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Aotearoa New Zealand was one of the first countries in the world to have a suicide prevention strategy and associated action plan. Significant reductions in suicide are unlikely to be achieved with isolated interventions that fail to connect with a coherent public health approach. No matter how much money we spend on clinical services, or how much we expand our mental health workforce, unless we tackle the structural determinants associated with suicide in Aotearoa New Zealand, particularly racism, poverty, discrimination, violence and alcohol control, we are unlikely to make major gains in preventing deaths by suicide, particularly for Māori.

Online alcohol deliveries: age verification processes of online alcohol delivery companies in Auckland, New Zealand

Sarah Sneyd, Molly Richardson

We undertook a study looking at the age verification processes for online alcohol deliveries in Auckland, New Zealand, with a focus on rapid alcohol delivery (delivery within 2 hours of ordering). We found that it is common for online alcohol deliveries in Auckland to be left unattended on delivery or delivered without requesting age identification.

Primary care experience in people with mental health conditions: results from a national patient experience survey

Ruth Cunningham, Julie Artus, Fiona Imlach, James Stanley, Tracy Haitana, Helen Lockett, Debbie Peterson, Catherine Gerard

This study used responses from a survey conducted by the Health Quality and Safety Commission that asks about people's experiences with primary healthcare (general practice) services. We compared people who said they had a long-term mental health condition with other people who had been to primary care services. People with mental health conditions were less likely to have positive experiences, including being less likely to feel listened to and get what they needed out of their appointment. People with mental health conditions who were also Māori had even worse experiences of healthcare. Improving healthcare quality is important for reducing the gap in life expectancy between people with and without mental health conditions.

Outcomes following the introduction of an interdisciplinary shared decision-making clinic for older patients with colorectal cancer

Alison Jackson, Christopher Shaw, Brian O'Sullivan, Siva Govender, Jesse Fischer

Colorectal cancer is common and occurs more frequently in older patients. The best treatment often includes surgery, but the risks of major surgery must be carefully balanced against the benefits in older people. A clinic appointment involving surgeons, anaesthetists and geriatricians may facilitate the best decision and improve outcomes for older patients with colorectal cancer.

Cultural safety support and requirements for international medical graduates in Aotearoa New Zealand

Analee Toro, Gabrielle McDonald, Peter Crampton

Cultural safety is an essential component of high-quality, effective healthcare and is necessary if the health system is to achieve health equity for Māori. The health workforce in Aotearoa New Zealand is highly dependent on international medical graduates (IMGs) who have obtained their primary medical qualification in a country other than Aotearoa New Zealand. There is limited existing literature regarding cultural safety training for IMGs, despite cultural safety being regarded as an essential pillar to support the provision of high-quality healthcare. We reviewed the policies of a selection of key organisations and conducted interviews with key informants. We found that each organisation included in the review had varying approaches to including cultural safety within their policies, and we could not identify any IMG-specific cultural safety policies. We recommend that specific and accessible IMG-specific cultural safety policies be developed, that cultural safety requirements are integrated into existing registration pathways and that the responsibility for the provision of cultural safety induction and training for IMGs be clearly defined.

The New Zealand Ministry of Health indicators for inpatient stroke care: results from an Auckland hospital

Zofia E Karasinska-Stanley, Kalpa Jayanatha, Edward Wong, Arindam Kar

When people come to hospital with a sudden stroke, certain measures of care are associated with better outcomes. The Ministry of Health (MoH) asks hospitals to collect data on how well they perform with regard to three metrics that have been selected as being desirable outcomes. These are: “reperfusion therapy” (thrombolysis or clot retrieval), admission to a stroke unit within 24 hours and transfer to inpatient rehabilitation within 7 days. This study showed that a large Auckland tertiary hospital met the MoH target for the first metric but did not meet the target for the other two.

Key factors related to happiness and anxiety in Aotearoa New Zealand during the COVID-19 pandemic

Mana Mitchell, Bradley I Tomlinson, Grace O Egan, Yanming Huang, Emily C Kellett, George P F Rowley, Sophie I Tang, Ysobel G Maindonald, Ellie M Logan, Bruce R Russell, Nicholas Bowden, Olivia K Harrison

Anxiety is ever-prevalent and on the rise, particularly in the wake of the global COVID-19 pandemic. We investigated measures of anxiety and happiness from December 2020 in Aotearoa New Zealand, in the midst of this pandemic. We found that both anxiety and happiness were related to loneliness, physical health, family wellbeing, financial wellbeing, age and gender. After controlling for all other factors, Māori and Pacific populations had higher levels of happiness than Pākehā. Anxiety and happiness were also different in some ways, where discrimination was related to anxiety, while greater levels of trust in the police, the health system and more general trust were related to greater happiness.

Addressing data needs crucial for improving infant, child and youth mental health and substance-related harms in Aotearoa New Zealand: key design and ethical considerations for future research

Lovely Dizon, Vartika Sharma, Terryann C Clark, Jude Ball, Terry Fleming, Karin Isherwood, Helen Lockett

In this viewpoint, the authors propose design principles for a contemporary approach to mental health and addiction research studies for infants, children and young people. We recommend future studies use research methods that uplift the values and perspectives of people with lived experience, and advance hauora Māori and other priority groups. Structural factors, including racism and discrimination, are linked to the likelihood of developing any mental health condition or problematic substance use. Therefore, contextual factors need to be integral to future population-based studies as part of developing a better understanding of, and preventative response to, the mental health and substance use experiences of children and young people. The findings from this review are well placed to support the design of the recently announced child and youth mental health and addiction prevalence study.

A rare presentation of ST-elevation, mimicking an acute coronary syndrome, as a manifestation of seizure disorder—a case report

Maxine Cooper, Michael Dick, Pradeep Sreekumar

This article describes a patient presenting with recurrent seizures, who was noted to have an abnormal heart rhythm tracing suggestive of a major heart attack. They were also noted to have a significant kidney injury, likely as a consequence of muscle damage related to their seizures. Investigation for the possible heart attack demonstrated no disease of the heart arteries and normal pumping function of the heart. It is postulated that stress associated with the seizures generated a hormonal response that caused damage to the heart, or spasm of the heart arteries. This case highlights the association between seizures and abnormal heart rhythm tracings, considering possible mechanisms for this association.

The impact of surgical time of day and surgical site infection

David Cumin, James F Cheeseman, Guy R Warman

Disruptions in our biological rhythms (like sleeping and waking) can impact our immune system and slow wound healing. We looked at whether the time of day of major surgery (hip, knee and cardiac operations) had any effect on whether patients had a subsequent infection. In this preliminary analysis, we analysed more than 87,000 operations, of which 1,327 had an infection, and found that there was no effect of time of day on post-operative infection when we also took into account patient demographics.

Time for a more evidence-based approach to suicide prevention

Sarah Fortune

"*Success is a science; if you have the conditions, you get the result.*" – Oscar Wilde[1]

There have been some encouraging signs of a reduction in lives lost to suicide in the past few years, after a decade of relatively static rates.[2,3] Aotearoa New Zealand was one of the first countries in the world to have a suicide prevention strategy and associated action plan.[4] National suicide prevention strategies have the potential to draw together a collective vision for suicide prevention, signal government commitment and increase accountability.[5,6]

Globally, the suicide prevention community has agreed that suicide prevention action plans need to reflect that suicide is a complex phenomenon that occurs due to the convergence of factors, some of which may be considered as individual, such as mental illness, but all of which reflect directly, or indirectly, broader social and commercial determinants.[7] A public health framework reflects this complexity[8] and frames successful suicide prevention actions across three levels: universal programmes that target a whole population; selective programmes targeting sub-groups thought to be at elevated risk of suicidal behaviour, such as those with substance use problems or bereaved by suicide; and indicated programmes that target specific individuals experiencing suicidal distress, such as those attending hospital with self-harm.[9]

Minister Doocey recently released a *Draft Suicide Prevention Action Plan* for public consultation covering 2025–2029.[10] Submissions closed on 1 November. The proposed plan has the potential to deliver so much more, with greater integration of high-quality evidence and a coherent public health framework that acknowledges the centrality of Te Tiriti o Waitangi for suicide prevention in Aotearoa New Zealand. My colleagues and I were recently commissioned to conduct an evidence synthesis on the most up-to-date and relevant local and international literature on suicide prevention. It is somewhat surprising that this significant work is not cited in the public consultation document. The emphasis of the proposed action plan does not strongly align with the evidence synthesis on what types and levels of intervention are likely to save lives. While you are encouraged to read this document in its entirety (https://www.health.govt.nz/publications/evidence-synthesis-of-the-research-on-suicide-prevention-and-postvention-aotearoa-new-zealand-and), the key findings are highlighted below.

Universal approaches

First, universal approaches are effective, relatively under-utilised in Aotearoa New Zealand and represent interventions that are likely to save lives. Universal approaches have the potential to prevent deaths among communities who are unlikely to seek clinical services, particularly men, young people and Māori.[11] No matter how much money we spend on clinical services, or how much we expand our mental health workforce, unless we tackle the structural determinants associated with suicide in Aotearoa New Zealand, particularly poverty, discrimination, violence and alcohol control,[12] we are unlikely to make major gains in preventing deaths by suicide, particularly for Māori.

While workplace programmes are attractive, those who do not have work are in particular need of suicide prevention interventions; recessions are often associated with increased suicide rates among men, and require increased expenditure on unemployment benefits, active return to work programmes[13] and employment protection legislation.[14] We have had multiple iterations of responsible media reporting guidelines, and should focus on increasing adherence to help prevent young deaths by suicide rather than creating further updates. As urban density is actively pursued, we should restrict access to locations associated with jumping and increase the chances of intervention, using surveillance combined with staff training and updated technology for faster stopping of trains.[11] We should also restrict access to other methods of suicide, including guns (to prevent deaths among older men), carbon monoxide gas and pesticides (to prevent deaths in the Asian community) and paracetamol.[15] Adequate staffing and improved service user visibility in inpatient psychiatric facilities, police stations and prisons would likely reduce deaths in these settings, given current guidance on ligature points already exists.[11] We need action, not more reviews, to prevent deaths among Māori, who are over-represented in these settings. Reducing access to alcohol and increasing the price are important ways to prevent deaths among men, younger people and Māori.[7] There is a need for a greater focus on the prevention of all types of violence, and particularly sexual violence, as part of suicide prevention.[7]

Selective interventions

Peer support and social support interventions are an area of innovation and need to be well-planned and appropriately resourced. Peer support is not a free or low-cost workforce. Gatekeeper training appears to improve the immediate knowledge, skills and self-efficacy of gatekeepers, but so far has not been shown to have a measurable impact on rates of suicidal behaviour at a community level. Positive training effects last around 4–6 months.[11] Novel approaches to addressing these aspects of gatekeeper training are being investigated locally.[16] First responder (e.g., military, police, firefighters, ambulance staff) multilevel workplace interventions are associated with reduced suicide rates in these groups; however, in Aotearoa New Zealand we know very little about the needs of former military personnel, and our Defence Force has very different characteristics to the Australian Force. Communities should think carefully about approaches offering screening apps, taking care to consider the ethics of screening, including the psychometric properties of the tools, the ability of the community to respond to those identified in need of support, data sovereignty and cultural competence.[11]

Indicated interventions

Most psychological interventions focus on individuals as the unit of intervention, which is at odds with models of wellbeing such as Te Whare Tapa Whā and the evidence of good practice from Pacific peoples and Māori suicide prevention efforts in Aotearoa New Zealand.[11] The key unit of intervention should be whānau. Less costly, briefer, easy to deliver and scalable psychological interventions appear equally likely to be effective as technically complex, long-term, hard to deliver and less scalable interventions.[17] There are likely gains in enhanced adherence, with current best practice guidelines focussing on compassionate care in emergency department (ED) settings.[18]

The evidence for what works for youth is mixed, with mental health awareness training likely to be both effective and cost-effective. Interventions need to work for Māori youth, who drive our high rates. Early findings for rainbow youth are promising but need to differentiate between the needs of specific sexual and gender minorities. With an ageing population in Aotearoa New Zealand, more attention needs to be directed to the development and investigation of safe, culturally responsive and effective initiatives for this population. Interventions that target loneliness, address physical frailty, poverty and enhance social connection are promising (for women). The evidence for effective postvention is emerging; recent investment in bereaved by suicide services in Aotearoa New Zealand need increased facilitation of culturally specific grieving practices that do not pathologise grief or represent it as a mental health crisis.[11]

We need an agreed outcomes framework with greater clarity about the purpose of interventions and expected outcomes; for example, a rationale for how wellbeing interventions are expected to reduce suicide given the mixed findings and relatively weak correlation between the two, e.g.,[19] outcomes need to be publicly reported so the work can move forwards, rather than compromising scarce resources by re-doing work already done. We should look to implementation science[8] and evaluate the entire strategy, rather than expecting to be able to see benefit from individual elements.[20]

A great deal of the *Draft Suicide Prevention Action Plan* reflects a Western, individualised and psychiatric perspective on suicide, which is increasingly recognised as having significant limitations when considering the likelihood of success in preventing suicide across the whole population.[7] Significant reductions in suicide are unlikely to be achieved with isolated interventions that fail to connect with a coherent public health approach.

COMPETING INTERESTS

SF was lead author on an evidence synthesis on suicide prevention commissioned by the Ministry of Health to support suicide prevention activities in Aotearoa New Zealand. She is an IASP New Zealand member representative, previous chairperson of SuMRC and current member of the Counties Manukau Local CYMRC. She conducts a range of suicide prevention research projects.

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Online alcohol deliveries: age verification processes of online alcohol delivery companies in Auckland, New Zealand

Sarah Sneyd, Molly Richardson

ABSTRACT

AIM: This study aims to document the age verification processes for online alcohol deliveries in Auckland, New Zealand, with a focus on rapid alcohol delivery (delivery within 2 hours of ordering).

METHODS: Alcohol orders from Auckland online alcohol delivery companies were placed by a researcher under 25 years of age over a 2-month period in 2023. Procedures were recorded around speed of delivery and age verification processes.

RESULTS: In total, 33 (73%) of the 45 online alcohol orders did not require age verification at delivery. This comprises 22 (49% of the total) deliveries left unattended at the door and 11 (24%) in-person deliveries that did not request age verification. The average speed of delivery for rapid alcohol delivery companies was 29.5 minutes and the standard deviation 9.5 minutes.

CONCLUSION: It is common for online alcohol deliveries in Auckland to be left unattended on delivery or delivered without requesting identification. This has implications for increasing alcohol-related harm, including supply to minors. Additional regulation addressing alcohol delivery is needed in New Zealand.

The global online delivery sector has grown rapidly in recent years, driven by community lockdowns during the COVID-19 pandemic, increasing consumer desire for convenience, and technological advances.[1–5] The same is true in New Zealand, where much of New Zealand is now serviced by online delivery services,[6] and where the online food delivery sector is expected to grow by 9.47% a year.[7]

Similarly, the online alcohol delivery space in New Zealand has grown rapidly following COVID-19 community lockdowns, with 18% of a social media sample reporting that they used online alcohol delivery companies for the first time during lockdowns.[3] Over this time, many alcohol retailers were quick to expand their services to include remote sales and deliveries.[8] Now, alcohol delivery companies are common, with delivery timeframes being anywhere from the same day to within several days of ordering. A number of companies also offer delivery within 2 hours of ordering (known as rapid delivery).[9,10] Many rapid alcohol delivery companies function through a third-party delivery company, which is a facilitator service that connects the remote seller to the purchaser through a platform such as an online application.

While widespread research on the harms from online alcohol deliveries is still lacking, there have been some documented harms. These include recent heavier drinking,[3,11,12] extension of drinking sessions that would otherwise have ended[3,13] and delivery to minors.[12,14] There are growing concerns for these harms in New Zealand,[8,10,15] as well as fears for a worsening of domestic violence associated with heavy drinking in the home, and the use of machine learning and algorithms to target people recovering from addiction.[8] There are also particular concerns surrounding rapid alcohol delivery, including the increased access to alcohol and to a greater range of products than available locally,[8] as well as increased exposure to alcohol advertising.[4]

Vulnerable groups may be at particular risk. Firstly, young people are among the most frequent users of online delivery companies[1,11,16,17] and had the highest rates of hazardous drinking in 2022–2023 in New Zealand.[18] Secondly, low-income groups, Māori and Pacific peoples may be inequitably affected by online alcohol delivery harms through a greater exposure to online delivery companies offering predominantly unhealthy commodities in their local neighbourhoods.[15] Māori were also significantly more likely than

NZ Europeans and those of Other ethnicity to buy alcohol online for the first time during the August/September 2021 COVID-19 lockdown.[19] However, a recent study focussing on alcohol delivery companies has found no relationship between online alcohol delivery companies and areas with higher populations of low-income groups and Māori.[10]

Despite potential risks and the rapidly growing space of online alcohol delivery, there is little regulation in New Zealand, and there have been no substantial reviews or amendments to the *Sale and Supply of Alcohol Act 2012* since it was introduced in 2012. Currently, New Zealand law does not require age verification at purchase or upon delivery; rather, the requirements in section 59 (3) of the *Sale and Supply of Alcohol Act 2012* are that "*remote sellers (those selling alcohol over the internet, or by phone or mail order) take reasonable steps to verify that both the buyer and the receiver of any alcohol sold online for home delivery are over the legal purchase age*."[20] Reasonable steps are further defined in the *Sale and Supply of Alcohol Regulations 2013* part 1 section 14 (2) as, "*i) Ask the buyer to tick an on-screen box declaring that they are 18 years of age or over when they first enter the internet site; and ii) Ask the buyer to tick an on-screen box declaring that they are 18 years of age or over immediately before the sale of any alcohol is completed*." In essence, for remote sellers this requires providing two tick-boxes or date of birth boxes on the website, with no checks required at time of delivery.

In contrast, many countries overseas have regulated age verification checks at purchase and upon delivery. A 2021 study of 77 jurisdictions covering New Zealand, Australia, the United States of America, Canada, Ireland and the United Kingdom found that 71 of the 77 jurisdictions required age verification at time of delivery.[21] New Zealand was among the few countries with no requirements. In 44 of the jurisdictions, a signature was required in addition to sighting identification, and three jurisdictions did not allow alcohol delivery through third-party delivery companies at all. Several jurisdictions also limited the type of alcohol that could be delivered (mainly restricted to beer and wine), the quantity of alcohol able to be delivered, required delivery drivers to be trained in recognising minors and intoxicated people, and regulated the timeframe deliveries can occur within. Only a few jurisdictions, including New Zealand, allowed alcohol delivery outside of the regulated national trading hours.

In New Zealand, there is only one piece of research with information available on age verification checks. This study explored the purchasing and consumption patterns of people during COVID-19 through a social media sample, and 58% of the sample reported no age verification checks on delivery of alcohol.[3] In comparison, a study from Western Australia, where requirements for age verification currently exist, had 24% of the sample report no age verification checks.[22]

Given the paucity of information available on age verification checks on online alcohol deliveries in New Zealand, this study aimed to document the age verification processes for a sample of online alcohol deliveries in Auckland, New Zealand, with a focus on rapid alcohol delivery. Secondary aims included documenting delivery speeds for online alcohol deliveries, and whether online alcohol delivery companies followed their existing policies for the delivery and age verification of restricted items (that is, for alcohol).

Method

Sample

All remote sellers offering online alcohol delivery within 1 day in Auckland, including all third-party delivery companies offering alcohol delivery in Auckland, were eligible for inclusion in this study. The companies were identified through searches on Google, Apple and Android application stores, prior research and through social media. Several popular online alcohol delivery companies were also included in the study as a comparison measure, as were the majority of supermarket companies offering alcohol delivery.

Observation checklist

A checklist was created that outlined aspects to note during the purchasing and delivery processes. Items assessed during the purchasing stage were: age confirmation prompt/s; speed of delivery offered; delivery driver partners (if specified); and the existence of a policy for restricted items. Aspects noted during the delivery stage were: whether the delivery was left at the door unattended; if the delivery driver requested age verification; the speed of delivery; whether the age verification procedures stated in the company's restricted items policy were followed; and (where possible) the delivery driver's company or the courier company.

Procedure

This Alcohol Healthwatch project had the data collected by a research assistant studying at The University of Auckland, with oversight by a health promotion advisor at Alcohol Healthwatch. The research assistant was aged over 18 but under 22. Orders were placed by the research assistant across 2 months in the latter half of 2023 and delivered to two home addresses and one office address in Auckland.

Alcohol orders from 14 of the 16 online alcohol delivery companies were made three separate times, across separate days. Two of the 16 online alcohol delivery companies (Liquor Legends and Teddy) had two orders made, across separate times and days. Sufficient care was taken to ensure that the type of alcohol purchased varied across the orders. Orders were for a single alcohol product, or the minimum order requirement. Where the research assistant was able to indicate on the purchasing platform that "contactless delivery" (or orders to be left at the door) was preferred, this was indicated at time of sale. Where orders were placed from supermarkets, no other food item was included as part of the order, and the fastest delivery window was selected.

The research assistant monitored all orders, and first waited to see if the delivery was left at the door unattended. If it was evident that the delivery driver would not leave the delivery at the door unattended, the research assistant answered the door in the usual manner of a delivery and only offered age identification if prompted.

Ethical considerations

A number of steps were followed in attempts to adhere to ethical procedures and protect participant and researcher safety. Firstly, the research assistant was a student of The University of Auckland and at the time was involved with Alcohol Healthwatch as a placement student. The research assistant provided a clear conviction check from the Ministry of Justice/New Zealand Police prior to the commencement of project, with age identification sighted. The assistant also signed an ethical contract outlining expectations to behave ethically and with integrity. This document was provided by the University placement coordinator and arranged through the University placement paper as part of their standard placement paperwork. It also included the responsibility to protect, preserve and respect the information of clients and others, and to respect and consider a range of appropriate viewpoints. Effort was made to ensure informed and free consent from the research assistant. She was able to withdraw her contribution and involvement with the project at any time.

Both the research assistant and the lead supervisor understood and agreed on project requirements, including delivery of alcohol to the research assistant's home address. There was an agreed process in place for managing the collection of alcohol and putting it aside once it reached her home, for herself and household members' safety. This included the research assistant briefing her household members and storing the alcohol in a separate and dedicated cupboard. The research assistant's home address was chosen in part for convenience for the research assistant, but also to eliminate any potential biases or changes in usual procedure that a delivery to "Alcohol Healthwatch" offices might trigger. The research assistant was aware that if there were any concerns about delivery drivers, she was not to engage or open the door, and to call the police.

Secondly, all funding and payment of alcohol was arranged by Alcohol Healthwatch, with all alcohol purchases monitored and checked against a purchasing list. The lead supervisor had oversight of when and how deliveries were made and was available at these times to the research assistant. Plans for orders and deliveries were made and discussed at the start of each week. Receipts and invoices for deliveries were provided and collected by the lead supervisor at the end of each week. Twice weekly in-person check-ins were conducted throughout the course of the project, during which the wellbeing of the research assistant was discussed. At the close of the project, the lead supervisor picked the alcohol up from the research assistant's house in a vehicle (so there was no requirement to transport the alcohol in public), where it was disposed of at the Alcohol Healthwatch offices. Data around the alcohol deliveries are stored on secure Alcohol Healthwatch drives.

Results

Overview

Overall, 46 orders were placed with 45 delivered, leaving a total of 45 deliveries to be assessed across 16 different companies. These companies were: Countdown, Delivereasy, DoorDash, Fine O Wine, Laithwaites, New World, Bevee, Paddock to Pantry, Uber Eats, Teddy, Liquor Legends, Society Liquor, Fine Wine Delivery, Wine Central, Alcohol

Table 1: Characteristics of companies sampled.

	n (%)
Companies	16
Third-party delivery company	3 (19)
Supermarket	3 (19)
Online only off-licence	10 (63)
Order portal available	16
Website	10 (63)
Mobile application	5 (31)
Both	1 (6)

Table 2: Characteristics of deliveries.

	n (%)
Alcohol deliveries made	45
Left unattended at door	22 (49)
Required age verification	12 (27)
Did not require age identification	33 (73)
Rapid alcohol deliveries	17 (38)
(mean = 29.5 minutes, standard deviation = 9.5 minutes)	
Non-rapid alcohol deliveries	28 (62)
(mean = 45 hours and 53 minutes, standard deviation = 34 hours and 24 minutes)	
Followed delivery company's restricted items policy	12 (27)
Note: these entries do not add up to 45 as some orders fell into more than one category	
Deliveries requiring age verification	12
Rapid alcohol deliveries	10 (83)
Non-rapid alcohol deliveries	2 (17)

Delivery and Good Drop. Table 1 outlines the characteristics of the sample of companies.

Age verification

Table 2 outlines the characteristics of the deliveries. Of the total orders delivered (n=45), almost half of the deliveries (49%, n=22) were left at the door unattended. A further 24% (n=11) that were delivered did not check age identification. In total, 73% (n=33) of all deliveries did not check age identification.

Of the 16 companies, 62.5% (n=10) did not check age identification on any of their delivery orders. These companies were: Countdown, Alcohol

Delivery, Fine O Wine, Fine Wine Delivery, Good Drop, Laithwaites, Liquor Legends, Paddock to Pantry, Society Liquor and Wine Central. Only two of the 16 companies in this study verified age on all deliveries. One alcohol retailer, Teddy, had a specific condition on their licence that the delivery driver must sight photo identification, yet this was not adhered to for the two deliveries in this study.

Organisational policies and procedures

All (100%, n=16) companies had an available policy on restricted items, including a stipulation that age identification must be provided on delivery. However, from this sample only two companies (Uber Eats and DoorDash) adhered to their own policy for all deliveries.

Of all the orders placed (n=46), 15% (n=7) had at least one online age confirmation request on the ordering website or portal.

Delivery speeds

Overall, the average speed of all deliveries was 50 hours and 24 minutes. For rapid deliveries only, the average delivery speed was 29.5 minutes and the standard deviation 9.5 minutes. The shortest rapid delivery time was 17 minutes, and the longest rapid delivery time was 2 hours and 6 minutes.

For non-rapid deliveries, the average delivery speed was 1 day, 21 hours and 53 minutes, and the standard deviation 1 day, 10 hours and 25 minutes. The shortest non-rapid delivery time was 5 hours and 24 minutes, and the longest non-rapid delivery time was 4 days, 21 hours and 25 minutes.

Delivery drivers

Data was available on the delivery driver for all 45 deliveries. Of these, 23 (51%) of the deliveries were made by drivers hired by the licensee (e.g., a New World delivery driver) or self-employed through a third-party delivery company (e.g., an Uber Eats delivery driver). The remaining 22 (49%) deliveries were made by various independent courier companies (e.g., NZ Post).

Discussion

This study documents the age verification processes on delivery for a number of online Auckland alcohol delivery companies, particularly rapid delivery companies. The findings show that for the majority of deliveries age identification was not requested; it was common for alcohol to be left unattended at the doorstep or delivered without requesting identification. This has implications for under 18-year-olds accessing alcohol, as online tick-boxes can be easy to circumnavigate, in which case the alcohol is likely to be delivered to them without an identification check. This is in contrast to a recent study in Western Australia,[22] where almost none of the sample of deliveries were left unattended.

Given that New Zealand's current regulations likely did not anticipate the large growth and availability of online alcohol deliveries, it is not surprising that many orders were left unattended. While it has not been tested, an offence could be established under the *Sale and Supply of Alcohol Act 2012* if an alcohol delivery is handed to a minor or intoxicated person, whereas leaving an order unattended may not attract any offence. As delivery orders can contain unlimited amounts of alcohol, this highlights that further regulation is both necessary and desirable.

As well as this, there appeared to be an incongruence between the companies' policies for the delivery of restricted items and the actual processes followed by their delivery drivers. All companies had available statements or policies stating that identification must be provided, yet only two companies followed this for all deliveries. Companies evidently identify a need to require identification at delivery, but this does not appear to adequately transfer down to the on-the-ground delivery procedures.

It was also notable that, apart from supermarkets and third-party delivery companies, most alcohol companies outsourced the deliveries to courier companies. While a courier company may be held liable for delivery to a minor or an intoxicated person, they are not responsible for taking reasonable steps to ensure that the receiver is over the purchase age (this sits with the licensee). Currently, there is no mandate to train couriers on the particulars for delivering alcohol and it is unknown if and how couriers have had the company restricted items policies explained to them. That being said, a lack of age identification checks was seen across almost all companies and delivery drivers.

Interestingly, the rapid delivery companies appeared to be following their own policies more closely, with over half of the rapid speed deliveries (56%) requiring age verification compared with only 7% of other deliveries. In particular, Uber Eats and DoorDash asked for identification on every delivery made in this sample. The reasons behind this may vary. Firstly, rapid delivery companies are newer to the market and may have more comprehensive processes or training requirements. Being newer on the market and serving a more niche clientele may result in a greater protectiveness of their reputation and financial proceeds, and thus more robust training processes. Similarly, several rapid delivery companies have started requiring the customer to confirm a special code to the driver to claim their food items, to minimise the chance of the food being delivered to the wrong person. It is possible that alcohol policies have also been included in these stricter processes. As well as this, several countries overseas have banned the delivery of alcohol through third-party delivery companies. Pressures from overseas may be resulting in more consistent adherence to their own policies in New Zealand.

Lastly, the speed of the rapid delivery companies show how quickly alcohol can be supplied in Auckland. With the average delivery time for rapid deliveries being under 30 minutes, this vastly increases the accessibility of alcohol. In turn, this is likely to increase consumption, extend drinking sessions past when they would have otherwise finished and increase subsequent alcohol-related harm.

