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Infrastructure is not a cure: Aotearoa New Zealand's health crisis demands vision, not just buildings

Frank A Frizelle

The recent announcement by the present Government of a NZ$20 billion investment in health infrastructure over the next 10 years was very welcome. Aotearoa New Zealand's public health system is navigating a prolonged and deepening crisis. Despite major structural reforms, multiple strategies and alternating political mandates, key health outcomes continue to stagnate or deteriorate. Public hospitals are ageing and overcrowded, workforce morale is strained and inequities persist across ethnicity, geography and income. The 2024 *Health Infrastructure Review* provides a sobering assessment of the sector's physical state and capital needs. However, while bricks, beds and budgets remain important, infrastructure alone cannot address a crisis rooted in philosophical drift, political instability and demographic transition.

Clinician feedback for bi-annual quality improvement reports generated by the Prostate Cancer Outcomes Registry Australia and New Zealand

Andreas S Nicolaou, Eng Ann Toh, Judith Clarke, Stephen Mark, Phil Hider

The Prostate Cancer Outcomes Registry (PCOR) is an Australian and New Zealand registry that collects health and quality of life information from people with newly diagnosed prostate cancer. Data collected by PCOR are used to create standardised benchmarked measures that are collated into Quality Improvement (QI) reports and sent to urologists to provide performance feedback and encourage ongoing improvement. This study aims to 1) assess clinician perspectives on methods of report distribution, 2) assess the clinical value and utility of PCOR Quality Indicator (QI) reports for New Zealand urologists, and 3) identify barriers impacting engagement with these reports. Consultant urologists practicing in New Zealand who were receiving QI reports from the PCOR-NZ registry in December 2022 were invited to participate in this study. Clinicians provided feedback via completion of an online survey. Clinicians could additionally volunteer to provide further feedback through participation in interviews.

Assessment of burnout in New Zealand ophthalmology registrars

Theodore Andrew Sutedja, Luke Hawley, Kelechi Ogbuehi

A science-based survey was used to assess the level of burnout in the New Zealand ophthalmology registrar population. This was compared with several factors that affect the participating doctors to assess any correlation. This was used to draw conclusions where improvements can be made to improve the workplace and create a resilient workforce.

Radiology trainee retention in Auckland, New Zealand: a survey

Charles Robertson, Rhian Miranda, Divya Mehta

A survey was carried out on radiologists (specialist doctors who use medical imaging such as X-ray, computed tomography [CT], ultrasound and magnetic resonance imaging [MRI] to diagnose and treat disease) that began their specialty training in Auckland within the past 2 decades. The main purpose of the study was to see what proportion of these doctors we have been losing to Australia and other overseas countries, and to explore some of the reasons why. The perception is that radiology is an understaffed specialty area with rapidly growing demand that needs to focus on both increasing and retaining its workforce.

Endoscopic full-thickness resection using full-thickness resection device for treatment of upper and lower gastrointestinal tract lesions—the first New Zealand study

Sharon Wing-Kee Yiu, Erin Horsfall, Ravinder Ogra, Cameron Schauer, Anurag Sekra

We report the first case series of adopting an innovative treatment approach for the resection of upper and lower gastrointestinal tract lesions using the full-thickness resection device (FTRD). The aim of our study was to evaluate the safety and efficacy of this approach in New Zealand, where data are currently lacking. Three key criteria were used to assess efficacy via technical success: 1) successfully reaching the target lesion with the FTRD, 2) accurately applying the FTRD to the lesion, and 3) achieving immediate and complete resection of the lesion such that there is lack of residual lesion following the use of FTRD. Lesions were subsequently examined under the microscope to evaluate for R0 status, a phenomenon where, histologically, there is negative disease at the margins. Safety of this approach was studied by noting any complications that occurred during and after the procedure up to 30 days. Our findings are comparable to international evidence in terms of safety and efficacy of the FTRD and therefore emphasise this as a valuable modality to potentially avoid surgical resection.

Using Māori community aspirations to advocate for oral health integration into diabetes care

Kuramaiki Lacey, Margaret Clark, Breanna Jansen, Phoebe Skinner, Ethan Kamana, Esther Willing

Diabetes and periodontal disease are two chronic diseases that disproportionately impact Māori. This Kaupapa Māori research used wānanga to engage with the Porirua community and capture the aspirations of Māori adults with diabetes and their whānau. They identified several barriers in current care, and opportunities to integrate oral healthcare into diabetes management. The aspirations of whānau highlighted the need for improved access to education and information, plus a connection to Te Ao Māori.

Blunt cerebrovascular injury in trauma patients: an under-recognised injury pattern at Auckland City Hospital

Rebecca Schroll, Samuel A Flint, Donald Harris, Ian Civil

Patients who sustain blunt traumatic injuries, such as those from car crashes and falls, can sometimes have injuries to the major blood vessels that go to the brain. While these types of injuries are rare, if they are not found and treated they can lead to stroke and death. A computed tomography scan of the neck can be done for patients who are most likely to have these types of blood vessel injuries. If a patient has this type of injury, often simple treatment with aspirin can prevent stroke and death.

Mental health and wellbeing of ethnic migrant women and girls in Aotearoa New Zealand: a scoping review

Julia Vajda De Albuquerque, Roshini Peiris-John, Parvinca Saini, Sarah Hetrick, Rodrigo Ramalho, Isabelle Uy, Vartika Sharma

There is a significant lack of high-quality data on the mental health of Asian and Middle Eastern, Latin American and African (MELAA) women and girls in Aotearoa New Zealand. Existing evidence is limited and drawn from studies with diverse populations and outcomes, making it difficult to draw clear conclusions. Most of the available research does not specifically focus on mental health among Asian and MELAA women and girls and often does not provide detailed data for these groups. Only three peer-reviewed studies have examined the mental health and wellbeing of Asian women in New Zealand, and these were limited to a few sub-ethnic groups. No studies were found that focussed solely on MELAA women. These gaps in knowledge have important implications for the development and delivery of mental health services. Without accurate and detailed data, it is challenging to understand and respond to the specific needs of these communities.

Optimising the use of certification findings to support healthcare quality measurement and improvement

Jerome Ng, Jacky Chan, Jerson Valencia, Kaushik Kaushik, Fran Voykovich, Marama Tauranga, Andrew Connolly, Vanessa Thornton

In Aotearoa New Zealand, health and disability service providers are audited against Ngā Paerewa Health and Disability Service Standards 2021 to assure public safety. The qualitative and narrative nature of reports means they are suboptimally used. We propose a novel approach to better summarise and visualise audit findings to inform and support clinical governance and quality improvement.

Fighting steroids with steroids: a case of bilateral central retinal vein occlusion in an anabolic steroid user

Joshua Read, Colin Parsloe

Central retinal vein occlusion (CRVO) occurs when the blood flow in a major eye vein is blocked off. It often causes cystoid macular oedema (CMO), which is swelling in the back of the eye. CMO from CRVO is typically treated with anti-VEGF (anti-blood vessel growth medications) or corticosteroid (anti-inflammatory) eyeball injections. This case was a young male who developed central retinal vein occlusions in both eyes, one of which responded more favourably to corticosteroids. Despite this, his vision never returned to normal.

An assessment of e-liquid label accuracy in Aotearoa New Zealand

Renee Hosking, Jude Ball, Calvin Cochran, Janet Hoek

A recent analysis of Institute of Environmental Science and Research (ESR) product testing data for 221 vaping products sold in New Zealand found that over half had inaccurate nicotine levels compared to information provided on their labels or packages. Most of the mislabelled products (95%) had significantly less nicotine than advertised—some by over 50%. This mislabelling could make it harder for people trying to stop smoking; if they do not get enough nicotine from vaping, they may return to smoking, which would increase the risks they face. Alternatively, they could begin vaping more frequently or intensely, which could also increase health risks. A small number of mislabelled products (5%) had more nicotine than stated, which could raise addiction risks. These findings highlight the need for stronger enforcement of regulations and greater transparency about product testing results.

Infrastructure is not a cure: Aotearoa New Zealand's health crisis demands vision, not just buildings

Frank A Frizelle

The recent announcement by the present Government of a NZ$20 billion investment in health infrastructure over the next 10 years was very welcome. Aotearoa New Zealand's public health system is navigating a prolonged and deepening crisis. Despite major structural reforms, multiple strategies and alternating political mandates, key health outcomes continue to stagnate or deteriorate. Public hospitals are ageing and overcrowded, workforce morale is strained and inequities persist across ethnicity, geography and income. The 2024 *Health Infrastructure Review* provides a sobering assessment of the sector's physical state and capital needs. However, while bricks, beds and budgets remain important, infrastructure alone cannot address a crisis rooted in philosophical drift, political instability and demographic transition.

The infrastructure stocktake needs to be considered within a broader conversation about the future of public healthcare in Aotearoa New Zealand. The United Kingdom's (UK's) 2024 *Darzi Review* of the National Health Service (NHS) makes it clear that infrastructure renewal should be part of a wider effort to define the purpose, scope and limitations of the public health system with consideration of a modernised social contract for health, grounded in equity and realism, and protected from electoral volatility through a cross-party accord.

Aotearoa New Zealand's ageing health infrastructure

The *Health Infrastructure Review* identifies a capital shortfall of at least NZ$24 billion over the next decade, with NZ$6 billion required immediately to address critical safety and capacity risks.[1] Over 30% of hospital buildings are rated as poor or very poor. Many lack earthquake resilience, efficient ventilation or adequate digital infrastructure. Decades of deferred maintenance have produced bottlenecks, clinical risks and worsening patient experience. These findings are not surprising; they confirm what frontline workers and patients have long experienced.

Ageing infrastructure is not the only concern. Many existing facilities are fundamentally mismatched with modern patterns of illness. Aotearoa New Zealand's hospital system, like that of many Organisation for Economic Co-operation and Development (OECD) countries, was built in the mid-twentieth century for acute, episodic care. Today's health burden is increasingly chronic, multimorbid and community based. Infrastructure planning has failed to keep pace with this epidemiological transition.

The stocktake rightly calls for a long-term capital investment strategy. However, it says little about the philosophy guiding that strategy. Which models of care are we building for? What population needs are being prioritised? Without alignment between infrastructure and a clearly articulated vision of public healthcare, capital expenditure risks becoming reactive, disjointed and wasteful.

Learning from the *Darzi Review*: beyond bricks and mortar

The UK's *Darzi Review: Reimagining Health* (2024) offers a useful point of comparison. Commissioned by NHS England to chart a long-term direction for the health service, the report confronts many of the same issues facing Aotearoa New Zealand: ageing facilities, workforce shortages, fiscal constraints and health inequities. It too calls for capital investment in community care and digital technology—but places this within a broader philosophical framework.[2]

Central to the *Darzi Review* is the concept of a "renewed social contract" for health: a transparent, publicly negotiated understanding of what the NHS can and cannot provide, what rights and responsibilities citizens hold and what principles should govern trade-offs. This framing reflects an awareness that infrastructure and service models must be underpinned by shared values if they are to be sustainable.

Aotearoa New Zealand currently lacks such a shared understanding. The founding ideals of universal healthcare—enshrined in the 1938 *Social Security Act*—have eroded under the influence of neoliberal policy shifts since the late 1980s. Contractualism and market mechanisms now dominate many aspects of health governance. Yet the public expectation of comprehensive, state-funded care has not changed. This dissonance contributes to confusion, policy inconsistency and public dissatisfaction.[3]

The *Darzi Review* recognises that modernising the health system requires more than new buildings; it requires ideological clarity, democratic legitimacy and long-term continuity. Aotearoa New Zealand must now ask: what kind of health system do we want, and how will we pay for it?

Demographics and fiscal limits: confronting inconvenient truths

A crucial part of this discussion involves acknowledging the demographic and fiscal context in which the health system operates. Aotearoa New Zealand, like many high-income countries, is experiencing profound demographic change. In the 1960s, there were 7.1 working-age adults for every person over 65. By 2020, that figure had dropped to 4.2. By 2040, it is expected to fall to 2.8.[4] This shift places increasing strain on the health system, which must serve a growing population of older adults with fewer working taxpayers to fund services.

At the same time, healthcare costs are rising. Advances in pharmaceuticals, diagnostics and surgical technology—while improving outcomes—are also increasing per capita expenditure. Health is now the second-largest area of government spending, after social welfare. Without significant tax reform or productivity gains, sustaining an expansive model of universalism may not be feasible.

This does not mean abandoning equity or public provision. Rather, it requires a more precise and honest definition of what “universal access” should mean in the twenty-first century. We suggest that universality be reframed as equitable access to a core package of high-value, evidence-based services—delivered free at the point of use, prioritised according to need and responsive to population health goals.

This kind of prioritisation requires transparent criteria and public dialogue. Decisions about what services to fund, what technologies to adopt and where to invest should be guided by values as well as cost–benefit analysis. The alternative is *ad hoc* rationing, postcode lotteries and further erosion of trust.

The problem of political instability

Compounding the philosophical and demographic challenges is a third critical issue: political instability. In the past 5 years alone, Aotearoa New Zealand has had **six different ministers of health**. Each change in leadership has brought new priorities, new advisory groups and new reform agendas. The abolition of district health boards, the creation of Te Whatu Ora – Health New Zealand and Te Aka Whai Ora – Māori Health Authority and the frequent reshuffling of funding models have created an environment of perpetual transition.

This instability is demoralising for staff, confusing for the public and counterproductive for planners. It undermines institutional memory and weakens the ability of the health sector to make long-term decisions. More importantly, it prevents the kind of steady, bipartisan progress required to address complex, multigenerational challenges.

By contrast, the *Darzi Review* calls for insulation from short-term political cycles. It recommends multi-year funding plans, independent oversight and greater public engagement. These measures aim to foster continuity, coherence and legitimacy.

Aotearoa New Zealand must now consider similar structural solutions. We propose the establishment of a **Cross-Party Health Accord**: a formal, legislated commitment to long-term health planning, supported by a permanent Health Futures Commission. This body would be tasked with defining national health objectives, advising on infrastructure and workforce planning, and monitoring equity and performance outcomes.

Crucially, such an accord must be co-designed with Māori leadership, in line with Te Tiriti o Waitangi. Any national vision must incorporate Māori health aspirations, data sovereignty and governance rights. Equity cannot be achieved without partnership.

Towards a new vision of public healthcare

Aotearoa New Zealand's health debate is often trapped between nostalgia and technocracy—between calls to return to the "golden age" of social security and the data-driven imperatives of modern health management. What is missing is a future-facing vision that is honest about constraints but ambitious about values.

The infrastructure stocktake offers an opportunity to pivot towards such a vision. It should force us to confront the physical limitations of our current system, but it must also prompt deeper reflection. What should every New Zealander expect from their health system in 2040? What do we owe one another, across generations? What is the role of the state in securing health equity?

I would suggest that the following principles guide this reflection:

1. **Equity over equality**—Resources should be allocated to reduce disparities, not merely distributed evenly.
2. **Value-based universalism**—Core services should be universally accessible but must be evidence-informed and prioritised.
3. **Integrated care as default**—Infrastructure should support team-based, multidisciplinary, local models of care.
4. **Public trust through transparency**—Decisions about funding and access must be open, participatory and principled.
5. **Political continuity through accord**—Health system reform should be governed by bipartisan, long-term commitments, not political cycles.

Conclusion

The *Health Infrastructure Review* is a critical wake-up call. It outlines the immense physical and financial repair job facing our health system. But repairing roofs will not heal a system in philosophical disarray. Infrastructure is a means, not an end.

Aotearoa New Zealand must now undertake a more fundamental project: defining the purpose, scope and values of public healthcare in the twenty-first century. The *Darzi Review* shows that infrastructure renewal can—and should—be linked to vision, values and long-term planning.

Without a renewed social contract, and without cross-party commitment to shared goals, we will continue to rebuild crumbling hospitals on foundations of political short-termism and ideological confusion.

If we want a health system that is equitable, sustainable and future-ready, we must start not just with steel and concrete—but with clarity and courage.

COMPETING INTERESTS

None declared.

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Clinician feedback for bi-annual quality improvement reports generated by the Prostate Cancer Outcomes Registry Australia and New Zealand

Andreas S Nicolaou, Eng Ann Toh, Judith Clarke, Stephen Mark, Phil Hider

ABSTRACT

AIM: This study aims to 1) assess clinician perspectives on methods of report distribution, 2) assess the clinical value and utility of the Prostate Cancer Outcomes Registry (PCOR) Quality Indicator (QI) reports for New Zealand urologists, and 3) identify barriers impacting engagement with these reports.

METHODS: PCOR-ANZ provides 6-monthly QI reports to participating clinicians and hospitals. New Zealand urologists receiving scheduled reports were surveyed digitally. Interviews were conducted for qualitative feedback.

RESULTS: Thirty-three of 49 (67%) eligible urologists participated in this study. One hundred percent (n=33) of clinicians received notifications for new QI reports, 42% (n=14) finding them too lengthy. Seventy-six percent (n=25) and 70% (n=23) found the reports valuable for auditing and improving their practice, respectively.

CONCLUSION: Report distribution and data presentation are effective. PDFs are preferred by clinicians, but proposed interactive mediums were received positively. Reports are valued for auditing and improving practice. Report length and clinician time constraints are key barriers affecting engagement. A revision of the items included in QI reports would be beneficial to reflect modern practice. There is demand for a pathway to allow clinicians to contact others for peer review and advice.

The Prostate Cancer Outcomes Registry (PCOR) is an Australian and New Zealand (ANZ) registry that collects health and quality of life information from people with newly diagnosed prostate cancer. The New Zealand arm of the registry (PCOR-NZ) has been operational since 2016.[1] Data from PCOR-NZ and the six Australian jurisdictional-based PCORs feed into PCOR-ANZ and are used to create standardised benchmarked measures, which are collated into quality improvement (QI) reports. QI reports from PCOR-ANZ are generated by Monash University every 6 months and distributed by the local jurisdictions to participating hospitals and clinicians as confidential reports. In New Zealand, “hospital reports” are distributed to the relevant clinical director, and “clinician reports” are distributed to all clinicians who have signed an agreement to participate in the registry.[1,2] While urology QI reports have been distributed in New Zealand since PCOR-NZ’s inception, reports specific to radiation oncology departments and radiation oncologists were only distributed from the end of 2021. The urology QI reports consist of 12 quality indicators that were developed by an international multidisciplinary team using a modified Delphi process and approved by the PCOR-ANZ steering committee.[2] Currently, in New Zealand QI reports are sent as PDF files via a secure file transfer protocol for download.

Since 2019, all New Zealand public hospitals have participated in PCOR-NZ.[1] Data from these hospitals, in conjunction with around 60% of private clinics, now provide a national repository of information about the health and wellbeing of men diagnosed with and treated for prostate cancer. QI reports combining 3 years of data and comparisons across the full public hospital system have been available since 2022.

The PCOR aims to improve clinician performance and prostate cancer outcomes for patients in Australia and New Zealand.[1] The confidential reports from PCOR-NZ provide clinicians with personalised, risk-adjusted performance data based on the patients that clinician has either diagnosed or treated. This allows them to track their patients' quality of life outcomes over time, identify areas of weakness and compare their performance with the overall performance of clinicians across Australia and New Zealand. Additionally, reports can be used by clinicians and departments to implement changes in clinical practice, assess the impact these changes have made or act as external audits to ensure clinicians are providing the best possible care. Clinicians are not permitted to use the report information for advertising or marketing.

This study aims to: 1) assess clinician perspectives on methods of report distribution, 2) assess the clinical value and utility of the PCOR reports from the perspective of New Zealand urologists, and 3) identify any barriers that may prevent clinicians from engaging with the reports. This is the first study of its kind in Australia and New Zealand.

Methods

All consultant urologists practicing in New Zealand who were receiving QI reports from the PCOR-NZ registry in December 2022 were invited to complete a survey. Semi-structured interviews were also conducted with clinicians who volunteered to give additional feedback. As only a small number of radiation oncology reports had been distributed by the time of this study, the survey and interviews focussed on urologists and urology reports only.

The authors identified 54 consultant urologists practicing in New Zealand, 49 of whom were receiving scheduled QI reports. The five urologists who were excluded from this study either did not contribute to the registry, rarely diagnosed/treated prostate cancer or had not consented to participate in the QI reporting programme.

The survey consisted of seven sections, each assessing the clinicians' opinion on different aspects of the QI reports.

Section one gathered clinical practice information from participating urologists.

Section two investigated the effectiveness of QI report distribution, frequency, accessibility and notification, as well as clinicians' preferred methods of receiving reports, and the devices they used to access reports.

Section three focussed on identifying any concerns related to data privacy and security.

Section four inquired about the length, layout and presentation of data in the reports.

Section five ranked the clinical value of items within QI reports.

Section six evaluated clinicians' report utilisation, including discussion with colleagues, auditing practice, identifying areas for improvement, monitoring patient outcomes, performance tracking and peer comparison.

Section seven gauged the value of reports in auditing and improving clinical practice.

In December 2022, emails were sent to eligible urologists, outlining the aims of the project and encouraging them to participate. Each email contained a personalised URL link to the survey and an invitation to participate in an interview to further express their thoughts on the QI reports.

Between December 2022 and March 2023, reminder emails were sent fortnightly to clinicians who had not responded.

Semi-structured interviews with volunteer clinicians were conducted over Zoom, with an average duration of 25 minutes. A list of questions was used to guide the interviews; however, participants were encouraged to freely express their thoughts if they were relevant to the project aims. With clinician consent, Zoom audio was recorded and used to generate transcripts that were then reviewed by the lead author.

PCOR-NZ provided information about report access, i.e., opening their PDF report sent via email, related to all participating clinicians. Clinicians signed an agreement to participate in PCOR-NZ, and this study was undertaken as part of quality improvement activities to ensure that the quality and method of reports being distributed was acceptable, appropriate and of value to participating clinicians. Additionally, clinicians consented to participate in this study when they completed the survey.

Data analysis

Survey data were analysed using frequency distribution tables and percentage calculations. Interview data were assessed by thematic analysis using interview transcripts to identify patterns and group responses into related themes.

Results

Response rate

Thirty-three of the 49 (67%) urologists who participate in PCOR-NZ completed the survey, and four participated in interviews. Among the 33 responding urologists, 27 (82%) had opened their most recent QI report (Table 1). Eight (50%) of the 16 clinicians who did not participate in the survey also accessed their most recent QI report. A

Table 1: Survey responses versus viewing of last QI report.

	Survey		**Total**
Viewed last QI report	**Completed**	**Not completed**	
Yes	27	8	35
No	6	8	14
Total	**33**	**16**	**49**

QI = quality indicator.

Table 2: Use of QI reports by clinicians.

Use of QI reports	**Percentage *(%)***	**Count *(n)***
Identifying areas that need improvement	88%	29
Auditing practice	73%	24
Comparing my performance to colleagues	73%	24
Tracking performance over time	73%	24
Monitoring patient outcomes/identifying patients who warrant follow-up	30%	10
Other	6%	2

Multiple options permitted for responses.
QI = quality indicator.

total of 77% of urologists who had viewed their last report completed the survey. Four clinicians volunteered to be interviewed to provide additional feedback.

Survey responses

Most respondents (76%) had over 10 years of experience as a consultant urologist, 73% had a sub-specialty interest in prostate cancer and 88% performed radical prostatectomy as a treatment option for prostate cancer.

All clinicians reported that PCOR-NZ appropriately notifies them whenever a new QI report is released and agreed that sending the QI reports every 6 months is appropriate. Most (91%) could access reports easily. The most popular devices used for viewing reports were laptop (70%), phone (45%) and work desktop (36%).

Most clinicians (91%) expressed no concerns about the privacy and security of their data.

Some clinicians (42%) found the reports too long, but most (91%) indicated that the data were presented clearly and appropriately. Sixty-one percent of clinicians claimed to have read the reports in their entirety, with 25% taking less than 15 minutes to read the reports, 55% taking 15–30 minutes and 20% taking more than 30 minutes.

Half (52%) of clinicians discussed their reports with colleagues, 12% used them in formal meetings and 73% read them as individuals. It should be noted that clinicians could choose more than one response for this question.

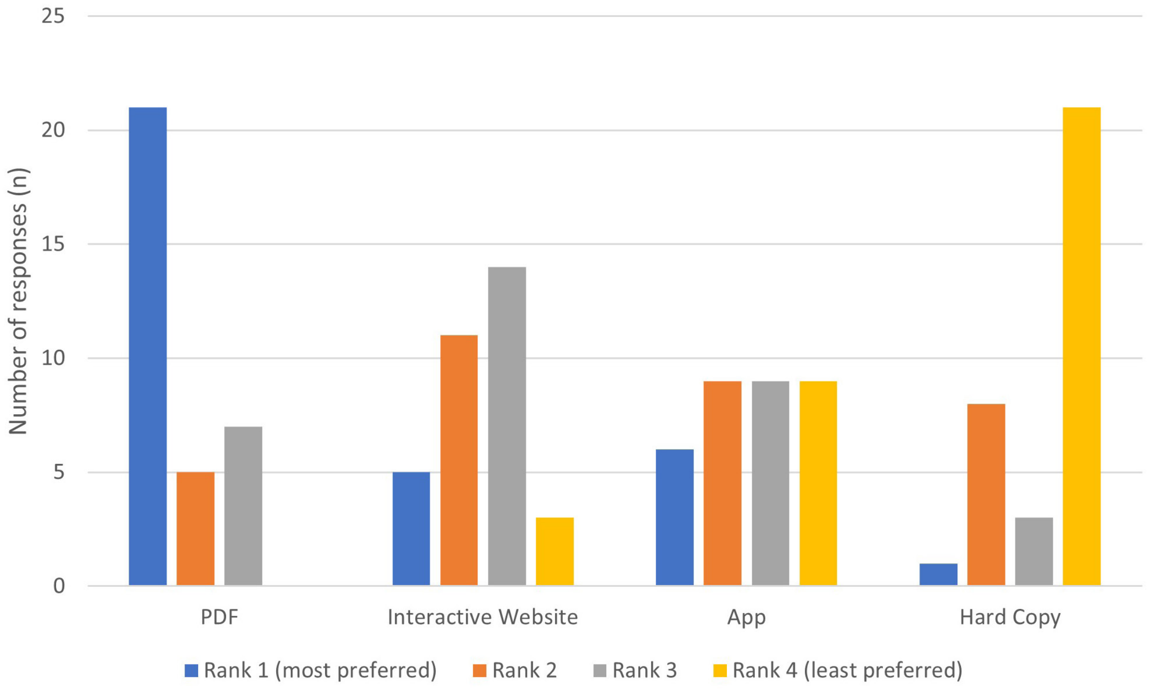
Clinicians primarily used the reports to audit their practice (73%), identify areas that need improvement (88%), track their performance over time (73%) and compare their performance with colleagues (73%).

Overall, most clinicians found the QI reports valuable to improve their practice (70%).

Methods of QI report distribution

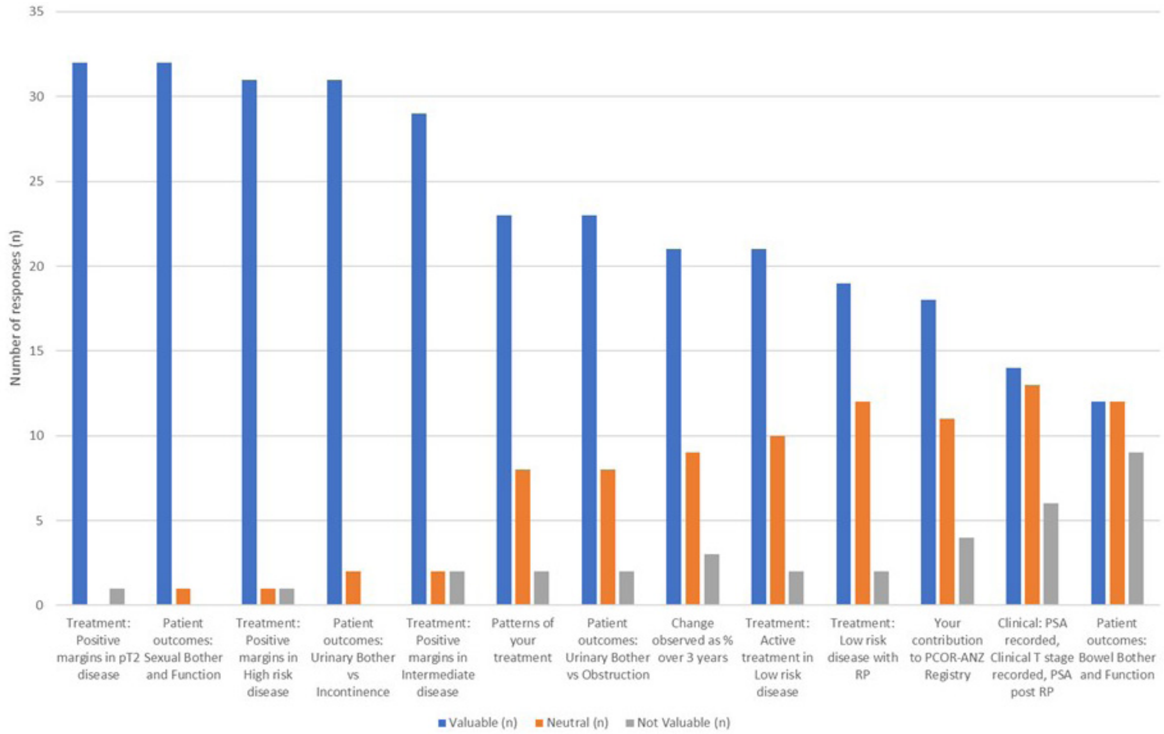
Sending the reports as PDFs was the most popular medium among clinicians, followed by the option of an interactive website, then a mobile app and finally hard copy printouts (Figure 1).

