Choosing Wisely means choosing equity

Firearms and lead

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Belinda J Loring, Sue Ineson, Derek Sherwood, David Tipene-Leach

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The Before School Check (B4SC): reporting outcomes and referral rates for all New Zealand children

Noni Richards, David Reith, Michael Stitely, Alesha Smith

The Before School Check (B4SC) is a health and development screening programme for four-year-olds. It captures information on the height, weight, vision, hearing and emotional and physical development of over 90% of four-year-old children in New Zealand. We found that less than 5% of children had problems with emotional and physical development. We also found that children from socioeconomically disadvantaged areas were more likely to be referred for extra assessment.

Dissonance in naming adiposity: a quantitative survey of naming preferences from a convenience sample of health professional and lay population in Aotearoa New Zealand

Caz Hales, Lesley Gray, Carol MacDonald, Gordon Purdie

This paper comprised 775 adult participants (330 health professionals, 440 non-health, five not specified) and is the first study of its kind in Aotearoa New Zealand to explore weight-related terminology. Communication has an essential role in the therapeutic relationship between patient and healthcare professionals (HCPs) where terminology used can significantly impact on an individual's perceptions of weight and experience of stigma. 'Weight' or 'high BMI' were the most preferred terms for describing excess adiposity for participants. There was a conflict in responses relating to the terms considered most blaming and those considered to be motivating terms to lose weight, which is perhaps unsurprising given the level of bias and stigma in relation to people with excess adiposity (fatness). Whichever term is selected, HCP-patient conversations need to be respectful, appropriate and support meaningful non-stigmatising dialogue.

Predictors of non-attendance at outpatient endoscopy: a five-year multi-centre observational study from New Zealand

Mehul Lamba, Yassar Alamri, Paras Garg, Chris Frampton, David Rowbotham, Richard Gearry

Our study has sought to identify patient groups who are more likely to miss outpatient endoscopy appointments. We found that younger patients, male gender, people from socio-economically deprived areas and Māori and Pacific peoples were much more likely to miss endoscopy appointments. Overall compliance with endoscopy appointments was greater in Canterbury compared to Auckland, likely due to different patient reminder systems used across both district health boards. While we have identified vulnerable population groups, further studies are needed to identify specific patient factors related to non-attendance to facilitate targeted intervention to improve compliance.
Early direct current cardioversion or ablation for atrial fibrillation or atrial flutter and acute decompensated heart failure
Fang Shawn Foo, Andrew Kerr, Ruvin Gabriel, David Heaven, Jen-Li Looi, Mayanna Lund, Jamie Voss, Timothy Sutton

Patients who present to hospital with heart failure and atrial arrhythmias (fast heart rhythms originating from the upper chambers of the heart) have traditionally been managed with medications to slow down the heart rate. We investigated the outcomes of patients having their heart rhythms restored to a normal rhythm with synchronised cardioversion (an electric shock to reset the heart rhythm) or with ablation (a procedure from within the heart to interrupt the electrical circuit). We found that this strategy had a relatively low rate of death and rehospitalisation for heart failure. Most patients also had significant improvement in heart function. A subgroup of patients appeared to do better with an ablation strategy compared with cardioversion.

Nature and delivery of cardiac rehabilitation in New Zealand: are services equitable to other high-income countries?
Brendon H Roxburgh, Marta Supervia, Karam Turk-Adawi, Jocelyne R Benatar, Francisco Lopez Jimenez, Sherry L Grace

Cardiac rehabilitation (CR) is a cost-effective service to improve risk factors after a heart attack and/or cardiac surgery, reducing mortality and risk of rehospitalisation. We compared the nature of CR programs in New Zealand and with those of countries with similar incomes and health systems. We found New Zealand CR programmes had fewer types and number of staff, provided fewer sessions and were less comprehensive, compared to those in other high-income countries. New Zealand did well in providing alternate forms of CR, such as community based.

Can direct-to-consumer advertising of prescription drugs be effectively regulated?
Joel Lexchin, David B Menkes

The New Zealand government is currently considering a draft Therapeutic Products Bill and is posing the question about whether direct-to-consumer advertising (DTCA) of prescription drugs should be regulated or banned. Recent studies demonstrate that DTC ads in the US continue to be misleading and contain minimal if any educational value, despite governmental regulatory efforts. Self-regulation by industry is even more ineffective. Vulnerable population groups, eg, those with poorer self-reported health status, older, less educated, lower income and ethnic minorities and those with unhealthy lifestyles are most likely to be affected by DTCA. Since evidence has demonstrated that regulation has consistently failed to prevent the inappropriate promotion of prescription medicines, the conclusion is that DTCA should be banned.
Choosing Wisely means choosing equity

Belinda J Loring, Sue Ineson, Derek Sherwood, David Tipene-Leach

OVertreatment and unnecessary care, and the consequences for patient safety and health system sustainability, are issues of increasing concern. Choosing Wisely is an international campaign that aims to promote a culture where low value and inappropriate clinical interventions are avoided, and patients and health professionals have well-informed conversations about treatment options, leading to better decisions and outcomes. Since 2016, the Council of Medical Colleges’ members and other specialty societies in New Zealand have issued over 150 recommendations of low-value tests, treatments or procedures that should be questioned, and health professionals, district health boards (DHBs) and primary health organisations (PHOs) are being encouraged to implement these recommendations in hospitals and primary care settings.

There are marked health inequities experienced by Māori and Pacific peoples in New Zealand, and new interventions are known to exacerbate inequity as they are taken up first by those in society with the most resources and the least need. Choosing Wisely activity must then avoid making these inequities worse, moreover, it should aim to reduce inequity. So how can we ensure that the Choosing Wisely campaign and other efforts to reduce unnecessary care do not fall into this trap?

Choosing Wisely concern around unnecessary care is based on improving the shared decision-making between patients and health professionals, but very little is known about who gets unnecessary care in New Zealand. For instance, while data around polypharmacy in older people is clear (ie, more common in Māori aged 65–74 years and European New Zealanders over 85 years), data on other areas of low value care relevant to Choosing Wisely recommendations, like inappropriate prescribing of antibiotics and unnecessary urine testing in hospital, are not available by gender, ethnicity or other equity stratifiers.

Much of the focus of routine data, such as the Health Quality and Safety Commission’s Atlas of Healthcare variation, is on variability in necessary care and we know that Māori receive fewer tests, prescriptions and referrals than other ethnic groups and subsequently, less treatment. Pacific people and other groups of low socioeconomic status are also less likely to receive the healthcare that they need. But there is, however, overseas evidence that underserved ethnic groups also experience overtreatment, and the health sector needs to understand how the issue of low-value and inappropriate care affects different ethnic and social groups. Choosing Wisely, in the effort to reduce overtreatment, needs to make sure that the message “more is not necessarily better” does not inadvertently worsen the undertreatment for Māori and other groups who do not receive enough of the care that they need.

The formulating of recommendations for the entire population is unlikely to be appropriate, or may even be contraindicated, for certain groups. For example, a Choosing Wisely recommendation not to prescribe antibiotics for acute upper respiratory tract infections (URTIs), may sound reasonable given the majority of URTIs are viral and antimicrobial resistance is a rising concern. However, for Māori and Pacific children in New Zealand, who experience high rates of rheumatic fever, sore throats should be swabbed and treated with antibiotics presumptively until swab results are available. New Zealand colleges and specialty societies therefore have a responsibility to evaluate the potential impact on health inequities of their recommendations and be very clear when communicating where recommendations should not be applied for all population groups.
Choosing Wisely depends on promoting shared decision-making, built on good communication and understanding between health professionals and patients, and promoting health literacy. Māori whānau were consistently and significantly less likely to get answers that they could understand when they had important questions to ask, and they were less likely to have had their condition adequately explained to them or feel that doctors or nurses listened to what they had to say.12 Given this, the Choosing Wisely encouragement to patients “to ask more questions” may not be addressing the real obstacles for Māori. The improvement of shared decision-making for Māori requires health professionals, when reviewing care options, to focus on barriers and facilitators to open communication and to be able to work with patient values and preferences. In addition, Choosing Wisely patient resources need to be informed by the views and needs of Māori and other underserved groups.

It would seem then, prudent to improve the cultural safety of Choosing Wisely in New Zealand. For this reason, Choosing Wisely New Zealand is partnering with Te Ohu Rata o Aotearoa—Māori Medical Practitioners Association (Te ORA)—a partnership that is intended to bolster the governance, the design and the implementation of the Choosing Wisely campaign. The evaluation of the campaign should address gaps in knowledge about ethnic, gender and other inequities in the provision of unnecessary care/overtreatment as it will routinely include a range of equity variables.

Many of the strategies identified for the Choosing Wisely campaign can apply more broadly to other health behaviour change campaigns in New Zealand. The process of proactively scoping potential unintended consequences on health inequalities should be routine for all health promotion campaigns, and many of the approaches identified are not unique to Choosing Wisely or efforts to reduce unnecessary care. The need to improve equity in shared-decision making is an issue which involves the entire health sector in New Zealand and reinforces the need for broader efforts to improve the cultural safety of both health professionals and organisations.