More than anything, this speed of access shows the highly changed nature of alcohol delivery since New Zealand's alcohol laws were introduced in 2012. At that time, alcohol delivery was uncommon and relegated primarily to boutique wine distributers, with delivery usually taking a number of days. In Australia, several states (New South Wales, Victoria and Western Australia) have amended their alcohol laws in the last few years in attempt to keep pace with the new online retail trends. However, New Zealand legislation has not kept up with the changing landscape of alcohol delivery and requires updating to address many of the new and emerging features of today's rapid and prolific alcohol delivery environment.

Limitations

This study has several limitations. Firstly, being a small study over a short period in a specific area limits the generalisability of the findings. Similarly, the data collection was undertaken by one research assistant and collected at only three sites. To provide a more comprehensive understanding of age verification processes, the methods could be replicated with a number of research assistants over numerous sites.

Secondly, while the research assistant did appear as a young person, if the research assistant had been under the age of 18 this would have strengthened arguments around potential harms and supply to minors.

Thirdly, the scope of the study allowed only for a focus on rapid delivery companies, supermarkets and a select few others. A larger study could explore the age verification processes across a range of different companies, both long-standing and newly established, including off-licences with online delivery options.

Lastly, further research exploring the age verification processes across different parts of New Zealand would be useful to assess whether these results are found elsewhere. In particular, future research might evaluate whether differences exist between regions, including university towns like Dunedin, where young people might be more inclined to utilise rapid delivery companies and engage in heavy drinking sessions.

Recommendations

Despite the limitations in the size and generalisability of the study, the findings do raise points to consider, particularly around changes that could be made to the legislation to reduce and prevent alcohol-related harm through online alcohol deliveries. These changes might include: banning "contactless" delivery of alcohol (that is, leaving alcohol deliveries unattended at the place of delivery); mandatory age verification checks on delivery, stipulating that alcohol cannot be delivered without sighting the identification of the receiver; and mandatory digital age verification checks at point of sale (whether online, or through a mobile application). This has been implemented overseas, including some states in Australia,[22] so many of the companies that operate across both Australia and New Zealand are likely to already be implementing this technology overseas. Additional changes might also include mandating alcohol deliveries to be next day only, and enforcement and monitoring of these provisions.

Notably, many of these changes could be made in the *Sale and Supply of Alcohol Regulations 2013* under the *Sale and Supply of Alcohol Act 2012*. This means that the changes can more easily and quickly be implemented by the Minister, foregoing the usual Select Committee process.

In conclusion, this is the first New Zealand study to document age verification processes of alcohol

companies for alcohol deliveries. The findings demonstrate that it is common for alcohol delivery orders in Auckland to be delivered without an age verification check, and that a number of rapid delivery companies will deliver alcohol to an address within 30 minutes. This has implications for increasing the availability and accessibility of alcohol and alcohol-related harm, including supply to minors. Additional regulation addressing alcohol delivery is needed in New Zealand.

COMPETING INTERESTS

All authors declare that they have no competing interests.

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Primary care experience in people with mental health conditions: results from a national patient experience survey

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ABSTRACT

AIM: The study explored whether the reported experience of primary healthcare differs for survey respondents in Aotearoa New Zealand who self-report having a mental health (MH) condition in comparison with those who do not.

METHOD: Responses to the New Zealand Health Quality & Safety Commission's adult primary care patient experience survey received from August 2020 to May 2022 were analysed. Comparative analysis of patient-reported experience measures were completed to contrast experiences reported by those with and without a MH condition, with results stratified by ethnicity (Māori/non-Māori), age group and gender. Age/gender-standardised estimates for proportions of positive responses to each question were developed for each group alongside standardised risk differences.

RESULTS: Our sample comprised 201,650 responses, with 21% reporting a current diagnosed MH condition. While most respondents reported positive experiences of primary healthcare, we found a consistent pattern of fewer positive experiences for those with MH conditions across dimensions of care quality**,** age and gender groups. When responses were separated by ethnicity, this difference was amplified among Māori.

CONCLUSION: This analysis adds to the increasing body of evidence that experience of MH conditions is associated with worse healthcare experiences. It demonstrates that data are available in Aotearoa New Zealand to routinely monitor and report on primary care experiences for this group. Interventions to improve healthcare should focus on care for Māori with MH conditions as a priority.

Mental health (MH) impacts physical health. In comparison with the general population, people with MH and substance use conditions have a greater level of exposure to risk factors that contribute to a range of chronic physical health conditions, leading to higher mortality and lower life expectancy.[1–3] This relationship between mental and physical health represents a significant element of the personal, social and economic impact of MH conditions for people throughout their lives.[4]

International evidence has shown that a more positive patient experience of healthcare can improve health, clinical, financial, service and satisfaction outcomes.[5] For people with MH and substance use conditions, several aspects of quality of care may contribute to inequitable outcomes. These include structural and financial barriers to accessing services, and prejudice and discrimination from health professionals (whether implicit or overt) that can lead to overlooked or misattributed physical symptoms, missed or late diagnoses and limited access to the best treatment options.[6] High-quality primary care has been shown to improve health outcomes and wellbeing of people with MH conditions;[7] however, studies conducted overseas show that people with MH conditions often report low levels of satisfaction with their primary healthcare experience.[8–10]

Te Tāhū Hauora (the New Zealand Health Quality & Safety Commission [HQSC]) has been running patient experience surveys for nearly a decade in Aotearoa New Zealand. The survey programme provides tools and data to support national and local monitoring and quality improvement initiatives. The adult primary care patient experience survey (PCPES) was the source of data for this study,[11] which samples people who have had a recent visit to a general practice.

The objective of this study was to compare the primary healthcare experiences of adult patients with and without long-term MH conditions (those lasting or expected to last for more than 6 months), using data from the PCPES. The main research question was: "*Does the reported experience of primary health care differ in survey respondents with a self-reported MH condition compared to those without?*" It was not possible to separately assess patient experience for people with substance use conditions due to the absence of relevant survey questions. Information on clinician-reported MH diagnoses was also not available.

Methods

Data sources/measurement

The HQSC PCPES data are collected on a quarterly basis. Every 3 months, a sample of adults aged 15 years and over who are enrolled with and have been seen by a general practice within Aotearoa New Zealand is invited to complete an online survey. Each participating practice prepares a list of all eligible patients who have had a consultation with the practice over a designated 1–2-week period. Eligible patients with contact details are invited by email to complete an online survey. Extra efforts are made to reach Māori and Pacific patients by sending an SMS reminder 2 days after the initial email invitation. The overall response rate is 16–17%.[11]

Study sample

We analysed PCPES responses in the 2-year period from quarter 3 of 2020 to quarter 2 of 2022 (August 2020 to May 2022). The survey asked respondents about experiences at the most recent interaction with a healthcare professional in primary care.

The survey question "*Which, if any, of the following long-term health conditions have you been diagnosed with and currently have?*" was used to classify respondents into those with and without MH conditions. A long-term health condition was defined in the survey as "*a physical or mental illness or condition that has lasted, or is expected to last, for more than six months. The symptoms may come and go or be present all the time.*" Where this question had not been answered, responses were excluded from analysis.

The "with MH condition(s)" group comprised responses from people reporting a diagnosis of at least one of "Anxiety", "Depression" or "Other MH conditions", and the "without MH condition(s)" group captured all remaining responses, including those who reported not currently having any long-term health conditions.

Key variables

Characteristics of each of the two groups were compared, stratified as follows:

- **Ethnicity:** European; Māori; Asian; Pacific peoples; and Other ethnicity, including Middle Eastern/Latin American/African (the survey allows selection of multiple ethnicities but was provided as prioritised ethnicity in the order: Māori, Pacific, Asian, Other, European), further stratified into Māori and non-Māori.
- **Age group**: 15–24 years; 25–64-years; and 65 years or over.
- **Gender:** Male; female; and another gender.
- **Long-term condition(s):** In addition to the responses indicating a MH condition, other potential responses were: arthritis (including gout); asthma; cancer (diagnosis or treatment in the last 5 years); chronic obstructive pulmonary disease; diabetes; heart disease; high blood pressure; long-term pain; stroke; other; and "*I do not currently have any long-term health conditions*."
- **Main type of healthcare professional (HCP) seen at the most recent appointment:** Doctor; nurse; MH professional; or another healthcare professional.

Seven experience of care questions were grouped into three dimensions of care outlined below:

Relationships:

- **Listened to:** Did the (HCP seen at most recent appointment) listen to you?
- **Involved in decisions:** Did the (HCP seen at most recent appointment) involve you as much as you wanted to be in making decisions about your treatment and care?
- **Treated with respect:** Did the (HCP seen at most recent appointment) treat you with respect?

Barriers to care:

- **Given enough time:** Did the (HCP seen at most recent appointment) spend enough time with you?
- **Unable to get an appointment:** In the last 12 months, was there ever a time when you

wanted healthcare from a GP or nurse, but you couldn't get it?

Meeting needs:

- **Individual needs were met:** Did you feel your individual needs were met? (For the first two survey quarters [August 2020 and Nov 2020], the question was "*Did you feel your individual and/or cultural needs were met*?" For the remaining six survey quarters, the question was "*Did you feel your individual needs were met*?")
- **MH needs were met:** Did you feel that the (HCP seen at most recent appointment) recognised and/or understood any MH needs that you might have had?

Analysis

Demographic and other descriptive characteristics are presented for the two groups using frequency counts and proportions. The number of other long-term health conditions reported by respondents was determined and frequency counts were reported for any conditions that represented over 10% of all responses for either group.

For experience of care measures, we reported the count and proportion of responses within each group that reported "yes definitely", "somewhat" and "no" to each question. Respondents that did not include an answer to a specific question were excluded from analysis relating to that question. Eight of the nine questions were framed so that a positive report of experience was indicated by "yes definitely", except for the question "*Were you unable to get an appointment with a GP/nurse sometime in past year*?", where a positive experience was indicated by "no". Response options for this question were limited to "yes" and "no". Comparisons focussed on the most positive responses ("yes definitely" and "no" respectively) in order to focus on the group reporting the best care experiences (as the aim of health services). However, all three levels of response are reported.

Comparative analysis of the experience of care measures was completed to contrast experiences reported by those with and without a MH condition. Results were further stratified by ethnicity (Māori/non-Māori), age group and gender.

Age/gender-standardised estimates of the proportions of responses to each question were developed for the groups with and without MH conditions, with 95% confidence intervals, following principles for age-standardisation of complex survey estimates.[12] Firstly, estimates of responses for each question were produced accounting for survey weights for each group (those with/without MH conditions), further stratified by age and gender. The age–gender standardisation step then involved creating reference weights reflecting the relative distribution of age and gender among PCPES respondents with MH conditions: these weights were then applied to the sample-weighted estimates stratified by group and age/gender to produce standardised estimates by group. Similarly, to compare experiences reported by Māori and non-Māori with and without MH conditions, age/gender-standardised estimates were developed that matched the age/gender structure of the MH conditions group. That is, to consider differences between groups without confounding by age or gender, the group with MH conditions was used as the standard population for standardisation.

For each analysis, risk differences were calculated from the standardised estimates to compare the proportions of the most positive responses from each group of survey questions. The risk difference (also called the absolute risk reduction) measures the difference observed for the outcome of interest between two groups, when accounting for a differential age/gender profile by group, providing an estimated difference in experiencing an event.[13]

Results

Participants

During the study period, there were 229,083 survey responses. Of these, 27,433 had not answered the long-term conditions question, leaving a total sample of 201,650 eligible responses.

Sample characteristics

About one in five (21%) of eligible survey respondents reported a current diagnosed MH condition, with the majority reporting anxiety (67%) and/or depression (59%) (Table 1). Survey respondents who reported not having a MH condition were more likely to be older, male and non-Māori than those with a MH condition.

Both groups presented with a substantial burden of chronic disease, reflecting a population of people attending primary care. Two-thirds of all respondents indicated they had at least one long-term physical health condition (not including MH

Table 1: Demographic characteristics of survey respondents without and with mental health conditions.

Characteristic[a]	Without mental health condition(s)		With mental health condition(s)	
	N=159,875		N=41,775	
	n	%	n	%
Ethnicity[b]				
European	99,286	67.5%	26,001	67.2%
Māori	20,770	14.1%	7,010	18.1%
Asian	9,583	6.5%	1,125	2.9%
Pacific peoples	6,631	4.5%	1,190	3.1%
MELAA/Other ethnicity	10,914	7.4%	3,340	8.6%
Missing values	12,691		3,109	
Age				
15–24 years	3,175	2.1%	2,439	6.3%
25–64 years	71,348	48.2%	25,566	65.7%
65 years or over	73,599	49.7%	10,890	28.0%
Missing values	11,753		2,880	
Gender				
Male	56,569	38.5%	10,108	26.2%
Female	89,845	61.2%	27,990	72.6%
Another gender	340	0.2%	451	1.2%
Missing values	13,121		3,226	
Long-term conditions				
Mental health conditions				
Anxiety			27,973	67%
Depression			24,659	59%
Other mental health condition			10,119	24%
Non-mental health long-term conditions				
No other conditions	58,760	36.8%	15,749	37.7%
1 other condition	53,179	33.3%	12,662	30.3%
2 other conditions	29,290	18.3%	7,198	17.2%
3 other conditions	12,618	7.9%	3,682	8.8%
4 or more other conditions	6,028	3.8%	2,484	5.9%

Table 1 (continued): Demographic characteristics of survey respondents without and with mental health conditions.

Most common non-mental health long-term conditions[c]				
High blood pressure	56,219	32.0%	12,177	24.7%
Arthritis	30,276	17.2%	8,156	16.6%
Asthma	18,522	10.5%	8,136	16.5%
Diabetes	18,019	10.3%	4,414	9.0%
Coronary health disease	17,295	9.8%	3,252	6.6%
Long-term pain	16,405	9.3%	8,566	17.4%

[a] Proportion calculations exclude “No response”, “NA” or “Prefer not to answer”. As percentages reported are unweighted, the table indicates differences in who is included in the study, rather than making inferential statements about these groups.
[b] The survey uses the prioritised ethnicity classification method. MELAA is Middle Eastern/Latin American/African.
[c] Percentages show proportions of all long-term condition responses within each group.

Figure 1: Age/gender-standardised proportions of positive responses to quality of primary healthcare questions for respondents with and without mental health conditions (95% confidence intervals).

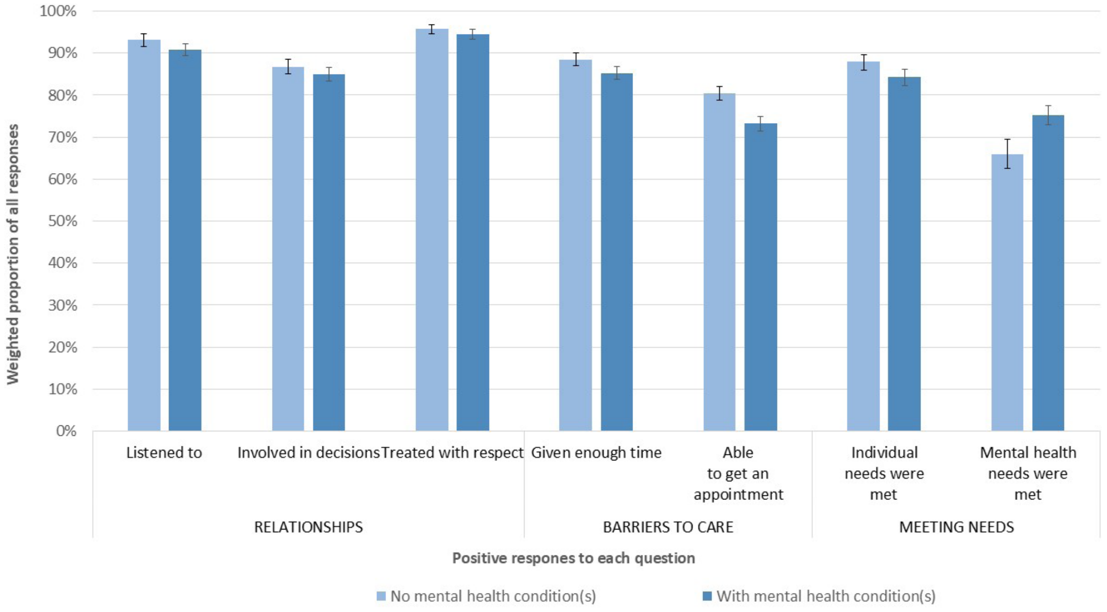

Table 2: Age/gender-standardised analysis of responses to quality of primary healthcare questions for respondents with and without mental health conditions.

Dimension of care/response to question	No MH condition(s)		With MH condition(s)		Risk difference—"with MH condition(s)" compared with "no MH conditions" (95% CI)
	N=159,875		N=41,775		
	n Crude responses[a]	% Standardised proportions	n Crude responses	% Standardised proportions	
Relationships					
Listened to					
Yes, definitely	115,548	93.1%	30,623	90.9%	-2.2 (-4.2–0.2)*
Somewhat	5,574	6.2%	2,300	7.8%	
No	597	0.7%	377	1.4%	
Involved in decisions					
Yes, definitely	110,075	86.8%	28,931	84.9%	-1.9 (-4.3–0.4)
Somewhat	10,423	10.2%	3,488	11.2%	
No	2,406	2.9%	1,121	3.9%	
Treated with respect					
Yes, definitely	117,290	95.8%	31,546	94.5%	-1.3 (-2.8–0.2)
Somewhat	2,974	3.4%	1,249	4.1%	
No	645	0.8%	368	1.4%	
Barriers to care					
Given enough time					
Yes, definitely	110,246	88.5%	28,812	85.3%	-3.2 (-5.4–1.0)*
Somewhat	8,536	8.7%	3,264	10.8%	
No	2,243	2.7%	1,115	3.9%	
Unable to get an appointment sometime in past year[b]					
Yes, definitely	22,883	19.6%	9,724	26.8%	
No	120,769	80.4%	28,226	73.2%	-7.1 (-9.5–-4.8)*
Meeting needs					
Individual needs were met					
Yes, definitely	80,428	87.9%	21,098	84.3%	-3.6 (-6.3–-0.9)*
Somewhat	6,562	9.1%	2,580	11.3%	
No	1,851	3.1%	935	4.4%	

Table 2 (continued): Age/gender-standardised analysis of responses to quality of primary healthcare questions for respondents with and without mental health conditions.

Mental health needs were met					
Yes, definitely	13,471	66.0%	16,560	75.2%	9.2 (5.2–13.2)*
Somewhat	3,277	18.8%	3,472	16.7%	
No	2,793	15.2%	1,686	8.1%	

[a] For age/gender-standardised analyses, n counts only include responses that report age and a valid gender (male, female or other). Denominators exclude "No response", "NA" or "Prefer not to answer", "Can't remember" and "I did not have any" responses to questions.
[b] Note that a "No" response indicates a positive experience for this question.
* Statistically significant difference.
MH = mental health; 95% CI = 95% confidence interval.

conditions). For respondents with one or more MH condition, 14.7% reported having three or more long-term physical health conditions, compared with 11.7% of those with no MH conditions. People with MH conditions were less likely to report high blood pressure and more likely to report long-term pain conditions and asthma than those without MH conditions, in keeping with the age and gender distribution of people with MH conditions in our sample.

Most respondents in both groups had seen a doctor at their recent visit—82% of respondents without MH conditions and 85% of those with MH conditions. Smaller proportions reported having seen a nurse—17% without MH conditions and 13% with MH conditions, respectively. Only 1% of respondents with MH conditions indicated they had seen a MH professional at their most recent primary care visit.

Primary care experience

While most respondents reported positive experiences of primary healthcare, we found a pattern of worse experiences for those with MH conditions reflected consistently across dimensions of care experience.

Those without MH conditions reported more positive experiences than those with MH conditions (Figure 1) across all but one experience of care measure (whether MH needs were met) after adjusting for age and gender differences between groups.

Standardised comparisons and risk differences are provided in Table 2. Within the "relationships" dimension of care, being treated with respect received the highest proportions of positive responses for both groups (95.8% without and 94.5% with MH conditions), with no significant difference between the groups. This was closely followed by being listened to (93.1% and 90.9% respectively), which also showed the widest difference between groups (risk difference [RD] = -2.2%) and the only significant difference between groups within this dimension of care.

Differences between groups were more marked across measures in the "barriers to care" dimension, particularly regarding the ability of respondents to access primary care consultations. Respondents with MH conditions were more likely to report problems with obtaining an appointment with a general practitioner (GP) or nurse during the past year than those without MH conditions (RD=7.1%). Respondents with MH conditions were also less likely to report that primary care providers spend enough time with them (RD=-3.2%).

Within the "meeting needs" dimension of care, respondents with MH conditions were less likely to report that their individual needs had been met (RD=-3.6%). Respondents with MH conditions were much more likely to report having their MH needs met at the most recent appointment (RD=9.2%). However, this question was not applicable to the majority of those without MH conditions, where only around one in 10 of this group (n=19,541) indicated that they had MH needs at the last appointment. Moreover, this dimension of care was the lowest scoring, with over one-quarter of people with MH needs at their primary care appointment not having those needs met.

When responses were separated by ethnicity, the differences in care experiences associated with MH conditions were amplified for Māori

Table 3: Age/gender-standardised analysis of responses to primary healthcare quality of care questions by group with or without mental health conditions, by ethnicity.

	Non-Māori					**Māori**				
	N=158,070					**N=27,780**				
	No MH condition(s)		**With MH condition(s)**		**Risk difference[b]: "with" compared with "no" MH condition(s) (95% CI)**	**No MH condition(s)**		**With MH condition(s)**		**Risk difference: "with" compared with "no" MH condition(s) (95% CI)**
Dimension of care	**N=126,414**		**N=31,656**			**N=20,770**		**N=7,010**		
Response to question[a]	**n Crude responses**	**% Standardised proportions**	**n Crude responses**	**% Standardised proportions**		**n Crude responses**	**% Standardised proportions**	**n Crude responses**	**% Standardised proportions**	
Relationships										
Listened to										
Yes, definitely	99,725	93.2%	25,223	91.0%	-2.2 (-4.3–0.03)	15,682	92.7%	5,375	90.0%	-2.8 (-8.3–2.8)
Somewhat	4,665	6.2%	1,816	7.7%		904	6.40%	483	8.5%	
No	479	0.7%	287	1.3%		118	0.90%	89	1.6%	
Involved in decisions										
Yes, definitely	94,948	86.9%	23,797	85.1%	-1.8 (-4.3–0.8)	14,987	86.6%	5,108	84.0%	-2.6 (-9.3–4.2)
Somewhat	8,861	10.3%	2,817	11.1%		1,554	9.9%	669	11.8%	
No	1,958	2.9%	878	3.8%		444	3.5%	242	4.2%	
Treated with respect										
Yes, definitely	101,163	95.8%	25,939	94.6%	-1.2 (-2.8–0.4)	15,993	95.4%	5,581	93.8%	-1.5 (-6.8–3.7)
Somewhat	2,470	3.4%	985	4.1%		499	3.7%	264	4.6%	
No	516	0.8%	281	1.3%		128	1.0%	86	1.6%	

Table 3 (continued): Age/gender-standardised analysis of responses to primary healthcare quality of care questions by group with or without mental health conditions, by ethnicity.

Barriers to care										
Given enough time										
Yes, definitely	95,056	88.5%	23,693	85.4%	-3.1 (-5.4–0.7)	15,060	88.7%	5,098	84.8%	-3.9 (-10.1–2.3)
Somewhat	7,317	8.7%	2,643	10.7%		1,209	8.5%	618	11.1%	
No	1,890	2.7%	890	3.9%		352	2.8%	224	4.1%	
Unable to get an appointment with GP/nurse sometime in past year[c]										
Yes, definitely	18,418	19.2%	7,545	26.2%	-7.0 (-9.6–4.4)	4,437	23.0%	2,171	30.7%	-7.7 (-13.9–1.5)
No	104,935	80.8%	23,536	73.8%		15,666	77.0%	4,665	69.3%	
Meeting needs										
Individual needs were met										
Yes, definitely	68,777	88.0%	17,148	84.4%	-3.6 (-6.5–0.6)	11,567	87.3%	3,934	83.5%	-3.8 (-10.4–2.8)
Somewhat	5,499	9.1%	2,074	11.4%		1,056	9.1%	505	11.2%	
No	1,481	3.0%	713	4.2%		367	3.6%	222	5.3%	
Mental health needs were met										
Yes, definitely	11,064	65.7%	13,458	75.4%	9.7 (5.3–14.2)	2,389	68.1%	3,086	74.2%	6.0 (-3.3–15.4)
Somewhat	2,729	19.3%	2,822	16.7%		545	15.9%	650	16.7%	
No	2,300	15.0%	1,299	7.9%		489	16.0%	386	9.1%	

[a] For age/gender-standardised analyses, n counts only include responses that report age and a valid gender (male, female or other). Denominators exclude “No response”, “NA” or “Prefer not to answer”, “Can’t remember” and “I did not have any” responses to questions.

[b] Risk differences are presented for most positive responses only.

[c] Note that a “No” response indicates a positive experience for this question.

MH = mental health; 95% CI = 95% confidence interval; GP = general practitioner.

(Table 3). The pattern of worse experiences of care among Māori and non-Māori with MH conditions compared with those without held across all measures (with the exception of meeting MH needs). Risk differences between those with and without MH conditions were consistently smaller for non-Māori than for Māori. For age and gender, there was a similar overall pattern of respondents with MH conditions reporting more negative experiences of primary care within all gender and age strata (Appendix Tables 1 and 2).

Discussion

A high proportion of all survey respondents reported that they felt listened to, treated with respect and involved in decisions (e.g., >90% reported definitely being treated with respect). People with self-reported MH conditions attending general practice in Aotearoa New Zealand report predominantly positive experiences in primary healthcare, and three-quarters report having their MH needs "definitely" met. However, a clear and consistent pattern of worse experiences of primary healthcare compared with those without MH conditions is evident. This same pattern holds across breakdowns by gender and age group, and across all dimensions of experience for Māori and non-Māori respondents.

Comparison with previous research

Other recent research on the healthcare experiences of people in Aotearoa New Zealand with MH and substance use conditions was conducted in 2022 using a web-based survey of adults.[6] Participants were recruited nationally through MH, addiction and lived experience networks and social media. In a subset of respondents who had accessed primary care services (n=335), the majority reported positive experiences; for example, always or most of the time being treated with respect (81%) and being listened to (79%). However, non-Māori had better experiences than Māori for both of these measures. The lower proportion of positive responses in that study compared with the PCPES reported here may relate to the survey sample. This was self-selected, which could introduce bias if people responded more to the survey if they had negative experiences to report and included a high proportion (more than 20%) of people with schizophrenia or bipolar disorder diagnoses, who experience more discrimination than people with other MH conditions. In addition, the majority (70%) were under 45 years of age and younger age in general is associated with responses that are not as positive as those from older people. The differences may also relate to respondents being asked about experiences over the last 5 years, and from all primary care staff. In comparison, the PCPES asks about reception or administrative staff separately and the results presented here concentrate on experiences of clinical interactions at the most recent visit. Another survey of people in Auckland who were engaged with MH services[14] found that people with MH conditions were much more likely to be unable to access a GP within 24 hours, compared with the general population.

Similar findings have also been found in research from Australia into physical healthcare service access for people with MH conditions.[15] This Australian study found that people with MH conditions, compared with those without MH conditions, reported lower levels of being treated with respect, higher levels of waiting for an appointment, not having a response from a GP clinic, not being involved in decisions and the GP not spending enough time.

Implications for clinical practice and research

The importance of strong therapeutic relationships with primary healthcare practitioners for people with MH conditions has long been acknowledged.[16] Positive relationships (characterised as empathetic, non-judgmental and person centred) facilitate access to services, while experiences of stigma or a lack of knowledge from providers act as a barrier.[17] Patient-centred approaches to care and a focus on empathy in communication styles have been central to primary care clinician training and practice for many years, and no doubt are contributing to the high levels of positive patient experiences reported.[18] However, stigmatised attitudes towards people with MH conditions are common in primary care providers, even more than in the general population.[19,20] Discrimination from health professionals also contributes to diagnostic overshadowing, where physical conditions in people with MH conditions are missed or undertreated.[21] People who experience stigma and discrimination are more likely to report unmet health needs, poor communication from providers and difficulties in accessing healthcare.[22] Healthcare experience is a modifiable factor that can improve health outcomes for people experiencing MH conditions. The results presented in this analysis, consistent with research conducted previously, emphasise the need to ensure that all primary health practitioners are skilled and comfortable with supporting people with MH conditions. A patient-centred approach, with a focus on empathy in communicating with patients, has the potential to both improve clinical outcomes and patient satisfaction with services.[23,24] Programmes to address stigma and discrimination in health professionals need to take a tailored and multifaceted approach, recognising that the origins and impacts of stigma and discrimination can differ across organisations and individuals.[25] The potential to reduce stigma and discrimination towards people with MH conditions goes hand-in-hand with improving both experiences of care and health outcomes.[26]

Relatively little research has been done on the intersection of MH discrimination and racism, but these factors can compound to cause negative impacts on patient–doctor relationships and quality of care,[8,27] and there is plenty of evidence that racism is a determinant of health in Aotearoa New Zealand.[28,29] Interventions tailored to the Aotearoa New Zealand context and workforce that address this intersection are urgently required, as well as equity targets to ensure that progress in addressing systemic racism is monitored and change is achieved.

