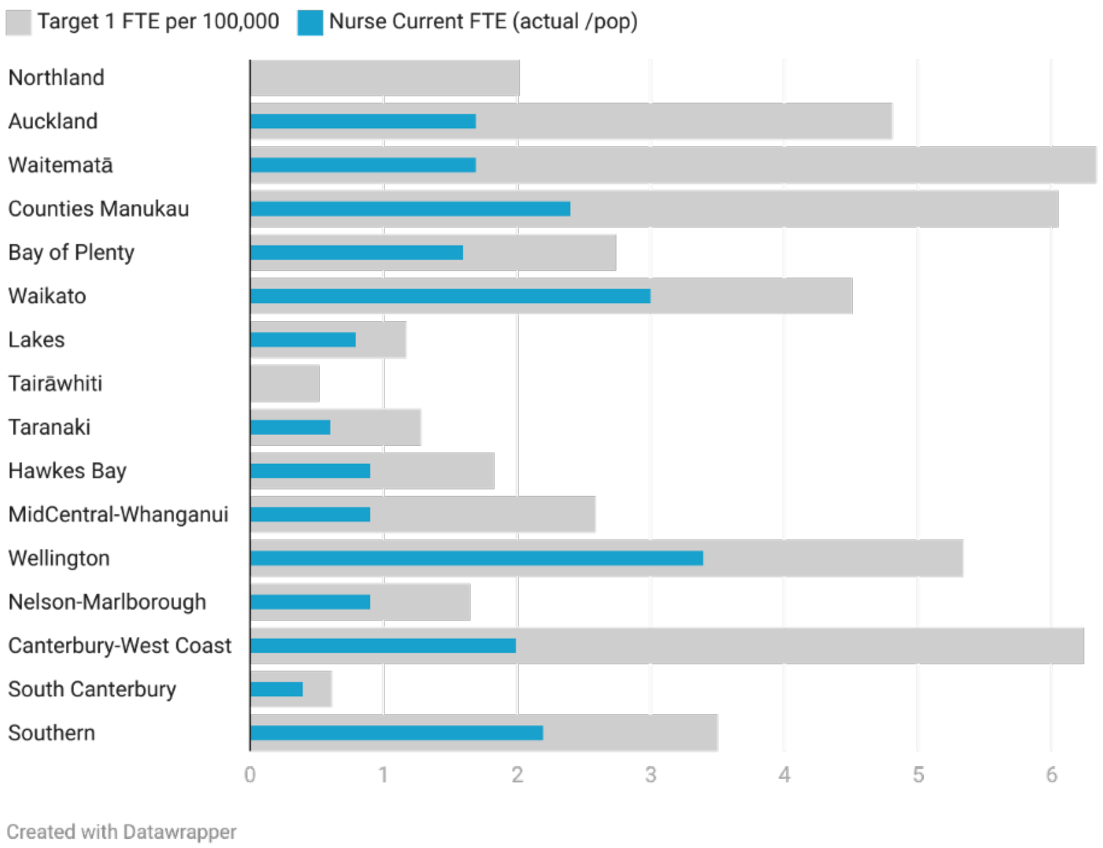
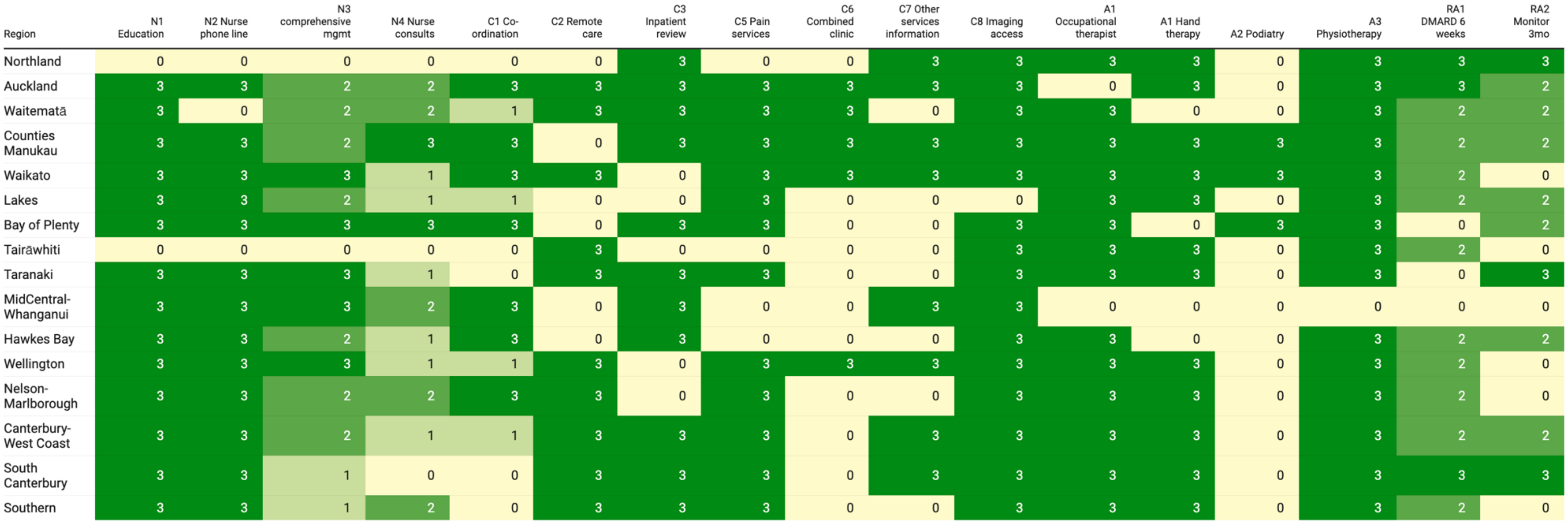


Figure 3: Self-reported adherence with service standards for nursing care, care processes, allied health and rheumatoid arthritis (RA) care for 16 rheumatology service in Aotearoa New Zealand.



Region	N1 Education	N2 Nurse phone line	N3 comprehensive mgmt	N4 Nurse consults	C1 Co-ordination	C2 Remote care	C3 Inpatient review	C5 Pain services	C6 Combined clinic	C7 Other services information	C8 Imaging access	A1 Occupational therapist	A1 Hand therapy	A2 Podiatry	A3 Physiotherapy	RA1 DMARD 6 weeks	RA2 Monitor 3mo
Northland	0	0	0	0	0	0	3	0	0	3	3	3	3	0	3	3	3
Auckland	3	3	2	2	3	3	3	3	3	3	3	0	3	0	3	3	2
Waitematā	3	0	2	2	1	3	3	3	3	0	3	3	0	0	3	2	2
Counties Manukau	3	3	2	3	3	0	3	3	3	3	3	3	3	3	3	2	2
Waikato	3	3	3	1	3	3	0	3	3	3	3	3	3	3	3	2	0
Lakes	3	3	2	1	1	0	0	3	0	0	0	3	3	0	3	2	2
Bay of Plenty	3	3	3	3	3	0	3	3	0	0	3	3	0	3	3	0	2
Tairāwhiti	0	0	0	0	0	3	0	0	0	0	3	3	3	0	3	2	0
Taranaki	3	3	3	1	0	3	3	3	0	0	3	3	3	0	3	0	3
MidCentral-Whanganui	3	3	3	2	3	0	3	0	0	3	3	0	0	0	0	0	0
Hawkes Bay	3	3	2	1	3	0	3	0	0	0	3	3	0	0	3	2	2
Wellington	3	3	3	1	1	3	0	3	3	3	3	3	3	0	3	2	0
Nelson-Marlborough	3	3	2	2	3	3	0	3	0	0	3	3	3	0	3	2	0
Canterbury-West Coast	3	3	2	1	1	3	3	3	0	3	3	3	3	0	3	2	2
South Canterbury	3	3	1	0	0	3	3	3	0	3	3	3	3	0	3	3	3
Southern	3	3	1	2	0	3	3	3	0	0	3	3	3	0	3	2	0

Created with Datawrapper

Legend 3 “always meets”, 2 “mostly meets”, 1 “sometimes meets”, 0 “does not meet”.

Nursing care

There are four service standard statements about nursing care (Table 1). Almost all services reported having nurse-led patient education (14/16) and nurse-led phone lines for patient enquiries/advice (14/16). Phone-line response time was reported to be within the recommended 1 working day in 11 of the 14 services providing a phone line (care standard #C2). Two services reported phone line responses in 2 to 3 days and one service reported phone line responses in 3 to 4 days. Services reported variable delivery of nurse involvement in comprehensive care (six services always, seven mostly, three sometimes) and independent nurse consultations (two services always, five mostly, seven sometimes and two not at all).

Care processes, delivery and services

Eight of the nine service standard statements about care processes, delivery and services were included in the survey (Table 1). Services reported that patient care was supported and coordinated routinely by 10 services, sometimes by four services and that care coordination was not provided in two services. Remote follow-up consultations, when appropriate, were reported to be routinely provided by telephone by 10 services and by video by three services. Eleven of 16 services reported providing timely in-person consultations for patients with rheumatic diseases who had been admitted to hospital. Twelve services reported that patients with chronic rheumatic diseases with issues with pain could be referred to a health professional specialised in pain management. Five services reported that patients with rheumatic disease could be seen in combined clinics with other disciplines with the named disciplines being dermatology (two services), renal (one service), hematology (one service) and “various” (one service). Only eight out of 16 services reported consistently providing their patients with information about outside services or providers that offer social, emotional or practical support.

Almost all services (15/16) had access to the imaging modalities: plain radiography, ultrasound (radiology department), computed tomography, bone mineral densitometry and magnetic resonance imaging. One service that did not have direct referral access to radiology services was a private specialist rheumatology service with a contract to provide services to the local Heath New Zealand – Te Whatu Ora hospital catchment. About half of services reported providing rheumatologist-performed point-of-care ultrasounds (8/16) and access to positron emission tomography–computed tomography (7/16).

Allied health services

There are three service statements about allied health services. Most services reported that patients had access to physiotherapy (15/16), occupational therapy (14/16), hand therapy (12/16) and orthotics (11/16). Access to health psychologists was reported by only five of these 16 services and to podiatry services by only three of 16 of these services.

Care for people with rheumatoid arthritis (RA)

Only two services reported always meeting both care standards for RA, with two other services reported always meeting one care standard for RA. For the care standard of people with RA being offered the opportunity to start a disease modifying anti-rheumatic drug within 6 weeks of referral to a rheumatology service a further 10 services reported “mostly” meeting this standard, with three never meeting this standard. For the care standard of patients with active RA being monitored every 3 months by the rheumatology service a further seven services reported “mostly” meeting this standard and six reported never meeting this standard.

Changes between 2023 and 2025

Reported changes in staffing included increases in employed rheumatologist FTEs at Wellington (increase of 1.4 FTE) and MidCentral–Whanganui (increase of 0.5 FTE) and in nursing FTEs at Counties Manukau (increase of 0.7 FTE) and Northland (1.0 FTE, previously nil). Details of smaller FTE changes and other service standard changes provided by clinical leads are reported in Appendix 2.

Discussion

This study is the first to report national-level data on staffing, services and care provision in publicly funded rheumatology services in Aotearoa New Zealand, and it had data provided from all services. None of the 16 Health New Zealand – Te Whatu Ora rheumatology services met all the 21 endorsed service standards: staffing levels were universally below recommendations, particularly for nursing staff; ability to refer to allied health was available for many but not all disciplines; access to established imaging modalities was generally good but variable for newer modalities; and ability to provide best practice care for RA was variable. These data suggest people in Aotearoa New Zealand using rheumatology services will not have equitable opportunities to achieve best possible health outcomes as essential elements of care provision are absent in some locations. Our data suggest that regional variations in services provided are potentially large, which is a recurrent finding across the Aotearoa New Zealand health system.[12–14]

In terms of staffing, only three services approached the conservative recommendations for rheumatologist staffing and none exceeded the one rheumatologist FTE per 100,000 population recommendation. Two rheumatology services did not have any nurses employed, and all services had lower nursing staffing than rheumatologist staffing and well below the one nurse FTE per 100,000 population. These nurse staffing levels meant nursing-provided and -led services for people with rheumatic diseases varied across the motu. National-level service standards have been developed for rheumatology services in the United Kingdom by the British Society for Rheumatology.[3] These standards recommend that services should employ one rheumatologist for every 60,000–80,000 in the population catchment. During development of service standards for Aotearoa New Zealand, rheumatologist staffing of one per 80,000 population was proposed; however, one per 100,000 was endorsed as this was viewed as potentially achievable while one per 80,000 was not.[4] The British Society for Rheumatology also recommends that nurse staffing is equivalent to rheumatologist staffing to provide the full benefits of nurses working at the top of scope in rheumatology. Our data suggest New Zealanders are missing out on the benefits of rheumatology nursing care, which is particularly disappointing as people using rheumatology services value nursing care particularly highly.[4,6] There is sufficient evidence supporting that nurse care in rheumatology can, at least for RA, achieve similar health outcomes to doctor-led care,[15,16] perhaps better outcomes than general practice care for people with gout,[17] and that nursing care increases patient self-management, self-efficacy and satisfaction with care provision.[18,19] Investment in nurse staffing in Health New Zealand – Te Whatu Ora rheumatology services seems an urgent need, and this seems likely to provide returns in terms of patient health outcomes and experience of care. Any such investment should come with developing a systematic approach to training of nurses in rheumatology scope of practice, which is inconsistent internationally.[19]

Our study reports health professional staff FTE data but does not address what activities staff undertake in this employment. We did find that five services did not provide inpatient consultation services. Previous work has suggested that hospital doctors in internal medicine services report potential negative impacts on patient care quality and doctor education when such consultation services are absent.[20] For this reason it seems important that appropriate workload models are developed and agreed upon at a national level for rheumatologists or other medical specialists employed in Health New Zealand – Te Whatu Ora; work that, as far as we are aware, has not happened. We did not collect data on workload models in our survey. Any future such work will need to: consider appropriate variation in practice expectations (such as need for time to undertake point-of-care ultrasounds), provide supervision and education to medical students and rheumatology trainees, provide consultations for tertiary or quaternary care inpatients and have the potential for justified variation for location or physician-specific matters.

In terms of access to diagnostic imaging, almost all services reported access to formal imaging services (reported by a radiologist) but only half of services had at least some rheumatologists undertaking point-of-care ultrasounds. Less than half of services had access to positron emission tomography–computed tomography. Interestingly, the one rheumatology service with a model of public services provided by a private provider reported challenges for their patients in accessing appropriate imaging. Any future arrangement for private contracting of ambulatory care services should ensure that arrangements for all necessary and expected supporting services are addressed during contracting. Internationally, point-of-care ultrasounds are widely, although variably, adopted to enhance assessment in rheumatology with professional bodies producing guidelines on indications[21] and techniques of ultrasounds performed by rheumatologists.[22] The frequently identified barriers to wider adoption are access to sufficient expert trainers and time for training rheumatologists and trainees.[23] A future focus on training in point-of-care rheumatology ultrasounds (so called “POCRUS”) would benefit patients by providing diagnostic imaging embedded with clinical reasoning during assessment, during a single consultation, reducing delays and referrals to stretch radiology services and enhancing rheumatologist satisfaction with practice. Expert-performed ultrasounds also have an established role in assessment of one of the most common rheumatic emergencies, giant cell arteritis,[24] and can mean temporal artery biopsy is avoided. Since giant cell arteritis is a serious, potentially sight-threatening disease with considerable potential for direct and treatment-related morbidity, equitable access to specific expertise in ultrasounds for this diagnostic process should be a high priority and provided equitably in all parts of Aotearoa New Zealand. Our survey did not specifically address this aspect of ultrasound use but our data suggest that access will be highly variable based on geography. While almost all services reported "access" to diagnostic radiology services, we did not collect data on wait times or distance to services for patients in different areas of the motu, and this should be a focus of future research.

In terms of access to allied health, most services reported an ability to refer to physiotherapy, occupational therapy, hand therapy and orthotics services, but there was universally poor reported availability of health psychology and podiatry services. In contrast, similar national surveys in Australia have reported inadequate staffing of allied health professionals within rheumatology services.[25] However, we did not report on staffing levels so these may in fact be inadequate. Health psychology services are not part of the endorsed rheumatology service elements but we included these in the survey as, previously, people using public hospital rheumatology services have reported these to be highly desirable and not easily accessed;[6] this is consistent with our finding that only three of 16 services had any access to referral to health psychology services. People with IARDs are known to have high levels of psychological distress, and service development work in the United Kingdom concluded that psychological services would be best built into rheumatology services.[26] Podiatry services for people with arthritis in the United Kingdom have been found to be highly variable with complicated and uncertain referral pathways.[27] Any future development of podiatry services could benefit from clear articulation of potential benefits and clear referral pathways. It is important to highlight that ability to refer does not capture any information about acceptance of referral or the acceptability of wait time and location of service to users.

Only two services reported consistently meeting services standards for provision of care for the management of RA; however, 10 of 16 services reported mostly providing the opportunity for starting a disease-modifying anti-rheumatic drug (DMARD) within 6 weeks of referral to people with RA. The latter is consistent with the data from the first year of the NZRA-endorsed national seropositive RA audit, in which 64.8% of the 355 people with RA seen by a participating rheumatology public or private service commenced a DMARD treatment within 6 weeks of referral.[9] The only two factors associated with "time to DMARD" were FTEs of rheumatology services and rurality; patients living 60–90 minutes' drive from services waited longer to DMARD treatment commencement. This observation reinforces the need to address the underemployment of specialist rheumatologists in hospitals in Health New Zealand – Te Whatu Ora. In the NZRA audit almost all (94.4%) people with seropositive RA seeing a rheumatology doctor were started on a DMARD at that visit, suggesting that care is appropriate when patients are seen.[9] Since RA is a chronic condition where disease activity can fluctuate over time, follow-up is essential to ensure adequate and ongoing suppression of inflammation, which is required for optimal long-term outcomes. Nine services reported always or mostly meeting standard of provision of monitoring of people with active RA every 3 months, while six services never met this standard. These data must, however, be viewed with caution as these are self-reported adherence to service standards and not underpinned (necessarily) by robust data analysis. Together our data suggest that rheumatology services may prioritise seeing new patients and be inadequately resourced for managing a constantly accumulating patient cohort. Since RA is a long-term condition without cure and requiring specialist care for medication prescribing, a gradual, planned increase in staffing will inevitably be required to maintain care standards. There may be considerable opportunity for providing ongoing safe clinical management for people with RA, at least over the short term, by remote monitoring, for example via reporting of patient-reported outcomes to a service using an app where clinical review is prioritised when patients have active disease.[28,29] In a Dutch randomised controlled trial this approach reduced in-person clinic visits by 38% with similar RA clinical outcomes at 1 year.[28] While such an approach is attractive, this would require significant investment in information technology and appropriate resources of change management and of change in clinical workflows. Our previous work has suggested that New Zealanders would find allocation of clinical service according to need and patient-self reported measures acceptable.[30]

Between 2023 and 2025 there was increased staffing in four services. Rheumatologist FTEs increased in two of the four services with the lowest rheumatologist:population ratios (Wellington and MidCentral–Whanganui). One service with no nurses now has a full-time rheumatology nurse. While these changes are positive, the staffing levels were previously highly inadequate for the population size. Increases in both rheumatologist and nurse staffing are still needed in all services to meet endorsed services standards.

This study has several strengths. Our survey for all 16 Health New Zealand – Te Whatu Ora rheumatology services in Aotearoa New Zealand had a 100% response rate. Where data provided were unclear or incomplete, we were able to verify the data via interview. Another strength of our study is that services reported against locally developed standards that have been endorsed by the relevant medical professional society and the non-governmental organisation that represents people with rheumatic diseases. Since Health New Zealand – Te Whatu Ora does not have any internal recommendations for rheumatology service provision and functions, we had to develop a set of rheumatology service standards, which are based on international standards with refinement from rheumatologists and with people with rheumatic diseases in Aotearoa New Zealand who have used rheumatology services.[4–6]

Our study must also be interpreted in light of potential limitations. The data were self-reported by the clinical service lead so are subject to recall bias and imprecision as respondents were able to interpret for themselves if their service “met” the criteria. This means the data likely suffer from under- and over-reporting. The information collected was also limited in that it reports service elements only and does not report on service efficiency (amount of service provided for level of staffing), effectiveness of service (patient outcomes) or on patient experience of services. “Access” to services (for example, imaging or allied health) only accounts for the ability for the rheumatology practitioner to refer to the service and does not describe wait times for the people using the service, nor other barriers to access such as travel time and costs. In areas with populations dispersed over large geographic areas, in practical terms these services are really only “accessible” (that is, useable with reasonable time, financial and other costs) for people living close to where the services are located. Future studies will need to describe the views of people referred to these services with respect to the location, costs and overall net benefit of the services. This will be particularly relevant in provincial and regional services. We also consider that future studies should consider patients’ views on the experience of the care, which we did not address. Another major limitation of our study is that the data are potentially out of date as soon as reported. We addressed this by data checking in June 2025 and report staffing FTEs and some small changes in services standards. Our survey did not include an item on infusions services (service standard C9), which was an oversight during survey development. A final limitation is that some potential service statements considered were not endorsed during development[5] even though these were important to people with rheumatic disease,[4] with an example being provision of telemedicine services and access to rheumatology services for people with non-inflammatory conditions. Therefore, any service recommendations taken from our data should also consider if rheumatology services need resourcing above that described in the service standards to meet community expectations for care or if other services should be developed to address these care needs.

In conclusion, this is the first national-level description of rheumatology services in public hospitals across New Zealand. The dataset was complete, with participation by all services, and found considerable heterogeneity across the country and that generally services did not meet all services standards.

COMPETING INTERESTS

RG, VM and ND designed the overall study. RG and VM acquired the data. RG, VM and ND all contributed to data analysis. RG wrote the first draft of the manuscript and RG, VM and ND critically revised it for intellectual content, with all providing critical revision for intellectual content. RG, VM and ND all approved the final manuscript for publication and all agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ACKNOWLEDGEMENTS

The authors thank the clinical heads of rheumatology departments in public hospitals in Aotearoa New Zealand that generously used their time to complete the survey and interview where needed. We also acknowledge Fionnagh Dougen (then in the interim leadership role for hospital and specialist services, Health New Zealand – Te Whatu Ora), Dr Peter Watson (then interim national director – medical, Health New Zealand – Te Whatu Ora) and Rosemary Clements (then interim national people and culture lead, Health New Zealand – Te Whatu Ora) for supporting this study. This study was undertaken with a grant from Arthritis New Zealand.

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URL

https://nzmj.org.nz/journal/vol-138-no-1623/rheumatology-services-in-aotearoa-new-zealand-do-they-meet-arthritis-new-zealand-new-zealand-rheumatology-association-endorsed-s

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Appendices

Appendix 1: Survey sent to the clinical lead of Health New Zealand – Te Whatu Ora rheumatology services.

Rheumatology services in Aotearoa New Zealand: what are they and is there variation?

Questionnaire for the leader of clinical services in a public rheumatology service in Aotearoa New Zealand

Rheumatologist-led care is required to achieve best outcomes for people with Inflammatory Rheumatic Diseases (IRDs).[1–5] The components of Aotearoa New Zealand pubic hospital rheumatology services have been previously identified by a Delphi process with health professionals (Gibbs & Grainger, 2022) and a qualitative study with patients (Ngan Kee, Grainger et al. 2022) to define best-practice rheumatology service provision. This survey is a continuation of this work. Studies have shown Aotearoa New Zealand does not have recommended numbers of rheumatologists for our population. No previous studies have described other aspects of rheumatology services in public hospitals in Aotearoa New Zealand. The aim of this survey is to gather information to describe rheumatology services in public hospitals (secondary care) in Aotearoa New Zealand. We thank you for your interest in our study. This survey should take 60 minutes to complete.

Screening questions

Please read the Participant Information Sheet (PIS) on the next page, or click here: (Link to PIS)

Consent

I have read the Participant Information Sheet, and I understand the nature of the research. I understand that the survey results will be reported by institution/hospital and my personal identity will not be reported, and I will remain anonymous. We plan to provide a summary of the findings for your institution/hospital and a national level. Please provide your email if you wish to receive a summary of the findings. You can complete the survey in more than one session by saving and exiting. Save and Exit on each screen.

I agree to take part:	YES / NO (Select one. If yes, go to SQ1. If no, exit survey.)

Download document

If you would prefer to complete a printable Word version of the survey, please download here (Word icon and link) and email to XXX when done.

This survey is by invitation to the clinical lead rheumatologist in a Health New Zealand – Te Whatu Ora rheumatology service, or a person delegated by the clinical lead. To continue with the survey, please complete the following two screening questions:

Screening Q1. Do you work in a Health New Zealand – Te Whatu Ora rheumatology service? **If no, then close survey with exit message** **If yes, go to SQ2**	Yes / No
Screening Q2. Please indicate which group you belong to:	Checkbox: select one
Clinical lead rheumatologist	
Clinical nurse specialist	
Other delegated staff member (please specify) **Go to SQ3**	Free text

Background information

SQ3	**For which Health New Zealand – Te Whatu Ora rheumatology service are you answering this survey? Go to D1**	Free text

Department characteristics

D1.0	**How many rheumatologists work in your service? Go to D1.1**	Free text
D1.1	**How many rheumatologists working in your service are permanently employed Go to D1.2**	Free text
D1.2	**How many rheumatologists working in your service are locums Go to D1.3**	Free text
D1.3	**Are all rheumatologists working in your service located in your institution? If yes, go to D2 If no, go to D1.4**	Checkbox: select one
D1.4	**How many rheumatologists working in your service are based elsewhere?**	Free text
D1.5	**How frequently do rheumatologists based elsewhere work in your service (e.g. 1 day per month)**	Free text
D2.0	**(Hidden S16) In total, how many full-time equivalent (FTE) rheumatologists (including permanent and locum) work in your rheumatology service? What is the total of onsite FTE rheumatologists**	Free text Free text
D3.0	**(Hidden S23) Does your rheumatology service have clinical nurse specialists (CNS) in rheumatology? If yes, go to D3.1 If no, go to D4**	Yes / No
D3.1	**How many rheumatology CNS nursing staff do you have?**	Specify: free text
D4.0	**What is the total FTE of these rheumatology CNS? permanent /locum**	Specify: free text
D5.0	**Does your rheumatology service have other specialist nursing staff? If yes, go to D5.1 If no, go to D6.0**	Yes / No
D5.1	**If yes, how many other specialist nursing staff do you have?**	Specify: free text
D6.0	**What is the total FTE of these other specialist nursing staff?**	Specify: free text
D7.0	**Does your rheumatology service have non-specialist nursing staff? If yes, go to D7.1 If no, go to D8**	Yes / No
D7.1	**How many non-specialist nursing staff do you have?**	Specify: free text
D8.0	**What is the total FTE of these non-specialist nursing staff?**	Specify: free text

Department characteristics continued.

D9.0	**Do you have any CNS staff positions that are funded, but vacant?**	Specify: free text
D10.0 **D10.1** **D10.2**	**Does your rheumatology service have RMO staff?** **If yes, go to D10.1** **If no, go to D11.2** **How many RMO do you have?** **What is the total FTE of RMO staff?** **Go to D11.0**	Yes / No Specify: free text Specify: free text
D11.1 **D11.2** **D11.3**	**Does your rheumatology service have rheumatology advanced trainee/s** **If yes, go to D11a** **If no, go to D12** **How many rheumatology advanced trainees do you have?** **What is the total FTE of rheumatology advanced trainees?** **Go to D12**	Yes / No Specify: free text Specify: free text
D12.0	**Do you have any other comments staff numbers?** **Go to D13**	Comment: free text
D13.0	**Are there processes for connecting Māori rheumatology patients with Māori health services/navigators within your rheumatology service/hospital** **Yes/No** **How do these processes improve access for Māori with chronic rheumatic diseases?**	Checkbox: select one Free text
D14.0	**How are referrals to rheumatology received: (Select all that apply)** **On paper letters (*Does anyone still do this?*)** **Via email letters** **Referral software** **Other, please specify**	Checkbox: multiple Free text
D15.0	**How do you advise patients to contact rheumatology services if they need advice or help outside of regular appointments?** **(Select all that apply)** **Email** **Landline phone** **Mobile phone** **Text** **Not at all (we expect then to see their GP).** **Comment**	Checkbox: multiple Free text

Service standards

The following questions relate to the statements of best-practice patient care that have been defined by health professionals and rheumatology patients.