Figure 1: Urologist rankings of QI report distribution methods.



QI = quality indicator.

Figure 2: Ranking of items included in QI reports according to clinical value.



Items in QI reports are grouped into the following categories: Diagnosis, Treatment, Clinical Outcomes and Patient-Reported Outcomes.
pT2 = pathological T2 stage; RP = radical prostatectomy; PSA = prostate-specific antigen; QI = quality indicator.

Clinical value of items in the QI reports

Figure 2 shows that the items clinicians considered most valuable in the reports were: Treatment: positive margins in pathological T2 stage (pT2) disease (97% found this valuable); Patient outcomes: sexual bother and function (97%); Treatment: positive margins in high-risk disease (94%); Patient outcomes: urinary bother vs incontinence (94%); Treatment: positive margins in intermediate disease (88%). Additionally, Patient outcomes: urinary bother vs obstruction (70%); and Patterns of your treatment (70%) ranked well among clinicians.

Conversely, the items clinicians found least valuable were: Clinical: prostate-specific antigen (PSA) recorded, Clinical T stage recorded, PSA post radical prostatectomy (RP) (42% found this valuable); and Patient outcomes: bowel bother and function (36% found this valuable).

Discussion

QI reporting is widely used in healthcare to improve quality of care.[3,4] The results from systematic reviews over the past 2 decades consistently suggest that QI reporting "*generally leads to small but potentially important improvements in professional practice*."[5,6] Lingard et al. conclude that surgeon-level QI reporting fosters accountability, enhancing both patient safety and surgical performance.[7]

This is the first study from PCOR-ANZ to assess urologists' perspectives on QI reports. It identifies areas that can be improved and offers insight into whether QI reports are useful for monitoring and improving clinical practices.

Aim 1) Assess clinician perspectives on methods of report distribution

Our data suggest that most urologists engage with these reports, with all participating clinicians receiving appropriate notification of new report generation, and over 80% reading their most recent report. Given most clinicians could easily access their reports, we can conclude that distribution via downloadable PDFs is effective—this is reflected in Figure 1, where clinician preference is for PDFs over other forms of report distribution. However, there is interest in more interactive forms of data distribution, such as a website or app. Upon discussing this in interviews, clinicians made it clear they do not think these should replace PDFs but rather supplement them, giving interested clinicians the option to engage further with their data. Interviewed clinicians universally valued the standardisation and benchmarking of current reports as they knew that all clinicians were compared using the same metrics. They hypothesised that most clinicians would not feel the need to engage with their data beyond what was provided in the reports (due to their comprehensive nature) but acknowledged that for those interested, the ability to do so would be valuable.

Additionally, Figure 1 highlights the clear preference for digital over physical methods of report distribution, with hard copy reports being ranked least preferred by most clinicians. When discussing this in our interviews, clinicians stated that they prefer digital reports, citing ease of access and the ability to keep multiple years of QI reports stored in one location. Some Australian jurisdictions within PCOR-ANZ distribute their reports to clinicians via hard copy mail. We can hypothesise that the results of this study may be generalisable to the Australian jurisdictions due to the likely similarities in populations (consultant urologists participating with PCOR); therefore, we suspect a switch to electronic report distribution would be positively received by Australian clinicians.

Aim 2) Assess the clinical value and utility of the PCOR reports

Clinicians find the reports useful for improving their clinical practice. Over 80% of clinicians use the reports to identify potential areas of improvement, and over 70% use them to audit and compare their performance to colleagues. With regards to the contents of reports, there are items that clinicians clearly found useful, and there are items that are more contentious. The top eight items, as displayed in Figure 2, are clearly valued, while the bottom two items are more uncertain, being valued by only 30–40% of clinicians. This tells us that, overall, clinicians find the items included in reports valuable; however, there is still room for improvement. One interviewed clinician stated there would be benefit in conducting a revised Delphi panel to update report items based on this study data. In particular, they would like to see the use of magnetic resonance imaging (MRI) and prostate-specific membrane antigen (PSMA) scanning for staging included in the reports, as these have become a larger part of the clinical decision-making process since the last Delphi panel in 2015.[1]

One clinician stated that they would like to see data for radical prostatectomies separated into open, laparoscopic and robotic subcategories. They highlighted that clinicians in larger urban centres likely perform more robotic surgeries than clinicians in smaller centres. Having the data show performance based on operation method, rather than performance overall, would be useful to eliminate any ambiguity as to whether the method of surgery affects overall performance. This would allow clinicians to assess whether they are better/worse at one type of surgery compared to the total pool of clinicians—highlighting in more detail areas of strength, and areas that require improvement. It is important to recognise that robotic vs open prostatectomies may have different patient outcomes, and that an individual's QI data would reflect this.[8] Clinicians could compare their own robotic vs their own open prostatectomy data to see discrepancies in performance based on method of surgery, *and* could compare their robotic and open data to the overall clinician data to assess their open/robotic performance compared to their peers. In other words, this would allow clinicians to answer two questions: *"How does my open/robotic performance compare to my peers?"* and *"How much of a discrepancy is there between my own open and robotic performance?"*.

Another point raised by clinicians was what to do if the reports identified that they were underperforming in any areas. Clinicians stated they would first scrutinise the data to see if there was a statistical explanation for the result (e.g., low sample size making results less precise). If the result was likely to be accurate, then clinicians expressed interest in seeking advice from others who performed well in this area. Data are anonymised, so clinicians do not know who to contact outside of those willing to discuss results within their own local departments. One clinician indicated that being able to contact PCOR-NZ to discuss their data was helpful. An opportunity to be linked with top-performing clinicians who might be willing to offer advice to those who sought it was suggested as a tool to support improvement.

Aim 3) Investigate barriers that prevent engagement with reports and the registry

Clinicians commonly cited length of reports as a barrier to engagement—with reports being approximately 50 pages long. One interviewed clinician stated that the reports had too much unnecessary information, making the important data difficult to find: *"The way the information is written and displayed is quite confusing … well, it's not confusing, but it takes a lot to get through the information."* Another clinician stated: *"I think the reports are too long for everyone to look at. But I think if you're engaged enough to look at it, they've got a good amount of data that's there."* Clinicians felt that the reports would benefit from having a summary of key information available at the beginning. It is apparent that 80% of clinicians spend less than 30 minutes reading their reports, so it is important to ensure that the reports readily provide key information to readers.

Conclusion

QI reports are effectively distributed to urologists, with good clinician engagement. PDFs are preferred; however, there is interest in having additional interactive forms of data distribution. Reports are useful for auditing and improving practice, with most items deemed valuable. Suggested feedback to improve reports includes differentiating between open, laparoscopic and robotic subcategories; updating the report items via a revised Delphi panel; and having a pathway for clinicians to contact others for peer review and advice. Report length appears to be a barrier to clinician engagement; most clinicians found that the data were presented clearly and appropriately, but there was a need for more succinct presentation of key results. The findings of this study may be generalisable to other types of reports generated by PCOR-NZ, and there may be value in a similar review being undertaken by the PCOR jurisdictions across Australia to ascertain the views of clinicians there in relation to their reports.

Strengths and limitations

A high proportion of urologists who participate in PCOR-NZ responded to the survey. However, the study has several limitations. It excluded New Zealand radiation oncologists and Australian clinicians, who also receive PCOR QI reports and may have differing views. Secondly, clinicians who volunteered to be interviewed are more likely to be more closely engaged with PCOR and may be more likely to give positive feedback. Furthermore, interviews were conducted with only four clinicians, meaning their feedback may not be reflective of all clinicians.

COMPETING INTERESTS

SM is the clinical lead for the NZ Prostrate Cancer Register and Chair of the charitable trust that runs registry CHOMNZ.

PH is the PCOR-NZ Steering Committee Chair.

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Assessment of burnout in New Zealand ophthalmology registrars

Theodore Andrew Sutedja, Luke Hawley, Kelechi Ogbuehi

ABSTRACT

AIM: Burnout is prevalent among medical professionals, particularly during training, and can lead to detrimental personal and professional outcomes. This study aims to assess burnout levels among New Zealand ophthalmology registrars.

METHODS: A cross-sectional, anonymous online survey was administered to trainee and non-trainee ophthalmology registrars across New Zealand. The survey collected demographic data, details about the work environment within ophthalmology departments, experiences with the impact of COVID-19 and assessed burnout levels using the Maslach Burnout Inventory – Human Services Survey for Medical Personnel (MBI-HSS MP).

RESULTS: Forty-five of 65 ophthalmology registrars (69%) completed the survey. Burnout was prevalent, affecting 55% of trainees and 77% of non-trainees. Non-trainees demonstrated significantly higher levels of emotional exhaustion and depersonalisation compared with trainees, with 64.3% and 57.1% of non-trainees, respectively, demonstrating burnout in the severe range. Additionally, workload manageability was found to have a significant association with burnout (p=0.0448), with non-trainees facing greater difficulty in managing their workload.

CONCLUSION: Burnout is highly prevalent among New Zealand ophthalmology registrars, with non-trainees particularly affected.

The medical workforce is prone to burnout and fatigue due to the emotionally demanding nature of the profession, where increased workloads, long hours and understaffing all play a role. It is now well documented that doctors have higher rates of burnout when compared with the general population.[1] Most literature focusses on the senior workforce, highlighting the demands on consultants in New Zealand's public health system.[2–4] With increased demands on the public health system, there is growing reliance on the junior workforce to maintain service provision. This in turn can result in increased patient load, decreased teaching opportunities and diminished opportunities to progress,[5,6] each of which increases the risk of burnout.[6]

Burnout is a serious concern at an individual level as there are links to increased risk of depression, anxiety, sleep disturbances, suicidal ideation and substance abuse.[5–7] Additionally, these effects are not only limited to the individual but also have downstream consequences, often leading to decreased empathy, increased absenteeism, higher risk of medical error and, ultimately, worse patient outcomes.[5–7]

Ophthalmology is a specialty that requires high levels of professionalism, clear communication, emotional intelligence and clinical/surgical competence.[8,9] Most ophthalmic procedures will affect patients' visual potential and, directly or indirectly, their quality of life.[9] Complications can result in significant loss of vision and even blindness, which is not only devastating to patients but also has a negative impact on the surgeon and causes further strain on the health system.

Currently, there are no studies published analysing the rates of burnout in training and non-training ophthalmology registrars within New Zealand. However, similar studies in several other first-world countries have shown high rates.[8–10] This study aims to assess the rates of burnout in New Zealand ophthalmology registrars with the hypothesis that the levels of burnout will be comparable to other developed countries with similar ophthalmology training pathways.

Methods

An anonymous, online 53-question survey was sent to New Zealand trainee and non-trainee ophthalmology registrars. To reach this intended group, the Royal Australian and New Zealand College of Ophthalmologists (RANZCO) ophthalmology trainee representative was contacted to be a point of contact for the study. They received the survey sent via email for distribution to the current RANZCO trainees. The non-training ophthalmology registrars were identified via trainees at each hospital with an ophthalmology

Table 1: Maslach Burnout Index score summary.

	Emotional exhaustion score (0–54)	Depersonalisation score (0–30)	Personal accomplishment score (0–48)
Low burnout	<19	<6	>39
Moderate burnout	19–26	6–9	34–39
High burnout	>26	>9	<34

department, and the non-training registrars also received the same survey via email link.

The survey included questions addressing demographics such as gender preference, age, ethnicity, relationship status and number of years within the specialty. Secondly, there were questions on their respective ophthalmology departments including setting of department, staffing levels and rostering. Thirdly, questions related to lifestyle included sleep patterns, exercise regimes, use of social media and use of alcohol or other substances.

The final section of the survey was the Maslach Burnout Inventory – Human Services Survey for Medical Personnel (MBI-HSS MP), which is a certified tool for assessing burnout.[11] Twenty-two questions addressed three facets: emotional exhaustion (EE; measures feelings of being emotionally overextended and exhausted by one's work), depersonalisation (DP; measures an unfeeling and impersonal response toward patients) and sense of personal accomplishment (PA; measures feelings of competence and successful achievement in one's work). A score is calculated for each facet and then stratified into either mild, moderate or severe burnout.

Parametric data between trainees and non-trainees were compared using unpaired Student's *t*-Tests. Demographic data were compared using the Chi-squared test. A p-value <0.05 was considered statistically significant. A multiple regression analysis was performed under the general linear model to establish associations between independent and outcome variables.

Ethics approval

Ethics approval for this study was obtained from the Academic Committees and Services of University of Otago Medical School. This study also has support from the Ngāi Tahu Research Consultation Committee.

Results

Out of the 35 trainee registrars surveyed, 31 responded, along with 14 out of 30 non-trainee registrars, yielding an overall response rate of 69%. Burnout was identified if respondents had high scores in any of the three facets on the MBI-HSS MP (Table 2). Among the respondents, 55% of trainees (17 out of 31) and 77% of non-trainees (11 out of 14) reported experiencing burnout.

Trainees exhibited moderate levels of burnout, with mean scores of 26.9 for EE, 7.2 for DP and 36.4 for PA. In contrast, non-trainees showed a trend towards higher levels of burnout, with mean scores of 32.1 for EE, 8.9 for DP and 32.6 for PA. A greater proportion of non-trainees fell into the severe range for both EE (64.3% vs 48.4%) and DP (57.1% vs 29%) compared with trainee registrars.

Manageable workload was the only variable found to be statistically significant between training and non-training registrars (p=0.0448, Table 3). Among trainees, 58.1% agreed that their workload was manageable, compared with only 14.3% of non-trainees. Conversely, 57.1% of non-trainees disagreed with the statement, indicating an unmanageable workload, compared with just 19.4% of trainees. These findings suggest a significant association between training status and perceptions of workload manageability, with significant implications for burnout.

Discussion

Burnout is a pervasive syndrome affecting medical professionals across various specialties. It has been well documented that it negatively impacts doctors worldwide, leading to depleted energy, increased mental distance from work, cynicism and diminished professional efficacy.[1,8,12–14] Burnout is particularly prevalent during the

Table 2: Breakdown of the Maslach Burnout Index.

Trainee Maslach Burnout Index summary									
	EE	Level	N (%)	*DP*	Level	N (%)	*PA*	Level	N (%)
		High	15 (48.4)		High	9 (29)		High	9 (29)
		Moderate	5 (16.1)		Moderate	6 (19.4)		Moderate	7 (22.6)
		Low	11 (35.5)		Low	16 (51.6)		Low	15 (48.4)
	EE score	***Mean***	***26.9***	***DP score***	***Mean***	***7.2***	***PA score***	***Mean***	***36.4***
		SD	***12.2***		***SD***	***6.2***		***SD***	***8.4***
Non-trainee Maslach Burnout Index summary									
	EE	Level	N (%)	*DP*	Level	N (%)	*PA*	Level	N (%)
		High	9 (64.3)		High	8 (57.1)		High	7 (50)
		Moderate	4 (28.6)		Moderate	1 (7.2)		Moderate	3 (21.4)
		Low	1 (7.1)		Low	5 (35.7)		Low	4 (28.6)
	EE score	***Mean***	***32.1***	***DP score***	***Mean***	***8.9***	***PA score***	***Mean***	***32.6***
		SD	***10.3***		***SD***	***4.9***		***SD***	***9.6***
p-value trainee vs non-trainee	0.169			0.383			0.189		

EE = emotional exhaustion; DP = depersonalisation; PA = personal accomplishment; SD = standard deviation.

Table 3: Summary of demographics and relevant factors.

Demographic		**Trainee (%)**	**Non-trainee (%)**	**p-value for trainee vs non-trainee**
Sex	Male	14 (45.2)	7 (50)	0.7633
	Female	17 (54.8)	7 (50)	
Age	25–29	1 (3.2)	9 (64.3)	
	30–34	19 (61.3)	2 (14.3)	
	35–39	6 (19.4)	3 (21.4)	
	40–44	5 (16.1)	0	
Ethnicity	NZ European	13 (42)	6 (42.9)	

Table 3 (continued): Summary of demographics and relevant factors.

Demographic		Trainee (%)	Non-trainee (%)	p-value for trainee vs non-trainee
	Māori	0	2 (14.3)	
	Chinese	9 (29)	3 (21.4)	
	Indian	1 (3.2)	1 (7.1)	
	Other	8 (25.8)	2 (14.3)	
Years as registrar	1–3	8 (25.8)	12 (14.3)	
	4–6	16 (51.6)	2 (85.7)	
	≥7	7 (22.6)	0	
Graduate	Undergraduate	21 (67.7)	8 (57.1)	
	Postgraduate	10 (32.3)	6 (42.9)	
Relationship	Single	3 (9.7)	2 (14.3)	0.1292
	Relationship	6 (19.4)	7 (50)	
	Married	20 (64.5)	4 (28.6)	
	Separated	2 (6.4)	1 (7.1)	
Hospital setting*	Secondary	7 (22.6)	2 (14.3)	
	Tertiary	24 (77.4)	12 (85.7)	
Full staffing	Yes	21 (61.8)	12 (85.7)	0.2069
	No	10 (38.2)	2 (14.3)	
Hours worked per week	40–49	3 (9.8)	1 (7.2)	0.8188
	50–59	13 (41.9)	8 (57.1)	
	60–69	13 (41.9)	5 (35.7)	
	70–79	1 (3.2)	0	
	80+	1 (3.2)	0	
Manageable volume	Agree	18 (58.1)	2 (14.3)	0.0448
	Neutral	7 (22.6)	4 (28.6)	
	Disagree	6 (19.4)	8 (57.1)	
Senior support	Agree	22 (71)	10 (71.4)	0.9018
	Neutral	5 (16.1)	2 (14.3)	
	Disagree	4 (12.9)	2 (14.3)	

Table 3 (continued): Summary of demographics and relevant factors.

Demographic		Trainee (%)	Non-trainee (%)	p-value for trainee vs non-trainee
Mistreatment from senior	Agree	5 (16.1)	4 (28.6)	0.1059
	Neutral	5 (16.1)	2 (14.3)	
	Disagree	21 (67.8)	8 (57.1)	
COVID-19 has increased workload	Agree	13 (42)	4 (28.6)	0.684
	Neutral	13 (42)	6 (42.8)	
	Disagree	5 (16)	4 (28.6)	
COVID-19 has decreased mood	Agree	10 (32.2)	4 (28.6)	0.8708
	Neutral	13 (42)	5 (35.7)	
	Disagree	8 (25.8)	5 (35.7)	

*Hospital setting: tertiary hospitals are the Auckland, Waikato, Capital and Coast, Canterbury and Southern hospitals; other hospitals are secondary hospitals.

demanding stages of medical training.[6,9,15] Despite common perceptions that ophthalmologists experience higher job satisfaction, a less stressful work environment and a generally more favourable lifestyle than other medical professionals,[16] research assessing burnout among ophthalmologists, particularly among registrars, is lacking. Our study reveals that more than half of New Zealand's ophthalmology registrars experience burnout, regardless of their level of training.

Ophthalmology in New Zealand is renowned for its high standards in both clinical practice and professional conduct. These standards are shaped by rigorous training programmes and the exemplary behaviours modelled by RANZCO and its members. The training process, though challenging and often stressful, is essential for preparing practitioners to excel in a specialty that focusses on improving or restoring visual function, a profoundly rewarding privilege shared among ophthalmologists.

Sedhom et al. revealed that 37.8% of 592 practicing ophthalmologists in the United States of America (USA) experienced burnout.[8] This rate is significantly lower compared with the burnout prevalence observed in our study, which focussed on registrars. In New Zealand, burnout was found—in this study—in 77% of non-trainee and 55% of trainee ophthalmology registrars, averaging 67% across both groups. These rates are comparable with the burnout prevalence among ophthalmology residents in the USA, where 63.3% reported experiencing burnout.[15] Conversely, burnout rates among ophthalmology residents in Saudi Arabia are notably lower at 41%.[9] Interestingly, when comparing these findings with burnout data from orthopaedic registrars in New Zealand, a similar pattern emerges. In the orthopaedic cohort, 52% of trainees and 50% of non-trainee registrars exhibited moderate to severe levels of burnout on the MBI-HSS MP scale.[6] These findings indicate that burnout is particularly prevalent among early career stages, regardless of surgical specialty. Thus, addressing the underlying factors contributing to burnout throughout training and equipping future ophthalmologists with effective coping strategies may help mitigate burnout in the present and future.

Securing a place in the ophthalmology training programme is highly competitive, more so than in many other medical specialties. To earn an interview for potential selection, candidates are evaluated using a points-based system with a maximum score of 34. Points are awarded based on several criteria, including Indigeneity, scholarly achievements, regional exposure, ophthalmic work experience and significant PAs. According to the RANZCO *2022–2023 Annual Report*, applicants typically work an average of

4.6 years after completing their medical degree before being selected for the programme.[17] In New Zealand, this equates to at least 2.6 years spent as a non-training registrar.

Chambers et al. found that 50% of New Zealand's senior medical workforce experienced burnout, with rates decreasing with age.[2] The age group most affected by burnout was those aged 30–39 years. This is particularly concerning given the average age of new trainees entering the 2023 RANZCO programme was 31 years,[17] and 80.7% of the trainees surveyed fell within this age bracket. This is especially concerning for the 30.7% of non-training registrars that fall within this age group, who face heightened pressure to boost their application scores through regional postings and extra academic commitments. These compounded pressures may leave them vulnerable to burnout while striving to secure a place on the training programme. This increased vulnerability is reflected in our study, where non-trainee registrars showed a trend towards higher levels of EE and DP, along with lower levels of PA.

Additional key points warrant mentioning. In our study, 90.2% of trainees and 92.8% of non-trainees reported working more than 50 hours per week. This contrasts with findings from Feng et al., who reported that ophthalmology residents in the USA averaged 67 hours per week (excluding on-call duties) and found a clear association between longer work hours and increased burnout and EE.[15] While our study did not find a significant correlation between the number of hours worked and burnout rates, it did reveal that workload manageability was a more critical factor. Only 58.1% of trainees and 14.3% of non-trainees felt their workload was manageable. Despite shorter workweeks, the intensity and demands of the workload for New Zealand registrars may contribute to heightened burnout.

Furthermore, over 70% of both trainees and non-trainees reported feeling well supported by their senior colleagues and did not report experiencing mistreatment. Senior colleagues play a vital role in providing mentorship, facilitating ongoing professional development, offering constructive feedback and creating opportunities for career advancement.[18] Although the association between senior support and burnout was not statistically significant in our study, existing literature underscores the important role of senior support in reducing burnout.[6,19] Enhancing senior support may thus be a key strategy for mitigating burnout, particularly in settings where such support is currently limited.

This study has a few limitations. With only 45 respondents, our sample size was small compared with similar studies,[9,15] which may have limited our ability to achieve statistical significance when analysing various demographic factors. However, this small sample size was anticipated given the limited number of ophthalmology registrars in New Zealand. Nonetheless, our high response rate of 69% enhances the generalisability of these findings to other medical specialties in New Zealand.

To address these issues and better understand the demographic factors influencing burnout, future research should expand the sample size by including Australian trainees and non-trainees under the RANZCO framework. While work experiences and environments may differ between these groups, their shared participation in the RANZCO training programme could offer valuable insights into the specific factors contributing to burnout. These insights could inform the development of targeted strategies to mitigate registrar burnout.

Being a cross-sectional anonymous survey, this study is affected by survey bias. Respondents are likely to have a vested interest in burnout, which may skew the results toward higher burnout rates compared with non-responders.

Furthermore, burnout is influenced by various factors beyond the work environment, including stress management, personal health and inherent personality traits,[20–22] which were not included in the survey. Future surveys should incorporate questions that assess personality characteristics such as grit, mindfulness and coping skills, which are known to predict wellbeing and offer protection against burnout.[23]

Conclusion

This study highlights the significant prevalence of burnout among New Zealand ophthalmology registrars, with non-trainees exhibiting higher levels of EE and DP compared with trainees. Workload manageability emerged as a crucial factor in burnout, with non-trainees facing greater challenges in managing their workload. These findings demonstrate the substantial impact of burnout, particularly on non-training registrars, and highlights the need for targeted interventions to improve workload management and alleviate burnout in this group.

COMPETING INTERESTS
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Radiology trainee retention in Auckland, New Zealand: a survey

Charles Robertson, Rhian Miranda, Divya Mehta

ABSTRACT

AIM: Amid growing concerns surrounding the radiology workforce in New Zealand, our primary aim was to capture the retention rate of recent graduates of the Auckland Regional Training Scheme.

METHODS: In September 2023 we sent a standardised survey to all Royal Australian and New Zealand College of Radiologists (RANZCR) fellows who commenced their radiology training in Auckland in the year 2000 or later. Additional questions were asked regarding prior subspecialty training, public versus private work mix, future career plans, the key factors influencing our radiologists' workplace selection and more.

RESULTS: With a response rate of 71.7% (99/138 survey recipients), we found that 75.8% (75/99) of our responders currently work in New Zealand, a greater proportion than perhaps anticipated. A little over half (58.2%) work in a mixture of both public and private settings, and 56.2% are considering, on some level, significantly reducing their hours in the next 1 to 5 years.

CONCLUSION: We hope the insights gained through this survey encourage further efforts to retain our growing number of trainees, while helping to paint the current landscape of our specialty at the consultant level.

Background

Each year, New Zealand trainees admitted to Fellowship of the Royal Australian and New Zealand College of Radiologists (RANZCR) are faced with the decision of whether to stay in their home country or pursue employment overseas. Our analysis focusses on recent trainees of the Auckland Regional Training Scheme specifically, the nation's largest centre.

Although our hypothesis is that a large proportion of recent Auckland trainees are choosing to shift elsewhere, this is yet to be specifically studied or documented.

Particularly at a time where the radiology workforce crisis is taking centre stage and we continue to increase the numbers of registrars in our domestic training programmes, it is even more pertinent for us to look back at our recent local graduates and establish how many of them we are retaining or losing and the reasons why.

Objectives

Our aim was to provide a standardised survey to all RANZCR fellows of the Auckland Regional Training Scheme who commenced their radiology training in the year 2000 or later (a period of approximately 2 decades). We hope to obtain the following primary data:

- Our retention rate: defined as the proportion of fellows physically working within New Zealand at the time of this survey. This includes those who may have completed overseas fellowships and returned home.
- The number and proportion of this cohort who have undergone post-fellowship/subspecialty training, and where.
- The reasons people have selected their current workplace(s), e.g., financial, lifestyle, family, job satisfaction, work-mix, academia.
- Basic demographic data: age and sex.

A secondary objective was to assess whether these trainees are working solely in a public healthcare system (or equivalent), solely in private practice or in a mixture of both. Other considerations include those working in teleradiology or no longer working at all.

Methods

Study design

An initial contact list was obtained from Auckland City Hospital clerical staff with a list of email addresses of all past and present radiology trainees, dating back to those who commenced training in the year 2000. The list of trainees was used as a base to obtain the best possible email addresses (multiple in some instances) through a multifaceted approach. Hospital directories were also searched to find email addresses of Waitematā/Te Toka Tumai/Counties Manukau radiologists. The Medical Council of New Zealand (MCNZ) registry was used to check whether some individuals still held practicing licences in New Zealand. Social connections and Google searches were used to confirm locations where some trainees were practicing if this was not within the wider Auckland public system; for instance, most private practices list their staff members and their respective training backgrounds.