**Competing interests:**
Dr Sherwood reports affiliation with Choosing Wisely NZ during the conduct of the study; personal fees from Nelson Marlborough District Health Board outside the submitted work. Sue Ineson is contracted by the Council of Medical Colleges to facilitate Choosing Wisely In NZ.

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**URL:**


The Before School Check (B4SC): reporting outcomes and referral rates for all New Zealand children

Noni Richards, David Reith, Michael Stitely, Alesha Smith

ABSTRACT

AIMS: Describe the data obtained through the Before School Check (B4SC) and report on the outcomes and referral rates of the B4SC measures.


RESULTS: After excluding duplicate entries, 287,572 children from the B4SC database were included for analysis. Two or more significant developmental concerns (assessed by the Parental Evaluation of Developmental Status (PEDS) questionnaire) were identified in 14,177 (4.9%) children. Less than four percent (n=10,941) of children had abnormal Strengths and Difficulties Questionnaire (SDQ) scores of 17 or more, indicating concerns about emotional and behavioural development. Eight percent of children (n=24,147) had BMIs in the 98th centile or above. Only half (56%) the number of children meeting the criteria for referral in the PEDS and SDQ assessments were referred or already under care. A quarter (25.2%) of all children in areas with the highest deprivation scores were referred for further assessment in at least one of the measured domains compared with 14% of children in areas with the lowest deprivation scores.

CONCLUSIONS: The B4SC database provides an overview of the development of four-year-old children in New Zealand. Less than 5% of children had abnormal scores in assessments that measure neurodevelopment, however not all children who met the referral criteria were referred to other health services. Rates of referral increased with increasing deprivation score.

The Before School Check (B4SC) is a health and development screening programme that assesses the school readiness of four-year-olds prior to school entry in New Zealand. The programme aims to identify any issues a child may have that could negatively affect their participation in education. Assessments cover a number of childhood health and development domains, including height and weight, oral health, vision, hearing and emotional and physical development.

Participation in the B4SC programme is voluntary and provided at no cost to the family. Assessments are carried out by registered nurses and vision and hearing technicians throughout New Zealand in different locations depending on the needs of the community, for example, preschools, general practice clinics and other community venues such as churches and marae. The assessments are part of the WellChild Tamariki Ora programme and are the eighth and final contact a child has with this programme from birth. The data are collected and stored in a secure national database that is managed by the Ministry of Health. Depending on the outcomes of the assessments, children may be referred to other services if required. Since 2013, over 90% of all eligible four-year-olds have participated in the programme each year, making it a unique collection of data covering the physical and psychosocial development of New Zealand four-year-olds.
The B4SC has been operating in New Zealand since 2008 and while the Ministry of Health measures and reports on the B4SC programme uptake and coverage against targets, little has been published that describes or analyses the data collected or to determine if the programme is achieving its goals. The aim of this study is to describe the data obtained through the B4SC and report on the outcomes and referral rates of the following B4SC assessments: vision, hearing, body mass index, emotional and physical development.

Methods

This is a cross-sectional study using the data collected by the B4SC. In addition to measuring vision and hearing using distance visual acuity, sweep audiometry and tympanometry, height and weight measurements are taken and children are screened for their emotional and physical development with two questionnaires, the Strengths and Difficulties Questionnaire (SDQ) and the Parental Evaluation of Development Status (PEDS) tool.3 The Appendix contains a more detailed explanation of collection methods used for each assessment. We obtained permission to access the data, which is stored and managed by the New Zealand Ministry of Health. The study was approved by the University of Otago Human Research Ethics Committee (HD17/003).

Study population

The study population is all children, aged between 37 months and 71 months, who have had an assessment as part of the B4SC between 1 January 2012 and 31 December 2016. Every person in New Zealand has a unique National Health Index (NHI) number, an alphanumeric identifier that is used in most interactions with the health system over their life. All cases in the B4SC had an NHI number. These NHI numbers were anonymised via encryption, and data obtained from the B4SC included all information collected for the following assessments: height, weight, body mass index (BMI), vision and hearing screening results, and outcomes of the PEDS and SDQ questionnaires (oral health checks were not included). Outcomes in the B4SC refers to service delivery outcomes and does not reflect overall health and wellbeing outcomes. Gender, age in months, ethnicity and socioeconomic deprivation quintile were provided as part of the dataset. Socioeconomic deprivation is estimated using The New Zealand Index of Deprivation 2013 (NZDep2013) which combines variables from the 2013 census data on eight dimensions of deprivation to provide a deprivation score for each ‘meshblock’ in New Zealand. A meshblock is a small geographical unit containing approximately 81 people with each meshblock assigned a scaled continuous score. To allow for categorical analysis, NZDep2013 divides New Zealand into fifths based on the distribution of these continuous scores. Quintile 1 represents the 20% of areas with the lowest (least deprived) NZDep2013 scores whereas a meshblock in quintile 5 is in the 20% of areas with the highest (most deprived) deprivation scores.4

Duplicate entries were removed and data were examined for accuracy with implausible measurements excluded, eg, a child whose age was entered as 144 months (12 years).

Analysis

The data were analysed using SPSS5 software (version 24) to generate descriptive statistics. Stata software (version 15) was used to compare referral rates by deprivation score using Pearson’s chi-square tests with significance set at p<0.05.

Results

Demographics

Excluding 3,921 (1.3%) duplicate entries from the dataset left 287,572 children participating. Participating children were not spread evenly across NZDep2013 quintiles; there was a higher proportion in quintile 5 than in the other NZDep2013 quintiles. European and other ethnicities were the most common ethnicity receiving the B4SC checks, followed by Māori. Table 1 describes the demographics of the cohort.

Vision and hearing assessment

The majority of children passed vision and hearing screening; 236,651 (82.3%) children passed vision screening and 233,411 (81.2%) children passed hearing screening. 19,204 (6.7%) children were referred for further vision assessment and 15,713 (5.5%) children were referred for further hearing screening. Nine thousand, eight hundred and ninety-nine (3.4%) children were
already under the care of an ophthalmologist/optometrist and 10,240 (3.6%) children were already under the care of an otorhinolaryngologist or an audiologist. Only 2.2% of children had caregivers decline screening. Virtually all children who failed vision or hearing screening in the B4SC were referred, rescreened or already under care. After failed visual acuity testing in either eye, 96.7% of children were referred, 2.0% were rescreened and 1.1% were already under care. After failed audiometry in either ear, 57.7% of the children were referred, 44.1% were rescreened and a further 2.0% were already under care.

Parents Evaluation of Development Status (PEDS) questionnaire

The majority of children (67.4%) assessed using the PEDS tool for the B4SC had no significant developmental concerns. The B4SC guidelines recommend that children with two or more significant concerns identified in PEDS should be referred for further assessment (Pathway A). Fewer than 5% of children (n=14,177; 4.9%) had two or more significant concerns. However, not all children assigned to Pathway A were referred to other services. Of those with two or more significant concerns identified in PEDS, 4,990 (35.2%) children were referred, 4,309 (30.4%) were already under care and 3,273 (23.1%) were given advice. Table 2 shows the number of children assigned to each PEDS pathway and the associated outcomes.

Of the 13,942 children who were referred, 9,789 referrals (70.2%) were completed, 2,799 (20.1%) were in progress, the service provider declined 866 children (6.2%) and 488 children (3.5%) did not attend the referral because the caregiver declined.

Strengths and Difficulties Questionnaire (SDQ): parent-completed

The majority of the cohort (87.4%) had normal SDQP scores less than 14. The B4SC recommends children scoring between 17 and 40 for a parent-completed SDQ should be referred for further assessment. A small proportion of the cohort, 10,941 (3.8%) children had total SDQ scores of 17 or higher and of those 3,207 (29.3%) were referred, 1,860 (17.0%) were already under care, and 3,832 (35.0%) were given advice. Table 2 compares the SDQ scores with the recorded outcome.

The SDQ score is significantly more sensitive if both a parent and teacher complete the questionnaire,6 however 48% of the teacher completed-SDQ results have declined, non-applicable or missing outcomes, therefore results from this part of the B4SC have been excluded from further analysis in this study.

Table 1: Demographics. Assessments by NZDep2013 quintile, ethnicity and gender.