Q1.0	**(Hidden S1) Are patients with active rheumatoid arthritis (RA) offered the opportunity to commence conventional disease-modifying anti-rheumatic drug (DMARD) therapy (e.g., methotrexate, sulfasalazine, hydroxychloroquine), within 6 weeks of referral to a rheumatology service.** **Yes / No** **Go to Q1.1**	Checkbox: select one
Q1.1	**Do you regularly audit time-to-treatment timeframes?** **Go to Q1.2**	Checkbox: select one
Q1.2	**What is your impression of the appropriateness of the timeframes to initiation of DMARD therapy?** **Go to Q2.0**	Free text
Q2.0	**(Hidden S2) Are patients with active RA monitored 3-monthly, by the rheumatology service?** **Yes / No** **If yes, go to Q2.2** **If no, go to Q2.1**	Checkbox: select one
Q2.1	**Do you rely on GPs to monitoring and report on active RA?** **Yes / No** **Go to Q2.2**	
Q2.2	**Are patients with active RA monitored using a composite score such as DAS-28 CRP/ESR, until their treatment target is met?** **Go to Q2.3**	Checkbox: select one
Q2.3	**What is your impression about how well 3-monthly monitoring is achieved for RA patients?**	Free text
Q3.0	**(Hidden S3) Do patients with chronic rheumatic disease, living in region, have access to a rheumatology service that can support coordinating their care (e.g., with a rheumatology nurse specialist or rheumatologist).** **Yes / No** **Go to Q4.0**	Checkbox: select one

Service standards continued.

Q4.0 **4.1** **4.2** **4.3**	**(Hidden S4) Are patients with chronic rheumatic disease and disease flares, or possible treatment-related side effects, able to receive advice within 1 working day of contacting the rheumatology service** **If yes, go to Q4.1** **If no, go to Q4.2** **Is this contact within 1 working day by? (please select all that apply)** **Landline phone** **Email** **Mobile phone** **Videocall or other digital technology** **Go to Q4.3** **How long are patients likely to wait for contact from the rheumatology service if they have concerns about flares or treatment side-effects? (select one)** **2–3 days** **3–4 days** **5 days** **More than 5 days** **Go to Q4.3** **What barriers do you have in meeting recommended contact timeframes?** **Go to Q5.0**	Checkbox: select one Checkbox: select multiple Checkbox: select one Free text
Q5.0 **5.1** **5.2**	**(Hidden S5) Do patients with chronic rheumatic disease have access to a nurse for education** **Yes / No** **If yes, go to Q5.1** **If no, go to Q5.2** **Is this contact for patient education by (please select all that apply)** **Scheduled appointment** **Mobile phone** **Videocall or other digital technology** **Timetabled classes** **Other (please specify)** **Do you think the educational tools in your rheumatology service are timely and meet patients' needs? (Please comment)** **Go to Q6.0**	Checkbox: select one Checkbox: select multiple Free text

Service standards continued.

Q6.0 **6.1** **6.2**	**(Hidden S6) Do patients with chronic rheumatic disease have access to a nurse-led telephone service for ongoing support** **Yes / No** **If yes, go to Q6.1** **If no, go to Q6.2** **How long are patients likely to wait for contact from the rheumatology service if they require ongoing support** **2–3 days** **3–4 days** **5 days** **More than 5 days** **Go to Q7.0** **Who would the rheumatology service refer patients to, if staff are not resources to provide ongoing support** **GP** **Arthritis NZ** **Local support group** **None** **Other (please specify)** **Go to Q7.0**	Checkbox: select one Checkbox: select multiple Checkbox: select one Checkbox: select multiple Free text
Q7.0 **7.1**	**(Hidden S7) Do specialist rheumatology nurses participate in comprehensive disease management of chronic rheumatic disease** **Yes / No** **Go to Q7.1** **Are there agreed protocols with the patient around this participation (please specify)** **Go to Q8.0**	Select one Free text
Q8.0 **Q8.1** **Q8.2**	**(Hidden S8) Do specialised rheumatology nurses have their own consultations with chronic rheumatic disease patients? Yes / No** **If yes, go to Q8.1** **If no, go to Q8.2** **Are nurse consultations an addition to a follow-up rheumatologist appointment?** **Do nurse consultations replace rheumatologist follow-up appointments?** **What are the aims of nurses consultations?** **Go to 9.0**	Checkbox: select one Checkbox: select one Free text

Allied health services

Q9.0	**(Hidden S9) Do patients with chronic rheumatic disease, and difficulties with activities of daily living have access to the following publicly funded specialist allied health services when they are needed? (Select all that apply)** **1. Occupational therapists** **2. Hand physiotherapists** **Go to Q10.0**	Checkbox: select multiple
Q10.0	**(Hidden S10) Do patients with chronic rheumatic disease, and active foot problems have access to the following publicly funded specialist allied health services when they are needed? (Select all that apply)** **1. Podiatrists (incl orthotics)** **2. Orthotics only** **Go to Q11.0**	Checkbox: select multiple
Q11.0	**(Hidden S11) Do patients with chronic rheumatic disease have access to publicly funded specialist physiotherapy, with periodic review (select one)** **Yes / No** **Go to Q12.0**	Checkbox: select one
Q11.0	**(Hidden S11) Do patients with chronic rheumatic disease have access to publicly funded specialist physiotherapy, with periodic review (select one)** **Yes / No** **Go to Q12.0**	Checkbox: select one
Q12.0	**Please describe barriers to patients in your region accessing these services?**	Free text
Q13.0 **Q13.1**	**(Hidden S12) To aid in the diagnosis and management of inflammatory arthritis is access clinically appropriate publicly funded musculoskeletal imaging available? (please select all that apply)** **1. Ultrasound within the rheumatology department** **2. Magnetic resonance imaging (MRI)** **3. X-ray imaging within the hospital** **4. CT scans** **5. Bone mineral densitometry** **Go to 13.1** **What are the barriers (if any) for patients accessing imaging services? (Please comment)** **Go to Q14.0**	Checkbox: multiple Free text

Allied health services continued.

Q14.0 Q14.1 Q14.2	(Hidden S13) Is a publicly funded qualified health professional who specialises in chronic pain management (e.g., specialist pain management physician or psychologist) available patients with chronic rheumatic disease who suffer from pain issues? Yes / No If yes, go to Q14.1 If no, go to Q14.2 Is this service accessed via 1. Timetables group classes 2. Individual appointments 3. Both of these 1 and 2 4. Other Go to 14.2 What are the barriers (if any) for patients accessing chronic pain management services (please comment) Go to 15.0	Checkbox: select one Free text
Q15.0	(Hidden S14) Does the rheumatology service include an infusion unit for the delivery of specialist-prescribed intravenous medications (e.g., infliximab, tocilizumab, rituximab), which is supervised (directly, or at a distance) by a member of the rheumatology service Yes / No Go to 16.0	Checkbox: select one
Q16.0 16.1	(Hidden S15) Are combined clinics within the rheumatology service that involve other specialists for the management of chronic disease available for patients with chronic disease that spans different specialties (e.g., combined clinics with dermatology or ophthalmology). How well do you think these combined clinics work (or would work) to support patients health needs? Go to 17.0	Checkbox: select one Free text
Q17.0 Q17.1	(Hidden S17) Does your rheumatology service provide outpatient assessment for patients with non-inflammatory musculoskeletal conditions, such as fibromyalgia and osteoarthritis, when specialist input is sought by primary care? Yes / No Go to Q17.1 How well resourced is your clinic to treat non-inflammatory conditions? Go to Q18.0	Checkbox: select one Free text

Allied health services continued.

Q18 **Q18.1**	**(Hidden S18) Is your rheumatology service supported in undertaking health equity assessments, using tools such as the Health Equity Assessment Tool, at appropriate time intervals?** **Yes / No** **If yes, go to Q18.1** **If no, go to Q19.0** **How frequently is the HEA reported?** **Go to Q19.0**	Checkbox: select one Free text
Q19.0 **Q19.1** **Q19.2** **Q19.3**	**(Hidden S20) Does your rheumatology service offer telephone or video follow-up consultations?** **Yes / No** **If yes, go to Q19.1** **If no, go to Q19.2** **Are these forms of follow-up routinely used by:** **1. Rheumatologists?** **2. Rheumatology nurses?** **3. Only used in exceptional situations (such as during the COVID-19 restrictions)?** **Go to Q19.3** **Are the plans in place to offer patients telephone or video follow-up consultations?** **Yes / No** **Go to 19.3** **What barriers, if any, are there to extending this service?** **Go to 20.0**	Checkbox: select one Checkbox: multiple Checkbox: select one Free text
Q20.0 **Q20.1**	**(Hidden S19) Does your rheumatology service have a plan for implementing and evaluating processes that aim to achieve equitable health outcomes for Māori, and other priority groups, as appropriate?** **Yes / No** **Go to Q20.1** **What, if any, barriers have been experienced in implementing an equitable outcomes plan?** **Go to Q21.0**	Checkbox: select one Free text

Allied health services continued.

Q21.0 **Q21.1**	**(Hidden S21)** **Does the rheumatology service have measures in place so that patients under its care, and admitted to a public (DHB) hospital can access a timely inpatient review, if requested and clinically appropriate?** **Yes / No** **Go to Q21.1** **Does your rheumatology service have resources to effectively manage an in-patient review process. Please comment.** **Go to Q22.0**	Checkbox: select one Free text
Q22.0 **Q22.1** **Q22.2** **Q22.3**	**(Hidden S22) Are patients with chronic rheumatic disease that is clinically stable, considered for discharge to primary care for ongoing follow-up without ongoing need for rheumatology service input (apart from administrative responsibilities, such as endorsement for methotrexate).** **Yes / No** **If yes, go to 22.1** **If no, go to 22.2** **Do patients discharged to primary care have clear, written treatment plans?** **Yes / No** **Go to 22.2** **Are there plans for rapid rheumatology reassessment if the patient's condition changes?** **Go to 22.3** **What are the most important barriers to discharge to primary care for clinically stable patients in your service?** **Go to 23.0**	Checkbox: select one Checkbox: select one Checkbox: select one Free text

Allied health services continued.

Q23.0 **Q23.1** **Q23.2**	**(Hidden S24) Do patients have specific rheumatologist(s) responsible for their care?** **Yes / No** **Go to 23.1** **Are patients provided with the names and roles of other medical, nursing, allied health and administrative staff who may be involved in their care?** **1. Yes, patients are provided with a written list of health professionals involved in their care** **2. Yes, patients are told who is involved/introduces to health professionals involved in their care** **3. No, patients are not assigned to specific health care professionals** **Go to Q23.2** **Are there staffing or other factors that impact on assigning patients to specialist rheumatology staff?** **Go to Q24.0**	Checkbox: select one Checkbox: select one Free text
Q24.0 **Q24.1**	**(Hidden S25) Does the rheumatology service actively provide information to patients with rheumatic diseases about outside services or providers that provide social, emotional or practical support? (select all that apply)** **1. National support services** **2. Local support groups** **3. Government services that provide practical and financial support** **4. Other services that can support patient needs** **Go to Q24.1** **How accessible are support services to rheumatology patients in your service?** **Go to P1.0**	Checkbox: multiple Comment: free text

Principles of care

The following three questions ask you to indicate how strongly you agree with the following principles, regardless of whether your service can meet them at this stage, or not. Please indicate your agreement with the following principles, where 1=not at all, and 7=strongly agree.

P1.0	**(Hidden P1) A rheumatology service should value individuals and their experiences through positive interpersonal interactions, supportive relationships and within a health system organised with the patient's needs at the centre**	Scale: 1–7
P2.0	**(Hidden P2) Healthcare professionals in a rheumatology service should actively support patients to participate in decision making and self-management** **Comment**	Scale: 1–7 Comment: free text
P3.0	**(Hidden P3) Healthcare professionals in a rheumatology service should ensure patients' education requirements about their rheumatic condition are met; including appropriate communication, content, and framed to support patients' active involvement in shared decision making** **Comment**	Scale: 1–7 Comment: free text

Please click the arrow to submit your questionnaire. The following page will provide a link if you would like to receive a copy of the study findings.

SUMBIT

Thanks for completing the questionnaire. Please click on the below link if you would like a summary of the results. The link will open in a new tab.

(Insert link on next screen)

Please provide your name and email address so we can contact you with a summary of the findings.

Name: ________________

Email: ________________

Thank you, please press submit.

SUMBIT

Appendix 2: Changes reported by clinical services leads between survey (2023) and update data request (2025).

Southern: Nursing FTE increased from 2.2 to 2.4 (0.2 increase).
South Canterbury: Rheumatologist FTE increased from 0.4 to 0.5 (0.1 increase).
Canterbury–West Coast: No change.
Nelson–Marlborough: Rheumatologist FTE increased from 0.6 to 0.8 (0.2 increase). Nursing FTE decreased 0.9 to 0.8 (0.1 decrease). Limited access to pain services—change of “always meets” to “sometimes meets”.
Wellington: Employed rheumatologist FTE increased from 1.95 to 3.35 (1.4 increase—fill vacancies and increased FTE of 0.6).
MidCentral–Whanganui: Rheumatologist FTE increased from 1.0 to 1.5 (0.5 increase).
Hawke’s Bay: Hand therapy now “sometimes meets”. Remote care phone consults care be provided.
Taranaki: No change.
Tairāwhiti: No change.
Lakes: No change to rheumatologist FTE (0.7) or nurse FTE (0.8); however, focus changed to fracture liaison service (including bone densitometry) so effective rheumatology FTE now rheumatologist 0.6 (decrease 0.1) and nurse 0.5 (decrease 0.3).
Bay of Plenty: No change.
Waikato: No change.
Counties Manukau: Nurse FTE increased from 2.4 to 3.1 (0.7 increase).
Waitematā: No change.
Auckland: No change.
Northland: Nurse FTE increased to 1.0 from 0 (increase 1.0).

Eating disorder risk in transgender youth and its association with unmet need for gender-affirming hormone therapy in Aotearoa New Zealand: a cross-sectional study

Micah Davison, Jaimie F Veale, Jack L Byrne, Ryan M Bentham, Philip J Schluter

ABSTRACT

AIM: This study aimed to estimate rates and factors associated with eating disorder risk in transgender youth, and to explore the association between this risk and unmet need for gender-affirming hormone therapy (GAHT).

METHODS: In a national cross-sectional survey of participants aged 14–24 years, the five-item Sick, Control, One stone, Fat, Food (SCOFF) instrument was used to assess eating disorder risk. GAHT demand was self-reported. Modified Poisson regressions were employed to assess risk.

RESULTS: Overall, 1,401 participants were eligible, of whom 1,010 (72.1%) had valid SCOFF scores. Of these, 398 (38.4%) participants met the threshold for eating disorder risk. In adjusted analyses, those aged 14–18 years had an increased prevalence ratio (PR) of eating disorder risk compared with their counterparts aged 19–24 years (PR: 1.26; 95% confidence interval: 1.06–1.50). GAHT demand was reported by 645 participants, with 277 (42.9%) having unmet need. No statistical evidence was found relating unmet GAHT need with eating disorder risk (p=0.29).

CONCLUSION: Nearly two in five transgender youth are at eating disorder risk, and unmet GAHT need rates appear higher. While it is recognised that eating disorders are a global health concern, they have not received the priority they deserve. In the calls for urgent action, transgender youth deserve particular attention.

Eating disorders are of increasing public health interest within Aotearoa New Zealand and across the globe, having potentially profound and devastating impacts on individuals, their families and whānau, and society.[1–3] They are illnesses characterised by severe and persistent disturbances in eating behaviours with impairment to physical and psychological functioning.[4] Aotearoa New Zealand national specialist mental health service data show that an increasing proportion of the population are being diagnosed with eating disorders, with a notable rise in the number of young people presenting and at an earlier age of onset.[5] Research of the general Aotearoa New Zealand population estimates a lifetime prevalence of 0.6% for anorexia nervosa, 1.0–1.3% for bulimia nervosa and 1.9% for binge-eating disorders.[6,7] However, a systemic lack of routine screening for these conditions in the health system is thought to contribute to an underdiagnosis and treatment of these illnesses in the general population.[8]

Transgender youth have historically been under-represented and under-reported in population health research,[9] including investigating eating disorders.[10] This under-representation has led to gaps in understanding their specific health needs and experiences.[11] Increased societal awareness, improved access to information and resources and improved data collection efforts have contributed to the increase in youth identifying as transgender over the past decade.[12] These factors are also likely to underpin the increase in transgender youth seeking gender-affirming care,[13] although many remain under-served by the public health system.[14] Research internationally has found that transgender youth experience higher levels of disordered eating and eating disorders than their cisgender peers.[15,16] However, Aotearoa New Zealand's national eating disorder statistics cannot be disaggregated for transgender populations, and there has been a dearth of data for these groups across a range of official socio-economic and health statistics more generally. Nonetheless, there is an emerging body of research and data related to transgender people in Aotearoa New Zealand that demonstrates they experience higher levels of unmet need for healthcare and an array of inequitable health outcomes relative to the general population.[17,18]

Screening for eating disorders is of critical importance in public health because early detection of and intervention for these illnesses can improve prognosis and increase the likelihood of recovery.[8] However, eating disorder screening and treatment approaches have been found lacking in their suitability and responsiveness for transgender people, potentially worsening the already increased risk of inequitable health outcomes for this population.[16,19]

Gender dysphoria and body dissatisfaction are commonly experienced by transgender people, and these can be exacerbated during puberty due to the development of secondary sex characteristics (e.g., breast development, facial hair) that may not align with their sense of self.[20] "Gender-affirming care" refers to any social, psychological, behavioural and medical intervention treatments transgender people may undergo to affirm their gender.[21] Gender-affirming hormone therapy (GAHT) is an important aspect of healthcare for many transgender people, and there has been an increase in the demand for GAHT observed in Aotearoa New Zealand over the last decade.[13] It is the only medical intervention that trans young people in Aotearoa New Zealand may also be able to access. Gender-affirming healthcare can alleviate experiences of gender dysphoria,[22] and there is some evidence that GAHT can act as a protective factor for eating disorders in transgender adults by alleviating eating disorder symptomology and body image disturbances.[23] Our literature review found scant published research on this topic within the Aotearoa New Zealand context, with most insights provided by two Counting Ourselves surveys—nationwide community-based studies of the health and wellbeing of transgender people in Aotearoa New Zealand—and associated community reports (see: https://countingourselves.nz/).[24,25] The 2018 survey found that transgender youth reported high levels of binge-eating and weight-control behaviours, with 55% reporting they have fasted or skipped meals and 18% vomiting or throwing up to lose weight.[24] This first survey did not include the Sick, Control, One stone, Fat, Food (SCOFF) measure for detecting eating disorder risk.

This study was designed to redress the empirical evidence deficit, which is of particular concern given the relevance of eating disorders for public health in Aotearoa New Zealand, the international evidence of heightened risk of eating disorders in transgender people and the lack of research relating these factors within the Aotearoa New Zealand context. The rise in youth identifying as transgender with high levels of unmet healthcare needs in Aotearoa New Zealand provides a further impetus for this study. Using the 2022 Counting Ourselves survey, the aim of this study is to estimate rates and factors associated with eating disorder risk in transgender youth. A secondary aim is to explore the association between eating disorder risk and unmet need for GAHT in transgender youth.

Methods

Study design

The Counting Ourselves survey is a repeated, non-randomised, national cross-sectional survey. This study utilised measurement wave two, which surveyed participants between 1 September and 14 December 2022. Measurement wave one did not include the eating disorder risk instrument.

Participants

Participants of the Counting Ourselves survey include transgender and non-binary people aged 14 years old and over living in Aotearoa New Zealand. Aligned with the World Health Organization's definition of youth, for the purpose of this study participants aged 14–24 years were included.

Procedure

The Counting Ourselves survey was community-led and employed a range of recruitment strategies designed to ensure high target participant reach and coverage. These recruitment strategies included: building relationships with transgender community groups; connecting with networks of health professionals and academic researchers interested in transgender health; and inviting community leaders from Māori, Pacific, Asian and disability groups to share information about the survey through their networks and platforms. Participants could respond online (via Qualtrics) or on paper versions of the survey. The majority (99%) responded online. Both modes included an information sheet with details about the study and how their information would be used and kept confidential. Responses to questions within the survey were not compulsory, meaning that some items (including SCOFF instrument items) could be skipped by participants. All data were uploaded to a secure electronic database. Detailed information about the study, utilised instruments and procedures are described elsewhere in the Counting Ourselves community report.[25]

Primary measures

Eating disorder risk was assessed using the five-item SCOFF instrument.[26] This screening tool elicits five questions, with dichotomous "yes(1)/no(0)" response options, which are then summed over all five items. A summed score ≥2 indicates a likely case of anorexia nervosa or bulimia nervosa. Thus, for this paper, we defined eating disorder risk as indicated if the summed SCOFF score ≥2. If one or more SCOFF instrument items were missing, then eating disorder risk was also set to missing. The SCOFF is increasingly employed in research and clinical settings due to its simple structure and brevity.[27] Pooled estimates in a meta-analysis of the SCOFF's diagnostic accuracy found it had good sensitivity (0.80) and specificity (0.93).[28] One study was identified that validated the SCOFF as an effective tool for eating disorder screening in transgender youth.[29]

GAHT demand was determined through a question that asked respondents "*Have you had, or do you want, gender affirming hormones, including estrogen, testosterone, or anti-androgens?*", with response options: 1) "*Yes, I am taking hormones or have taken hormones*", 2) "*I want to take hormones, but I have not been able to yet*", 3) "*I am not sure if I want to take hormones*", and 4) "*I do not want to take hormones*". For the purpose of this study, GAHT demand was defined by those responding affirmatively to response options 1 or 2, with 1 characterising met need and 2 unmet need.

Socio-demographic and potentially confounding variables

Participants were asked to categorise their gender as one of three options, prefaced with a statement that recognised the limited options and the utility of the broad categorisations for analytical purposes. Gender categories included: "trans woman, woman, or girl", "trans man, man, or boy" and "non-binary, genderqueer, agender, or similar identity". Ethnicity information was collected allowing for multiple identifications. For those with multiple identifications, a prioritised ethnicity was assigned based on the order: Māori, Pacific, Asian, and Pākehā/New Zealand European and other European (abbreviated to "European/Other" thereinafter). All other ethnicities were combined into an "Other" group due to the small number of responses across a diverse range of these ethnicities (consistent with the Counting Ourselves community report methodology). As this "Other" group remained small, it was combined with the European ethnic group and, to aid exposition, was labelled as European/Other. Living description was determined by asking participants whether they lived in: 1) a major city, 2) a large city, 3) a medium-sized town or city, or 4) a small town or rural area. Examples were provided for each. A dichotomous variable was created, defined by "major/large city" (combining 1 and 2 responses) and "living elsewhere" (combining 3 and 4 responses) values.

Statistical analysis

Reporting of this study was informed by the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines.[30] Participant flow, socio-demographic characteristics and primary variables were described with frequency analysis. All bivariable comparisons of categorical variables used Fisher's exact test. Complete case modified Poisson regression models, with robust variance estimators, were used to relate eating disorder risk to socio-demographic characteristics and GAHT demand. Prevalence ratios (PRs) and associated 95% confidence intervals (CIs) were derived. Both unadjusted and adjusted models were employed. Sensitivity analyses were then conducted for the primary aim, using chained equations multiple imputation (M=50) methods for all variables represented within the adjusted model. In these sensitivity analyses, the participants with invalid summed SCOFF scores were included to account for the difference in their socio-demographic characteristics when compared with those with valid summed SCOFF scores. All analyses were conducted in Stata SE version 18.0 (StataCorp, College Station, TX). A two-tailed $\alpha=0.05$ defined significance.

Ethics

Ethical approval was obtained from the New Zealand Health and Disability Ethics Committee (HDEC; approval number: 2022 FULL 12683). All methods were performed in accordance with HDEC's relevant guidelines and regulations.

Results

Participants

The Counting Ourselves study at measurement wave two included 2,631 participants, with an age range of 14–86 years. Of these, 1,230 (47%) participants were aged over 24 years and were excluded, leaving 1,401 within the analytical sample. A participant flow diagram appears in Appendix Figure 1.

Socio-demographic characteristics

Sample characteristics are presented Table 1. Just under half of participants were aged 14–18 years old; most participants' gender was non-binary, genderqueer, agender or a similar identity; European/Other ethnicity identification predominated; and the majority resided in a large city. Of the 1,070 participants defined as European/Other, 1,046 (97.8%) were European—an overwhelming majority.

SCOFF measures

Table 1 also presents the distribution of valid summed SCOFF scores by socio-demographic characteristics. Significant differences emerged across all reported characteristics, with those aged 14–18 years, non-binary, genderqueer, agender or similar identity, Pacific, and those residing outside major/large city all more likely to have missing SCOFF scores.

Appendix Table 1 provides the valid response distribution to the individual items of the SCOFF instrument, together with the overall SCOFF disordered eating threshold measure. Overall,

Table 1: Socio-demographic characteristics overall and by summed SCOFF score distribution (n=1,401).

			Summed SCOFF score				**p-value**
			Valid		**Missing**		
Characteristic	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Age group (years)							<0.001
14–18	633	(45.2)	416	(65.7)	217	(34.3)	
19–24	768	(54.8)	594	(77.3)	174	(22.7)	
Gender[a]							0.024
Trans man or boy	378	(27.2)	287	(75.9)	91	(24.1)	
Trans woman or girl	213	(15.3)	162	(76.1)	51	(23.9)	
Non-binary[b]	798	(57.5)	553	(69.3)	245	(30.7)	
Ethnicity[c]							0.001
Māori	197	(14.1)	123	(62.4)	74	(37.6)	
Pacific	22	(1.6)	11	(50.0)	11	(50.0)	
Asian	108	(7.7)	84	(77.8)	24	(22.2)	
European/Other	1,070	(76.6)	791	(73.9)	279	(26.1)	
Residential location[d]							0.001
Major/large city	1,116	(81.2)	829	(74.3)	287	(25.7)	
Living elsewhere[e]	258	(18.8)	164	(63.6)	94	(36.4)	

[a] Missing values for 12 participants.
[b] Includes non-binary, genderqueer, agender, or similar identity.
[c] Missing values for four participants.
[d] Missing values for 27 participants.
[e] Includes all other cities, towns or rural areas.
SCOFF = Sick, Control, One stone, Fat, Food.

398 (39.4%) participants from 1,010 with valid total SCOFF scores met the threshold for eating disorder risk. In terms of the individual SCOFF items, just over half (52.5%) screened positive for the "control" screening question, a quarter (24.7%) screened positive for the "food" question and a fifth of participants screened positive for the "sick" (20.9%), "ounce" (19.3%) and "fat" (21.4%) items.

Regression analyses

The distribution of eating disorder risk indication by sample characteristics, together with unadjusted and adjusted PRs and associated 95% CIs derived from complete case modified Poisson regression models, are presented in Table 2. In unadjusted analyses, significantly higher PRs were observed among those aged 14–18 years compared with their 19–24-year-old counterparts (p=0.006), and among Pacific participants compared with the European/Other group (p=0.035). No other significant differences were found. When all the socio-demographic characteristics were simultaneously included in the adjusted analysis (N=985), some confounding was noted with small shifts in estimated adjusted PRs (see Table 2). Although PRs observed among Māori participants were significantly higher at the bivariate level, they were not significant at the multivariate level (see Table 2). This suggests that a larger sample size may uncover significant differences at the multivariate level for eating disorder risk in Māori

Table 2: Distribution of eating disorder risk by sample characteristics, together with unadjusted and adjusted prevalence ratios (PRs) and associated 95% confidence intervals (CIs) derived from modified Poisson regression models.