The survey questions (Appendix 1) were designed in conjunction with the supervising radiologist, Dr Rhian Miranda, with the above study objectives in mind. The questions were sent out via online survey (SurveyMonkey), and the survey was free to complete and submit.

Participants

(See Figure 1 for a visual schematic.)

A list of 155 fellows was obtained for the period of training commencing in 2000, to completion in 2022. Five of these did not complete training and were not contacted; one no longer has a valid practicing licence and was not contacted; and seven fellows were unable to be contacted despite our best efforts using the above methods. Therefore, 149 fellows were eligible to participate in the study. Overall, 142 fellows were contacted, i.e., 95.3% (142/149) of potential email addresses obtained.

Note on ethics/consent

Formal ethics approval was not sought or felt necessary.

A disclaimer was applied at the beginning of the survey once the link was opened: *"Although quantitative and qualitative data gathered from this survey may be published and/or presented at a later date, all individual responses to the survey will remain entirely confidential."*

Consent was implied by survey participation.

Bias

We recognise here that we are missing data from several non-responders who work in Australia. Possible reasons for non-response include not having up-to-date email addresses, survey fatigue, participants simply being too busy, or perhaps unwilling to participate, given the lack of personal connection to the author(s) through the local hospital network.

However, based on several sources of data (e.g., MCNZ registry, listed practitioners on private practice websites, word of mouth), we believe that the relative proportion of survey non-responders working in Australia is roughly equal to the proportion that we have in our cohort of responders. Eight of our 39 non-responders (20.5%) are believed to currently work in Australia, which is comparable to the 21/99 (21.2%) of responders that stated they are working in Australia.

Statistical methods

Basic descriptive statistics were yielded from raw data provided via SurveyMonkey.

Results

Participants

(See Figure 1b a for visual schematic.)

Four email addresses had either opted out from or bounced-back SurveyMonkey surveys. Thus, 138 surveys were successfully sent out (135 via direct email invitation and three via web link).

Timeline:

- Survey first sent out: 4 September 2023
- Reminder messages: 10 October 2023
- Final reminder: 20 November 2023
- Survey closed: 1 December 2023.

We received 99 total responses (99/138=71.7% total response rate) (39/138=28.2% non-responders). Ninety-six completed the entire survey (96/138=69.7% complete response rate) (96/99=96.9% survey completion rate). There were 3.1% partially complete responses—note that the responses for the questions they did answer were recorded and included in study data, which explains why the denominator for some response data is not 99. The average completion time was 3 minutes 28 seconds.

Response data

Tables providing complete response data for all survey questions are provided below.

Discussion

The shortage of radiologists in both Auckland and New Zealand at a wider national level are contributed to by a variety of factors, including an ageing population and a disproportionate increase in demand for medical imaging. Health New Zealand – Te Whatu Ora's profession-specific analysis for radiology and imaging, as part of their 2024 *Health Workforce Plan*, estimates 90+

full-time equivalent (FTE) shortages for radiologists across the health sector (13.6% of our total need).[1] To this measure, there have been recent increases in medical student numbers, as well as a temporary increase in the number of radiology trainees in New Zealand.

This survey aimed to capture how many of our local Auckland-trained radiology trainees we are retaining, another potentially key factor.

A 2022 MCNZ workforce survey[2] demonstrated a snapshot of New Zealand medical graduates from the year 2000 that were retained in New Zealand with every subsequent year. It shows that the medical graduate retention rate slowly declined with every year post registration. For instance, at 8 years post-registration (i.e., graduation from medical school), an average of 81% of medical graduates had been retained in New Zealand. For our interest's sake, this point in time may arbitrarily be when someone may have completed radiology training. The number of retained medical graduates slowly declined and plateaued over subsequent years; for instance, for the cohort graduating between 2000–2006, their retention rates ranged between 59–74% at 15 years post-registration. The survey found that most New Zealand-trained doctors practicing outside of New Zealand are in Australia (2,187 in 2019).

Of the 99 Auckland-trained radiologists who completed our survey (all having commenced training from 2000, to completion by 2020), 75.8% (75/99; Table 3) answered that they currently work in New Zealand. Hence 75.8% is our retention rate, arguably better than what was found in the 2022 MCNZ survey.

Referring again to Health New Zealand – Te Whatu Ora's recent analysis,[1] there is a clear acknowledgement of the need for relative growth across the radiology workforce going forwards, as this is where the greatest impact of the 24.2% of "lost" radiologists highlighted in our study would be felt. Perhaps bolstering workforce numbers through targeting improvements in retention rates would be an effective strategy, alongside the increase in trainee numbers.

Beyond the retention rate, the following data were also obtained through the survey:

Seventy-eight of our responders (78.8%; Table 4) are fellowship-trained, with 39.7% (n=31) having completed this training in New Zealand, and the remainder overseas (61.3% [n=61]).

Of those that completed an overseas fellowship, 51.3% (n=40; Table 5) did so in Australia (note that some people completed more than one fellowship).

A total of 41.0% (n=32; Table 6) completed a fellowship in musculoskeletal radiology, far outweighing any other subspecialty.

A total of 83.7% of our ex-trainees felt their registrar training in Auckland prepared them well for their first senior role (Table 16). Although training can always be improved, this is a reassuring statistic and was not felt to be the main cause for loss of retention.

The top three quoted reasons for current choice of workplace(s) (calculated by weighted average; Table 10) were "geography/lifestyle", "family/friends" and "work-mix". "Family/friends" had the highest proportion of people rating it as an "*extremely* important" factor.

The top five reasons included "flexibility" and "financial" reasons. With nation-wide medical specialist strikes taking place in New Zealand in late 2023,[3] the ongoing cost of living crisis and established salary gap to Australia,[4] financial factors are likely to continue to be a key factor.

More than half (58.2%; 57/98) of our survey responders work in a mixture of both public and private settings. Only 17.3% (17/98) work solely in public. Although none of our responders currently do pure teleradiology, 11.1% (11/98) are incorporating some form of teleradiology work, a number that may rise in future.

When considering how the landscape of radiology may change given the rising demands and pressures of the specialty, it is worth noting that more than half (56.2% [54/96]; Table 13) of responders are "definitely" or "possibly" considering significantly reducing their work hours over the next 1 to 5 years. "Parenting/family-related" factors were the most frequently selected reason (Table 14).

Half of these individuals considering cutting down their hours are "feeling overworked" and/or "have poor work–life balance". Twenty-seven percent have "declining job satisfaction". Only one person selected "approaching retirement" as their reason for wanting to reduce work hours; given that 89.9% of our responders were under 50 (Table 2), it is assumed that there would be more individuals wanting to reduce hours within the older cohort of radiologists (not surveyed here).

A total of 68.1% (66/97) of responders state they are overall "satisfied" or "very satisfied" with their current work (Table 9), and 97.9% (95/97) still felt satisfied with radiology as their choice of career (Table 15).

Limitations

As with any survey, an improved response rate could have strengthened the validity of our results. We were, however, pleased with our response rate of 71.7% (99/138). For reference, the 2020 RANZCR *Clinical Radiology Workforce Census Reports* of New Zealand[5] and Australia[6] had response rates of 55.7% and 47% respectively.

The primary statistic that we wanted to minimise bias in was the overall retention rate. As aforementioned, the proportion of non-responders (20.5%, n=8) suspected or known to be working in Australia was fortunately equivalent to our proportion of responders working in Australia (21.2%, n=1).

It is feasible that our non-responders would have provided different responses to the more subjective study questions (e.g., reasons for selecting workplace, considerations made to reducing hours).

Generalisability

External validity of study results cannot be determined, given we have selected a very specific demographic and timeframe, i.e., ex-Auckland trainees from the year 2000 to 2022. Retention of these trainees to New Zealand was our chosen metric, as opposed to retention within the Auckland region specifically. This survey also only assesses current incidence at the time the survey was conducted. It would be interesting to follow up with another study of ex-Auckland trainees in the future to assess evolving trends, and to compare retention rates with other regions of New Zealand.

Conclusion

How we define an acceptable number of retained versus “lost” trainees is open to debate, and is of growing importance given the radiology workforce crisis within New Zealand. The survey results hope to aid in providing some perspective on this, as well as some of the underlying factors that contribute to workplace selection. The success of a recent pilot initiative to increase the number of radiology training positions will rely on adequate retention of Auckland’s large number of fellowship-trained radiologists.

Figure 1a: Summary of study method and participants.

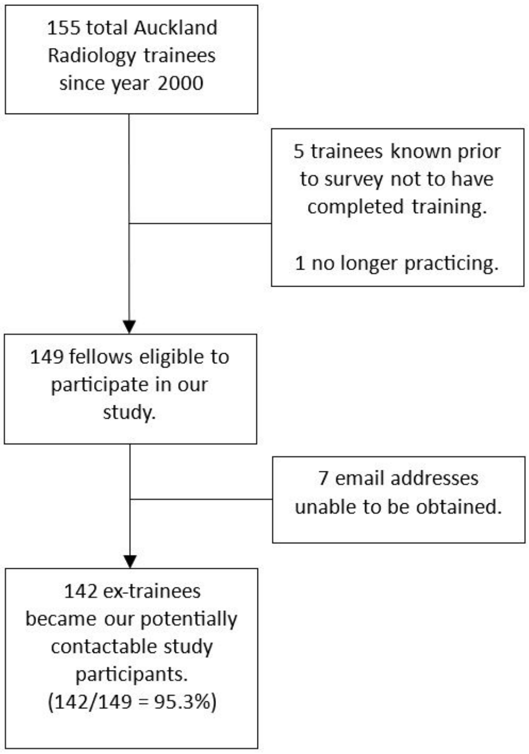

Figure 1b: Summary of study method and participants.

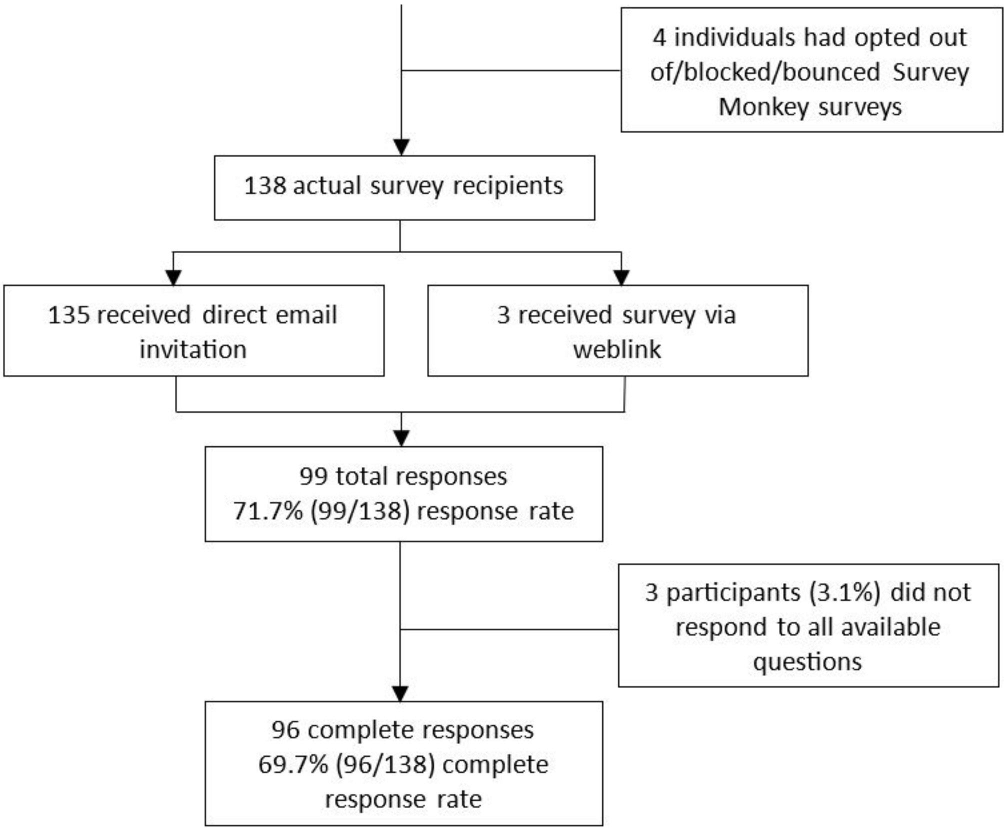

Table 1: Participant gender.

Gender	Responses
Female	40.4% (n=40)
Male	58.6% (n=58)
Non-binary/other	0.0% (n=0)
Prefer not to say	1.0% (n=1)
	Total=99

Table 2: Participant age.

Age	Responses	
30–39	37.4% (n=37)	30–49 89.9% (n=89)
40–49	52.5% (n=52)	
50–59	10.1% (n=10)	
60+	0.0% (n=0)	
	Total=99	

Table 3: Current work location of study participants.

Current work location	Responses
New Zealand	75.8% (n=75)
Australia	21.2% (n=21)
Other[†]	2.0% (n=2)
No longer in radiology[‡]	1.0% (n=1)
	Total=99

[†] United Kingdom, Europe.
[‡] We were not aware they had not completed training at the time of survey distribution, and their responses have been kept.

Table 4: Post-training fellowship status.

Fellowship-trained	78.8% (n=78)
No fellowship training	21.2% (n=21)
	Total=99

Table 5: Fellowship training location, if completed.

Fellowship training location	
Australia	51.3% (n=40)
New Zealand	39.7% (n=31)
USA	11.5% (n=9)
UK	10.3% (n=8)
Canada	3.9% (n=3)
Other[†]	1.3% (n=1)
	Total=92[‡]

[†] Europe.
[‡] Total of 92 responses from 78 responders, due to some completing multiple fellowships.
Percentages are based on the number of responders, not responses.

Table 6: Fellowship subspecialty, if completed.

Fellowship subspecialty	Number of fellowships (in descending order of frequency)
Musculoskeletal	32
Interventional radiology	11
Body/abdominal	11
Oncology	10
Breast	8
Paediatrics	8
Diagnostic neuroradiology	8
Dedicated PET/CT fellowship	6
Chest/thoracic	5
ENT/ORL	4
Interventional neuroradiology	4
Obstetrics and gynaecology	2
Cardiac	2
Other[†]	2
Nuclear medicine[‡]	1
	Total=114[§]

[†] MRI, Emergency/Trauma.
[‡] Four of our recent non-responders are currently undertaking or have recently undertaken training in Nuclear medicine in Australia
[§] Total of 114 from 78 responders, as some completed more than one fellowship
PET = positron emission tomography; CT = computed tomography; ENT = ear, nose, throat; ORL = oral and maxillofacial radiology.

Table 7: Health sectors in which responders currently work.

Sectors currently worked in	Responses, n (%)
Public	83 (83.8%)
Private	74 (74.8%)
Teleradiology	11 (11.1%)
University/academic institution	1[†] (1.0%)
No longer working in radiology	1 (1.0%)

[†] This individual was also working in both public and private.

Table 8: Further breakdown of health sector data.

Further breakdown of sectors currently worked in	Responders
Pure public	17 (17.3%)
Pure private	13 (13.3%)
Public + private	57 (58.2%)
Public + teleradiology	6 (6.1%)
Private + teleradiology	1 (1.0%)
All three	3 (3.1%)
Pure teleradiology	1 (1.0%)
	Total=98[†]

[†] Does not total to 99 due to a partial responder not completing this question.

Table 9: Level of overall work satisfaction, qualitatively scaled.

Level of overall work satisfaction	Percentage	
Very satisfied	18.6% (n=18)	Satisfied OR Very satisfied 68.1% (66)
Satisfied	49.5% (n=48)	
Neutral	19.6% (n=19)	
Dissatisfied	11.3% (n=11)	Dissatisfied OR Very dissatisfied 12.3% (12)
Very dissatisfied	1.0% (n=1)	
	Total=97[†]	

[†] Does not total to 99 due to two partial responders not completing this question—the same applies below to subsequent tables.

Table 10: Reasons for choosing current workplace (descending order of weighted average).

	Irrelevant	Not very important	Neutral	Important	Extremely important	Total	Weighted average
Geographic location/lifestyle preferences	0%	2.1%	11.3%	65.0%	21.7%	97	4.06
Family/friends/ whānau	2.1%	4.1%	12.4%	49.5%	32.0%	97	4.05
Work-mix†	0%	4.2%	8.3%	68.8%	18.8%	96	4.02
Flexibility‡	0%	5.2%	16.5%	54.6%	23.7%	97	3.97
Financial/ remuneration	1.0%	3.1%	13.5%	72.9%	9.4%	96	3.86
Reputation or prestige of institution	4.1%	16.5%	33.0%	43.3%	3.1%	97	3.25
Job availability	14.4%	13.4%	22.7%	43.3%	6.2%	97	3.13
Academia/research	13.5%	46.9%	33.3%	6.3%	0%	96	2.32
Political reasons	27.1%	30.2%	31.2%	10.4%	1.0%	96	2.28

† "e.g., opportunity to perform procedures, variety of cases/modalities".

‡ "Flexible hours, choice in days worked, etc."

Key points:

- **Top three reasons**: geography/lifestyle, family/friends, work-mix.
- **Top five reasons**: geography/lifestyle, family/friends, work-mix, flexibility, financial.
- Family/friends was the reason with the highest proportion of people rating as "extremely important".
- Academia/research and politics were not considered as important by a considerable margin.

Table 11: "Are you considering any future career transitions, such as (additional) subspecialty training, research-focussed positions, leadership roles, or simply moving to another location or workplace?"

Yes, definitely	16.3% (n=16)	Yes, definitely OR possibly 46.9% (n=46)
Yes, possibly	30.6% (n=30)	
Haven't considered	4.1% (n=4)	
No intention currently	48.0% (n=47)	
	Total=97	

Table 12: Factors most influential in shaping decision to make a career transition.

	% of people who selected this as an influential factor
More flexible hours	34 (69.4%)
Increased earning potential	32 (65.3%)
Opportunities for professional growth/leadership	29 (59.2%)
Geographic location/lifestyle preferences	29 (59.2%)
Family/friends/whānau	27 (55.1%)
Work-mix (procedures, variety of cases/modalities)	26 (53.1%)
Reputation or prestige of institution	6 (12.2%)
Political reasons	4 (8.2%)
Other[†]	3 (6.1%)
Academia/research	2 (4.1%)

[†] Quoted reasons: "To learn at a world leading institution", "Balancing out the stress of working in public, chronically short staffed", "Diversity in subspecialty training for future job security and interest".

Key points:

- **Top two reasons**: flexible hours, increased earning potential.
- Professional growth/leadership, geography/lifestyle, family/friends and work-mix were also considered important factors.
- Reputation/prestige of institution, politics and academia/research were not considered as important.

Table 13: Plans to significantly reduce work hours over the next 1 to 5 years.

Yes, definitely	22.9% (n=22)	Considering on some level 56.2% (n=54)
Yes, possibly	33.3% (n=32)	
Haven't considered	4.2% (n=4)	
No, not considering	39.6% (n=38)	
	Total=96	

Table 14: Reasons for considering reducing work hours.

	% of people who selected this as an influential factor
Parenting/family-related reasons	71.2% (n=42)
Excessive workload/stress	54.2% (n=32)
Poor work–life balance	50.1% (n=30)
Declining job satisfaction	27.1% (n=16)
Workplace relationships/dynamics	6.8% (n=4)

Table 14 (continued): Reasons for considering reducing work hours.

Financial reasons	3.4% (n=2)
Approaching retirement	1.7% (n=1)
	59 Respondents

Key points:

- Parenting/family-related reasons were the most popular.
- Half of people feel overworked and/or have poor work–life balance.
- Twenty-seven percent have declining job satisfaction.
- Only one person was approaching retirement—note that 89.9% of our responders were under 50 years old; it is plausible there may be more individuals wanting to reduce hours in older age groups in the foreseeable future.

Table 15: Overall satisfaction with choice of radiology as a career.

Very satisfied	60.8% (59)	Very satisfied OR satisfied 97.9% (95)
Satisfied	37.1% (36)	
Neutral	2.1% (2)	
Dissatisfied	0.0% (0)	
Very dissatisfied	0.0% (0)	
	Total 97	

Table 16: “Did your training as a radiology registrar make you feel adequately prepared for your first senior role?”

Yes, completely prepared	15.3% (15)	Yes 83.7% (92)
Yes, to a large extent	68.4% (67)	
Somewhat prepared	14.3% (14)	
No, inadequately prepared	1.0% (1)	

COMPETING INTERESTS

Nil.

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Harriet Robinson, Auckland City Hospital Business Support Manager.

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Appendix

Appendix 1: Survey questionnaire

1. In which year did you complete your radiology training?
   a. Drop down of options: 2000–2022

2. Please select your gender: Female / Male / Non-binary/Other / Prefer not to say

3. Current age: 30–39 / 40–49 / 50–59 / 60+ / Prefer not to say

4. Which country do you <u>currently</u> work in?
   a. New Zealand
   b. Australia
   c. Other—please specify [free-text box]
   d. No longer working
   (If you are currently on temporary leave, e.g., maternity, sabbatical, then please select the most recent option that applies and/or where you intend to return to work)

5. Did you undertake post-fellowship / subspecialty training?: Yes / No

6. If so, where?
   a. No
   b. Yes
      i. Australia
      ii. New Zealand
      iii. Other—please specify [free-text]

7. If so, which subspecialty/subspecialties? Select all that apply:
   a. Interventional radiology
   b. Interventional neuroradiology
   c. Diagnostic neuroradiology
   d. Musculoskeletal
   e. Body/abdominal
   f. Oncology
   g. Chest/thoracic
   h. Cardiac
   i. Obstetrics and gynaecology
   j. Paediatrics
   k. Breast
   l. ENT/ORL
   m. Nuclear medicine
   n. Dedicated PET/CT fellowship
   o. Other (please specify)

8. Select the following option(s) that apply to your current practice.
   I <u>currently</u> work in the following sector(s):
   a. Public
   b. Private
   c. Teleradiology
   d. Academic institution/university
   e. No longer working

Appendix 1 (continued): Survey questionnaire

9. How satisfied are you overall with your current work environment?
   a. Very satisfied
   b. Satisfied
   c. Neutral
   d. Dissatisfied
   e. Very dissatisfied

10. Please rate on a scale of 1–5 the importance of each of the following factors on your decision to work in your <u>current</u> location?
    a. Job availability
    b. Financial/remuneration
    c. Flexibility (flexible hours, days worked, etc.)
    d. Geographic location/lifestyle preferences
    e. Family/friends/whānau
    f. Academia/research
    g. Political reasons
    h. Work-mix (e.g., opportunity to perform procedures, variety of cases/modalities)
    i. Reputation or prestige of the institution
    j. No longer working

11. Are you considering any future career transitions, such as (additional) subspecialty training, research-focussed positions, leadership roles, or simply moving to another location/workplace?
    a. Yes, definitely
    b. Yes, possibly
    c. Undecided
    d. No, not considering

12. If you plan to make a future career transition, which factors would be most influential in shaping your decision? Please select all that apply:
    a. Increased earning potential
    b. More flexible hours
    c. Opportunities for professional growth
    d. Geographic location/lifestyle preferences
    e. Family/friends/whānau
    f. Work-mix (e.g., opportunity to perform procedures, variety of cases/modalities)
    g. Academia/research
    h. Reputation or prestige of the institution
    i. Political reasons
    j. Other (please specify): [free-text]

13. Do you have plans to, or have you considered significantly reducing your hours over the next 1 to 5 years?
    a. Yes, definitely
    b. Yes, possibly
    c. Undecided
    d. No, not considering

14. If you are considering reducing your hours, what are the main drivers for this?
    Please select all that apply:
    a. Excessive workload/stress
    b. Workplace dynamics/relationships
    c. Poor work life balance

Appendix 1 (continued): Survey questionnaire

  d. Parenting/family-related factors
  e. Declining interest/job satisfaction
  f. Financial reasons

15. Overall, how satisfied are you with your choice of radiology as a career?
    a. Very satisfied
    b. Satisfied
    c. Neutral
    d. Dissatisfied
    e. Very dissatisfied

16. Did your radiology registrar training make you feel adequately prepared for your current role?
    a. Yes, completely prepared
    b. Yes, to a large extent
    c. Somewhat prepared
    d. No, inadequately prepared
    e. Not applicable (e.g., transitioned to a different specialty)

17. Please add any further comments to supplement your answer to any of the above questions:

    [free-text]
    For practical reasons, the responses to this question have not been published in this manuscript but could be provided on request.

Endoscopic full-thickness resection using full-thickness resection device for treatment of upper and lower gastrointestinal tract lesions—the first New Zealand study

Sharon Wing-Kee Yiu, Erin Horsfall, Ravinder Ogra, Cameron Schauer, Anurag Sekra

ABSTRACT

AIM: The full-thickness resection device (FTRD) offers an innovative treatment approach for lesions unsuitable for traditional endoscopic resection. This study evaluates FTRD's safety and efficacy for resection of upper and lower gastrointestinal tract lesions in New Zealand, where data are currently lacking.

METHOD: This multicentre retrospective study included patients who underwent FTRD at Middlemore Hospital and North Shore Hospital between 1 January 2017 and 30 April 2023. Histology and post-procedural complications up to 30 days were collated. Ethics approval and locality assessment were granted.

RESULTS: A total of 51 patients—18 males (35%) and 33 (65%) females—with a mean age of 63.5 years were included. Five lesions were upper gastrointestinal (four gastric body; one duodenal) and 46 were colonic cases (20 appendiceal orifice lesions; five caecal; four from hepatic flexure; two each at sigmoid, ascending and transverse colon; one descending colon and 10 from the rectum). Technically successful FTRD deployment was achieved in 86% (n=44), with negative histological margins (R0 resection) seen in 82% (n=31). Thirteen patients were excluded from this calculation, as histological clearance was not applicable. Procedure-related complications occurred in 12% (n=6): there were three appendicitis cases; one experienced delayed bleeding requiring blood transfusion and endoscopic management; and two experienced technical complications (one snare entrapment and one clip entrapment).

CONCLUSION: This study demonstrates our experience with FTRD in New Zealand with technical success and R0 resection rates similar to the published literature. There is a considerable adverse event rate that requires careful patient discussion and consent prior to selection of this procedure.

Endoscopic resection has revolutionised the management of gastrointestinal (GI) tract lesions, offering a minimally invasive alternative to traditional surgical approaches with reduced morbidity and shorter recovery times. Previously, we have shown conventional endoscopic techniques such as endoscopic mucosal resection and endoscopic submucosal dissection (ESD) to be efficacious and safe in the treatment of mucosal and subepithelial lesions.[1,2] However, application may be limited by factors including difficult location, depth of invasion and significant fibrosis.