<table>
<thead>
<tr>
<th>NZDep2013 quintile</th>
<th>No. (%)</th>
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<tr>
<td>1 – least deprived score</td>
<td>55,140 (19.2)</td>
</tr>
<tr>
<td>2</td>
<td>53,160 (18.5)</td>
</tr>
<tr>
<td>3</td>
<td>52,734 (18.3)</td>
</tr>
<tr>
<td>4</td>
<td>55,169 (19.2)</td>
</tr>
<tr>
<td>5 – most deprived score</td>
<td>69,224 (24.1)</td>
</tr>
<tr>
<td>Missing</td>
<td>2,145 (0.7)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European and other</td>
<td>154,082 (53.6)</td>
</tr>
<tr>
<td>NZ Māori</td>
<td>66,479 (23.1)</td>
</tr>
<tr>
<td>Pacific</td>
<td>29,052 (10.1)</td>
</tr>
<tr>
<td>Asian/Indian</td>
<td>33,466 (11.6)</td>
</tr>
<tr>
<td>MELAA</td>
<td>4,493 (1.6)</td>
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<table>
<thead>
<tr>
<th>Gender</th>
<th>No. (%)</th>
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</thead>
<tbody>
<tr>
<td>Male</td>
<td>147,864 (51.4)</td>
</tr>
<tr>
<td>Female</td>
<td>139,708 (48.6)</td>
</tr>
<tr>
<td>Total</td>
<td>287,572</td>
</tr>
</tbody>
</table>

NB: 0.7% missing includes those assigned quintile 0, which is invalid. MELAA: Middle Eastern/Latin American/African.

Implausible measurements were infrequent across the B4SC database but excluded from analysis where they occurred. This resulted in 530 (0.2%) children excluded due to invalid age reporting and 181 (0.06%) children excluded due to implausible BMI measurements, which were BMI measurements that were <5 or >5 standard deviations from the mean without a referral explanation.

The majority of the cohort (87.4%) had normal SDQP scores less than 14. The B4SC recommends children scoring between 17 and 40 for a parent-completed SDQ should be referred for further assessment. A small proportion of the cohort, 10,941 (3.8%) children had total SDQ scores of 17 or higher and of those 3,207 (29.3%) were referred, 1,860 (17.0%) were already under care, and 3,832 (35.0%) were given advice. Table 2 compares the SDQ scores with the recorded outcome.

The SDQ score is significantly more sensitive if both a parent and teacher complete the questionnaire, however 48% of the teacher completed-SDQ results have declined, non-applicable or missing outcomes, therefore results from this part of the B4SC have been excluded from further analysis in this study.
Table 2: PEDS Pathways, SDQ Parent scores and outcomes.

<table>
<thead>
<tr>
<th>Outcome of assessment after assignment of PEDS pathway or SDQP score</th>
<th>Advice given n= 63,988</th>
<th>No action n=185,906</th>
<th>Referred - referral declined n=2,687</th>
<th>Declined assessment n=2,687</th>
<th>Referred n=13,942</th>
<th>Under care n=10,786</th>
<th>Missing n=8,254</th>
<th>Total n=287,572</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEDS Pathways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A – ≥2 concerns</td>
<td>3,273 (23.1)</td>
<td>1,084 (7.6)</td>
<td>502 (3.5)</td>
<td>19 (0.1)</td>
<td>4,990 (35.2)</td>
<td>4,309 (30.4)</td>
<td>0 (0.0)</td>
<td>14,177 (4.9)</td>
</tr>
<tr>
<td>B – 1 concern</td>
<td>18,847 (47.1)</td>
<td>9,426 (23.6)</td>
<td>685 (1.7)</td>
<td>17 (0.0)</td>
<td>6,184 (15.5)</td>
<td>4,822 (12.1)</td>
<td>0 (0.0)</td>
<td>39,981 (13.9)</td>
</tr>
<tr>
<td>C – 1 non-significant concern</td>
<td>14,406 (53.1)</td>
<td>8,982 (33.1)</td>
<td>528 (1.9)</td>
<td>8 (0.0)</td>
<td>2,206 (8.1)</td>
<td>1,017 (3.7)</td>
<td>0 (0.0)</td>
<td>27,147 (9.4)</td>
</tr>
<tr>
<td>D – communication difficulties</td>
<td>548 (34.4)</td>
<td>897 (56.3)</td>
<td>26 (1.6)</td>
<td>1 (0.1)</td>
<td>80 (5.0)</td>
<td>41 (2.6)</td>
<td>0 (0.0)</td>
<td>1,593 (0.6)</td>
</tr>
<tr>
<td>E – no concerns</td>
<td>26,914 (13.9)</td>
<td>165,517 (85.4)</td>
<td>268 (0.1)</td>
<td>15 (0.0)</td>
<td>482 (0.2)</td>
<td>597 (0.3)</td>
<td>1 (0.0)</td>
<td>193,794 (67.4)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>2,627 (24.1)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>8,253 (75.9)</td>
<td>10,880 (3.8)</td>
</tr>
<tr>
<td>SDQ score totals categorised</td>
<td>Advice given n= 55,794</td>
<td>No action n=204,591</td>
<td>Referred - referral declined n=2,866</td>
<td>Declined assessment n=4,109</td>
<td>Referred n=7,709</td>
<td>Under care n=4,246</td>
<td>Missing n=8,257</td>
<td>Total n=287,572</td>
</tr>
<tr>
<td>No concern (0–13)*</td>
<td>47,217 (18.8)</td>
<td>198,426 (79.0)</td>
<td>1,167 (0.5)</td>
<td>74 (0.0)</td>
<td>2,888 (1.1)</td>
<td>1,549 (0.6)</td>
<td>1 (0.0)</td>
<td>251,322 (87.4)</td>
</tr>
<tr>
<td>Some concern (14–16)</td>
<td>4,745 (36.1)</td>
<td>5,310 (40.4)</td>
<td>585 (4.5)</td>
<td>43 (0.3)</td>
<td>1,614 (12.3)</td>
<td>837 (6.4)</td>
<td>1 (0.0)</td>
<td>13,135 (4.6)</td>
</tr>
<tr>
<td>Refer (17–40)</td>
<td>3,832 (35.0)</td>
<td>855 (7.8)</td>
<td>1,114 (10.2)</td>
<td>73 (0.7)</td>
<td>3,207 (29.3)</td>
<td>1,860 (17.0)</td>
<td>0 (0.0)</td>
<td>10,941 (3.8)</td>
</tr>
<tr>
<td>Missing</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>3,919 (32.2)</td>
<td>0 (0.0)</td>
<td>0 (0.0)</td>
<td>8,255 (67.8)</td>
<td>12,174 (4.2)</td>
</tr>
</tbody>
</table>

*The no concern category includes some children ‘under care’ because these categories are assigned by calculating the score totals for the individual domains. Some of the children who were already under care had not been assessed using the SDQP and therefore their scores had been entered as zeroes instead of blanks.

Height, weight and BMI centile

Only 720 children (0.3%) in the cohort were in the lowest BMI centile group (0.4% and under) and of those, 34 (4.7%) were referred. A large proportion of the cohort (24,147 children; 8.4%) had BMIs in the 98th centile or above (Figure 1). Referral rates were higher from children in the higher BMI percentiles, 11.6% of the 98 to 99.6 centile were referred and 37.6% of those who were over the 99.6 centile were referred.

The median BMI is 16.16. 4.7% of the sample had missing values including 0.9% that did not have a BMI centile entered into the database.
Referrals by deprivation index (NZDep2013 quintiles)

Children living in areas with the highest deprivation scores (NZDep2013 quintile 5) had the highest proportion of referrals in each assessment and overall (p < 0.001). A quarter (25.2%) of the children in NZDep2013 quintile 5 were referred for further assessment in at least one of the measured domains compared with 13.9% of children living in areas with the lowest deprivation scores (NZDep2013 quintile 1). Table 3 shows the number of children referred for each assessment and overall.

Table 3: Referrals by NZDep2013 quintile.

<table>
<thead>
<tr>
<th>NZDep2013 quintile</th>
<th>Hearing n=15,713</th>
<th>Vision n=19,204</th>
<th>PEDS n=13,942</th>
<th>SDQP n=7,709</th>
<th>Growth percentile n=7,120</th>
<th>Any referral No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – least deprived score</td>
<td>2,044 (3.8)</td>
<td>3,041 (5.6)</td>
<td>1,980 (3.7)</td>
<td>781 (1.5)</td>
<td>685 (1.3)</td>
<td>7,411 (13.9)</td>
</tr>
<tr>
<td>2</td>
<td>2,186 (4.2)</td>
<td>3,056 (5.8)</td>
<td>2,102 (4.1)</td>
<td>1,024 (2.0)</td>
<td>820 (1.6)</td>
<td>7,774 (15.1)</td>
</tr>
<tr>
<td>3</td>
<td>2,461 (4.7)</td>
<td>3,332 (6.4)</td>
<td>2,397 (4.7)</td>
<td>1,199 (2.3)</td>
<td>1,111 (2.2)</td>
<td>8,723 (17.0)</td>
</tr>
<tr>
<td>4</td>
<td>3,214 (5.9)</td>
<td>3,860 (7.1)</td>
<td>2,900 (5.4)</td>
<td>1,736 (3.2)</td>
<td>1,467 (2.7)</td>
<td>10,564 (19.7)</td>
</tr>
<tr>
<td>5 – most deprived score</td>
<td>5,725 (8.4)</td>
<td>5,792 (8.5)</td>
<td>4,485 (6.6)</td>
<td>2,923 (4.3)</td>
<td>3,016 (4.5)</td>
<td>17,061 (25.2)</td>
</tr>
<tr>
<td>Missing quintile</td>
<td>83 (3.9)</td>
<td>123 (5.7)</td>
<td>78 (3.6)</td>
<td>46 (2.1)</td>
<td>21 (1.0)</td>
<td>291 (13.8)</td>
</tr>
</tbody>
</table>

*percentage with a referral within each NZDep2013 quintile.