Strengths and limitations

This study used a large sample of people accessing primary care in Aotearoa New Zealand, where self-reported information on MH conditions was available for almost every participant. The PCPES is one of the main measures of patient experience of care in Aotearoa New Zealand and uses validated measures on patient care experiences. Although the response rate is relatively low, this is comparable to similar surveys and a strong survey methodology and representative sampling mean that the risk of non-response bias is low.[30] However, it only captures people who have accessed primary care, and people with MH conditions may not seek healthcare due to fear or past experiences of discrimination.[20,31] The data collection period occurred during the COVID-19 pandemic, which could have affected patient experiences. However, it is notable that predominantly positive experiences were reported.

The focus of this study was on comparing those with and without MH conditions within the responding sample, and so while survey weights were used in the calculations (typically serving to weight responses to be representative of the population accessing primary care), the presented results as proportions and risk differences have been age/gender-standardised to the profile of the group with a history of MH conditions in order to adjust for confounding by these factors. This maximises internal validity for comparing these groups, but means that the proportions of responses are not directly comparable to other survey analyses using weighted data.

The data available allowed us to identify people with MH conditions. However, it was not possible to explore history of MH conditions in more detail than the diagnoses of anxiety and depression and an “other” category. It was therefore not possible to explore whether there were different impacts on care experiences for people diagnosed with different types of condition; for example, psychosis versus mood disorders. Previous research has indicated that people with substance use conditions experience stigma impacting on quality of care provided.[32,33] In this survey, data on substance use conditions were not collected and so it was also not possible to explore the impact of substance use conditions on care experiences. The group identified as having MH conditions lasting longer than 6 months will include those with conditions having a higher impact, who are likely to be accessing specialist MH services, as well as those whose conditions are managed in primary care.

We have focussed on comparing the reported experiences of Māori as the Indigenous population compared with non-Māori. However, we recognise that the non-Māori group will include other ethnic groups that experience discrimination and marginalisation, including Pacific peoples. This will mean that the true of extent of inequities between Māori and NZ European, as the most privileged group, may be masked in this comparison.

From a public health and equity perspective, our findings demonstrate the importance of thinking carefully about the populations we compare when monitoring patient experience and outcomes. Adopting an approach that considers healthcare equity for people with MH conditions will support improved understanding of how experience of care may impact on outcomes for people experiencing long-term mental distress and contribute to improving experiences of care.

Within this, inequalities in the receipt of quality physical healthcare may be intensified among those who experience MH conditions and are also members of other minoritised or marginalised groups. Our results demonstrate that for Māori, poor experiences of healthcare are compounded among people with MH conditions.

Conclusion

This analysis adds to the increasing body of evidence that experience of MH conditions is associated with adverse healthcare experiences. It demonstrates that data are available in Aotearoa New Zealand to routinely monitor and report on care experiences for this group. Interventions to improve healthcare to provide equitable care for Māori with MH conditions are required as a priority. Further research should focus on developing and evaluating the effectiveness of interventions in the Aotearoa New Zealand context.

COMPETING INTERESTS

Nil.

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Appendix

Appendix Table 1: Primary healthcare quality of care responses for respondents without or with mental health conditions, by gender (unweighted and unstandardised data).

	Male				**Female**				**Other gender**			
	N=83,043				**N=118,198**				**N=1,052**			
Dimension of care	**No MH condition(s)**		**With MH condition(s)**		**No MH condition(s)**		**With MH condition(s)**		**No MH condition(s)**		**With MH condition(s)**	
Response to question[a]	**N=67,943**		**N=15,100**		**N=88,233**		**N=29,965**		**N=402**		**N=650**	
Relationships												
Listened to												
Yes, definitely	45,266	96.1%	8,117	93.6%	71,550	94.2%	22,433	91.5%	248	87.9%	340	84.2%
Somewhat	1,679	3.6%	467	5.4%	3,957	5.2%	1,814	7.4%	33	11.7%	46	11.4%
No	171	0.4%	85	1.0%	437	0.6%	279	1.1%	1	0.4%	18	4.5%
Involved in decisions												
Yes, definitely	43,159	90.4%	7,589	86.7%	68,217	89.0%	21,296	86.2%	216	78.0%	306	76.5%
Somewhat	3,805	8.0%	907	10.4%	6,736	8.8%	2,549	10.3%	51	18.4%	71	17.8%
No	771	1.6%	257	2.9%	1,670	2.2%	852	3.4%	10	3.6%	23	5.8%
Treated with respect												
Yes, definitely	45,672	97.6%	8,287	96.0%	72,882	96.6%	23,179	94.9%	256	92.4%	351	87.3%
Somewhat	934	2.0%	253	3.1%	2,070	2.8%	973	4.2%	17	6.6%	38	10.8%
No	173	0.4%	88	1.1%	481	0.7%	271	1.2%	4	1.6%	13	3.7%

Appendix Table 1 (continued): Primary healthcare quality of care responses for respondents without or with mental health conditions, by gender (unweighted and unstandardised data).

Barriers to care												
Given enough time												
Yes, definitely	36,511	95.7%	6,268	91.1%	56,792	93.1%	17,001	88.5%	191	85.7%	248	76.8%
Somewhat	1,279	3.4%	458	6.7%	3,341	5.5%	1,695	8.8%	24	10.8%	55	17.0%
No	354	0.9%	154	2.2%	890	1.5%	521	2.7%	8	3.6%	20	6.2%
Unable to get an appointment with GP/nurse sometime in past year[b]												
Yes, definitely	6,561	11.7%	1,847	18.4%	16,587	18.6%	7,809	28.0%	85	25.1%	178	39.6%
No	49,678	88.3%	8,187	81.6%	72,615	81.4%	20,040	72.0%	253	74.9%	272	60.4%
Meeting needs												
Individual needs were met												
Yes, definitely	31,083	92.1%	5,540	87.4%	50,227	89.6%	15,513	85.3%	153	75.0%	228	75.2%
Somewhat	2,119	6.3%	587	9.3%	4,490	8.0%	1,962	10.8%	42	20.6%	55	18.2%
No	546	1.6%	213	3.4%	1,336	2.4%	714	3.9%	9	4.4%	20	6.6%
Mental health needs were met												
Yes, definitely	4,698	70.3%	4,321	78.4%	8,885	68.2%	12,170	75.7%	57	62.0%	205	60.7%
Somewhat	1,009	15.1%	835	15.1%	2,283	17.5%	2,590	16.1%	22	23.9%	73	21.6%
No	979	14.6%	358	6.5%	1,854	14.2%	1,310	8.2%	13	14.1%	60	17.6%

[a] All proportion calculations exclude "No response", "NA" or "Prefer not to answer", "Can't remember" or "I did not have any" responses from denominators.

[b] Note that a "No" response indicates a positive experience for this question.

MH = mental health; GP = general practitioner.

Appendix Table 2: Primary healthcare quality of care responses for respondents without or with mental health conditions, by age group (unweighted and unstandardised data).

	15–24 years				**25–64 years**				**65 years or over**			
	N=5,614				**N=96,914**				**N=84,489**			
Dimension of care	**No MH condition(s)**		**With MH condition(s)**		**No MH condition(s)**		**With MH condition(s)**		**No MH condition(s)**		**With MH condition(s)**	
Response to question[a]	**N=3,175**		**N=2,439**		**N=71,348**		**N=25,566**		**N=73,599**		**N=10,890**	
Relationships												
Listened to												
Yes, definitely	2,450	88.1%	1,887	84.8%	56,471	93.6%	20,521	91.4%	59,343	96.6%	8,762	95.1%
Somewhat	295	10.6%	279	12.5%	3,458	5.7%	1,654	7.4%	1,945	3.2%	415	4.5%
No	35	1.3%	60	2.7%	429	0.7%	286	1.3%	144	0.2%	37	0.4%
Involved in decisions												
Yes, definitely	2,193	80.2%	1,732	78.9%	52,727	87.7%	19,300	85.8%	57,759	91.8%	8,434	89.1%
Somewhat	404	14.8%	318	14.5%	5,771	9.6%	2,378	10.6%	4,518	7.2%	863	9.1%
No	136	5.0%	145	6.6%	1,657	2.8%	823	3.7%	668	1.1%	169	1.8%
Treated with respect												
Yes, definitely	2,558	92.4%	2,013	91.1%	57,646	96.0%	21,179	94.6%	59,828	98.2%	8,928	97.4%
Somewhat	169	6.1%	146	6.6%	1,915	3.2%	924	4.1%	962	1.6%	198	2.2%
No	42	1.5%	51	2.3%	466	0.8%	81	1.3%	151	0.2%	42	0.5%
Barriers to care												
Given enough time												
Yes, definitely	2,257	81.1%	1,722	77.6%	53,805	89.4%	19,367	86.4%	56,744	93.2%	8,246	90.2%

Appendix Table 2 (continued): Primary healthcare quality of care responses for respondents without or with mental health conditions, by age group (unweighted and unstandardised data).

Somewhat	396	14.2%	347	15.6%	4,875	8.1%	2,242	10.0%	3,476	5.7%	726	7.9%
No	130	4.7%	149	6.8%	1,510	2.5%	818	3.6%	651	1.1%	171	1.9%
Unable to get an appointment with GP/nurse sometime in past year[b]												
Yes, definitely	747	23.6%	854	35.1%	15,148	21.3%	7,413	29.1%	7,547	10.4%	1,647	15.3%
No	2,418	76.4%	1,579	64.9%	55,896	78.7%	18,042	70.9%	65,340	89.6%	9,135	84.7%
Meeting needs												
Individual needs were met												
Yes, definitely	1,524	81.8%	1,177	76.4%	38,233	88.3%	14,058	85.1%	42,618	93.0%	6,275	89.2%
Somewhat	249	13.4%	255	16.6%	3,763	8.7%	1,757	10.6%	2,718	5.9%	614	8.7%
No	91	4.9%	108	7.0%	1,324	3.1%	699	4.2%	496	1.1%	143	2.0%
Mental health needs were met												
Yes, definitely	451	53.4%	1,164	66.1%	8,650	68.4%	11,961	76.3%	4,700	72.0%	3,709	79.8%
Somewhat	233	27.6%	378	21.5%	2,199	17.4%	2,463	15.7%	909	13.9%	688	14.8%
No	160	19.0%	219	12.4%	1,790	14.2%	1,247	8.0%	915	14.0%	251	5.4%

[a] Response data exclude “NA” or “No response” for all quality and access measures.
[b] Note that a “No” response indicates a positive experience for this question.
MH = mental health; GP = general practitioner.

Outcomes following the introduction of an interdisciplinary shared decision-making clinic for older patients with colorectal cancer

Alison Jackson, Christopher Shaw, Brian O'Sullivan, Siva Govender, Jesse Fischer

ABSTRACT

AIM: Colorectal cancer (CRC) incidence is highest in older patients, who also have high rates of concurrent multimorbidity and frailty. Shared decision making is important when deciding treatment. The aim of this study was to compare outcomes before and after introduction of a shared decision-making (SDM) pathway, which includes an anaesthetist and geriatrician, for older patients with CRC at Waikato Hospital.

METHOD: Retrospective review of patients over 70 years of age considered for surgical resection was performed before (2018) and after (2020) introduction of the SDM pathway. Primary outcome was days alive out of hospital (DAOH) at 12 months. Data were collected on demographics, disease factors, specialist assessments, frailty and cognitive function, treatment, deviation from colorectal multidisciplinary meeting (MDM) recommendation and outcomes.

RESULTS: In total, 169 patients were included. There were 103 males and the median age was 79 years (range 70–95). After the introduction of the SDM clinic, more patients underwent non-operative management (16.1% vs 4.9%, p=0.02) and had management that deviated from MDM recommendation (18.4% vs 4.9%, p=0.01). DAOH was marginally higher after introduction of the SDM clinic (358 vs 352, p=0.02). There was no difference in survival.

CONCLUSION: An interdisciplinary SDM clinic for older patients with CRC is feasible in a tertiary hospital in New Zealand and may increase non-operative management and DAOH without impacting overall survival.

Colorectal cancer (CRC) is the third most common cancer world-wide and the incidence is highest in older patients.[1] The standard of care for CRC includes surgical resection for stage 1–3 and selected cases of stage 4 disease, but older patients with CRC have high rates of concurrent multimorbidity[2] and frailty,[3] which are known to increase perioperative risk.[4] Pre-operative frailty has been associated with poorer outcomes after surgery for CRC, including prolonged length of hospital stay (LOS) and increased rates of major complications.[5] Similarly, while surgery for all patients with CRC carries risk of morbidity and mortality,[6] this risk is significantly increased in older patients who have increased LOS and rates of complications.[7]

Peri-operative risk must be weighed against the natural history of the disease in the context of patient life expectancy, quality of life and goals of care. Surgeons require an excellent understanding of the natural history of surgical disease and peri-operative risks but surgical decision making for older patients has become more complex due to increased life expectancy, multimorbidity and frailty. Interdisciplinary pathways for high-risk patients considering surgical treatment have been described to address this problem.[8] In 2019, a shared decision-making (SDM) pathway for older patients with CRC being considered for surgical resection was instituted in Waikato Hospital, a tertiary referral centre in New Zealand. SDM pathway goals are to facilitate SDM for older patients with CRC who are moderate or high peri-operative risk and to facilitate peri-operative optimisation for patients proceeding to surgery.

Despite an increasing volume of literature supporting SDM in surgical patients,[8–10] there is no published literature reporting a dedicated SDM pathway for older patients with CRC. This study aimed to compare real-world outcomes for older patients with CRC considered for elective surgery before and after the introduction of an interdisciplinary SDM pathway at Waikato Hospital. The primary outcome was days alive out of hospital (DAOH). Secondary outcomes included mortality, treatment delivered and treatment deviation from colorectal multi-disciplinary meeting (MDM) recommendation (“gold standard” treatment recommendation).

Method

The standard and SDM clinical care pathways during the study period are shown in Figure 1. SDM consultation involves a holistic assessment in a single outpatient clinic visit, incorporating colorectal surgeon consultation, anaesthetic assessment and/or comprehensive geriatric assessment (CGA) by a specialist physician. Key stakeholders (patients, family/whānau and medical specialists) then participate in a values-based discussion of all treatment options and predicted risks and benefits drawing on the surgical, anaesthetic and geriatric assessments.

From 1 January to 31 December 2020, all patients diagnosed with CRC over 70 years of age discussed at the MDM were entered into a prospective database. Patients with CRC over 70 years of age discussed in the colorectal MDM from 1 January to 31 December 2018 were identified after screening all MDM lists. All patients with CRC in Waikato Hospital are discussed in the MDM prior to elective treatment, and usually prior to first specialist appointment (FSA) with a colorectal surgeon. Patient selection for the SDM pathway was determined by consultant medical specialists after screening patients over the age of 70 for multimorbidity or frailty using the Geriatric 8 (G8) score (score <14 used as indicator of frailty). Inclusion criteria for this study were age 70 years or over, discussed in CRC MDM, treated at Waikato Hospital in 2018 or 2020, being considered for surgical resection (palliative or curative intent) and confirmed histological diagnosis of adenocarcinoma of colon, rectum or appendix. Patients recommended for non-operative management by MDM or treated in the private sector were excluded.

Data were collected retrospectively from clinical records, including demographics, disease factors such as staging, tumour location and pathology results, assessment undertaken including specialist consultation, frailty scores and cognitive function, treatment factors including surgery vs non-operative care, deviation from MDM recommendation and outcomes including DAOH, mortality and LOS. DAOH was defined as the number of days the patient was alive excluding any days admitted to hospital (including all-cause emergency and elective admissions) in the 12 months from the day of surgery. Univariate statistical analysis used Chi-squared or Mann–Whitney U test as appropriate. Survival analysis was performed using the Kaplan–Meier method and the Mantel–Cox test. A two-sided alpha of 0.05 was considered statistically significant. Outcome analysis was performed of outcomes for patients who did not proceed to surgical treatment for CRC after SDM discussion.

Full ethics approval was obtained from the New Zealand Health and Disability Ethics Committee (HDEC 2022 FULL 12313).

Results

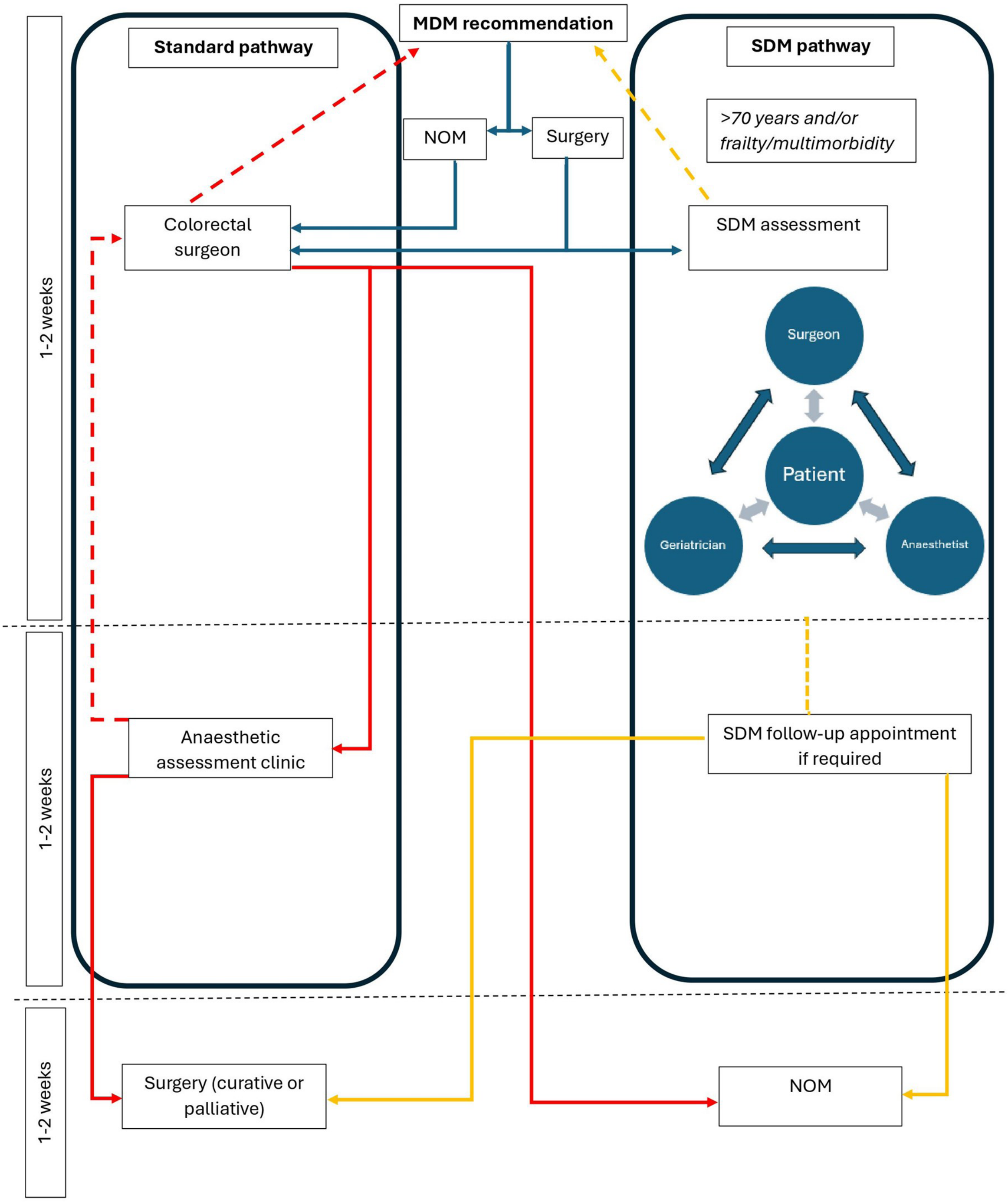
One hundred and sixty-nine patients were included in the study. One hundred and three (60.9%) were male; the median age was 79 years (range 70–95) and was similar across both years of the study. Eighty-two out of 169 (48.5%) patients were treated in 2018 and 87/169 (51.5%) were treated in 2020. All patients had at least 12 months of follow-up performed. Twenty-seven out of 169 (16.0%) were diagnosed with stage 4 disease at time of discussion in MDM. Patient demographics and selected disease characteristics are presented in Table 1.

In 2018, no patients underwent formal frailty scoring or objective assessment of cognitive impairment. In 2020, 24 patients had a CGA performed, and 25 patients were seen formally in the SDM clinic with either anaesthetic or geriatric assessment performed. Frailty as a binary outcome of geriatric physician assessment, cognitive impairment scores and G8 scores are presented in Table 2.

Table 3 presents the treatment plans recommended by the MDM and treatment delivered for all patients in the study, as well as outcome data. After the introduction of the SDM clinic, a greater proportion of patients underwent non-operative management (16.1% vs 4.9%, p=0.021) and experienced a deviation in management from the MDM recommendation (18.4% vs 4.9%, p=0.008). DAOH was 6 days higher in 2020 after the introduction of the SDM clinic. There was no difference in LOS for surgical patients.

There was no statistically significant difference in all-cause mortality (Table 4) or survival (Figure 2) by Kaplan–Meier method using the Mantel–Cox test (2018 mean 45.5 months vs 2020 mean 30.9 months, median was not reached for either year,

Figure 1: Flow diagram showing standard and shared decision-making pathways for patients with colorectal cancer.



SDM = shared decision-making; NOM = non-operative management.

Table 1: Patient characteristics for all patients in the study.

	Total	2018 (Pre-SDM)	2020 (Post-SDM)	p-value
Age in years, median (range)	79.0 (70–95)	80 (70–95)	78 (70–94)	0.40
Male sex	103/169 (60.9)	50/82 (61.0)	53/87 (60.9)	1.00
Ethnicity				0.13
New Zealand European	132/166 (79.5)	59/82 (72.0)	73/84 (86.9)	
New Zealand Māori	7/166 (4.2)	4/82 (4.9)	3/84 (3.6)	
Asian	2/166 (1.2)	1/82 (1.2)	1/84 (1.2)	
Other	23/166 (13.9)	16/82 (19.5)	7/84 (8.3)	
Unknown	2/166 (1.2)	2/82 (2.4)	0/84 (0.0)	
Tumour site				0.25
Right colon	61/169 (36.1)	30/82 (36.6)	31/87 (35.6)	
Left colon	62/169 (36.7)	30/82 (36.6)	32/87 (36.8)	
Rectum	38/169 (22.5)	20/82 (24.4)	18/87 (20.7)	
Appendix	3/169 (1.8)	2/82 (2.4)	1/87 (1.1)	
Metastatic recurrence	5/169 (3.0)	0/82 (0.0)	5/87 (5.7)	
Stage 4 disease (in MDM)	27/169 (16.0)	13/82 (15.9)	14/87 (16.1)	1.00

Missing ethnicity data for 3 patients. All data n (%) unless otherwise stated.
SDM = shared decision-making; MDM = colorectal multi-disciplinary meeting.

Table 2: Shared decision-making clinic assessment in 2020.

Seen in shared decision-making clinic	25/87 (28.7)
Cognitive impairment	
None	17/76 (22.4)
Mild	4/76 (5.3)
Moderate	3/76 (3.9)
Severe	1/76 (1.3)
Not formally assessed	51/76 (67.1)
Frailty	
No	20/76 (26.0)
Yes	12/76 (15.6)
Not formally assessed	45/76 (58.4)
Geriatric 8 score	
>14 (normal)	21/63 (33.3)
≤14 (abnormal)	42/63 (66.7)

All data n (%). Denominators provide indication of missing data.

Table 3: Treatment and outcomes for all patients.

	Total	2018 (Pre-SDM)	2020 (Post-SDM)	p-value
Emergency surgery	9/169 (5.3)	3/82 (3.7)	6/87 (6.9)	0.50
MDM recommendation				0.77
Surgery (curative intent)	130/169 (76.9)	63/82 (76.8)	67/87 (77.0)	
Surgery (uncertain intent)	1/169 (0.6)	1/82 (1.2)	0/87 (0.0)	
Surgery after neoadjuvant treatment	24/169 (14.2)	11/82 (13.4)	13/87 (14.9)	
Surgery or colonic stent insertion (palliative intent)	14/169 (8.3)	7/82 (8.5)	7/87 (8.0)	
Final management				0.02
Died before clinic appointment	2/169 (1.2)	0/82 (0.0)	2/87 (2.3)	
Non-operative (including colonic stent insertion)	18/169 (10.7)	4/82 (4.9)	14/87 (16.1)	
Surgery (including watch-and-wait for rectal cancer)*	149/169 (88.2)	78/82 (95.1)	71/87 (81.6)	
Deviation from MDM recommendation	20/169 (11.8)	4/82 (4.9)	16/87 (18.4)	0.01
Neoadjuvant treatment				0.71
Systemic chemotherapy	1/169 (0.6)	0/82 (0.0)	1/87 (1.1)	
Long-course chemoradiotherapy (rectal cancer)	2/169 (1.2)	1/82 (1.2)	1/87 (1.1)	
Short-course radiotherapy (rectal cancer)	14/169 (8.3)	8/82 (9.8)	6/87 (6.9)	
Stoma formation	37/148 (25.0)	19/77 (24.7)	18/71 (25.4)	1.00
Return to theatre	13/148 (8.8)	7/77 (9.1)	6/71 (8.5)	1.00
LOS in days, median (range)	7 (2–68)	7 (2–68)	7 (2–46)	0.19
Days alive out of hospital, median (range) for patients undergoing surgery	355 (0–363)	352 (0–363)	358 (4–363)	0.02

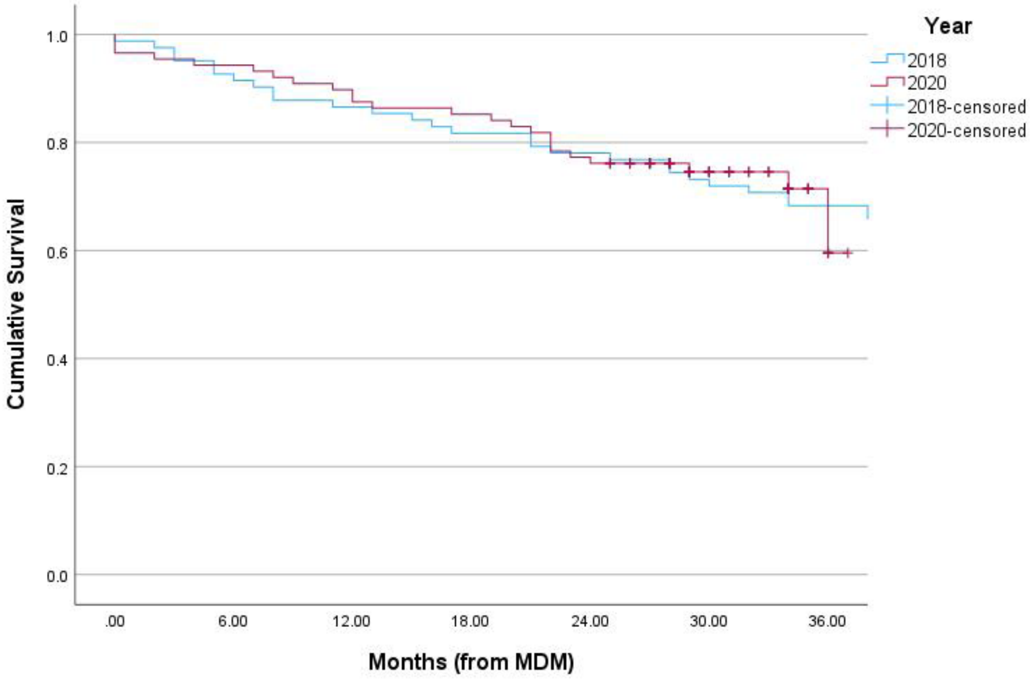
*One patient managed with watch-and-wait strategy for rectal cancer in 2018.
SDM = shared decision-making; LOS = length of hospital stay post-operatively for patients undergoing surgery; MDM = colorectal multi-disciplinary meeting.
All data n (%) unless otherwise stated.

Table 4: All-cause mortality for all patients.

	Total	2018 (Pre-SDM)	2020 (Post-SDM)	p-value
Mortality from date of MDM				
30 days	5/169 (3.0)	1/82 (1.2)	4/87 (4.6)	0.37
90 days	8/169 (4.7)	3/82 (3.7)	5/87 (5.7)	0.72
12 months	20/169 (11.8)	10/82 (12.2)	10/87 (11.5)	1.00
Mortality from date of surgery				
30 days	6/148 (4.1)	4/77 (5.2)	2/71 (2.8)	0.68
90 days	7/148 (4.7)	5/77 (6.5)	2/71 (2.8)	0.45
12 months	17/148 (11.5)	11/77 (14.3)	6/71 (8.5)	0.31

All data n (%).
SDM = shared decision-making; MDM = colorectal multi-disciplinary meeting.

Figure 2: Kaplan–Meier survival curve for all patients comparing the year prior (2018) with the year after (2020) the introduction of the shared decision-making clinic.



p=0.92) after introduction of the SDM pathway. Overall median survival was 34 months for those who did not have surgery; median was not reached for surgery group. For patients seen in the SDM clinic compared with those not seen in SDM clinic in 2020, there was no significant difference in overall survival (mean 33.2 months non-SDM and 30.0 months SDM, p=0.12). Median survival was not reached in either group. For the 25 patients seen in the SDM clinic, there was no difference in survival between patients who did and did not have surgery (mean 27.5 months without surgery, mean 31.2 months with surgery, p=0.22).

Twenty-five patients were formally seen in the SDM clinic in 2020. Fifteen out of 25 had elective surgery, 10/25 had planned non-operative management, of which one patient later underwent acute surgery, leaving nine patients managed non-operatively after SDM discussion. Two out of nine patients pursuing non-operative management died within 12 months of first MDM discussion and a further five patients had died at last follow-up. Causes of death were CRC-related (n=2), cerebrovascular accident (n=2), respiratory failure (n=1), cardiac failure (n=1) and unknown cause (n=1). One patient with significant multimorbidity and frailty who initially elected for non-operative management underwent emergency open right hemicolectomy for a bowel obstruction 10 months after MDM and died in hospital of heart failure 7 days post-operatively (355 DAOH from initial MDM).