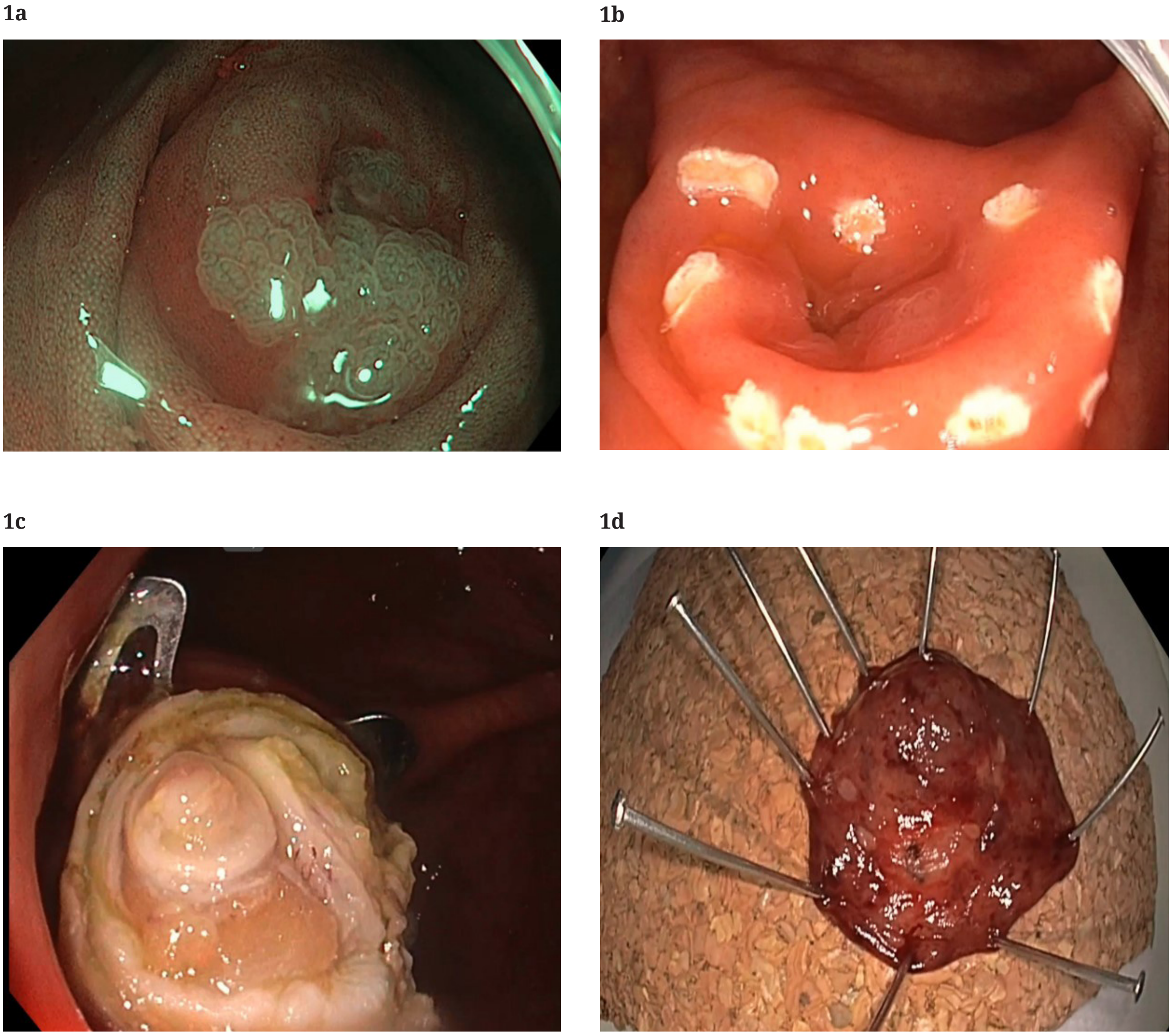
The full-thickness resection device (FTRD® system, Ovesco Endoscopy AG, Tuebingen, Germany) represents an advanced endoscopic tool designed to overcome some of these limitations to potentially reduce the need for more invasive surgery by enabling resection of GI tract lesions that are not possible to remove with traditional endoscopic techniques. This over-the-scope device combines a grasper, snare and large clip, designed to enable the resection to include all layers including the muscularis propria. The device is equipped with a specialised clip to immediately close the inevitable perforation that occurs during the resection of the muscular layer, effectively sealing the site to minimise complications. Common indications for FTRD include scarred or non-lifting polyps, subepithelial lesions, early cancers, lesions located in difficult anatomic sites such as the appendiceal orifice and diagnostic resection for suspected Hirschsprung's disease or amyloidosis where analysis of the muscularis propria is required.[3] The safety and efficacy of FTRD has been demonstrated in multiple retrospective and prospective studies;[4–8] however, no studies have evaluated this in New Zealand.

A schematic presentation of endoscopic full-thickness resection (EFTR) of a lesion at appendiceal orifice using FTRD is illustrated in Figure 1.

Method

We performed a retrospective study including consecutive adult (>18 years) patients who had an endoscopic resection of upper and lower GI tract lesions using the FTRD at two tertiary centres, Middlemore Hospital and North Shore Hospital in Auckland, New Zealand. Three endoscopists performed the procedures: two at Middlemore Hospital and one at North Shore Hospital. Data from all consecutive procedures performed between 1 January 2017 and 30 April 2023 were included. Written informed consent was obtained from all patients. All endoscopists completed a mandatory in-person training course for safe use of the device. After completion of FTRD, patient and procedural characteristics as well as histology and post-procedural complications up to 30 days were collated. The study protocol was reviewed and approved by the Auckland Health Research Ethics Committee (AHREC) and was granted locality approval at each study centre.

Figure 1: Illustration of endoscopic full-thickness resection of an appendiceal orifice lesion using the full-thickness resection device. 1a: Sessile serrated lesion at the appendiceal orifice in narrow band imaging view. 1b: Lesion marked using coagulation marker. 1c: Post-resection bed with over-the-scope clip securing the base. Muscle layer and omentum are evident confirming full-thickness resection. 1d: Lesion *ex vivo* pinned on corkboard for submission to histology. Markings are visible on the specimen confirming complete resection.



Outcomes

The primary endpoint was to assess technical success of the procedure. This was defined as achieving three key criteria: 1) successfully reaching the target lesion with the FTRD, 2) accurately applying the FTRD clip to the lesion, and 3) achieving immediate and complete resection of the lesion.

Complete resection was determined by the endoscopist's assessment and was defined as the lack of visible residual lesion following the use of the FTRD.

Secondary end points of this study included:

1. Histological margin: R0 resection was characterised as histologically complete removal of the lesion with negative resection margins both lateral and deep. R1 resection was defined as microscopic evidence of residual pathology at the margins of resection. Histological examination of the removed lesions was conducted on-site at each study centre.
2. Immediate and delayed procedure-related complications up to 30 days: Immediate complications were adverse events that occurred during the FTRD procedure until completion. Any complications that occurred after the procedure up to 30 days was classified as delayed. Minor immediate bleeding was described as bleeding necessitating haemostasis via endoscopic means only. Major immediate or delayed bleeding was defined as bleeding that required repeat endoscopy for haemostasis or bleeding that warranted further interventions such as transfusion of blood or blood products and/or surgical treatment. Minor delayed bleeding was bleeding that only required observation and spontaneously self-resolved, entailing no additional intervention. Other complications including infection, perforation or need for surgery were collected.

Data sources and statistical analysis

Patient, procedure and histological data were collected online from a digital service provider (Clinical Portal). Data were then de-identified and analysed using SAS software (SAS Institute, Cary, North Carolina). Binomial calculation with Wald confidence intervals was conducted to calculate the rate of technical success of the FTRD. The technical success was further explored by gender, age group, indication groups and endoscopic lesion size. For categorical variables, Fisher's exact test was used to assess associations between groups. The two-sided *t*-Test was utilised to compare the success rate of the study with the 90% benchmark.

Results

Between January 2017 and April 2023, 51 patients underwent EFTR using the FTRD (see Table 1). Patients had a mean age of 63 years, and the majority were female (65%). The mean lesion size was 15mm (range 4–30mm). Forty-six lesions (90%) were located in the colon, including 20 at the appendiceal orifice. Five lesions (10%) were in the upper GI tract. The mean diameter of specimens was 17mm (standard deviation [SD] 7.3, range 6–45mm). Most cases were performed for lesion resection, with 8% of cases performed for diagnostic purposes. Histopathological results are shown in Table 2.

Technical success

Technical success was achieved in 44/51 patients (86%). Sub-group analysis was performed to evaluate the technical success rate by gender, age group, indication and lesion size, without any significant differences noted ($p<0.05$).

R0 status for neoplastic lesions was achieved in 31/38 patients (82%). Five incompletely resected lesions from the colon were managed successfully with repeat endoscopy. One patient had rectal adenocarcinoma that was positive at radial margin. This patient successfully completed long-course chemoradiotherapy with 50Gy in 25 fractions with capecitabine, without evidence of disease recurrence at 12-month follow-up.

A high-grade dysplastic lesion in the gastric antrum was positive at radial margin. The patient has opted for further attempts at endoscopic resection with ESD technique.

Procedure-related adverse events

The rate of procedure-related adverse events within 30 days was 12%. Three patients developed appendicitis (two managed conservatively, one surgically) following appendiceal orifice lesion resection. One patient developed delayed bleeding requiring endoscopic management and blood transfusion. Technical complications occurred in two cases: one snare entrapment causing perforation and requiring surgical intervention and one clip entrapment requiring endoscopic retrieval.

Table 1: Patient and lesion characteristics.

Characteristics of patients at baseline	
Age, years	
Mean±standard deviation	63.5±14.2
Gender, number (%)	
Females	33 (65)
Males	18 (35)
Ethnicity, number (%)	
New Zealand European	35 (69)
All Asian	7 (14)
Māori/Pacific	4 (8)
Other	5 (10)
Endoscopies by type of anaesthesia, number (%)	
General anaesthesia	9 (18)
Conscious sedation	42 (82)
Lesion location, number (%)	
Upper gastrointestinal tract	5 (10)
Gastric body	4 (8)
Duodenum	1 (2)
Lower gastrointestinal tract	46 (90)
Appendiceal orifice	20 (40)
Caecum	5 (10)
Ascending colon	2 (4)
Hepatic flexure	4 (8)
Transverse colon	2 (4)
Descending colon	1 (2)
Sigmoid colon	2 (4)
Rectum	10 (20)
Endoscopic lesion size (mm)	
Mean±standard deviation	14.9±6.4
Lesion size as per pathologist report (mm)	
Mean±standard deviation	17.1±7.3
Range	39

Table 1 (continued): Patient and lesion characteristics.

Indication for FTRD, number (%)	
For lesion removal	47 (92)
Mucosal lesions (polyps and cancers)	20 (43)
Lesion located in difficult anatomic site (i.e., appendiceal orifice)	20 (43)
Submucosal lesion (GIST, NET, vascular lesions)	7 (14)
Diagnostic	4 (8)
To rule out Hirschsprung's disease	3 (6)
To rule out amyloidosis	1 (2)

FTRD = full-thickness resection device; GIST = gastrointestinal stromal tumour; NET = neuroendocrine tumour.

Table 2: Histopathological findings.

Histopathological findings, number (%)	
Sessile serrated lesion	13 (25)
Low-grade adenoma	12 (24)
High-grade adenoma	3 (6)
Adenocarcinoma	6 (12)
Subepithelial lesions	4 (8)
Other (normal, scar tissue, inflammation, vascular, Brunner's glands, lipoma, pancreatic heterotopia, lymphoid hyperplasia, hypertrophy/fibrosis)	13 (25)

Discussion

This is the first study to describe the efficacy and safety profile of the FTRD for EFTR of both upper and lower GI lesions in the New Zealand setting.

We report a technical success rate of 86%, aligning closely with existing literature where success rates typically range from 80% to 90%.[3–5] These lesions are among the most difficult to remove, where other endoscopic techniques are not possible to employ, and traditionally these lesions would have been sent for surgical management.

Lesion characteristics may play perhaps the most significant role in determining technical success. This series includes the complete learning curve for this procedure, and we have since modified local protocols regarding case selection, including requirement for biopsy confirmation of pathology (as opposed to occasional cases referred with endoscopic optical biopsy).

We achieved an R0 resection rate of 82%. The ability to achieve clear histological margins is critical in achieving cure. This rate is comparable to other FTRD studies reporting rates between 70% and 85%.[3–5] Risk factors for incomplete resection include lesion size >3cm, right-sided colonic lesions and tissue fibrosis leading to difficulty with lesion retraction.[9]

Adverse events occurred in 12% of cases, similar to rates in comparably sized retrospective studies[10] and recent meta-analyses.[4,5] Appendicitis occurred in 3/20 lesions (15%) at the appendiceal orifice, similar to previously reported rates of 17%.[10] The high rates of appendicitis have raised concerns about the safety of FTRD for this indication; however, most cases of appendicitis were managed conservatively, with only one requiring surgical intervention in our cohort. All cases were given intravenous antibiotics during the procedure, and for 3–5 days orally thereafter. All potential cases in our centres are discussed with the patient in-clinic for a thorough consent process, where a laparoscopic surgery is offered as an alternative. In our experience, anecdotally, there is an approximate 50% split between modalities chosen.

Major bleeding occurred in one patient, who had a lesion located in the stomach, requiring blood transfusion and repeat endoscopy for haemostasis. EFTR using the gastroduodenal FTRD is a more novel development, with recent meta-analysis showing this technique to be feasible, safe and efficacious.[4] The RESET trial[11] reported minor peri-procedural bleeding that was managed endoscopically in 31% of the patients undergoing EFTR for gastric subepithelial lesions. However, in a larger cohort of 56 patients, Hajifathalian et al. reported similar major delayed bleeding rates to our cohort.[10] Most bleeding events were managed endoscopically without the need for surgical intervention. We observed no bleeding with FTRD in the colorectal procedures and this is in accordance with existing studies that report higher bleeding rates in the upper compared with lower GI tract.[10] This may be due to rich blood supply and a thicker gastric wall, resulting in suboptimal compressive effect of the over-the-scope clip.

Other potential adverse events reported in larger cohorts that we did not observe include post-polypectomy syndrome and enterocolonic fistula formation.[3]

Technical complications, which occurred in two cases—snare and clip entrapment—with rare device failures, have been reported in other series.[12] Ovesco have since modified the FTRD system to prevent the likelihood of this occurrence, which occurred very early in our experience, and we have not had any further recent episodes. It does also emphasise the importance of appropriate training and advanced endoscopic skills to navigate these challenges.

Strengths of this study include the enrolment of consecutive patients, which limits selection bias. This is a real-world experience that includes the complete learning curve in terms of lesion resection and technical use of this device. Limitations include its retrospective nature.

In conclusion, we report the first case series in New Zealand of the FTRD for management of GI lesions. Our findings are comparable to international evidence. This work highlights the potential of the FTRD as a valuable tool in the interventional endoscopist's arsenal as a modality to potentially avoid surgical resection. It does also, however, underscore the need for careful patient selection, individualised treatment planning and consent. Further research is required to assess long-term outcomes of the lesions managed with the FTRD and also further refinement of lesion and patient assessment to delineate the role of the FTRD in GI lesion management.

COMPETING INTERESTS

Nil.

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Using Māori community aspirations to advocate for oral health integration into diabetes care

Kuramaiki Lacey, Margaret Clark, Breanna Jansen, Phoebe Skinner, Ethan Kamana, Esther Willing

ABSTRACT

AIM: Diabetes and periodontal disease are two chronic diseases that disproportionately impact Māori in Aotearoa New Zealand. This study aimed to identify the aspirations of Māori adults with diabetes and their whānau regarding integrating oral health into diabetes management.

METHOD: This Kaupapa Māori research engaged with Māori adults diagnosed with diabetes and their whānau across two community wānanga in Porirua. Both wānanga were audio recorded and transcribed verbatim. The researchers conducted a thematic analysis to identify key themes reflecting the participants' aspirations regarding oral healthcare within the context of their diabetes management.

RESULTS: The aspirations of 26 participants were captured in the study. Māori adults with diabetes experience several barriers to accessing dental care and they outlined opportunities to integrate oral healthcare into managing diabetes health, including: need for multidisciplinary care, improved access to education and information on the impact of diabetes on oral health and connection to Te Ao Māori.

CONCLUSION: Despite the impact of diabetes on periodontal disease, oral health seldom features in diabetes management and care. Māori community aspirations highlight the urgent need for oral health to be integrated into diabetes management.

Māori are the Indigenous people of Aotearoa New Zealand who, as a result of colonisation, experience systematic inequities in health outcomes, access to health and social services and differential exposure to the determinants of health.[1] Māori are disproportionately affected by diabetes—a chronic condition characterised by the inability of the body to produce or effectively use insulin—at rates three times that of non-Māori. Not only do Māori experience an earlier onset of diabetes, but complications are also highest among Māori.[2] Periodontitis is a chronic condition characterised by inflammation of the supportive structures of the tooth, which if left untreated can cause destruction of the gums and bone, leading to tooth loss. Māori have a greater prevalence of untreated gum disease, periodontal pocketing and tooth loss.[3] Diabetes is a known risk factor for periodontitis,[4] and has been described as increasing the risk and severity of periodontitis.[3] Therefore, it is recognised that people with periodontal disease would benefit from interventions focussed on controlling diabetes.[5]

Despite clear oral health inequities between Māori and non-Māori within Aotearoa New Zealand, there are few studies that work directly with Māori communities to identify their aspirations for their own healthcare. One study that explored the experiences of Māori patients with type 2 diabetes in Northland identified key barriers for Māori, including the high costs of dentistry, limited access to services and systemic issues within health service delivery that see oral health separated from diabetes care. They outlined an urgent need for integrated, subsidised and culturally responsive oral health initiatives to improve diabetes outcomes and reduce inequities in diabetes-related complications for Māori.[6]

This research engaged with participants enrolled at the Ora Toa primary health organisation (PHO), an iwi Māori health provider of Te Rūnanga o Toa Rangatira in Porirua. According to the Health Quality & Safety Commission (see: https://public.tableau.com/app/profile/hqi2803/viz/DiabetesPHO2022FINAL/Diabetes2022?publish=yes), in 2022 patients enrolled at the Ora Toa PHO had a significantly greater prevalence of diabetes (10.4%) compared with the rest of Aotearoa New Zealand (6.4%) across all age groups, all genders and all ethnic groups. This study was developed in collaboration with the

PHO, who had identified addressing diabetes inequities as a priority. The research aimed to identify if Māori adults impacted by diabetes want oral healthcare provided as part of their diabetes management, including any barriers and opportunities to integrate care.

Methods

Ethics approval

Ethical approval was obtained from the University of Otago Human Ethics Committee (H23/11) and from consultation with Te Rūnanga o Toa Rangatira, including the Clinical Advisory Group and director of health.

Methodology

A Kaupapa Māori research methodology engaged with Māori communities through wānanga (see Appendix for te reo glossary), a traditional method of Māori knowledge transmission.[7] Wānanga involves engaging in open discussion, reflection and knowledge sharing between researchers and participants. Central to wānanga are the values of mihimihi (greeting and building relationships), whakawhanaungatanga (sharing of whakapapa to connect at a deeper level), kōrero (discussion within the group and sharing on an open floor) and ako (learning and sharing information to strengthen the collective knowledge of the group). Wānanga enabled a safe space for participants to contribute to the research process. Wānanga are useful in Kaupapa Māori research, representing a traditional practice and normal way of life for Māori. Wānanga support the transmission of intergenerational knowledge among whānau, allowing the collective dialogue to address concerns and issues experienced by Māori communities.[7]

Recruitment

Recruitment was carried out over 6 weeks and sought participants from Porirua to engage across two wānanga. As this research was conducted by the Ora Toa PHO, participants were recruited from its four provider locations; together, all providers deliver services to approximately 20,000 people across the wider Wellington Region. As a result, participants come from a convenience sample. Adults diagnosed with any form of diabetes were invited directly by either the Ora Toa PHO diabetes health team or the oral health team by phone call or face-to-face. Poster advertisements for the wānanga were distributed around the Ora Toa PHO health centres, which contained a QR code for participants to register directly. All participants who registered were contacted to confirm their attendance over the phone or by email. Reminders were sent over email before wānanga commenced. A total of 36 participants signed up for either of the two wānanga.

Inclusion criteria

Eligible participants were those who were enrolled at the Ora Toa PHO, who identified as Māori, had a clinical diabetes diagnosis, were over the age of 18 and could provide informed consent. Participants were invited to bring as many whānau members, friends or support persons as they saw fit to support them during the wānanga, to acknowledge that health within the Māori worldview is not separate from the family context.[8] These whānau members did not need to be enrolled patients or be Māori, but did need to be over the age of 18 to participate in wānanga discussions.

Research design

All wānanga commenced with a karakia, mihimihi and whakawhanaungatanga, with formalities beginning with researcher introductions. The research team were all Māori, and included one researcher with whakapapa to Ngāti Toa Rangatira, and another researcher who is employed by the health provider as a clinical dentist. A short presentation was delivered to explain the relationship between diabetes and periodontitis. Using open-ended question techniques, researchers and participants discussed barriers encountered in accessing oral healthcare, experiences of referral pathways and perspectives on integrating oral health into diabetes management. Participants were asked what oral health support and information they required to support their diabetes health journey. Wānanga concluded with the opportunity for participants to ask questions and closed with kai and a koha. The koha included a supermarket voucher, an oral health pack and a dental voucher to receive treatment from the Ora Toa PHO–based dentist.

Data analysis

The researchers' analysis included a detailed, iterative review of transcripts from written notes from throughout the wānanga, and transcripts that were initially audio recorded and then transcribed verbatim. These transcripts were thoroughly read to identify the trends of discussion, and the researchers conducted a thematic analysis[9] to develop a coding matrix from the transcripts. Specific codes that reflected the topics discussed were analysed and re-defined, combining similar codes under the same sub-groups and then themes. The researchers collectively identified and discerned principal themes that highlighted the participants' priorities for oral healthcare and diabetes management. Participants were invited to a subsequent dissemination wānanga to verify that the analysis accurately reflected their experiences and aspirations regarding diabetes and oral health management.

Results

While 36 participants signed up for the wānanga, a total of 26 attended and contributed to the data. The research team analysed the data, from which four themes were identified: barriers to dental care, a need for integrating oral health and multidisciplinary care, access to education and information on the impact of diabetes on oral health and connecting to Te Ao Māori.

Barriers to dental care

The cost of dental treatment was a significant barrier to accessing oral healthcare services, with the price a driving force behind avoiding dental care, denying dental care or deferring treatment needs. Many participants expressed that while oral health was considered important, the cost of treatment competed with the cost of living, and ultimately prevented them from attending dental appointments until they experienced pain:

> "[Oral health] *has always been important, but I guess with the cost of living it hasn't always been prioritised unless you are feeling the pain or something. It is not really taken as importantly as it probably should, and I've never really thought about the link with diabetes. I mean, diabetes just affects everything."*

> *"When you ring in to make an appointment, it's always bearing in mind that payment is due on the day. Seeing that straight away is like—forget it. I don't have $500 to come in to get two teeth sorted. And this is half the reason why we don't come here."*

> *"A lot of payment plans have been pulled, like there used to be a dental plan where I could pay every week, and if I needed something major, I could pay half on the day. And now those have been pulled too and you just have to go in with the cash. Now a lot places have Afterpay and that, but that's just another thing that is going to get you into trouble."*

Long wait times to be seen by a dentist, or in some instances the complete lack of appointment availability, also contributed to inaccessible dental care. Participants commented on the challenge of accessing the onsite dental service at the Ora Toa PHO, as well as public hospital services at Kenepuru Hospital in Porirua. For the latter, relief of pain appointments were limited and offered on a first in, first served basis. It also prioritised those with urgent needs and required a Community Services Card, which made it difficult to be seen for those who were working full time but were in severe pain:

> *"You have to ring at eight o'clock in the morning and by five past eight all the appointments are gone."*

> *"If you're working full time, unless you've got a Community Services Card you can't go anywhere that's like Kenepuru or Wellington* [hospitals]. *You have to actually be at a really bad point, like abscess upon abscesses before they send you in there. Recently, my partner had a toothache and he had to suffer for a couple of days before he could even get an appointment. So we ended up going into Wellington Hospital and that's when they said, 'oh no you're really bad so we need to go drain you out', so it had to get to a really bad point before he even got any help. And like even prior to that they were just giving antibiotics even knowing it wasn't working 'cause it had been a whole week of him ringing up saying I've got a toothache, I need to get in."*

Integrating oral health and multidisciplinary care

In addition to financial constraints, participants emphasised the lack of integrated services as another barrier to effective oral health management. Most were unaware of the impact of diabetes on oral health and the link between the two chronic diseases. Many expressed that at no point had oral healthcare been discussed as part of their diabetes management, nor had they been asked about their oral health during their diabetes reviews:

> *"From the start of getting diabetes like 20 years ago, we knew how important feet were, we didn't know the mouth side."*
>
> *"But yeah it's just diabetes in general, you don't learn much about it unless you come to wānanga like these or you actually ask the right questions to your doctors."*
>
> *"I don't think I've ever talked to my GP* [general practitioner] *about my mouth. It's always been about other issues."*
>
> *"My GP's never talked to me since I've had diabetes about oral health."*

Annual diabetes reviews were identified as a potential opportunity to discuss oral health. However, participants shared that during diabetes reviews, other areas of the body deemed at risk of complication, such as the eyes and feet, were typically prioritised. They noted that oral health was seldom part of the discussion and advocated for an integrated approach to managing diabetes and oral health, whether through referrals or by having oral health screening integrated into routine diabetic appointments:

> *"It should be a whole package, you get your feet checked, your eyes checked, everything else checked, so why not your mouth? And having that would motivate people to actually get their teeth looked at."*
>
> *"It's the same with the mouth as well, you get infections there and lose your teeth. It's ongoing so we need the whole package of care."*
>
> *"Referrals, just a quick referral to see how your oral health is. Even if there is a small fee, not an out the gate fee, but you know, something just to make sure your oral healthcare is all good."*

Access to education and information

When asked about the oral health support participants needed to support integrated oral healthcare, they expressed a need for more information regarding the impact of diabetes on oral health and what oral health support is available to them. They touched on the importance of their health provider giving them this information earlier in the disease process, such as during the pre-diabetes stage, and not delaying the sharing of information and resources until they have been diagnosed with diabetes:

> *"For those that do have it* [diabetes], *especially in those early stages, it's important for them to know what's out there, what they can access and what they are entitled to for free if they have diabetes. I think that's one of the big ones as Māori."*
>
> *"I think it* [information] *would be really good at the pre-diabetic stage… Even if it's just a dental plan that comes out of it, you know? It's saying, 'well your gums are in this state, what we need to do over the next year for you is this…' and the plan should have that cost in it. This is what it will cost you, so you can prepare yourself for that financial burden."*

Participants felt that in the first instance, information of their health should come from their health practitioner face-to-face. They suggested that these discussions could then be complemented by education and resources shared across social media, television, advertisements and posters being displayed. They believed that more must be done to raise awareness of diabetes and the impact that it has on health:

> *"Usually when you look at a pamphlet, you're just reading, and then once you put it down, that information is not retained in your head. Whereas, if you have a one-on-one conversation with your GP or dentist, at least you understand what they're saying and if you've got questions you can ask them straight away. So face-to-face would be the best one."*
>
> *"I think one of the biggest barriers is awareness, okay? I mean, if I think about just recently, there's now new ads about cancer and going to get yourself tested and all that. I've learned a lot tonight, and*

> *now I'm thinking to myself… If they've got that awareness playing nationally, now why isn't there something about diabetes? Why isn't there something putting out the awareness? Hey, you might be sitting at home with an abscess and you don't even know you've got diabetes and you're wondering why your teeth are falling out all the time, you know? Why aren't we making a bigger noise about it so it's getting more attention, so it forces the government into making better decisions about the scenario."*

Connecting to Te Ao Māori

To further support oral health education and access to information, connection to Te Ao Māori was identified as important to support integrated oral healthcare. Participants discussed whakapapa and caring for mokopuna, and the future generations throughout both wānanga. Supporting whānau throughout the lifecourse was also emphasised, particularly throughout Kaupapa Māori settings like Kōhanga Reo. Participants suggested information and resources be shared with whānau from all ages and reiterated the importance of healthy messaging to pēpi, their parents and whānau at home:

> *"So I think the information needs to be sent out to the parents of tamariki, that, you know, diabetes is a really big killer in our whānau at the moment. So information can be handed out at kindergartens and Kōhanga Reo 'cause I reckon it needs to start there. We're already teaching them our reo and our tikanga, so why not teach them the proper kai to eat. Because they are gonna be our carriers of everything else later in life, they're gonna be our leaders and that's where we need to start, with our babies and rangatahi."*

> *"Teach the rangatahi before they get to our age and you're already there."*

The value of wānanga and coming together as a community was appreciated by participants. They believed that this platform was important for sharing knowledge and was beneficial since many shared similar experiences regarding their hauora:

> *"I think just having information nights like this, um 'cause it brings the community together you know, and not only that, but we also get to hear other people's stories and how it has affected them, and kind of resonates within yourself a little bit aye, and you reflect on yourself, but also there is a lot of helpful information which you can just discuss in that night, you know?"*

> *"We're all in the same waka, so you might as well hoe that waka together."*

Discussion

This study has shown that for Māori adults with diabetes in Porirua, there is a disconnect between the delivery of oral health and diabetes management. It also demonstrates that Māori with diabetes do value oral health and want access to the tools and resources that will support them to achieve good oral health as part of their diabetes diagnosis.

Oral health research that worked directly with Māori in Northland[6] noted there were several barriers to accessing oral healthcare, including financial barriers, wait times and an unmet service need. Our findings confirm that these barriers are not unique to Northland and are experienced by whānau living in Porirua. It is unsurprising that the cost of dentistry, which is an out-of-pocket expense for adults aged 18 years and over,[10] impacts the ability for Māori to access dental services, given the distribution of relative socio-economic deprivation in Aotearoa New Zealand.[11] As a result of colonisation, more Māori live in relative deprivation than non-Māori in Aotearoa New Zealand[12] and are more likely to face substantial cost-related barriers when seeking dental treatment.[6] Financial constraints limit the ability of whānau Māori to afford necessary dental care, leading to deferral or avoidance of treatment. Such cost-related barriers support oral health funding for diabetic patients.