		Eating disorder risk indicated		**Unadjusted model**		**Adjusted model[c]**	
	N	**n**	**(%)**	**PR**	**(95% CI)**	**PR**	**(95% CI)**
Age group (years)							
14–18	416	185	(44.5)	1.24	(1.07–1.44)	1.23	(1.04–1.44)
19–24	594	213	(35.9)	1	(reference)	1	(reference)
Gender							
Trans man or boy	287	120	(41.8)	1.10	(0.93–1.31)	1.07	(0.90–1.27)
Trans woman or girl	162	63	(38.9)	1.02	(0.82–1.27)	1.03	(0.82–1.29)
Non-binary[a]	553	210	(38.0)	1	(reference)	1	(reference)
Ethnicity							
Māori	123	57	(46.3)	1.19	(0.97–1.47)	1.24	(1.00–1.52)
Pacific	11	7	(63.6)	1.63	(1.04–2.58)	1.63	(0.99–2.68)
Asian	84	26	(31.0)	0.79	(0.57–1.11)	0.79	(0.56–1.11)
European/Other	791	308	(38.9)	1	(reference)	1	(reference)
Residential location							
Major/large city	829	315	(38.0)	1	(reference)	1	(reference)
Living elsewhere[b]	164	74	(45.1)	1.19	(0.98–1.44)	1.08	(0.88–1.31)

[a] Includes non-binary, genderqueer, agender or similar identity.
[b] Includes all other cities, towns or rural areas.
[c] Adjusted model had N=985 (97.5%) participants.

transgender youth. The difference between age groups remained significant (p=0.014), whereas the difference between Pacific and European/Other participants was not (p=0.054). While the estimated effect sizes remained unchanged for the latter comparison, the small sample number of Pacific participants and decreased statistical power likely explains this finding.

Sensitivity analyses

Chained equations multiple imputations were undertaken for missing data, using multinomial logistic regression for ethnic identification and gender and binary logistic regression for age group, residential location and eating disorder risk. For this model (N=1,401), the adjusted PR of eating disorder risk indication was 1.21 (95% CI: 1.03–1.43) for those aged 14–18 years compared with participants aged 19–24 years. This estimate is strikingly similar to the complete case estimate of 1.23 (95% CI: 1.04–1.44), suggesting that those with missing summed SCOFF scores did not

Table 3: Distribution of eating disorder risk for those with GAHT demand (unmet and met need) by sample characteristics, together with unadjusted and adjusted PRs and associated 95% CIs derived from modified Poisson regression models.

		Eating disorder risk indicated		**Unadjusted model**		**Adjusted model**[c]	
	N	**n**	**(%)**	**PR**	**(95% CI)**	**PR**	**(95% CI)**
GAHT demand							
Met need	368	147	(39.9)	1	(reference)	1	(reference)
Unmet need	277	117	(42.2)	1.06	(0.88–1.27)	0.89	(0.72–1.10)
Age group (years)							
14–18	255	126	(49.4)	1.40	(1.16–1.68)	1.49	(1.21–1.83)
19–24	390	138	(35.4)	1	(reference)	1	(reference)
Gender							
Trans man or boy	275	116	(42.2)	1.06	(0.85–1.31)	0.98	(0.79–1.22)
Trans woman or girl	153	61	(39.9)	1.00	(0.77–1.29)	0.98	(0.76–1.28)
Non-binary[a]	213	85	(39.9)	1	(reference)	1	(reference)
Ethnicity							
Māori	81	39	(48.1)	1.18	(0.92–1.52)	1.24	(0.97–1.59)
Pacific	6	3	(50.0)	1.23	(0.55–2.75)	1.23	(0.52–2.91)
Asian	44	13	(29.5)	0.73	(0.45–1.16)	0.69	(0.42–1.13)
European/Other	513	209	(40.7)	1	(reference)	1	(reference)
Residential location							
Major/large city	529	212	(40.1)	1	(reference)	1	(reference)
Living elsewhere[b]	103	44	(42.7)	1.07	(0.83–1.36)	0.93	(0.73–1.19)

[a] Includes non-binary, gender-queer, agender, or similar identity.
[b] Includes all other cities, towns or rural areas.
[c] Adjusted model had N=628 (97.4%) participants.
GAHT = gender-affirming hormone therapy; PRs = prevalence ratios; CIs = confidence intervals.

differentially affect the regression results.

Secondary aim: unmet need for GAHT and eating disorder risk

Appendix Table 2 presents the distribution of socio-demographic characteristics for the group with a demand for GAHT (partitioned by met or unmet need). The distribution of unmet need for GAHT varied by age group, gender and residential location (all Fisher's exact tests p<0.001). Participants who were aged between 14 and 18 years old, were non-binary or lived outside of a major/large city had higher levels of unmet need for GAHT. However, no significant differences were observed between ethnic groups (Fisher's exact test p=0.12).

The distribution of SCOFF screening measures by demand for met or unmet need for GAHT is presented in Appendix Table 3. The distribution of positive responses for the "control" SCOFF screening question significantly varied between those with a met or unmet need for GAHT (Fisher's exact test p=0.007), with participants who have lost control having higher levels of rates of unmet need (48.2%) compared with those with control (37.3%). However, positive responses across the other SCOFF items and overall eating disorder risk indication appeared similar between those with a met or unmet need for GAHT (all Fisher's exact tests p>0.05).

Table 3 presents the distribution of eating disorder risk for those with GAHT demand (unmet and met need) by sample characteristics together with unadjusted and adjusted PRs and associated 95% CIs derived from modified Poisson regression models (N=645). No significant differences were detected between those with a met or unmet need for GAHT in the unadjusted or adjusted analyses. However, age group remained significantly associated with eating disorder risk indication (p<0.001).

Discussion

Findings from this large national sample of transgender youth in Aotearoa New Zealand revealed high rates of eating disorder risk. These rates (39.4%) were substantially higher than the pooled estimate of eating disorder risk prevalence in youth observed from a general population cohort (22%) constructed with data from 32 studies across 16 countries, where we would expect comparability with the general Aotearoa New Zealand youth population.[31] Among youth, a greater risk was observed in those aged 14–18 years old compared with their older counterparts aged 19–24 years old. Additionally, the results highlight a potentially increased eating disorder risk for Māori and Pacific transgender youth. This finding is particularly important in the context of the low level of treatment and access to specialist eating disorder services observed for Māori with eating disorders relative to non-Māori.[32] This is likely underpinned by systemic bias, largely in the form of under-recognition of eating disorders in Māori.[5] The potentially increased eating disorder risk for Pacific participants is also of importance and warrants further research, particularly given the significant inequitable outcomes for Pacific people in Aotearoa New Zealand in general. While the differences for Māori and Pacific participants were non-significant here, the small sample size yet relatively large estimated effect sizes likely mask these important underlying ethnic differences. We found no significant differences in eating disorder risk between gender groups or residential location.

The high rates of eating disorder risk in transgender youth found here corroborate patterns reported within a recent international systematic review.[33] A scoping review of eating disorder symptomology in transgender youth found that a common theme for those engaged in restrictive and/or compensatory eating behaviours was a motivation to prevent puberty onset or progression.[16] These findings suggest that problematic eating behaviours could serve as a coping mechanism for gender dysphoria or gender-related stress in transgender youth. The association between eating disorder risk and gender dysphoria is likely particularly important among those aged 14–18 years old—an age range where pubertal development is generally more marked.

An association between elevated eating disorder risk and unmet need for gender-affirming healthcare has been identified in previous international research;[34,35] however, this association was not identified here. This finding does not provide evidence for GAHT being either a protective or risk factor for eating disorder risk in transgender youth in this cohort—more research with additional covariates (including those related to minority stress) would be needed to validate this, particularly given the broader context of pathologisation and stigma experienced by transgender people. Furthermore, this finding cannot be extrapolated to suggest there is no association with an unmet need for gender affirming healthcare more broadly, including access to puberty blockers, voice therapy, hair removal or a range of gender-affirming surgeries. GAHT is only one aspect of a broader range of healthcare that transgender youth may need, and there is evidence of a significant association between unmet need for gender-affirming healthcare as a social determinant of mental health inequities for transgender youth.[17]

Strengths and limitations

The Counting Ourselves survey represents the largest targeted sample of transgender and non-binary people in Aotearoa New Zealand, providing a highly valuable and rich source of information across a range of health and wellbeing measures for transgender youth. Limitations of this research include that this study was based on a non-probability sample, with an over-representation of participants with European ethnicity. The proportion of non-binary participants in this study was similar to the Aotearoa New Zealand 2023 Census transgender population. However, the proportion of trans women and girls was higher and trans men and boys was lower in this study than these Census figures.[36] Further research on this topic would benefit from employing a representative, probability-based sample, although the pragmatic and ethical considerations of doing this must also be recognised. The socio-demographic differences between those with a valid SCOFF measure and those without should also be noted, although the sensitivity analyses revealed little differences between complete case and imputed results. The smaller eligible sample and reduced statistical power for the secondary analysis of the association between eating disorder risk and unmet need for GAHT may explain the lack of any significant finding between these variables. Ideally, a larger sample would redress this, and potentially replicate the significant findings reported elsewhere. Further study into the association of a broader range of met vs unmet healthcare needs and social determinants of health on eating disorder risk in transgender youth would be beneficial to gain a more comprehensive view of the risk and protective factors for eating disorder risk in this population. Stigma and discrimination, gender dysphoria, desire to prevent puberty onset or progression and inadequate access to healthcare have all been associated with an increased risk of eating disorders in transgender youth in the international literature and would merit further exploration in the Aotearoa New Zealand context on that basis.[16,37]

Conclusions

This study provides timely evidence for the Aotearoa New Zealand context, where there has been an increase in eating disorder prevalence in the general population yet little empirical evidence of the heightened eating disorder risk experienced by transgender youth. This study provides novel insights for health professionals and policymakers about the high level of eating disorder risk in transgender youth in Aotearoa New Zealand, particularly for those aged 14–18 years of age. The high levels of eating disorder risk in transgender youth suggest that targeted and culturally responsive prevention, screening and treatment mechanisms are needed to improve health outcomes for this population. Resourcing initiatives to build transgender cultural safety among healthcare providers working in eating disorder care is essential to ensuring equitable and effective support for this population. These findings highlight the need for future research that further examines the underlying risk and protective factors associated with eating disorder risk in transgender youth. Efforts to ensure national eating disorder statistics can be disaggregated for the transgender population in Aotearoa New Zealand would also improve the evidence base available to inform and target public health measures to address the inequities experienced by this population.

COMPETING INTERESTS

Nil.

JFV was awarded a 2020 Rutherford Discovery Fellowship from the Royal Society Te Apārangi, which supported her leadership of the Counting Ourselves project. RMB received a doctoral scholarship from the University of Waikato | Te Whare Wānanga o Waikato. No other funding was received.

ACKNOWLEDGEMENTS

We would like to thank the Counting Ourselves project team, and all the participants who gave up their time and energy in responding.

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URL

https://nzmj.org.nz/journal/vol-138-no-1623/eating-disorder-risk-in-transgender-youth-and-its-association-with-unmet-need-for-gender-affirming-hormone-therapy-in-aotearoa-n

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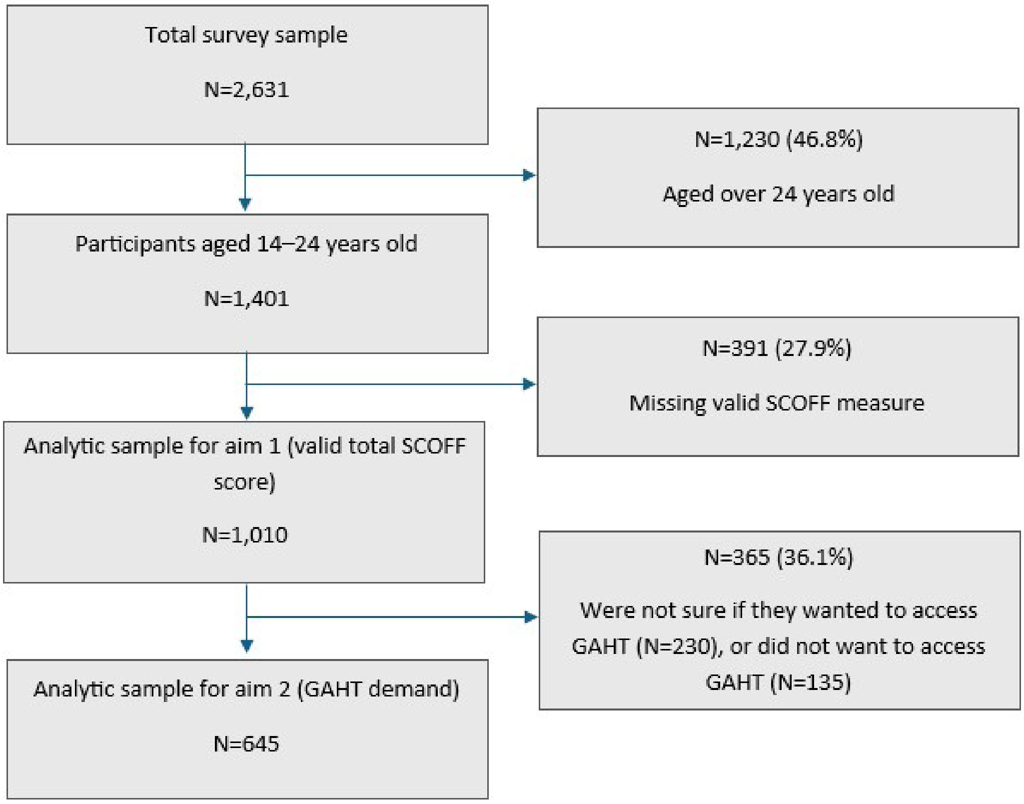
Appendix

Appendix Figure 1: Participant flow diagram.



Appendix Table 1: Distribution of valid responses to the SCOFF screening questions.

SCOFF screening questions	n	(%)
Sick: Do you make yourself sick because you feel uncomfortably full?		
Yes	210	(20.9)
No	797	(79.1)
Control: Do you worry you have lost control over how much you eat?		
Yes	528	(52.5)
No	478	(47.5)
Ounce: Have you recently lost more than 1 stone (6.35kg) in a 3-month period?		
Yes	193	(19.3)
No	809	(80.7)
Fat: Do you believe yourself to be fat when others say you are too thin?		
Yes	215	(21.4)
No	788	(78.6)
Food: Would you say food dominates your life?		
Yes	248	(24.7)
No	758	(75.3)
Eating disorder risk (based on total SCOFF score threshold)		
Indicated	398	(39.4)
Otherwise	612	(60.6)

SCOFF = Sick, Control, One stone, Fat, Food.

Appendix Table 2: Distribution of socio-demographic characteristics by GAHT demand (N=833).

			GAHT demand				**p-value**
			Met need		**Unmet need**		
Characteristic	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Age group (years)							<0.001
14–18	367	(44.1)	101	(27.5)	266	(72.5)	
19–24	466	(55.9)	335	(71.9)	131	(28.1)	
Gender[a]							<0.001
Trans man or boy	353	(42.7)	187	(53.0)	166	(47.0)	
Trans woman or girl	197	(23.8)	134	(68.0)	63	(32.0)	
Non-binary[b]	277	(33.5)	113	(40.8)	164	(59.2)	
Ethnicity[c]							0.12
Māori	119	(14.3)	54	(45.4)	65	(54.6)	
Pacific	11	(1.3)	4	(36.4)	7	(63.6)	
Asian	56	(6.7)	25	(44.6)	31	(55.4)	
European/ Other	645	(77.6)	351	(54.4)	294	(45.6)	
Residential location[d]							<0.001
Major/large city	668	(81.9)	377	(56.4)	291	(43.6)	
Living elsewhere[e]	148	(18.1)	55	(37.2)	93	(62.8)	

[a] Missing values for six participants.
[b] Includes non-binary, gender-queer, agender, or similar identity.
[c] Missing values for two participants.
[d] Missing values for 12 participants.
[e] Includes all other cities, towns or rural areas.
GAHT = gender-affirming hormone therapy.

Appendix Table 3: Distribution of SCOFF screening measures by GAHT demand.

SCOFF screening questions			GAHT demand				p-value
			Met need		Unmet need		
	n	(%)	n	(%)	n	(%)	
Sick: Do you make yourself sick because you feel uncomfortably full?							0.50
Yes	141	(21.9)	77	(54.6)	64	(45.4)	
No	502	(78.1)	291	(58.0)	211	(42.0)	
Control: Do you worry you have lost control over how much you eat?							0.007
Yes	332	(51.6)	172	(51.8)	160	(48.2)	
No	311	(48.4)	195	(62.7)	116	(37.3)	
Ounce: Have you recently lost more than 1 stone (6.35kg) in a 3-month period?							0.13
Yes	147	(23.0)	92	(62.6)	55	(37.4)	
No	493	(77.0)	273	(55.4)	220	(44.6)	
Fat: Do you believe yourself to be fat when others say you are too thin?							0.056
Yes	143	(22.3)	72	(50.3)	71	(49.7)	
No	498	(77.7)	296	(59.4)	202	(40.6)	
Food: Would you say food dominates your life?							0.85
Yes	157	(24.5)	89	(56.7)	68	(43.3)	
No	485	(75.5)	279	(57.5)	206	(42.5)	
Eating disorder risk (based on total SCOFF score threshold)							0.57
Indicated	264	(40.9)	147	(55.7)	117	(44.3)	
Otherwise	381	(59.1)	221	(58.0)	160	(41.2)	

SCOFF = Sick, Control, One stone, Fat, Food; GAHT = gender-affirming hormone therapy.

Climate change impacts on health in Aotearoa New Zealand: a scoping review

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ABSTRACT

This paper addresses the evidence on the health impacts of climate change in Aotearoa New Zealand with particular attention to who, where and what activities are most vulnerable. Applying the Arksey and O'Malley scoping review framework, it consolidates academic and grey literature to identify gaps and future research priorities. The review—conducted from February to October 2024—included 61 papers from 2,265 that were initially screened. The results reveal that temperature and extreme precipitation are the main climate risks associated with health in Aotearoa New Zealand. These are associated with direct and indirect impacts, including heat-related illness and death, enteric diseases, poor mental health, access to safe drinking water/food supplies and access to healthcare. Most regions across Aotearoa New Zealand are susceptible to climate change–induced health risks, with unique pressures for coastal regions, metropolitan areas, rural areas and regions experiencing disproportionate socio-economic inequity. Workers in outdoor manual labour—exposed to heat stress, air pollution and sun damage—are vulnerable to climate change–induced health risks. The review also highlights key demographic characteristics—ethnicity, age, skin colour, occupation, gender, housing, disability and pre-existing health needs, and socio-economic deprivation—that affect vulnerability. In conclusion, the review underscores the importance of responses to climate change-induced health addressing the underlying, intersectional risk factors to protect vulnerable populations.

Anthropogenic climate change, mediated through environmental changes, poses significant direct and indirect challenges to human health—death, injury, disability, wellbeing, inequity and social connectedness—to the extent it has been characterised as a global health emergency for the last decade.[1–3] While every continent will be exposed to the adverse human health impacts of climate change (hereafter climate–health impacts), certain populations and regions are more vulnerable.[2] Vulnerability considers exposure, existing sensitivity and the capacity to prepare, respond or adapt.[4]

While the body of climate–health scholarship is growing in Aotearoa New Zealand, there is value in an updated comprehensive methodological review. The purpose of this paper is to review the evidence on the direct and indirect climate–health impacts in Aotearoa New Zealand. The aims are threefold. Firstly, investigate the range of evidence related to climate–health impacts, with particular attention to the climate processes of concern to health and who, where and what activities (e.g., occupations, tasks) are most vulnerable. Secondly, consolidate academic (published and peer-reviewed literature) and grey literature to expand the depth and breadth of the review. Lastly, identify gaps in the current literature to inform future research priorities and policy interventions that address the intersections of climate change and health in Aotearoa New Zealand. Together, these support the identification of intersectional vulnerabilities—networked, and not able to be attributed to a single event—and research gaps, which are critical for climate–health research because of the inequitable impact of climate change and the multifaceted response required.

These purposes contribute to building a conceptual overview of the interaction and processes related to changing climatic conditions, and the direct and indirect health impacts that result. The Helldén et al. conceptual framework—which we adapt to an Aotearoa New Zealand context in Figure 5—offers a structured way to visualise how processes influence health outcomes while highlighting vulnerable populations, geographic regions and activities and potential opportunities for mitigation and adaptation.[5]

Methods

This review was informed by Arksey and O'Malley's five-stage scoping review methodology—suitable for broad research questions—to address the research question: what is the evidence regarding the impact of climate change on human health in Aotearoa New Zealand?[6]

Table 1: Keywords for search strategy.

Category	Keywords
Setting	Aotearoa, New Zealand
What	Climate change, climate warming, climatic change, global warming, extreme weather events, sea-level rise, extreme heat, flood, extreme precipitation, global heating
Related to	Health, wellbeing, social determinants or Hauora (health)

Table 2: Database search strings for all grey literature electronic databases/websites used in the scoping review.

Category	Source	Search terms employed
Grey literature database	NZ Research (for master's and PhD dissertations/ theses from all New Zealand universities) The Hub Koi Tū Centre for Informed Futures data.govt National Library Grey matter newsletter (Ministry of Health – Manatū Hauora)	Health and "climate change" (and "New Zealand") OR Health climate change New Zealand OR Health "climate change" "New Zealand"
Customised Google searches	Google was used for two different purposes. The first was to identify websites and grey literature databases that were then used in targeted Google searches. The second use was running site-specific Google searches (alongside searching directly on the website), i.e., "site:[website]".	Health and "climate change" (and "New Zealand") OR Health climate change New Zealand OR Health "climate change" "New Zealand"
Targeted websites	Targeted website searching was done using the search function on the website of the page as well as a site:[website] search on Google. Where there was a searchable publication page on a website, this was also searched.	Health and "climate change" (and "New Zealand") OR Health climate change New Zealand OR Health "climate change" "New Zealand"
	Government agencies: Health New Zealand – Te Whatū Ora Te Aka Whai Ora – Māori Health Authority Ministry of Health – Manatū Hauora Ministry for the Environment – Manatū Mō Te Taiao Stats NZ The Treasury – Te Tai Ōhanga Ministry for Primary Industries – Manatū Ahu Matua	

Table 2 (continued): Database search strings for all grey literature electronic databases/websites used in the scoping review.

Category	Source	Search terms employed
Targeted websites (continued)	Government-adjacent (Crown research institutes, commissions): Accident Compensation Corporation (ACC) Climate Change Commission – He Pou a Rangi NIWA – Taihoro Nukurangi Health & Disability Commissioner – Te Toihau Hauora, Hauātanga	
	Non-governmental organisations: Public Health Association of New Zealand – Kāhui Hauora Tūmatanui o Aotearoa OraTaiao: New Zealand Climate and Health Council Royal Society Te Apārangi Community and Public Health – Te Mana Ora Climate Health Aotearoa	

It focusses on the climate change processes of concern to health, and who, where and what activities are most vulnerable.

A review protocol and search strategy—aligned to the PRISMA ScR checklist and registered with PROSPERO—assisted paper selection. The search strategy employed keywords (alongside their Boolean operators) (Table 1). These were developed with assistance from a discipline-specific University of Oxford librarian and were used to yield academic literature on 3 February 2024 in the following databases: Ovid Embase, Ovid Global Health, Ovid MEDLINE, Scopus and Web of Science (all databases), referenced in Appendix 1.

A wide interpretation of grey literature was adopted so that the review could include documents that are influenced by research but take an applied or policy focus.[7] Electronic grey literature databases, customised Google searches and searching (Table 2) comprised the grey literature search strategy. The websites and databases were selected through a process of keyword searching and consultation with experts.

Although common inclusion and exclusion criteria were applied (Table 3), selection processes differed. Academic literature was uploaded to and stored in Rayyan.ai. Rayyan.ai detected potential duplicates, which were then resolved and screened manually by two independent reviewers. Reviewers independently screened titles and abstracts, progressing to full-text review when necessary. Disagreements were resolved by consensus and, if needed, with supervisor input. The searching processes were further iterated for Google searches. Relying on relevancy filters—embedded into Google searching—the first 60 results were screened. The same two independent reviewers assessed relevance, resolving conflicts before inclusion.

The final step—backward and forward snowballing—was limited for grey literature due to the lack of comprehensive referencing within the selected papers themselves.[8] Two additional papers were subsequently identified, screened and added to the review.[9,10] Information was extracted inductively—as they organically emerge—from the selected papers into a combined spreadsheet, and then organised into results tables (Appendix 2). Narrative synthesis—based on the identification of themes that emerge through the organisation of the data—was used to collate, summarise and report the results.

Results

A total of 61 papers (n=61), were included in the final review, represented in Figure 1.

Table 3: Inclusion and exclusion criteria (population, intervention, comparison and outcome).

Inclusion criteria		**Exclusion criteria**
Category	**Criteria**	Papers not written in English were excluded. Material not available online was excluded. Interim and final grey literature material can be considered; with the interim report being excluded if both are available. Studies that only focus on tools, interventions, policies, recommendations, mitigation or adaptation strategies were excluded. Studies were excluded if they report on health impacts without a discussion on climate change or environmental consequences that are made more likely due to climate change. Literature published by international non-governmental organisations (e.g., World Health Organization, United Nations, Intergovernmental Panel on Climate Change) were excluded for their lack of specificity to Aotearoa New Zealand and where it was difficult to disambiguate data. News articles and book chapters were excluded for risk of bias.
Population	Human samples in Aotearoa New Zealand. This study covers the national general population in Aotearoa New Zealand (there are no demographic groups selected for).	
Intervention	Climate change–related weather events, including but not limited to global warming, extreme weather events, extreme heat, sea-level rise, flooding, extreme precipitation. Even where causation due to climate change has not yet been established, but climate change is considered “high likely”’ to be the cause, these papers were still considered.	
Comparison	N/A	
Outcome	All health impacts of climate change–related events, including infectious diseases, non-communicable diseases and mental illness are considered. A specific definition of health was not prescribed for this review. Studies will be included if they report on at least *one* health impact or consequence of climate change. Studies must clearly present the link between the health issue and the meteorological factor that has the potential to be modified by climate change, irrespective of the usage of the exact nomenclature (alternative terms such as global warming, extreme weather events, extreme heat, sea-level rise, flooding, extreme precipitation were considered).	
Other	No restrictions apply to the date of publication, given that a natural time boundary is created by anthropocentric climate change being a relatively recent known phenomenon. Research, reports, position papers, submissions, guidelines and recommendations published by government agencies and local non-governmental organisations, as well as unpublished theses or dissertations, were considered.	

Climate change processes of concern to health

Most papers included in the review specified particular climate change processes of concern to health (Figure 2).

Climate change–induced health outcomes

The direct and indirect health burden of climate change in Aotearoa New Zealand is wide ranging, from physical and mental health to social connectedness and access to—and delivery of—healthcare. However, heat-related illnesses and death associated to temperature changes, and enteric diseases, including water- and food-borne diseases, are impacts of great concern to Aotearoa New Zealand, as is access to safe drinking water and food supplies as well as health system impacts and access to healthcare services. The distinction between direct and indirect health outcomes in climate–health literature is somewhat immaterial in this review because of the broad categorisation of health outcomes, and the multiple potentially overlapping and interacting climate change processes that give rise to such health impacts. We have instead chosen to map these health outcomes against the associated climate change processes (Table 4).

Climate–health outcomes by demographic group

A growing body of evidence in Aotearoa New Zealand suggests that ethnicity, age, skin colour, occupation, gender, housing and living conditions, disability and existing health needs and socio-economic deprivation affect vulnerability to climate–health impacts.