Of the 15 patients who proceeded to elective surgery after the SDM clinic, seven patients had a right-sided colonic tumour, six patients had a left-sided colonic tumour, one patient had a rectal tumour and one patient had metastatic recurrence in the anterior abdominal wall. The median LOS was 8.9 days, median DAOH was 356 days (range 258–361 days). One patient in this group died within 12 months after undergoing a laparoscopic low anterior resection and loop ileostomy formation for rectal cancer followed by an 8-day post-operative hospital stay. Five unplanned re-admissions for high ileostomy output and cardiac disease resulted in an additional 16 days in hospital (333 DAOH), before the patient died of metastatic rectal cancer at home with palliative care support 357 days after the initial elective operation.

Discussion

This study demonstrates outcomes for older patients with CRC being considered for elective surgical management in a tertiary referral hospital in New Zealand before and after the introduction of an interdisciplinary SDM clinic. The results demonstrate a significant increase in non-operative management and deviation from MDM recommendation following introduction of the SDM clinic. This is the first report in published literature of an interdisciplinary SDM clinic specifically for older patients with CRC.

DAOH is a composite, patient-centred outcome measure describing a patient's journey from a point in time, encompassing hospitalisation and mortality. DAOH has been gaining traction in surgical literature,[11,12] and was chosen in this instance because of implications for mortality, quality of life impact and resource consumption. It can also be calculated retrospectively from routinely collected data in the New Zealand health system. Median DAOH was 6 days higher after introduction of the SDM clinic; this difference may have resulted from selecting fewer patients for surgery with multimorbidity and frailty, which are likely to increase all-cause hospital readmission rates and mortality. This is a clinically important difference; considering the absolute mortality rate is low, this indicates a significant reduction in hospital bed days for patients undergoing surgery after SDM pathway introduction, although an accurate cost analysis is beyond the scope of this study.

There is evidence that consideration of high-risk surgery in older adults may not follow SDM principles when consultation is with a surgeon alone, as surgeons focus on risk assessment and informing patients of risks rather than taking part in a values-based SDM process.[13] The addition of interdisciplinary specialists has potential to mitigate this. While a resource-intensive intervention, and while the current study does not include a cost–benefit analysis, there are significant potential cost savings from the SDM approach if major surgery is avoided in high-risk candidates at increased risk of complications and prolonged LOS. Rehabilitation needs can also be anticipated in advance, streamlining the post-operative pathway. Such a patient-centred, integrated approach also encompasses many aspects of tikanga Māori[14] and therefore may be more acceptable to Māori patients, who are known to suffer from numerous ethnicity-based health inequities.[15]

There was no statistically significant difference in post-operative mortality or survival on

Kaplan–Meier analysis after the introduction of the SDM clinic, but the study was not expected to demonstrate a difference in this metric due to total participant numbers and mortality being a rare event. A significant reduction in high-risk patients undergoing operative management leads the authors to hypothesise that patient selection for surgery was improved, with poorer candidates electing not to have surgery after SDM discussion. A larger study with statistical power to detect a true difference may help elucidate this. The high mortality rate prior to introduction of the SDM pathway should be noted; this was a driver for the quality improvement process.

A relatively small number of patients (n=25) were formally seen by an anaesthetist and/or geriatrician after the introduction of the SDM clinic. Because not all patients over 70 are seen, patient selection is reliant on the professional opinion of clinicians involved. However, the authors hypothesise that the benefit of the SDM pathway extends beyond those patients formally assessed, as the presence of an anaesthetist and geriatrician in the outpatient clinic alongside colorectal surgeons allows for *ad hoc* informal consultation. This discussion may result in formal SDM assessment, referral to another specialist and/or additional investigations. The senior clinicians involved have an excellent working relationship with free flow of information between them, and this working relationship itself may contribute to improved outcomes.

To maximise efficiency in a resource-constrained environment, MDM discussion for patients with new diagnoses of CRC in Waikato has historically occurred prior to colorectal FSA and therefore patient factors must be carefully considered when determining the final management plan in-clinic. Some patients must be re-discussed at the MDM if the optimal management pathway does not align with patient fitness and goals of care. It is likely that, with extensive values-based discussion and expert interdisciplinary consensus, good decisions are made in the SDM pathway, but this is reliant on the professional expertise of clinicians involved. Outcome assessment for patients managed non-operatively after SDM discussion found only 2/9 died of CRC-related causes. This suggests performing elective surgery would not have prolonged survival for at least 7/9 of these patients, irrespective of the occurrence of peri-operative complications, for which they would undoubtedly be a high-risk group. This provides some reassurance that patients are unlikely to be harmed by the shift to increased non-operative management.

There are important limitations of the study reported, and the findings associated with SDM pathway introduction cannot be claimed to be causative based on this retrospective, uncontrolled study. The implementation of the SDM clinic was driven by a desire to improve outcomes for older patients with CRC, and changes in care during the study period may have confounded the results. A new colorectal surgeon was employed in 2020, joining the four surgeons present in 2018. The average age of frailty onset has been reported as 69 years,[16] but younger patients with frailty and multimorbidity have been excluded from this study. There are other important measures of success, including patient-reported outcomes such as decision regret and patient satisfaction with the SDM process. Further studies must explore these areas. A randomised study would be practically challenging, and to deny patients access to an established SDM clinic could be seen as unethical, as there are no apparent objective detrimental effects for the patient in a patient-centred SDM approach.

Conclusions

An SDM approach to older patients with CRC being considered for surgical resection combining colorectal surgeons, anaesthetists and geriatricians in a single consultation is a feasible option in a tertiary referral centre in New Zealand. The introduction of an SDM clinic in Waikato was associated with increased rates of deviation from MDM recommendation towards non-operative management and increased DAOH in patients undergoing surgery. An interdisciplinary SDM approach may improve patient selection for surgical resection and should be considered by those treating high-risk older patients with CRC. Future work should focus on patient-reported outcomes for patients seen in the SDM clinic.

COMPETING INTERESTS

Nil.

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Cultural safety support and requirements for international medical graduates in Aotearoa New Zealand

Analee Toro, Gabrielle McDonald, Peter Crampton

ABSTRACT

WHĀINGA (AIM): To investigate the requirements for, and process of, cultural safety training for international medical graduates (IMGs) when seeking to gain registration in Aotearoa New Zealand.

TIKANGA (METHOD): To identify cultural safety standards and policies for IMGs: 1) a review of training policies of seven specialist colleges and other key organisations was carried out, and 2) four key informant interviews were conducted, and interviews were recorded and transcribed via Zoom. Thematic analysis was used to analyse the transcripts.

OTINGA (RESULTS): There are no mandatory requirements for IMGs to be trained in or to demonstrate cultural safety when applying for registration within the medical workforce of Aotearoa. There is limited support and training for IMGs in cultural safety. The themes identified from key informant interviews were: resource availability, cultural safety expectations for IMGs and education responsibilities.

WHAKAPAUNGA (CONCLUSION): To support the provision of high-quality care to communities throughout Aotearoa, it is essential that cultural safety training for IMGs is both mandatory and readily available.

Cultural safety is an essential component of high-quality, effective healthcare and is necessary if the health system is to achieve health equity for Māori.[1] Te Kaunihera Rata o Aotearoa (the Medical Council of New Zealand)[2] defines cultural safety as:

> *"The need for doctors to examine themselves and the potential impact of their own culture on clinical interactions and healthcare service delivery.*
>
> *The commitment by individual doctors to acknowledge and address any of their own biases, attitudes, assumptions, stereotypes, prejudices, structures and characteristics that may affect the quality of care provided.*
>
> *The awareness that cultural safety encompasses a critical consciousness where healthcare professionals and healthcare organisations engage in ongoing self-reflection and self-awareness and hold themselves accountable for providing culturally safe care, as defined by the patient and their communities." – Cultural Safety Statement, Te Kaunihera Rata o Aotearoa*

There are multiple concepts used when discussing this topic within literature, including cultural safety,[1,3–5] cultural competency[6–8] and cultural awareness.[9] Although these approaches have some similarities, there are differences between these terms in respect of how they are defined, interpreted and implemented. This paper will focus on the construct of cultural safety. The construct of cultural safety has had currency in Aotearoa since the 1980s. It is built on the foundations of an *"understanding of colonial history and a sense of how culture affects individuals and professional practice."*[10] Cultural safety is regarded as an essential pillar to support the provision of high-quality healthcare that benefits all patients. Cultural safety applies to all aspects of an individual's identity. However, in this paper we focus on cultural safety as it applies to healthcare provision to Māori individuals and whānau. There is limited existing literature regarding cultural safety training for international medical graduates (IMGs). Current literature primarily focusses on the importance of cultural safety in the provision of healthcare,[1,3,11] and the inclusion of cultural safety in health professional education.[12,13]

Both medical schools in Aotearoa include cultural safety within their curricula.[14,15] In 2022, 550 new medical graduates were registered and qualified to enter the medical workforce in Aotearoa from The University of Auckland and the University of Otago medical schools.[16] Medical education in Aotearoa aims to ensure that students graduate with relevant skills, knowledge and attitudes, including: *"Respect for, and an ability to respond to the cultural context and aspirations of patients, colleagues, other healthcare workers and communities,"*[17] and *"Explain the influence of one's own culture and that of the health system on health outcomes."*[18] Even though at least 90% of domestic graduates from the 2015, 2016, 2017 and 2018 graduate cohorts remained in the Aotearoa workforce for at least 5 years after initial registration,[16] Aotearoa is highly dependent on IMGs to sustain the medical workforce, with 42.7% of doctors being IMGs.[16] Aotearoa has the second-largest proportion of IMGs in the Organisation for Economic Co-Operation and Development (OECD),[19] and a high turnover, with just over 60% of IMGs leaving within 2 years of registering in Aotearoa.[16] Entry to medical practice in Aotearoa is regulated by Te Kaunihera Rata o Aotearoa, with specific requirements depending on the country of origin and the qualifications held by each IMG. Prospective IMGs are invited to use a "registration self-assessment tool" to "determine which pathway to registration you might be eligible for."[20] There are seven possible pathways for an IMG to gain general scope registration, and three possible pathways to gain vocational scope registration. Within these many possible pathways, the majority of IMGs are able to meet the requirements for fitness to register and to gain registration in Aotearoa with their existing qualifications.[21]

The aim of this research was to investigate the requirements for, and process of, cultural safety training for IMGs when seeking to gain registration in Aotearoa.

Methods

We acknowledge the impact our worldview has on the exploration and interpretation of qualitative research. The first author is a Māori medical student from Ngāruahine who is interested in the application of cultural safety in a clinical setting, and more generally, in the medical workforce of Aotearoa. Although she is at the beginning of her journey in medicine, she is committed to improving Māori health outcomes and advocating for hauora Māori. The second and third authors are Pākehā public health physicians who are committed to improving health outcomes for Māori, including through supporting policy and practice to develop a health workforce that meets the needs of Māori.

Te Kaunihera Rata o Aotearoa and medical colleges are integral to the process of gaining registration in Aotearoa as an IMG. The policies from selected medical colleges and Te Kaunihera Rata o Aotearoa were searched. The Royal New Zealand College of General Practitioners (RNZCGP), the Royal Australasian College of Physicians (RACP) and the Royal Australasian College of Surgeons (RACS) were selected for inclusion as they are the largest medical colleges in Aotearoa.[16] The Royal Australian and New Zealand College of Psychiatrists (RANZCP), the Australasian College for Emergency Medicine (ACEM) and the Royal Australian and New Zealand College of Obstetrics and Gynaecologists (RANZCOG) were also selected for inclusion because they are the colleges with the largest proportion of IMGs.[16] The policy review adopted a largely quantitative approach, focussing on the presence or absence of specific items found on the respective organisations' websites.

A review of the websites of Te Kaunihera Rata o Aotearoa and the medical colleges listed above was undertaken to identify relevant policies relating to cultural safety requirements and resources for IMGs. The search strategy included the following search terms: "overseas-trained doctor", "international doctor", "overseas-trained physician", "culturally safe", "training", "international medical graduate" and "culturally competent" and was conducted using the search function on each organisation's website. This initial search failed to produce any returns, so the search was widened to include any mention of cultural safety within published documents, continuing professional development (CPD) programmes and training curricula, and any other relevant material. The search strategy for the extended search included the following search terms: "cultural safety", "Māori health", "indigenous health", "New Zealand", "cultural competency", "cultural CPD" and "training", and was conducted using the search function on each organisation's website.

A further search was carried out using the search function on the website for Te Whatu Ora – Health New Zealand. The search terms used were: "IMG induction", "international medical graduate induction", "IMG", "international medical graduate", "induction", "cultural safety" and "cultural safety induction".

Key informant interviews were conducted by the first author to contextualise the policies in a clinical setting and to gain insights into their practical implications. Eight key informants were selected via purposive sampling. The specific institutions included were RACP, RNZCGP, RACS and Te Kaunihera Rata o Aotearoa. Two potential key informants were unavailable during the data collection period, and two potential key informants were not interviewed as they referred the researchers to individuals with specific IMG expertise within their organisations. All key informants who agreed to be interviewed were included. Interviews were conducted one-on-one; three were on Zoom and one was face-to-face. All interviews were recorded via Zoom. The average interview time was 25 minutes. Two of the participants were Māori and two were non-Māori. All participants were female and based in Aotearoa. The following broad topics were explored: Organisation policies to ensure cultural safety for IMGs; Available cultural safety guidance and training; Perceived attitudes of IMGs towards cultural safety training; The key informant's opinion regarding the next steps for cultural safety within their organisation. Analysis of the collected data used an experiential qualitative framework for thematic analysis to explore individual perspectives and understandings. The specific steps taken during analysis were data familiarisation, data coding, initial theme generation, theme development and review, and theme refining and naming. The Appendix contains the consolidated criteria for reporting qualitative research (COREQ) checklist criteria that was used to assist reporting.[22] Ethics approval was granted by the University of Otago Human Ethics Committee (Health) (D23/323).

Table 1: Policies included in the review of cultural safety training requirements for IMGs.

Organisation	Statement/ position of intent	Acknowledgement or commitment to Indigenous health	Cultural safety integration in training	Māori health strategy	CPD cultural safety requirements
The Royal New Zealand College of General Practitioners			Fellowship Pathway Regulations[23]	Māori strategy[24]*	Te Whanake[25†]
The Royal Australasian College of Physicians	RACP cultural safety standards[26]		Professional practice framework[27]	Indigenous strategic framework[28]	Professional practice framework[27]
The Royal Australasian College of Surgeons		Indigenous health position paper[29]	Surgical competence and performance framework[30]	Te Rautaki Māori – RACS Māori Health Strategy and Action Plan[31]	Continuing professional development (CPD) programme[32]
The Royal Australian and New Zealand College of Psychiatrists	Cultural safety[33]	Our commitment to Māori mental health[34] Recognising the siginificance of Te Tiriti o Waitangi[35]	2012 Fellowship program overview[36] Fellowship competencies[37]	Māori mental health[38]	CPD Programme Guide[39] Cultural safety and health equity in CPD[40]

Table 1 (continued): Policies included in the review of cultural safety training requirements for IMGs.

The Royal Australian and New Zealand College of Obstetrics and Gynaecologists	Cultural safety statement of intent[41]	RANZCOG reaffirms its commitment to Te Tiriti o Waitangi and equity of health outcomes[42]	Fellowship of RANZCOG Curriculum (after 1 Feb 2024)[43]		Updates to the RANZCOG CPD programme in 2024[44]
Australasian College for Emergency Medicine	Statement of culturally-competent care and cultural safety in emergency medicine[45]	Acknowledging Aboriginal and Torres Strait Islander peoples and Māori at college meetings and events[46]	FACEM (Fellowship ACEM) Training Programme Handbook[47]	Te Rautaki Manaaki Mana Strategy[48‡]	Approved cultural safety activities for CPD[49]
Organisation	**Statement/ position of intent**	**Acknowledgement or commitment to Indigenous health**	**Publication**	**Evaluation report**	
Te Kaunihera Rata o Aotearoa	Statement on cultural safety[2]	He Ara Hauora Māori: A Pathway to Māori Health Equity[50]	Cultural Safety Training Plan for Vocational Medicine in Aotearoa[51]	Evaluation report: "Welcome to practice in Aotearoa New Zealand" workshops for IMGs'[52]	

*Numbers in the table relate to references.
†CPD programme for the Royal New Zealand College of General Practitioners.
‡Māori health strategy for the Australasian College for Emergency Medicine.

Results

Policy review

The policy review resulted in a total of 32 papers and reports including peer-reviewed papers, continuing professional development (CPD) documents, fellowship training curricula, Māori strategy reports, evaluation reports and web pages. Table 1 provides a summary of documents that were discovered in the search.

Using the search function on the selected medical colleges' websites, a statement or position of intent regarding cultural safety was identified for four medical colleges[26,33,41,45] and could not be identified for the remaining two medical colleges. Using the same search function, an acknowledgement or commitment to Indigenous health was found on the websites of four medical colleges,[29,34,35,42,46] and could not be found on the websites of two medical colleges. The acknowledgements to Indigenous health that were identified contained statements such as:

> *"The College acknowledges Māori as Tangata Whenua and their unique rights under Te Tiriti o Waitangi and rights as Indigenous people under the United Nations Declaration on the Rights of Indigenous Peoples as adopted by the New Zealand Government in 2009." – RACS*[29]

The CPD requirements from five colleges required their members to complete cultural safety education or activities with varying stipulations regarding the hours required to satisfy the requirements.[25,27,32,44,49] The sixth college did not specify that their members complete cultural safety activities or education, and instead required their members to complete 12.5 hours of self-guided learning and educational activities.[39] However, there was no specific requirement for those activities to include cultural safety training or education.

Five colleges were found to have a "Māori Health Strategy" that outlined the organisation's plan to contribute to improving Māori health outcomes,[24,28,31,48] for example:

> *"Manaaki Mana is ACEM's commitment to achieving Pae Ora – excellence in emergency care for Māori patients, whānau and staff. This strategy provides practical ways for health equity to be delivered for Māori in emergency departments." – Te Rautaki Manaaki Mana Strategy, ACEM*[48]

> *"We are a long way from achieving health equity and understand that, in order to make significant change RACS will need to acknowledge and address the legacy of colonisation processes and the resultant racism and privilege at curricular and institutional levels. Te Rautaki Māori provides the mechanism to implement this." – Te Rautaki Māori, RACS*[31]

The fellowship training curricula from the six selected medical colleges were reviewed. Five medical colleges included cultural safety in some capacity within the training curricula.[23,27,30,43,47] Of these, three medical colleges included cultural safety as a key domain of professional practice, while ACEM required trainees to complete training modules,[47] and RNZCGP stated that cultural safety was a general requirement.[23] There was no mention of cultural safety in RANZCP's fellowship training curricula.[36,37]

A search of the website of Te Kaunihera Rata o Aotearoa identified four key documents. 1) A statement on cultural safety, which outlines the definition of cultural safety and sets cultural safety standards for all doctors who practise in Aotearoa;[2] 2) *He Ara Hauora Māori: A pathway to Māori Health Equity*, which was released alongside the statement on cultural safety to provide guidance for practitioners and healthcare organisations to support achieving Māori health equity, and a rationale for addressing Māori health;[50] and 3) a workshop called "Welcome to practice in Aotearoa New Zealand", which was run in May 2022, aiming to "*introduce recently registered IMGs to Council's standards on professionalism, cultural safety and health equity within the Aotearoa New Zealand context*." The workshop was reported to be "*useful in educating IMGs on key aspects of good practice and cultural safety in the Aotearoa New Zealand context*." The final key document identified on the Te Kaunihera Rata o Aotearoa website was the *Cultural Safety and Training Plan for Vocational Medicine in Aotearoa*, which was launched by Te Kaunihera Rata o Aotearoa and was informed by the *Literature and Environmental Scan of Cultural Safety in Medical Training*.[53] The purpose of this document was to assist medical colleges in the "*development of high quality training for registrars and CPD packages for fellows*."[51]

The search of the website of Te Whatu Ora – Health New Zealand returned no results outlining any standardisation of cultural safety training and induction for IMG employees. There appear to be no cultural safety requirements within the registration process.

Key informant interviews

Eight individuals were contacted and invited to participate in the study. Four accepted; two from the Royal Australasian College of Physicians and two from Te Kaunihera Rata o Aotearoa. All four key informants held positions either within the organisation's administration, or with direct involvement in IMG assessment and/or admission within their respective organisation. Key informants participated in the interview representing their own views, bringing their varied backgrounds and experiences to provide insights. The three major themes identified from key informant interviews were: resource availability, cultural safety expectations for IMGs and education responsibilities.

The first key theme identified from key informant interviews was the resources available for IMGs when they are moving to practise in Aotearoa. All key informants spoke about the e-modules and other courses that are recommended by their organisations. Additionally, three key informants questioned the efficacy of course-based learning for cultural safety.

> *"You can do courses all you like but does it change your practice? I think that might be part of the dichotomy that I often see. 'I've done my course, tick.' But how do you know that translates into real practice changed at the bedside."*

> *"A course does not change behaviour. A course does not change your attitude or how you look at your own bias."*

The second theme was the key informants' opinions regarding their organisation's cultural safety expectations for IMGs. Cultural safety is stated as a supervision requirement expected by Te Kaunihera Rata o Aotearoa. In reference to this, one key informant described the "*high-trust model*" used for "*the supervisors and their IMGs*," which enables supervisors to report on the progress of their IMG supervisee without direct oversight from Te Kaunihera Rata o Aotearoa.

> *"We have to accept what the supervisor says, and often there's not a lot of information. Sometimes it's just satisfactory, or making progress, or is fine."*

A key informant from the Royal Australasian College of Physicians highlighted an existing mandatory requirement for prospective IMGs to complete a cultural safety course or educational component. One informant also stated the view that there has been progress in recent years in relation to cultural safety training:

> *"When I first started on the committee there was absolutely no requirements for cultural safety to obtain vocational registration in New Zealand. But we've introduced that over the last few years."*

The third theme identified from key informant interviews referred to educational responsibilities. When asked about the educational responsibilities of their organisation, a key informant from Te Kaunihera Rata o Aotearoa outlined the role of the organisation as "*protecting the safety of the public by regulating the training and standards about which doctors practice*." The role of medical colleges was reported to be "*providing specialist training and facilitating CPD*," placing the role of educator with the employer. Three key informants indicated the employer is responsible for ensuring employees access and complete cultural safety training beyond CPD requirements.

> *"[Te Kaunihera Rata o Aotearoa] isn't the educator. We would expect [doctors] to go to their employer [for cultural safety education]."*

> *"The onus is on the employer and the supervisors to ensuring that the doctor completes the workshops on cultural safety and the Treaty."*

In addition to these three major themes, one key informant highlighted the equal importance of clinical skills and cultural safety skills while mentioning the moral and ethical difficulties that can occur when attempting to recruit and maintain a medical workforce. The pressure to recruit essential doctors to work in the health system in Aotearoa can result in the reduction of cultural safety standards for practitioners.

> *"I understand that we do need a workforce. Alongside that though, there is an obligation to have clinicians who are clinically experts and culturally experts because the two are not separate."*

Discussion

This study reviewed seven organisations' policies on cultural safety and utilised key informants to gather information about the cultural safety support and requirements for IMGs when attempting to gain registration in Aotearoa. It was found that each of the medical colleges included had varying approaches to the inclusion of cultural safety within their policies, and there were no requirements for an IMG to demonstrate cultural safety prior to gaining registration in most circumstances. Furthermore, there was a paucity of research investigating the IMG experience of cultural safety training and the integration of cultural safety for IMGs.

The health system does not consistently ensure that IMGs have adequate cultural safety training before commencing practice, beyond the standard CPD requirements that are expected of Aotearoa-trained practitioners. Additionally, given the low retention rates of IMGs, some practitioners may not remain in Aotearoa for the complete medical college CPD cycle. We were not able to identify evidence of policies that required IMGs to learn about or demonstrate cultural safety while attempting to gain registration in Aotearoa. Additionally, an IMG could expect to experience different requirements for cultural safety training and competence depending on their particular medical college. These differences include the requirement to complete a cultural safety course, CPD programmes and fellowship training curricula.

Three key informants assigned the responsibility of cultural safety training to employers. However, the primary accountabilities for cultural safety education remains largely undefined and unclaimed. As Te Kaunihera Rata o Aotearoa is the governing body, with a defined responsibility to accredit and ensure education standards are upheld, it would be inappropriate for Te Kaunihera Rata o Aotearoa to facilitate training or education beyond pilot programmes such as "Welcome to practice in Aotearoa New Zealand"[52] workshops for IMGs. However, as a governing body responsible for accrediting facilities and programmes, there is potential scope for Te Kaunihera Rata o Aotearoa to require existing programmes to increase cultural safety education. Medical colleges are reported as being responsible for maintaining CPD standards for their members and providing specialist training. There is a potential for cultural safety training to be integrated into the responsibilities of medical colleges or employers that should be explored further.

As there appears to be no cultural safety requirements within the registration process, a prospective IMG may infer that cultural safety is not valued as highly as clinical expertise and experience. IMGs cannot be expected to understand the importance and significance of cultural safety within the healthcare system of Aotearoa if it is not set as a clear expectation from the beginning of the process to gain registration in Aotearoa and without the necessary learning/training resources to support them. The Te Whatu Ora – Health New Zealand *Health Workforce Plan 2023/24* recommends Aotearoa recruit around 300 full-time equivalent (FTE) international doctors and retain 100 international FTE, along with other domestic measures, to close the current medical workforce gap by 2030.[54] A medical workforce in Aotearoa without IMGs is not predicted to occur in the foreseeable future, and therefore strong and consistent policies that include the training requirements of IMGs are required to ensure the cultural safety of the medical workforce.

This study built on the existing cultural safety literature[1,3–5] by investigating cultural safety education in the context of IMGs. We found there is limited and varied support for the provision of cultural safety proficiency and education for IMGs. In keeping with the existing literature, we found that cultural safety is viewed as being important in general, as evidenced by the inclusion of cultural safety policies by all organisations investigated.

A limitation of this study is that policies could only be included if they were publicly available; there may be relevant material not in the public domain that has been missed from the policy review. We did not approach colleges or their representatives to enquire about information on available cultural safety training and requirements for IMGs. Further information may have been made available to us had we done so. Eight interview invitations were sent out to key informants representing four different organisations. However, only four people from two institutions agreed to be interviewed, and as a result the breadth and depth of data may have been more limited than would have been the case with a larger sample. Additionally, there might be significant differences between Te Kaunihera Rata o Aotearoa and college key informants that we could not determine due to the small number of interviews.

We recommend that Te Kaunihera Rata o Aotearoa, medical colleges and employers consider implementing the following changes:

1. Te Kaunihera Rata o Aotearoa and medical colleges should develop a specific policy outlining cultural safety expectations for IMGs. An IMG should be able to easily view these expectations when researching the requirements to gain registration in Aotearoa.
2. Te Kaunihera Rata o Aotearoa and medical colleges should integrate cultural safety standards and training into the existing registration pathways for IMGs.
3. The responsibility for the provision of standardised cultural safety induction and training should be clearly defined. The expectations and guidelines for the organisation(s) assigned the responsibility of cultural safety education should be outlined and monitored by Te Kaunihera Rata o Aotearoa.

These proposed changes are a starting point but are not exhaustive, as we expect there are other improvements to be made to ensure IMGs are sufficiently supported to provide high-quality, culturally safe care to all communities in Aotearoa. It is essential that further research is conducted to gather data from IMGs regarding their experiences within the system to inform the development of future policies, workshops and training resources to support IMGs in developing their cultural safety.

In conclusion, to support the provision of high-quality care to communities throughout Aotearoa it is essential that cultural safety training for IMGs is both mandatory and readily available.

COMPETING INTERESTS
Nil.

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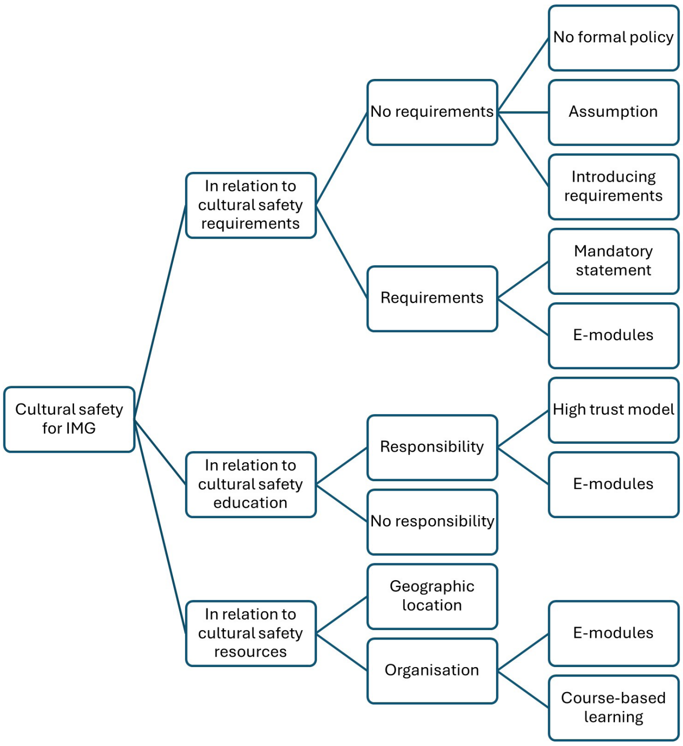
Appendix

Appendix Table 1: Consolidated criteria for reporting qualitative research (COREQ): 32 item checklist.