Participants cited long wait times for appointments and in some cases, the complete unavailability of appointments through the public system. This left them suffering through pain for an extended amount of time. Accessing emergency dental care through the public system favours tooth extraction, focussing on symptomatic relief.[13] This is a downstream measure, with tooth loss from periodontal disease severely impacting on oral health–related quality of life[14] and the ability to eat and drink, all of which are important to maintain diabetic health.

Oral health promotion and prevention are key features of *The Strategic Vision for Oral Health in New Zealand*.[15] Offering periodontal treatment for diabetic patients as a form of prevention is an upstream attempt to save an individual's tooth, prevent pain and improve quality of life. To further support this, raising awareness of the impact of diabetes on oral health was recommended by the community. They were concerned that there was little effort to raise awareness of the impact of diabetes on oral health and urged for more resources, information and education about periodontal disease. This is in line with other findings where diabetic participants knew of other medical complications on the eyes, kidneys and feet due to the emphasis by their GP.[16] The literature supports integrating oral health into medical consultations, especially for patients diagnosed with diabetes,[17] with oral health assessments recommended as part of routine diabetes management.[18] While "*an examination of the teeth and gums and referral to dental care if presence of significant dental/periodontal disease*" is included within the annual diabetes review guidelines (see: https://t2dm.nzssd.org.nz/Section-115-Annual-diabetes-review), participants from our study noted that oral health seldom featured in their diabetes appointments, unless they specifically enquired about it. The participants in our study have confirmed that an integrated, multidisciplinary approach to diabetes management should include oral health.

The *Māori Health Action Plan* calls for whānau, hapū and iwi Māori to exercise their authority to improve their health and wellbeing.[19] This research engaged with Māori communities through an iwi health provider, an attempt to express tino rangatiratanga and develop Kaupapa Māori services. Investing in Kaupapa Māori services gives expression to Te Tiriti o Waitangi, ensuring research can both clinically and culturally respond to the needs of Māori.[20] Participants identified the importance of taking a whānau approach to promoting health, ensuring that people across their lifecourse have access to the tools and knowledge to promote whānau health. These findings reflect Māori values and priorities where health is inseparable from the whānau reality and support the notion that concerns for Māori are driven by factors that affect the community as a whole.[21]

Recommendations

The Government of New Zealand is focussed on accelerating action to address five non-communicable diseases, one of which is diabetes.[22] To ensure that diabetic patients have early access to preventative and early interventions, oral health objectives must be explicitly outlined within the broader diabetes policies and strategies to ensure that it is reflected clinically. An action area of *The Strategic Vision for Oral Health in New Zealand*[15] is to build links between oral health and primary healthcare, which oral health has typically been marginalised from. While the interconnectedness of diabetes and oral health are frequently acknowledged, there are currently no Indigenous or Māori oral health frameworks or guidelines for patients with diabetes, and this is a gap in the current care provided for patients with diabetes. On the other hand, the Ministry of Health and Health New Zealand – Te Whatu Ora have released comprehensive clinical diabetes guidelines for managing retinal pathologies[23] and podiatry risks.[24] To meet the needs of Māori communities with diabetes, it is important that oral health receives the same attention, funding, referral processes and awareness as other parts of the body known to experience complications from the diabetes process.

Limitations

As this research was conducted by the Ora Toa PHO, the scope of participants who could be engaged were limited to those who engaged with the service. Therefore, recruitment was from a convenience sample from only one Māori health provider, and the research reflected the views and aspirations of Māori diabetic adults in Porirua only and may not reflect the experiences or aspirations of other population groups living in Aotearoa New Zealand. We hope that our research findings may be useful for other communities and Māori health providers in Aotearoa New Zealand, but we acknowledge that some of the barriers to and opportunities for access may be specific to the Ora Toa community.

Conclusion

Māori adults with diabetes and their whānau want to integrate oral health into their diabetes management and treatment. While there are many barriers to accessing oral health services, there are also many opportunities to improve health outcomes for Māori communities. Future policy and strategy related to diabetes should consider the oral health context and, importantly, should prioritise the relationships and needs of communities who suffer from the chronic disease.

COMPETING INTERESTS

Nil.

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Appendix: glossary

Ako—learning
Hapū—sub-tribe
Hauora—to be fit, well and healthy
Hoe—paddle
Iwi—tribe
Kai—food
Karakia—prayer
Kaupapa Māori—Māori approach, Māori topic, Māori customary practice
Koha—gift
Kōhanga Reo—te reo Māori immersion preschool
Kōrero—discussion
Māori—the Indigenous peoples of Aotearoa New Zealand
Mihimihi—acknowledgements and greetings through the sharing of whakapapa
Mokopuna—grandchild(ren), descendent(s)
Pēpi—baby
Porirua—a city in the wider Wellington Region of Aotearoa New Zealand
Rangatahi—young people
Reo—language
Tamariki—children
Te Ao Māori—the Māori world
Te Tiriti o Waitangi—the Māori language text of the Treaty of Waitangi
Tikanga—customs/protocol
Tino rangatiratanga—self-determination, sovereignty, autonomy
Waka—canoe
Wānanga—traditional knowledge system and place of learning; seminar, conference, forum
Whakawhanaungatanga—forming authentic relationships
Whakapapa—familial lineage
Whānau—family

Blunt cerebrovascular injury in trauma patients: an under-recognised injury pattern at Auckland City Hospital

Rebecca Schroll, Samuel A Flint, Donald Harris, Ian Civil

ABSTRACT

AIM: Blunt cerebrovascular injury (BCVI) is a rare but potentially devastating injury that can lead to stroke and death without early diagnosis and treatment. Evidence-based practice guidelines recommend screening at-risk patients with neck computed tomographic angiography (CTA). We sought to evaluate the efficacy of such a screening protocol at a high-volume trauma centre in Aotearoa New Zealand.

METHODS: A retrospective chart review was conducted of adult blunt trauma patients who presented to our trauma centre from March to August 2023 who had injuries that met criteria for screening. Adherence to protocol as determined by capture of neck CTA within 6 hours of admission, incidence of BCVI, stroke and death were collected.

RESULTS: Ninety-five patients met criteria to screen for BCVI; only 41 (43%) underwent screening CTA. BCVI incidence was 6/41 (14.6%). Of the 54 patients not screened, there was one BCVI that progressed to stroke. Overall BCVI rate is estimated at 2.4%; an additional seven BCVIs may have been present.

CONCLUSION: BCVI is more common than previously recognised in blunt trauma patients. Increased awareness of BCVI screening protocols and systematic screening systems to facilitate early identification and treatment should be implemented to diminish the incidence of missed injury and devastating sequela.

Injury to the carotid and vertebral arteries after blunt traumatic injury, or blunt cerebrovascular injury (BCVI), is rare but potentially life-threatening, and has been reported in 1–3% of blunt trauma patients. Untreated BCVI is associated with a substantial rate of stroke (8–25%) and stroke/death (35–55%);[1,2] medical treatment is associated with improved patient outcomes (stroke <5%, stroke/death <20%).[3–5] Most patients are asymptomatic at time of presentation; as such, computed tomographic angiography (CTA) has become widely adopted as the test of choice to screen at-risk patients for BCVI presence.[6,7] Early screening of at-risk patients facilitates rapid detection of asymptomatic lesions and initiation of medical therapy in appropriate candidates, which is associated with reduced stroke risk.[3–5]

Our trauma centre is one of many hospitals throughout Aotearoa New Zealand and worldwide that have adopted a policy of identifying at-risk blunt trauma patients. Our initial protocol was successfully implemented a decade ago.[8] Blunt trauma patients who are undergoing computed tomography (CT) scans of the head, cervical spine and/or torso are evaluated for presence of clinical and radiographic criteria associated with risk of BCVI; patients who meet these criteria undergo screening neck CTA. We recently sought to evaluate the efficacy of our protocol at identifying BCVI and preventing stroke and to determine the baseline incidence of BCVI in our trauma patient population.

Methods

We conducted a retrospective chart review of the New Zealand Trauma Registry (NTZR) inclusive of all adult (age >15) blunt trauma patients who presented initially to our trauma centre from 1 March 2023 to 31 August 2023. We identified all patients who had Abbreviated Injury Scale (AIS) codes consistent with injuries that met radiologic criteria to obtain screening neck CTA based on our current protocol, which included: acute infarction (brain stem infarction, cerebellar infarction due to traumatic vascular occlusion or cerebral infarction due to traumatic vascular occlusion), all diffuse axonal injuries, complex skull vault fractures, all skull base fractures, LeFort II and III fractures, mandible fractures, cervical spine fractures, cervical spine spinous ligament injuries and cervical spine facet subluxation/dislocation. We also included all patients with upper rib fractures (first, second or third rib), which have previously not been officially included in our protocol but often prompt our providers to request a CTA. Data collected for each patient included demographics, injury patterns and mechanisms, incidence and timing of CTA and outcomes including stroke occurrence and death.

Results

A total of 760 patients met inclusion criteria. We identified 95 patients who had AIS codes consistent with injuries requiring screening neck CTA. Of these, a total of 41 (43%) eventually underwent screening neck CTA, six of whom were positive for BCVI (Figure 1).

CTA was obtained at the same time as the initial trauma CT in 26 patients and within 6 hours in an additional 10 patients, for a total of 36 patients (37.8%) in whom indicated screening CTA was conducted in a timely fashion. Four additional patients had screening CTAs conducted at 17 hours, 18 hours, 45 hours and 93 hours, respectively, and one patient had a CTA nearly a month after initial injury for other reasons, and a BCVI was incidentally noted and treated. Of the 41 patients who eventually underwent screening CTA, six had a definite or possible BCVI identified and treated; the overall rate of BCVI in patients who met screening criteria and underwent screening CTA was therefore 6/41 (14.6%). Of these, one had progression to posterior circulation stroke despite timely treatment, two had progression to death due to severe concomitant traumatic brain injury and three had no sequelae.

Fifty-four patients did not undergo screening CTA as indicated. Of these, one had a missed BCVI that progressed to symptomatic stroke at 63 hours, at which point CTA identified the injury. The remaining 53 patients who did not have a screening CTA did not have evidence in the available medical record of readmission for or treatment of subsequent stroke.

Rate of CTA performance was analysed by type of injury identified (Table 1). The most common types of injuries requiring screening CTA were upper rib fractures (46 patients) and skull base fractures (38 patients). Incidence of screening CTA varied from 88% for patients with complex skull fractures to only 25% for those with mandible fractures.

All patients who were known to have BCVI are listed in Table 2.

Figure 1: Study flow diagram.

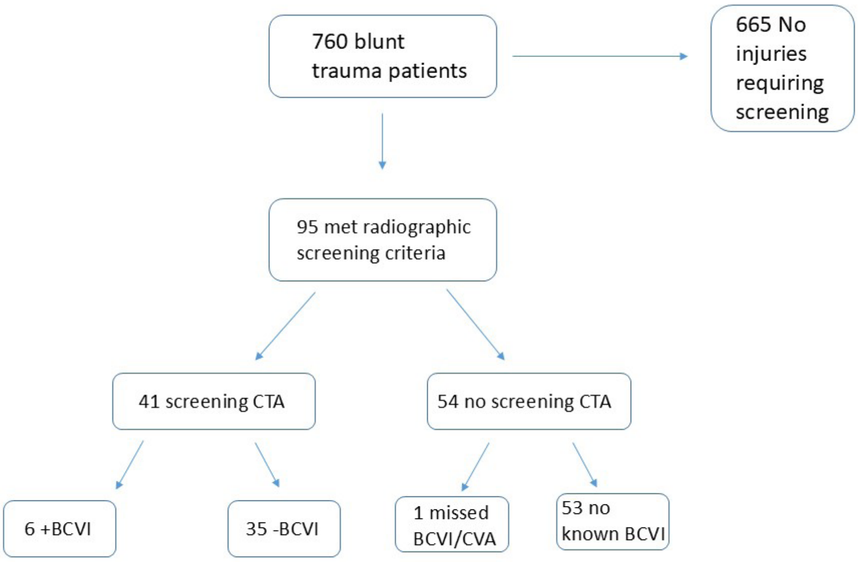


Table 1: CTA incidence stratified by injury type.

Radiologic criteria met for screening CTA	N total	N CTA	% CTA
DAI and GCS <6	3	1	33
Complex skull fracture	8	7	88
Skull base fracture	38	22	58
Occipital condyle fracture	2	1	50
LeFort fracture	3	2	67
Mandible fracture	4	1	25
C1–3 fracture	10	1	10
Other c spine fracture	7	5	71
Facet subluxation	3	2	67
C spine ligamentous injury	3	2	67
Upper rib fractures	46	13	28
Total*	**95**	**41**	**43**

*Some patients had more than one injury type.
CTA = computed tomographic angiography; DAI = diffuse axonal injury; GCS = Glasgow Coma Score; C spine = cervical spine.

Discussion

BCVI is an uncommon but increasingly recognised injury pattern, and it requires prompt diagnosis and treatment to prevent serious complications including stroke and death. Progression from asymptomatic to symptomatic BCVI tends to happen early (most strokes occur between 12 and 72 hours, with a median time to stroke <48 hours).[9] Strokes in the trauma patient population are particularly devastating as they result in higher years of life lost, higher quality years of life lost and increased cost of care compared with medical stroke patients.

Previously, the gold standard for diagnosing BCVI was with invasive and resource-intensive angiography. However, advancements in CT technology in recent years have allowed CTA to supplant angiography as the test of choice to diagnose BCVI. CTA is accurate, rapid and low risk for detection of BCVI.[6,7]

As awareness of BCVI has increased, it has increasingly been identified to occur in association with a wide variety of injury patterns and mechanisms. Protocols have been developed to identify blunt trauma patients with injury mechanisms, injury patterns and clinical signs and symptoms who would benefit from CTA screening for BCVI. The so-called "extended Denver criteria" is currently the most widely studied and adopted.[10–12] This protocol utilises a standard set of clinical and radiographic findings to identify patients at risk for BCVI who would benefit from screening CTA (Figure 2).

Current trauma guidelines consistently endorse protocolised screening for BCVI,[7,12–14] such that it should be considered a standard of care. Increased awareness of and screening for BCVI, combined with adoption of high-quality CTA, has led to increased rates of injury as high as 7% in blunt trauma patients.[15]

Once identified on CTA, lesions can be graded on a standardised severity scale, such as the Biffl/Denver grading scale. While medical management should be based on clinical considerations, grading can facilitate prognostication and risk/

Table 2: Patients with known BCVI.

Patient	Age	Injury mechanism	Criteria	Time to CTA	Injury type	Injury grade	Outcome
1	25	Motor vehicle collision	Occipital condyle fracture, skull base fracture, C6TP fracture	Immediate	LVA reduction in calibre at fracture site	1	CVA
2	24	Motor vehicle collision	Skull base fracture	Immediate	LICA narrowing	1	Death (TBI)
3	62	Motor vehicle collision	C4 vertebral body fracture, C3/4 facet subluxation, c spine ligamentous injury	Immediate	LVA narrowing	1	Death (TBI)
4	53	Mechanical fall	Skull base fracture	Immediate	Possible carotico-cavernous fistula	2	No sequelae
5	34	Pedestrian vs motor vehicle	1st–3rd rib fractures	<1 hour	LICA narrowing at fracture site	1	No sequelae
6	56	Motor vehicle collision	3rd rib fracture	63 hours	BCA occlusion, R CCA dissection	4	CVA
7	60	Fall from bicycle	Skull base fracture	1 month	LICA dissection with intimal flap	3	No sequelae

BCVI = blunt cerebrovascular injury; CTA = computed tomographic angiography; TP = transverse process; LVA = left vertebral artery; CVA = cerebrovascular accident; LICA = left internal carotid artery; TBI = traumatic brain injury; c spine = cervical spine; BCA = brachiocephalic artery; R CCA = right common carotid artery.

Figure 2: Denver screening criteria for BCVI.

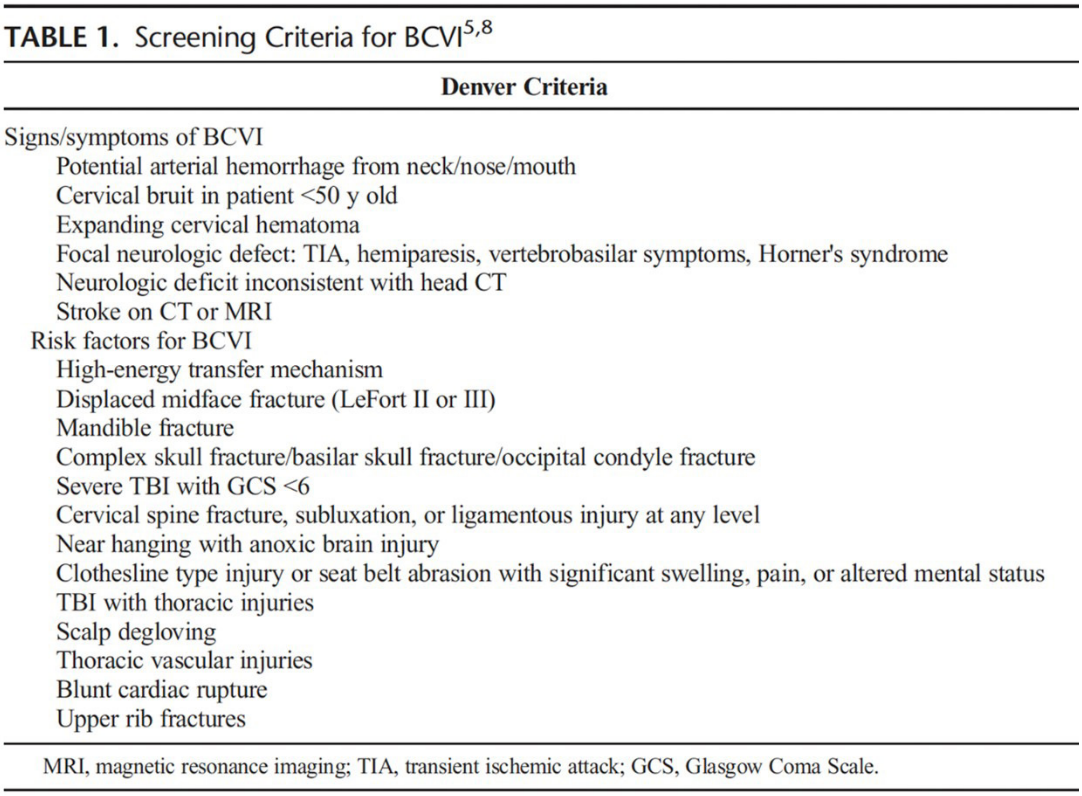


TABLE 1. Screening Criteria for BCVI[5,8]

Denver Criteria

- Signs/symptoms of BCVI
  - Potential arterial hemorrhage from neck/nose/mouth
  - Cervical bruit in patient <50 y old
  - Expanding cervical hematoma
  - Focal neurologic defect: TIA, hemiparesis, vertebrobasilar symptoms, Horner's syndrome
  - Neurologic deficit inconsistent with head CT
  - Stroke on CT or MRI
- Risk factors for BCVI
  - High-energy transfer mechanism
  - Displaced midface fracture (LeFort II or III)
  - Mandible fracture
  - Complex skull fracture/basilar skull fracture/occipital condyle fracture
  - Severe TBI with GCS <6
  - Cervical spine fracture, subluxation, or ligamentous injury at any level
  - Near hanging with anoxic brain injury
  - Clothesline type injury or seat belt abrasion with significant swelling, pain, or altered mental status
  - TBI with thoracic injuries
  - Scalp degloving
  - Thoracic vascular injuries
  - Blunt cardiac rupture
  - Upper rib fractures

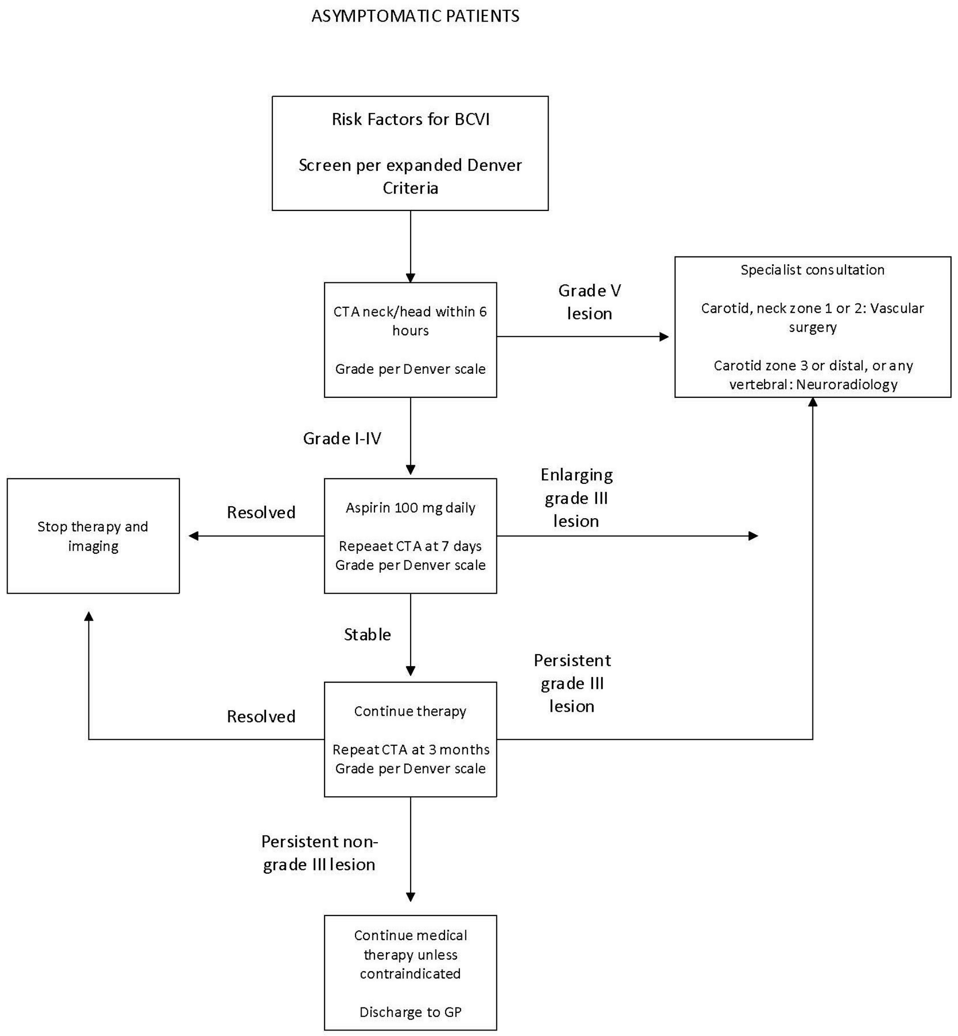
MRI, magnetic resonance imaging; TIA, transient ischemic attack; GCS, Glasgow Coma Scale.

benefit assessment regarding medical therapy, inform decision making regarding repeated imaging for surveillance and enable structured reporting for documentation, audit and research purposes.[7]

Early diagnosis allows for prompt medical therapy, which is associated with lower rates of stroke and death in asymptomatic non-haemorrhagic BCVI.[3–5] While there is no consensus regarding antiplatelet regimens vs anticoagulation, aspirin monotherapy is often recommended because it is a mainstay of preventing cerebrovascular events in similar non-traumatic conditions and has a low risk of clinically significant bleeding complications in most scenarios. Even patients with concomitant traumatic brain injury or solid organ injury can typically be safely managed with aspirin without increasing the risk of bleeding complications.[16,17]

This audit assessed the efficacy of our current BCVI screening protocol by measuring completion of timely screening CTA (within 6 hours) and found that only 41% of patients who had injury patterns associated with BCVI had a timely CTA. Of the patients who underwent CTA, incidence of BCVI was 14%; extrapolating a similar incidence in those who met criteria but were not screened, it is possible at least eight additional BCVIs may have been missed during this study period. It is possible that the actual number of missed BCVIs might be lower if there is some selection bias leading to patients with injuries being more likely to be screened; however, we found no unifying pattern of injury associated with more likely BCVI occurrence. The most common injury type associated with BCVI was upper rib fractures, occurring in 46 of the 95 patients, but patients with these injuries had one of the lowest rates of timely CTA completion at only 28%. This is unsurprising, as until recently this criterion was not part of our formal screening protocol. Of the 46 patients with upper rib fractures, nine had other injuries that met criteria for screening CTA, and all of them received one. However, of the remaining 37 patients in which isolated rib fracture was the only screening criteria, only four (11%) had a timely screening CTA. Unfortunately, one patient who was not screened progressed to a possibly preventable stroke. Better protocol adherence and inclusion of expanded criteria (especially

Figure 3: Updated BCVI screening and treatment algorithm.



Expanded Denver Criteria Risk Factors
Le Fort II or III midface fracture
Mandible fracture
Complex skull fracture
Scalp de-gloving
Cervical spine fracture, subluxation, or ligamentous injury at any level
Severe TBI with GCS <6
Near hanging with anoxic brain injury
TBI with thoracic injuries
Upper rib fractures (ribs 1–3)
Thoracic vascular injuries
Blunt cardiac rupture

Denver BCVI grading scale

I	Luminal irregularity or dissection with <25% stenosis
II	Dissection or intramural hematoma with ≥25% stenosis
III	Pseudoaneurysm
IV	Occlusion
V	Transection with extravasation

Initiate medical therapy unless contraindicated by severe bleeding risk (e.g., intra-axial haemorrhage or non-controllable haemorrhage)
Heparin anti-coagulation is an alternative in patients in whom rapid reversal is desired
Dual therapy is not required for patients already on anti-platelet or therapeutic anti-coagulation therapy

upper rib fractures) might have resulted in the capture of at least eight missed BCVIs and prevented one stroke during the study period.

We suspect there are several factors contributing to the suboptimal adherence rate to protocolised BCVI screening. Patients may have injuries that meet radiographic criteria but are subtle or otherwise not identified on initial review at the time initial CTs are conducted. Our analysis did not indicate any particular type of injury as more likely to be missed initially and cause CTA performance to be delayed. Logistical challenges inherent in organising an expeditious second trip to the CT scanner for a neck CTA once these patients have been moved to the operating room, intensive card unit or ward can be numerous, hence our finding of a subset of patients whose screening CTA was not completed until many hours after admission. Concerns regarding administration of a second contrast bolus to such patients can also lead providers to delay obtaining CTA. Additionally, patients may have initial trauma CT scans at other hospitals but then are transferred to a referring centre for definitive treatment once their injuries are identified; these patients would not undergo the same screening protocol in the emergency department (ED) CT scanner as patients who are initially evaluated in our ED, and as such are at risk of not being identified as high risk for BCVI and flagged to undergo screening through our usual process.

We have suggested a new screening protocol that is more widely encompassing of all clinical and radiographic patterns associated with BCVI (Figure 3). Our processes are being refined to improve protocol adherence, including widely publicising the new protocol throughout trauma patient care areas and holding education sessions for clinical staff who are involved in acute management of trauma patients, particularly in the radiology and EDs. We advise a goal of completing indicated BCVI screening within 6 hours of presentation.

Unfortunately, this difficulty with implementing screening protocols has been described by others and is one of the factors that has led some to advocate for universal screening of all trauma patients with concerns for significant head, face, neck and upper torso trauma. These patients are likely already undergoing CT scans with IV contrast, so the addition of a neck CTA is likely to achieve the highest rate of injury detection with minimal additional risk, and has previously been shown to be cost effective in some settings.[18–20] An additional widely cited drawback to screening protocols is that even the most robust screening protocols with 100% adherence still do not capture all BCVI patients. The extended Denver criteria has been found to miss at least 25–30% of patients who have BCVI.[15,18,19] Taking this into account, we estimate that the overall incidence of BCVI in our patient population may be as high as 2.4%, and that even with the most stringent criteria-based screening protocol we still might miss a handful of BCVI patients per year at our institution alone. We advocate that further analysis of local BCVI injury patterns should be conducted to determine whether universal screening might be the optimal management and cost-effective use of resources for our patient population.