*percentage that had any type of referral within each NZDep2013 quintile.
Rates of referral to specialist care following abnormal PEDS and SDQP assessments increased with increasing deprivation score (Table 4). This contrasted with the proportion of children that had an abnormal PEDS or SDQP assessment, who were already under specialist care. Children living in NZDep2013 quintile 1 were more likely to be already under specialist care than children living in NZDep2013 quintile 5. There were no significant differences by deprivation score in referral rates following failed vision and hearing screening.

**Discussion**

Although individual aspects of the B4SC have been examined in detail,7–10 this study examines the database across a number of indicators. We reported on the outcomes of the assessments that form the B4SC and found that not all children who meet the referral criteria are referred to other health services and the proportion of children referred for further assessment increased with increasing deprivation score.

**Assessment outcomes**

In addition to 3.4% of children who were already under care for vision impairment, 6.7% of the four-year-old population were referred for additional vision assessment from the vision screening in the B4SC. This aligns with findings from a study examining the prevalence of vision impairment in pre-schoolers in Sydney, which found that 6.4% had some vision impairment in one or both eyes.11

Less than 5% of the children in the B4SC had two or more significant developmental concerns during screening, putting them at increased risk of developmental problems. In addition, 13.9% of this cohort had one significant concern and another 9.4% had a non-significant concern. Studies of other populations using the PEDS questionnaire have found a higher prevalence of developmental concerns, for example an Australian study of children aged between 18 months and five years, nine months found two or more significant concerns in 9% of the population and one significant concern in 19%. They also found that 24.4% of parents reported a non-significant concern.12 PEDS standardisation studies from the US also found a higher prevalence of parental concerns, 11% identified two or more developmental concerns and 26% of parents identified one significant concern, however a large proportion of the children were recruited from paediatric clinics which may introduce bias towards a higher prevalence of developmental concerns because parents are seeking healthcare.13 A meta-analysis of 37 studies reporting outcomes from the PEDS found that overall 13.8% of parents had concerns indicating that their child was a high developmental risk and 19.8% had concerns indicating their child was at moderate developmental risk.14 Studies included in the meta-analysis were conducted in 12 countries and involved children ranging in age from less than one month to seven years, 11 months. It is possible that the rate of developmental

### Table 4: Referrals following abnormal PEDS and SDQP assessments, by NZDep2013 quintile.

<table>
<thead>
<tr>
<th>NZDep2013 quintile</th>
<th>PEDS ≥2 concerns n=14,177</th>
<th>SDQP score (17–40) n=10,941</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Referred n (%)</td>
<td>Under care n (%)</td>
</tr>
<tr>
<td>1 – least deprived score</td>
<td>707 (33.3)</td>
<td>688 (32.4)</td>
</tr>
<tr>
<td>2</td>
<td>799 (34.2)</td>
<td>759 (32.5)</td>
</tr>
<tr>
<td>3</td>
<td>940 (37.2)*</td>
<td>791 (31.4)</td>
</tr>
<tr>
<td>4</td>
<td>1,131 (38.2)**</td>
<td>901 (30.4)</td>
</tr>
<tr>
<td>5 – most deprived score</td>
<td>1,890 (45.7)**</td>
<td>1,145 (27.7)**</td>
</tr>
<tr>
<td>Missing</td>
<td>25 (26.3)</td>
<td>25 (26.3)</td>
</tr>
</tbody>
</table>

NB: rate of referral and proportion of children already under specialist care compared by NZDep2013 quintile with NZDep2013 quintile 1 as the reference category, * denotes p<0.05; ** denotes p<0.001.
concerns is lower in this New Zealand cohort because the age of children assessed in the B4SC is different to other studies. Other potential reasons for the difference could be underreporting by parents, or children have already been identified and referred to services by other health or education providers.

Similar to studies in other populations, most children in the cohort had normal SDQ scores between 0–13 and only 3.8% had abnormal SDQ scores of 17 and above. A US sample of four- to seven-year-olds found that 87.7% had SDQ scores between 0 and 13, 6.0% had SDQ scores of 14 to 16 and 6.3% had SDQ scores 17 and higher. A Spanish sample of four-year-olds found 88.5% had scores 0 to 13, 6.7% had scores 14 to 16 and 4.8% had scores 17 and above.

Other researchers have examined the B4SC data specifically investigating BMI measurements. Rajput et al. found that between 2009 and 2012, one in three children were overweight or obese and Shackleton et al. found rates of obesity in preschool children declined between 2010/11 and 2015/16. Comparison of our analysis to these studies is difficult because they have used different reference standards, however our analysis of this dataset also revealed more children in the highest percentiles for BMI compared to the lowest percentiles.

Referral rates

The B4SC guidelines suggest that all children with two or more concerns identified by the PEDS questionnaire should be referred through Pathway A onto other services such as speech and language assessment, occupational/physiotherapy, mental health services or intellectual/educational assessments. In this cohort, 37% of the children assigned Pathway A were referred. This most likely reflects the fact that nurses use clinical judgment to decide who needs referral and who is suitable to receive tailored advice. Other studies have found varying rates of referral following the identification of potential developmental delay in screening tests. One study of infants followed up at age 12–16 months following NICU admission in California found that 34% of those identified with developmental concerns were not referred to any intervention services. Another study found that only 60% of the children identified as having at-risk scores on a developmental questionnaire were referred, with providers reporting that they were most likely to refer if children were scored at-risk across a number of measures or had a gross-motor developmental delay. Additionally, real or perceived lack of availability of services decreased the likelihood of referral. Referral rates from the parent-completed SDQ were lower than those from the PEDS assessment. Fewer than 30% of children with concerning SDQ scores were referred. In this cohort, it is possible that some children had already been identified for referral for behavioural problems by the PEDS questionnaire as this questionnaire is usually administered first. Feedback from nurses in an early pilot study indicate that SDQ referrals are underrepresented because children with behavioural problems had already been identified and referred through the PEDS pathways. It is also possible that the low referral rates are due to services having been unavailable in some areas. Ideally, the teacher-completed SDQ would have been analysed as it increases the sensitivity and specificity of the SDQ, however it was missing for a large proportion of the population.

Referrals increased with increasing deprivation score. Two possible reasons for this could be a higher rate of health problems in children in higher deprivation groups and that children from areas with lower deprivation scores (ie, NZDep2013 quintile 1) were more likely to have already been referred to further services for developmental concerns before they attended the B4SC. Children living in areas with higher deprivation scores (NZDep2013 quintile 5) had a higher rate of referral following an abnormal PEDS or SDQ assessment, but conversely the proportion of those already under care was lower when compared to children from areas with lower deprivation scores. Children younger than four years old already under specialist care are likely to have been referred by other health professionals. In these cases clinical judgement may determine who requires referral, however this alone has low accuracy and can be subject to provider bias. For example, the likelihood of an autism diagnosis has been shown to be affected by the socioeconomic status of the child. In two
studies, children from high socioeconomic backgrounds were diagnosed with autism earlier\textsuperscript{23} or more likely to be diagnosed with autism from case vignettes\textsuperscript{24} when compared to those from low socioeconomic backgrounds. Standardised and validated tools such as the PEDs questionnaire, which has a sensitivity of 74–79\% and specificity of 70–80\% when detecting disabilities in children across different age groups, are used in the B4SC to identify developmental delays in children.\textsuperscript{25}

The B4SC appears to identify some children who have been missed earlier for referral. However, despite a large cohort of children being identified and referred for assessment of previously unrecognised need, there is also a significant group who have not been referred. To understand the reasons for this, further investigation is required.

Data completeness and suitability of use in research

The B4SC is offered to all four-year-olds enrolled in a Primary Health Organisation (PHO; 93\% of the population are estimated to be enrolled in a PHO with enrolment of children likely to be higher)\textsuperscript{26}). Uptake of the B4SC has increased each year and achieved 92\% of all eligible children in 2015/16.\textsuperscript{2} This has resulted in a large database of children and their assessments. Overall, the data completeness in this cohort was good, with less than 5\% of assessments missing in all domains except the teacher-completed SDQ. The number of duplicate cases was low and very few cases were excluded due to implausible data. All cases had an encrypted NHI attached, which means they can be linked to other databases using this encrypted identifier. We identified a relationship between deprivation index and the proportion of children referred. This would suggest that any further research involving B4SC analyses should have NZDep2013 quintile as a covariate.

Strengths

This database covers a large proportion of the four-year-olds in New Zealand therefore capturing data across all socioeconomic and ethnic backgrounds. It captures data about the psychosocial development of children across New Zealand that would not otherwise be captured. Data errors were infrequent considering the size of the database.