COREQ: 32 item checklist	
1. Interviewer/facilitator	Analee Toro
2. Credentials	University of Otago Medical Student (Second year)
3. Occupation	Student
4. Gender	Female
5. Experience and training	The researcher had little prior experience in qualitative research but was trained and supervised in this research to facilitate her learning and promote good research practice.
6. Relationship established	Prior relationships were not established prior to the research as part of the research protocol. However, by chance, two of the participants were known to one or more of the research team.
7. Participant knowledge of the interviewer	All participants hold prominent roles within medical colleges or the Medical Council of New Zealand (MCNZ) and therefore are likely to value cultural safety.
8. Interviewer characteristics	The interviewer is a Māori medical student from Ngāruahine who is interested in the application of cultural safety in a clinical setting and, more generally, in the medical workforce of Aotearoa. Although she is at the beginning of her journey in medicine, she is committed to improving Māori health outcomes and advocating for hauora Māori.
9. Methodological orientation and What methodological orientation was stated to underpin the study? e.g., grounded theory	A realist/experiential qualitative framework underpinned the study.
10. Sampling	Purposive selection
11. Method of approach	Participants were approached via email.
12. Sample size	Four
13. Non-participation	Four, reasons for non-participation was unavailability within required timeframe and referral to more appropriate key informants.
14. Setting of data collection	One interview was conducted face-to-face. Three interviews were conducted during work hours online.
15. Presence of non-participants	Only the participant and the researcher were present.

Appendix Table 1 (continued): Consolidated criteria for reporting qualitative research (COREQ): 32 item checklist.

16. Description of sample (Demographic data, date etc.)	Key informant 1. Female, Māori, December 2023 Key informant 2. Female, Māori, December 2023 Key informant 3. Female, Pākehā, December 2023 Key informant 4. Female, Pākehā, December 2023
17. Interview guide	General topics explored • IMG specific organisation policies to ensure cultural safety? • Cultural safety guidance and training available? • Perceived attitude of IMGs towards additional cultural safety training? • Opinion of next steps for the organisation in terms of cultural safety? • Is there anything else I should know about regarding IMGs and cultural safety?
18. Repeat interviews	No
19. Audio/visual recording	Visual recording (via Zoom recording)
20. Field notes	No
21. Duration	Interview 1: 22min, Interview 2: 14min, Interview 3: 40min, Interview 4: 23min
22. Data saturation	No
23. Transcripts returned	No
24. Number of data coders	One
25. Description of the coding tree	

Appendix Table 1 (continued): Consolidated criteria for reporting qualitative research (COREQ): 32 item checklist.

26. Derivation of themes	Themes were derived from the data.
27. Software	Microsoft Word
28. Participant checking	No
29. Quotations presented	Quotations were presented, quotations were not identified (e.g., Participant number).
30. Data and findings consistent	Data and findings were consistent.
31. Clarity of major themes	The themes identified from key informant interviews were: resource availability, cultural safety expectations for IMGs and education responsibilities.
32. Clarity of minor themes	Minor themes reported include: efficacy of course-based learning for cultural safety, recruitment and maintenance of the medical workforce.

The New Zealand Ministry of Health indicators for inpatient stroke care: results from an Auckland hospital

Zofia E Karasinska-Stanley, Kalpa Jayanatha, Edward Wong, Arindam Kar

ABSTRACT

AIM: New Zealand's Ministry of Health sets three quality metrics for inpatient stroke care: admission to an organised stroke unit within 24 hours (target 80%), appropriate use of reperfusion therapy (target 12% for ischemic stroke) and transfer to rehabilitation services within 7 days (target 80%). Our aim was to evaluate a large Auckland tertiary hospital's performance against these indicators.

METHODS: A retrospective study of 200 consecutive stroke patients admitted between April 4 and August 1, 2021, was conducted.

RESULTS: Fifty percent (100/200) of patients were admitted to the stroke unit within 24 hours. Sixteen point six percent (27/183) of ischaemic stroke patients received reperfusion therapy. Twenty-four point five percent (49/200) were transferred to rehabilitation services, of which 40.8% (20/49) were within 7 days of presentation. Patients were less likely to be admitted to the stroke unit within 24 hours if not admitted by the stroke service, if admitted out-of-hours or if suffering an inpatient stroke. Timely admission to the stroke unit was associated with receipt of reperfusion therapy, shorter time to inpatient rehabilitation transfer and shorter duration of admission. Patients with inpatient stroke were less likely to be discharged in a timely manner (adjusted hazard ratio [HR] 0.19; 95% CI 0.07–0.50). All-cause mortality during a hospitalisation episode with a stroke diagnosis was likely to occur early in the admission (adjusted HR 1.82; 95% CI 1.01–3.32).

CONCLUSIONS: The hospital met the reperfusion therapy target but fell short on timely stroke unit admission and rehabilitation transfer. An after-hours effect on stroke unit admission was observed, previously undocumented in New Zealand.

In New Zealand, the National Stroke Network was formed in 2011 as a joint initiative between the Ministry of Health (MoH) and the Stroke Foundation to implement clinical guidelines for stroke management. Based on this, the MoH stipulates three quality metrics as benchmarks to evaluate inpatient delivery of care.[1]

Targets are set for admission to an organised stroke unit (80% within 24 hours of presentation), appropriate use of reperfusion therapy (12% of patients with ischaemic stroke) and early transfer to rehabilitation services (80% within 7 days of admission).

It is known that there exist significant regional variations in access to stroke care in New Zealand, inclusive of the three interventions selected as indicators by the MoH.[2,3] Earliest data are from a national audit in 2008, predating the MoH targets.[2] While they provide a baseline for comparison, the landscape of acute stroke care has changed radically since then, with widened thrombolysis windows, introduction of percutaneous stroke intervention and increased availability of stroke units and inpatient rehabilitation services.

Since 2015, hospitals have been mandated to prospectively enter all reperfusion patients into a National Stroke Register. The most recently published data from this register suggest that the MoH reperfusion metric is being met.[4] It is more challenging to assess how well the other two metrics have performed, with no published literature specifically addressing the successes or challenges of hospitals in meeting these targets.

Some insight may be gained from data prospectively collected from the nation-wide observational study REGIONS Care in 2018, which suggests a shortfall in the domain of inpatient rehabilitation, quoting 51.4% of New Zealand Europeans as accessing this within 7 days compared with 49.4% of New Zealand Māori.[5] The same paper demonstrates differences in stroke unit access, but does not comment on admission within 24 hours.

While each secondary care stroke unit submits quarterly performance reports to the government, these are not in the public domain. In their absence, it is challenging to assess both the delivery of acute stroke care in New Zealand and the utility of the stroke indicators as a measure of performance.

This study aims to assess the performance of a large tertiary hospital in Auckland with respect to the three MoH indicators, specifically whether the recommended targets were met. Where unmet, this study aims to explore possible reasons using admission events and qualitative data, where available, in order to understand the challenges of stroke care in the hospital.

Methods

Ethics approval was granted by the Auckland Health Research Ethics Committee (AH23984). Locality approval was granted by Health New Zealand – Te Whatu Ora. The clinically significant differences between the achieved and MoH indicator percentages were deemed to be 10% for stroke unit admission within 24 hours, 6% for appropriate reperfusion therapy for ischaemic stroke and 20% for rehabilitation service within 7 days. Effect sizes, estimated using Cohen's h, were 0.232, 0.213 and 0.442 for the three indicators, respectively.

Sample size calculations using the single proportion method yielded estimates of 145, 174 and 40 patients for the three indicators, respectively. Based on these calculations and clinical experience, a study sample size of 200 patients was chosen. Two hundred consecutive patients with a coded discharge diagnosis of stroke admitted to a large tertiary hospital in Auckland between 4 April 2021 and 1 August 2021 were included in the study.

The International Classification of Diseases (ICD) codes of I61 "non-traumatic intracerebral haemorrhage", I63 "cerebral infarction" and I64 "stroke, not specified as haemorrhage or infarction" were used to classify eligible cases.[6] Cases were excluded if they did not represent the index event, if the actual diagnosis as determined by review of discharge paperwork and investigations was not an acute stroke or if the patients were out-of-area and thus not eligible for funded rehabilitation.

The time frame was chosen to avoid periods of national and regional COVID-related lockdowns. The study utilised routinely collected electronic admission and discharge data that were de-identified and encrypted. Ethnicity was self-determined, and patients were grouped based on Statistics New Zealand prioritisation as New Zealand European or Other, Māori, Pacific, or Asian.[7] Data extraction was performed by the study investigators.

Categorical variables are presented as absolute numbers with percentages. Continuous variables are presented as means with standard deviations for data drawn from Gaussian distributions or medians with lower and upper quartiles for non-Gaussian data. Comparison of differences between continuous variables drawn from non-Gaussian distributions was performed using the Mann–Whitney U test for two groups and the Kruskal–Wallis test for three or more groups. A significance level (α) of less than 0.05 was deemed to be statistically significant.

Clinically relevant explanatory variables were manually selected for Cox proportional-hazards regression analysis. Assessments for interaction terms, violation of the proportional-hazards assumption and time-dependent covariates were completed prior to the development of a Cox proportional-hazards model for the end point of time to hospital discharge.

All statistical analyses were performed in the R programming language (version 4.0.3) using the RStudio (version 2023.06.1+524) integrated development environment with relevant compiled packages from The Comprehensive R Archive Network.

Results

The characteristics of the study cohort are presented in Table 1. The demographic data suggest proportionally higher rates of stroke in Māori and Pacific peoples than might be expected from Census data, which is in keeping with previous research findings that age-standardised rates of stroke are 30–60% higher in these ethnicities.[4,8–10]

The proportion of patients that received reperfusion therapy for ischaemic stroke achieved the MoH stroke indicator; however, the indicators of stroke unit admission within 24 hours and transfer to rehabilitation facility within 7 days were not achieved (Table 2). Fifty percent of stroke patients (100/200) were admitted to the stroke unit within 24 hours. Comparisons between the patients that were and were not admitted to the stroke unit within 24 hours are presented in Table 3.

In total, 49/200 patients (24.5%) proceeded to inpatient rehabilitation for ongoing care. Of these patients, 20/49 (40.8%) were transferred within the target of 7 days from initial presentation (Table 2). Comparisons between the patients that were and were not transferred to inpatient rehabilitation within 7 days are presented in Table 4. A review of free-text response comments by rehabilitation services to electronic referrals suggested some possible reasons for delays in transfer of patients to inpatient rehabilitation (Figure 1).

There was no association between ethnicity, gender or age and the achievement of the MoH stroke indicators of admission to the stroke unit within 24 hours, receipt of reperfusion therapy for ischaemic stroke or transfer to inpatient rehabilitation within 7 days. The Cox proportional-hazards model (Table 5) for time to all-cause discharge revealed that patients with inpatient stroke were more likely to spend time in hospital (all-cause discharge adjusted hazard ratio [HR] 0.19; 95% confidence interval [CI] 0.07–0.50) (Figure 2). All-cause mortality during a hospitalisation episode with a stroke diagnosis was likely to occur earlier during admissions (all-cause discharge adjusted HR 1.82; 95% CI 1.01–3.32) (Figure 3).

Discussion

The MoH stroke indicator for reperfusion therapy was met, which corroborates the locally reported National Stroke Register data.[4] The MoH stroke indicators of admission to the stroke unit within 24 hours of presentation and transfer to inpatient rehabilitation within 7 days of hospitalisation were not met. The proportion of stroke patients (40.8%) transferred to inpatient rehabilitation within 7 days during the study period was less than that documented by Thompson et al. in 2022 (51.4%).[5]

Some studies have reported possible ethnicity-based inequities in access to key stroke interventions and stroke outcomes in New Zealand; however, this study does not show an association between ethnicity and the achievement of the MoH stroke indicators.[5,8] Thematic analysis of the results of this study raises the possibility of an after-hours effect that may contribute to delayed admission to the stroke unit.

During the period these data were collected, the stroke service ran in-hours between 8 am and 4 pm, Monday through Friday. Within these hours, any acute stroke patient would be seen by a stroke consultant, registrar and clinical nurse specialist, and would be admitted directly under the stroke service if appropriate. After-hours, the patient would be seen by a medical registrar and admitted under a general medicine team. This study shows an association between presentation to hospital during standard working hours, as well as review by the stroke team at the time of presentation, with increased likelihood of admission to the stroke unit within 24 hours (Table 3).

While there is evidence that stroke unit care reduces disability and mortality when compared with general medical wards, regardless of patient age, gender and type or severity of stroke, it is likely that a portion of stroke care will inevitably fall to other medical services within the current resource constraints of the health system.[11] This study adds to the body of literature relating to the after-hours effect in secondary care and provides the first example of this phenomenon in a cohort of stroke patients in New Zealand. However, targeted research is required to explore the existence, causes and ramifications of this possible after-hours effect in stroke care.[12]

The use of quantitative targets has been a key aspect of quality improvement measures in healthcare—as such, there has been much discussion of the pros and cons of this approach.[13] Our study adds to this discussion by identifying possible sub-groups of stroke patients that may complicate the interpretation of the MoH stroke indicators. One such sub-group might be patients who experience an inpatient stroke, which appears to be associated with prolonged hospitalisation (Figure 2). It is unclear whether this reflects a unique set of clinical circumstances or, alternatively, whether it is prognostic in itself.

Other sub-groups that might be less likely to be admitted to the stroke unit within 24 hours may include stroke patients with minor neurological deficits, stroke patients with significant neurological deficits or those with complex comorbidities requiring care under specialist services. Unfortunately, this study was unable to explore associations between the National Institutes of Health Stroke Scale (NIHSS), modified Rankin Score (mRS), admission residence and comorbidities with the three MoH stroke indicators.

The results of this study suggest that patients are more likely to be transferred to rehabilitation services within 7 days if admitted to the stroke unit within 24 hours. However, this difference in transfer to rehabilitation may reflect selection bias for stroke unit admission in favour of patients who are candidates for reperfusion therapy or those with higher potential for neurological recovery. This may also explain the finding that patients admitted to the stroke unit in under 24 hours appear to have a shorter total duration of hospitalisation.

The reasons for delayed transfer to inpatient rehabilitation are further complicated by other interdependent factors, which include the referring team (e.g., timeliness of referral), the accepting service (e.g., workforce and bed capacity) and fluctuations in the course of a patient's illness. Further research into enablers and barriers to rehabilitation transfer following stroke is required, which should include clinical variables such as residence at time of admission, stroke severity (NIHSS), functional status (mRS), comorbidities, bed availability and staffing.

This study has multiple weaknesses, including single-centre origin, retrospective observational nature and missing clinically significant variables, such as NIHSS, mRS, comorbidities and residence at the time of admission. There is the possibility of type I error inflation through multiple statistical testing and the small sample size may potentiate type II error. Interpretation of the analyses are limited to the variables in the dataset; there are likely unmeasured variables that may affect the interpretation and generalisability of the results of this study.

In summary, this study corroborates the locally submitted National Stroke Register data for the MoH stroke indicator of reperfusion therapy for ischaemic stroke, which was met during the study period. Patients admitted to the stroke unit within 24 hours were more likely to have had reperfusion therapy, shorter time to rehabilitation transfer and shorter duration of admission; however, it is unclear whether this reflects patient selection, inpatient care received or a combination of the two.

The findings of this study suggest that inpatient stroke may be associated with longer duration of admission, and that if mortality occurs during an admission with a stroke, it may happen relatively soon after the stroke event. This is the second study in New Zealand to document non-achievement of the MoH stroke indicator for transfer to inpatient rehabilitation within 7 days of admission.[5] Finally, this is the first study in a stroke cohort in New Zealand to suggest the possibility of an after-hours effect with regard to delayed admission to the stroke unit.

Table 1: Demographic characteristics of the study cohort (N=200).

Variables	Categories	Results
Gender (n/200) (%)	Female	108 (54)
Ethnicity (n/200) (%)	New Zealand European/Other	75 (38)
	Māori	34 (17)
	Pacific	68 (34)
	Asian	23 (12)
Age (years)	Median (IQR)	72.3 (60.5–82.6)
	Mean (SD)	70.4 (55.4–85.4)
	Minimum	20.9
	Maximum	98.6
Type of stroke (n/200) (%)	Ischaemic	163 (82)
	Haemorrhagic	37 (18.5)
Inpatient events (n/200) (%)	-	8 (4.0)

IQR = interquartile range; SD = standard deviation.

Table 2: Comparison of achieved to benchmark standards for the three MoH stroke indicators.

Indicator	Proportion achieving indicator (n/N)	Proportion of MoH indicator	Difference in proportion (95% CI)	P-value
Admission to the stroke unit within 24 hours	0.50 (100/200)	0.80	-0.30 (-0.39–0.21)	<0.001
Reperfusion therapy for ischaemic strokes	0.17 (28/167)	0.12	+0.05 (-0.03–0.12)	0.215
Transfer to rehabilitation within 7 days	0.41 (20/49)	0.80	-0.39 (-0.57–0.21)	<0.001

MoH = Ministry of Health; CI = confidence interval.

Table 3: Comparison between patients admitted to the stroke unit within 24 hours (stroke unit <24h) and patients not admitted to the stroke unit within 24 hours (stroke unit >24h).

Variables	**Categories**	**Stroke unit <24h (n/100) (%)**	**Stroke unit >24h (n/100) (%)**	**Point estimate (95% CI)**	**P-value**
Gender	Female	57 (57)	51 (51)	-0.06 (-0.20–0.08)	0.413
Ethnicity	New Zealand European/Other	36 (36)	39 (39)	0.03 (-0.16–0.10)	0.774
	Māori	19 (19)	15 (15)	-0.04 (-0.14–0.06)	
	Pacific	32 (32)	36 (36)	0.04 (-0.17–0.09)	
	Asian	13 (13)	10 (10)	-0.03 (-0.12–0.06)	
Median age (years) (IQR)	-	70.4 (60.5–82.0)	73.4 (60.6–82.7)	3.0 (-2.40–5.96)	0.103
Type of stroke	Ischaemic	83 (83)	81 (81)	-0.02 (-0.13–0.09)	0.602
	Haemorrhagic	17 (17)	19 (19)	0.02 (-0.13–0.09)	
Inpatient event	Yes	0 (0)	8 (8)	0.08 (-0.13–-0.03)	0.006
Admission specialty	Stroke	61 (61)	28 (28)	-0.33 (-0.46–0.20)	<0.001
	General medicine	39 (39)	60 (60)	0.21 (-0.35–-0.07)	
	Other	0 (0)	11 (11)	0.11 (-0.17–-0.05)	
Stroke takeover	Yes	38/39 (97)	30/71 (42)	-0.55 (-0.68–-0.43)	<0.001
In-hours admission	Yes	50 (50)	33 (33)	-0.17 (-0.30–-0.04)	0.018
Median duration of hospitalisation (hours) (IQR)	-	136.2 (96.3–184.6)	168.2 (96.7–278.1)	32.0 (0.9–58.9)	0.003
Reperfusion therapy	Yes	26/83 (31)	1/80 (1)	-0.30 (-0.40–-0.20)	<0.001
Inpatient rehabilitation	Yes	32 (32)	17 (17)	-0.15 (-0.27–-0.03)	0.012
Death	Yes	5 (5)	18 (18)	0.13 (-0.22–-0.04)	<0.001

CI = confidence interval; IQR = interquartile range.

Table 4: Comparison between patients transferred to inpatient rehabilitation within 7 days (rehab <7 days) and those not transferred within 7 days (rehab >7 days).

Variables	Categories	Rehab <7 days (n/20) (%)	Rehab >7 days (n/29) (%)	Point estimate (95% CI)	P-value
Gender	Female	9 (45)	16 (55)	0.10 (-0.39–0.18)	0.579
Ethnicity	New Zealand European/Other	6 (30)	8 (28)	-0.02 (-0.28–0.23)	0.972
	Māori	2 (10)	3 (10)	0.00 (-0.18–0.17)	
	Pacific	10 (50)	14 (48)	-0.02 (-0.30–0.27)	
	Asian	2 (10)	4 (13)		
Median age (years) (IQR)	-	68.0 (56.6–73.1)	72.3 (62.7–81.1)	4.3 (-1.1–15.7)	0.053
Type of stroke	Ischaemic	17 (85)	21 (72)	-0.13 (-0.35–0.10)	0.501
	Haemorrhagic	3 (15)	8 (27)	0.13 (-0.35–0.10)	
Inpatient event	Yes	0 (0)	1 (3)	0.03 (-0.10–0.03)	0.433
Admission specialty	Stroke	14 (70)	14 (48)	-0.22 (-0.49–0.05)	0.306
	General medicine	6 (30)	14 (48)	0.18 (-0.45–0.09)	
	Other	0 (0)	1 (3)	0.03 (-0.10–0.03)	
Stroke takeover	Yes	6 (30)	15 (51)	0.22 (-0.49–0.05)	0.087
In-hours admission	Yes	8 (40)	13 (44)	0.05 (-0.33–0.23)	0.564
Admission to the stroke unit within 24h	Yes	18 (80)	14 (48)	-0.42 (-0.64–-0.19)	0.007
Median duration of hospitalisation (hours) (IQR)	-	136.2 (96.3–148.7)	238.4 (203.7–328.8)	102.2 (86.0–163.0)	<0.001
Reperfusion therapy	Yes	4/17 (23)	2/21 (9)	-0.14 (-0.38–0.10)	0.259
Median time from admission to rehabilitation referral (hours) (IQR)	-	83.6 (54.6–100.1)	146.1 (99.5–193.9)	62.5 (31.4–104.1)	<0.001

CI = confidence interval; IQR = interquartile range.

Table 5: Cox proportional-hazards model for time to all-cause discharge.

Variables	**Categories**	**Adjusted HR (95% CI)**	**P-value**
Patients in model, N	-	200	-
Events, N	-	200	-
Ethnicity	New Zealand European/ Other	1	
	Māori	0.95 (0.57–1.60)	0.857
	Pacific	0.78 (0.52–1.19)	0.255
	Asian	0.91 (0.54–1.54)	0.724
Age	<75 years	1	
	>75 years	0.72 (0.50–1.04)	0.082
Gender	Male	1	
	Female	1.08 (0.80–1.48)	0.611
Inpatient event	-	0.19 (0.07–0.50)	<0.001
Type of stroke	Ischaemic	1	
	Haemorrhagic	0.76 (0.51–1.13)	0.177
Admission specialty	General medicine	1	
	Stroke	0.97 (0.66–1.42)	0.873
	Other	0.48 (0.19–1.17)	0.104
Discharge specialty	General medicine	1	
	Stroke	1.40 (0.63–3.09)	
	Other	0.99 (0.48–2.06)	
Stroke unit admission	-	0.66 (0.32–1.36)	0.254
Stroke unit admission within 24h	-	1.33 (0.89–2.00)	0.161
Weekend admission	-	0.85 (0.54–1.35)	0.494
Friday admission	-	0.84 (0.53–1.33)	0.451
In-hours admission	-	0.88 (0.59–1.30)	0.528
Reperfusion therapy	-	1.17 (0.72–1.90)	0.522
Inpatient rehabilitation	-	0.72 (0.50–1.04)	0.076
Mortality	-	1.82 (1.01–3.32)	0.049

Model performance parameters: concordance=0.663 (standard error=0.024), likelihood ratio=57.47 on 16=8 degrees of freedom [DF] (p<0.001), Wald test=43.32 on 18 DF (p<0.001, and score (Log-Rank) test=47.81 on 18 DF (p<0.001).
HR = hazard ratio; CI = confidence interval.

Figure 1: Possible reasons for transfer to inpatient rehabilitation >7 days based on rehabilitation service responses to referrals (n=29).

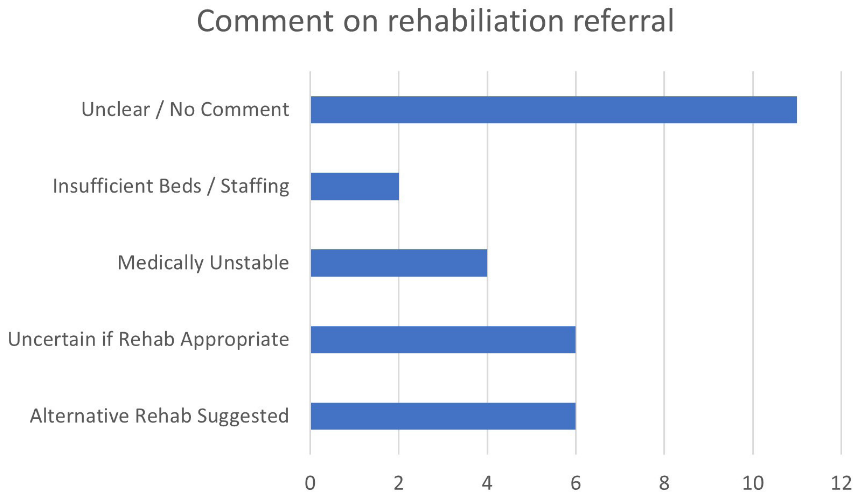


Figure 2: Adjusted Cox proportional-hazards curve for time to all-cause discharge subset by inpatient stroke.

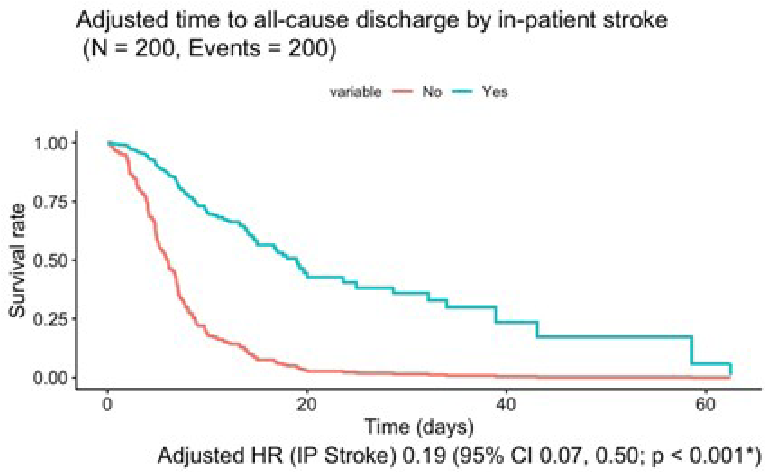
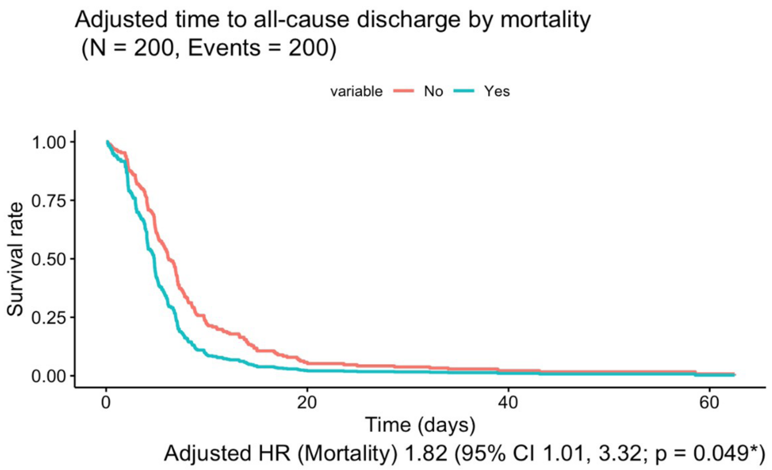


Figure 3: Adjusted Cox proportional-hazards regression curve for time to all-cause discharge subset by mortality.



COMPETING INTERESTS

Nil.

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Key factors related to happiness and anxiety in Aotearoa New Zealand during the COVID-19 pandemic

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ABSTRACT

AIM: Mental wellbeing has been one of the most prominent health concerns in Aotearoa New Zealand and has only been exacerbated by the COVID-19 pandemic. Here we explored factors associated with anxiety and happiness in a mid-pandemic climate in Aotearoa.

METHODS: Analyses were performed on the anxiety and happiness scores from the wellbeing survey in December 2020 (Statistics NZ Tatauranga Aotearoa; 30,000 responders contacted for the *Household Labour Force Survey*). Correlations and general linear models were used to identify significant predictor variables related to anxiety and happiness scores.

RESULTS: A number of factors correlated with both anxiety and happiness, including loneliness, physical health, family wellbeing, financial wellbeing, age and gender. After controlling for many ethnically stratified social burdens, Māori and Pacific populations demonstrated higher levels of happiness. Discrimination was only associated with anxiety, while generalised trust, trust in the police and in the health system all related to happiness.

CONCLUSION: Anxiety and happiness in a mid-pandemic environment shared many related variables spanning physical, social and financial domains. Additionally, anxiety was associated with greater levels of discrimination, and happiness with trust in public services. Here we provide a window into the state of mental wellbeing in Aotearoa during a global health crisis.

The COVID-19 pandemic will undoubtedly be recalled as one of the defining events of the twenty-first century, with preliminary data already demonstrating widespread mental and physical health effects worldwide and throughout Aotearoa New Zealand.[1,2] Given the gravity and potential longevity of these changes, it is crucial our understanding of wellbeing reflects the changing socio-cultural, financial and political post-pandemic climate.