The impact of climate change on health for tangata whenua (people born of the land/Indigenous people) was widely addressed by many papers included in the review.[14,47,54,59] Three reasons were commonly acknowledged: firstly, the inseparable ancestral relationship of tangata Māori with Te taiao (the environment), including whenua (land) and wai (water);[10,14,21,23,24,52,60] secondly, the existing inequitable burden of diseases and illness;[9,10,15,21,23,26,27,30,41,52,59,61] and lastly, disproportionate socio-economic deprivation.[12,14,15,19,21,23,26,27,52,59] Similar reasons were cited for the susceptibility of Pacific peoples in Aotearoa New Zealand.[10,12,30,52,61,62]

While there is growing concern that children experience greater anxiety due to climate change,[10,15,23,44,55,61] McBride et al.'s research states that there is no statistically significant evidence to support the view that psychological harm from climate concern is stronger in young people in Aotearoa New Zealand.[63] However, children are vulnerable to enteric and heat-related diseases and mortality due to immature thermoregulation.[15,17,18,32,51] At the other end of life, older adults are also identified as one of the key vulnerable groups in Aotearoa New Zealand due to heat-related illnesses and death.[9,15,16,25,38,51]

Pregnant women are vulnerable to rising temperatures.[15,17,18] During extreme weather or heat stress, disabled people and those with health needs reliant on life-support equipment may face limited support, communication and evacuation.[10,12,15,16,55] Specific health conditions including *“kidney diseases, diabetes, heart conditions, respiratory insufficiency, Parkinson’s disease, cancer and severe mental illness”*[17,18] and chronic cardio-respiratory conditions were specifically identified.[52]

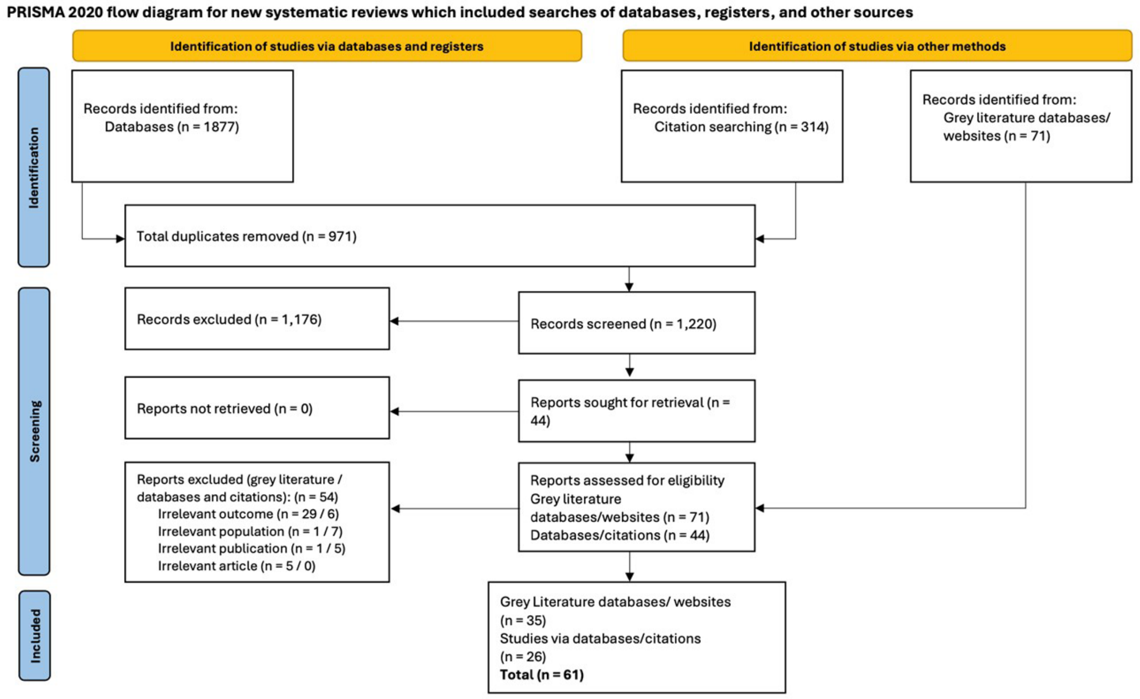
Socio-economic deprivation sits at the nexus of other demographic indicators of vulnerability that have been summarised in the review, including housing and living conditions, ethnicity and gender. Papers describe poverty as a cause of vulnerability in the face of climate–health impacts[9,19,26,27,52] and, equally, housing insecurity.[12,16–18,37,42,52]

Climate–health outcomes by geographic region

Coastal regions, large metropolitical areas, rural areas and regions experiencing disproportionate socio-economic inequity in Aotearoa New Zealand experience distinct climate–health impacts. Together, these regions encompass the majority of Aotearoa New Zealand (Figure 3). Coastal and flood-prone areas are vulnerable to sea-level rise and coastal inundation.[9,15,17,18,52] Six papers identified rural and remote farming communities as vulnerable to climate change.[9,10,19,23,52,61] Their sensitivity to extreme weather disrupts farming, social cohesion and income, impacting mental health.[19,23,61] Four papers highlighted risks for those relying on untreated or high-risk water supplies due to changes in water-borne diseases.[12,22,29,64] Large metropolitan areas—Christchurch and Auckland—already experience heat-related deaths, with 14 fatalities per year among adults over 65 when temperatures exceed 20 degrees Celsius.[38]

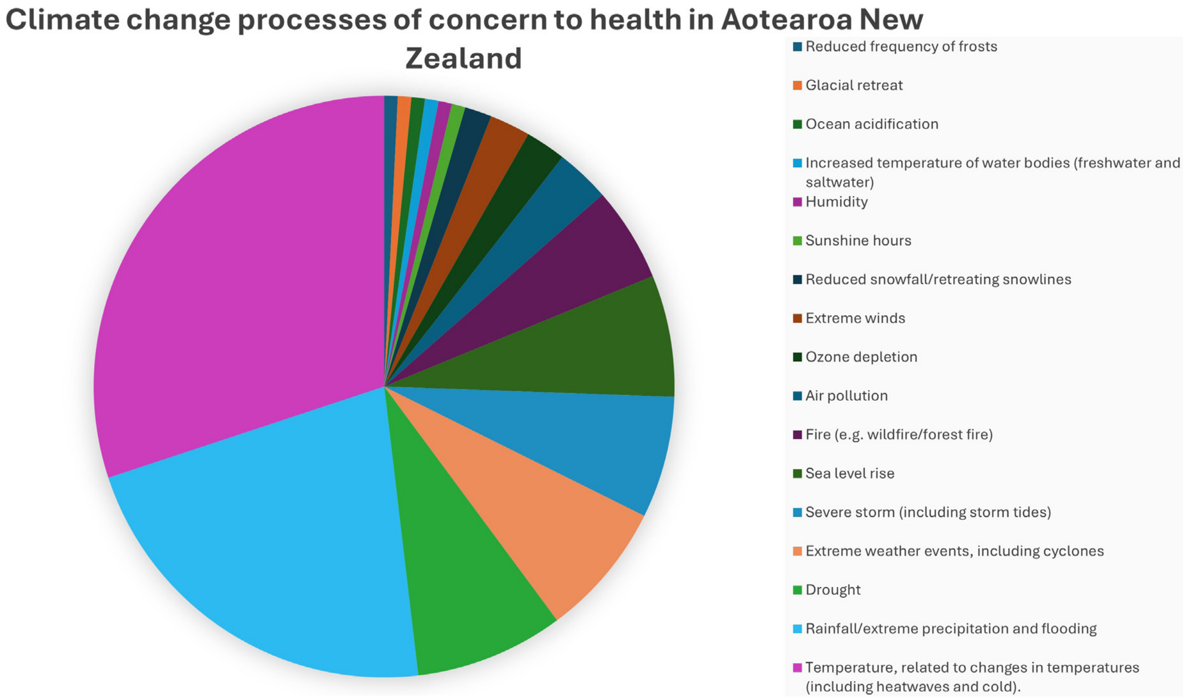
The review surfaced the complex interplay of existing geographic susceptibility with demographic characteristics of communities that can exacerbate existing vulnerability.

Figure 1: PRIMSA flow diagram.[11]



Adapted from: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Figure 2: Climate change processes of concern to health in Aotearoa New Zealand outlined in the reviewed literature.



NB: Percentages in the pie chart are based on the number of documents directly addressing the variable, not the perceived impact/incidence of the variable in relation to all the other variables.

Table 4: Climate change–induced health outcomes (direct and indirect) associated with climate change processes.

Climate change–induced health outcomes	Climate change processes associated with the outcome
Heat-related illnesses and death	• Temperature[9,12–28] • Air pollution[16]
Injury, accidents and illness from extreme weather events	• Temperature[15,22] • Extreme precipitation and flooding[16,26,27] • Extreme weather events[9,10,20] • Wildfire[26,27] • Severe storms[26,27]
Exposure to ultraviolet radiation/skin cancer	• Ozone layer depletion[12]
Enteric diseases, including water- and food-borne diseases	• Temperature[15,23,24,26,27,29–34] • Extreme winds[15,29] • Extreme precipitation and flooding[12,14,15,23,24,26,27,29,30,32,33,35] • Extreme weather events[10,15,24] • Wildfire[15] • Droughts[19,29] • Reduced snowfall/retreating snowlines[29] • Sea-level rise[29]
Vector-borne diseases	• Temperature[12,15,20,22,24,26,27,36–38] • Sea-level rise[37] • Extreme precipitation[15,20,26,27] • Extreme weather events[15,23,26] • Extreme winds[15] • Drought[15,23] • Wildfire[23]
Respiratory and allergic diseases	• Temperature[15–18,22,24,26,27,39] • Altered patterns of precipitation[39] • Extreme precipitation[15,24,26,27] • Extreme weather events[10,15] • Extreme winds[15] • Drought[15,40] • Air pollution[16] • Wildfire[24,40]

Table 4 (continued): Climate change–induced health outcomes (direct and indirect) associated with climate change processes.

Climate change–induced health outcomes	Climate change processes associated with the outcome
Diseases (non-specific, communicable and non-communicable)	• Temperature[12,15–19,41,42] • Humidity[42] • Extreme precipitation and flooding[15,19] • Extreme weather events[9,15,19,43] • Extreme winds[15] • Sea-level rise[15] • Drought[15] • Wildfire[15] • Air pollution[16]
Skin infections	• Extreme weather events[10]
Mental ill health, including climate anxiety and self-harm	• Temperature[15,26,27,34,37,38,44–46] • Water temperature[47] • Sea-level rise[15,21,24,26,27,37,47,48] • Ocean acidification[47] • Extreme weather events[10,15,19,20,21,23,26,27,49–52] • Extreme precipitation and flooding[15,21,48] • Extreme winds[15] • Drought[12,14,15,48,53] • Wildfire[15]
Access to safe drinking water and food supplies	• Drought[12,16,19,23,34,44,47] • Temperature[19,23,26,27,47,54] • Wildfire[47] • Extreme precipitation and flooding[16,19,26,27,44,54] • Sea-level rise[19,23,27,47] • Ocean acidification[26,47] • Water temperature[47] • Extreme weather events[10,19,23,25,27,50,52]
Health system impacts and access to healthcare facilities	• Temperature[15,55] • Storms[55] • Sea-level rise[15,25,56] • Extreme precipitation[15] • Extreme weather events[10,15,50,52] • Extreme wind[15] • Drought[15] • Wildfire[15]

Table 4 (continued): Climate change–induced health outcomes (direct and indirect) associated with climate change processes.

Climate change–induced health outcomes	Climate change processes associated with the outcome
Social networks, cohesion and inequality	• Temperature[34,37,55,57] • Severe storms[57] • Sea-level rise[15] • Extreme precipitation and flooding[15] • Extreme weather events[15,21] • Extreme wind[15]
Physical activity	• Temperature[14,15] • Extreme precipitation and flooding[15] • Extreme weather events[15] • Extreme winds[15] • Sea-level rise[15]
Assault/violence	• Temperature[21,58] • Extreme precipitation and flooding[15] • Extreme weather events[15] • Extreme winds[15]
Spiritual health	• Extreme weather events[10]

Northland[12,16,17,23,34,37] and Tairāwhiti[10,16,17,22,32,34,37] are susceptible to extreme weather events and temperature rise, alongside existing health, social and economic vulnerability. Despite their size differences, the median personal income of adults in Tairāwhiti (NZ$35,800), similarly to Northland (NZ$33,100), is markedly lower than the national median (NZ$41,500).[65] Both regions have significant Māori populations relative to size (54% and 37% in Tairāwhiti and Northland respectively). They are also regions with higher levels of vulnerable mobile populations and persisting health inequities.[37,66]

Climate–health outcomes by activity

The vulnerability of occupational and recreational activities was the least evidenced part of this review. Nonetheless, it underscores the significance of climate change for occupational health, which was the focus of three papers in the review.[28,49,52] Figure 4 presents a range of industry-related activities that are vulnerable to climate–health impacts.

Many of these industries are based outdoors, where workers are exposed to heat stress, air pollution and sun damage.[12,15,22] Farmers are vulnerable to stress and poor mental health mediated through impacts to stock health following severe weather events.[52] Healthcare workers and first responders are susceptible to stress, burnout, abuse and poor occupational environments through response efforts.[10] Overall, this review reveals a critical research gap in our understanding of the structural conditions shaping occupational exposure and risk.

Discussion

Drawing on the Helldén et al. framework, this scoping review provides a contextual adaptation to the Aotearoa New Zealand context (Figure 5).[5]

This review did not prescribe a definition of health, allowing it to be interpreted from multiple perspectives. As identified, these ranged from disease, injury and mortality to a spectrum of mental health impacts. Health was also understood

Figure 3: Map of geographic areas vulnerable to climate–health impacts in Aotearoa New Zealand (excluding general urban and rural areas).

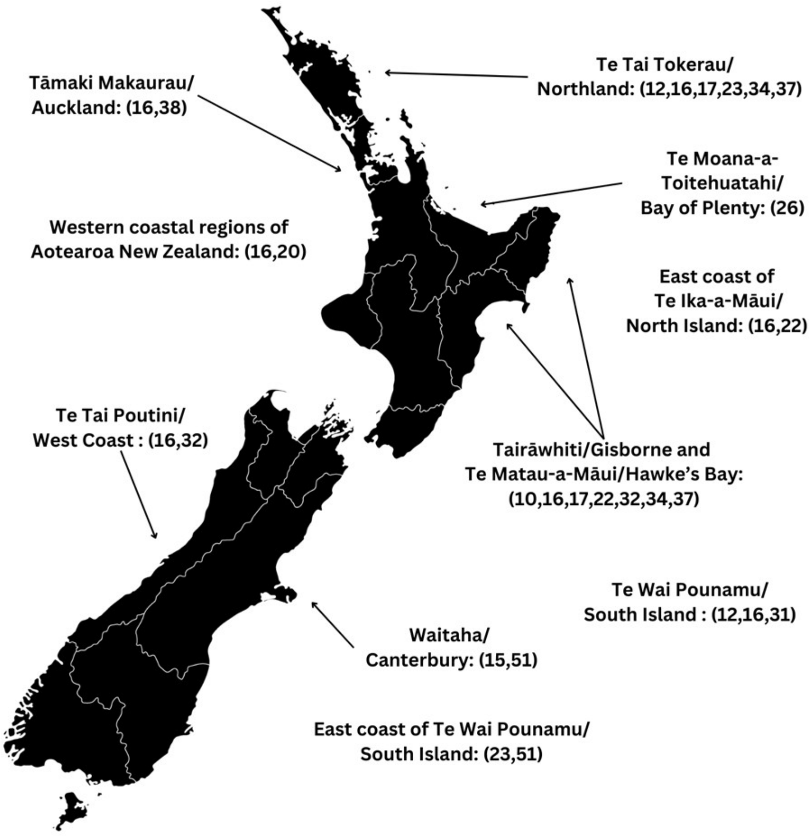


Figure 4: Industries vulnerable to climate change–induced health impacts in Aotearoa New Zealand outlined in the reviewed literature.

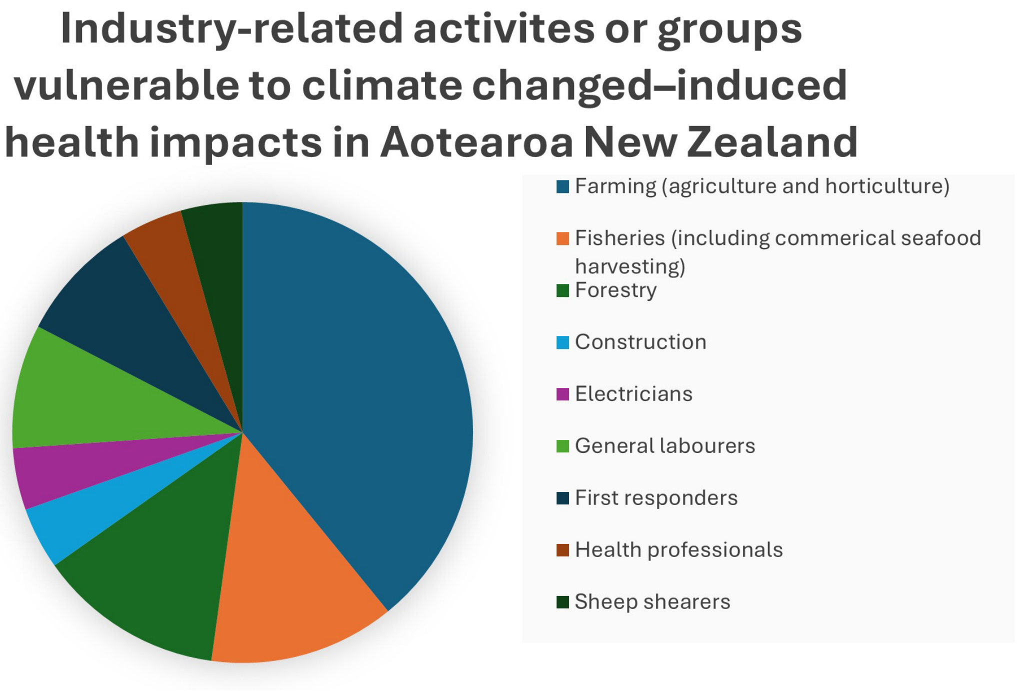
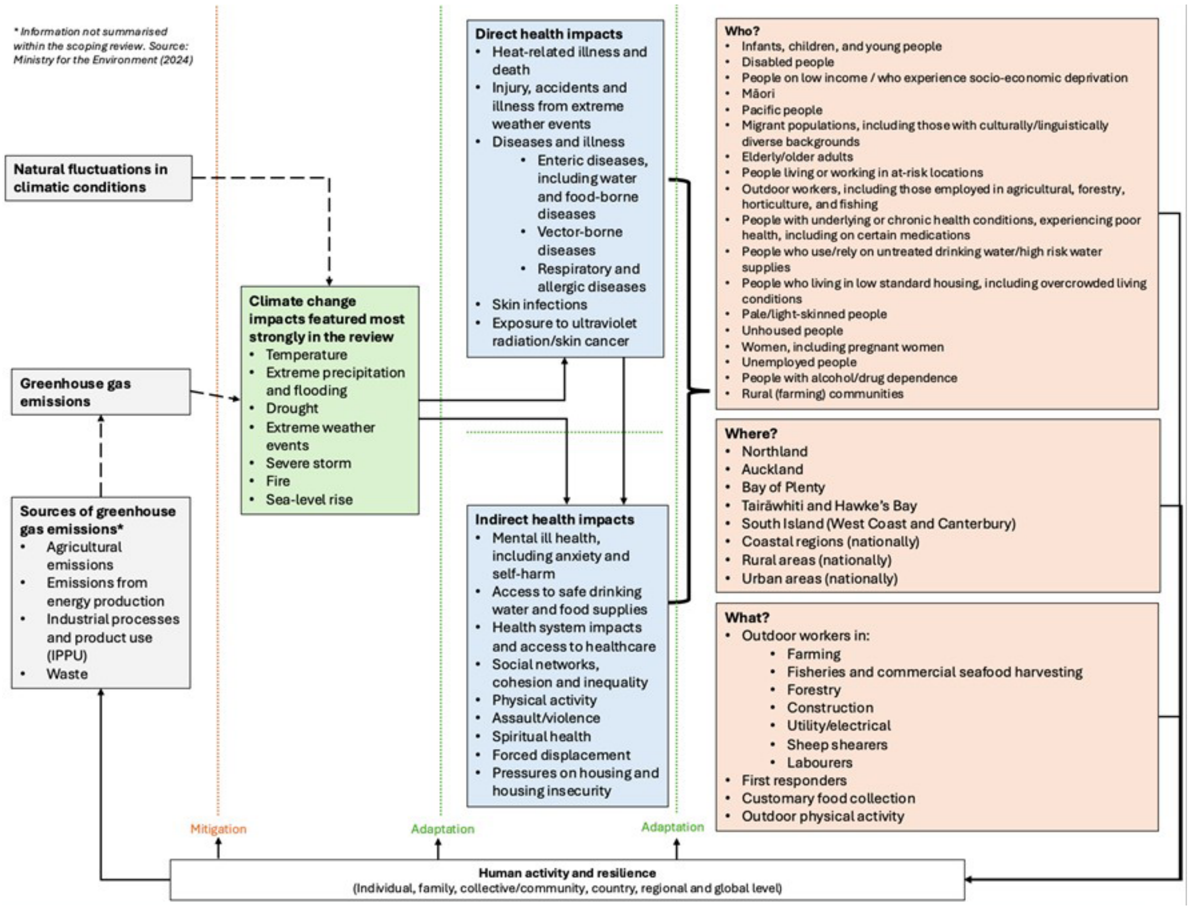


Figure 5: Summary diagram adapted from Helldén et al.[5]



spiritually, shaped by ancestral ties to whenua—such as the inability to return for tangihanga (funerals) or burials at urupā (cemeteries)—disrupted by climate-induced extreme weather.[10,19,47] Furthermore, health was also framed defined by economic and social determinants: forced displacement, food, water and housing insecurity and impact to social networks, cohesion and inequity. These social and economic determinants of health were portrayed as core elements of health in their own right[15,34,55,57] and as prerequisites, causes or symptoms of mental or physical health.[14,67] In this sense, health was commonly described collectively, with reference to public infrastructure, facilities, community belonging[15] and social cohesion.[55,57] Health was also qualified by inequity[15,24] and through violence and conflict.[15,21,34,58] These findings show that climate change creates complex pressures that disproportionately affect marginalised groups. Furthermore, the impacts of climate change on physical and mental health are potentially exacerbated by community-level impacts of climate stressors.[68]

Overwhelmingly, the papers in the review identified the harm of climate–health impacts. Few papers identified that there could be positive impacts arising from climate change. Examples include a reduction in cold temperatures, which could see a reduction in influenza and winter illness; reduced food insecurity, allowing crops to grow in previously unsuitable conditions; and warmer temperatures encouraging greater physical activity.[15,16,47] However, there is no existing quantifiable evidence in Aotearoa New Zealand to support these claims, so further work is needed to understand how these potential benefits can be measured and realised to support action on climate change and eliminating health inequities.

As presented in Table 4, the review also highlighted how direct and indirect health outcomes are impacted by a multiplicity of climate change processes. For example, vector-borne diseases, including dengue, Ross River virus and *P. falciparum* malaria are associated with changing temperatures, sea-level rise, extreme weather events and extreme precipitation to name a few. Although such vectors are not currently endemic in Aotearoa New Zealand, the review identified that changing climatic conditions could mean these vectors become domestically established.

One benefit of this form of review is that it highlights connection and overlap between discrete parts of the literature. For example, by reviewing the literature firstly by climate change processes, then activity, geography and demography, we can begin to see the intersectionality of the evidence relating to climate–health impacts in Aotearoa New Zealand. Rooted in critical and feminist theoretical traditions, intersectionality values understanding embedded social structures and power.[69] It emphasises that vulnerability is not attributable to a single cause, but a network of interconnecting and dynamic considerations.[69] Through this perspective we can begin to expose the connection and power relationships underpinning the vulnerabilities that this review has surfaced. This is important because—as this review demonstrates—climate change comprises many different, albeit connected, processes and events that threaten all aspects of health, including compounding health and relating inequities that already exist.[59]

This review has some limitations. Overall, the literature reviewed is fairly limited, with significant gaps. Papers varied substantially in their methodologies and protocol—including some grey literature reports that did not provide a protocol—which increases the heterogeneity of the review. This lack of uniformity required a more interpretive approach to synthesising the findings. The review did not consider articles that were not available online. This would have considerably changed the scope and search strategy of the review, likely requiring a larger team of contributors. While the use of Rayyan.ai in this review gives rise to the potential for significant limitations in the rigor of the review, the software was simply used by multiple reviewers to store and manually sort the papers that were extracted from academic databases.

The exclusion of Intergovernmental Panel on Climate Change or similar organisational reports because of their lack of national specificity could be interpreted as a limitation of this review; however, the findings of this review are consistent with them and do not raise additional novel substantive content. Similarly, the decision to use only the term “climate change” when searching grey literature, rather than incorporating alternative terms commonly used in academic literature, may have limited the scope of the material identified. However, this choice was made for pragmatic reasons due to the limited search functionalities of grey literature platforms.

The review also excluded adaptations or solutions to climate–health impacts. Considered in isolation, this review runs the risk of deficit framing, which has the potential to entrench and recirculate negative and disempowering perspectives of vulnerability within marginalised communities. The absence of quality or risk of bias assessment(s) in scoping reviews gives rise to the potential for a degree of uncertainty in the accuracy of the evidence synthesised. While Pourzand et al. have successfully scoped adaptation policy in Aotearoa New Zealand related to climate change and health, a review that comprehensively summarises impacts and solutions would be of great benefit.[70] Equally, narrowing a review to focus on demographic characteristics—ethnicity, gender and age—would be helpful to understand the nuance within climate-vulnerable groups in Aotearoa New Zealand.

Undeniably, attribution—linking climatic events to climate change, and in turn to associated health impacts—is one of the most significant challenges of this research field, as well as policy, economic and social responses. The challenge of attribution does not refute the unequivocal determination that climate change is anthropogenic, nor the need for concerted action, but it does influence—made apparent through this review—the type and distribution of the research that has been conducted into climate–health impacts to date, including the critical research gap in the area of climate change impacts to occupational health in Aotearoa New Zealand.

Conclusion

This review contributes to the existing literature on the impact of climate change on health in Aotearoa New Zealand and summarises the climate change–induced health outcomes relevant to Aotearoa New Zealand, focussing on who and where is affected and what activities are at risk. While there is an expanding body of international evidence on climate change and health, the 61 papers addressing this nexus in Aotearoa New Zealand since 2001—of which 35 are grey literature—highlight growing national concern for this issue. Understanding the specificities of the Aotearoa New Zealand context is crucial to ensuring that responses to climate change–induced health impacts are responsive to intersectionality, complexity, structural drivers and lived experience, as this review has revealed.

Notes

The term Aotearoa New Zealand is used throughout this paper, and in the search terms of this review. Aotearoa is the Indigenous, Māori term for New Zealand. Written together as Aotearoa New Zealand it refers to the contemporary nation.

COMPETING INTERESTS

This work was supported in part by the Rhodes Trust. ILI received support to attend: Global Bioethics Forum on Global Health Conference in Malaysia, 2024; Climate Health and Sustainable Health Care Conference in Wellington. ILI is an Executive Committee Member of Ora:Taiao: New Zealand Climate and Health Council. SRW reports support from Health Research Council grants 24/458, 24/399 for this manuscript. SRW received support to attend: Ōtākou Whakaihu Waka conference scholarship. SRW is a Co-convenor of Ora:Taiao: New Zealand Climate and Health Council.

ACKNOWLEDGEMENTS

We acknowledge the essential help of Eli Harriss, Bodleian Health Care Libraries, University of Oxford, United Kingdom, with search strategies, choice of databases and use of reference and systematic review management software. Te reo Māori translations are sourced from Te Aka Māori Dictionary.