Limitations

The data describes how many children were referred to other services, but does not contain complete information on the effect of the referrals, ie, whether these referrals had positive results for these children. Despite good coverage nationwide (92\%), we do not have any information about the 8\% of children missing from the dataset or the up to 7\% of children not enrolled with a PHO.

The data quality largely relies on the measurements taken and recorded by individual nurses introducing the possibility of non-uniform measurements. However, all nurses are trained in the B4SC and follow standardised guidelines. In addition, as with other database studies, the results rely on the accuracy of the data entry. As there were very few implausible measurements discovered in the data, it is likely that data entry inaccuracies were minimal.

Conclusions

The B4SC provides an overview of the physical and psychosocial development of children aged four years in New Zealand. Less than 5\% of children had abnormal scores in assessments that measure neurodevelopment, however not all children who met the referral criteria were referred to other health services; the reasons for this warrant further investigation. Rates of referral increased with increasing deprivation score.
Appendix

Assessments used in the B4SC aim to measure a number of child developmental domains.1

Vision

The B4SC uses the Parr letter-matching vision charts from four metres to screen for visual acuity. The outcomes are recorded as pass, rescreen or refer. Children are not screened during the B4SC if they are already under the care of an ophthalmic/optometric practitioner.

Hearing

Audiometry screening for the B4SC involves children responding to sound cues at various decibels and frequencies. Tympanometry, to rule out any fluid on the ear, follows any abnormal audiometry screening. Children under the care of an otorhinolaryngologist or an audiologist, wearing hearing aids, with cochlear implants or currently with grommets inserted do not undergo audiometry or tympanometry.

Development

The B4SC uses the Parents Evaluation of Development Status (PEDS) questionnaire to screen for developmental delays in children. Parents answer a 10-item questionnaire to detect developmental and behavioural concerns from birth to eight years old. The PEDS questionnaire asks general questions about behaviour, development, speech and language, and motor skills to assign children to Pathways A, B, C, D or E depending on the number of parental concerns.13 Pathway A is two or more significant developmental concerns, Pathway B is one significant concern, Pathway C is one non-significant concern, pathway D is parental communication difficulties and pathway E is no concerns.

Referral pathways differ by region and nurses need to use clinical judgement about which services to refer a child to. Children with two or more significant concerns (Pathway A) may be referred for speech and language assessment, occupational/physiotherapy, mental health services or intellectual/educational assessments, depending on specific concerns and the results of the other aspects of the B4SC.

Behaviour and emotion

The Strengths and Difficulties (SDQ) questionnaire is a brief questionnaire for parents and early childhood teachers comprising five important domains of child psychopathology, including emotional symptoms, conduct problems, hyperactivity-inattention and peer problems. The SDQ is scored using a 3-point Likert scale where 0 = not true, 1 = somewhat true and 2 = certainly true; several questions are reverse scored.27 The resultant SDQ scores can be used as continuous variables but are often classified into the categories normal, borderline and abnormal. For example, for total difficulties with a parent as the informant, normal is a score of 0–13, borderline is 14–16 and abnormal is 17–40. This varies slightly for SDQ scores generated by the teacher questionnaire with normal being a score of 0–11, borderline 12–15 and 16–40 being an abnormal score.

Height and weight

B4SC nurses use calibrated scales to measure weight and stadiometers to measure height. The average of two readings for each measurement is plotted on reference charts to work out height and weight centiles. These height and weight centiles are plotted on a BMI centile chart to determine BMI centile. BMI centile is recorded to monitor the weight status of the child population and is also used to determine which children require referral. B4SC referral guidelines advise that children less than the 0.4th percentile for height, weight or BMI or above the 98th centile for BMI should be referred.
Competing interests:  
Nil.

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7-june-2019/7895

REFERENCES:  


Effective communication is essential in the relationship between a patient and healthcare professional (HCP) with terminology playing an important role. The terminology used by HCPs can impact on an individual's perceptions of weight and experience of stigma, how people respond to public health directives, treatment seeking and utilisation of healthcare, how an individual feels about their health and the patient-practitioner relationship. The use of stigmatising terms when referring to people with excess weight adds to the existing discrimination and weight bias in healthcare settings, particularly when the terminology is associated with broader moral perceptions and judgments about the individual being described.
As HCPs are increasingly being urged to talk with patients about health and weight,9,10 it is crucial to understand the power of language in providing bias-free healthcare.1 While there have been increasing calls for the use of people-first language (eg, person living with obesity) in the context of obesity,1,6,8,12 the terminology used by HCPs to describe a person with an excessive accumulation of body fat (adipose tissue) remains a contentious and interactionally delicate issue.7,13 The lack of a clear consensus on terminology in ‘fat/obesity’ research and practice and the need for common language to facilitate clear and respectful cross-disciplinary communication was highlighted by participants at the 2015 Weight Bias Summit in Canada.14

The ways in which terminology is used are complicated and often contradictory. For example,15 the terms ‘overweight’, ‘obese’, ‘morbidly obese’ and ‘obesity’ are predominantly used in biomedical literature, in which understandings of obesity are grounded in a language of disease, risk, prevention and treatment.13 In contrast, in the feminist and fat studies literature the term ‘fat’ is preferred over ‘obesity’.14,16 In this biopolitical sphere, understandings of excess weight are embedded in a language of power, oppression, stigma, prejudice and discrimination.13 In practice, excess adipose tissue terminology is further complicated by the nature of the health practitioner-patient interaction and the need for the language used to have clinical meaning for patients.7,17

Preferences for obesity-related terms have been described by primary-care patients with obesity,18,19 community populations,4,20,21 weight-loss patients,22,23 and candidates for weight-loss surgery.23

A Scottish study which explored men’s motivations in joining a weight loss intervention highlighted a tension between acceptable and motivating weight-related terminology.20 Although male participants reported finding terms like ‘fat’ hurtful, they felt that the use of such terms may be more motivating than terms such as ‘overweight’.20 An earlier study by Gray and colleagues24 found that men reported being diagnosed as ‘obese’ was a motivating factor. In contrast, participants in a large community sample of American adults rated the terms ‘unhealthy weight’ and ‘overweight’ as motivating to lose weight, whereas the terms ‘weight’ and ‘chubby’ were rated as the least motivating.4 Participants in that study rated ‘morbidly obese’, ‘fat’ and ‘obese’ to be most blaming, with ‘high BMI’ and ‘weight’ in particular, as least blaming.

A study which focused on male obesity in New Zealand further highlighted the tension between acceptable and motivating weight-related terminology and communication style preferences.25 In that study men reported that while they want the topic of their weight raised, they want sensitivity around the terminology used. In another qualitative study, Gray et al. sought to identify approaches used by general practitioners and how the issue of overweight or obesity is raised with patients in general practice consultations. What appeared to be effective, whichever words were applied was linking the clinical relevance of the discussion.7 This aligns with work by MacKean and GermAnn26 who found that actual terminology used is generally of less importance to patients than the tone of the conversation.

There has been no quantitative research exploring issues around weight-related terminology in the New Zealand health service context. This study addresses that gap by exploring the perceptions and preferences of commonly used terms to describe adiposity among a convenience sample of New Zealand HCPs and lay adult population.

Method

Sampling and recruitment

Adults aged 18 years and over residing in New Zealand were recruited. Visitors to New Zealand were not eligible as the aim was to understand language preferences from the New Zealand context. Convenience sampling aimed to gather responses from a sample of HCPs attending seminars addressing quality care of higher-weight patients and from non-HCPs (lay population).

Between January to June in 2016, research survey stands were intermittently set up at various sites around New Zealand (Auckland, Wellington, Christchurch and Dunedin), including two supermarket entrances, two shopping malls, a tertiary hospital main atrium and two university campuses. The HCP-specific sites included

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four health professional research seminar events about quality care for larger patients, and two university health schools. HCPs could also complete a survey at a general survey stand. The survey stands were staffed by the first and second author and two research assistants recruited to this project.

Data collection
A self-report questionnaire was developed specifically for use in the study to assess perceptions and preferences of commonly used terms to describe adiposity. Questions relating to preferences of terms were adapted from questionnaires previously administered for similar purpose in other countries and the terms used in the questionnaire reflect terminology used in those previous studies assessing adult weight-related preferences. In addition, the term ‘bariatric’ was added to reflect a move towards the term ‘bariatric care’ used frequently in New Zealand health services and by HCP participants in other New Zealand research, to describe care of patients with a body mass index of 40kg/m² and above.

Perceptions of terms were assessed by asking participants to rate the degree to which listed terms were 1) stigmatising, 2) blaming of the person for their weight, and 3) motivating a person to lose weight. Participants rated each of the following terms using a four-point scale (eg, 1 = Not at all, 2 = Slightly stigmatising, 3 = Stigmatising, 4 = Very stigmatising). The terms presented were: fat, chubby, obese, high BMI, morbidly obese, bariatric, heavy, large, overweight and weight.

Participants were further asked to indicate their preference for terms (listed above) using a seven-point scale (1 = Very undesirable, 7 = Very desirable). They were first asked to rate the terms according to how desirable or undesirable they would find each of the terms “if someone you did not know used it to refer to your weight” and then “if someone you did know used it to refer to your weight”.