The December 2020 quarter wellbeing supplement of the *Household Labour Force Survey* (Statistics NZ Tatauranga Aotearoa) saw the addition of happiness and anxiety to the biennial survey, a measure of positive and negative affect and relevant emotional correlates of subjective wellbeing.[3] This provides an opportunity to better understand how certain factors may relate to anxiety or decreased happiness, particularly during our current social climate. Such knowledge may prove useful in informing future interventions that are more sensitively tailored to the needs and concerns of our current situation.

With the increasing popularity of social determinant models,[4] much of Aotearoa's health research over the past 2 decades has focussed on establishing equity across age, gender, ethnic and socio-economic demographics. However, despite the extensive research this approach has birthed, the relationship between many of these factors and mental wellbeing in Aotearoa has remained poorly understood, with results usually being inconsistent and counterintuitive.

Like almost every developed country, Aotearoa has faced a number of challenges associated with an ageing population.[5] These challenges were again brought to the forefront with the primary mortality and morbidity burden of COVID-19 placed disproportionately on older populations.[6] It has also spurred a growing discourse that considers the ways ageing populations are discussed and portrayed, especially in the media.[7] Previous research reporting the counterintuitive finding that wellbeing improves with age has garnered such attention that the phenomenon has become well-known in popular culture, dubbed "the paradox of ageing".[8] While the findings have been replicated, so too have they been critiqued and contradicted, with many outlining that such a pattern should not be considered paradoxical, that no such pattern exists, or indeed that older populations may be less happy and more anxious.[8–12] However, any association is likely a complex one, and thus it is unknown how a pandemic environment has influenced this, or will continue to shape wellbeing in older age. Given the potential long-term physiological and sociological effects that the pandemic may bring, investigating its effects on ageing populations will likely be of increasing importance.[1,13,14]

In addition to the direct effects of social isolation, many of the chronic or acute illnesses associated with ageing became more difficult to manage with increased barriers to healthcare and medication throughout lockdowns.[15,16] Ageing is a multifactorial and complex process, influenced by a number of convoluted cultural, psychosocial and physiological interactions.[17] Thus, the full effects of the pandemic on older populations have not yet been fully appreciated. This provides a strong rationale to track the wellbeing of older adult populations throughout, and perhaps beyond, the COVID-19 pandemic.

Physical health status and mental health status are undoubtedly closely intertwined, with numerous bidirectional associations having been previously outlined.[18] Given the links between loneliness, social isolation and the constant threat of nationwide lockdown, the contribution of isolation to happiness and anxiety will likely be particularly prominent in the coming years, especially for communities with lower physical health.[19] Similarly, disabled communities typically record higher rates of social isolation, alongside an increased number of mental health challenges.[20] As with elderly populations, stress associated with the management of chronic or acute illness may be amplified by isolations and difficulties accessing healthcare.

Gender difference is perhaps one of the most thoroughly explored topics in mental health fields, with literature—although often conflicting—generally supporting the idea that women experience higher rates of negative affect, such as anxiety or depressive symptoms, and yet are typically happier than men.[21–23] While we are yet to fully understand the impact of COVID-19 on such gender and mental health interactions, preliminary studies have suggested that participants reporting as female have experienced higher rates of distress during the COVID-19 pandemic than male-reporting participants.[24] In addition to the existing disparity in anxiety for women, a number of gender-related stressors have been influenced by the pandemic environment, such as increased violence against women and higher mental health risk for peripartum women.[25–27] Some studies have, however, found no difference between genders, and a Netherlands cohort showed women experiencing higher rates of anxiety, but men having higher rates of depression.[28–30] Thus, while gender continues to be a relevant factor in discussions of mental wellbeing, such associations have remained unclear, and we will likely continue to uncover new modifying factors within the post-COVID climate.

A number of socio-economic factors are strongly intertwined with mental wellbeing, with income, housing and employment each contributing significantly to subjective wellbeing.[31–33] Given the nationwide economic and commercial effects of COVID-19, struggles with job security, housing and employment may have contributed even more strongly to anxiety and happiness scores.

Previous studies have also disagreed about the nature of ethnic effects on mental wellbeing, with Māori and Pākehā populations having been contrastingly described as the group with the highest rate of mood disorders.[34,35] Further analysis of what factors may be contributing to feelings of anxiety and happiness may be central in understanding these apparent disagreements within the data, and better appreciating the unique challenges experienced by the different facets of Aotearoa's increasingly multicultural population. And while we are not yet able to fully appreciate the broad scope of differences between ethnic group responses to the COVID-19 pandemic, given that socio-economic structure, workforce distribution, likelihood of hospitalisation and perspective on disease and vaccination all differ by ethnicity,[36,37] it is likely that different responses to the pandemic will become more apparent as we move forward.

Finally, trust on both institutional and personal levels have been previously shown to influence feelings of anxiety.[38–39] This has clear relevance to the pandemic's effects, which were, of course, not solely biomedical, having effected dramatic socio-cultural and political change on a global scale.[1] Trust in the government and in the general populace has become actively discussed and critiqued on a daily basis, which may have influenced how strongly trust contributed to feelings of anxiety and happiness within this dataset. All these factors were considered for their potential association with anxiety and happiness scores in Aotearoa in December 2020.

Methods

Data

We conducted a cross-sectional study to identify the possible contributors to the mental health status of New Zealanders in December 2020. We used the data sample collected in the wellbeing survey, where up to 30,000 responders were contacted from across Aotearoa as part of the *Household Labour Force Survey* (*HLFS*).

Regression outcome variables

We conducted two separate analyses on the mental wellbeing outcome variables of happiness and anxiety. The use of two independent models allows us to assess contributing factors to both a positive aspect of mental wellbeing (i.e., happiness, from the answer to the question “How happy were you yesterday?” on a scale of 0–10) and a negative aspect of mental wellbeing (i.e., anxiety, from the answer to the question “How anxious were you yesterday?” on a scale of 0–10) as unvalidated measures of happiness and anxiety. Notably, the study data were collected in the midst of the global COVID-19 pandemic, and thus the results of this observational study taken at a single time point reflect the factors that were related to mental health within Aotearoa amid this pandemic, but at a time where most New Zealanders were able to undergo relatively normal activities under Alert Level 1 (international borders were closed).

Predictor variables

The predictor variables for each of the models constituted the key wellbeing measures provided within the *HLFS*, including:

- Age (in years)
- Sex (female/male)
- Ethnicity (categorical variables of Pākehā, Māori, Pacific peoples, Asian, MELAA [a combination of 39 ethnic groups] and other, and individuals could have multiple ethnicity identifications)
- Whether someone has been discriminated against in the last 12 months (yes/no/don’t know)
- Physical health (self-rated status: excellent/very good/good/fair/poor/don’t know)
- Whether someone has a disability (yes/no)
- Loneliness (how often someone felt lonely in the last 4 weeks: none of the time/a little of the time/some of the time/most of the time/all of the time/don’t know)
- Employment status (categorical variables of employed or unemployed)
- Financial wellbeing (how well the respondent’s [and partner’s] income meets everyday needs: excellent/very good/good/fair/poor/don’t know)
- Damp housing (does accommodation have no problem, a minor problem or a major problem with dampness or mould: no problem/minor problem/major problem/don’t know)
- Cold housing (does accommodation have no problem, a minor problem or a major problem with heating and/or keeping it warm in winter: no problem/minor problem/major problem/don’t know)
- Parent status (indicator showing whether a person is in a parent role in the household: yes/no)
- Family wellbeing (in general, how is your family doing: 0–10 extremely badly–extremely well)
- Generalised trust (how much respondent trusts most people in New Zealand: 0–10 not at all–completely)
- Trust in parliament (0–10 not at all–completely)
- Trust in the police (0–10 not at all–completely)
- Trust in the health system (0–10 not at all–completely)
- Trust in the media (0–10 not at all–completely)

Modelling

We firstly quantified a full correlation matrix between all variables within the statistical programming software R to assess the associations between the identified factors. Multiple linear regression models were then fit for both anxiety and happiness scores, with each of the predictor variables listed above. Variables were Z-scored prior to entry into the model, such that the magnitude of each of the covariates could be reported and compared.

Significance testing and correction for multiple comparisons

The significance of each of the predictor variables were assessed using a threshold of $p < 0.05$, with additional Bonferroni correction to account for the number of predictors included within the model. Both corrected and uncorrected values are reported, with significance values that survive only the uncorrected threshold labelled as exploratory results.

Results

The respondents to the wellbeing supplement of the *HLFS* in December 2020 totalled 12,465. All counts below 6 have been suppressed, and randomly rounded to a base of three according to the output rules of Statistics New Zealand, to maintain data confidentiality. A summary of the data is provided in Tables 1 and 2.

Correlations

Greater anxiety scores were found to be most strongly related to smaller happiness scores,

Table 1: Data summary for continuous variables utilised from the wellbeing supplement of the *Household Labour Force Survey* (December 2020), conducted in Aotearoa by Statistics New Zealand.

Characteristic	Median	Interquartile range
Anxiety score (“How anxious were you yesterday?”; scale 0–10)	1	(0, 5)
Happiness score (“How happy were you yesterday?”; scale 0–10)	8	(7, 9)
Age (years)	48	(35, 62)
Family wellbeing (“In general, how is your family doing?”; scale 0–10):	8	(7, 9)
Generalised trust (how much respondent trusts most people in New Zealand; scale 0–10)	7	(6, 8)
Trust in parliament (scale 0–10)	7	(5, 8)
Trust in the police (scale 0–10)	8	(7, 9)
Trust in the health system (scale 0–10)	7	(6, 8)
Trust in the media (scale 0–10)	5	(3, 6)
Characteristic	**Unknown answer count**	**Unknown answer percentage**
Anxiety score (“How anxious were you yesterday?”; scale 0–10)	51	0.4%
Happiness score (“How happy were you yesterday?”; scale 0–10)	48	0.4%
Family wellbeing (“In general, how is your family doing?”; scale 0–10):	264	2.1%
Generalised trust (how much respondent trusts most people in New Zealand; scale 0–10)	144	1.2%
Trust in parliament (scale 0–10)	174	1.4%
Trust in the police (scale 0–10)	72	0.6%
Trust in the health system (scale 0–10)	72	0.6%
Trust in the media (scale 0–10)	150	1.2%

Table 2: Data summary for binary and ordinal variables utilised from the wellbeing supplement of the *Household Labour Force Survey* (December 2020), conducted in Aotearoa by Statistics New Zealand.

Characteristic	Count	Sample percentage
Sex (female)	6,930	55.6%
Ethnicity: Pākehā	9,087	72.9%
Ethnicity: Māori	1,638	13.1%
Ethnicity: Pacific peoples	681	5.5%
Ethnicity: Asian	1,527	12.3%
Ethnicity: MELAA	165	1.3%
Ethnicity: Other	207	1.7%
Discrimination:		
Discriminated against in the last 12 months	2,424	19.5%
No discrimination in the last 12 months	9,945	79.8%
Don't know	87	0.7%
Refused to answer	6	0.1%
Self-rated physical health status:		
Excellent	2,106	16.9%
Very good	4,776	38.3%
Good	3,792	30.4%
Fair	1,299	10.4%
Poor	477	3.8%
Don't know	9	0.1%
Refused to answer	Suppressed	Suppressed
Disability status:		
Have a disability	744	6.0%
No disability	11,718	94.0%
Disability status unknown	Suppressed	Suppressed
Loneliness (how often someone felt lonely in the last 4 weeks):		
None of the time	6,957	55.8%
A little of the time	3,078	24.7%
Some of the time	1,914	15.4%
Most of the time	381	3.1%

Table 2 (continued): Data summary for binary and ordinal variables utilised from the wellbeing supplement of the *Household Labour Force Survey* (December 2020), conducted in Aotearoa by Statistics New Zealand.

All of the time	96	0.8%
Don't know	27	0.2%
Refused to answer	6	0.1%
Employment status:		
Employed	8,628	69.2%
Unemployed	411	3.3%
Not in the workforce	3,423	27.5%
Financial wellbeing (how well does respondent's [and partner's] income meet everyday needs):		
Not enough money	1,068	8.6%
Only just enough money	3,090	24.8%
Enough money	5,661	45.4%
More than enough money	2,601	20.9%
Don't know	30	0.2%
Refused to answer	12	0.1%
Damp housing (does accommodation have no problem, a minor problem or a major problem with dampness or mould?):		
No problem	9,507	76.3%
Minor problem	2,493	20.0%
Major problem	429	3.4%
Don't know	30	0.2%
Refused to answer	6	0.1%
Cold housing (does accommodation have no problem, a minor problem or a major problem with heating and/or keeping it warm in winter?):		
No problem	9,987	80.1%
Minor problem	1,785	14.3%
Major problem	600	4.8%
Don't know	87	0.7%
Refused to answer	6	0.1%
Parent status (yes)	4,731	38.0%

greater loneliness, poorer physical health, poorer family wellbeing and poorer financial wellbeing. Alongside a negative correlation between happiness and anxiety, greater happiness scores were found to be most strongly related to greater family wellbeing, greater physical health, smaller loneliness scores, greater financial wellbeing, and greater generalised trust, trust in the police and trust in the health system. A depiction of the full correlation matrix results is presented in Figure 1, and R and p-values can be found in the Appendices.

Anxiety regression

The variables most strongly associated with self-reported anxiety using multiple linear regression were age, sex (female), discrimination, poor physical health, loneliness, unemployment status, poorer financial wellbeing and poorer family wellbeing. Other significant but more weakly associated variables include disability, damp housing, playing a parental role, less trust in the police and more trust in the media. While participants who identified as Māori or Other were associated with a p-value <0.05, these did not survive Bonferroni correction for multiple comparisons. The complete list of regression parameters is provided in Table 3.

Happiness regression

The variables most strongly associated with self-reported happiness using multiple linear regression were age, ethnicity (Māori and Pacific peoples), financial wellbeing and family wellbeing. Greater levels of generalised trust, trust in the police and trust in the health system also correlated with greater happiness scores. Contrastingly, poor

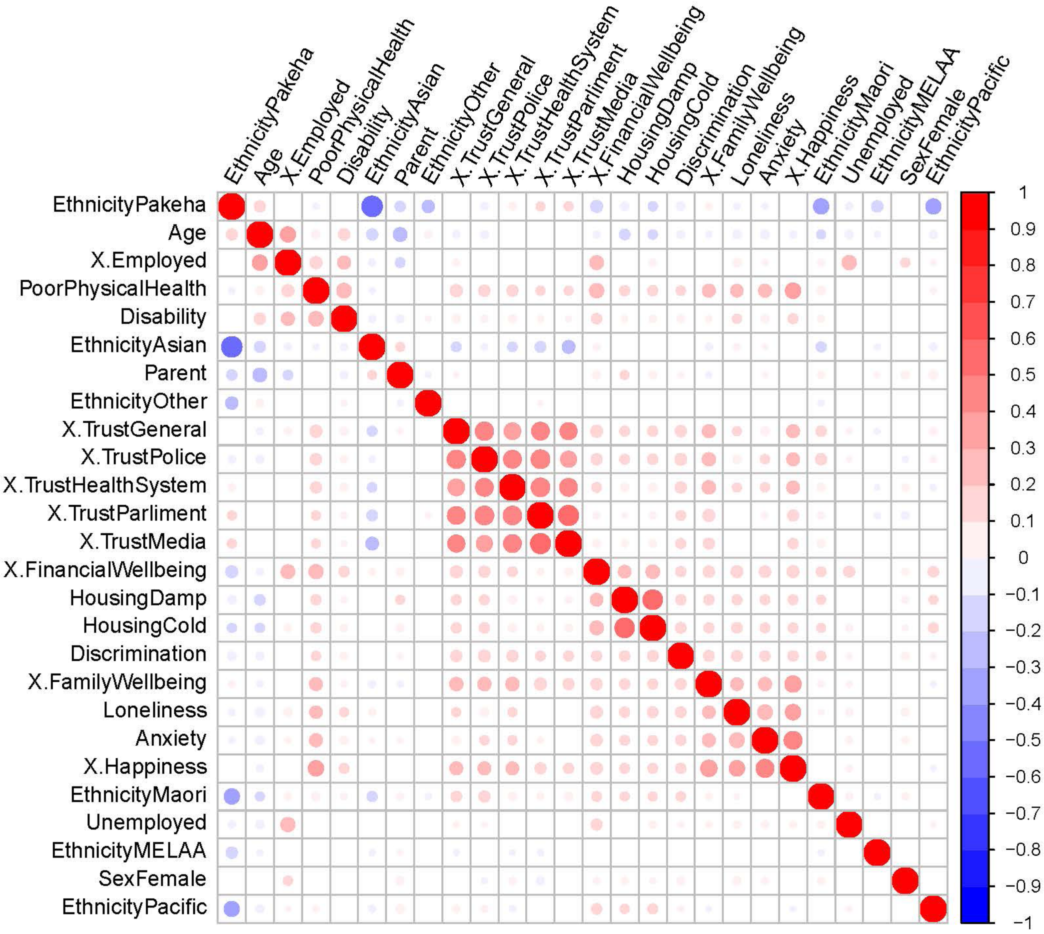

Figure 1: A correlation matrix of all variables utilised in this sample. All coloured circles are significant with Bonferroni correction for the number of variables, with the size and colour of the circles denoting the strength of the correlation. Variables with an X have been inverted prior to entry into the matrix to maintain coherent valence for grouping purposes. Variables are grouped along each axis according to similarity within the matrix. Please see methods for a full description of each of the variables.

Table 3: Anxiety regression results for the wellbeing supplement of the *Household Labour Force Survey* (December 2020), conducted in Aotearoa by Statistics New Zealand.

Coefficient	**Beta estimate**	**Standard error**	**T-statistic**	**P-value**
(Intercept)	2.45	0.02	103.37	**p <2.0e-16****
Age	-0.17	0.03	-5.98	**p = 2.3e-9****
Sex (female)	0.08	0.02	3.38	**p = 7.3e-4****
Ethnicity Pākehā	<0.01	0.05	0.01	p = 0.99
Ethnicity Māori	-0.08	0.03	-2.31	p = 0.02*
Ethnicity Pacific peoples	<-0.01	0.03	-0.12	p = 0.91
Ethnicity Asian	0.04	0.04	1.03	p = 0.30
Ethnicity MELAA	0.02	0.03	0.76	p = 0.45
Ethnicity Other	-0.07	0.03	-2.47	p = 0.01*
Discriminated against	0.14	0.03	5.51	**p = 3.7e-8****
Poor physical health	0.36	0.03	13.51	**p <2.0e-16****
Disability	0.06	0.03	2.14	p = 0.03*
Loneliness	0.57	0.03	21.94	**p <2.0e-16****
Employed	0.03	0.03	1.22	p = 0.22
Unemployed	0.10	0.03	3.90	**p = 9.8e-5****
Better financial wellbeing	-0.16	0.03	-5.70	**p = 1.2e-8****
Damp housing	0.06	0.03	1.96	p = 0.05*
Cold housing	0.05	0.03	1.74	p = 0.08
Playing a parental role	0.06	0.03	2.35	p = 0.02*
Better family wellbeing	-0.35	0.03	-13.26	**p <2.0e-16****
Generalised trust	0.05	0.03	1.50	p = 0.13
Trust in parliament	<0.01	0.03	0.14	p = 0.89
Trust in the police	-0.07	0.03	-2.35	p = 0.01*
Trust in the health system	-0.06	0.03	-1.95	p = 0.05
Trust in the media	0.06	0.03	2.05	p = 0.04*

**Significant with Bonferroni correction for multiple comparisons (p <0.002).

*Significant at p <0.05.

Table 4: Happiness regression results for the wellbeing supplement of the *Household Labour Force Survey* (December 2020), conducted in Aotearoa by Statistics New Zealand.

Coefficient	**Beta estimate**	**Standard error**	**T-statistic**	**P-value**
(Intercept)	7.92	0.02	524.08	**p <2.0e-16****
Age	0.07	0.02	3.71	**p = 2.1e-4****
Sex (female)	0.05	0.02	2.98	p = 2.8e-3*
Ethnicity Pākehā	-0.04	0.03	-1.22	p = 0.22
Ethnicity Māori	0.08	0.02	3.97	**p = 7.3e-5****
Ethnicity Pacific peoples	0.11	0.02	5.34	**p = 9.6e-8****
Ethnicity Asian	0.02	0.03	0.62	p = 0.53
Ethnicity MELAA	<0.01	0.02	0.27	p = 0.78
Ethnicity Other	<-0.01	0.02	-0.06	p = 0.96
Discriminated against	-0.03	0.02	-2.14	p = 0.03*
Poor physical health	-0.37	0.02	-21.65	**p <2.0e-16****
Disability	-0.05	0.02	-3.02	p = 2.5e-3*
Loneliness	-0.41	0.02	-24.76	**p <2.0e-16****
Employed	-0.08	0.02	-4.30	**p = 1.7e-5****
Unemployed	-0.06	0.02	-3.55	**p = 3.8e-4****
Better financial wellbeing	0.08	0.02	4.64	**p = 3.6e-6****
Damp housing	-0.03	0.02	-1.69	p = 0.09
Cold housing	<-0.01	0.02	-0.28	p = 0.78
Playing a parental role	-0.05	0.02	-3.16	**p = 1.6e-3****
Better family wellbeing	0.43	0.02	25.69	**p <2.0e-16****
Generalised trust	0.09	0.02	4.96	**p = 7.3e-7****
Trust in parliament	0.02	0.02	0.80	p = 0.43
Trust in the police	0.12	0.02	5.85	**p = 5.0e-9****
Trust in the health system	0.09	0.02	4.60	**p = 4.2e-6****
Trust in the media	<-0.01	0.02	-0.04	p = 0.97

**Significant with Bonferroni correction for multiple comparisons (p <0.002).
*Significant at p <0.05.

physical health, being a parent and both being employed or unemployed (as opposed to not in the labour force, such as retired populations) were related to lower reports of happiness. Weaker associations were found between happiness, recording sex as female, lower reported discrimination and being without a disability. A full list of results is provided in Table 4.

Discussion

Here we investigated the relationships between anxiety and happiness with a host of social, physical, financial and mental health variables in Aotearoa, in the midst of the COVID-19 pandemic (December 2020). As expected, happiness and anxiety were inversely related, and shared a number of contributing variables. Loneliness, physical health, family wellbeing, financial wellbeing, age and gender all had associations with both anxiety and happiness. Furthermore, these results provide a platform for future longitudinal studies that may gauge social progressions in equity and wellbeing for Aotearoa.

Aligning with previous literature, older adults reported higher levels of happiness and lower levels of anxiety.[40,41] One leading hypothesis suggests that mental wellbeing in older adults may be more intrinsically generated rather than dependent on specific extrinsic stimuli, with greater emotional control possibly adaptive in combating the physical and social challenges of ageing.[42] Such a perspective may explain why, despite the added and disproportionate stress COVID-19 placed on older populations, better mental wellbeing was still observed. This was supported by the regression analysis, with higher happiness and lower anxiety scores associated with age that persisted beyond the exclusion of employment status, financial wellbeing and a number of other extrinsic contributors to mental wellbeing. Additionally, the results also accounted for many of the potential insults to mental wellbeing in older adults, including loneliness, physical health and discrimination. Useful future research might include monitoring changes within populations reaching older age in a post-pandemic environment.

Our gender analyses also supported previous literature, with women reporting higher rates of anxiety,[43] with gender being one of the main associated factors in the anxiety regression. However, being female was also weakly associated with greater happiness in the regression analysis. It is unclear how this was influenced by the pandemic, however, due to the pandemic's known effects on gender-related inequities such as violence, perinatal mental illness and employment.[25–27] It should also be noted that this study was restricted to a binary view of gender and therefore may not appreciate the full scope of mental wellbeing within non-binary populations.

One of the most prominent factors associated with both anxiety and happiness was physical health. This coincides with previous findings demonstrating links between mental and physical wellbeing, with many concluding that this relationship is likely complex and bidirectional.[44] It is also possible that the links between physical and mental health may have been intensified by COVID-19's particular threat to populations with poor physical health, potentially exacerbating this relationship further.

Loneliness, both during and before the pandemic, has been clearly associated with higher anxiety and lower happiness.[45,46] This was certainly supported by our results, with loneliness being the factor with the highest association to anxiety, and among the highest (inverse) correlates of happiness. Perhaps counterintuitively, during the pandemic, younger populations were more likely to report high levels of loneliness.[47] Our data showed similar patterns, with age being inversely associated with loneliness. However, older populations have also seen an increase in loneliness during the pandemic.[48] The impacts of loneliness predictably affect selective demographics, being correlated with lower financial wellbeing, poorer physical health and disability. Being Pākehā or male was also protective against loneliness; however, these correlations were more subtle. Like with many other factors, while the effects may not be immediately evident, large aspects of social routine have been, and continue to be, disrupted. Evidence has shown such disruptions may have widespread mental and physical health effects, again underscoring the cruciality of monitoring our adjustment to post-pandemic society.[49]

The impacts of financial wellbeing and socio-economic status have been among the most studied areas in the last few decades, spanning a number of disciplines.[50,51] Unsurprisingly, the far-reaching effects of financial wellbeing have been found to contribute to mental wellbeing during pandemic times in a number of countries.[52–54] However, due to the stark differences in healthcare, economic and social welfare systems, it is unknown whether such results are valid when applied internationally and cross-culturally. One study, in fact, observed greater decline in happiness among higher socio-economic groups.[55] Our results showed financial wellbeing as significantly correlated with happiness and inversely correlated with anxiety. While associations of damp or cold housing status did not survive Bonferroni correction, given the overlap between financial wellbeing and housing quality, much of the socio-economically relevant variance was likely accounted for by the overall financial wellbeing correlate. While employment had a small association with anxiety, unemployment demonstrated a stronger correlation. Contrastingly, employment was associated more strongly with unhappiness during the pandemic than was unemployment, while pre-pandemic studies describe employment as positively associated with happiness.[56] However, with the turbulent work environment brought on by the pandemic, many were required to work from home and increased burden was often placed on those whose work was deemed essential in Aotearoa. It should be noted, however, that studies from Israel and South Africa have outlined employment as protective against distress and poor mental health.[57,58] This may highlight the need for interventional measures to counteract challenges to mental wellbeing in post-pandemic professional environments.

Family wellbeing was strongly associated with both decreased anxiety and increased happiness, where nationwide household isolations may have further strengthened the impact of family on wellbeing. This association is not specific to pandemic times, with a number of studies outlining a clear association between family wellbeing and overall wellbeing, with many reporting family wellbeing as more important than personal wellbeing.[59] Poor family wellbeing was also associated with a number of other relevant factors including poor physical health, loneliness and decreased trust in all measured areas.

While no ethnic population findings survived Bonferroni correction in the anxiety regression, it is worth noting that discrimination was among the strongest of anxiety correlates and was correlated with identifying as Māori or Pacific peoples. The other primary correlates of anxiety were poor physical health, poor financial wellbeing, poor family wellbeing and loneliness, each of which was higher in Māori populations. Similarly, higher than average proportions of Pacific populations reported poor physical health and poor financial wellbeing. In contrast, the regression analyses demonstrated that being Māori or Pacific peoples was, in fact, associated with higher happiness scores. As with anxiety, this is after accounting for many ethnically distributed happiness correlates such as the influence of physical health, loneliness and family wellbeing. Interestingly, discrimination, while associated with anxiety, was not significant in its association with happiness after Bonferroni correction. These results highlight that the racial inequalities in mental wellbeing that exist in Aotearoa are likely deeply preventable, and potentially stem from a number of inadequacies within our social, economic and cultural structures.

Furthermore, reports have shown that while Māori, Pākehā and Pacific populations reported similar rates of psychological distress throughout lockdown, recovery after lockdown was decreased in Māori and Pacific communities.[60] Asian communities, however, reported less psychological distress during lockdown.[61] It is unknown how this may affect contributing factors in happiness and anxiety between ethnic groups; however, if such trends continue, we may see ethnicity as more strongly associated with anxiety and happiness in the coming years, as lagging effects on wellbeing and recovery time become more apparent.

Finally, no measured trust variables showed significant independent associations with anxiety in the regression model. However, higher rates of generalised trust, trust in the police and trust in the health system were all significantly associated with higher levels of happiness. This aligns with past research on trust in Japanese populations, which has demonstrated an association between individual and social trust, and happiness.[38,39] However, trust in parliament and media showed no significant independent association in the current analyses, despite the constant, daily communication from parliament. While media transparency has perhaps never been a more salient issue in this country's history, it is possible that this effect was accounted for by other significant trust measures.

Conclusion

The COVID-19 pandemic posed a number of novel socio-cultural, psychological and political challenges on a global scale. While much research has been conducted both during and after the pandemic to understand the ramifications of this, there has been limited documentation of how different demographics, attitudes, gender and ethnicity intersected with mental wellbeing in Aotearoa at a time of national crisis. While these cross-sectional analyses can only measure association rather than causation, it is hoped this will provide a valuable snapshot of national wellbeing. Moreover, it will prove valuable to compare this dataset with future trends in data, to aid our understanding of how the social and demographic determinants of mental wellbeing may differ during times of crises, such that future measures can be effectively and sensitively tailored to the needs of different subpopulations within Aotearoa.

COMPETING INTERESTS
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Appendices

Appendix Table 1: Pearson's R values for Correlation Matrix in Figure 1.