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Appendix 1

Appendix 1: Database search strings for all academic literature electronic databases used in the scoping review with number of results.

Ovid Embase (1974 to present)
1 exp climate change/(63682) **2** ("climate change" or "climate warming" or "climatic change" or "global warming" or "extreme weather events" or "sea level rise" or "extreme heat" or flooding or "extreme precipitation").ti,ab,kf. (86184) **3** "global heating".ti,ab,kf. (67) **4** 1 or 2 or 3 (108438) **5** (health or wellbeing or well-being or "social determinants" or hauora).mp. (5383158) **6** New Zealand/(65693) **7** ("New Zealand" or Aotearoa or Maori).ti,ab,kf. (85148) **8** 6 or 7 (113035) **9** 4 and 5 and 8 (195) **10** limit 9 to English language (195)
Ovid Global Health (1973 to 2024 week 5)
1 exp climate change/(14466) **2** ("climate change" or "climate warming" or "climatic change" or "global warming" or "extreme weather events" or "sea level rise" or "extreme heat" or flooding or "extreme precipitation").ti,ab. (19855) **3** "global heating".ti,ab. (22) **4** 1 or 2 or 3 (21951) **5** (health or wellbeing or well-being or "social determinants" or hauora).mp. (1440852) **6** exp New Zealand/(14627) **7** ("New Zealand" or Aotearoa or Maori).ti,ab. (16006) **8** 6 or 7 (18493) **9** 4 and 5 and 8 (84) **10** limit 9 to English language (82)
Ovid MEDLINE (Ovid MEDLINE® epub ahead of print, in-process & other non-indexed citations, Ovid MEDLINE® Daily and Ovid MEDLINE®) 1946 to present)
1 exp climate change/(31838) **2** ("climate change" or "climate warming" or "climatic change" or "global warming" or "extreme weather events" or "sea level rise" or "extreme heat" or flooding or "extreme precipitation").ti,ab,kf. (87797) **3** "global heating".ti,ab,kf. (76) **4** 1 or 2 or 3 (94466) **5** (health or wellbeing or well-being or "social determinants" or hauora).mp. (3836644) **6** New Zealand/ (44787) **7** ("New Zealand" or Aotearoa or Maori).ti,ab,kf. (65684) **8** 6 or 7 (84217) **9** 4 and 5 and 8 (106) **10** limit 9 to English language (106)
Scopus
(TITLE-ABS-KEY (("climate change" OR "climate warming" OR "climatic change" OR "global warming" OR "extreme weather events" OR "sea level rise" OR "extreme heat" OR flooding OR "extreme precipitation" OR "global heating")) AND TITLE-ABS-KEY (health OR wellbeing OR well-being OR "social determinants" OR hauora) AND TITLE-ABS-KEY ("new zealand" OR aotearoa OR maori)) AND (LIMIT-TO (LANGUAGE , "english"))

Appendix 1 (continued): Database search strings for all academic literature electronic databases used in the scoping review with number of results.

Web of Science (ALL)
“climate change” or “climate warming” or “climatic change” or “global warming” or “extreme weather events” or “sea level rise” or “extreme heat” or flooding or “extreme precipitation” or “global heating” (Topic) and health or wellbeing or well-being or “social determinants” or hauora (Topic) and “New Zealand” or Aotearoa or Maori (Topic) and Preprint Citation Index (Exclude – Database) and English (Languages)

Work satisfaction, stress and burnout in New Zealand ophthalmologists: a comparison of public hospital and private practice

Theodore A Sutedja, Verona E Botha, Elizabeth A Insull

ABSTRACT

AIM: In New Zealand, ophthalmologists encounter varying degrees of work stress, job satisfaction and burnout. Significant clinical demands, long work hours and high-pressure responsibilities increase the likelihood of burnout in this specialty. The present study aims to examine differences in ophthalmologists' work stress, job satisfaction and burnout across public hospital and private practice settings.

METHOD: A cross-sectional quantitative study was conducted using a modified Mini Z 2.0 Burnout Survey to assess workplace satisfaction, stress and burnout among 171 New Zealand ophthalmologists. Demographic and practice-related data were also collected.

RESULTS: Out of 161 delivered surveys, 84 responses were received (52% response rate). Among respondents, 84.5% had public sector roles and 81% worked in the private sector. Twenty-one percent of public sector ophthalmologists reported a joyous workplace (Mini Z score ≥30) compared with 75% in the private sector. Public sector clinicians reported significantly higher burnout symptoms, stress levels and workplace disorder, as well as poorer workload control and misalignment with leadership, compared with their private sector counterparts.

CONCLUSION: The study highlights substantial disparities in job satisfaction and burnout between ophthalmologists working in the public and private sector. Factors such as excessive workload, bureaucratic inefficiencies and limited resource allocation in the public sector contribute to these differences. Adoption of private sector practices, including improved administrative support and autonomy, as well as public–private partnerships, may enhance retention and wellbeing in the public system.

Burnout is a psychological syndrome that results from chronic workplace stress, characterised by emotional exhaustion, depersonalisation and a reduced sense of personal accomplishment.[1] Ophthalmologists, like other healthcare professionals, are susceptible to burnout due to high workloads, long hours and the emotional toll of patient care. Despite being viewed as a highly desirable specialty,[2–4] several studies have shown that at least 25% of ophthalmologists report experiencing burnout, which negatively impacts both their mental health and the quality of care they provide to patients.[4–8]

Ophthalmology services in New Zealand are delivered across both the public and private sectors, with government-funded public hospitals and privately run practices providing patient care. The public health system, Health New Zealand – Te Whatu Ora, provides essential healthcare services to all New Zealanders, ensuring equitable access regardless of financial status. However, the public sector is often constrained by annual budget allocations, resulting in long waitlists and resource limitations.[9–11] Public ophthalmologists manage a wide range of cases, including complex trauma, acute eye conditions and emergency treatments, in addition to subspecialty and multidisciplinary work. They also play a key role in registrar training, providing hands-on supervision and contributing to clinical education. Additionally, their responsibilities extend to participation in the on-call acute roster, further increasing their workload. Despite these demands, the public healthcare system provides valuable opportunities for professional growth, including access to continuing medical education funding and dedicated leave, supporting ongoing career development and advancement.

In contrast, private practices offer more timely access to care, funded either directly out of pocket, through private health insurance—held by approximately 37% of New Zealanders as of 2022[12]—or by Accident Compensation Corporation (ACC) claims. Private practitioners maintain greater autonomy over their workload and patient intake, with a focus on elective procedures, routine follow-ups and non-urgent care.[9,11] This distinction in practice environments has a direct impact on job satisfaction, with public sector clinicians often facing higher stress and burnout risks due to workplace pressures, while private practitioners benefit from greater flexibility in managing their clinical responsibilities.[9–11,13]

As of 2023, there were 175 Medical Council of New Zealand (MCNZ) vocationally registered ophthalmologists serving a population of about 5.1 million people.[14] This equates to roughly 34 ophthalmologists per 1,000,000 people.[14,15] Compared with other high-income countries such as Japan, Switzerland, Australia and the United States, where the ophthalmologist-to-population ratios range from 40 to 114 per million population, New Zealand's ratio of 34 per million is one of the lowest.[16] Of the 175 ophthalmologists, 47.4% primarily worked within the public sector, 48.9% primarily in the private sector and the small remainder were within academic or government departments.[14]

Method

A cross-sectional quantitative study design was utilised to address the study objectives. At the start of the study, 171 MCNZ-registered ophthalmologists were identified as eligible participants.

The primary outcome was assessed using a modified version of the Mini Z 2.0 Burnout Survey, a validated tool developed by the American Medical Association to measure workplace satisfaction, stress, burnout and their associated risk factors. This survey has been validated against the Maslach Burnout Inventory.[17,18] The original Mini Z survey consists of 10 items scored on a five-point Likert scale and evaluates key workplace factors, including job satisfaction, stress levels, burnout symptoms, workload control, alignment of professional values with organisational leadership, teamwork efficiency, administrative time pressure and workplace disorder. For this study, minor modifications were made to the survey by combining documentation, electronic medical record (EMR) use and EMR proficiency into a single category labelled "administrative time". This adjustment was necessary as EMR use is not uniformly implemented across all New Zealand regions, rendering it less applicable to the study population. A total Mini Z score of ≥30 (out of 40) was used to define a joyful work environment.

Responses from the five-point Likert scale were transformed into binary variables. Positive responses (e.g., strongly agree and agree) were grouped together, while neutral and negative responses (e.g., neither agree nor disagree, disagree and strongly disagree) were similarly categorised.

In addition to the Mini Z survey, demographic data were collected, including gender, age, subspecialties and years of experience within the specialty. Further practice-related demographics were also captured, such as full-time equivalence, work location, specialty and certification status and presence of registrars.

Data were collected using an anonymous SurveyMonkey survey. (Symphony Technology Group, 2017, trademark SURVEYMONKEY®). Email addresses were collected only for survey distribution, and responses were de-identified.

A reminder email was sent 2 weeks prior to the survey's closure, with the survey remaining open for a total of 6 weeks, from 11 November 2024 to 25 December 2024.

Statistical analyses were conducted using Mann–Whitney U test to compare the Mini Z survey responses between ophthalmologist working in the public and private sectors. Single logistic regression was used to estimate odds ratio (OR). A p-value <0.05 was considered statistically significant.

The study has been evaluated by the New Zealand Health and Disability Ethics Committee and deemed not to require ethics approval.

Results

A total of 171 questionnaires were distributed; 10 were undeliverable due to invalid email addresses, resulting in 161 successfully delivered surveys. Of these, 84 responses were received, an overall response rate of 52.0%.

Among the 84 respondents, 53 (63.1%) worked across both public and private sectors, while 18 (21.4%) were exclusively in the public sector and 13 (15.5%) exclusively in the private sector. Given that most respondents had experience in both sectors, the analysis focussed on comparing their experiences rather than categorising them into exclusive groups.

The demographic characteristics of ophthalmologists working in the public and private sectors, along with the number and percentage achieving a Mini Z score of ≥30, indicative of a joyful workplace, are summarised in Table 1.

Table 1: Demographic and practice characteristics of ophthalmologists working in the public and private sectors, and rate of a joyful workplace.

Demographics		Public, N (%)	Joyful workplace (≥30), N (%)	Private, N (%)	Joyful workplace (≥30), N (%)
Total		71	15 (21.1)	68	51 (75)
Sex	Male	56 (79)	14 (25)	55 (81)	34 (79.1)
	Female	15 (21)	1 (6.7)	13 (19)	21 (77.8)
Age	30–39	7 (10)	1 (14.3)	5 (7)	2 (40)
	40–49	22 (31)	5 (22.7)	21 (31)	16 (76.2)
	50–59	28 (40)	6 (21.4)	30 (44)	23 (76.7)
	60–69	13 (18)	3 (23.1)	11 (16)	9 (81.8)
	70+	1 (1)	0	1 (1)	1 (100)
Years worked	<5	6 (8)	0	5 (7)	1 (20)
	5–9	11 (16)	4 (36.4)	10 (15)	10 (100)
	10–15 years	16 (23)	2 (12.5)	14 (21)	11 (78.6)
	>15	38 (54)	9 (23.7)	39 (57)	29 (74.4)
Workload	0.1–0.49 FTE* (4–20 hours per week)	28 (40)	9 (32.1)	17 (25)	12 (70.6)
	0.5–0.79 FTE (20–32 hours per week)	27 (38)	3 (11)	40 (59)	31 (77.5)
	0.8–0.99 FTE (32–40 hours per week)	13 (19)	3 (23.1)	8 (12)	5 (62.5)
	More than 1.0 FTE (40+ hours per week)	3 (4)	0	3 (4)	3 (100)
Specialty	General ophthalmologist	18 (25)	5 (27.8)	16 (24)	19 (73.1)
	Subspecialist	53 (75)	10 (18.9)	52 (76)	35 (81.4)
Workplace	Urban	46 (65)	7 (15.2)	46 (68)	34 (77.3)
	Regional*	25 (35)	8 (32)	22 (32)	17 (73.9)
Certification	RANZCO*	53 (75)	10 (18.9)	55 (81)	42 (76.4)
	IMG*	18 (25)	5 (27.8)	13 (19)	9 (69)

Table 1 (continued): Demographic and practice characteristics of ophthalmologists working in the public and private sectors, and rate of a joyful workplace.

Registrar presence	No	2 (3)	2 (25)	13 (19)	4 (66.7)
	Non-training registrars only*	8 (11)	0	6 (9)	9 (69.2)
	Training registrars only*	9 (13)	3 (33.3)	7 (10)	6 (85.7)
	Training and non-training registrars	52 (73)	10 (19.2)	42 (62)	32 (76.2)

FTE = full-time equivalent; RANZCO = Royal Australian and New Zealand College of Ophthalmologists; IMG = international medical graduate.
Regional centres refer to locations outside the major urban cities of Auckland, Hamilton, Wellington, Christchurch and Dunedin.
Non-training registrars = not enrolled in the official RANZCO training programme. Training registrars = enrolled under the official RANZCO training programme.

Figure 1: Comparison of mean scores on Mini Z survey items based on workplace experience in the public versus private sectors. Respondents reported greater job satisfaction, stronger alignment of professional values with organisational leadership, improved teamwork efficiency and better time management for administrative tasks when working in the private sector compared with the public sector. Additionally, they reported lower levels (reflected by higher Mini Z survey scores) of stress, burnout symptoms and workplace disorder. The difference in these mean scores is statistically significant.

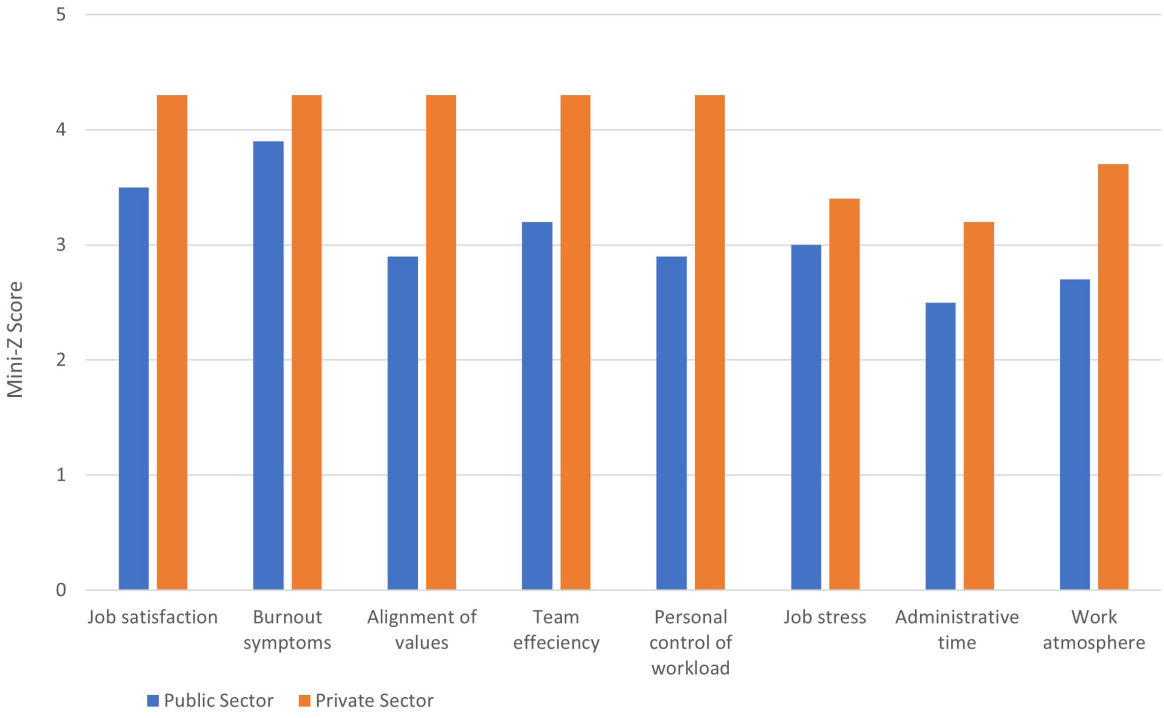

Table 2: Comparison of categorised items on the modified Mini Z survey between public and private sector ophthalmologists.

Survey item (response)	**Public, n (%)**	**Public mean score**	**Private, n (%)**	**Private mean score**	**Odds ratio[a]**	**P-value**
Overall	71 (100)		68 (100)			
Satisfaction with current job (agree or strongly agree)	44 (62)	3.5	64 (94.1)	4.3	0.11	0.01
Burnout symptoms (present to severe)	14 (19.7)	3.9	3 (4.4)	4.3	5.42	0.03
Values aligned with those of management leaders (agree or strongly agree)	21 (29.6)	2.9	62 (91.2)	4.3	0.04	0.01
My team works efficiently together (satisfactory to optimal)	55 (77.5)	3.2	66 (97.1)	4.3	0.09	0.01
Personal control of workload (poor or minimal)	25 (35.2)	2.9	3 (4.4)	4.3	2.66	0.01
Feeling a great deal of stress (agree or strongly agree)	18 (25.4)	3	12 (17.6)	3.4	2.06	0.05
Sufficient time for documentation and administrative work (poor or marginal)	33 (46.5)	2.5	14 (20.6)	3.2	3.71	0.01
Work atmosphere (chaotic or trending towards chaotic)	36 (50.7)	2.7	6 (8.8)	3.7	6.92	0.01
Summary score ≥30 (joyful workplace)	15 (21.1)	24.8	51 (75.0)	31.7		

[a] Odds ratio from single logistic regression models, with public ophthalmologists as the comparison group.

Overall, a total of 71 (84.5%) respondents had roles within the public sector, of whom 15 (21.1%) achieved a Mini Z score of ≥30, reflecting a joyful workplace. In contrast, a total of 68 (81.0%) worked in the private sector, of whom 51 (75.0%) achieved a Mini Z score of ≥30.

Ophthalmologists reported distinct experiences when working in public versus private settings, with higher scores across all Mini Z items seen in the private sector: job satisfaction, stress levels, burnout symptoms, workload control, alignment of professional values with organisational leadership, teamwork efficiency, administrative time pressure and workplace disorder (Figure 1). Logistic regression analysis, using public sector work experience as the reference group (Table 2), identified statistically significant differences across all Mini Z survey items (P<.05).

While 62.0% of ophthalmologists reported job satisfaction when working in the public sector, only 21.1% characterised their workplace as joyful. In contrast, 94.1% of ophthalmologists working in the private sector reported job satisfaction, with a significantly higher 75.0% describing their workplace as joyful.

Burnout symptoms were noted in 19.7% of ophthalmologists working in the public sector, significantly higher than the 4.4% observed in private practice. Similarly, 25.4% of ophthalmologists working in the public sector reported experiencing a great deal of stress, compared with 17.6% in the private sector.

Although 77.5% of ophthalmologists working in the public sector reported efficient teamwork, 50.7% described their work environment as chaotic or trending towards chaos. By contrast, 97.1% of those working in the private sector noted efficient teamwork, with only 8.8% characterising their workplace as chaotic. Ophthalmologists working in the public sector also reported significantly poorer alignment of personal values with leadership (OR 0.04), worse control over workload (OR 4.3) and less time for administrative tasks (OR 3.7) compared with working in the private sector.

Discussion

New Zealand ophthalmologists report notable differences in their working environment between the public and private sectors, with working in the public sector being perceived as significantly less joyful. This aligns with existing literature indicating that other New Zealand healthcare specialists, including radiologists, oncologists and psychologists, within the public system face challenges that increase their susceptibility to work dissatisfaction and burnout.[9–11] Key contributors include excessive workloads, bureaucratic inefficiencies and the added pressures of political and administrative constraints.[13,19,20]

Public hospitals are essential in providing equitable access to ophthalmic care, regardless of financial status. However, resource limitations and growing patient demand place considerable strain on the public sector workforce. Ophthalmologists must manage heavy caseloads, on-call responsibilities and the additional duty of training junior staff, contributing to significant occupational stress. These cumulative pressures heighten the risk of burnout, reduce job satisfaction and diminish workplace enjoyment. This aligns with existing evidence identifying excessive workload as a major contributor to burnout among ophthalmologists.[5–7]

In addition to workload pressures, ophthalmologists working in the public sector frequently face inequities in resource allocation.[13,15,19] Performance targets set by hospital organisational leaders, such as increasing clinic capacity to decrease patient backlog, often fail to account for the severity of patients’ conditions.[21,22] As a result, similar time and resources are allocated to both low- and high-severity cases, creating inefficiencies in care delivery. Clinicians often need to dedicate additional time and attention to complex cases, which limits their ability to address the needs of other patients—a challenge that is frequently overlooked by hospital leaders.[20] This imbalance forces ophthalmologists in the public sector to work longer hours to meet demand, often without adequate remuneration. The resulting misalignment of values between clinicians and hospital leadership further exacerbates the strain on public sector ophthalmologists, impacting both their job satisfaction and wellbeing.[13,20,23]

Unlike public hospitals, private practices provide ophthalmologists the opportunity to serve as their own organisational leaders. This autonomy allows for greater control over workload and patient volumes, facilitating a more manageable balance between clinical responsibilities and personal wellbeing.[5,6,9–11,20]

Administrative tasks present a challenge for ophthalmologists, particularly in public hospitals, where bureaucratic inefficiencies are frequently encountered. These tasks, including extensive documentation, triaging referrals, conducting audits and frequent departmental meetings, consume significant clinical time and are a reported source of frustration.[5,6,24] Although intended to enhance workplace performance and team cohesion, many senior clinicians perceive them as excessive or unnecessary, thereby increasing job stress and contributing to burnout.[13,19] In contrast, ophthalmologists in private practice benefit from more efficient systems and a higher level of administrative support, allowing the delegation of non-clinical responsibilities. This redistribution significantly alleviates the administrative burden,[13] highlighting the importance of streamlined processes in mitigating stress and enhancing job satisfaction in private practice settings.

Implications

Our study indicates that nearly one in five ophthalmologists in the public sector report symptoms of burnout, reflecting a substantial workforce burden. With an ageing population and increasing demand for eye care services, this prevalence is expected to rise in the absence of targeted interventions. Adding to this concern is the perception that public healthcare sectors are less desirable workplaces, prompting many ophthalmologists to transition to private practice. A 2022 survey by the Association of Salaried Medical Specialists revealed that 15.5% of health professionals were reducing their public workloads to increase private practice hours.[25] This shift was largely driven by dissatisfaction with remuneration, the desire for greater control over workload and scheduling and higher clinical satisfaction—all of which, as this study demonstrates, are more favourable in private practice.

As the demand for eye care continues to grow, ensuring that the ophthalmology workforce is adequately prepared to meet these challenges is critical. While ophthalmology remains a desirable specialty among medical students and junior doctors,[2–4] workforce projections indicate a concerning decline. Despite a retention rate of 71%, with approximately two-thirds of New Zealand-trained ophthalmologists remaining in the country (26), the ophthalmologist-to-population ratio is projected to decrease from 34 to 30.6 per million by 2050, marking a 9.8% reduction.[14] These workforce challenges underscore the urgency of addressing workplace factors that influence job satisfaction and burnout in the public sector.

The findings of this study highlight key strategies that could improve the public sector's appeal and retain ophthalmologists. Public hospitals could adopt best practices from private practice, such as delegation of administrative processes, minimising unnecessary bureaucratic burdens (e.g., excessive reports, audits or mandatory meetings that do not directly impact patient care) and granting ophthalmologists greater autonomy over their work.

Public–private partnerships (PPPs) offer another potential strategy for enhancing ophthalmic care delivery by integrating private sector capacity with government-funded healthcare systems. These collaborative agreements aim to improve service efficiency, optimise resource utilisation and support workforce distribution.[27–29] By enabling clinicians to work across both sectors and facilitating publicly funded procedures in private settings, PPPs can help alleviate pressure on public hospitals and improve job satisfaction and retention within the public system. However, without proper oversight, PPPs may exacerbate health inequities by prioritising insured patients and fostering a profit-driven model that increases healthcare costs and strains public resources.[27–29] To maximise benefits while minimising risks, PPPs must be structured with transparency, equitable access and a patient-centred approach.

Limitations and suggestions for future research

Like all voluntary self-report surveys, our research is subject to non-response biases that can influence both the data collected and their interpretation.[30] Non-response bias could result in the underestimation of stress or burnout if affected ophthalmologists were less likely to participate. Nevertheless, the response rate of 52% aligns with similar studies,[6–8] supporting the representativeness of the findings. Additionally, self-reported data are inherently prone to reporting bias, as participants may exaggerate or downplay their experiences due to factors such as social desirability or recall limitations.

Future research could include longitudinal studies to evaluate the long-term effects of workplace interventions on job satisfaction and burnout among ophthalmologists. Additionally, further studies may offer deeper insights into the unique challenges across different workplace sectors, providing a clearer understanding of the factors influencing satisfaction, stress and burnout. An upcoming study is currently assessing the impact of various workplace factors on burnout, specifically addressing these raised questions.

Conclusion

This study identifies significant disparities in job satisfaction, stress and burnout of ophthalmologists working in New Zealand's public and private sectors. Those working in the public sector face notable challenges, including heavier workloads and bureaucratic inefficiencies, whereas those working in private benefit from greater autonomy, administrative support and better organisational structures. Integrating key strategies from the private sector, including competitive remuneration, enhanced workload management, flexible scheduling and strategic implementation of PPPs, may help improve job satisfaction and retention within the public sector. These findings have broader implications for workforce planning, recruitment and retention of ophthalmologists and other health professionals, both in New Zealand and in public health systems worldwide.

COMPETING INTERESTS

This project is funded through a STONZ research grant.
VEB reports roles in the RANZCO Executive Committee, ANZSOPS Executive Committee and the RANZCO NZ Workforce Committee.
EAI is the RANZCO NZ Chair and a Shareholder and Senior Partner at Eye Institute.

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https://nzmj.org.nz/journal/vol-138-no-1623/work-satisfaction-stress-and-burnout-in-new-zealand-ophthalmologists-a-comparison-of-public-hospital-and-private-practice

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Eating disorders on medical wards: breaching clinical standards, patient rights and scopes of practice

Cindy Towns, Vuk Sekicki, Kay Hodgetts, Phillipa Shirtcliffe, Chris Cameron, Cathal McCloy, Chris Giedt, Nicolien Lourens, Sonya Burgess

Eating disorders (EDs) are psychiatric disorders with high morbidity and mortality. Their management is complex and requires specialist care. There is a lack of ED units in New Zealand and hence people with EDs are frequently defaulted to general medical wards for prolonged periods; a practice that has been invisible in terms of the mental health crisis. Medical wards are not resourced to provide the care needed. The practice breaches the rights of the ED patient, undermines the rights of general medical patients and introduces medico-legal risk for physicians working outside their scope of practice. Given the bed shortages on medical wards, the medical needs of the ageing population and the increasing prevalence of EDs this practice is untenable.