Demographic data collected included: occupation, age, gender, ethnicity and weight status. Ethnicity and weight status were self-reported by the category participants most closely aligned with.

Data analysis
The terms were compared with Friedman’s tests and when these were significant, pairs of terms were compared with Wilcoxon signed-rank tests. For each preference group (eg, stigma, blame) analysis was restricted to participants who had rated all of the terms. SPSS v24 (IBM Corp., Armonk, NY) was used for this analysis. Ratings of HCP and the lay population where compared with Wilcoxon rank-sum tests. SAS 9.4 (SAS Institute Inc., Cary, NC, USA) was used for this analysis and for Figures 1–6. The Holm-Bonferroni method for multiple comparisons and a significance level of 5% were used to assess statistical significance.

Ethical considerations
All participants gave implied consent by the decision to complete the questionnaire and ethical approval was given by the Victoria University of Wellington Human Ethics Committee (Approval Number 22185).

Results
Participants
In total, 775 participants completed questionnaires for data analysis (HCP n=329, lay population n=446). The HCP group included students who identified they were studying a health professional qualification whereas the lay population group included students who were not studying a health professional qualification or did not specify their study area. The lay population convenience sample of participants were mainly female (62%), aged between 18–25 (56%) with 66% identifying as Pakeha/European, and is not generalisable to the New Zealand population. (See Table 1).

The HCP participants stated ethnicity was similar to the New Zealand nursing workforce.

Preferences for weight-related terms
There were significant differences between participants’ perception of terms used to describe people of different body weight with respect to stigma, blame, motivation to lose weight and desirability, whether people were known or unknown to the participant (all p<0.0001 Friedman’s test).
Participants rated ‘weight’ as the least stigmatising term, with 69% rating ‘weight’ as ‘not at all’ stigmatising. Contrary, morbidly obese and fat were rated as the most stigmatising terms, with 42% and 30% of participants rating ‘morbidly obese’ and ‘fat’ as ‘very stigmatising’, respectively (See Figure 1).

Blaming terms
Participants rated ‘weight’ as the least blaming term, with 63% of participants rating this as ‘not at all blaming’ (see Figure 2). In contrast, participants rated the terms ‘morbidly obese’ (41%), ‘fat’ (26%) and ‘obese’ (25%) as ‘very blaming’ terms.

Motivating terms
‘Weight’ was rated as the term least likely to motivate someone to lose weight, with 51% rating this term as ‘not at all’ motivating (see Figure 3). Whereas 42% and 26% of participants rated the terms ‘morbidly obese’ and ‘obese’, respectively, as ‘very motivating’ terms to encourage someone to lose weight.

Table 1: Summary of sample characteristics (N=775).

<table>
<thead>
<tr>
<th></th>
<th>Lay population N=440 % (n)</th>
<th>Health professionals (including health professional students) N=330 % (n)</th>
<th>Total N=775 % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>62% (271)</td>
<td>91% (300)</td>
<td>74% (571)</td>
</tr>
<tr>
<td>Male</td>
<td>37% (163)</td>
<td>9% (30)</td>
<td>26% (198)</td>
</tr>
<tr>
<td>Other</td>
<td>1% (6)</td>
<td>0% (0)</td>
<td>1% (6)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–25</td>
<td>56% (247)</td>
<td>23% (77)</td>
<td>42% (324)</td>
</tr>
<tr>
<td>26–35</td>
<td>14% (62)</td>
<td>21% (68)</td>
<td>17% (133)</td>
</tr>
<tr>
<td>36–45</td>
<td>9% (41)</td>
<td>23% (75)</td>
<td>15% (116)</td>
</tr>
<tr>
<td>46–60</td>
<td>9% (40)</td>
<td>29% (95)</td>
<td>18% (137)</td>
</tr>
<tr>
<td>Over 60</td>
<td>11% (50)</td>
<td>4% (14)</td>
<td>8% (64)</td>
</tr>
<tr>
<td>Not stated</td>
<td></td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakeha/European</td>
<td>66% (291)</td>
<td>75% (248)</td>
<td>70% (539)</td>
</tr>
<tr>
<td>Māori</td>
<td>10% (42)</td>
<td>6% (20)</td>
<td>8% (63)</td>
</tr>
<tr>
<td>Pacific Peoples</td>
<td>5% (23)</td>
<td>6% (21)</td>
<td>6% (46)</td>
</tr>
<tr>
<td>Asian</td>
<td>15% (65)</td>
<td>6% (21)</td>
<td>11% (88)</td>
</tr>
<tr>
<td>Other</td>
<td>7% (32)</td>
<td>6% (21)</td>
<td>7% (53)</td>
</tr>
<tr>
<td><strong>Self-estimated weight status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>5% (20)</td>
<td>3% (9)</td>
<td>4% (29)</td>
</tr>
<tr>
<td>Normal weight</td>
<td>67% (293)</td>
<td>59% (195)</td>
<td>64% (493)</td>
</tr>
<tr>
<td>Overweight</td>
<td>24% (107)</td>
<td>30% (100)</td>
<td>27% (207)</td>
</tr>
<tr>
<td>Very overweight</td>
<td>4% (16)</td>
<td>6% (20)</td>
<td>5% (36)</td>
</tr>
<tr>
<td>Extremely overweight</td>
<td>1% (4)</td>
<td>2% (5)</td>
<td>1% (9)</td>
</tr>
<tr>
<td>Not stated</td>
<td></td>
<td>(1)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

Note: Occupational group was not stated for five participants.
Figure 1: Least to most stigmatising terms.

Note: Participants rated each word on a 4-point Likert scale (from ‘Not at all’ to ‘Very stigmatising’). Numbers in circles are the percentage of participants. *Indicates groups of terms that are not statistically significantly different (using the Holm–Bonferroni method for multiple comparisons). N=693.

Figure 2: Least to most blaming terms.

Note: Participants rated each word on a 4-point Likert scale (from ‘Not at all’ to ‘Very blaming’). Numbers in circles are the percentage of participants. *Indicates groups of terms that are not statistically significantly different (using the Holm–Bonferroni method for multiple comparisons). N=683.
Terms used to describe participant’s weight by people known to the participant and people not known to the participant

Regardless of whether the person was known or unknown to participants, ‘weight’ was rated as the ‘most desirable’ term with 11% rating ‘weight’ as ‘very desirable’ by people known to the participant and 12% by people not known to the participant. The terms ‘morbidly obese’, ‘fat’ and ‘obese’ were rated as the most undesirable (for people known to participants, 50% rated ‘morbidly obese’; as more undesirable; 40% for ‘fat’ and 41% ‘obese’ as ‘very undesirable’) when used to describe participant’s weight irrespective of whether the person was known or not known to participants (See Figures 4 and 5).

Differences between HCP and lay population participant responses

Participant responses were grouped as either HCP or lay population. The groups were compared with each other to identify any significant differences in responses between the two groups.

After adjusting for multiple comparisons there were three terms which presented statistically significant differences between the two groups. The terms ‘overweight’ and ‘obese’ were perceived to be more motivating by the lay population (both p<0.0001), and ‘chubby’ was more likely to be rated as an undesirable term to describe adiposity of someone not known to the participant by HCPs (p<0.0001). The lay population group rated ‘overweight’ as ‘motivating’ (40%) compared to the HCP group rating overweight as ‘slightly motivating’ (40%). For the lay population, 32% rated ‘obese’ as ‘very motivating’. While both groups rated ‘chubby’ in the undesirable range for use by someone not known to the participant, 38% of HCP and 28% of the lay population rated ‘chubby’ as ‘very undesirable’ (See Figure 6).

Figure 3: Least to most motivating terms.

Note: Participants rated each word on a 4-point Likert scale (from ‘Not at all’ to ‘Very motivating’). Numbers in circles are the percentage of participants.
*Indicates groups of terms that are not statistically significantly different (using the Holm–Bonferroni method for multiple comparisons). N=680.
**Figure 4:** Least to most desirable terms used by someone known to participant in relation to participant’s adiposity.