	Anxiety	X.Happiness	Age	SexFemale	EthnicityPakeha	EthnicityMaori	EthnicityPacific	EthnicityAsian	EthnicityMELAA	EthnicityOther	Discrimination	PoorPhysicalHealth	Disability	Loneliness	X.Employed	Unemployed	X.FinancialWellbeing	HousingDamp	HousingCold	Parent	X.FamilyWellbeing	X.TrustGeneral	X.TrustParliament	X.TrustPolice	X.TrustHealthSystem	X.TrustMedia
Anxiety	1	0.442655	-0.09881	0.056221	-0.04348	0.027407	0.020638	0.035832	0.01592	-0.02336	0.139216	0.22533	0.083189	0.298281	0.041038	0.069688	0.176155	0.125632	0.124255	0.036835	0.230099	0.098429	0.044899	0.111623	0.110579	0.033468
X.Happiness	0.442655	1	-0.06015	-0.00033	0.027968	0.023433	-0.03699	-0.02656	-0.00632	0.004436	0.141155	0.325098	0.128118	0.327914	0.033421	0.05464	0.189621	0.127636	0.125783	0.010503	0.369483	0.226735	0.162661	0.219816	0.21665	0.138498
Age	-0.09881	-0.06015	1	-0.00471	0.16609	-0.10479	-0.08781	-0.16479	-0.04478	0.068667	-0.0806	0.0887	0.171169	-0.09975	0.314102	-0.0905	-0.05545	-0.14766	-0.11226	-0.2575	-0.04924	-0.06552	0.031361	-0.0814	0.01361	-0.01727
SexFemale	0.056221	-0.00033	-0.00471	1	-0.00476	0.060131	0.004646	-0.01275	-0.01522	-0.01784	0.077751	0.010788	0.010893	0.081296	0.110075	0.01054	0.058277	0.059976	0.039292	0.083166	-0.0044	0.02785	-0.08446	-0.04066	0.069213	-0.00832
EthnicityPakeha	-0.04348	0.027968	0.16609	-0.00476	1	-0.3209	-0.31413	-0.59299	-0.17071	-0.20434	-0.09861	-0.04538	-0.00426	-0.05543	-0.02852	-0.07007	-0.19325	-0.0931	-0.11159	-0.13755	0.052107	-0.0117	0.1022	-0.06815	0.068224	0.104897
EthnicityMaori	0.027407	0.023433	-0.10479	0.060131	-0.3209	1	-0.01076	-0.13453	-0.04122	-0.04897	0.11759	0.095312	0.058433	0.036336	0.058045	0.06159	0.123267	0.108758	0.101952	0.064518	0.05223	0.145436	0.058636	0.164223	0.083994	0.089695
EthnicityPacific	0.020638	-0.03699	-0.08781	0.004646	-0.31413	-0.01076	1	-0.0692	-0.02797	-0.02859	0.041814	0.048438	-0.00819	0.001918	0.038404	0.037144	0.144085	0.105745	0.129677	0.099996	-0.03605	0.07029	-0.03198	0.052115	-0.04629	0.015766
EthnicityAsian	0.035832	-0.02656	-0.16479	-0.01275	-0.59299	-0.13453	-0.0692	1	-0.04354	-0.02974	0.027087	-0.03868	-0.0631	0.061424	-0.06294	0.00672	0.057153	-0.00885	-0.02542	0.100542	-0.06861	-0.12611	-0.15495	-0.05064	-0.11643	-0.21858
EthnicityMELAA	0.01592	-0.00632	-0.04478	-0.01522	-0.17071	-0.04122	-0.02797	-0.04354	1	-0.01522	0.012216	-0.01772	-0.00872	0.01369	-0.00661	0.013788	0.005711	0.004457	0.030101	0.033952	-0.00884	-0.04039	-0.04832	-0.02028	-0.03416	-0.02569
EthnicityOther	-0.02336	0.004436	0.068667	-0.01784	-0.20434	-0.04897	-0.02859	-0.02974	-0.01522	1	0.027304	0.011731	0.038368	-0.01348	0.015855	-0.00301	0.008249	-0.01952	-0.00969	-0.04292	0.017451	0.013037	0.034188	0.019676	0.0275	0.027862
Discrimination	0.139216	0.141155	-0.0806	0.077751	-0.09861	0.11759	0.041813	0.027087	0.012216	0.027304	1	0.115035	0.075385	0.152866	-0.01172	0.040178	0.134694	0.140244	0.153136	0.038739	0.155874	0.168259	0.124236	0.187973	0.167553	0.132507
PoorPhysicalHealth	0.22533	0.325098	0.0887	0.010788	-0.04538	0.095312	0.048438	-0.03868	-0.01772	0.011731	0.115035	1	0.290264	0.209154	0.196052	0.028332	0.276403	0.138183	0.137859	-0.01907	0.223682	0.196849	0.108608	0.171619	0.164401	0.102383
Disability	0.083189	0.128118	0.171169	0.010893	-0.00426	0.058433	-0.00819	-0.0631	-0.00872	0.038368	0.075385	0.290264	1	0.104405	0.230126	-0.00834	0.140783	0.044845	0.067105	-0.07618	0.050499	0.087408	0.050157	0.059632	0.081248	0.041411
Loneliness	0.298281	0.327914	-0.09975	0.081296	-0.05543	0.036336	0.001918	0.061424	0.01369	-0.01348	0.152866	0.209154	0.104405	1	0.0924	0.068409	0.189424	0.133063	0.148109	-0.03214	0.214317	0.103738	0.019088	0.09617	0.104063	0.012922

Appendix Table 1 (continued): Pearson’s R values for Correlation Matrix in Figure 1.

X.Employed	0.041038	0.033421	0.314102	0.110075	-0.02852	0.058045	0.038404	-0.06294	-0.00661	0.015855	-0.01172	0.196052	0.230126	0.0924	1	0.276349	0.257785	0.022554	0.065899	-0.12298	-0.00309	0.064149	-0.00935	0.032539	0.000201	-0.00451
Unemployed	0.069688	0.05464	-0.0905	0.01054	-0.07007	0.06159	0.037144	0.00672	0.013788	-0.00301	0.040178	0.028332	-0.00834	0.068409	0.276349	1	0.161381	0.027425	0.066708	0.009053	0.044016	0.043595	-0.00132	0.034865	0.008088	0.012455
X.FinancialWellbeing	0.176155	0.189621	-0.05545	0.058277	-0.19325	0.123267	0.144085	0.057153	0.005711	0.008249	0.134694	0.276403	0.140783	0.189424	0.257785	0.161381	1	0.214359	0.253255	0.084807	0.172102	0.195726	0.059771	0.165842	0.12103	0.077415
HousingDamp	0.125632	0.127636	-0.14766	0.059976	-0.0931	0.108758	0.105745	-0.00885	0.004457	-0.01952	0.140244	0.138183	0.044845	0.133063	0.022554	0.027425	0.214359	1	0.538762	0.101298	0.138178	0.129081	0.037526	0.127671	0.08841	0.056143
HousingCold	0.124255	0.125783	-0.11226	0.039292	-0.11159	0.101952	0.129677	-0.02542	0.030101	-0.00969	0.153136	0.137859	0.067105	0.148109	0.065899	0.066708	0.253255	0.538762	1	0.073025	0.134259	0.136323	0.060282	0.140042	0.090242	0.06989
Parent	0.036835	0.010503	-0.2575	0.083166	-0.13755	0.064518	0.099996	0.100542	0.033952	-0.04292	0.038739	-0.01907	-0.07618	-0.03214	-0.12298	0.009053	0.084807	0.101298	0.073025	1	-0.0432	0.035155	-0.01141	0.004561	0.014766	0.022817
X.FamilyWellbeing	0.230099	0.369483	-0.04924	-0.0044	0.052107	0.05223	-0.03605	-0.06861	-0.00884	0.017451	0.155874	0.223682	0.050499	0.214317	-0.00309	0.044016	0.172102	0.138178	0.134259	-0.0432	1	0.236532	0.192334	0.238693	0.241108	0.164337
X.TrustGeneral	0.098429	0.226735	-0.06552	0.02785	-0.0117	0.145436	0.07029	-0.12611	-0.04039	0.013037	0.168259	0.196849	0.087408	0.103738	0.064149	0.043595	0.195726	0.129081	0.136323	0.035155	0.236532	1	0.438936	0.469038	0.381139	0.402719
X.TrustParliament	0.044899	0.162661	0.031361	-0.08446	0.1022	0.058636	-0.03198	-0.15495	-0.04832	0.034188	0.124236	0.108608	0.050157	0.019088	-0.00935	-0.00132	0.059771	0.037526	0.060282	-0.01141	0.192334	0.438937	1	0.490471	0.480603	0.563696
X.TrustPolice	0.111623	0.219816	-0.0814	-0.04066	-0.06815	0.164223	0.052115	-0.05064	-0.02028	0.019676	0.187973	0.171619	0.059632	0.09617	0.032539	0.034865	0.165842	0.127671	0.140042	0.004561	0.238693	0.469038	0.490471	1	0.437128	0.356385
X.TrustHealthSystem	0.110579	0.21665	0.01361	0.069213	0.068224	0.083994	-0.04629	-0.11643	-0.03416	0.0275	0.167553	0.164401	0.081248	0.104063	0.000201	0.008088	0.12103	0.08841	0.090242	0.014766	0.241108	0.381139	0.480603	0.437128	1	0.439976
X.TrustMedia	0.033468	0.138498	-0.01727	-0.00832	0.104897	0.089695	0.015766	-0.21858	-0.02569	0.027862	0.132507	0.102383	0.041411	0.012922	-0.00451	0.012455	0.077415	0.056143	0.06989	0.022817	0.164337	0.402719	0.563696	0.356385	0.439976	1

Appendix Table 2: P-values for Correlation Matrix in Figure 1.

	Anxiety	X.Happiness	Age	SexFemale	EthnicityPakeha	EthnicityMaori	EthnicityPacific	EthnicityAsian	EthnicityMELAA	EthnicityOther	Discrimination	PoorPhysicalHealth	Disability	Loneliness	X.Employed	Unemployed	X.FinancialWellbeing	HousingDamp	HousingCold	Parent	X.FamilyWellbeing	X.TrustGeneral	X.TrustParliament	X.TrustPolice	X.TrustHealthSystem	X.TrustMedia
Anxiety	NA	0.00E+00	0.00E+00	3.67E-10	1.26E-06	2.26E-03	2.15E-02	6.53E-05	7.62E-02	9.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-06	7.55E-15	0.00E+00	0.00E+00	0.00E+00	4.05E-05	0.00E+00	0.00E+00	6.67E-07	0.00E+00	0.00E+00	2.09E-04
X.Happiness	0.00E+00	NA	1.98E-11	9.70E-01	1.83E-03	9.03E-03	3.74E-05	3.08E-03	4.81E-01	6.21E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.96E-04	1.11E-09	0.00E+00	0.00E+00	0.00E+00	2.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Age	0.00E+00	1.98E-11	NA	5.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.70E-07	1.67E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.27E-10	0.00E+00	0.00E+00	0.00E+00	5.28E-08	3.35E-13	5.07E-04	0.00E+00	1.30E-01	5.53E-02
SexFemale	3.67E-10	9.70E-01	5.99E-01	NA	5.95E-01	1.84E-11	6.04E-01	1.55E-01	8.92E-02	4.64E-02	0.00E+00	2.29E-01	2.24E-01	0.00E+00	0.00E+00	2.39E-01	8.08E-11	2.21E-11	1.23E-05	0.00E+00	6.27E-01	1.99E-03	0.00E+00	5.97E-06	1.22E-14	3.56E-01
EthnicityPakeha	1.26E-06	1.83E-03	0.00E+00	5.95E-01	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.08E-07	6.35E-01	6.27E-10	1.45E-03	4.88E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.48E-09	1.94E-01	0.00E+00	3.06E-14	2.89E-14	0.00E+00
EthnicityMaori	2.26E-03	9.03E-03	0.00E+00	1.84E-11	0.00E+00	NA	2.30E-01	0.00E+00	4.17E-06	4.52E-08	0.00E+00	0.00E+00	6.68E-11	5.08E-05	8.87E-11	5.91E-12	0.00E+00	0.00E+00	0.00E+00	5.61E-13	7.82E-09	0.00E+00	7.75E-11	0.00E+00	0.00E+00	0.00E+00
EthnicityPacific	2.15E-02	3.74E-05	0.00E+00	6.04E-01	0.00E+00	2.30E-01	NA	1.02E-14	1.79E-03	1.41E-03	3.29E-06	6.39E-08	3.61E-01	8.31E-01	1.80E-05	3.36E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.80E-05	5.77E-15	3.92E-04	6.44E-09	2.53E-07	8.02E-02
EthnicityAsian	6.53E-05	3.08E-03	0.00E+00	1.55E-01	0.00E+00	0.00E+00	1.02E-14	NA	1.16E-06	8.98E-04	2.59E-03	1.58E-05	1.79E-12	7.20E-12	2.01E-12	4.53E-01	1.85E-10	3.24E-01	4.69E-03	0.00E+00	3.31E-14	0.00E+00	0.00E+00	1.70E-08	0.00E+00	0.00E+00
EthnicityMELAA	7.62E-02	4.81E-01	5.70E-07	8.92E-02	0.00E+00	4.17E-06	1.79E-03	1.16E-06	NA	8.93E-02	1.74E-01	4.80E-02	3.31E-01	1.27E-01	4.61E-01	1.24E-01	5.25E-01	6.19E-01	8.13E-04	1.50E-04	3.29E-01	7.32E-06	8.34E-08	2.40E-02	1.42E-04	4.36E-03
EthnicityOther	9.27E-03	6.21E-01	1.67E-14	4.64E-02	0.00E+00	4.52E-08	1.41E-03	8.98E-04	8.93E-02	NA	2.39E-03	1.91E-01	1.83E-05	1.33E-01	7.67E-02	7.37E-01	3.58E-01	2.96E-02	2.81E-01	1.64E-06	5.39E-02	1.48E-01	1.50E-04	2.85E-02	2.20E-03	1.99E-03
Discrimination	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-06	2.59E-03	1.74E-01	2.39E-03	NA	0.00E+00	0.00E+00	0.00E+00	1.93E-01	7.83E-06	0.00E+00	0.00E+00	0.00E+00	1.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PoorPhysicalHealth	0.00E+00	0.00E+00	0.00E+00	2.29E-01	4.08E-07	0.00E+00	6.39E-08	1.58E-05	4.80E-02	1.91E-01	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	1.57E-03	0.00E+00	0.00E+00	0.00E+00	3.34E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disability	0.00E+00	0.00E+00	0.00E+00	2.24E-01	6.35E-01	6.68E-11	3.61E-01	1.79E-12	3.31E-01	1.83E-05	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	3.52E-01	0.00E+00	5.71E-07	7.97E-14	0.00E+00	2.40E-08	0.00E+00	2.66E-08	3.08E-11	0.00E+00	4.30E-06
Loneliness	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.27E-10	5.08E-05	8.31E-01	7.20E-12	1.27E-01	1.33E-01	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	2.26E-14	0.00E+00	0.00E+00	0.00E+00	3.38E-04	0.00E+00	0.00E+00	3.45E-02	0.00E+00	0.00E+00	1.52E-01
X.Employed	4.80E-06	1.96E-04	0.00E+00	0.00E+00	1.45E-03	8.87E-11	1.80E-05	2.01E-12	4.61E-01	7.67E-02	1.93E-01	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	1.19E-02	2.18E-13	0.00E+00	7.33E-01	1.03E-12	3.00E-01	2.91E-04	9.82E-01	6.17E-01

Appendix Table 2 (continued): P-values for Correlation Matrix in Figure 1.

Unemployed	7.55E-15	1.11E-09	0.00E+00	2.39E-01	4.88E-15	5.91E-12	3.36E-05	4.53E-01	1.24E-01	7.37E-01	7.83E-06	1.57E-03	3.52E-01	2.26E-14	0.00E+00	NA	0.00E+00	2.23E-03	1.11E-13	3.12E-01	1.15E-06	1.29E-06	8.84E-01	1.04E-04	3.68E-01	1.67E-01
X.FinancialWellbeing	0.00E+00	0.00E+00	6.27E-10	8.08E-11	0.00E+00	0.00E+00	0.00E+00	1.85E-10	5.25E-01	3.58E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.58E-11	0.00E+00	0.00E+00	0.00E+00
HousingDamp	0.00E+00	0.00E+00	0.00E+00	2.21E-11	0.00E+00	0.00E+00	0.00E+00	3.24E-01	6.19E-01	2.96E-02	0.00E+00	0.00E+00	5.71E-07	0.00E+00	1.19E-02	2.23E-03	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E-05	0.00E+00	0.00E+00	4.78E-10
HousingCold	0.00E+00	0.00E+00	0.00E+00	1.23E-05	0.00E+00	0.00E+00	0.00E+00	4.69E-03	8.13E-04	2.81E-01	0.00E+00	0.00E+00	7.97E-14	0.00E+00	2.18E-13	1.11E-13	0.00E+00	0.00E+00	NA	4.44E-16	0.00E+00	0.00E+00	2.66E-11	0.00E+00	0.00E+00	1.02E-14
Parent	4.05E-05	2.42E-01	0.00E+00	0.00E+00	0.00E+00	5.61E-13	0.00E+00	0.00E+00	1.50E-04	1.64E-06	1.64E-05	3.34E-02	0.00E+00	3.38E-04	0.00E+00	3.12E-01	0.00E+00	0.00E+00	4.44E-16	NA	1.81E-06	9.51E-05	2.06E-01	6.12E-01	1.00E-01	1.13E-02
X.FamilyWellbeing	0.00E+00	0.00E+00	5.28E-08	6.27E-01	8.48E-09	7.82E-09	6.80E-05	3.31E-14	3.29E-01	5.39E-02	0.00E+00	0.00E+00	2.40E-08	0.00E+00	7.33E-01	1.15E-06	0.00E+00	0.00E+00	0.00E+00	1.81E-06	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X.TrustGeneral	0.00E+00	0.00E+00	3.35E-13	1.99E-03	1.94E-01	0.00E+00	5.77E-15	0.00E+00	7.32E-06	1.48E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-12	1.29E-06	0.00E+00	0.00E+00	0.00E+00	9.51E-05	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X.TrustParliament	6.67E-07	0.00E+00	5.07E-04	0.00E+00	0.00E+00	7.75E-11	3.92E-04	0.00E+00	8.34E-08	1.50E-04	0.00E+00	0.00E+00	2.66E-08	3.45E-02	3.00E-01	8.84E-01	3.58E-11	3.24E-05	2.66E-11	2.06E-01	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00	0.00E+00
X.TrustPolice	0.00E+00	0.00E+00	0.00E+00	5.97E-06	3.06E-14	0.00E+00	6.44E-09	1.70E-08	2.40E-02	2.85E-02	0.00E+00	0.00E+00	3.08E-11	0.00E+00	2.91E-04	1.04E-04	0.00E+00	0.00E+00	0.00E+00	6.12E-01	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00	0.00E+00
X.TrustHealthSystem	0.00E+00	0.00E+00	1.30E-01	1.22E-14	2.89E-14	0.00E+00	2.53E-07	0.00E+00	1.42E-04	2.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.82E-01	3.68E-01	0.00E+00	0.00E+00	0.00E+00	1.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	0.00E+00
X.TrustMedia	2.09E-04	0.00E+00	5.53E-02	3.56E-01	0.00E+00	0.00E+00	8.02E-02	0.00E+00	4.36E-03	1.99E-03	0.00E+00	0.00E+00	4.30E-06	1.52E-01	6.17E-01	1.67E-01	0.00E+00	4.78E-10	1.02E-14	1.13E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA

Addressing data needs crucial for improving infant, child and youth mental health and substance-related harms in Aotearoa New Zealand: key design and ethical considerations for future research

Lovely Dizon, Vartika Sharma, Terryann C Clark, Jude Ball, Terry Fleming, Karin Isherwood, Helen Lockett

ABSTRACT

AIM: To evaluate the available data on mental health and substance-related harm among infants, children and young people (ICY) in Aotearoa New Zealand.

METHODS: A scoping review was undertaken to take stock of current data and identify gaps.

RESULTS: Although there are quality studies, there is a lack of comprehensive, contemporary population-based data to monitor the prevalence and magnitude of mental health conditions and substance use–related harm for children and young people. Existing data are inconsistently measured and are not centrally located or available for all age groups, particularly infants and children. Whānau/family units are seldom considered or prioritised.

CONCLUSIONS: Aotearoa New Zealand lacks accurate, up-to-date, comprehensive ICY mental health and substance use data to inform investment, service delivery and evidence-based policy. We advocate for enhanced surveillance and monitoring through population-based mental health and addiction studies with Indigenous and other locally designed measures, and propose key design and ethical considerations for future research. Future research must prioritise Māori and other priority groups, with non-stigmatising, strengths-based approaches. Addressing these data gaps presents a critical opportunity to improve outcomes for children, young people and their whānau.

Over the past two decades, public awareness and advocacy regarding mental health, mental illness and substance use–related harms (including addiction) have increased dramatically. There is growing pressure on governments and institutions to address these critical issues. In Aotearoa New Zealand, key policy and legislative documents set strategy and requirements: *Kia Manawanui: Long-term pathway to mental wellbeing* summarises the policy priorities and vision to transform the mental health and addiction system with a focus on prevention, promotion, early intervention and effective treatment and support. The *Pae Ora (Healthy Futures) Act 2022* commits to the principle of setting mental health in parity with physical health.

Achieving these goals requires robust and comprehensive population data on the prevalence and impact of mental ill health and substance use–related harms. Such data are essential for determining where and to whom investments should be targeted. Additionally, robust epidemiological data support the design and implementation of preventative public health policies and programmes aimed at reducing risk factors and enhancing protective factors. Currently, Aotearoa New Zealand lacks these comprehensive data, particularly for infants and children.[1,2]

Given that most mental health conditions and problematic substance use develop during childhood and adolescence,[3] good data on the prevalence among, drivers of and experiences of infants, children and young people (ICY) are crucial. Even before the global pandemic, there were growing concerns about the influence of climate change, global unrest and the financial crisis, and social media, the internet and cyberbullying, alongside growing school pressures, on the mental health of ICY.[4,5] Indicators of greater levels of self-reported psychological distress among young people, at least in English-speaking high-income nations, are well documented.[6,7] This includes increasing numbers of young people reporting high levels of distress and symptoms of anxiety, depression and suicidality in Aotearoa New Zealand.[8] Further to this, recent international epidemiological studies estimate that at any given time an average of one in eight children and young people are experiencing mental health conditions, which impact functioning. Many would benefit from support and services, but less than half are accessing support.[9]

Indigenous and minoritised ICY (e.g., ethnic minorities, sexual minorities, gender minorities, refugees and migrants and disabled ICY) are continuing to experience high levels of discrimination and issues related to structural violence, colonisation and intergenerational trauma and conflict, as well as inequitable rates of distress and lack of access to appropriate care.[10–14] Structural factors, including racism and discrimination, are inextricably linked to the likelihood of developing any mental health condition or problematic substance use. Therefore, contextual factors must be integral to future population-based studies as part of developing a better understanding of, and preventative response to, the mental health and substance use experiences of ICY in Aotearoa New Zealand.

Taking stock—the current state of data

To bring together knowledge on existing data and to identify gaps and future opportunities, national mental health and addiction workforce agencies—Te Pou, Le Va and Whāraurau—convened a rōpū (group) comprising diverse experts and partnered with researchers at The University of Auckland to undertake a scoping review focussing on the ICY population. From this review it was clear that while we have some data, most of the current research focusses on mid-to-late adolescents and covers a limited number of mental health conditions and some aspects of substance use, with a focus on youth in mainstream education settings.[2]

The review identifies that longitudinal studies, including Growing Up in New Zealand and the Pacific Islands Families Study, provide important information about the developmental pathways and causal factors for the onset and progression of mental health conditions and problematic substance use, following a cohort of people from birth to old age. However, these studies are not designed to provide representative estimates of population prevalence because they use smaller, geographically specific, purposeful samples, in contrast to the large, random sampling required for prevalence studies.

Aotearoa New Zealand also has repeated cross-sectional surveys, such as the New Zealand Health Survey (NZHS), and the General Social Survey (GSS). These provide limited but useful data to estimate prevalence of mental health symptoms for ICY and substance use for youth, and changes over time. The NZHS also collects information on some specific contextual factors such as sleep, screen time and child discipline. Periodically, the NZHS includes an additional mental health and problematic substance use module. While this provides greater insights than are available in the standard annual NZHS data, it is still limited in scope. For example, there are no questions on patterns of problematic eating, or psychosis symptoms.[15] Also, the samples of children and young people are too small, limiting further subgroup analysis, e.g., by gender or ethnic group.[2] This means these data can tell us next to nothing about priority groups. While the NZHS provides estimates of the population rates of children and young people diagnosed with attention-deficit/hyperactivity disorder (ADHD) and autism, these data are based on people seeking help, accessing it and receiving a diagnosis. An upwards trend does not necessarily indicate increasing prevalence; it could mean increasing help seeking.

The Youth2000 series has provided the most comprehensive, national-level overview of youth (13–18 years) mental health and substance use, and, like the NZHS and GSS, the repeated nature of this survey allows for meaningful comparison over time. These studies cover a range of topics, including mental health, use of substances and contextual factors, and have included participants from diverse school settings, including wharekura (secondary schools where the medium of instruction is the Māori language), alternative education, Y-NEETS (young people who are not in education, employment and training) and teen parent units. They have also provided evidence related to priority groups, including young people in the care of Oranga Tamariki, young people from different ethnic groups, such as Māori, Pacific and Asian, young people with disabilities and those who identify as LGBTQIA+.[10–14] The scope of the studies does not include infants and children, and hence they cannot provide a comprehensive understanding of ICY mental health and substance use. The most recent survey from Youth2000 was in 2019, pre-COVID—hence, newer data are important. There is no funding secured for further surveys in this Youth2000 series. The Ministry of Social Development's What about Me? survey asked questions about mental health and substance use among young people, but the questions and sample were not comparable with Youth2000 nor international surveys, so trends and population-level prevalence were unclear. The Ministry of Social Development is planning a new youth survey that will have some population-level mental health and substance use indicators included, although at the time of writing these do not provide a high level of detail.

Aotearoa New Zealand lacks epidemiological studies with a dedicated focus on mental health, substance use and addiction for children and young people. Many existing surveys, due to having a broader scope and therefore limitations on the number of items that can be asked, use brief self-report screening tools. For mental health these screening tools include the Strengths and Difficulties Questionnaire, Reynolds Adolescent Depression Screening: Short Form, Kessler-10 and Kessler-6. While such measurement tools are useful to capture potential need, and symptoms indicative of distress at the population level, they are unable to provide clinical estimates of the prevalence of mental health conditions, problematic substance use, neurodiversity, the context in which these symptoms are experienced (the possible drivers) and the impact on the person, whānau, education and communities.[16] Furthermore, screening tools like Kessler are not commonly used in secondary mental health and addiction services, so there is a dissonance between research and clinical measures.

Datasets drawn from clinical samples also have major limitations as they are likely to significantly under-estimate the true extent of concerns, as most people who need mental health and addiction services do not receive them due to limitations of service delivery and inequitable access to care.[2] Similarly, questions on substance use rarely go beyond prevalence of use of common substances, and often do not explore associated harms. Questions on other addictive behaviours (e.g., gambling) are similarly limited. Studies outside of population-based and clinical studies are crucial to plan and invest in mental health and addiction support and services.

Of huge concern is that very few measurement tools used to understand mental health conditions and problematic substance use have been culturally validated in Aotearoa New Zealand.[2] There is an urgent need for Indigenous-determined measures. Research validating Indigenous measures is multilayered, requiring a combination of culturally meaningful, clinically relevant measures with careful analysis considering Indigenous contexts and worldviews.[17]

Other indicators of the changing mental health status of ICY can be gathered from administrative data, including hospitalisations with a primary coding as a mental health or behavioural condition, as well as data on waitlists. A strength of administrative data is inclusion of ICY aged between 0–19 years. Trends show the average number of hospitalisations for child and youth mental health or behavioural concerns have almost doubled over the last 10 years.[18] However, administrative data are based on access to hospitalisation (e.g., does not count primary care presentations or those who cannot get help), therefore significantly under-counting population and clinical need. It is well recognised that Indigenous and minoritised groups do not equitably access mental health care based on a range of barriers including financial or transport barriers, wait times and stigma.[19–21] These datasets are thus inherently biased towards those willing and able to access support and services.[16] So, while these service access and waitlist data provide valuable information, they are limited and cannot provide an accurate understanding about the types and magnitude of need for infants, children and young people.

The case for better surveillance and monitoring

In contrast to the existing studies and datasets, well-designed, dedicated population-based mental health and addiction studies can provide an accurate assessment of the scale and nature of mental health conditions and problematic substance use in the community and unmet need, and better understand drivers and the role of contextual factors.[22] It is important that future population-based mental health and addiction studies focus on populations regularly left out (e.g., individuals living with disability, chronic illness, young children), or incorrectly represented, like Indigenous and minoritised groups, and groups in youth justice. In addition, sample sizes need to be sufficient to enable the analysis of sub-groups, e.g., disabled children, Māori tamariki (children) or children living in rural areas.[10,23] This type and level of epidemiological information is a crucial part of effective mental health and addiction policy and planning. The knowledge generated supports effective commissioning of preventative, as well as treatment-based, supports and services.[5] Prevalence studies can help answer questions such as:

- What are the contexts (individual, social and political) in which we observe a higher or lower prevalence of mental health conditions and substance-related harm on children and young people?
- How many children and young people, for example, have ADHD, autistic spectrum disorder or obsessive-compulsive disorders?
- Of these children and young people, how many are accessing support and how many are not? Who are the populations, and where are needs the greatest?