Eating disorders are complex psychiatric conditions

The *Diagnostic and Statistical Manual of Mental Illnesses* (*DSM-5*) defines several EDs, including: anorexia nervosa (AN), bulimia nervosa (BN), binge-eating disorder (BED), avoidant/restrictive food intake disorder (ARFID), among other rarer subtypes.[1] ED prevalence has gone up considerably in the last 50 years. Five to 10% of young people have an ED and of these 50% will have disordered eating for over 5 years.[2] COVID-19 resulted in increased ED diagnoses globally with new admissions for care for New Zealand youth doubling during this time.[1]

EDs frequently co-occur with other mental disorders with estimates ranging from 58 to 98% of patients.[3,4] They are also strongly associated with temperamental traits, developmental and personality disorders such as attention-deficit hyperactivity disorder (ADHD), post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD) and autism spectrum disorder (ASD).[2] AN in particular is difficult and complex to manage. It is associated with challenging behaviours (e.g., excessive exercise), emotional dysregulation, anxiety and depression and has one of the highest mortality rates of all mental illness. Suicide risk is high—it is estimated to be the cause of death in 25% of cases.[5] Mortality in ED patients goes up significantly when co-existing psychiatric disorders are present.[5–7]

International guidelines highlight psychological management as the cornerstone of treatment for AN with a focus on causal and maintenance factors.[8] Treatment has a focus on family therapy for adolescents and individualised psychotherapy for adults.[8] Relapse rates are high and many individuals develop a chronic course; one-third never recover.[2,9] Pharmacotherapy has a limited role but olanzapine may offer value.[2] Treatment focusses on restoring sufficient calories, nutritional balance and appropriate eating patterns but even for moderate to severe AN, this should be outpatient-based.[2] Given the chronicity of the disorder, individually tailored treatment is needed with psychological interventions running alongside nutritional and weight monitoring. For BN, cognitive behaviour treatment produces remission in up to 40% and fluoxetine is approved in the United Kingdom with topiramate also prescribed (outside of pregnancy).[2]

The role of physicians and acute medical wards

Physicians have an important but limited role in the management of EDs. When an ED is recognised, monitoring for complications such as electrolyte disturbances and dehydration should be initiated. Longer-term complications such as gastric motility issues and osteoporosis also need to be routinely assessed for. Most management will occur within primary care or intensive outpatient programmes.[2] If concerns are raised regarding the rapidity of weight loss, hypoglycaemia, dehydration or electrolyte abnormalities then management may need to be escalated to an inpatient unit. Guidelines recommend specialist eating disorder units, but in New Zealand patients are frequently defaulted to acute general medical wards regardless of bed shortages or ED resources.[10]

The key role for the hospital physician is in the avoidance, assessment and management of refeeding syndrome (RS) and its complications. RS is a constellation of metabolic and electrolyte abnormalities that occur as a result of the reintroduction of calories after a prolonged period of decreased intake.[11] Phosphate depletion in these settings—alongside potassium and magnesium decreases—can cause respiratory depression and decreased cardiac contractility. The disturbance can precipitate arrythmias; hence the role for physicians in assessment, electrolyte repletion and monitoring, i.e., medical stabilisation.

Guidelines recommend checking potassium, magnesium and phosphate before initiation of feeding then regular monitoring of patients at risk until stabilised (not requiring electrolyte supplementation for 2 days).[11]

Multiple studies have shown the degree of malnutrition to be the most important predictive factor in the development of RS.[12] However, a recent Australian study showed that no patient—even when severely malnourished—developed clinical manifestations (symptoms or organ dysfunction) of RS when it occurred.[12] Canadian research from a specialist ED unit utilising rapid refeeding for weight gain had no full cases of RS, severe hypophosphataemia or death over 4 years and no need for medical ward transfer for RS (n=103).[13] Hence, although monitoring is important, it is possible that treating teams are being overly cautious in admitting those deemed to be at risk.

The use of telemetry monitoring for AN complicated by syncope, severe sinus bradycardia, junctional rhythm or marked prolongation of the QT interval is recommended, but evidence for malignant arrhythmias as a cause of sudden death in EDs is limited, cardiac death is rare and most cardiac manifestations are mild and reversible.[14,15] Cardiac instability acutely is dependent on electrolyte depletion and hence if these are replete and the ECG stable then there is no indication for ongoing cardiac monitoring. Nutrition, weight and electrolyte monitoring can occur in the community alongside the psychological treatment integral to recovery. None of the eight international guidelines informing best practice for the management of EDs (available in English) mandate prolonged telemetry or prolonged inpatient care on a medical ward for cardiac monitoring.[16–23] Postural hypotension is common with low body mass, exists in numerous other clinical situations and is not an indication alone for acute medical admission.

Hence there is no need for a hospital physician outside of acute stabilisation. Weight and electrolyte monitoring alongside feeding do not require a medical ward.

Current practice breaches standards and violates patient rights

Despite the emphasis on specialist units, ED specialists, psychologists and psychiatrists, people with EDs in New Zealand are routinely admitted to acute medical wards for prolonged periods that well exceed that required for medical stabilisation. For example, in Wellington Regional Hospital the mean length of stay (LOS) is 19.11 days. At Hutt Hospital the mean LOS is 29.8 days. This is over double the mean LOS of a unit in Australia set up to provide specialist care.[24]

Neither the Wellington nor Hutt hospitals employ an ED specialist. Wellington consult liaison psychiatry teams are expected to provide the care required yet their own referrals have doubled over the last decade without a commensurate increase in resources. This means that general physicians are frequently left to “lead” the care of a complex psychiatric condition outside their scope of practice with no training or resources. Healthcare assistants, rather than psychiatric nurses, are also used to provide day to day nursing care and meal monitoring. Although there have been increases in resources for the community EDs service in Wellington, they do not take patients under the *Mental Health (Compulsory Assessment and Treatment) Act 1992* for weight restoration.

Despite the lack of medical input required, psychiatric services do not take over care when patients are stable—the expectation is that patients remain on medical wards. This practice creates false expectations in those with EDs and their families that they require inpatient medical care when they only need feeding. The psychiatric care including intensive psychological support needed for treatment and remission is not available on medical wards.[25] This creates challenges for physicians who retain duty of care over a condition that is primarily psychiatric. It also presents challenges for nursing staff who are not trained in EDs and are unable to provide the psychological input required, potentially leading to moral distress. The close observation required for EDs in terms of ensuring caloric input is also a time-consuming task for busy medical nursing staff.

Current practice not only breaches the guidelines for specialist care but also compromises patient rights. The C*ode of Health and Disability Services Consumers' Rights* (the *Code*)[26] establishes the rights of consumers and the obligations of providers. Right four states that consumers have the right "*to services of an appropriate standard*". This includes the right to "*reasonable skill*" in the delivery of care and the right to a service that complies with "*professional*" standards.

Admitting ED patients to medical wards breaches these standards. Physicians and medical nurses are not trained in ED management, nor do they have psychiatric training and hence standards outlined by professional bodies cannot be followed. Access to psychologists is poor and sometimes absent altogether.[25] General medicine is also the admitting service for infectious disease and hence has a high prevalence of transmissible infection. Prolonged inpatient admissions to medical wards puts ED patients at risk of nosocomial infection as New Zealand hospitals lack the basic design requirements to apply appropriate preventive measures.[27]

Admitting people with EDs to medical wards also impacts the care of other patients. Although people with EDs do not usually have behavioural disturbances that directly compromise the care of others, their admissions still have an impact on the rights of medical patients.[27,28] When psychiatric admissions utilise medical wards—or fail to be discharged when stable—they occupy beds required for medical patients. New Zealand hospitals do not have the bed numbers to meet medical need, and many patients wait for long periods in the emergency department—often in corridors. In Wellington, "bed block" was so extreme in 2024 that a corridor outside the waiting room was blocked off and used as a temporary ward. Older adults—those most likely to be admitted to acute medical wards—are particularly vulnerable to the complications of long waits including higher in-hospital mortality, falls and bed sores.[29]

When medical patients are waiting in emergency department corridors for beds their rights to privacy and dignity are also compromised. People with EDs are often admitted to the limited number of single rooms despite these being required for infectious disease, delirium, dementia and terminal care.[27] ED patients' right to privacy appears to be prioritised over the clinical needs and rights of medical patients who are less able to manage their own privacy and dignity due to physical, cognitive and sensory impairments.[27,28]

It is an exercise in double book-keeping to admit psychiatry patients to medical beds *because* of the mental health crisis and lack of ED beds. Doing so ignores the paucity of medical beds and the harm that occurs with bed block, delays in medical care and the poor access to single rooms.

Risks to physicians

Admitting people with EDs to medical wards not only breaches patient rights, it also exposes physicians to sanctions and complaints from patients and their families. Doctors practicing outside their scope are subject to professional censure under the *Health Practitioners Competency Assurance Act 2003* but all complaints—even when not escalated—take a toll on doctors. Admitting people with EDs for weight gain (i.e., not just medical stabilisation) in addition to their own medical workloads also contributes to stress and burnout for physicians who are already responsible for the largest admitting units in New Zealand hospitals.

Although demand outstrips supply in all public specialities, general physicians are the only specialists expected to repeatedly manage the workload of another service in addition to their own. It should be noted that when surgical lists are unable to be managed in the public system they are outsourced to private providers at significant cost to the tax payer—a practice that has been flagged to increase.[30] For mental health, despite the well-documented shortages, the expectation appears to be to continue to default complex and severe conditions to general medicine despite longstanding concerns regarding resources, standards of care and patient rights.[25,31]

Summary and recommendations

Expecting acute general medicine wards to manage EDs breaches the right to an appropriate standard of care for people with EDs, compromises the rights of medical patients waiting for inpatient beds and places physicians at medico-legal risk. Given the prevalence of EDs, the paucity of medical beds and the increasing medical needs of an ageing population the practice is untenable.

People with EDs need access to timely specialist care with a high level of psychological support and appropriate psychiatric supervision. This may occur in an inpatient, outpatient or community setting depending on the needs of the individual. The role of a medical ward and physicians is to provide acute stabilisation in severe cases, not to provide prolonged admissions for weight gain.

We recommend all general medicine teams request their LOS data on EDs and insist that hospitals stop using medical wards for the long-term management of a complex psychiatric condition. Funders need to recognise that all patients—not just those awaiting surgeries—need access to timely and appropriate care.

COMPETING INTERESTS

Nil.

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https://nzmj.org.nz/journal/vol-138-no-1623/eating-disorders-on-medical-wards-breaching-clinical-standards-patient-rights-and-scopes-of-practice

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How should New Zealand health professionals respond to Trump 2.0?

Alistair Woodward

ABSTRACT

Donald J Trump began his second term as president of the United States (US) in January 2025. Since then, his administration has abandoned the precedents necessary for good government, brushed aside restrictions on executive power, sacked tens of thousands of federal workers and undermined healthcare within the US and overseas. I argue the consequences of Trump's actions are so serious they must concern health professionals everywhere, and outline three ways to respond. These are: to actively and effectively support colleagues in the US; to do what we can to sustain health gains worldwide; and to oppose health-damaging Trump-like thinking in Aotearoa New Zealand.

The Trump administration in the United States (US) was installed recently, at the beginning of 2025, but the president and his supporters have moved quickly to up-end the way the country operates.

The *British Medical Journal* is doing its best to keep up with the changes caused by the new regime in the US, and reported in its 31 March issue[1] that: the National Institutes of Health (NIH) had announced it will cease funding research on climate change; a letter signed by 500 doctors and researchers warned that closing PEPFAR (the US President's Emergency Fund for AIDS Relief) would kill 6 million people in the next 4 years worldwide; and NIH had been ordered to provide a list of research grants involving mRNA vaccines—it was expected that many or maybe all of these grants willl be cancelled.

Since March, the US has withdrawn from the Global Alliance for Vaccines and Immunization; the *One Big Beautiful Bill Act*, signed on 5 July by President Trump, is projected to increase the number of Americans without health insurance by about 14 million by 2034; and the new head of the Environmental Protection Agency announced the ban on chrysotile asbestos will be "reconsidered" and there will no longer be limits on greenhouse gas emissions from power plants.[2,3]

There are themes in the disorder. One is the socially regressive effect of the changes, as benefits flow to the wealthiest Americans and costs fall most heavily on those with low incomes. Conventions to manage conflicts of interest are ignored, and the Trump family is considerably enriched. There is no respect for science and expert knowledge. Indeed, as shown by the policies on climate and vaccines, as two examples, the wishes of the president and his appointed staff have been executed regardless of advice from professionals. Marginal groups are demonised—this is most painfully apparent in the treatment of migrants. The president has encouraged law-breaking and political violence. The Republican majority in Congress has relinquished its responsibility to check executive excess.

The Trump presidency has surprised many, but it has deep roots. Suspicion of government and democratic institutions and conventions has been a feature of America since European settlement.

Ezra Klein writes:

> *"Illiberalism is part of the American tradition: Jim Crow. The Red Scare. The internment of Japanese Americans. Operation Wetback. Trump is not the first to name a domestic enemy, decide that their rights are no longer valid and turn the machinery of the state against them."*[4]

However, polarisation and confrontation became more intense following the end of the Cold War—a preoccupation with the external threat posed by the Soviet Union was replaced by fear of anti-American forces within. Politics was increasingly animated by "*culture wars*" and "*aggressive rhetoric redefined political rivals as enemies to be defeated*".[5] Since 2016, the American conservative movement has become more strident and explicit in its attacks on democratic institutions.[6] Structural changes that paved the way for Trumpism (and are not confined to the US) include increasing inequalities in wealth, the rise of a new class of the supremely rich, fragmentation of the media and proliferation of curated and untested digital sources of information.

It may feel far away, and it may be difficult to think of anything that we can do personally in Aotearoa New Zealand. Therefore, it is tempting to ignore Trump 2.0, and hope the fuss goes away when a new president is elected in 2028. I think this would be a mistake. The US is physically distant, but only a mouse click or a flight away, and underlying causes of damaging populism are present also in New Zealand. My argument is that the consequences of Trump 2.0 affect us all—but we are not helpless.

Here are three actions that New Zealand health professionals can, and should, take, in my view:

- Support our colleagues in the US.
- Do what we can to continue health gains globally.
- Anticipate Trump-like thinking in New Zealand, and respond vigorously.

1. Solidarity

The *International Journal of Epidemiology* (*IJE*) is one of the oldest and most widely read journals in its field. In March, my co-editor in chief, Stephen Leeder and I wrote to American members of the *IJE* Editorial Board saying we thought the *IJE* should take a stand on Trump's actions, and sought their views.

Here is one of the replies:

> *"What is happening in the US is frightening. I have never been this alarmed and stressed in my life…*
>
> *Your editorial could reassure the epidemiological community that* IJE *will not take part in censoring US science and scientists. We have to be able to live with our ourselves and our conscience. I fear silence is not an option. Non-US-based journals and institutions have critical roles to play in mitigating the unfolding catastrophe.*
>
> *Thank you for your empathy, braveness and solidarity."* (Email from *IJE* Editorial Board member, 6 March 2025)

Subsequently, an editorial was published that described the assault on health sciences in the US, and ways to counter these attacks.[7]

This is a small thing to do, but multiplied many times over, let's not underestimate the power of speaking up.

2. Aim to limit the losses internationally

Trump has gutted American aid internationally, although it has been the largest source of development funding in many parts of the world. Closures, which have occurred in an abrupt and capricious fashion, may be hugely damaging. For instance, efforts by the United States Agency for International Development (USAID) to control Ebola virus outbreaks in Africa were shut down. (This was "a mistake" according to Elon Musk, who directed de-funding of USAID, but it is uncertain whether work on Ebola can be re-started.[8])

Good health depends on the rule of law within countries,[9] and on robust international agreements. These agreements apply not only to infectious diseases such as Ebola, which spread freely across borders, but other problems that are inherently global, such as climate change, widespread chemical pollution and loss of biodiversity.[10] However, Trump's view of national interest is exceedingly narrow, and he sees international relations as competitive and transactional. In this universe conventions and treaties are suspect because they hinder powerful nations intent on dominating less powerful states.

In the past, New Zealand has been regarded by many as an honest broker in the difficult work of balancing national interests and global wellbeing. Our country was a leader in negotiations for the Framework Convention on Tobacco Control. Recently, New Zealand was at the centre of the overhaul of the International Public Health Regulations. In the future there will be much to do, including:

a. Agreeing on a new architecture for funding of international development in the absence of USAID.
b. Determining the future of the World Health Organization (WHO). Trump has signed an executive order to end all US contributions.[11] These amount to 15–20% of the WHO budget overall, but are unevenly distributed and some programmes are heavily dependent on American money.
c. Supporting action on climate change. The globe is heating faster than ever,[12] but

Trump has announced the US will withdraw from the Paris climate agreement.[13]
In the past New Zealand has exerted greater influence at international climate meetings than might be expected on the basis of its size alone. The effectiveness of member states depends on steady political commitment and top-class public servants to front the negotiations. It is not clear how strongly the present New Zealand coalition Government will adhere to previous commitments on climate change. Health professionals can be vital influencers[14] through specialist bodies and organisations such as OraTaiao, and may contribute directly by providing technical assistance to bodies such as WHO and the Intergovernmental Panel on Climate Change.

3. Look out for Trump-like thinking at home

The rise of an authoritarian regime in the US may embolden those inclined to similar views within New Zealand. The risk is high. This country has experienced many of the social changes that contributed to Trump 2.0. They include deepening disparities in wealth and opportunity, a sense of reduced social cohesion and, among many, loss of trust in public institutions.[15,16] Although there were fewer cases and mortality rates from COVID-19 were lower in New Zealand than most other countries, the disruption caused by the pandemic amplified for some the feeling the government does not look out for them.

Actions taken by the present New Zealand Government that resemble moves by ill-liberal populist regimes in the US and elsewhere include growing use of urgency and fast-tracking to minimise public scrutiny of controversial legislation such as the *Regulatory Standards Bill*,[17] belittling by ministers of doctors who advocate for population health[18] and a cavalier approach to managing conflicts of interest when business is involved with policymaking.

Here are three examples of accelerating Trumpism I think we should look out for in New Zealand.

a. "You can't make an omelette without breaking a few eggs"

This is the argument that one can't bring about change without moving fast and disrupting the status quo. Maybe good things will come from Trump giving the system a decent shake. Former New Zealand Prime Minister Sir John Key thought so,[19] and Simon Jenkins wrote along similar lines in *The Guardian*.[20]

Jenkins compared Trump's disregard for the established way of doing things with the approach taken by businessmen such as Zuckerberg and Musk. They disrupted at pace, and out of the ashes rose, phoenix-like, world-shaping enterprises such as Facebook and SpaceX. In Trump's case, wrote Jenkins, "*Among the chaos are challenges to convention that were overdue*."[20] This includes (according to Jenkins) bloated aid programmes, over-reach at NATO and unnecessary federal interventions in education and health.

Jenkins did not refer to Gough Whitlam, but he might have. Like Trump, Whitlam was a tall man who thought highly of himself, and a powerful orator. He was the leader of the Australian Labor Party and went to the 1972 federal election promising to "crash through, or crash". He believed he must move fast to achieve reforms such as withdrawing from the Vietnam war, establishing a national publicly funded health service and extending equal pay to women. Post-election, Whitlam unleashed a whirlwind of legislation and regulation, testing to the limit due process and convention.[21] In New Zealand, a decade later, the fourth Labour Government also thought it necessary to move fast on many fronts to achieve radical change.[22]

Trump's moves are wilful; they are not supported by a coherent and well-argued plan for the country. His actions are frequently unpredictable and inconsistent, and the president shows no interest in feedback on the effects of cutting funding, firing people and upending government bodies. Does shutting USAID lead to leaner, more effective international aid? There is no sign that Trump wishes to find out. Unlike the business examples that are often cited, in Trump world no attention is paid to preserving the capacity to rebuild.

According to Robert Reich, former US Secretary of Labor, "*With Trump, you don't need to look for reasons for apparently crazy actions. This is all about power, and Trump's thirst for power is all about converting the US into a dictatorship*."[23] I agree with Reich: no other goal makes sense but a new imperial age, and I reject the omelette argument. If good things result from Trump's interventions, this will be accidental, and will likely be small beer compared with the harm done.

b. Choosing language to divide and distract

Trump is a master of choosing words to provoke, undermine and belittle opponents. Here are two terms that were not invented by Trump but feature in his rhetoric: "woke" and "DEI".

The language has gained a foothold here. Winston Peters gave a state of the nation speech, headlining a "war on woke".[24] Simeon Brown, as minister of transport, dismissed road safety as "woke".[25]

New Zealanders should not let these taunts pass unchallenged. But let's not lose our temper. Instead, I recommend we follow the example of the cast of *Doctor Who*, the long-running BBC show. In the latest iteration all the main characters, the crew of a time machine disguised as a 1950s-era police call box called the Tardis, are people of colour. This led to claims that the BBC had gone "woke". One of the new actors, Varada Sethu, nailed what I think is the right way of dealing with provocation of this this kind. Sethu said, "*Being called woke proves we are on the right track*."[26]

> *"Woke just means inclusive, progressive and that you care about people. And, as far as I know, the core of* Doctor Who *is kindness, love and doing the right thing."*[26]

Note there are two steps here: 1) rather than objecting to being called woke, Sethu reminds people what woke means, and then 2) she points out that these are generally valued qualities.

On the other hand, there is no reason to engage with "DEI", despite the attempt by several parties in the present New Zealand Government to make it an issue.[27] I suggest we refer instead to concepts that New Zealanders are familiar with, such as acting fairly, widening the talent pool and building effective teams. Most people would agree these are important in their own right. But it is worth pointing out also that fairness, drawing on talent everywhere and teamwork make the world better in a host of direct and practical ways.

In the past, those who worked on New Zealand wharves were almost all men, but in Auckland now there is a remarkably diverse workforce, including a large number of women. According to Roger Gray, boss of the Port of Auckland, this has nothing to do with wokeness and DEI. Gray said "*I want a great workforce and I am deeply committed to fairness*."[28] Gray said he sought talent wherever he could find it, and he observed that nurturing a workforce was good for the business.

> *"In a workplace where people feel safe, included and able to thrive and build a career, they give you discretionary effort—they go that extra bit that helps the bottom line."*[28]

He agreed employment should be on the basis of merit, but Gray pointed out there are different kinds of merit. For example, he said he is keen to get more women on the straddle cranes, because he expects there will be savings on repairs, servicing and down-time.

> *"It's quite well acknowledged now within heavy industrial businesses that female plant operators … are often better because they're less hard on the equipment."*[28]

c. Mythical histories

Trump and the new Secretary of the Department of Health and Human Services, Robert F Kennedy Jr have established a Commission to Make America Healthy Again (MAHA).[29]

There are two remarkable features of this initiative. One is how little attention is paid to infectious diseases: the Commission's terms of reference are skimpy but apply mainly to chronic conditions, especially those affecting children. And, like MAGA at large, the Commission assumes a treasured past. The purpose of MAHA is to return the US to a time when there was little diabetes or heart disease, and Americans lived longer and better lives than anybody on the planet. This is fantasy, because there was no such past. Americans have never lived longer and better lives than anyone else. There are indeed modern blights such as over-eating and under-exercising, opioid misuse and high rates of self-harm. US life expectancy at birth has dipped recently. But in general, the health of the population is better than ever. Americans live on average 11 years longer than they did in 1950,[30] infant mortality is much reduced, smoking-related cancers have nose-dived and coronary heart disease has fallen by 70% from its peak in the late 1960s.[31] MAHA includes no serious analysis of what it seeks to achieve, and the danger is that hundreds of millions of dollars will be wasted. It is expected that targets will include minor problems such as food additives and over-use of weight loss medicines, alongside a misconceived assault on vaccines.

When he is in full MAGA mode, Trump invokes an America that was glorious, frontier-tough and masculine. Historian Heather Cox Richardson has described it this way:

> *"Trump's undermining of the global economy reflects forty years of Republican emphasis on the myth that a true American man is an individual who operates outside the community, needs nothing from the government, and asserts his will by dominating others."*[32]

Wishful thinking without a sound basis is familiar in New Zealand also. At the last election, National promised to "get our country back on track". New Zealand First campaigned on "take our country back". The Prime Minister's response to those concerned about the new cut-price school lunch programme referred to a golden age when children thrived on marmite sandwiches and apples.[33]

How far back do we need to go? This question is never answered, but it was better before, no doubt. Those were truly the good old days. The prospect appeals to many people, even though according to so many measures it is magical thinking and must be challenged.

Conclusion

In his second presidential term Trump proceeds to destroy public health and comprehensive healthcare in the US. There will be knock-on effects everywhere. This is alarming but does not justify despair. In addition to the resistance that is growing within the US,[34] there are signs of Trump-rejection elsewhere. For instance, unexpected re-elections in Canada and Australia of sitting governments have been attributed, in large part, to concerns about Trump's destructive actions at home and abroad.

It is natural to want to shut out the madness overseas and focus on local affairs. I believe this would be a mistake. Health, science and education are deeply political and, as shown by current events in the US, are bound to be targeted by authoritarian governments. Health professionals in New Zealand must speak up, support colleagues who are directly affected, act where we can to reduce the damage to global health and oppose toxic Trump-thinking that washes up on our shores.

COMPETING INTERESTS

Nil.

ACKNOWLEDGMENTS

Kirsty Wild drew my attention to *Doctor Who*.
I benefitted greatly from the comments of three anonymous reviewers.

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URL

https://nzmj.org.nz/journal/vol-138-no-1623/how-should-new-zealand-health-professionals-respond-to-trump-2-0

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A novel theory of trauma offers new treatment possibilities

Robin Youngson

ABSTRACT

A novel theory speculates how trauma is stored in the brain, the physiology of traumatic reactions and identifies a molecular mechanism that may rapidly erase traumatic memories and reverse their consequences. This theory is the basis of Havening Techniques®, used by more than 1,000 certified mental health practitioners worldwide. While trauma therapies such as eye movement desensitisation and reprocessing (EMDR) are well validated by clinical trials, the underlying mechanism of action is unknown. The theory of Havening offers a potential unifying mechanism involving the role of delta brain waves in memory processing, initiated by lateral eye movements (EMDR) or specific forms of touch (Havening). If validated by further clinical trials, Havening Techniques may represent an important advance in mental health care as trauma is a significant but potentially reversable cause of chronic anxiety, depression, post-traumatic stress disorder (PTSD), phobias and addictions. Moreover, the theory includes precise diagnostic criteria for identifying traumatic events and predicting the mental and physical health consequences. Clinical experience suggests that erasing the specific traumatic memories may also lead to sudden relief of stress-induced illness and some cases of chronic pain.

Childhood trauma is a major risk factor for adult illness, including liver disease, chronic obstructive pulmonary disease, coronary artery disease, autoimmune disease and psychiatric illness. Individuals with adverse childhood event (ACE) scores higher than six have a life expectancy two decades shorter than healthy, untraumatised children.[1] A New Zealand community survey found that 51% of people had experience of traumatic events, 9% in the last year, including such events as accidents, medical treatment and violent attacks. Traumatic exposure correlates with symptoms of post-traumatic stress disorder (PTSD) and psychological distress.[2]

The best treatments for PTSD, according to experts such as Bessel van der Kolk, involve some form of exposure followed by trauma processing, such as eye movement desensitisation and reprocessing (EMDR), yoga or other somatic therapies.[3,4] EMDR is well validated in systematic reviews as a treatment for PTSD, although the therapy is empirical and the mechanism of action is not established.[5] Havening Techniques® appear to accelerate trauma processing through the action of delta waves on molecular mechanisms that erase the exposed traumatic memory in the amygdala. A similar mechanism is now postulated for EMDR, as researchers have noted the similarity of delta waves recorded by electroencephalogram (EEG) during the lateral eye movements of EMDR and those occurring during the slow-wave (deep) sleep implicated in memory processing.[6]

Trauma mechanisms are more easily understood when we consider their purpose. Why did the brain evolve mechanisms for encoding trauma when this causes human suffering, including traumatic flashbacks, anxiety, panic, PTSD, depression and serious physical illness? Because it's a built-in safety system designed to protect us from threats to our survival and wellbeing.

Our environment presents many threats to life. The human body therefore has multiple defence mechanisms including our immune system, protective reflexes and the trauma system.

Just as the immune system has memory and rapidly responds to reinfection, traumatic memories exist to remember past threats and to instantly alert us to potential danger. The relevant part of our brain—the right amygdala—continuously scans sensory signals for potential threats. It is part of the limbic system, which subconsciously processes sensory information, emotions and memories at a rate of billions of bits per second (bit/s). In contrast, our conscious, thinking brain only manages 10 bit/s.[7]

The amygdala is directly connected to multiple body systems: the autonomic nervous system, somatosensory system, hypothalamic-pituitary-adrenal (HPA) axis and emotional and cognitive systems. When a traumatic memory is subconsciously triggered, we mount a fight-or-flight reaction within 75 milliseconds—four times faster than our conscious thought. Thus, if we were once mugged on a dark street, this mechanism causes us to feel anxious walking in the dark and will trigger an acute fear response when approached by a potential attacker.