<table>
<thead>
<tr>
<th>Term</th>
<th>Very undesirable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Very desirable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidly obese</td>
<td>50</td>
<td>16</td>
<td>19</td>
<td>12</td>
<td>6</td>
<td>3</td>
<td>1–2</td>
</tr>
<tr>
<td>Fat</td>
<td>40</td>
<td>20</td>
<td>16</td>
<td>11</td>
<td>6</td>
<td>4</td>
<td>2-3</td>
</tr>
<tr>
<td>Obese</td>
<td>41</td>
<td>18</td>
<td>16</td>
<td>13</td>
<td>6</td>
<td>3</td>
<td>2-3</td>
</tr>
<tr>
<td>Bariatric</td>
<td>34</td>
<td>16</td>
<td>12</td>
<td>22</td>
<td>7</td>
<td>6</td>
<td>4-5</td>
</tr>
<tr>
<td>Chubby</td>
<td>27</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>6</td>
<td>8</td>
<td>4-5</td>
</tr>
<tr>
<td>Heavy</td>
<td>22</td>
<td>15</td>
<td>20</td>
<td>18</td>
<td>13</td>
<td>10</td>
<td>6-9</td>
</tr>
<tr>
<td>Large</td>
<td>22</td>
<td>15</td>
<td>18</td>
<td>18</td>
<td>12</td>
<td>11</td>
<td>6-9</td>
</tr>
<tr>
<td>Overweight</td>
<td>19</td>
<td>16</td>
<td>19</td>
<td>17</td>
<td>11</td>
<td>11</td>
<td>6-9</td>
</tr>
<tr>
<td>High BMI</td>
<td>21</td>
<td>13</td>
<td>17</td>
<td>21</td>
<td>12</td>
<td>8</td>
<td>6-9</td>
</tr>
<tr>
<td>Weight</td>
<td>13</td>
<td>9</td>
<td>13</td>
<td>30</td>
<td>11</td>
<td>13</td>
<td>6-9</td>
</tr>
</tbody>
</table>

Note: Participants rated each word on a 7-point Likert scale (from ‘Very undesirable’ to ‘Very desirable’). Numbers in circles are the percentage of participants. *Indicates groups of terms that are not statistically significantly different (using the Holm–Bonferroni method for multiple comparisons). N=674.

**Figure 5:** Least to most desirable terms used by someone not known to participant in relation to participant’s adiposity.

<table>
<thead>
<tr>
<th>Term</th>
<th>Very undesirable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Very desirable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidly obese</td>
<td>55</td>
<td>15</td>
<td>13</td>
<td>14</td>
<td>6</td>
<td>3</td>
<td>1–2</td>
</tr>
<tr>
<td>Fat</td>
<td>50</td>
<td>21</td>
<td>13</td>
<td>15</td>
<td>4</td>
<td>3</td>
<td>1–2</td>
</tr>
<tr>
<td>Obese</td>
<td>46</td>
<td>12</td>
<td>13</td>
<td>11</td>
<td>5</td>
<td>3</td>
<td>2-3</td>
</tr>
<tr>
<td>Chubby</td>
<td>33</td>
<td>18</td>
<td>15</td>
<td>15</td>
<td>7</td>
<td>3</td>
<td>2-3</td>
</tr>
<tr>
<td>Bariatric</td>
<td>34</td>
<td>16</td>
<td>13</td>
<td>21</td>
<td>7</td>
<td>5</td>
<td>6-7</td>
</tr>
<tr>
<td>Heavy</td>
<td>23</td>
<td>17</td>
<td>17</td>
<td>22</td>
<td>12</td>
<td>3</td>
<td>2-3</td>
</tr>
<tr>
<td>Overweight</td>
<td>22</td>
<td>17</td>
<td>20</td>
<td>8</td>
<td>9</td>
<td>6</td>
<td>6-7, 7-8, 7&amp;9</td>
</tr>
<tr>
<td>Large</td>
<td>24</td>
<td>13</td>
<td>20</td>
<td>21</td>
<td>12</td>
<td>7</td>
<td>6-7, 7-8, 7&amp;9</td>
</tr>
<tr>
<td>High BMI</td>
<td>21</td>
<td>15</td>
<td>15</td>
<td>21</td>
<td>13</td>
<td>8</td>
<td>6-7, 7&amp;9</td>
</tr>
<tr>
<td>Weight</td>
<td>14</td>
<td>11</td>
<td>10</td>
<td>31</td>
<td>11</td>
<td>12</td>
<td>6-7, 7&amp;9</td>
</tr>
</tbody>
</table>

Note: Participants rated each word on a 7-point Likert scale (from ‘Very undesirable’ to ‘Very desirable’). Numbers in circles are the percentage of participants. *Indicates groups of terms that are not statistically significantly different (using the Holm–Bonferroni method for multiple comparisons). N=666.
Discussion

The present study examines perceptions and preferences of commonly used terms to describe adiposity in a sample of adults living in New Zealand. Generally, the findings are consistent with previous research with ‘weight’ considered to be the more desirable, least stigmatising and least blaming terms than other commonly used language to describe a person’s body size. ‘Weight’ has consistently been rated as a more desirable term for HCPs to use when discussing a patient’s size.4,20,22,23 The use of ‘high BMI’ by HCPs also tended to be rated as more acceptable than other terms (after ‘weight’), as has been found in a previous study.21 One reason for this acceptability could be that these terms are objective measurements.

The terms ‘morbidly obese’, ‘fat’ and ‘obese’ were rated as more stigmatising, more blaming and more undesirable when used to describe participant’s adiposity, regardless of whether the person was known or unknown to participants; similar to findings in other studies.4,10,20–23 Due to the varied use and negative connotations of the terms ‘obese’, ‘morbidly obese’ and ‘fat’ in social media, these terms have greater social meaning beyond healthcare than other terms used during patient-HCP interactions. The use of stigmatising language by health professionals was highlighted in a recent study where 19% of participants indicating they would avoid contact with that health professional and 21% would seek a new doctor.4

The term ‘fat’ which is actively applied and promoted in the field of fat studies, to understand how fat people are portrayed, represented and treated over time, is a conscious choice to move away from terminology that medicalises obesity.18 Yet in this study participants rated the term ‘fat’ to be as stigmatising as ‘morbidly obese’ and ‘obese’. This contrasts with an earlier qualitative Australian study where 80% (N=76) said that they hated or disliked the word ‘obesity’ and would rather be called ‘fat’ or ‘overweight’.30 In America, a study exploring how university students use and react to fat-related terms31 found that in spite of the fact that most participants

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Note: This figure shows the three terms that presented statistically significant differences between the HCP and lay population. Participants rated motivating terms on a 4-point Likert scale (from ‘Not at all’ to ‘Very motivating’). Participants rated the desirable term on a 7-point Likert scale (from ‘Very undesirable’ to ‘Very desirable’). Numbers in circles are the percentage of participants.

Figure 6: Statistically significant differences between HCP and lay population participant responses.
viewed terms such as ‘fat’ and ‘obese’ to be unacceptable, female participants were more likely to report using ‘fat’ and ‘obese’ in daily conversations and especially in self-descriptions. This suggests dissonance in application of terms.

Our research found that there was a dissonance in relation to terms identified as most blaming to those identified as most likely to motivate people to lose weight. ‘Weight’ was considered to be the least blaming yet was not considered to be a motivating term to lose weight. Similarly, ‘obese’, ‘morbidly obese’ and ‘fat’ were considered the most blaming terms but deemed to be the most likely to motivate someone to lose weight. This supports the notion that weight stigma and the social meaning attached to terminology has a significant influence during patient-HCP interactions.6,7,17

One strategy adopted during HCP-patient interactions to minimise issues of weight stigma is the use of terms voiced by the patient. Hales13 found that HCPs felt more comfortable using terms deemed stigmatising and blaming such as ‘obese’ and ‘fat’ if the patient used these terms in their conversations. Likewise, other studies have reported that HCPs use terminology rated more favorably by patients and avoid terms that patients may find undesirable.19,22 In a study of pre-registration dietitians, nurses and doctors, the preferred terms when raising the issue of obesity with clients were ‘BMI’, followed by ‘weight’.19 Similarly, Dutton et al22 found that physicians were most likely to use the term ‘weight’ and least likely to use ‘fatness’, ‘excess fat’, ‘heaviness’ and ‘large size’ in discussions with overweight or obese patients.

Of concern for HCPs is the meaningful nature of terms used during weight-related conversations and care situations. The term ‘weight’ has been identified in this and other studies as the preferred term to use during patient-HCP interactions as it is less blaming and less stigmatising. However, this term may not convey the appropriate message in some clinical contexts. For example, weight is used as a measurement to assess fluid status in patients with end-stage kidney disease and congestive heart failure; often many of these patients have high levels of body fat. In this context the gaining and losing of weight does not relate to changes in actual adipose tissue and yet many of these patients are encouraged to lose ‘weight’ to promote better health and delay further complications of their disease states. Therefore, weight loss conversations using the preferred non-judgmental term of ‘weight’ can be highly problematic.

Similarly, being specific about what the care issue is during a conversation can add meaning to the conversation and portray less judgment. For example, weight is often not the issue when caring for patients of larger size as much of the equipment in use can accommodate patient weights of over 150kg. However, the person’s physical size and shape is the factor of concern in these care situations and discussing weight in this context can lead to further confusion and inappropriate use of terminology.17 Thus, the terms used during each clinical situation must be carefully considered to ensure conversations are respectful, appropriate and support meaningful dialogue.

The term ‘bariatric’, although increasingly utilised and promoted within healthcare,13 was identified as an issue during data collection for the lay population sample. Many participants in this study had not heard of the term at the time of completing the survey, despite increasing adoption of the term in New Zealand healthcare.28 This raises two important points; firstly, that people are generally not familiar with a term frequently used in healthcare practice to describe care services for larger-bodied people, and secondly that the data related to the term ‘bariatric’ may be misleading due to how participants interpreted the term.