Mental health–specific ICY population-based studies establish a baseline measure from which to track progress, changes over time and impact of investments made. Correlations between changes in contextual factors (e.g., parenting and school factors) and mental health outcomes can also be examined if contextual data are collected consistently.[10] Repeat cross-sectional data also allow an exploration of the drivers of mental health and substance use trends and can provide knowledge to inform approaches to prevention and early intervention, potentially delaying the progression of worsening health conditions.[24]

Other countries have invested in a repeated programme of child and adolescent mental health and addiction studies. For example, Australia is now on their third national child and adolescent mental health survey. The first took place in 1998, the second in 2014 and the third is about to commence.[25] The large-scale, repeated nature of this research provides ongoing evidence on the nature and extent of mental health conditions and has informed targeted investment in youth mental health programmes, such as the roll out of the headspace National Youth Mental Health Foundation.

Future opportunities

The last Aotearoa New Zealand mental health survey, Te Rau Hinengaro,[26] was undertaken 20 years ago. This was a high-quality, comprehensive and rigorous study; however, it only included those aged 16 years and above. Another epidemiological study specific to mental health and substance use is well overdue.

Aotearoa New Zealand can extend its knowledge of mental health conditions, addiction and substance-related harm for ICY and support the generation of data that uplift and support the mental health and wellbeing of ICY. We believe that future studies can achieve this by intentional consideration of the following:

1. That this research is non-stigmatising, shifts away from a deficit-based narrative and informs action that harness the strengths of communities.
2. Who is included in the studies and the settings in which they take place.
3. How mental health conditions and substance-related harm are understood by the communities and measured, including key contextual factors.

1. Non-stigmatising strengths-based approaches that identify protective, community-based factors

Future research can be conducted in a way that does not contribute to stigma, discrimination and deficit-based narratives. Intentional and thoughtful procurement of the research, its design and implementation are needed to align with Indigenous worldviews, give priority to minoritised voices and uphold the values and perspectives of people with lived experience. Research conducted in this way can seek to change the narrative upon which policies are developed and services delivered. While it is important to make a distinction between transient emotional experiences such as mental distress and mental health conditions, which are longer lasting and impact on functionality, we believe this reporting can be done in a non-stigmatising, strengths-based way. The Youth19 survey series, among others, offers one such example.[27]

We believe that future epidemiological studies focussed on mental health, addiction and substance-related harm could utilise the *Consolidated criteria for strengthening the reporting of health research involving indigenous peoples* (CONSIDER) statement.[28] The CONSIDER statement provides a checklist to optimise the advancement of hauora Māori, adopt a partnership approach across researchers and communities impacted and guide all aspects of the research governance, design, data collection, data analysis and dissemination.

Indigenous and lived experience–led research demonstrates methods that uplift and empower,[29] rather than perpetuate deficits and disempower narratives and statistics.

2. Who is included and the settings for research with ICY

Considering "who is included" means prioritising groups who are often under-represented and misrepresented in research and current data. Priority groups for future research are those communities we know are disproportionately impacted, including LGBTQIA+, Māori, Pacific and Asian ICY, refugees and migrants, ICY with disabilities, children involved with Oranga Tamariki and the youth justice system, those not engaged in education or work, those without secure housing, those living in small towns, remote or rural areas and those with low prevalence conditions, including first-episode psychosis.[2,10]

Relatedly, consideration must be given to the settings in which data collection take place. Many of the large-scale studies regularly conduct surveys in mainstream school settings—thus, information about ICY not in mainstream education is sparse. Similarly, information about young people in tertiary education (e.g., university or polytechnics) or the workforce (including apprentice programmes) and infants and children in early learning education settings or home settings is very limited. The B4 School Check may also provide an opportunity for measuring the mental health of 4-year-olds, and support the collection of a nationally representative sample. This will require careful consideration at the design stage to find strategies to safely include samples from these population groups.

Future research must also focus on including diverse age groups in ICY. We advocate for a greater understanding of infant mental health and substance-related harms on infant wellbeing (e.g., *in utero* exposure to tobacco, alcohol or other drugs; exposure to second-hand smoke).

3. Exploring use of a new set of measures

Careful consideration needs to be given to what measurement tools are used to quantify the prevalence of mental health conditions and understand substance-related harm. Our recent scoping review[2] highlights the myriad of measures available that are used both internationally and within Aotearoa New Zealand.[30] Of great concern is that very few of these measurement tools have been culturally validated in Aotearoa New Zealand. Investing in the development of measurement tools, alongside cultural validation of some of these internationally developed tools, will help to ensure that they accurately capture the unique experiences faced by ICY in Aotearoa New Zealand.

It is equally important to understand and seek evidence related to positive measures of mental health and broader wellbeing, identifying the strengths of individuals, families and communities and exploring factors that uplift and improve mental health and wellbeing. These measures can provide crucial insights into what the services and support systems should offer and inform policy and other population-based interventions; for instance, developing measures that are holistic, whānau-centred and culturally grounded,[23] and aligned with Māori and Pacific worldviews, such as Te Whare Tapa Whā, Māori youth–specific model Te Tapatoru, the Tongan Fonua model and the Fonofale model.[31–33] Similarly, the Integrated Tree Model, a therapeutic framework developed by Asian Family Services, can be used for Asian and other ethnic communities.[34] He Piki Raukura[29] is a measurement tool developed to understand and assess development of Māori children within Kaupapa Māori early years education, but potentially could be used in a wider community sample. Flower of Two Soils is a measurement tool designed primarily for screening for ADHD, depression and conduct issues using dimensional measures and was found to have adequate evidence for reliability and validity with Indigenous young people in North America.[35] We are not advocating for different measures for different populations; rather, we are highlighting that there is a range of culturally grounded measures that could be brought into large-scale population surveys as part of a standard set of questions for all participants.

Ellison-Loschmann et al.[23] propose an approach to advance mental health and addiction research in Aotearoa New Zealand, by adopting a whānau-based study rather than individual-based population surveys. While more complicated than individual-based studies, they argue that whānau-based studies are feasible to conduct.[23] They also identify existing whānau-based mental health measures, such as the Whānau Ora assessment tool.[36] This would include the measurement of contextual factors for promotion, prevention and early intervention, also allowing an understanding of what factors are important to maximise whānau wellbeing and resilience. The importance of measuring the relationship between whānau and health and bringing whānau perspectives into assessment and support plans is not new. Durie and Kingi[37] in their report to the Ministry of Health offer a framework for measuring Māori mental health outcomes, with whānau perspectives and relationships integral to all measures. For ICY, this is likely to include, but will not be limited to, measuring family and whānau support, intergenerational experiences of inclusion, school connectedness, school environments, social and peer support, the role of social media, sleep, physical activity and nutrition.[22]

Conclusions

Demand for mental health and addiction support and services is increasing in Aotearoa New Zealand, as in many other nations. There have been investment and service developments to help address this; however, there is a lack of ICY population–based data to understand where investments are most required and what are the effects of these investments. It is important to institute regular quality research to understand needs, unmet needs and changes over time, alongside the role of ecological and contextual factors. Aotearoa New Zealand has not conducted a comprehensive mental health and addiction study in 20 years, and no such study has ever been conducted for those under 16. To inform future service delivery and evidence-based policy, accurate, up-to-date data are urgently required. Addressing unmet and inequitable mental health and addiction needs presents a critical opportunity to improve outcomes for children, young people and their whānau.

Language and terminology

Mental health challenges—a strengths-based term preferred by people with lived experience that describes experiences from symptoms through to meeting diagnostic criteria for a mental health condition. This term also encompasses the experience of mental distress.

Mental distress (also known as psychological distress)—an emotional state that is usually transient and often occurs in response to stressors or life events. Commonly, people experience non-specific symptoms such as thoughts they find troubling, anxious feelings, low mood and disrupted sleep. These experiences may impact on daily routines and relationships. Mental distress ranges in intensity and impact. Many people with a significant degree of distress may not meet criteria for a diagnosable mental health condition.[38]

Mental health conditions—a term used instead of mental disorders to describe when people meet specific diagnostic criteria. The distinction between mental distress and mental health conditions is not always easy to make, especially in children and young people. To be termed a “mental health condition”, according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR), a person’s symptoms need to be present for a specific length of time and be severe enough to limit their functioning on a daily basis. As stated above, mental distress is usually transient.[38]

Problematic substance use—patterns of substance use that negatively impact people’s lives, including those that do not meet diagnostic criteria for substance use disorders. Substance use disorder may sometimes be used when specifically referring to people who meet diagnostic criteria.

Substance-related harm—any form of harm arising from substance use to the person using and/or to their whānau or communities.

COMPETING INTERESTS

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Lovely Dizon is a member of the Asian Family Services Ethnic Advisory Group.

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Jude Ball is secretary of the Public Health Association, Wellington Branch, a member of the Smokefree Expert Advisory Group, Health Coalition Aotearoa and a member the Tūturu development rōpū, NZ Drug Foundation.

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A rare presentation of ST-elevation, mimicking an acute coronary syndrome, as a manifestation of seizure disorder—a case report

Maxine Cooper, Michael Dick, Pradeep Sreekumar

Acute coronary syndrome (ACS) remains a significant contributor to morbidity and mortality, accounting for approximately 15% of New Zealand's annual deaths, with mortality rates exceeding those of many Western countries.[1]

Neurological conditions, including stroke and intracranial haemorrhage (ICH), can mimic the presentation of ACS with ST-elevation on electrocardiogram (ECG), without obstructive coronary disease.[2,3] Seizures presenting with acute ST-elevation is much more rarely described. While the pathophysiology remains unclear, understanding the potential causes of ST-elevation myocardial infarction (STEMI) with non-obstructive coronary arteries is important for making a diagnosis and determining further management.[4] Here we present a rare case of seizures mimicking an ACS, presenting with ST-elevation with normal coronary arteries.

Case report

A 21-year-old epileptic man with poor medication compliance presented following five successive seizures over a period of hours without full recovery. He was initially unresponsive with a low-grade fever, but haemodynamically stable with normal cardiorespiratory examinations and no rashes. Investigations demonstrated an acute kidney injury (AKI) (creatinine [Cr] 250 micromol/L, N = 60–105 micromol/L), leukocytosis (17.2 x10^9/L, N = 1.9–7.5 x10^9/L) with neutrophilia (12.4 x10^9/L, N = 1.9–7.5 x10^9/L) and elevated C-reactive protein (22mg/L, N <8mg/L). Elevated lactate levels were observed on admission, which quickly normalised and remained stable. Ceftriaxone and acyclovir were given as empiric cover for meningoencephalitis, levetiracetam and phenytoin as anti-epileptics, as well as ketamine, quetiapine and haloperidol for agitation.

ECG the following day demonstrated sinus rhythm with a newly prolonged corrected QT interval (QTc) and global T-wave inversion, presumed to be medication related (Figure 1 and 2). Over subsequent days he remained agitated, requiring intermittent sedatives and on-going cardiac monitoring. A progressive AKI (Cr 713 micromol/L) was observed. As urinalysis was not performed, the exact trigger remains uncertain, however rhabdomyolysis is considered the most likely cause based on the presentation and associated elevation in creatine kinase (CK 2077 U/L).

Day-5 ECG demonstrated dynamic inferolateral ST-elevation, with reciprocal ST-depression without haemodynamic compromise (Figure 3). CT head excluded ICH or hydrocephalus. Urgent echocardiogram demonstrated normal biventricular size and systolic function, normal valves, and no features of Takotsubo cardiomyopathy. There was no significant metabolic acidosis or electrolyte derangement noted. High-sensitivity troponin-I, not previously measured, was elevated (498ng/L, N <20ng/L).

Dual anti-platelet therapy was given, and urgent coronary angiogram demonstrated normal coronary arteries with no evidence of coronary vasospasm at the time of contrast injection. Subsequently, agitation gradually improved with persistent QTc prolongation; AKI steadily improved with fluid rehydration (Cr 116 micromol/L), and anti-epileptic medications were re-introduced with no further seizures observed.

Discussion

ACS typically relates to atherosclerotic plaque rupture or erosion, with STEMI resulting from complete culprit artery occlusion. It is well documented that other conditions, including acute neurologic events, can give rise to cardiac abnormalities.[2,3] The so-called neurogenic stunned myocardium can mimic an ACS presentation,

Figure 1: ECG at baseline.

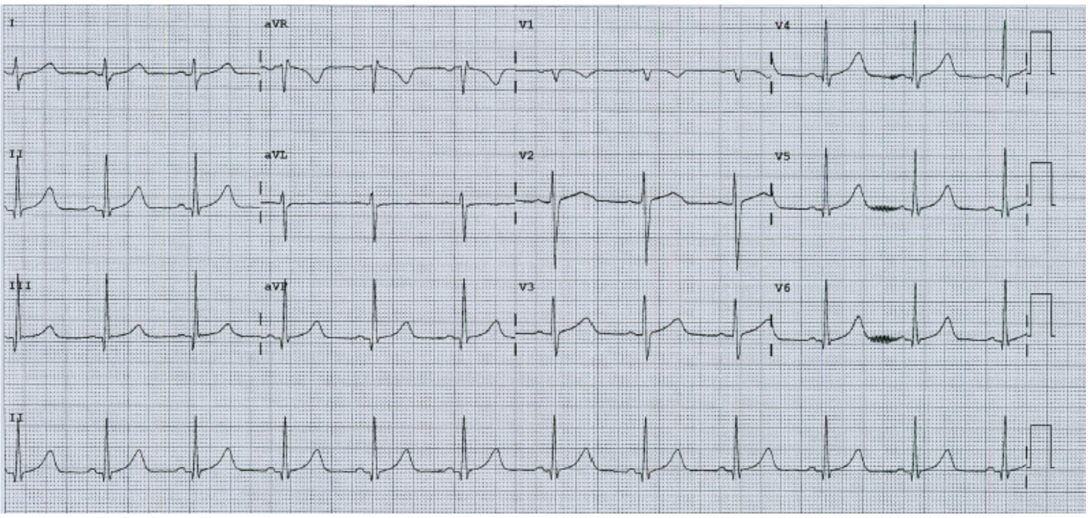


Figure 2: ECG demonstrating prolonged QTc.

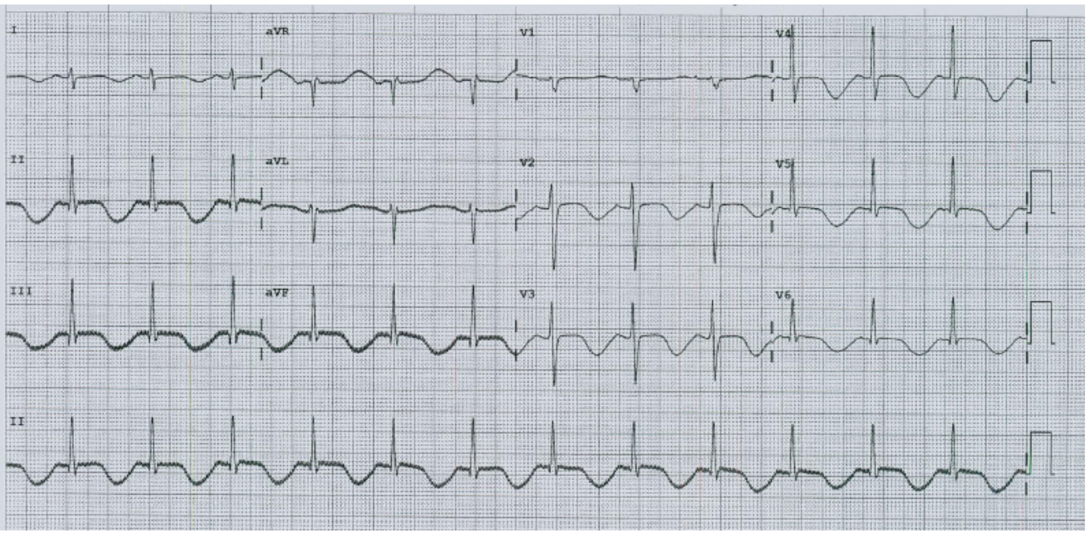
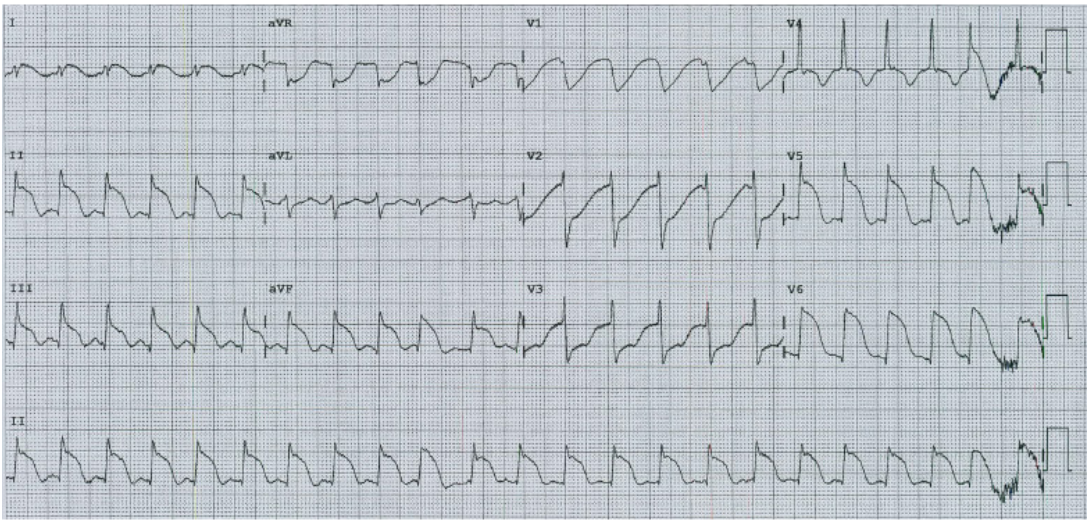


Figure 3: ECG demonstrating ST-elevation with reciprocal ST-depression (day 5 of admission).



with ischaemic ECG changes (including ST-elevation), elevated troponin and occasionally reduced cardiac function, without significant coronary artery obstruction.[5]

Seizure patients demonstrating ST-elevation is more rarely described. One case described a 75-year-old woman with known ischaemic heart disease presenting with severe headaches and hypertensive emergency without ICH, complicated by a seizure with acute ST-elevation and troponin rise.[6] Coronary angiography demonstrated 80% in-stent restenosis of a prior coronary stent without evidence of thrombus or plaque-rupture on intravascular imaging.[6] Her final diagnosis was posterior reversible encephalopathy syndrome secondary to malignant hypertension causing seizures.[6]

One proposed mechanism for the neuro-cardiac association involves sympathetic overactivity with a catecholamine surge (potentially triggered by illness-related stress) following damage to areas of the brain controlling the autonomic nervous system.[7] These excess catecholamines may induce direct cardiotoxicity, or precipitate coronary vasospasm. Similarly, studies report more highly elevated plasma epinephrine and norepinephrine levels being associated with hypertension, ST-segment changes and poorer clinical outcomes.[2,8,9] If coronary vasospasm is suspected, specific provocation testing with acetylcholine can be considered.[10] CT coronary angiogram can serve as an alternative to invasive angiography for ruling out significant obstructive coronary artery disease (CAD), especially in younger patients with a low risk of CAD. However, for cases where the diagnosis is uncertain and there is clinical urgency due to haemodynamic instability or evidence of ongoing ischaemia, invasive angiography remains the preferred approach.[11]

In summary, this case demonstrates that ST-elevation can occur following seizures without associated coronary plaque. Though the underlying pathophysiology remains unclear, it may be related to increased circulating catecholamines, and while specific guidelines are lacking, neurogenic stunned myocardium and other stress-induced cardiomyopathies are typically reversible and managed medically.[5,12] Clinicians should be alert to this possibility in patients with acute seizure episodes.

COMPETING INTERESTS
Nil.

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The need for diagnosis in dementia

John Turbott

Dr Macleod has written a timely, comprehensive and humane article about the thorny issues of management in end-stage dementia.[1] But while the precise cause of the catastrophic brain failure that characterises late dementia may at that stage no longer be of direct relevance to management, I was nonetheless puzzled that Dr Macleod gave just passing reference to diagnosis and only mentioned Alzheimer's disease, the most common cause, in his last paragraph.

As he states, dementia is a progressive, life-limiting syndrome. It is not a diagnosis in itself, but diagnosis is important. Occasionally, apparently profound dementia may have reversible causes such as hypothyroidism or severe, undiagnosed depressive disorder. Sometimes specific treatments may be indicated in the subtypes of neurodegenerative disorder that most commonly underly dementia. As they become better defined, it is increasingly likely that the associated genetic abnormalities will become of vital interest to relatives of sufferers. Precise diagnosis is also a necessary aspect of research.

In contemporary New Zealand practice, a diagnosis of the type of disorder causing dementia is usually made on clinical grounds by an experienced medical specialist, but not all patients see specialists. Psychometric testing is sometimes useful and imaging may provide a more definitive diagnosis, but both are constrained by the resources available. Post-mortem brain examination is rarely done. The lack of a definitive diagnosis, supported by imaging or pathology, in many cases of dementia is regrettable, albeit that it may not contribute a great deal to the management of advanced cases.

COMPETING INTERESTS

Nil.

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The impact of surgical time of day and surgical site infection

David Cumin, James F Cheeseman, Guy R Warman

ABSTRACT

Disruption to the circadian clock has impacts on health and wellbeing, including impaired immune function and wound healing. It is plausible that the timing of surgical procedures could impact the body's response to trauma and susceptibility to infections. Using the Health Quality & Safety Commission data on surgical site infections (SSI) we sought to investigate any possible time of day effects on the incidents of recorded infections. All recorded data from June 2017 to July 2021 were extracted for cardiac and orthopaedic operations in New Zealand. The incidence of SSI was calculated for each 4-hour bin of time across the day. There was a total of 87,034 cases in the analysis, of which 1,327 (1.5%) had an infection. Univariately, there was a significant time of day effect, with operations after 8 pm being 3.91 times more likely to have an infection ($p<0.001$), and operations between 4 pm and 8 pm being 0.71 times more likely ($p=0.03$) to have an infection compared to operations conducted between 12 pm and 4 pm. However, when age, acuity and American Society of Anesthesiologists scores were included in the model, there were no differences in the rate of infection by time of day. This preliminary work suggests that surgical time of day does not significantly impact incidence of surgical infection when other variables are controlled for. However, this work has not considered other factors that may also be important. We plan to link the SSI data with the National Minimum Dataset to investigate these other factors and conduct a more comprehensive analysis.

Circadian rhythms—biological and physiological changes that follow a roughly 24-hour cycle—exist in all organisms. These rhythms are driven by the body's internal circadian clock and are influenced by environmental cues such as light and temperature. The most apparent circadian rhythm in humans is the sleep–wake cycle. However, we also know that the clock has a profound effect on innate and acquired immunity,[1,2] and that disruption to the clock has impacts on health and wellbeing, including impaired immune function[3] and wound healing.[4] It is plausible that the timing of surgical procedures could impact the body's response to trauma and susceptibility to infections.

A retrospective cohort study of 56,920 general and vascular operations found a time of day effect on morbidity, which included infection.[5] However, a similar study of 21,985 cases found there was no correlation between time of surgery and post-operative infection.[6] Our preliminary study aimed to investigate the possibility of surgical time affecting post-operative infection using New Zealand data.

Methods

Using the Health Quality & Safety Commission (HQSC) data on surgical site infections (SSI)[7] we sought to investigate any possible time of day effects on the incidents of recorded infections. With ethics approval (AH22794), all recorded data from June 2017 to July 2021 for cardiac (including coronary artery bypass grafts) and orthopaedic (hip and knee arthroplasty) operations in New Zealand were extracted from the HQSC.[8] Admissions classified as "arranged" or "acute" were considered acute admissions; those classified as "waiting list" were considered elective.[9] The incidence of SSI was calculated for each 4-hour bin of time across the day, using the knife-to-skin time. Cases where this was recorded as being exactly at midnight were removed as likely artefacts. Any case where the age of the patient was under 18 years was also removed, as were cases with unknown or unrecorded American Society of Anesthesiologists scores. A logistic regression model was used to determine any time of day effects (with reference to the data between 12 pm and 4 pm), while controlling for age, acute admission and ASA scores.

Results

There was a total of 91,165 cases in the dataset. Of these, 3,480 were removed for being recorded at exactly midnight, a further 1,939 were removed for being under 18 and 2,192 more cases were excluded for having missing ASA data. This left 87,034 cases, of which 1,327 (1.5%) had an infection. Univariately, there was a significant time of day effect, with operations after 8 pm being 3.91 times more likely to have an infection ($p<0.001$), and operations between 4 pm and 8 pm being 0.71 times more likely ($p=0.03$) to have an infection compared to operations conducted between 12 pm and 4 pm. However, when age, acuity and ASA scores were included in the model, there were no differences in the rate of infection by time of day. There were no significant differences in the rate of infection by age, but there were increasing rates of infection as ASA score increased, with patients with ASA 2 being 1.81 ($p=0.003$), ASA 3 being 3.99 ($p<0.001$), ASA 4 being 7.28 ($p<0.001$) and ASA 5 being 9.26 ($p<0.001$) times more likely to have an infection compared to patients with ASA 1; acute admissions were 1.60 ($p<0.001$) times more likely to have an infection compared to non-acute cases.

The acute cases were more likely to have higher ASA scores (Kruskal–Wallis $p<0.001$), and there were more acute cases operated on outside of business hours: between the hours of 8 am and 8 pm, the percentage of acute cases was approximately 35%. This rose to between 60% and 65% outside of those hours, reflecting the more urgent nature of the operations. Similarly, during 8 am–8 pm and in the non-acute cases, there was some evidence that patients with a higher ASA score were scheduled earlier: the percentage of patients with ASA <3 rose from 62.4% to 65.4% and the percentage of patients with ASA >3 dropped from 7.7% to 5.2% between 8 am–12 pm and 12pm–4 pm (Chi-squared $p<0.001$).

Discussion

Simple, univariate analysis of time of day effects may mask more complex mechanisms. This preliminary work suggests that surgical time of day does not significantly impact incidence of surgical infection when other variables are controlled for.

This may partly reflect the decisions of list schedules, in which patients at more risk of infection are prioritised for earlier surgery, and patients with a large number of comorbidities and more acute need are seen out of normal hours.

We also did not access data about the experience of surgeons or other team members for each operation despite possible correlations with post-operative infection. This work has also not considered the administration of antibiotics, circadian disruption pre-surgery or other factors that may also be important.

We included all ASA levels—with appropriate preliminary analysis—as they were recorded, and we have not done any work to verify them.

Future work is required to link the SSI data with the National Minimum Dataset to investigate these other factors and conduct a more comprehensive analysis.

COMPETING INTERESTS

Nil.

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Fluctuating Virulence in Common Organisms

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We would draw attention to an important article by *Dr. Lynch* in this number, in which he gives a convincing account of the great virulence acquired by the staphylococcus aureus following the epidemics of influenza which occurred in Dunedin in 1918 and 1923. The knowledge that various disease-producing bacteria show a seasonal or periodic variation in their activities is, of course, commonplace, and forms one of the axioms of epidemiology. Such diseases as plague, sleeping sickness, measles, etc., are well-known to exist in a comparatively mild endemic state, and then for reasons that are by no means clear to take on the character of a raging epidemic. Doubtless this may be explained to some extent, by conditions affecting the carrier or its host, by lowered resistance in the population from famine, or the hardships and anxieties of war; but there is ground for the belief that the causal organism itself acquires from within, as it were, an awakening from its hibernation and an increased vigour apart from that which is imparted by the better soil for growth and multiplication, supplied by a diminished resistance in its victims. The phenomena of the decline and termination of epidemics can, moreover, be with difficulty explained *in toto* by considering that all suitable pabulum has been exhausted by a general increase of resistance, as the survivors, through anxiety and weariness following the tending of the sick might be considered more liable to attack. Nor can it be fully accounted for by change in environment and seasonal conditions. There must be, in addition, an inherent tendency in the germ itself to revert to its pristine innocuous state. The rise and fall of these hosts of death, like the rise and fall of nations, however difficult to fully understand, are at least facts of common knowledge, but it is rather a startling reflection that the secondary organisms that accompany or follow their ravages are able to share in their conquests, and going on from strength to strength reach a pitch of virulence little short of the primal germ, and indeed carry on with their increased powers long after the latter has relapsed into a state of impotence. The conquering army, weary of the slaughter, has retired on its base, but the camp followers, unsatiated, carry on the campaign.

The facts suggested, and indeed proved, for such a relatively harmless germ as staphylococcus will cause the profession to consider whether other bacteria have not equally benefited by recent influenza epidemics. We have a strong feeling that the bacillus coli and its congeners also, have taken a more prominent place than formerly in every-day pathological conditions. The ordinary inhabitant of the intestine is, of course, a creature of little pathogenicity compared with its fellow as found in appendix abscess. Whether that increased virulence is entirely due to its growth in unusual tissues, or whether all the colon bacilli of that particular patient have a more virulent character, which predisposes him to the attack, is open to question. At any rate it is not uncommon to see cases where the bacillus passes through the pelvis of the kidney in large numbers, causing few or no symptoms, while others suffer an intense and intractable pyelonephritis. May it be that all of the bacillus coli of the latter are more potent than those of the former?

We think that the subject may force itself on the notice of the profession in other directions. It may serve to explain some of our puerperal problems. It shows that the possible changes in the nature of bacteria whose operations and effects are supposed to be well-known may enable them to show manifestations that will leave us in bewilderment. It brings home to us that the devastating effects of such an epidemic as influenza are not limited to the time of the duration of that epidemic; and that much of the sickness that follows may be due not alone to permanent damage to organs and general lowering of vitality caused by the primary disease; but probably also to the more permanent lodgment in the body of other organisms whose enhanced virulence, gained at the time of the epidemic, enables them to propagate and initiate disabling conditions long after the principal germ has ceased to operate.