The proposed physiology of traumatic memories

Ronald Ruden is an internal medicine specialist in New York with a lifelong interest in addictions and trauma. His sentinel paper describing his proposed mechanisms of trauma was published in *EXPLORE* in 2018.[8]

According to his theory, traumatic memories are stored in the (right) lateral amygdala, in the first synapse connecting neurones conveying sensory information from the thalamus. The neurotransmitter is glutamate, which binds to a-amino-3-hydroxy-5-methyl-4-isoxazolepro-pionic acid (AMPA) receptors. During a traumatic event, sensory neurones from the thalamus release glutamate, which also activate N-methyl-D-aspartate (NMDA) receptors in the synapse, activating voltage-gated calcium ion channels and de-polarising the post-synaptic membrane.

In the presence of a major stress reaction and fast gamma brain waves (up to 100Hz), the frequency-sensitive enzyme calmodulin reacts to the rapid intra-cellular oscillation of calcium ions and activates protein mechanisms that push AMPA receptors onto the post-synaptic membrane. Calcium oscillations are ubiquitous signals present in many cells that provide efficient means to transmit intracellular biological information.[9]

The upregulation of AMPA receptors thus forms new synaptic connections with the many neurones that contain sensory information specific to this traumatic event. Then a phosphokinase called PKMZeta phosphorylates a subunit of the AMPA receptor, anchoring it permanently in the cell membrane.[10] These upregulated synapses create a permanent “alarm circuit” connecting the sensory information about the threat to the traumatic stress reaction. See Figure 1 (reproduced with permission from Ruden).

Figure 1: Potentiation of synapses in the lateral amygdala in the presence of high-frequency gamma waves.

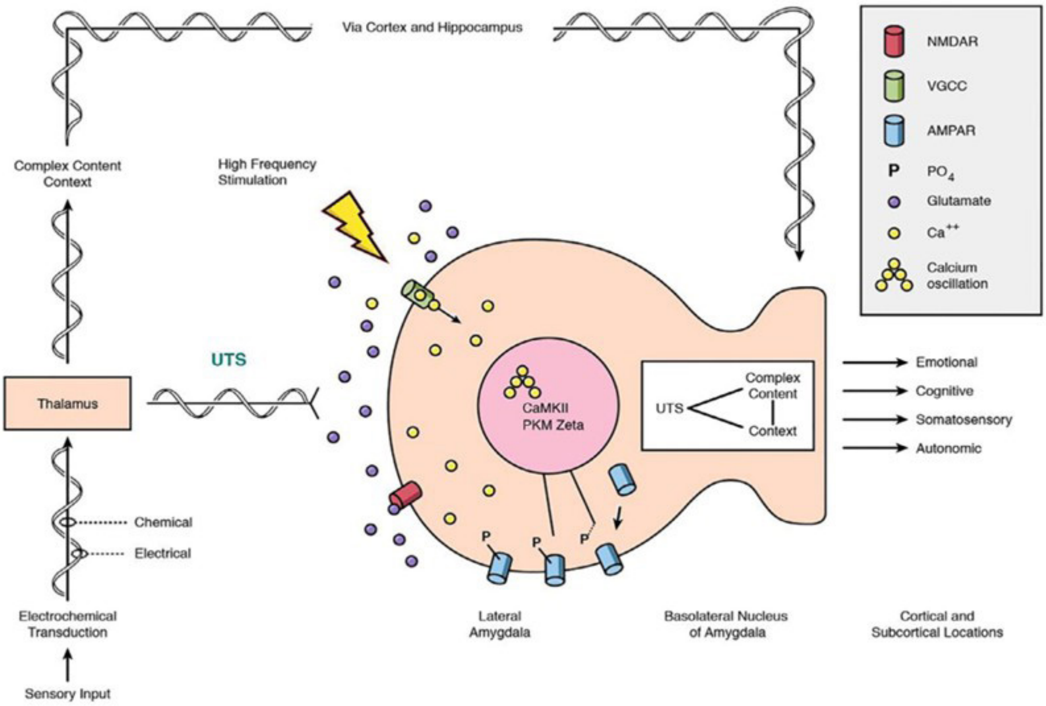
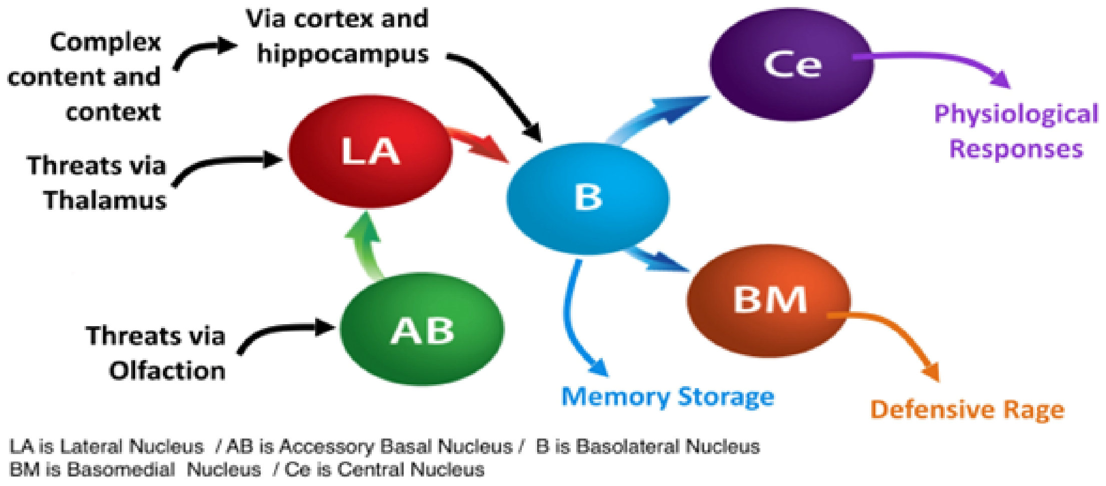


Figure 2: Pathways through the amygdala.



While information directly about the threat (unconditional threat stimulus, UTS) is relayed directly from the thalamus, more complex sensory information is processed in the hippocampus and sensory cortex, entering the basolateral nucleus of the amygdala. Thus, the context of the event and associated sensory information can be assessed and stored. Outflow tracts from the amygdala connect to the autonomic, cognitive, somatosensory and emotional systems. See Figure 2.

If, in the future, any sensory signal arrives at the amygdala that correlates with the experience of the original trauma—a subconscious trigger—then the upregulated receptors generate an immediate autonomic stress reaction, emotions, bodily sensations and thoughts. For instance, a client who suffered a major assault from a man developed a severe phobia and was unable to enter a hardware store for fear of meeting a strange man.

How can we recognise a traumatic event?

Ruden's theory also includes the conditions that must be met for a challenging life event to be encoded as a trauma. Trauma depends not on the nature of the event but how the individual perceives it. When we are truly resilient, we can marshal the resources to overcome a challenge without being traumatised. Conversely, when we are emotionally vulnerable as a result of prior trauma, major life stresses, sleep deprivation or physical illness, then we are much more easily traumatised. The key psychological factor is whether we feel capable of escaping the potential trauma or feel powerless, helpless and trapped in the moment.

The theory of Havening formulates this condition for traumatisation as an acronym, "EMLI". "E" is the distressing event. "M" is the meaning of this event for the individual, which must represent a threat to the person for trauma to be encoded; the same event might not be threatening to a different individual. "L" is the landscape of the mind; an expression of pre-existing emotional vulnerability. "I" is inescapability, or a sense of being powerless or trapped. All elements of EMLI must be true for a challenging life event to be encoded as a trauma.

I remember when, as a young man, I was caught in a storm in the Arctic Ocean, in a small open boat, far from rescue. While the event was truly frightening, I was fortunate to be at the helm, and I navigated to safety. I felt in control and was not traumatised. In contrast, I remember one day as an anaesthetic registrar when a young mother died despite my best attempts to save her. The final image of that event was seared in my mind and reminders of that day, for instance watching a TV drama, made me sob in distress. This is a traumatic memory (since healed).

Ruden adds a second framework, using the acronym "CASE", to remind us that trauma is a full mind-body experience. The letters stand for the cognitive, autonomic, somatosensory and emotional elements of a trauma. When a traumatic memory is triggered, all elements of CASE may be re-experienced including painful images, autonomic stress reactions, bodily symptoms and emotional reactions.

A mechanism to erase trauma

Fortunately, the paper by Ruden also identifies an innate brain mechanism that may rapidly erase the encoding of a memory in the amygdala (a traumatic memory) and reverse all the negative consequences of said memory

If a client recalls a traumatic event, the neural network encoding this trauma is activated and the post-synaptic membranes are depolarised; voltage-gated calcium channels are opened, and intracellular mechanisms can now act on the receptors. If the brain is flooded with delta waves (low-frequency brain waves) then the slow intracellular oscillation of calcium ions is decoded by calmodulin and activates calcineurin, which is a phosphatase. The phosphorylation of the AMPA receptor subunit is reversed, breaking the chemical anchor to the cell membrane, and then dynamin and clathrin remove the receptors by endocytosis. This action of delta waves on the amygdala only impacts depolarised neurons; thus the action is specific to the neural network encoding the trauma, which has been activated by imaginal recall (traumatic exposure).

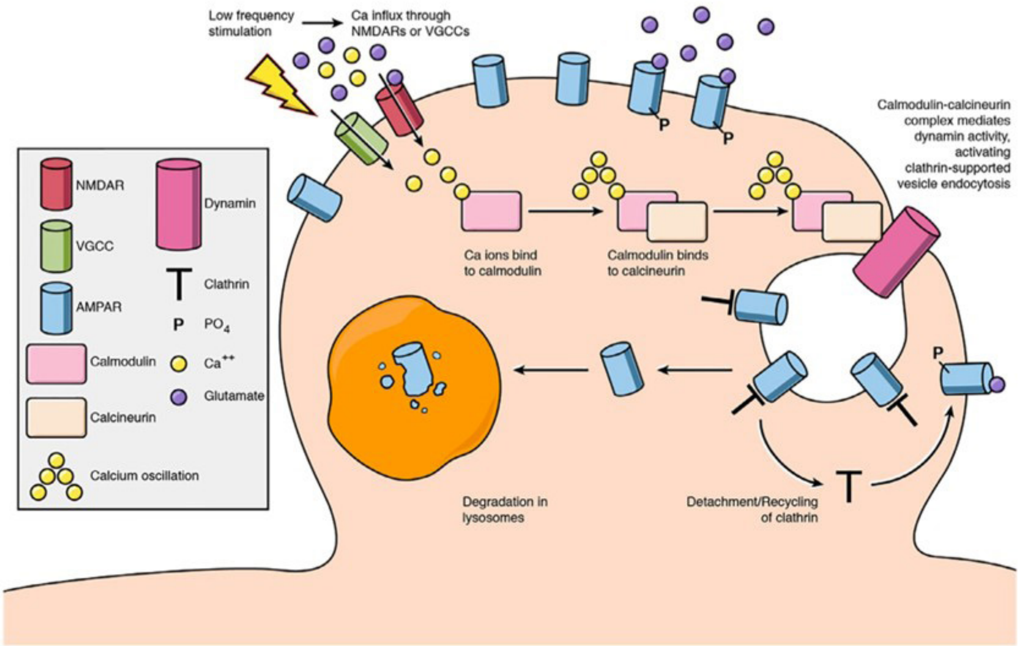
Many other researchers have linked delta waves to memory processing in different parts of the brain.[11] But how can we stimulate delta waves in a subject when they are usually only present during slow-wave sleep?

In a leap of intuition, Ruden linked soothing touch to the upper arms, the face and the palms of the hands, the generation of delta waves and stress regulation. He noted the primacy of touch in the secure mother–baby relationship, and how we all intuitively express empathy by rubbing the shoulder of a person in distress. We also spontaneously touch or rub our faces when feeling distressed or overwhelmed. Recent research has highlighted the importance of affective touch in stress regulation and has described C-tactile afferent nerves that are velocity and temperature sensitive, signaling a soothing touch to the skin.[12]

Ruden found research by Harper, who measured the EEG response to cutaneous stimulation.[13] Aligned with Ruden's intuition, Harper showed that stimulation of the palms of the hands, the shoulders and upper arms and the face generates high levels of delta waves (0.5 to 2Hz).

Ruden then synthesised an elegant protocol for erasing trauma. The client is asked to recall a traumatic moment and then to assign a subjective rating of distress, where 10/10 is the worst imaginable. Soothing strokes are applied to the client's palms, upper arms and face, either by the

Figure 3: De-potentiation of the amygdala (shared from Ruden with permission).



practitioner or the client doing self-touch, which rapidly induces a feeling of profound safety and connection. Mental distractions are used to divert the client's thoughts away from the trauma and the touch is continued for 5 minutes. The client then recalls the traumatic memory, which often now feels more distant and less distressing. The cycle is repeated until there is no emotional reaction to the previous trauma, which typically takes 15 to 20 minutes.

Many clients express astonishment that a memory that caused extreme distress and floods of tears 20 minutes earlier now seems like a distant, factual memory with no distress. This shift is often accompanied by laughter of relief and a profound relaxation response.

During therapy, marked changes in the client's physiology are observed, as the traumatic stress response is removed. The factual memory of events is unchanged but the emotional and stress reactions are removed. Triggers that previously caused a strong reaction now have no effect.

Two randomised controlled trials (RCTs) have begun to validate this technique. Hodgson et al. examined the Type D personality profile in clients seeking treatment for trauma, which is a psychological indicator of illness-prone personality.[14] Scores on the DS-14 scale fell significantly in the treatment group after one session of therapy. In a sub-group of 40 clients in the treatment group, salivary cortisol fell from 5.3ng/ml to 4.2ng/ml at 24 hours, and then to 3.7ng/ml a month later ($p<0.001$).

The same research group showed in a RCT that one session of Havening dramatically increased resilience in trauma-exposed clients, as measured by the Connor-Davidson Resilience Scale (CD–RISC).[15] Pre-treatment resilience scores correlated with the presence of PTSD, and post-treatment scores, 30 days later, approached that of a healthy population ($p<0.001$).

Both trials used wait list subjects as controls, which is a limitation because previous trials of treatment for PTSD have shown a strong short-term placebo response when subjects are given regular attention by researchers.[3] In contrast to EMDR, which might typically involve eight 90-minute sessions of therapy, the trials of Havening used one brief therapy session.

Clinical observations by many practitioners appear to validate the theory, the diagnostic criteria, the physiological consequences of trauma and the efficacy of Havening Techniques. Further research including well-designed RCTs and longitudinal studies is essential to evaluate the efficacy and underlying mechanisms of the technique. In addition to standardised measures of mental health outcomes, a range of biophysical markers, hormone assays, immunological markers and pain scores may be relevant.

The medical implications of trauma

While the treatment of trauma has major implications for mental health, including the potential cure of problems such as anxiety and depression, few doctors appreciate that trauma may also cause chronic physical symptoms long after a physical injury has been resolved. When a traumatic memory is created, all aspects of the sensory experience are encoded, including concurrent physical symptoms. If at the moment of emotional trauma the patient is experiencing physical pain, neurological symptoms, muscle tension, weakness, disability or mental confusion, these symptoms can become chronic because the traumatic memory is continually triggered in a feedback loop.

Many patients present to doctors with "functional illness" for which no physical cause can be found. However, this novel theory of trauma provides a potential mechanism for functional illnesses, and their possible relief.

A medical system that reduces patients to passive recipients of medical care renders them helpless. When threatened with serious injury or illness and not given emotional support the conditions for traumatic encoding are potentially set up. Thus, a patient experiencing high levels of anxiety and pain after surgery may encode this pain as part of their trauma, which might explain why 20–30% of surgical patients experience chronic post-surgical pain in the 6 to 12 months after surgery.[16] Erasing the trauma may abolish the pain. Such approaches warrant investigating.

Childhood trauma is linked to adult obesity and diabetes.[17] The emotional pain of trauma leads to addictive snacking and over-eating. Also, the inescapable stress caused by trauma leads to elevated cortisol levels, which greatly increase blood glucose. Trauma therapy may be an important strategy for addressing the epidemic of obesity and diabetes (see the case below).

Illustrative case histories

Clients with complex trauma, especially from childhood, may require extensive therapy by appropriately qualified mental health practitioners. The following cases illustrate the potential to work with resilient clients who have clearly identified individual traumas. These reports were all observed by the author in his clinical practice.

1. Post-traumatic stress related to an armed hold-up

A client in her 70s presented with 20 years of nightmares, anxiety and fear responses related to an armed hold-up in South Africa. In 15 minutes of Havening her trauma was completely erased—see this short video: https://vimeo.com/469382631.[18] In the 5 years following she has never had a recurrence of the nightmares or the fear reactions.

2. Phobia of being in a motor car

A clinical psychologist drove her car to the clinic and was experiencing multiple fear reactions on the journey related to a head-on crash suffered 35 years before. That traumatic memory was erased, and when she drove home after the appointment she had no fear responses. They have never returned.

3. Chronic post-concussion syndrome

A young man presented with 18 months of severe post-concussion syndrome and was unable to work following a head impact during a rugby game. He experienced mental impairment, inability to concentrate, poor memory and his balance was affected. When the traumatic memory was erased, all his symptoms immediately resolved and he returned to work the next week.

4. A patient having panic attacks prior to an elective C-section

A patient presented with frequent PTSD symptoms related to a traumatic first birth, which had culminated in an emergency C-section. The thought of returning to the same hospital for an elective C-section caused uncontrollable panic attacks. After one session of therapy her PTSD symptom score dropped close to zero and she subsequently had a completely calm childbirth.

5. Severe pelvic and hip pain of unknown origin

A pregnant woman presented with severe pelvic pain, much worse at night-time. The chronic pain specialist was unable to diagnose the problem but prescribed methadone and clonidine, which the patient refused. A focussed history revealed she had been raped when she was 7 years old. The traumatic memory was erased and the pain vanished during the first session of therapy. It has not returned after several years.

6. Needle phobia and invisible veins

As the anaesthetist on-call, I was called to the emergency department because nobody could secure an intravenous line in an obese patient. I was unable to palpate or see any veins and considered using ultrasound-guided cannulation. I discovered that the patient had a needle phobia and empathised with her distress. In 10 minutes of Havening, she completely erased the trauma that initiated her needle phobia and became very relaxed. Her hand veins were now easily visible as the vasoconstrictive stress response was abolished. She accepted cannulation with no distress.

7. Patient with obesity and type 2 diabetes

This client had a 20-year-old son with a chronic disability as a result of a traumatic birth. The client had severe PTSD related to the birth, at a level that would predict immune suppression and high levels of cortisol (Impact of Events Scale score IES=56). She identified two other major traumas in her life. After the birth trauma was erased and the PTSD resolved (IES 6), her blood glucose fell by 40%, with no change in medication, exercise or diet. HbA_{1c} fell from 94 to 60. Two more sessions addressed other traumas. The trend is shown in Figure 4 (shared with permission).

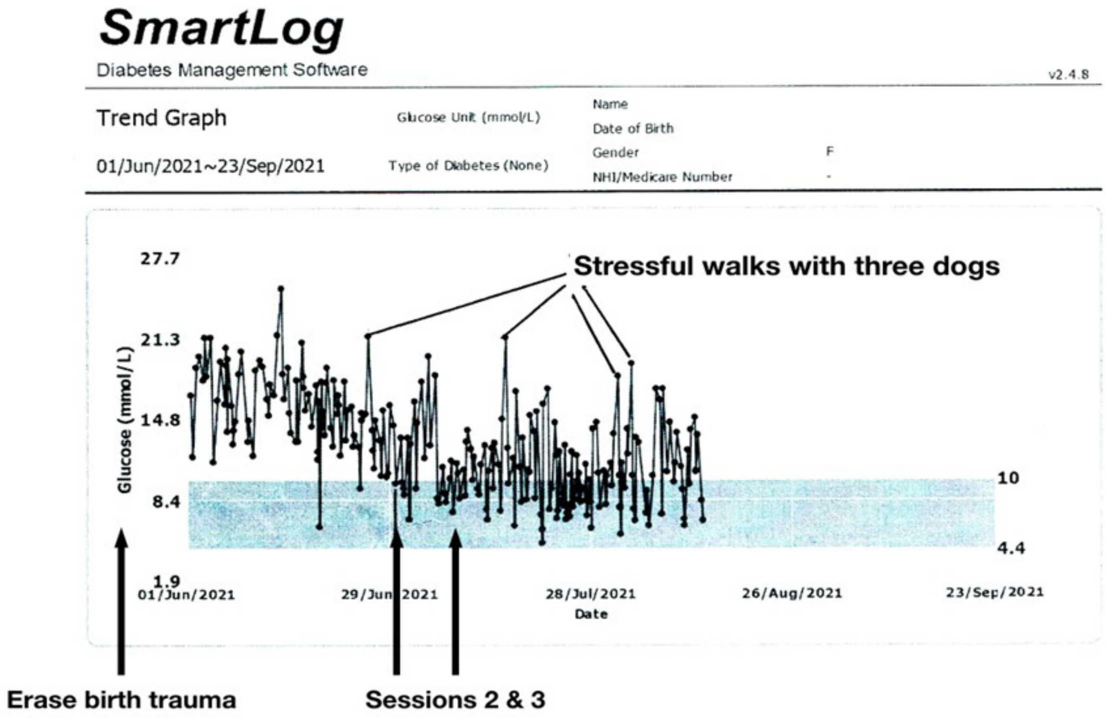
8. Chronic depression

A nurse specialist presented with years of severe depression, multiple admissions to a psychiatric hospital and telling me she was “brain damaged”. The underlying cause of her depression, helplessness and low self-worth was sexual violence. After four sessions of therapy, the depression and mental confusion resolved. She had a setback during the COVID-19 lockdown but after several more sessions she was able to return to work, has had no episodes of depression for 4 years and is off all medication.

Implications for physician wellbeing

A recent survey in the United Kingdom found that 37.9% of physicians had symptoms of burnout, which include emotional exhaustion, depersonalisation and a reduced sense of self-actualisation.[19] Burnout is associated with reduced

Figure 4: Fall in blood glucose after three traumatic events were erased.



patient satisfaction and care quality, higher rates of medical error, increased physician turnover, alcohol and drug abuse and physician suicide.

These symptoms of burnout correlate closely with the dorsal vagal response to trauma, described in the polyvagal developed by Steven Porges: dissociation, depression, feeling trapped, helpless and hopeless.[20] Life as a junior doctor creates the conditions for traumatisation: high levels of stress and anxiety, emotional vulnerability, sleep deprivation, exhaustion and traumatic events over which the doctor has no control—such as the sudden death of a young patient.

Because these traumatic events occur in the clinical setting, doctors are surrounded by subconscious triggers that may cause high levels of chronic anxiety and frequent traumatic stress reactions. In the face of this overwhelming stress, we tend to dissociate from our feelings and painful memories, which allows us to function in our professional roles. We may look OK on the outside while concealing high levels of internal stress, and we are no longer emotionally available to our patients and our spouses.

Dr Gabor Maté, a physician and renowned trauma expert argues, "*We need trauma-informed medical care, trauma-informed education. If we had a trauma-informed society, we would have a society that looks much more compassionate*." He describes how his own childhood trauma of abandonment still shapes his attitudes and behaviours as a physician and speculates that many doctors may be "*wounded healers*" with hidden childhood trauma. A comprehensive overview appears in his bestselling new book *The Myth of Normal*.[21]

In my clinic I have treated many mid-career medical specialists who appeared high-functioning yet had high levels of trauma and PTSD. Through Havening Techniques they substantially improved their mental and physical wellbeing and restored their resilience and work satisfaction. Trauma may thus be a major contributor to burnout.

Summary

The theory behind Havening Techniques provides an elegant and easily understandable explanation for the effects of trauma and offers the potential for relief based on a speculative mechanism for the rapid erasure of traumatic memories in the amygdala.

While clinical observations appear to support this theory, it is yet to be proven in major, placebo-controlled trials. A growing number of mental health practitioners are seeking training in

Havening Techniques, based on their personal experience of having traumas erased.

The potential use of Havening Techniques by laypersons raises ethical and safety concerns. All practitioners engaged in trauma care require training in trauma therapy and must invest in their own reflective practices of self-development and clinical supervision. Practitioners must also be mindful of their safe scope of practice.

Footnote

Havening Techniques is a registered trademark of Ronald Ruden, 15 East 91st Street, New York. More information may be found at havening.org.

COMPETING INTERESTS

Nil.

ACKNOWLEDGEMENTS

Thanks to Ronald Ruden, MD, for supplying the illustrations from his original article.

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https://nzmj.org.nz/journal/vol-138-no-1623/a-novel-theory-of-trauma-offers-new-treatment-possibilities

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Caecal volvulus in third trimester of pregnancy

Maria Nonis, Jay Maloney

We present a case of an uncommon cause of abdominal pain in a pregnant woman in the third trimester. This report outlines the presentation and investigations that resulted in the diagnosis and subsequent surgical management for this patient.

Case report

A 31-year-old Gravida 3 Parida 2 (G3P2) 37+1 pregnant woman was admitted under Obstetrics with abdominal pain. Following serial cardiotocography readings and obstetric evaluation she was deemed to not be in labour, and a general surgical review was sought.

She had no significant medical or surgical history. Prior deliveries were vaginal and during this pregnancy an elective caesarean section (C-section) was planned.

Symptoms of abdominal pain and anorexia were present for 4 days and worsened in the last 24 hours with two episodes of vomiting, prompting presentation to hospital. The last reported bowel movement was 3 days prior, not out of keeping with the patient's usual bowel habit.

Examination revealed a generally tender and distended abdomen, beyond that of a gravid uterus. There was no peritonism, including on serial examination. Blood results were unremarkable with a normal white blood cell count (10) and a C-reactive protein <3, including on repeat bloods 8 hours later. Urinalysis was negative.

Initial imaging was an ultrasound, which reported a small volume of simple free fluid and echogenic mesentery in the right iliac fossa. The appendix was not identified. The patient proceeded for a magnetic resonance imaging (MRI), which showed swirling of the mesentery and vessels within the right upper quadrant.

Over the period of these investigations, pain had escalated such that the patient now required patient-controlled analgesia delivery with fentanyl.

Following General Surgery and Obstetrics discussion, a joint decision was made to proceed to theatre for a C-section and exploratory laparotomy, particularly given the pregnancy was at term. Delivery of the foetus was uncomplicated. Exploratory laparotomy revealed a meso-axial caecal volvulus with mildly dilated small bowel without bowel compromise. Intraoperatively, the decision was made to perform a caecopexy as we presumed the underlying pathology was due to displacement caused by the gravid uterus, due to the absence of a narrowed and elongated mesentery.

The patient and newborn recovered well and were discharged a few days later.

Figure 1: MRI image in coronal plane. Green circle outlines mesenteric swirling, suggestive of volvulus.

Discussion

Volvulus is an unusual cause of abdominal pain and obstruction in pregnancy, with current literature suggesting that caecal volvulus is rarer than sigmoid volvulus.[1] Two cases have been reported with pregnant women presenting with sepsis due to intestinal ischaemia secondary to caecal volvulus. In both cases symptoms were present for approximately 24 hours prior to presentation and the foetus was delivered stillborn.[2,3]

A further case outlined a patient at 18 weeks gestation for whom diagnosis was confirmed on abdominal X-ray. This patient required a right hemicolectomy due to an ischaemic caecum.[1] This case discussed the presence of this pathology in the right upper quadrant, possibly secondary to displacement caused by the gravid uterus.

Patients may present with non-specific symptoms: abdominal pain, obstipation and vomiting. Clinical examination may reveal a tender abdomen with or without focal tenderness and peritonism. Imaging findings may be both non-specific and non-confirmatory. MRI was readily available at our hospital; however, computed tomography would be an alternative. In the third trimester the risk is largely to the foetus, both to development and the cumulative childhood cancer risk.