Our study had broader implications for trauma patients across Aotearoa New Zealand. While a major trauma centre in Aotearoa New Zealand, our hospital sees just under 15% of all major trauma cases; 6/7 of all trauma patients have initial care in a wide array of other hospital settings throughout the country, many of which are not major trauma centres. Over 6 months at our hospital, 54 major trauma patients missed screening for BCVI and one had a missed stroke. If BCVI screening protocols are similarly underutilised across Aotearoa New Zealand, there may be over 700 patients annually who do not undergo appropriate screening for BCVI, and an additional 15 patients with missed, and possibly preventable, strokes. While our hospital has taken steps to improve adherence to our BCVI screening protocol, we suggest there should be a national protocol for BCVI screening that all hospitals can adhere to and audit against.

This study has some limitations. It is a retrospective chart review and as such is limited by the availability and accuracy of the data in the medical record and trauma registry. The incidence of BCVI and stroke in the unscreened population is unknown, as many have no follow-up data in our medical record system, and may have sought follow-up care elsewhere. We are unable to know the true incidence of BCVI in our patient population and have attempted to estimate it based on the incidence in the portion of the population that has been screened. However, selection bias may mean that the true incidence rates between the two groups are not similar.

Conclusion

In recent years, universal screening for BCVI in all blunt trauma patients has been advocated by some, citing essentially zero missed injury rates, improved early diagnosis and treatment leading to decreased stroke and mortality rates, and even cost-effectiveness.[15,18,19] Given the limitations of protocolised identification of patients to be screened as discussed above, and the devastating sequelae of missed injury on patients, their whānau and our society, consideration should be given to integrating neck CTA into standard trauma CT protocols. Increased awareness of BCVI screening protocols and more systematic screening to facilitate early identification and treatment should be implemented across Aotearoa New Zealand.

COMPETING INTERESTS

Nil.

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Mental health and wellbeing of ethnic migrant women and girls in Aotearoa New Zealand: a scoping review

Julia Vajda De Albuquerque, Roshini Peiris-John, Parvinca Saini, Sarah Hetrick, Rodrigo Ramalho, Isabelle Uy, Vartika Sharma

ABSTRACT

AIM: To identify and synthesise the literature on mental health and wellbeing of Asian and MELAA (Middle Eastern, Latin American and African) women and girls in Aotearoa New Zealand (New Zealand).

METHODS: We searched American Psychological Association (APA) PsycInfo, CINAHL, Embase (Ovid) and MEDLINE (Ovid) for studies published in English up to July 2023 investigating the mental health and wellbeing of Asian and MELAA women and girls living in New Zealand. Studies including other participants were eligible if they provided disaggregated data for Asian and MELAA women/girls in New Zealand. We extracted data on study characteristics and all relevant findings related to their mental wellbeing.

RESULTS: Twenty-four studies provided data on approximately 15,000 Asian and MELAA women and girls aged over 12 years. The studies had heterogeneous population groups and outcomes. Three exclusively focussed on Asian women. Most studies (n=17) did not provide disaggregated data for Asian and MELAA women and girls in relation to all relevant outcomes reported. Investigated outcomes included prevalence data and symptoms of mental health conditions and mental wellbeing (n=18) and associations of socio-demographic factors with mental health (n=9).

CONCLUSION: The limited peer-reviewed data underpin the lack of evidence-based policy planning. Future research focussed on Asian and MELAA women and girls is needed to enhance their wellbeing and achieve equitable health outcomes.

Women constitute nearly half of global migrants.[1] They migrate for different reasons. While some pursue more equal development possibilities in wealthier countries, which increasingly demand care work,[2] others accompany their husbands or partners, becoming "trailing spouses".[3] As economic migrants, these women often take up specifically gendered roles in the global labour market, e.g., care work, nursing or factory work.[3] Some women may migrate to escape restrictive gender norms.[4] Those with refugee backgrounds or asylum seekers may have dealt with physical and sexual violence, loss of family members and persecution—which are risk factors for poor mental health and have major implications for access to care.[5,6] Irrespective of the reason, migration is a stressful process that poses a significant risk to the mental health and wellbeing of migrant women.[5]

Women's migration experiences are frequently shaped by the intersection of gendered inequalities (such as access to nutrition, education, income and safety) and migration-related social inequalities (such as legal dependency on spouses, greater involvement in caregiving roles, lack of employment in the new country).[7] Unlike their male counterparts, women are more likely to experience intersectional discrimination of both racism (from the host society) and sexism (including from their own communities), which creates distinct social and health inequities.[5] For example, families and male partners may demand gender roles and attitudes from women, which may conflict with how most women live their lives in their new country.[5] Migration has also been consistently identified as a significant risk factor for family violence in minority communities.[8]

Since the 1986 immigration reforms in Aotearoa New Zealand (New Zealand), there has been a significant increase in migration from Asian, and Middle Eastern, Latin American and African (MELAA) countries. These population groups are some of the fastest growing in New Zealand, constituting 19.2% of the total population.[9] Of these, at least half are women.[9] The Asian and MELAA groups, usually being presented as distinct population groups, have high heterogeneity regarding country of origin, visa status (e.g., temporary workers, international students, refugees etc.), time of residence in New Zealand and degree of integration into the New Zealand society. Furthermore, this group also presents varied social markers (e.g., age, religion, sexuality, socio-economic status) and settlement patterns (rural versus urban centres).[10]

In 2018, less than a quarter of the Asian and MELAA populations was born in New Zealand, indicating a high proportion of them are first-generation migrants who have been living in New Zealand for varied periods.[10] The limited evidence that exists highlights that Asian and MELAA communities experience several health inequities in New Zealand, including high rates of cardiovascular diseases,[11,12] diabetes,[13] low birth weight,[11] mental health issues[14] and high risk of stroke.[11] At the same time, these communities show lower access rates to health services and healthcare utilisation, including primary care enrolment, screening services, mental health services, disability support and aged residential care.[15]

A recent review identified significant structural barriers, i.e., policies and frameworks that create inequitable access to healthcare services.[16] These included cost of healthcare, limited access and quality of interpreter services (language barriers), short-duration appointments with long waiting times, difficulty navigating the health system and logistical barriers such as lack of knowledge on how to access health services. Language and cultural differences between service users and service providers have also been shown to reduce access to specialised services, such as mental health.[17]

The Asian and MELAA populations in New Zealand are projected to constitute over 25% of the total population by 2043.[18] Understanding the mental health needs of Asian and MELAA women and girls and providing culturally and gender-responsive services can no longer be overlooked. The first step involves revealing what is currently known. Thus, we conducted a scoping review to identify and synthesise the existing literature relating to mental health and wellbeing of Asian and MELAA women and girls in New Zealand (both New Zealand born and migrants). The ultimate objective was to describe evidence gaps that need to be addressed to improve mental health outcomes for this population.

Methods

This review focussed on research on the mental health of Asian and MELAA women and girls living in New Zealand (both New Zealand–born and migrants). Research articles published up to July 2023, in English, that used quantitative, qualitative or mixed methods to measure or focus on specific dimensions of mental health of women/girls in New Zealand who self-identify as Asian and MELAA (irrespective of age or sex assigned at birth) were included. Studies with additional types of participants were included only if disaggregated data for Asian and MELAA women/girls were provided. Studies with data from different countries, including New Zealand, on the mental health of migrants, ethnic groups or women, were included only if disaggregated data for Asian and MELAA women/girls in New Zealand were provided.

Based on the eligibility criteria and medical subject headings related to mental health conditions described in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR), separate search strategies were created for four databases: American Psychological Association (APA) PsycInfo, CINAHL, Embase (Ovid) and MEDLINE (Ovid) (see Appendix). Following the search, all identified citations were collated and uploaded into EndNote 21 (Clarivate Analytics, PA, USA), and duplicates were removed. One reviewer (JVDA) screened titles and abstracts and assessed them against the inclusion criteria, consulting the wider research group for clarifications. Potentially relevant sources were retrieved in full for detailed assessment against the inclusion criteria. Reference lists of included studies were screened for additional sources of evidence. Grey literature (e.g., reports, policy literature, working papers, government documents) was not included.

Data were extracted (by JVDA) using a data extraction table developed for this review to document general information about each study (e.g., study design, participant characteristics, methods) and findings related to the review question, i.e., mental health and wellbeing of Asian and MELAA women and girls. These included data on the prevalence or incidence of a broad range of mental health conditions and psychological factors that could influence mental health and wellbeing (e.g., quality of life, life satisfaction, sense of connectedness and sense of belonging). No contact was made with the authors of the included study for any additional data.

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines[19] to report the study findings, which include the study characteristics, mental health outcome measures and the outcome data.

Results

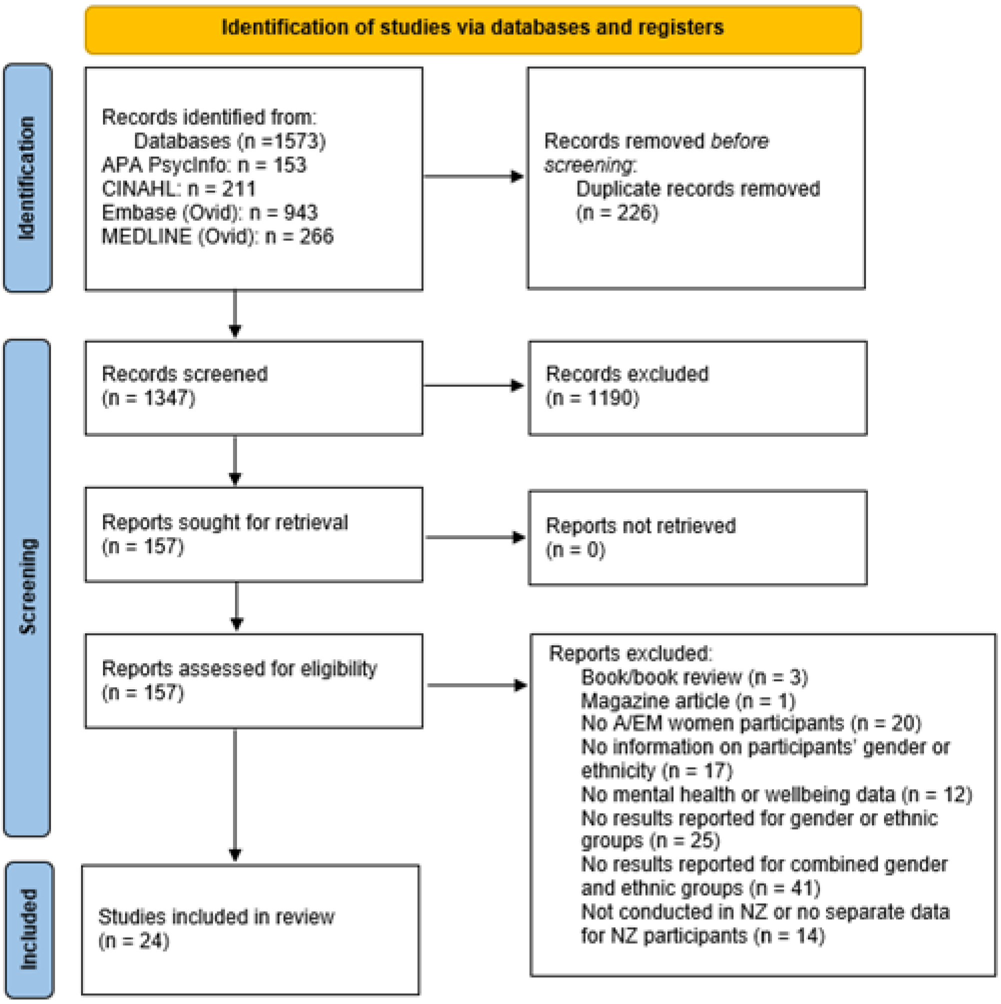
The searches retrieved 1,573 records, of which 226 were identified as duplicates and removed. The title and abstracts of the remaining 1,347 records were screened, and the full text was reviewed for 157 studies. Only 24 studies met the inclusion criteria and were included in this review. Most excluded studies either did not report the participants' gender or ethnicity, or did not provide disaggregated data for them (Figure 1).

1. Overview of the included studies

Overall, the included studies provided data on approximately 15,000 Asian and MELAA women and girls aged over 12 years living in New Zealand. They were published between 1992 and 2023. All studies provided data on Asian women. Three studies exclusively investigated Asian women.[20–22] Seven studies focussed on Asian populations, including women and men,[23–27] or boys and girls.[28,29] The other 14 studies also included MELAA participants but only two reported disaggregated data for MELAA women and girls.[30,31]

In terms of specific population groups, two included studies focussed on secondary school and/or undergraduate students.[32,33] Seven studies focussed on perinatal women.[31,34–39] Only one of these studies provided disaggregated data for MELAA women/girls.[31] The other six studies with perinatal women were analyses from the Growing Up in New Zealand study (GUiNZ) that separately reported data for Asian women/girls but combined the data for MELAA women/girls in the "other" category (including other ethnicities).[34–39] In

Figure 1: PRISMA study flow diagram.



PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

addition, five studies investigated New Zealand residents over 15 years old,[30,40–43] providing data mostly on Asian women/girls—only one also provided disaggregated data for MELAA women.[30]

The included studies investigated a wide range of concepts and outcomes related to mental health and mental wellbeing, which can be reported into two broad domains. First, prevalence and symptoms of mental health conditions and psychological wellbeing (n=18).[20,23–31,33,34,37,39–43] Second, associations of socio-demographic factors with mental health conditions (n=9).[20–23,32,35,36,38,41] Three studies reported findings related to both domains.[20,23,41] The tables of included studies presented exclusively describe the key findings specific to Asian and MELAA women and girls.

2. Prevalence and symptoms of mental health conditions and mental wellbeing

The review findings highlight the use of a variety of approaches to measure the prevalence of mental health conditions and mental wellbeing. The first approach was using questionnaires and scales or reviewing secondary mortality data to identify the prevalence of mental health conditions in Asian and MELAA women and girls and assess symptoms (n=10) (Table 1a). These included minor psychiatric symptomatology (i.e., higher levels of distress that could lead to psychiatric disorders; n=1),[20] eating disorder symptomatology (n=2),[24,25] general mental health (n=2),[23,41] depression (n=4),[32,35,36,38] stress (n=2),[34,39] self-esteem and life satisfaction (n=1)[33] and suicide (n=1).[28]

The second approach to assess the prevalence of mental health conditions was used in five studies (Table 1b). It involved analysing medicine prescription and use for specific conditions, viz., dementia,[30] depression in pregnancy[31,37] and psychosis.[42,43]

The third approach was through the proxy indicator of mental health service use (Table 1c). Three studies provided data related to the use of support services, i.e., for autism spectrum disorder (ASD),[29] public mental health services[40] and a helpline for Chinese speakers.[27]

3. Associations of mental health with socio-demographic factors

Among the 24 included studies, nine analysed a range of factors commonly associated with mental health outcomes (Table 2). Two studies explored the impact of migration or refugee status.[21,22] Three studies examined associations of socio-demographic factors (such as age, education, socio-economic status and depressive symptoms) with perinatal depression,[36,38] one with minor psychiatric morbidity[20] and two with general mental health.[23] One study investigated intimate partner physical conflict and prenatal perceived stress.[35] One study estimated the impact of neighbourhood fragmentation (described as compositional factors that can fragment social connections within a neighbourhood)[41] and another investigated the relationship between sexuality and gender with depressive symptoms, suicide attempts and the wellbeing of secondary school students.[32]

Discussion

To the best of our knowledge, this is the first scoping review to examine the available evidence on mental health and wellbeing of Asian and MELAA women and girls in New Zealand and identify related knowledge gaps. The included studies estimated outcomes through symptom screening and proxy measures (prescription medicine use and factors associated with mental health) and association with different socio-demographic factors. Nevertheless, this review revealed a lack of robust data to estimate population-level prevalence rates or service use for mental health conditions in Asian and MELAA women and girls in New Zealand. Where these data exist, they are drawn from studies that have focussed on very few mental health conditions, are limited to certain population groups (e.g., specific ethnic groups within Asian communities) and are not evenly distributed across all settings (e.g., outside Auckland) in which Asian and MELAA women and girls live. This review provides limited data on Asian and MELAA migrant women and girls, particularly from smaller ethnic sub-groups and indicates that data for other intersecting groups (such as the rainbow community and women with disabilities) are even more scarce.

The included studies provided information regarding the prevalence of only a few mental health conditions—ASD,[29] dementia,[30] depression,[34,39] eating disorders,[24,25] minor psychiatric morbidity,[20] psychosis[42,43] and suicide.[28] Where data were available, they indicated gender differences in the Asian sub-group. Asian women/girls were at higher risk of depression,[26] being prescribed anti-psychotics,[43] experiencing a minor mental health condition[23] or having body dissatisfaction than their male counterparts.[25] On the other hand, Asian women/girls represented fewer cases of young suicide deaths,[28] adult schizophrenia[42] and young ASD diagnoses.[29] In addition, while Asian and MELAA women/girls and men/boys presented similar rates of public mental health services use,[40] Asian women/girls were more likely to use the helpline for Chinese speakers.[27]

Differences between ethnic groups in women were also noted, with Asian women and girls at higher risk of antenatal depression than European women and girls.[39] However, at the same time, Asian women and girls had lower rates of antenatal antidepressant use compared to European women and girls,[31,37] suggesting limited access to mental health services. The findings also suggest a negative association between poor mental health outcomes and a range of socio-demographic factors, such as migration or refugee status,[22] gender identity and sexuality[32] and intimate partner conflict.[35] Furthermore, prevalent structural barriers to health services access in New Zealand[16] were reported by migrant and refugee women.[21,22] These included financial constraints (cost of healthcare), language barriers (access and quality of interpreter services), lack of information on the health system and health services (obstacles navigating the health system) and logistical barriers (lack of knowledge on how to access health services). Thus, Asian and MELAA women and girls may need targeted support to know where and how to seek culturally responsive mental health services.

Asians are a very heterogeneous group comprising 37 sub-ethnicities. However, most studies that provided disaggregated data limited them to Asian women and girls, as they constitute most of the ethnic minority population in New Zealand.[44] Using "Asians" as a category is ineffective, as it masks the lived realities and specific needs of smaller ethnic groups within the Asian ethnicity.[45] This issue is also observed in the broad and diverse MELAA group. Despite Asian and MELAA communities being one of the fastest growing communities, we found only three studies that specifically investigated the mental health of Asian women, [20–22] and none focussed on MELAA women. Even for the Asian community, only a few sub-ethnic groups (i.e., Bhutanese, Chinese, Indian, Korean and Pakistani) were included.

New Zealand has a growing population of Asian and MELAA ethnic migrant women and girls.[44] However, lack of funding for studies focussed on their health[46] leads to scarce mental health research for these women and girls. Our scoping review indicates very little data on Asian and MELAA women and girls, with a small range of conditions studied and few Asian and MELAA subgroups. Data specific to Asian and MELAA women and girls need to be recognised as a priority area to support clinical practice and evidence-based designing, planning and implementation of policies and programmes for these populations. Future studies could sample Asian and MELAA women and girls to achieve adequate explanatory power. We also recommend studies with the general population to provide disaggregated data for all gender and ethnic groups, separately and combined, when applicable. Cross-sectional studies are needed to expand the current limited number of culturally validated measurement tools. It is also important to engage Asian and MELAA communities in research and policy spaces, including their voice in decision-making.

Most studies (n=17) provided data that could only be partially extracted due to a lack of disaggregated data for Asian and MELAA women/girls for all the relevant outcomes. Three studies did not report the total number of participating Asian and MELAA women/girls.[31,38,43] Thus, the exact number of Asian and MELAA women and girls included in this review is unclear (approximately 15,000). Seven studies included MELAA women and girls but did not provide disaggregated data for this group.[34–39] Five studies analysing results from the GUiNZ survey did not provide disaggregated data for Asian women and girls in all analyses related to perinatal depression.[34,36–39] Three studies compared outcomes related to mental health between ethnic groups but did not account for gender.[30,40,42] Another three studies also did not account for gender and ethnicity combined in all analyses.[26,33,43] Three studies with Asian participants also did not provide disaggregated data for women/girls for all outcomes.[23,24,27]

Thus, we could not extract all relevant data, even though they existed in the raw dataset. Similarly, many studies did not meet the inclusion criteria due to a lack of disaggregated results for women/girls, Asian and MELAA participants, or both combined (e.g., outcomes reported for women/girls and Asian and MELAA participants but not for Asian and MELAA women/girls). The way through which authors reported outcomes limited the findings of this review. Authors face word limits for publications and report what is relevant to their research questions. Data on small or minority population groups may be lost in primary studies with diverse populations and no disaggregated data.

The main strengths of this review include its focus on Asian and MELAA women and girls, and its robust search process, adapted to four databases, using an extensive list of medical subject headings (and their synonyms) related to mental health conditions, with no date limits. We included both quantitative studies measuring indicators of mental health and wellbeing and qualitative studies revealing the perspectives of Asian and MELAA women and girls on their experience as migrant or ethnic women in New Zealand. This review only included published research articles. Other types of studies could complement the available evidence if ethnicity and gender disaggregated data are provided.

This review highlighted that peer-reviewed studies investigating the mental health and wellbeing of Asian and MELAA women and girls in New Zealand are scarce. The available evidence has heterogeneous populations and outcomes. Most data were drawn from studies that did not specifically investigate mental health issues in Asian and MELAA women/girls and frequently did not present disaggregated data for Asian and MELAA women/girls for all reported outcomes. Thus, this review indicates significant gaps in our understanding of the mental health needs of these populations. The lack of relevant data implies that the current policies, service provisions and resource allocations may not align with present needs, relying instead on sporadic and, in some instances, obsolete data. With growing populations in New Zealand, studies focussed on Asian and MELAA women and girls represent a key priority to enhance their wellbeing and promote equitable health outcomes. Additional data could inform the development and implementation of policies, strategies and programmes that address the needs of these growing populations and provide culturally and gender-responsive services.

Table 1a: Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Abbott et al. 1999,[23] cross-sectional.	Chinese migrants; Auckland.	173; unclear.	Cases and severity of non-psychotic mental disorders: 12-item version of the Chinese Health Questionnaire (CHQ-12), a culturally validated adaptation of the General Health Questionnaire (GHQ).	Women were at greater risk of minor mental health conditions than men (p-value and total scores not reported).
Bécares and Atatoa-Carr 2016,[34] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	1,091 (Asian); mean age 30.01 years (SD 4.7).	Prenatal perceived stress: 10-item Perceived Stress Scale (PSS). Symptoms of prenatal and postnatal depression: Edinburgh Prenatal and Postnatal Depression Scale (EDS and EPDS, respectively).	Asian women reported low prenatal perceived stress (mean score=12.85, SD=6.2). 17.2% had prenatal depression, 13.1% had postnatal depression.
Chan et al. 2010,[25] cross-sectional.	Korean migrants; Auckland.	72; unclear.	Eating-disorder symptomatology, i.e., disordered eating behaviours, feelings about one's body and psychological correlates commonly present in (but not exclusive to) anorexia nervosa and bulimia nervosa: Eating Disorder Inventory (EDI; max score 42, with greater values indicating higher levels of disordered eating behaviours).	EDI total mean score of Korean women was 34.1 (SD 20.0). The mean scores for the subscales (ranging from 1, never, to 6, always, with greater values indicating higher levels of disordered eating behaviours) were: drive for thinness = 5.5 (SD 5.3), interoceptive awareness = 3.7 (SD 3.8), bulimia = 2.5 (SD 2.7), body dissatisfaction = 8.8 (SD 6.0), ineffectiveness = 2.5 (SD 2.8), maturity fears = 5.72 (SD 4.1), interpersonal distrust = 3.24 (SD 3.3). Compared to men, women had a higher score for body dissatisfaction and a lower score for maturity fears.

Table 1a (continued): Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Chan and Owens 2006,[24] cross-sectional.	Chinese migrants; Auckland.	179; unclear.	Eating-disorder symptomatology (definition as per above): EDI.	Total scores not reported, mean scores for the subscales: drive for thinness = 4.5 (SD 4.8), interoceptive awareness = 3.4 (SD 4.2), bulimia = 1.4 (SD 2.6), body dissatisfaction = 9.6 (SD 7.0), ineffectiveness = 3.5 (SD 3.5), maturity fears = 6.4 (SD 4.5), interpersonal distrust = 3.1 (SD 2.9).
Cheung and Spears 1992,[20] cross-sectional.	Chinese women; Dunedin.	127; 18–80 years.	Minor psychiatric morbidity (i.e., higher levels of distress that could lead to psychiatric disorders): 28-item version of the GHQ-28.	21.3% presented minor psychiatric morbidity.
Goh et al. 2021,[28] retrospective, population-based descriptive.	Asians aged 10 to 24 years who died from suicide (2002 to 2017 inclusive); New Zealand.	29; 12–24 years (no suicide deaths recorded for 10- and 11-year-old Asians).	Prevalence of suicide, calculated based on suicide mortality rates described in the Mortality Review Database at the University of Otago.	Prevalence rate among Asian young women and girls: 3.2 per 100,000. Women represented 31.8% of young Asians who died from suicide.
Ivory et al. 2011,[41] cross-sectional.	Permanent New Zealand residents over 15 years old; New Zealand.	668 (Asian); over 15 years.	2002/2003 data from the New Zealand Health Survey: Australian and New Zealand version of the 36-Item Short Form Survey (SF-36; max score 100, with higher scores indicating better mental health status).	In Asian women/girls, the SF-36 Mental Health Scale mean score = 82.3, 95% CI 81.2 to 83.5.
Montayre et al. 2022,[26] cross-sectional.	Asians living in New Zealand.	676; unclear.	Depression: Kessler Psychological Distress Scale (K10) and the Short-Form 12-Item Health Survey Mental Component Score (SF-12 MCS). Data from the 2016/2017 New Zealand Health Survey cohort.	Among Asians diagnosed with depression, 71.9% were women. Compared to Asian men, Asian women had a significant increased risk for depression: K10 adjusted odds ratio (aOR) = 2.60 (1.37 to 4.94); SF-12 MCS aOR = 2.36 (1.26 to 4.42; $p<.01$).

Table 1a (continued): Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Reese et al. 2017,[33] cross-sectional.	Māori, Chinese and European school and university students aged 12 to 21 years; New Zealand.	48; 12–21 years.	Depression: 30-item Reynolds Adolescent Depression Scale – 2nd edition (max score 120, with greater values indicating higher symptoms of depression). Self-esteem: 10-item Rosenberg Self-Esteem Inventory (max score 30, with greater values indicating higher self-esteem). Life satisfaction: 5-item Satisfaction with Life Scale (max score 35, with greater values indicating higher satisfaction with life).	The mean scores among Chinese young women and girls ranged from: 60.7 to 63.9 for severity of depressive symptoms, indicating none to minimal depressed mood (i.e., ≤75); 19.4 to 20.5 for self-esteem, indicating a normal range (between 15 and 25); 22.8 to 24.21 for satisfaction with life, indicating participants were "slightly satisfied" (between 22 and 25).
Waldie et al. 2015,[39] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	802 (Asian); unclear.	Perceived maternal stress: PSS. Symptoms of prenatal depression: EDS.	Asian women approximately twice as likely to suffer from antenatal depression than European women (n=3,168; p<0.01; disaggregated total scores for Asian women not reported).

MELAA = Middle Eastern, Latin American and African; SD = standard deviation; CHQ-12 = Chinese Health Questionnaire; GHQ = General Health Questionnaire; PSS = Perceived Stress Scale; EDS and EPDS = Edinburgh Prenatal and Postnatal Depression Scale; EDI = Eating Disorder Inventory; SF-36 = 36-Item Short Form Survey; CI = confidence interval; K10 = Kessler Psychological Distress Scale; SF-12 MCS = Short-Form 12-Item Health Survey Mental Component Score; aOR = adjusted odds ratio.