The standard of treatment for caecal volvulus is a right hemicolectomy; however, we presumed the pathology in this case to be different and therefore a caecopexy was performed. Should the patient represent with volvulus, a right hemicolectomy would be the operative management.

Although uncommon, clinical suspicion must remain in the situation of persistent abdominal pain without obvious clinical signs and reassuring inflammatory markers. A high index of suspicion is required given the risk to both mother and foetus. We suggest a low threshold for imaging and/or exploratory surgery, particularly in the situation where the foetus is at term.

COMPETING INTERESTS

Nil.

ACKNOWLEDGEMENTS

We acknowledge and thank the patient and her whānau for allowing us to share their story and images.

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https://nzmj.org.nz/journal/vol-138-no-1623/caecal-volvulus-in-third-trimester-of-pregnancy

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Primary oesophageal melanoma—recognition and evolution of management

Kevin YY Chen, Grant A Crane, Chris YJ Kim, Ahmed WH Barazanchi, Jason Hill

Melanoma is one of the most common malignancies diagnosed in New Zealand with a reported incidence of approximately 55 per 100,000; one of the highest in the world.[1] The vast majority of cases worldwide are cutaneous melanoma, whereas primary oesophageal melanoma (POM) only accounts for <0.05% of malignant melanomas and 0.1–0.2% of all oesophageal tumours.[2] There are only a few hundred case reports of this entity worldwide.[3] In this report, we examine the case of a woman in her 50s of mixed Māori and European heritage who presented with progressive oesophageal dysphagia to solids over 3 months and an associated 5kg weight loss.

Case report

Our patient was referred for direct-access endoscopy by the ear, nose and throat (ENT) service who had been managing a benign right thyroid nodule and came across her dysphagia incidentally. Past medical history includes a known atrial septal defect, uterine leiomyoma and previous caesarean section. Her body mass index was 38. She never smoked and had minimal alcohol consumption. She underwent upper gastrointestinal endoscopy, which identified a large partially obstructing oesophageal mass with stigmata of recent bleeding in the lower third of the oesophagus, 35cm from the incisors (Figure 1).

Staging scans were performed and an enlarged epigastric lymph node with mild fluorodeoxyglucose (FDG) uptake was suspicious for nodal metastasis (Figure 2 and 3). No other FDG avid nodes were seen, nor distant metastatic disease. Histology from the endoscopic biopsy revealed squamous mucosa with high grade poorly differentiated epithelioid cells that were positive for SRY-related HMG-box gene 10 (SOX10) and negative for cytokeratins, neuroendocrine and squamous markers. The features were consistent with melanoma. BRAF mutational analysis was negative. Complete skin, pelvic and anorectal examination has not revealed another primary melanoma lesion.

Figure 1: Left—large mass with minor bleeding found in the lower third of the oesophagus, 35cm from incisors. Right—retroflexed view of the gastric cardia. Note mild haemorrhage from the tumour passing the gastro-oesophageal junction next to the endoscopic shaft.

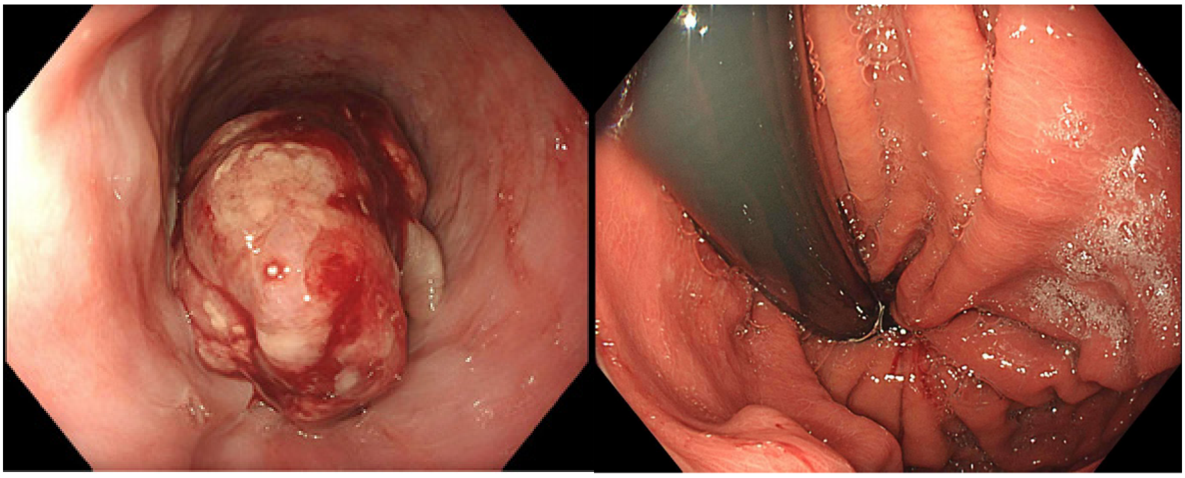


Figure 2: Staging computed tomography (CT) found lobulated hyperdense mass in the lower oesophagus without transmural extension (red arrow).

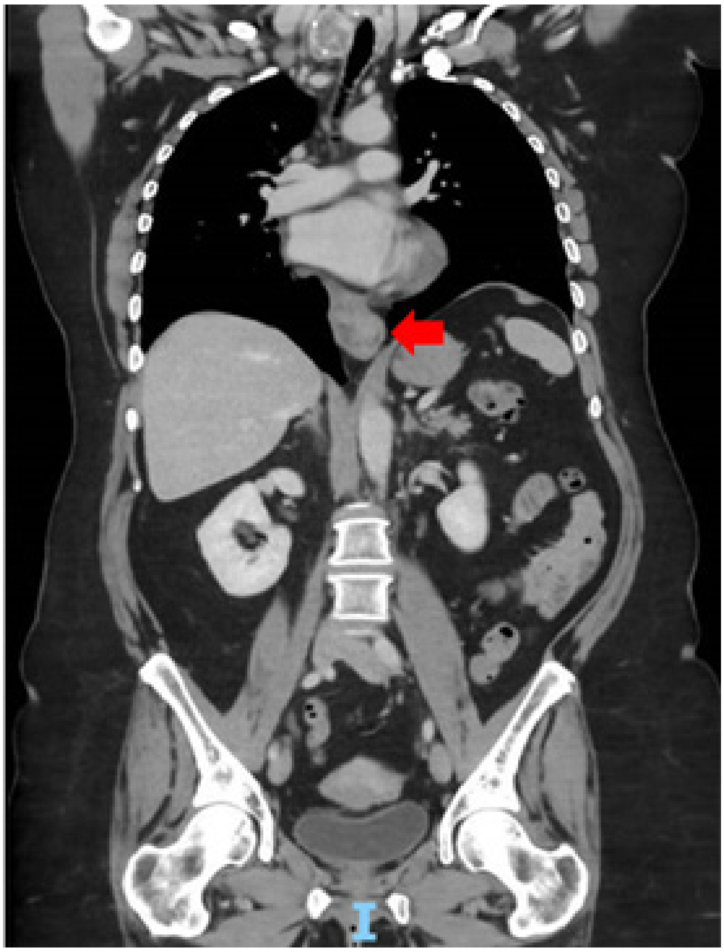
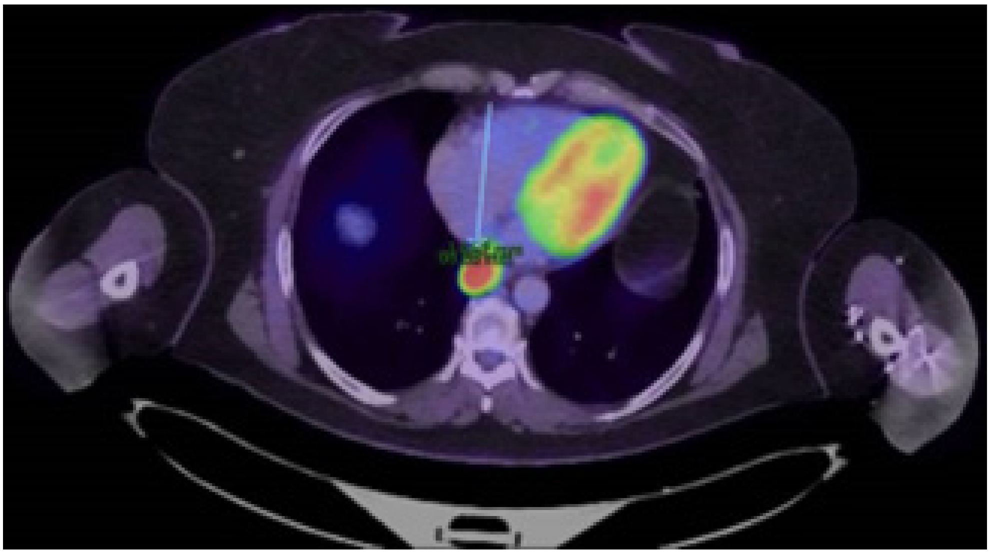


Figure 3: Positron emission tomography (PET) shows FDG-avid mass in the lower oesophagus posterior to the left atrium of the heart.



After a melanoma multidisciplinary meeting (MDM) discussion she was referred for surgical resection with curative intent. She underwent a two-stage minimally invasive oesophagectomy and pyloroplasty without serious complications. The resected specimen showed 6 foci of invasive melanoma arising from *in situ* melanoma, with the largest measuring 42x25x20mm (Figure 4 and 5). Deepest invasion was to submucosa without lymphovascular or perineural invasion. Resection margins were clear. All 36 resected nodes were negative for malignancy. Final pathological staging is pT1bN0M0. Additional targeted mutational analysis of the resection specimen did not show mutations in KIT, KRAS, NRAS, GNA11 and GNAQ genes. Adjuvant therapy was not recommended by MDM, but she will have surveillance CT at 6-month intervals for 3 years, then annually for 5 years under the upper gastrointestinal surgery service.

Discussion

The first histologically confirmed case of POM was described in literature in 1952.[4] A recent systematic review found that the mean age of diagnosis is 61.[5] About half of cases have metastasised to other organs by the time of diagnosis, and the overall prognosis is poor with an estimated median survival of 10 months and 2–5% at 5 years.[3] The pathogenesis and risk factors for POM remain poorly understood but it is known that 4–8% of the general population have melanocytes present in the oesophageal mucosa.[5–7]

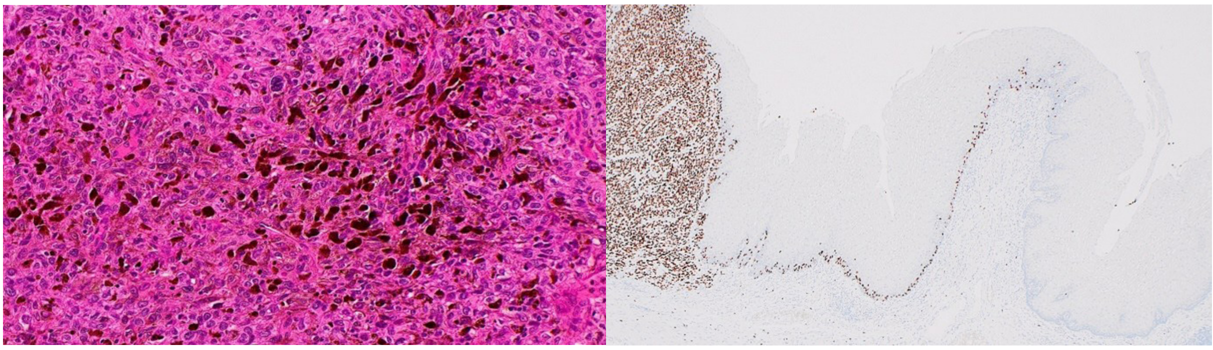
The clinical manifestations of POM include dysphagia (75%), retrosternal pain (69%), epigastric discomfort (8.6%) and overt gastrointestinal bleeding (8.6%).[3,5] While the vast majority (90%) of cases are found in the middle and lower third of the oesophagus, only 73–85% of POM cases exhibit melanocytic pigmentation.[3,5] Thus, POM is still a differential for amelanotic polypoid lesions in the oesophagus necessitating histopathological examination for a confirmed diagnosis.[7] Presence of melanin granules with tumour cells is a cornerstone criterion for the histopathological diagnosis of POM.[8] Twelve percent of cases involved multifocal lesions. Immunohistochemistry for S-100 protein, Melan-A, HMB-45, SOX10 and KBA.62 also aid in diagnosis.[3] Of note, the commonly detected BRAF mutation for cutaneous melanoma is typically not detected in POM, which may instead harbour mutations in other genes such as KIT, influencing the selection of targeted immunotherapy agents.[8]

Like other solid organ malignancies, staging of POM is crucial for both treatment decision and prognosis, as up to 25% of cases worldwide used PET/CT to rule out distant metastasis.[5] Both lymph node metastases and the overall TNM staging with the American Joint Commission on Cancer staging classification for the oesophagus have been demonstrated to be independent predictors for POM prognosis.[9] Surgical resection is the gold standard for treatment with curative intent in POM without distant metastases, and while there is no established standard systemic therapy in the adjuvant or metastatic settings, there is increasing evidence that immunotherapy offers significantly extended overall survival compared to limited efficacy from chemotherapy or locoregional radiotherapy.[3,5] There is high disease recurrence after curative resection for POM occurring in 40% of cases and the median time to recurrence is 6 months.[5] The risk of recurrence extends to at least 5 years, which highlights the importance of surveillance post-resection of POM.[10]

Our case report fits with the classic descriptions and features of POM but has an amelanotic endoscopic appearance as well as favourable pathological staging after receiving standard of care surgical resection. Her favourable prognosis is partly attributable to the prompt recognition by the ENT team that progressive dysphagia requires urgent endoscopic evaluation. Due to its rarity, post-resection management remains poorly defined and underinvestigated. Further studies in this area will help address the high disease recurrence and improve overall survival.

Figure 4: Side and top-down views of resected specimen showing the lower oesophagus on the right including the protruding polypoid lesions of invasive melanoma adjacent to the gastro-oesophageal junction. The gastric cardia is characterised by the rugal folds.

Figure 5: Left—histopathology slides hematoxylin and eosin stain (H&E stain) showing melanin deposits within the tumour. Right—SOX10 immunostain (nuclear stain for neural derived tissue and melanocytes) showing invasive melanoma on the left and melanoma *in situ* trickling along the basal layer of the squamous mucosa.



COMPETING INTERESTS

Nil.

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https://nzmj.org.nz/journal/vol-138-no-1623/primary-oesophageal-melanoma-recognition-and-evolution-of-management

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Distant stoma chyme reinstallation—the first use of The Insides Channel

Louise Calder, Jevon Puckett

This case report is of a 72-year-old patient (patient T) who is the first patient to receive reinstallation of chyme from one stoma to a second, distant stoma using The Insides® Channel device.[1] Patient T had an elective open repair of an abdominal aortic aneurysm (AAA) resulting in a distal emboli shower with patchy visceral organ necrosis. Following an emergency laparotomy and resection of segmental bowel, patient T was recovered to the intensive care unit (ICU) with three stomas, including a high-output ileostomy, and unused remnant colon with proximal and distal ends brought out as distinct colostomies. The Insides® Channel allowed for chyme reinstallation and use of the defunctioned colon. Utilising as much bowel as possible aided in nutrition and integrity of the remaining bowel, allowing for a successful operation when their ileostomy and ascending colon were subsequently rejoined.

History

Patient T had a pre-operative computed tomography aortogram (CT-A) showing a 57mm juxtarenal aneurysm with crowded visceral vessels proximally. An open repair via retroperitoneal approach with supraceliac clamping was therefore proposed. The operation occurred without incident and the patient was admitted to the ICU post-operatively for routine monitoring. Over the following 36 hours the patient failed to thrive and blood tests showed an ongoing metabolic acidosis. A repeat CT-A showed occlusion of the celiac trunk, ileocolic artery and a right renal infarct. Given the CT findings and clinical concern, the patient was returned to theatre for an exploratory laparotomy. Patient T was found to have a gangrenous gallbladder, terminal ileum, ascending colon and sigmoid colon. A cholecystectomy, ileocolic resection along with a left-sided resection of distal descending colon to proximal rectum were performed. The operation note reports the resected length of terminal ileum measured 120cm, but does not specify the length of resected colon. The patient then had three distinct stomas fashioned: an end ileostomy in the right lower quadrant, a venting colostomy for the ascending colon in the right upper quadrant and an end colostomy for the descending colon in the left upper quadrant. Instability of the patient and short mesenteries meant the terminal ileum and ascending colon were not able to be anastomosed at the time or brought out as a double barrel stoma. A Mikulicz drain was inserted to limit the chance of a pelvic collection developing, and 24Fr drains were placed in each paracolic

Figure 1: The Insides® Channel on a demonstration patient.

gutter. A gastrostomy was also inserted to facilitate enteral feeding. The patient then returned to ICU for ongoing care.

Patient T made slow but steady progress in the ICU. High ileostomy outputs were persistently recorded despite standard medical therapies to reduce output: omeprazole, loperamide and St Mark's solution. The Insides® Company was then approached to enable reinstallation of chyme from the ileostomy to the ascending colon stoma after responding to feedback from clinicians and developing a system for this purpose (see Figure 1).[2]

This is the first case of distant ostomy reinstallation using The Insides® Channel, designed and supplied by The Insides® Company in New Zealand. Reinstallation first started with The Insides® System, which used a patient-managed device to refeed stoma contents, either from a loop or double barrel stoma, into a distal lumen of a stoma or fistula at the same site. Here, refeeding occurred within the same ostomy appliance. The Insides® Channel is an extension of this. Accessories allow for separate stoma bags to be connected and facilitate chyme transfer and reinstallation from one ostomy to another. Analysis of data from The Insides® Company's clinical registry of high-output stoma and fistula patients receiving chyme reinfusion therapy over the past 3 years indicates that the total cost of care for a patient with a separated stoma (requiring both The Insides® System and The Insides® Channel) is approximately NZ$204,000 over an 8-month period. In contrast, the cost for patients receiving the standard of care (i.e., prolonged hospitalisation and ongoing parenteral nutrition) is estimated at NZ$531,000 over the same period, resulting in a cost saving of approximately $327,000 per patient.[3]

The Insides® Channel system was first used on patient T on 9 May 2025 (see Figure 2). This, in essence, allows for gastrointestinal continuity outside of the abdominal cavity. The ileostomy and ascending colon stomas were connected via the Insides® Channel tubing and pumps, which transferred chyme from the ileostomy bag to the ascending colon bag, and reinstallation of the chyme into the ascending colon. The descending colon stoma was then able to be used as an end colostomy. Prior to reinstallation, ileostomy outputs had been up to 2,600ml/day. Following reinstallation, colostomy outputs were consistently <1,000ml/day (with the addition of loperamide) and the patient was no longer reliant on parenteral nutrition or intravenous hydration. Patient T remained an inpatient over this time to recover from their two surgeries and regain sufficient nutrition to undergo a third operation. They also required regular nursing care as they were unable to manage The Insides® Channel device independently.

Eleven weeks after their emergency laparotomy, and 6 weeks after having The Insides® Channel installed, patient T returned to theatre to have their ileostomy and ascending colon stomas joined. The colorectal surgeon at the time made a point of noting how good the quality and structure of the colon was. The aim of this operation was to leave patient T with an end colostomy that they could manage independently

Figure 2: The Insides® Channel applied to the first patient, with arrows showing the direction of chyme transfer.

and be discharged home with. Post-operatively, patient T experienced difficulties with high end colostomy stoma outputs for 3 weeks, with an average 24-hour output of 1,700ml despite high doses of loperamide and codeine. After 3 weeks the stoma outputs decreased to be consistently less than 1,000ml/day. Patient T remains an inpatient despite the acceptable stoma outputs because of anorexia, nausea and vomiting, which has subsequently caused a reliance on parenteral nutrition. The exact cause of this is unknown as blood tests and imaging have been clear. There is a proposal, currently, for them to remain an inpatient and have their descending colon rejoined to their remaining rectum in an effort to maximise the available colon for water reabsorption. This would need to happen at least 2 months following the previous operation and would significantly increase the length and cost of their admission; however, it is being considered as it is hoped it would improve their bowel function and quality of life.

Conclusion

The Insides® Channel is considered instrumental in helping patient T recover from their second operation, which required the resection of their gangrenous gallbladder, terminal ileum, ascending colon and sigmoid colon. It enabled the use of their remnant colon, which significantly reduced their stoma outputs post-operatively (see Figure 3). Using the colon also meant it was of good quality when it came time to rejoin their ileostomy and ascending colon stomas, allowing for a successful and uncomplicated procedure. Prior to this operation, the hope had been that patient T would be able to be discharged with a well-functioning end colostomy. Unfortunately, the initial issues with their high stoma outputs and current issues with nutrition have meant they remain an inpatient.

Figure 3: The Insides® Channel device.

COMPETING INTERESTS

Information regarding The Insides® Channel device supplied by The Insides® Company.

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Weekend warrior and exercise snacks: potential patterns of physical activity to promote healthier lifestyle in primary care

Apichai Wattanapisit, Phiphat Khlongdi, Kiattisak Pechpan, Sanhapan Wattanapisit

Current international recommendations on physical activity (PA) suggest that adults should engage in at least 150–300 minutes of moderate- to vigorous-intensity physical activity (MVPA) per week.[1] Additionally, light-intensity PA in daily life is recommended as a replacement for sedentary behaviours.[1] While the importance of sufficient MVPA is well established, the health benefits of light-intensity PA have gained increasing attention in recent years.[2]

Several PA promotion initiatives have been established in primary care settings such as Green Prescription (New Zealand), Let's Get Moving (United Kingdom) and Exercise is Medicine (United States).[3] However, only a small proportion of primary care patients receive PA counselling from their healthcare providers.[4] Systemic barriers, such as time constraints, are a major obstacle to PA promotion during clinical encounters.[5] In addition, motivating patients to meet the recommended PA levels remains challenging due to personal limitations.[5]

"Weekend warrior" and "exercise snacks" are patterns of PA that are gaining recognition in both public perception and scientific literature. This letter explores these two PA patterns and proposes potential approaches to promoting PA in primary care.

Weekend warrior

The term "weekend warrior" has been used in medical literature for over 20 years. A landmark article published in 2004 defined a weekend warrior as an individual who expends ≥1,000kcal per week through sports or recreational activities performed 1–2 times per week.[6] A more recent article, published in 2023, differentiated two patterns of achieving the recommended PA levels: 1) engaging in PA in 1–2 sessions per week, referred to as the "weekend warrior pattern' and 2) distributing PA across multiple sessions per week, known as the "regularly active pattern".[7] In general, being a weekend warrior involves accumulating at least 150 minutes per week of moderate-intensity PA or 75 minutes per week of vigorous-intensity PA within 1 or 2 days.

A systematic review and meta-analysis of seven studies, including 426,428 participants, found significant reductions in cardiovascular mortality (relative risk [RR] 0.73, 95% confidence interval [95% CI] 0.60–0.90) and all-cause mortality (RR 0.83, 95% CI 0.77–0.90) in individuals following the weekend warrior pattern compared with those who were physically inactive.[7] Additional analysis indicated that the weekend warrior and regularly active PA patterns resulted in similar risk reductions.[7] Nevertheless, this PA pattern may increase musculoskeletal injuries and trauma.[7]

Exercise snacks

The term "exercise snacks" has gained public attention since 2007.[8] Recent literature defines exercise snacks as "*isolated bouts of vigorous exercise lasting ≤1 minute, performed multiple times throughout the day*"[8] or "*engaging in multiple brief exercise sessions, each lasting less than or equal to 1 min, spaced at intervals of 1–4 hours throughout the day*".[9] Based on the Borg Category Ratio 10 Perceived Exertion Scale (0= nothing at all; 10=maximal exertion), an exercise snack is rated at close to or greater than 5 (hard effort and above).[8] There are some variations of the definition of exercise snacks, in terms of the bout duration and the intensity of activity. In addition, other terms under the umbrella term of intermittent PA are used interchangeably to refer to exercise snacks.[10] Snacktivity is multiple 2–5-minute bouts of MVPA across the day, and vigorous intermittent lifestyle PA is up to 5-minute bouts of vigorous-intensity PA in daily living activities.[10]

Exercise snacks can be incorporated into routine activities in various settings, such as homes, schools and offices.[9] For example, an individual may walk briskly up the stairs to use a toilet on a different floor.[8] One key advantage of exercise snacks is that they do not require specific exercise equipment or settings.[9] Exercise snacks can be categorised into two types: 1) vigorous intermittent exercise and 2) moderate intermittent exercise.[9]

Physiological outcomes, as surrogate markers, from exercise snacks have been documented, including improved cardiorespiratory fitness, reduced plasma glucose and lipid levels and enhanced muscle strength and blood flow.[8,9] However, the long-term effects of exercise snacks, such as their role in preventing major non-communicable diseases and reducing mortality, require further investigation. A consideration of exercise snacks is that brief and intermittent bouts of PA at moderate- to vigorous-intensity may pose a challenge and risk of injuries for physically inactive individuals.

Conclusion

Weekend warrior and exercise snacks offer additional options for promoting PA in primary care. Although these PA patterns are evidence-based, flexible, adaptable and potentially pragmatic, they are not the replacement of regular MVPA throughout the week. Weekend warrior can lead to meeting the recommended PA levels; however, it may not reduce daily sedentary behaviours. Exercise snacks help break sedentary time during the days; however, it may not be sufficient to meet the recommended PA levels. Both PA patterns may increase risks of injuries, especially in inactive individuals and patients with medical conditions. Therefore, safety issues should be considered, and the fundamental principle of “start low and go slow” is applicable to minimise the risk of adverse events.

COMPETING INTERESTS

Nil.

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https://nzmj.org.nz/journal/vol-138-no-1623/weekend-warrior-and-exercise-snacks-potential-patterns-of-physical-activity-to-promote-healthier-lifestyle-in-primary-care

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Caesarean Section with Acute Appendix.

By MARY A. CHAMPTALOUP, M.B.

NZMJ, 1925

The following case, operated on by Dr. C. North, Assistant-Gynæcologist, Dunedin Hospital, shows the value of the extraperitoneal method of a Cæsarean section.

Mrs H., æt. 21, admitted to Dunedin Hospital, 1st March, 1925. Liquor amnii began to escape 14 days previous. Labour pains present seven days, and were severe for last four days. On the day before admission she was seized with a sharp stabbing pain in right iliac region, continuous between the labour pains, and accompanied by vomiting. She had then a two finger dilation of the os, and the fœtal head was free above the pelvic brim. The fœtal heart sounds were good.

On admission her temperature was 96deg., pulse 54. She was intensely tender in the right lower abdomen, and operation was decided on. The abdomen was opened by a right rectus incision. It contained free fluid with a B. coli odour. The uterus was pulled over to the left, the abdominal cavity packed off, and an acutely inflamed appendix, covered with fibrinous exudate removed with considerable difficulty. The appendix region was swabbed out with warm ether, and the peritoneum carefully closed.

The skin wound was then extended 1½ in. downwards, the bladder and lower peritoneal reflection defined, and displaced respectively medially and upwards, thus laying bare the lower uterine segment. This was incised somewhat obliquely and the fœtal head was speedily delivered by uterine contraction. The placenta and membranes were removed in the usual way, and the uterine wound closed by three layers of catgut sutures. An extraperitoneal cigarette drain was inserted in the lower angle of the wound and removed after 24 hours.

As far as the uterine condition was concerned her recovery was uneventful. On the twelfth day involution was normal, the os quite closed, and no tenderness present in the fornices. The only trouble arose from some infection of the upper angle of the wound with B. coli pus formation.

Küstner advocates Trendelenburg position for this operation, but no difficulty was experienced with the patient lying flat. He also fills the bladder with saline to aid in its identification. The reflection of bladder and peritoneum was easily performed owing to the laxity of the connective tissue planes during pregnancy.