Table 1b: Studies that provided data on the prevalence of medicine prescription and use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chan et al. 2023,[30] retrospective, population-based descriptive.	Individuals diagnosed with dementia; New Zealand.	1,515 (Asian); all ages included.	Prevalence of anti-dementia medication use: rate between the number of individuals with a diagnosis of dementia and anti-dementia medication dispensing rates, retrieved from New Zealand's Integrated Data Infrastructure (IDI).	Of the women using anti-dementia medication from 2016 to 2020, Asian women constituted 4.2 to 5.1% and non-Asian ethnic women constituted 0.5 to 0.6%.
Donald et al. 2021,[31] retrospective, population-based descriptive.	Pregnant women aged 15 to 49 years prescribed with antidepressants from 2005 to 2014; New Zealand.	100,488 Asian and 51,600 MELAA pregnancies; unclear.	Antidepressant dispensing patterns: number of pregnancies from the New Zealand pregnancy cohort with one or more dispensing of any antidepressants.	Asian women and girls: dispensing rates increased from 0.5% to 1.7%; MELAA women and girls: from 2.9% to 6.8%. Compared to European/other ethnicity pregnancies (n=347,419), Asian and MELAA pregnancies were less commonly dispensed with antidepressants. In Asians, the adjusted risk ratio (aRR) ranged from 0.17 (95% CI 0.15 to 0.19) to 0.24 (95% CI 0.22 to 0.24). In MELAA, the difference was smaller, with the aRR ranging from 0.87 (95% CI 0.83 to 0.91) to 0.91 (95% CI 0.84 to 0.91). Asian pregnancies were less likely to have at least one dispensing in trimester 2 or 3 than European/other ethnicity pregnancies (aRR 0.59, 95% CI 0.53 to 0.66). This difference was not observed in MELAA pregnancies (aRR 0.96, 95% CI 0.91 to 1.01). The rate of continued use of medication was also lower in Asian pregnancies (29.1%) than in European/other pregnancies (44.2%), whereas for MELAA pregnancies this rate was similar (43.8%).

Table 1b (continued): Studies that provided data on the prevalence of medicine prescription and use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Svardal et al. 2022,[37] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	1,092 (Asian); unclear.	Rate of unmedicated depression based on symptoms of prenatal depression (measured through the EPDS) and use of antidepressant (based on self-report).	Asian women (n=1,092) had the lowest rate of antenatal antidepressant use (0.7%) compared to Pacific peoples (0.9%, n=1,160), Māori (2.4%, n=1,260), Other (2.7%, n=310) and European women (4.8%, n=4,210).
Wheeler et al. 2008,[42] retrospective, population-based descriptive.	Adult schizophrenia outpatients; Auckland.	118 (Asian); unclear.	Antipsychotic medication: medication charts and clinical notes.	From 2000 to 2004, the proportion of women among adult Asians dispensed with medication for schizophrenia increased from 38.7% to 44.1%.
Wilkinson and Mulder 2018,[43] retrospective, population-based descriptive.	Individuals over 15 years old prescribed an antipsychotic; New Zealand.	Unclear; over 15 years.	Antipsychotic prescribing data from the Pharmaceutical Management Agency of New Zealand (PHARMAC).	In 2015, less than 1% of Asian women and girls were prescribed antipsychotics, with this rate increasing with age. Asian women and girls were less prescribed antipsychotics compared to women and girls from other ethnic groups, across all age groups. Asian women and girls across all age groups were more likely to be prescribed antipsychotics compared to Asian men and boys, at an overall rate of 1.25 times.

MELAA = Middle Eastern, Latin American and African; IDI = Integrated Data Infrastructure; aRR = adjusted risk ratio; CI = confidence interval; EPDS = Edinburgh Postnatal Depression Scale; PHARMAC = Pharmaceutical Management Agency of New Zealand.

Table 1c: Studies that provided data on the prevalence of mental health services use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chow and Mulder 2017,[40] retrospective, population-based descriptive.	Individuals who used public mental health services from 2008 to 2013; New Zealand.	5,007 (Asian); unclear.	Mental health service utilisation: demographic data from the Programme for the Integration of Mental Health Data (PRIMHD) on patients who presented at least once to public mental health service.	Women represented 52.43% of Asians using public mental health services (reasons for using this service not described).
Htut et al. 2020,[29] retrospective, population-based descriptive.	Asian children under 20 years diagnosed with autism spectrum disorder (ASD) in 2016; Auckland.	130; under 20 years.	Profiling of Asian children with ASD under 20 years: demographic data from the Ministry of Health's Disability Support Services	Young women and girls diagnosed with ASD were Chinese (n=38), Indian (n=25), Filipino (n=13), Korean (n=9), Indonesian (n=5), Sri Lankan (n=5), Cambodian (n=3), Vietnamese (n=3), other (not Japanese, Pakistani, Thai, Burmese, Malay, Laotian; n=4), Afghani (n=1) and Bangladeshi (n=1). Asian women and girls (across all ages, including adults) constituted 18.7% of all women and girls allocated to support services for ASD, and a similar percentage of all Asians (19.3%).
Yang Dong 2016,[27] retrospective, population-based descriptive.	Users of the Chinese Lifeline; New Zealand.	133; unclear.	Demographic characteristics of users. Presenting symptoms.	Most callers were women (90.5%). Presenting symptoms for women not reported.

MELAA = Middle Eastern, Latin American and African; PRIMHD = Programme for the Integration of Mental Health Data; ASD = autism spectrum disorder.

Table 2: Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Abbott et al. 1999,[23] cross-sectional.	Chinese migrants; Auckland.	173; unclear.	Cases and severity of non-psychotic mental disorders: CHQ-12.	Married women with children living without their spouse were significantly more likely to be classified as “suffering from mental disorder” than those with a resident spouse (25% vs 9%, p=0.02).
Akhtar et al. 2022,[21] cross-sectional.	Adult Pakistani women living in New Zealand for <5 years.	200; 18–54 years.	Questionnaire about challenges in accessing and understanding the New Zealand healthcare system.	Most women (87%) believed they still needed information on the New Zealand healthcare system, including that on mental health, particularly perinatal and child mental health.
Bird et al. 2021,[35] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	883 (Asian); unclear.	Prenatal perceived stress: PSS. Symptoms of prenatal depression: EPDS. Prevalence of intimate partner physical conflict (multiple-choice questions) and its association with stress and depression.	Higher perceived stress was associated with increased odds of intimate partner conflict (in the past month; OR=1.07), which was reported by 20% of Asian participants.
Chiang et al. 2017,[32] cross-sectional.	Secondary school students; New Zealand.	851 (Asian); unclear.	Symptoms of depression: Reynolds Adolescent Depression Scale-Short Form (RADS-SF). Attempted suicide: closed question (yes/no). General psychological wellbeing: WHO-5 Wellbeing Index.	Among Chinese and East Asian girls: 13.4% of SG majority and 21.8% of SG minority reported significant depressive symptoms. The latter had lower odds of significant depressive symptoms (OR 0.46, 95% CI 0.28 to 0.76) than NZ European SG minority girls.

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chiang et al. 2017,[32] cross-sectional (continued).	Secondary school students; New Zealand (continued).	851 (Asian); unclear (continued).	Symptoms of depression: Reynolds Adolescent Depression Scale-Short Form (RADS-SF). Attempted suicide: closed question (yes/no). General psychological wellbeing: WHO-5 Wellbeing Index. Questions about gender and sexuality to categorise students into sexual and/or gender (SG) majority (exclusively sexually attracted to the opposite sex) or SG minority (sexually attracted to people of the same sex, both sexes or those who were not sure about this) (continued).	3.1% of SG majority and 5.2% of SG minority reported suicide attempts. The latter had lower odds of significant suicide attempts than NZ European SG minority girls (OR 0.29, 95% CI 0.12 to 0.70). 56.7% of SG majority and 67.8% of SG minority reported good wellbeing. The latter had higher odds of reporting good wellbeing (OR 2.07, 95% CI 1.23 to 3.48) than NZ European SG minority girls. Among Indian and other Asian girls: 15.2% of SG majority and 36% of SG minority reported significant depressive symptoms. The latter had similar depressive symptoms to NZ European SG minority girls. 6.5% of SG majority (n=367) and 11% of SG minority reported suicide attempts. The latter had similar depressive symptoms to NZ European SG minority girls. 74.2% of SG majority and 52.5% of SG minority reported good wellbeing. The latter had similar depressive symptoms to NZ European SG minority girls but lower odds of reporting good wellbeing than Chinese and East Asian girls SG majority girls (OR 0.38, 95% CI 0.21 to 0.67).

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Cheung and Spears 1992,[20] cross-sectional.	Chinese women; Dunedin.	127; 18–80 years.	Minor psychiatric symptomatology (i.e., higher levels of distress that could lead to psychiatric disorders): GHQ-28.	Higher rates of minor psychiatric morbidity among those born in China, those who were living in New Zealand for 10 years or more, had migrated for family reasons and spoke English less frequently.
Farewell et al. 2022,[36] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	797 (Asian); unclear.	Growth mixture modelling to identify resources (demographic data) associated with low risk for perinatal depression (assessed with the EPDS and 9-item Patient Health Questionnaire [PHQ-9]).	14.1% of Asians were classified as at low risk of depression. In Asian perinatal women, internal and external resources (such as age, education, income, spirituality, neighbourhood integration, community belonging) were not associated with low risk for depression.
Ivory et al. 2011,[41] cross-sectional.	Permanent residents over 15 years old; New Zealand.	668 (Asian); over 15 years.	Associations between mental health (SF-36; max score 100, with higher scores indicating better mental health status) and neighbourhood fragmentation (measured with the New Zealand Index of Neighbourhood Social Fragmentation).	In Asian women and girls, the SF-36 mental health scale mean score was not associated with neighbourhood social fragmentation.
Shrestha-Ranjit et al. 2020,[22] qualitative case study.	Bhutanese refugee women; Palmerston North or Feilding.	32; 18–82 years.	Effectiveness of primary healthcare services in addressing mental health needs of women refugees. Information collected via focus group discussion; thematic analysis used.	Participants reported their mental health deteriorated due to traumatic refugee journeys and resettlement challenges in New Zealand, such as language barriers, loneliness, family separation, financial constraints, pressure to find paid work and uncertainty about the future. Lack of awareness about available mental health supports or services, despite wanting to access them.

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Underwood et al. 2017,[38] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	Unclear; unclear,	Associations between symptoms of prenatal and postnatal depression (EPD, EPDS).	Asian women with antenatal or postpartum depression symptoms (ADS or PDS) were more likely to have ADS (OR 1.80, 95% CI 1.21 to 2.69), PDS (OR 1.86, 95% CI 1.20 to 2.88), or ADS+PDS OR 2.40, 95% CI 1.21 to 4.79) than Asians with no depression symptoms.

MELAA = Middle Eastern, Latin American and African; CHQ-12 = 12-item Chinese Health Questionnaire; PSS = prenatal perceived stress; EPD/EPDS = Edinburgh Postnatal Depression Scale; OR = odds ratio; RADS-SF = Reynolds Adolescent Depression Scale-Short Form; WHO = World Health Organization; SG = sexuality and/or gender; CI = confidence interval; GHQ-28 = 28-item General Health Questionnaire; PHQ-9 = Patient Health Questionnaire 9-item; SF-36 = 36-item Short Form Survey; ADS = antenatal depression symptoms; PDS = postpartum depression symptoms.

COMPETING INTERESTS

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Appendix: Search strategies

Appendix Table 1: Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
1	(wom*n or female? or girl?).mp.	1,339,169
2	(migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	46,484
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	521,086
4	(mental health or mental hygiene or mental well* or emotional well*).mp.	292,388
5	(psychologi* stres* or life stres* or psychological stressor).mp.	22,212
6	(anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	317,463
7	(depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	530,575
8	(PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	54,326
9	(psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	200,749
10	(self injur* or self harm or self destructive behavio?r? or automutilation).mp.	18,623
11	suicide?.mp.	69,313
12	(eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	53,780
13	(somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	11,740

Appendix Table 1 (continued): Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
14	((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	17,199
15	(sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	46,433
16	(neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	265,889
17	(dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	117,756
18	(separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	295,651

Appendix Table 1 (continued): Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
19	(New Zealan* or Aotearoa or NZ).mp.	15,044
20	2 or 3	546,977
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	1,530,672
22	1 and 19 and 20 and 21	154
23	limit 22 to english language	153

Appendix Table 2: Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
1	exp female/ or wom*n.mp. or female?.mp. or girl?.mp.	11,651,326
2	exp migrant/ or exp refugee/ or exp ethnic group/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	254,525
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	3,743,566
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	420,510
5	exp physiological stress/ or (psychologi* stres* or life stres* or psychological stressor).mp.	343,420
6	exp anxiety/ or exp anxiety disorder/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	666,735
7	exp depression/ or exp mood disorder/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	1,153,597
8	exp posttraumatic stress disorder/ or exp adjustment disorder/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	90,854

Appendix Table 2 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
9	exp psychosis/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	371,055
10	exp automutilation/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	29,439
11	exp suicide/ or suicide?.mp.	126,315
12	exp eating disorder/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	180,016
13	exp somatoform disorder/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	33,413
14	exp sleep disorder/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	303,659
15	exp sexual dysfunction/ or exp paraphilic disorder/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	108,395
16	exp disorders of higher cerebral function/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	1,170,337

Appendix Table 2 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
17	exp dissociative disorder/ or exp personality disorder/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	169,858
18	exp mental disease/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	2,625,125
19	(New Zealan* or Aotearoa or NZ).mp.	126,159
20	2 or 3	3,836,230
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	4,017,589
22	1 and 19 and 20 and 21	945
23	limit 22 to English language	943

Appendix Table 3: Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
1	exp female/ or wom*n.mp. or female?.mp. or girl?.mp.	11,651,326
2	exp migrant/ or exp refugee/ or exp ethnic group/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	254,525
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	3,743,566
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	420,510
5	exp physiological stress/ or (psychologi* stres* or life stres* or psychological stressor).mp.	343,420
6	exp anxiety/ or exp anxiety disorder/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	666,735
7	exp depression/ or exp mood disorder/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	1,153,597
8	exp posttraumatic stress disorder/ or exp adjustment disorder/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	90,854
9	exp psychosis/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	371,055
10	exp automutilation/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	29,439
11	exp suicide/ or suicide?.mp.	126,315

Appendix Table 3 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
12	exp eating disorder/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	180,016
13	exp somatoform disorder/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	33,413
14	exp sleep disorder/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	303,659
15	exp sexual dysfunction/ or exp paraphilic disorder/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	108,395
16	exp disorders of higher cerebral function/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	1,170,337
17	exp dissociative disorder/ or exp personality disorder/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	169,858

Appendix Table 3 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
18	exp mental disease/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	2,625,125
19	(New Zealan* or Aotearoa or NZ).mp.	126,159
20	2 or 3	3,836,230
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	4,017,589
22	1 and 19 and 20 and 21	945
23	limit 22 to English language	943

Appendix Table 4: Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
1	exp women/ or wom*n.mp. or female?.mp. or girl?.mp.	10,057,537
2	(exp transients/ and migrants/) or exp refugees/ or exp “ethnic and racial minorities”/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	64,005
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	2,773,725
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	278,546
5	exp stress, psychological/ or (psychologi* stres* or life stres* or psychological stressor).mp.	162,566
6	exp anxiety/ or exp anxiety disorders/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	370,810
7	exp depression/ or exp mood disorders/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	782,722
8	exp stress disorders, post-traumatic/ or exp adjustment disorders/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	61,078
9	exp psychotic disorders/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	244,920
10	exp self-injurious behavior/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	89,318
11	exp suicide/ or suicide?.mp.	103,093

Appendix Table 4 (continued): Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
12	exp “feeding and eating disorders”/ or exp “feeding and eating disorders of childhood”/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	87,011
13	exp somatoform disorders/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	25,863
14	exp “sleep initiation and maintenance disorders”/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	35,486
15	exp sexual dysfunction, physiological/ or exp sexual dysfunctions, physiological/ or exp paraphilic disorders/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	56,873
16	exp neurocognitive disorders/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	598,722
17	exp dissociative disorders/ or exp personality disorders/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	127,051

Appendix Table 4 (continued): Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
18	exp neurodevelopmental disorders/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	341,705
19	(New Zealan* or Aotearoa or NZ).mp.	83,449
20	2 or 3	2,806,420
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	2,393,923
22	1 and 19 and 20 and 21	267
23	limit 22 to English language	266

Optimising the use of certification findings to support healthcare quality measurement and improvement

Jerome Ng, Jacky Chan, Jerson Valencia, Kaushik Kaushik, Fran Voykovich, Marama Tauranga, Andrew Connolly, Vanessa Thornton

ABSTRACT

Certification is one of several regulatory tools intended to support and ensure the safe provision of health and disability services, such as hospitals and rest homes, to the public. Health and disability service providers must be certified and meet all relevant service standards if they are to provide healthcare services. Not surprisingly, service providers, regulators and auditors spend a significant amount of effort and resources to prepare for, undertake, administer and report the audits. Given the substantial investment by all involved, it is essential to optimise the use of the findings to support system learning and quality improvement. However, in reality and practice, the qualitative and narrative nature of the audit findings means that they are unable to be used to optimise their return for the commensurate effort. In this viewpoint article, we propose and describe a complementary quantitative approach to using certification data to enable and support clinical governance and quality improvement in and across organisations. We reflect on our proposed approach in practice and consider its limitations and implications on practice, research and policy.

There is an ongoing debate about whether certification and accreditation lead to better healthcare, health outcomes and whānau experiences.[1,2] Regardless, certification is a mandatory requirement of the *Health and Disability Services (Safety) Act 2001*, which ensures the safe provision of health and disability services to the public and enables the establishment of standards for safe service provision in Aotearoa New Zealand.[3,4] Under section 9 of the *Act*, service providers such as hospitals and rest homes and person(s) providing healthcare must only do so while certified and must meet all relevant service standards.

Health and disability service providers seeking certification are required to provide evidence and findings that demonstrate their adherence to the Ngā Paerewa Health and Disability Services Standard (HDSS) NZS 8134:2021.[5] The HDSS sets minimum standards that service providers must comply to and contains a total of six outcomes. While the *Health and Disability Services (Safety) Act* and the HDSS are administered by the Ministry of Health – Manatū Hauora, the actual auditing of service providers is carried out by independent external designated auditing agencies (DAA). The DAA audit health and disability service providers against the HDSS. Service providers, regulators and auditors spend significant effort and resources to prepare for, undertake, administer and report the audits.

Given certification is mandatory and a significant amount of effort is required from all involved, it is sensible to optimise the use of certification findings to support system learning and quality improvement. However, in reality and practice, the narrative nature of the 60–90-page certification report presents a significant challenge for time-pressured staff to read it in its entirety, which results in under-utilisation of the intended benefits of the findings. Furthermore, the qualitative data obtained from the certification report cannot easily be incorporated within succinct 1–2-page organisational quality scorecards and electronic health intelligence dashboards for routine progress monitoring. Out of sight (and out of mind) from routine organisational quality monitoring, with data that cannot be easily viewed at a glance in time-poor senior leadership meetings, it is perhaps unsurprising to observe in practice that staff do not always engage with certification reports or their corrective actions. Further, the qualitative nature of existing certification reports hinders comparability and leads to difficulty in understanding variation in practice across organisations. Consequently, identifying and spreading learning from the best performers becomes challenging.

The current narrative and qualitative certification reports provide rich context and a comprehensive account of the audit findings and should not be rejected outright. Instead, we suggest a complementary quantitative approach to present certification data, which may be more easily incorporated within routine quality measurement scorecards and dashboards to support engagement, measure and monitor progress over time and identify variation in practice to enable learning from best performers. In this viewpoint article, we describe our proposed quantitative approach and reflect on its use in practice to enable and support clinical governance and quality improvement (QI) in and across organisations. Finally, we consider the limitations of our proposed approach and implications for practice, research and policy.

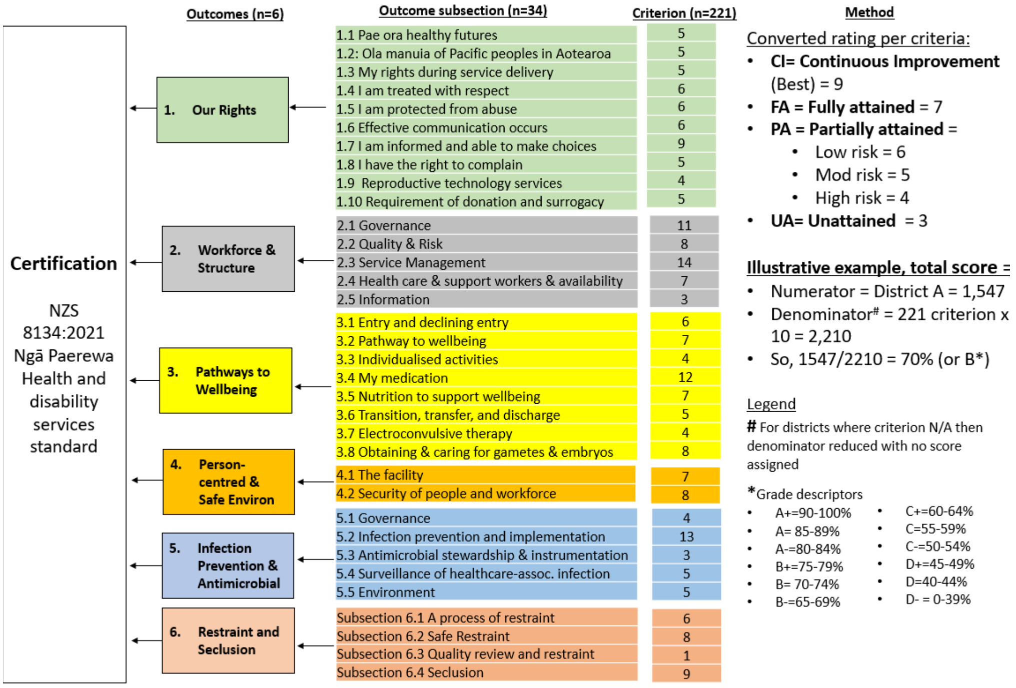
Quantitative approach to presenting certification data

To augment the narrative and qualitative nature of the certification report, one approach is to visually display them as radar charts—see Figures 1–3.

As can be seen in Figure 1, the HDSS contains a total of six outcomes, 34 subsections and 221 criteria. As part of the certification process, service providers are required to provide documents, evidence and findings that demonstrate their adherence to the HDSS criteria alongside onsite visits. For example, for Section 2: Workforce and Structure: Subsection 2.2 (Quality and risk)—criterion 2.2.3: *Service providers shall evaluate progress against quality outcomes*, a hospital may provide copies of their organisational quality scorecard/dashboards and clinical governance group meeting minutes that illustrate their use for informing quality improvement to demonstrate as evidence. Based on this evidence and what is sighted in the onsite visit, the DAA rates each of the criterion using a four-point scale (i.e., unattained [UA], partially attained [PA], fully attained [FA] and continuous improvement [CI]). Where criteria have not or have only partially been met and are determined to be a risk by the DAA, their risk severity is highlighted (low, moderate, high), and corrective actions request (CAR) are assigned, which have to be achieved by the service provider within the specified time.

Our proposed approach converts the qualitative rating into an equivalent quantitative score for each criterion—see Figure 1. For example, if the previous criterion 2.2.3 example was rated as FA, the converted equivalent score would be 7 out

Figure 1: Approach to convert certification qualitative rating into quantitative scores.



Certification

NZS
8134:2021
Ngā Paerewa
Health and
disability
services
standard

Outcomes (n=6)	**Outcome subsection (n=34)**	**Criterion (n=221)**
1. Our Rights	1.1 Pae ora healthy futures	5
	1.2: Ola manuia of Pacific peoples in Aotearoa	5
	1.3 My rights during service delivery	5
	1.4 I am treated with respect	6
	1.5 I am protected from abuse	6
	1.6 Effective communication occurs	6
	1.7 I am informed and able to make choices	9
	1.8 I have the right to complain	5
	1.9 Reproductive technology services	4
	1.10 Requirement of donation and surrogacy	5
2. Workforce & Structure	2.1 Governance	11
	2.2 Quality & Risk	8
	2.3 Service Management	14
	2.4 Health care & support workers & availability	7
	2.5 Information	3
3. Pathways to Wellbeing	3.1 Entry and declining entry	6
	3.2 Pathway to wellbeing	7
	3.3 Individualised activities	4
	3.4 My medication	12
	3.5 Nutrition to support wellbeing	7
	3.6 Transition, transfer, and discharge	5
	3.7 Electroconvulsive therapy	4
	3.8 Obtaining & caring for gametes & embryos	8
4. Person-centred & Safe Environ	4.1 The facility	7
	4.2 Security of people and workforce	8
5. Infection Prevention & Antimicrobial	5.1 Governance	4
	5.2 Infection prevention and implementation	13
	5.3 Antimicrobial stewardship & instrumentation	3
	5.4 Surveillance of healthcare-assoc. infection	5
	5.5 Environment	5
6. Restraint and Seclusion	Subsection 6.1 A process of restraint	6
	Subsection 6.2 Safe Restraint	8
	Subsection 6.3 Quality review and restraint	1
	Subsection 6.4 Seclusion	9

Method

Converted rating per criteria:

- **CI= Continuous Improvement** (Best) = 9
- **FA = Fully attained** = 7
- **PA = Partially attained** =
  - Low risk = 6
  - Mod risk = 5
  - High risk = 4
- **UA= Unattained** = 3

Illustrative example, total score =

- Numerator = District A = 1,547
- Denominator# = 221 criterion x 10 = 2,210
- So, 1547/2210 = 70% (or B*)

Legend

For districts where criterion N/A then denominator reduced with no score assigned

*Grade descriptors

- A+=90-100%
- A= 85-89%
- A-=80-84%
- B+=75-79%
- B= 70-74%
- B-=65-69%
- C+=60-64%
- C=55-59%
- C-=50-54%
- D+=45-49%
- D=40-44%
- D- = 0-39%

Figure 2: Illustrative examples of different types of group analysis (e.g., by outcomes, by subsection).

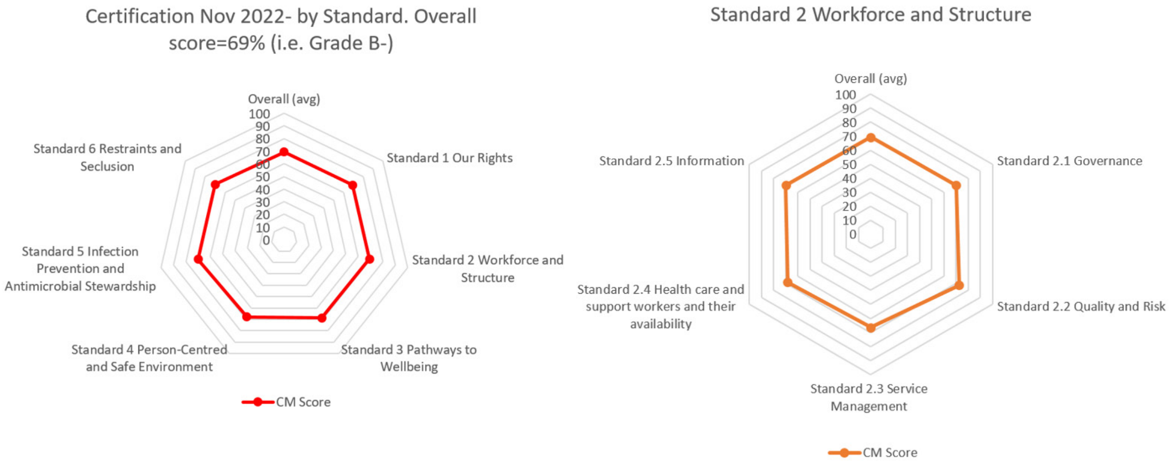


Figure 3: Illustrative examples of monitoring progress over time and in and across groups.

of 10 (or 70%). If the same criterion was rated as UA, this would be 3 out of 10 (or 30%) and so on. In this way, each criterion (and so on) can be converted to an equivalent quantitative score out of 10. Because there are 221 criteria in total, the total score is 2,210. The overall score for an organisation is, thus, the added total score for each of the assessed criterion divided by the total score. For instance, as can be seen in Figure 1, if the total score for the organisation was 1,547, this would equate to 70% overall (i.e., divided by 2,210).

The proposed scoring aligns with the CI grade intent in that there is always room for improvement (vs no improvement required), so it is not possible to get 100%. Thus, even if all criteria were rated at CI, the highest possible score for an organisation would be 90%. The inability to achieve a "perfect" 100% score is in keeping with the definition of quality care "*being the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge*."[6] Since professional knowledge and technologies are continuously changing, what is deemed as high-quality care today may not be so tomorrow. And thus, there is always room for continuous improvement.

Some criteria will not be applicable for certain settings. Non-applicable criteria can be excluded in these cases, and the denominator score adjusted accordingly. For example, Subsection 1.1: (Requirement of donation and surrogacy) may not apply in a public hospital. Because there are five criterion for this subsection, a total of 50 points (i.e., 10 points per criteria) are deducted from the total 2,210 score, and the denominator is adjusted to 2,160.

Figure 2 shows the converted quantitative data for each criterion, which can be grouped and analysed in different ways, such as by outcomes, by subsections and by criterion. Presented in a radar chart, it enables at-a-glance understandability of key strengths and flags potential areas for improvement. To support engagement and understanding of what the result means, an equivalent grade descriptor[7] used commonly by schools and universities and familiar to most people, including governors and the general public, can be used. For example, the overall organisation score in Figure 2 was 69%, equating to a B−, which indicates generally good to strong quality in key areas, with opportunities for further improvement.

Health and disability service providers are expected to undergo an audit cycle of a fixed 3-year certification period with an 18-month surveillance audit. With certification being undertaken at one point in time, our proposed approach to convert quantitative ratings into qualitative scores can be used to monitor progress over time. For instance, as can be seen in Figure 3, certification scores between 2022 and 2024 can be compared, and in this case, the improvement of Subsection 2.2 (Quality and risk) from 68% to 73%. Because all health and disability service providers are required to be certified and the HDSS is consistently used for assessment, the quantitative scoring approach can also be used to compare and contrast different organisations to enable the identification of variation in practice to identify and support learning from best performers. The proposed quantitative approach can also be used to group different individual organisations, such as district public hospitals, together to provide an overall score, for a region or nation, as an example.

Reflections on application in practice

Based on and building on a similar method created for medication safety self-assessment,[8] the proposed quantitative approach to using certification data was first developed in 2020. Relatively simple, straightforward and logical in concept and method, it has been well received in practice, having been in use by several Aotearoa New Zealand public hospitals. Recognising its value, Health New Zealand – Te Whatu Ora recently adopted our quantitative approach to consolidate certification data from different organisations, thereby facilitating national quality measurement, improvement and reporting. Five years on since the conception of the quantitative approach, this section provides an overview of our reflections on the benefits, limitations and potential future implications for practice, research and policy.

Benefits of the proposed approach

As outlined at the start of this viewpoint article, certification reports, while comprehensive, present challenges for practical application due to their qualitative and narrative nature. By converting qualitative findings into quantitative data and visualising this using radar charts, and with the addition of peer data for relativity, we have observed more attention being given by senior clinical and non-clinical leaders and managers to certification results and overall clinical governance. Moreover, in fact, as can be seen in Figure 3, the data were used to inform and support planning and improvement to clinical governance and quality systems, resulting in an improvement to the quality and risks scores for Subsection 2.2: (Quality and risk) from 68% to 73% in 2022 and 2024, respectively, for a large metropolitan district. The next surveillance is due in 2026. Examining the CARs provided by auditors, some criteria, such as staffing levels, new fit-for-purpose buildings and quality of food, cannot be significantly improved by the district unless there are significant uplifts to budgets and/or change to national contracts. And so, if only CARs that can be feasibly controlled and improved by the districts are included and improved to FA levels, it is conservatively estimated that a target score of 75–78% is possible. The score can potentially be higher if it can be improved to CI levels.

Several factors appear to have contributed to the positive outcome observed. Firstly, clinical governance and senior leadership meetings are often time-poor with numerous competing agenda items, and so any key points and requests for action must be clear, succinct and concise. Alongside written and verbal commentary, the use of radar charts and overall scores expressed as a percentage or grade provides at-a-glance understanding. Secondly, the inclusion of peer scores alongside other quality metrics supports a more complete and balanced picture of quality in the organisation, which enables better interpretation of the data in terms of its size, magnitude and relativity for informing not just whether action is required, but also its urgency and extent. Thirdly, we have found that when a district's grade is significantly low (e.g., C−) or lower than its peers, senior leaders are typically more motivated to direct resources, act and close the gap. Fourthly, because quantitative scores enable monitoring over time, we have also observed that it supports positive reinforcement of quality improvement behaviours, since progress is measurable, tangible and validated by independent auditors.

An interesting and unexpected benefit observed in practice is that our proposed quantitative approach is generating a culture of incremental innovation (cf vs radical innovation[9]), applying the same concept and approach for different settings. For example, the same proposed approach to convert qualitative certification findings into quantitative data has been applied to other certification and assessment tools such as the Te Arawhiti *Māori Crown Relations Capability Framework for the Public Service*,[10] HealthShare's *He Ritenga*[11] and the *Fundamentals of Care Programme*[12] to support the measurement and monitoring of the maturity of organisations in giving effect to Te Tiriti o Waitangi and providing core healthcare essentials, respectively.

Limitations

While there are benefits to our proposed approach to convert qualitative certification findings into quantitative data, there are also limitations. Notably, the proposed approach was developed empirically with no formal content or construct validation undertaken. Consequently, there is the potential that it oversimplifies the rich and nuanced narrative of the qualitative certification reports. Furthermore, each criterion is weighted equally and not adjusted for its importance and risk severity, which may potentially lead to overestimation or underestimation of the actual quality of the organisation audited. Given the proposed approach is largely based on the average of converted scores from individual criterion, it is possible that significant criterion showing high risk may not be immediately visible without in-depth analysis. Moreover, the reliance on averaged results means there is a risk that the data will appear "ok" with little change over time, potentially fostering a sense of complacency and hindering proactive measures to address quality concerns and cultivate a strong quality culture. In Figure 3, it was noted that there was an improvement in HDSS score from 68% to 73% from 2022 to 2024, respectively. While this improvement may be due, in part, to our proposed novel approach, other possible reasons for the positive change may be due to factors such as inherently strong and continuously improving culture, leadership changes and general continuous improvement efforts.

Implications for practice, research and policy

As previously mentioned, our proposed approach has been adopted in practice by several districts nationally, and has been applied in different settings. The approach can be used to aggregate individual district results to support regional and national reporting, monitoring and improvement, which is particularly pertinent for the current Aotearoa New Zealand healthcare environment, where there is increased regionalisation and centralisation due to the health reforms. The limitations of the proposed approach need to be understood and taken into account when it is interpreted and used to make decisions. In our view, our proposed approach is a practical, albeit blunt, tool that can be used to augment and complement pre-existing qualitative and narrative certification reports to support clinical governance and inform quality measurement and improvement. We suggest that our proposed approach is used alongside other quality metrics, such as those measuring outcomes, processes and organisational culture, and includes leading and lagging indicators, so that insights are triangulated and interpreted in a more balanced manner to inform more precise improvement.

Future research examining the importance and extent of association to outcomes for each of the 221 criterion in the HDSS standards will be helpful in informing weighting and the development of more precise assessment. For example, if a particular criterion is found to have a higher extent of association to outcomes compared to another, weighting can be applied to provide a more complete and accurate picture of the quality of the organisation. Healthcare resources are limited, and in this way, scarce resources can be directed to improve the most significant areas.

Beyond metrics largely focussed on throughput, timeliness and experiences of care, there are relatively less quality measures focussing on patient safety, clinical effectiveness, health equity and the giving of effect to Te Tiriti o Waitangi that are used by Health New Zealand – Te Whatu Ora.[13] The HDSS is unique because it aligns with and gives effect to Te Tiriti o Waitangi, *He Korowai Oranga – Māori Health Strategy*, United Nation (UN) Treaties and the UN *Declaration on the Rights of Indigenous Peoples*. The HDSS was updated in 2021 to give a stronger focus on increasing positive life outcomes and achieving pae ora, healthy futures for Māori and for those traditionally underserved by the health system such as Pacific peoples, disabled, rural and rainbow communities.[3] The revised standards also strengthened focus on infection prevention and antimicrobial stewardship, meeting Te Tiriti o Waitangi obligations, and clinical governance, to ensure people's care and support needs are appropriately met. Because the HDSS is comprehensive and brings together various policy obligations, our proposed approach can support optimal use of certification results to measure and monitor the maturity of organisations across these dimensions.

Conclusion

This viewpoint article highlights the significant effort and resources required to certify and audit health and disability service providers. We argued that given the effort and the fact that it is a mandatory requirement, certification findings should be optimally used to support system learning and quality improvement. Despite this, in reality, the long, narrative and qualitative nature of certification reports means that they can be challenging to use as part of routine quality measurement, monitoring and reporting, and do not always engage people for quality improvement or support learning from best performers. We describe a proposed complementary approach to augment narrative certification reports by converting them into quantitative data, which enables them to be understood at a glance, used to measure and monitor progress over time in and across organisations and enable learning from best performers. Overall, we believe our proposed approach offers a simple, logical and straightforward solution that complements existing narrative and qualitative certification reporting to support better quality measurement and improvement with a view to achieve better and more equitable health outcomes and experiences of patients and whānau.

COMPETING INTERESTS

Nil.

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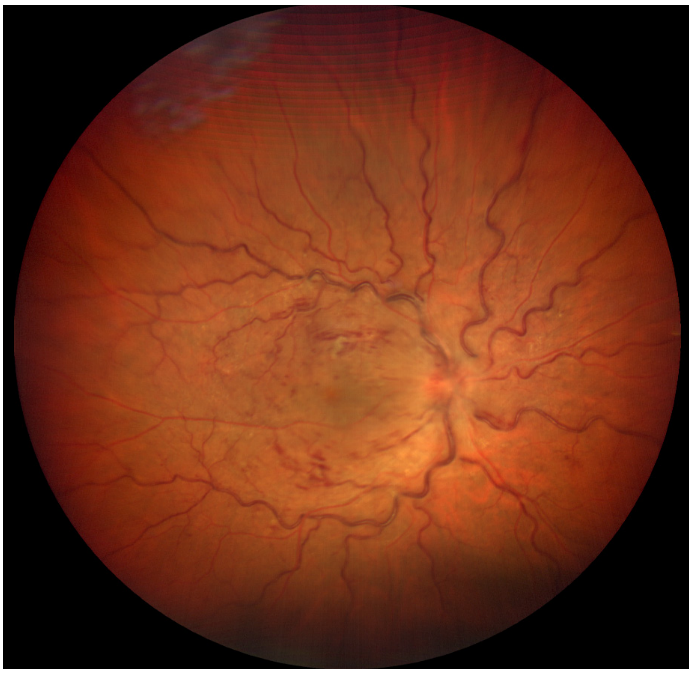
Fighting steroids with steroids: a case of bilateral central retinal vein occlusion in an anabolic steroid user

Joshua Read, Colin Parsloe

Central retinal vein occlusion (CRVO) is a common cause of painless monocular vision loss, typically occurring in adults over 50 years old with hypertension, hyperlipidaemia and diabetes mellitus.[1–4] It rarely occurs in younger individuals without traditional cardiovascular risk factors.[4,5] CRVO is thought to be caused by a thrombotic event occurring in the central retinal vein, posterior to the lamina cribrosa.[1,2] Contributing factors include compression, venous endothelial damage and thrombophilia.[1,2] Ophthalmic examination of CRVO reveals dilated and tortuous retinal veins with intraretinal haemorrhages in all quadrants.[1] Management includes metabolic optimisation for secondary prevention and treatment of sequelae such as ocular neovascularisation and cystoid macular oedema (CMO) with intravitreal anti-vascular endothelial growth factor (anti-VEGF) agents, corticosteroids and laser photocoagulation.[1]

This report highlights a unique case of a 47-year-old male with sequential bilateral CRVOs associated with anabolic steroid use. Anabolic steroids are becoming increasingly recognised for their prothrombotic effects, yet their role in retinal vascular occlusions remains largely unexplored. This case provides insights into the potential pathophysiological mechanisms linking anabolic steroid use to retinal vascular disease and underscores the importance of identifying non-traditional risk factors in younger patients presenting with vascular disease. Understanding these associations is critical as anabolic steroid use becomes more prevalent, particularly among athletes and bodybuilders. Additionally, this report discusses the challenges in managing refractory

Figure 1: Right fundus photo demonstrating central retinal vein occlusion (CRVO).



CMO and optimising visual outcomes in atypical CRVO presentations.

Case presentation

A 47-year-old male presented with a 2-day history of painless monocular vision loss in his left eye. He had a history of recreational anabolic androgenic steroid use consisting of weekly intramuscular injections of 500mg testosterone enanthate and occasional nandrolone decanoate (DECA) use. His typical regime included 1 month off anabolic steroids every 2–3 months. He had no significant medical history and was not on any other regular medications. On examination, the left eye visual acuity (VA) was 6/60+2 (pinhole [PH] no improvement), with an intraocular pressure (IOP) of 40mmHg. There was no relative afferent pupillary defect (RAPD). On gonioscopy, his left eye's anterior chamber angles were closed without neovascularisation. Fundoscopy showed CRVO, and optical coherence tomography (OCT) revealed CMO. Workup included blood pressure (114/71mmHg), full blood count (within normal limits), renal function (estimated glomerular filtration rate [eGFR] >90mL/min/1.73m^2), lipids (total cholesterol 5.7mmol/L, high-density lipoprotein [HDL] 0.94mmol/L, low-density lipoprotein [LDL] 3.4mmol/L), HbA_{1c} (34mmol/mol) and coagulation studies (international normalised ratio [INR] and activated partial thromboplastin time [APTT] within normal limits).

Treatment with a single intravitreal bevacizumab injection resolved the CMO, improving VA to 6/12 (PH no improvement). Bilateral peripheral iridotomies were performed, after which both eyes' IOP remained 9–10mmHg and his angles remained open without plateau iris configuration or peripheral anterior synechiae. Despite being encouraged to stop, the patient continued to use anabolic steroids.

Fifteen months later, the patient developed right CRVO with CMO (Figure 1). Initial treatment with three monthly intravitreal bevacizumab injections improved but did not resolve the CMO. Subsequent intravitreal triamcinolone resolved his CMO, improving the right eye VA from 6/120 (PH 6/76-1) to 6/12 (PH 6/9.5).

Discussion

While CRVO primarily affects older patients with hypertension, hyperlipidaemia and/or diabetes, younger patients often have non-traditional cardiovascular disease risk factors.[4,5] Rothman et al. found traditional risk factors were present in all patients older than 50 with CRVO, but only 53% of those younger than 50.[4] Of the remaining 47%, a non-traditional risk factor was identified in 71% of cases, most commonly thrombophilia.[4]

Anabolic steroids are associated with coronary, cerebral, retinal and limb thrombosis.[6,7] They promote thrombosis through several mechanisms, including stimulating thrombopoiesis, erythropoiesis and coagulation factor production.[7] Additionally, anabolic steroids enhance platelet aggregation by increasing platelet-activating factor (PAF), elevating intracellular calcium levels and promoting both the production and sensitivity of thromboxane A2 (TxA2).[7] Moreover, these agents impair vascular endothelial function by reducing nitric oxide (NO) production and suppressing prostaglandin I2 (PgI2) synthesis, exacerbating the prothrombotic state.[7] Finally, anabolic steroids contribute to hyperlipidaemia, accelerating atherosclerosis and increasing the risk of cardiovascular disease.[8]

CMO, a common complication of CRVO, results from raised venous pressure, blood-retinal barrier disruption, inflammatory cytokines and elevated VEGF levels.[9] Intravitreal anti-VEGF therapy is first-line therapy; however, corticosteroids offer the theoretical benefit of reducing inflammation in addition to disrupting the VEGF pathway.[9,10] Prior literature suggests that intravitreal therapy is more effective in younger patients, resulting in fewer injections required.[5] In this case, the multifaceted prothrombotic effects of anabolic steroids may have contributed to the refractory nature of his right eye's CMO. Perhaps the pathways described above are more responsive to anti-inflammatory agents. Despite the resolution of CMO, the patient's final VA remained limited to 6/12 bilaterally. Studies have shown that final VA outcomes in CRVO are strongly influenced by initial VA and the degree of retinal ischaemia.[1] Before the advent of intravitreal anti-VEGF therapy, patients presenting with a VA of 6/15–6/60 only improved to better than 6/15 in 19% of cases.[11] Additionally, photoreceptor damage due to subclinical retinal ischaemia and prolonged CMO likely contributed to the incomplete visual recovery, despite resolution of the oedema.

This report is the first to associate anabolic steroid use with CRVO. Previous cases of branch retinal vein occlusions (BRVOs) have been documented in young bodybuilders using anabolic steroids.[6] Given the increasing prevalence of anabolic steroid use, with a lifetime prevalence of 6.4% among males, clinicians must maintain a high index of suspicion when assessing young patients with vascular disease.[12,13] Identifying anabolic steroid use as a contributing risk factor may help to explain vascular disease in atypical cohorts and aid in forming treatment strategies.

Conclusion

This case highlights the importance of recognising androgenic anabolic steroid use as a potential risk factor for retinal vascular disease in younger patients. It emphasises the need for a thorough history to identify non-traditional cardiovascular risk factors. As anabolic steroid use becomes increasingly prevalent, clinicians must remain vigilant for identifying its complications and tailor treatments accordingly.

COMPETING INTERESTS

Nil.

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An assessment of e-liquid label accuracy in Aotearoa New Zealand

Renee Hosking, Jude Ball, Calvin Cochran, Janet Hoek

E-liquid, also known as vape juice, contains nicotine, flavourings and a base (usually propylene glycol and vegetable glycerin) that can be converted into aerosol for inhalation using a vaping device. The *Smokefree Environments and Regulated Products (Vaping) Amendment Act 2020* marked the first attempt to regulate vaping products in Aotearoa New Zealand.[1] However, the statute did not anticipate the rapid growth in vaping product technology, particularly the evolution of nicotine salt products, which typically have higher nicotine concentrations than e-liquids containing freebase nicotine. Disposable nicotine salt vapes appealed to children, and youth vaping rates rose rapidly from 2019, though recent data suggest they have declined slightly since the peak in 2022.[2,3] In response to pressure from parents and health groups,[4] the Government introduced new product safety requirements in December 2023, including reducing the nicotine concentration limit in single-use vapes to 20mg/ml and to 28.5 mg/ml in reusable vaping products containing nicotine salts.

Internationally, researchers have found the accuracy of nicotine concentration labelling highly variable.[5] A systematic review of 20 cross-sectional studies (published 2011–2019) examined deviations of more than ±10% between the nicotine concentration stated in labels and the concentration found following analysis of e-liquids.[6] It found nearly half (48.3%) of the 574 samples analysed differed from the reported concentration, with both under-reporting and over-reporting of nicotine content commonplace.

Although the Institute of Environmental Science and Research (ESR) routinely assesses the nicotine concentration of e-liquids, under contract from the Ministry of Health – Manatū Hauora, the findings are not reported publicly. Therefore, people who use vaping products cannot assess the accuracy of product labelling. We obtained data from the ESR testing programme and assessed the accuracy of nicotine concentration labels on e-liquids sold in Aotearoa New Zealand.

Methods

We obtained the data via an Official Information Act (OIA) request to the Ministry of Health – Manatū Hauora seeking the results of ESR's e-liquid analyses. (Contact the corresponding author for the full OIA response document.) We received test results from 221 vaping products available on the Aotearoa New Zealand market that ESR had selected randomly from the Health Advisory and Regulatory Platform (HARP) database of notified products and tested between June 2023 and June 2024. The categories for product notification, which were also used by ESR, were vaping "devices" (n=32) i.e., prefilled disposable vapes; and "substances" (i.e., e-liquids and prefilled pods), which were subdivided into freebase (n=21) or nicotine salt (n=168).

We analysed differences between the reported and actual nicotine concentrations in mg/ml, and relative percentage differences between the reported and actual nicotine concentrations.

Results

As shown in Table 1, among 221 samples, 58.4% (129 samples) deviated by ≥10% from their labelled nicotine concentration. Of those, six (4.7% of samples) had a nicotine concentration greater than the stated nicotine concentration (range between 10.4% and 23.3% greater); the average deviation was 13.9%.

Of the samples with a ≥10% deviation in nicotine concentration, 123 out of 129 (95.3%) had less nicotine than the product label stated (average 40.6% less, range between 10.4% and 66.0% less). Some contained substantially less nicotine than stated, with 39 samples (30.2%) containing ≥50% less (average 57.3% less, range between 50.3% to 66.0% less).

When analysed by sample type, vaping devices were more likely than other products tested to fall outside the 10% range (75%) (24/32), followed by nicotine salt e-liquids (58.9%, 99/168) and freebase nicotine e-liquids (28.6%, 6/21).

Table 1: Differences between reported and actual nicotine concentration.

Parameter	Percentage (%)	Count (n)/total (N)	Average deviation (%)	Min–max (%)
Total samples deviating by ≥10%	58.4	129/221		
Nicotine concentration greater than stated (≥10%)	4.7	6/129	13.9	10.0–23.3
Nicotine concentration less than stated (≥10%)	95.3	123/129	40.6	10.4–66.0
≥50% deviation	30.2	39/129	57.3	50.3–66.0
Vaping device	75	24/32		
Greater than stated	4.2	1/24	N/A	N/A
Less than stated	95.8	23/24	44.1	12.8–64.2
Nicotine salt e-liquid	58.9	99/168		
Greater than stated	5.1	5/99	14.5	10.0–23.3
Less than stated	94.9	94/99	40.1	10.4–66.0
Nicotine freebase e-liquid	28.6	6/21		
Greater than stated	0	0/6	N/A	N/A
Less than stated	100	6/6	34.7	14.2–56.7

Discussion

Our findings reveal significant discrepancies in nicotine labelling, emphasising the need for stricter regulatory oversight of Aotearoa New Zealand's e-liquid market.

Both under- and over-reporting of nicotine concentration pose risks to people who use vaping products. People attempting to quit smoking using vaping products may find the transition from smoking to vaping more difficult if the e-liquids they use contain less nicotine than stated on the label. Furthermore, they may vape more frequently or inhale more deeply to meet their need for nicotine, potentially increasing their exposure to heavy metals and other toxicants. In the worst case, these people may find vaping does not satisfy cravings and revert to smoking.[7] Conversely, people using nicotine recreationally may face a greater risk of addiction if they unwittingly use products containing more nicotine than described on packaging.

Our findings align with a 2021 systematic review that found nearly half (48.3%) of the 574 samples analysed differed from the reported concentration. However, this review found considerable variability in the direction of the differences reported whereas we found products predominantly had less nicotine than stated on the label.[6] Ongoing monitoring will be important to assess whether different samples show more variability or if over-reporting continues to be the dominant finding in Aotearoa New Zealand.

While e-liquids are often marketed as a safer alternative to smoking, inaccuracies in labelling may mislead consumers and potentially contribute to unsafe use. This finding is particularly concerning for young people, who may be physiologically more susceptible to nicotine addiction,[8] and who have been targeted by vaping product manufacturers using appealing flavours and packaging.[9]

Limitations

The sample did not include any e-liquids with a reported 0mg/ml nicotine concentration; however, United States (US) research has found that 91% of US-manufactured e-liquids labelled 0mg/ml contained nicotine.[5] Nicotine concentration in these samples ranged from 5.7mg/ml to 23.9mg/ml.[5] The absence of 0mg/ml nicotine samples highlights an opportunity to extend future testing to ensure people using zero nicotine vaping products to stop smoking can feel confident they will not be exposed to nicotine.

Our study focussed solely on nicotine; given the potential for mislabelling of other ingredients, or inclusion of disallowed ingredients in e-liquids, future testing should be more comprehensive. For example, US researchers investigating alcohol concentration in e-liquids found that alcohol was present in 33 of the 35 e-liquid samples labelled as only containing nicotine.[10] Laboratory studies have shown that alcohol significantly impacts e-liquids by altering their physiochemical properties, and increasing aerosol production and the amount of nicotine deposited in the airways, which may heighten their addictive potential.[11] In Aotearoa New Zealand, ESR tested ethanol content in a subsample of 30 products, but compliance with alcohol labelling regulations has not been evaluated as far as we are aware. Future research should investigate this question, test for disallowed ingredients (e.g., colourings) and assess whether other regulated substances (e.g., formaldehyde, heavy metals) exceed specified limits.

Finally, we did not examine the cause of any discrepancies, which future research should also explore.

Conclusion

Our findings underscore the urgent need to enforce regulatory standards for e-liquid nicotine concentration, particularly given the government's reliance on vaping as a means to reduce smoking prevalence.[12] Greater transparency about product testing results and any subsequent regulatory action is needed.

COMPETING INTERESTS

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CC is a member of Health Coalition Aotearoa Smokefree Expert Advisory group; policy lead, Vape-Free Kids NZ.
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The Therapeutic Value of the Stomach Tube

By W. YOUNG, M.D., F.R.C.S.E.

(*Read at British Medical Association Meeting, Wellington, 4th July,* 1924).

Washing out the stomach is an old method of treatment of stomach ailments, but the use of the stomach tube for this purpose is quite modern. Apparently Cullen did not know of it, for in his "Practice of Physic," published in 1791, he recommends the washing of the stomach "by throwing in a large quantity of warm and mild liquids, and by exciting vomiting."

According to Osler the stomach tube was introduced by Kussmald in 1867. It is such a simple appartus that one finds it difficult to believe that it is of such recent origin. Used with a funnel, as a syphon, it has now almost superseded the stomach pump,

Lavage with the tube has of recent years become with many a favourite method of treatment for stomach ailments, and one can agree with Osler "that, while perhaps in some hands the measure has been carried to extremes, it is one of such extraordinary value in certain cases that it should be more widely employed by practitioners." It is because I have only in the last few years begun to appreciate this that I thought it worth while opening a discussion on the subject to-night.

It sometimes takes a good deal of pluck to recommend to a patient the use of a stomach tube, especially if the patient is very ill, or if of a very nervous temperament. Often the difficulties are great in pursuing treatment by lavage owing to the almost insuperable objections of the individual for, although doubt it causes little or no discomfort when once the habit is acquired, it is distinctly unpleasant to most people at first, and this is especially so if the patient is very ill. Sometimes, I am sorry to say, I have had to do it by force, but I have always found the ends justified the means. Frequently the patients get so used to the tube that they pass it themselves. To give the patient confidence, as well as to judge for himself the effect on the patient, a doctor should, as far as possible, do the operation himself, certainly on the first occasion. In a few cases laryngeal spasm is set up, and one has to desist. In some patients lavage causes a considerable amount of shock, which must be provided for.

THE TUBE.—If the contents of the stomach are fluid, a small-sized tube should be used, for the small the tube the less the discomfort of the patient. It is necessary to always measure the tube, for one was sold to me recently as a child's size, but I found the white mark was 24 inches from the end. When one remembers that in the average adult the cardiac orifice of the stomach is about 16 inches from the incisor teeth, one can imagine the result of passing a tube 24 inches long down a child's gullet. It is well to mark off 16 inches on the tube.

While considering the nature of the tube used, I should like to say that the best kind of tube, and one difficult to get, is blind at the end and has two lateral openings. The ordinary tube, patent at end, with one lateral opening, is too easily blocked by particles of food: this latter would be improved by making a second lateral opening higher up.

LOTIONS.—The best solutions to use are, in most cases, either plain warm water or warm water with the addition of bi-carbonate of soda (one teaspoonful to the pint).

CONTRA-INDICATIONS.—Apart from aneurism of the aorta there are few contra-indications to the use of lavage. Even hæmatemesis is not a contra-indication. In a recent discussion (March 5th) at the Royal Society of Medicine, Dr. Hurst recommended the treatment of severe hæmatemesis by lavage. I should like to quote his own words: "When the hæmorrhage was severe and continuous after hæmorrhage had occurred, or when in spite of its severity it was not sufficiently rapid to cause the sudden distension which resulted in its ejection by mouth, death might result unless steps were taken to empty the stomach. A stomach tube should be passed just far enough to reach beyond the cardia; in this way the bleeding surface could not directly be disturbed, and the stomach emptied. . . . The stomach was washed out with about four ounces of ice cold water, which was repeated until the water came back no longer blood-stained. Instead of water 1 in 1000 ferric chloride, also iced, might be used. When the last trace of water had been evacuated a drachm of 1 in 1000 adrenalin chloride should be poured into the stomach before withdrawing the tube."

INDICATIONS.—In most cases of poisoning and of alcoholic gastritis, lavage has long been used by most practitioners. In eclampsia it is now used by some obstetricians, but as I have had no experience in this treatment for eclampsia, I hope other members will relate their experiences with it in these cases. In the indigestion of infants, and in pyloric obstruction in infants, it is now considered an invaluable means of treatment, but as I have had of late little to do with these cases I should like to hear the opinion of other members on the value of lavage in pedriatics. I notice that Still reports (*Medical Annual*, 1924), that of 78 cases of pyloric obstruction, 48 recovered after treatment by lavage.