Limitations
This was a convenience sample. While the samples are not representative of the lay or HCP populations, the participant demographics are similar to the HCP population in New Zealand. It is possible some health professional students or non-practising health professionals are included in the lay population group. This is an overview paper, as sub set analysis, eg, for gender and/or ethnicity has not yet been conducted. Finally, the term ‘bariatric’ was poorly understood by participants as reported by the data collection field workers, therefore data related to the term ‘bariatric’ may be misleading due to how participants interpreted the term.
Conclusion

Medicalised terminology has become stigmatising language in relation to weight stigma and HCPs are in a difficult position as there is no universal agreement on preferred non-stigmatising terms, particularly in clinical scenarios in which a person’s size, shape and weight are relevant to the care discussion. While ‘one term does not fit all’ HCPs should refer to weight or high BMI instead of ‘obesity’ terms and recognise that language has the ability to harm and must be applied with care, particularly in first encounters.

This study presents preferences for adiposity-related terms in New Zealand. The study highlights that HCPs and lay population samples may lack understanding about the impact of utilising blaming terms when attempting to motivate a person in relation to weight loss. Care must be taken to ensure HCPs do not contribute to weight stigma through inappropriate use of language.

Competing interests:
Nil.

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References:


Predictors of non-attendance at outpatient endoscopy: a five-year multi-centre observational study from New Zealand

Mehul Lamba, Yassar Alamri, Paras Garg, Chris Frampton, David Rowbotham, Richard Gearry

ABSTRACT

AIMS: Outpatient endoscopy non-attendance leads to diagnostic delay and increasing wait times. We aimed to analyse endoscopy non-attendance rates and factors associated with it at the Canterbury and Auckland District Health Boards during a five-year period.

METHODS: Consecutive appointments between April 2012 and March 2017 were assessed. The following procedures were included: gastroscopy, colonoscopy and endoscopic retrograde cholangiopancreatography. Predictors of non-attendance were assessed using univariate and multivariate binary logistic regression.

RESULTS: A total of 58,434 appointments were offered (Canterbury—33,697, Auckland—24,737), of which 2,694 (4.6%) were not attended. Māori (OR 3.0, 95%CI 2.63–3.42) and Pacific Peoples (OR 3.1, 95%CI 2.7–3.55) were significantly more likely to miss appointments compared with Europeans. Patients from socioeconomically most deprived areas (NZDep10) had higher rates of non-attendance (OR 2.13, 95%CI 1.72–2.63) compared with NZDep1. Males (OR 1.43, 95%CI 1.32–1.56) and the Auckland District Health Board patients (OR 2.28, 95%CI 2.08–2.50) had higher non-attendance rates.

CONCLUSION: Overall, 4.6% patients did not attend endoscopy appointments. Māori, Pacific Peoples and patients from socioeconomically deprived areas had higher non-attendance rates. Targeted interventions for at-risk groups would potentially lessen health inequalities and optimise utilisation of endoscopy resources.

Endoscopic gastrointestinal procedures play a vital role in diagnosing gastrointestinal pathology and enable less invasive therapeutic options compared with traditional surgical approaches. Missed and cancelled appointments for endoscopy lead to inefficient use of healthcare resources, increased financial costs, diagnostic and therapeutic delays, and longer wait times.1–3 Based on recent data released by the Ministry of Health (MoH), it was found that of the 20 district health board (DHB) hospitals across New Zealand, eight DHBs did not meet MoH targets for providing urgent colonoscopy, and 11 DHBs did not meet MoH targets for providing urgent colonoscopy due to at least in part, to long waiting lists.4 Identification of population groups that are more likely to miss endoscopy appointments is prudent and can aid in optimising endoscopy service delivery as well as reducing health inequality and outcomes.

Few studies have been performed to identify factors associated with poor attendance. Adams et al assessed attendance at outpatient endoscopy procedures in Western Australia and found higher rates of non-attendance among young patients, those referred by non-gastroenterology specialists, and procedures scheduled on Mondays.5 A North American study found high rates of outpatient endoscopy non-attendance (22%) in patients with lower socioeconomic status, although pre-procedural consultation...
with the endoscopist significantly increased attendance rate. A Spanish study reported non-attendance of 14.7% in their outpatient cohort and found that those patients referred by non-specialists or those who had been on waiting lists for longer time were less likely to attend appointments. While these studies provide some insights regarding predictors of non-attendance, their limitations included small-sized cohorts, short follow-up periods and single-centre experience restricting extrapolation and generalisability. Contemporary local data are required so that appropriate changes can be implemented in order to improve endoscopy attendance rates and optimise resource utilisation.

The aims of the present study were to evaluate non-attendance rates at outpatient endoscopy across two large public hospitals in New Zealand and identify any associated factors.

Methods

All consecutive endoscopy appointments offered during a five-year period (1 April 2012 to 31 March 2017) at the adult Gastroenterology unit at Canterbury DHB (CDHB) (population 482,178) and Auckland DHB (ADHB) (population 436,344) were assessed, representing 21.6% of the New Zealand population.

Non-attendance was defined as failure to present to the booked procedure without prior notification of cancellation. The following procedures were included: gastroscopy, colonoscopy and endoscopic retrograde cholangiopancreatography. All consecutive new patient and follow-up appointments were included.

Reminder strategies

In Christchurch, an appointment letter is sent to patients four to six weeks prior to their endoscopy appointment, and patients are advised to call and confirm their attendance. Patients booked for colonoscopy are additionally sent laxatives for bowel preparation as well as an information sheet. Two weeks prior to the appointment, a reminder text message is sent to patients with a registered mobile number. One week before the procedure is due, patients with unconfirmed appointments are identified, and are contacted by administrative staff to confirm attendance.

In Auckland, appointment letters are sent several weeks in advance, along with laxatives as necessary (for colonoscopy); patients are advised to ring and confirm their attendance. Further reminder text-messages are sent to the patient’s registered mobile number three days before the appointment. Patients who do not confirm attendance are contacted a day before the procedure.

Data collection

For each appointment, following data were obtained: age, sex, ethnicity, New Zealand deprivation index (NZDep). The NZDep is a national index for socioeconomic deprivation that takes into account various variables obtained from the 2013 New Zealand census, including income, home ownership, employment, qualifications, family structure, housing, and access to transport and communications. The deprivation index is provided for each meshblock (smallest geographical unit for which statistical data are available), and is scored into deciles from 1 to 10, where 1 represents least deprived and 10 represents areas with most deprived scores.

Ethnicity classification was based upon the ethnic group profiling used in the 2013 census. These were European, Asian, Māori and Pacific Peoples. Patients of Middle Eastern, Latin American, African or other ethnicity, and where ethnicity was not stated were grouped as ‘Others’.

Statistical analysis

Factors potentially associated with non-attendance at outpatient endoscopy were assessed using univariate and multivariate binary logistic regression analyses. The following variables were analysed: age, sex, ethnicity, NZDep and DHB where the endoscopy was offered. Results were expressed as odds ratios (OR) with 95% confidence intervals. A p-value <0.05 was considered statistically significant. Statistical analysis was performed using IBM SPSS V.22 software.

Results

Patient demographics

A total of 58,434 outpatient endoscopy appointments were offered during the five-year study period, including 24,737 at ADHB and 33,697 at CDHB. Overall, 2,694 appointments (4.6%) were not attended.
Baseline characteristics are described in Table 1. The median age at the time of endoscopy appointment was 60 years (IQR 47.6–71.0) and 47.6% of patients were male. Most of the patients were European (76%), followed by Asian (11.7%), Māori (4.7%) and Pacific Peoples (3.6%).

**Predictors of non-attendance: univariate analysis**

The non-attendance rates for each 10-year group are shown in Figure 1. The highest non-attendance rate was seen in the 20–29-year age group (8.5%), while the lowest non-attendance was seen in the 70–79-year patients (2.0%). The non-attendance rate in male patients was 5.5%, compared with 3.8% in females (OR 1.43, 95% CI 1.33–1.54, \(p<0.01\)). Male patients were more likely to miss appointments across all age-groups, except the 80–99-year group (Figure 1).

Ethnicity-specific non-attendance rates are shown in Figure 2. Overall, 12.9% Māori, and 16.5% Pacific Peoples did not attend endoscopy appointments, when compared with 3.5% Europeans. Overall non-attendance rate among Asian patients was 5%.

### Table 1: Baseline characteristics of the study population.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>CDHB</th>
<th>ADHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>58,434</td>
<td>33,697</td>
<td>24,737</td>
</tr>
<tr>
<td>Median age, in years</td>
<td>60.25</td>
<td>61.21</td>
<td>57.33</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>6,843</td>
<td>1,160</td>
<td>5,683</td>
</tr>
<tr>
<td>European</td>
<td>44,397</td>
<td>29,393</td>
<td>15,004</td>
</tr>
<tr>
<td>Māori</td>
<td>2,738</td>
<td>1,454</td>
<td>1,284</td>
</tr>
<tr>
<td>Pacific Peoples</td>
<td>2,088</td>
<td>379</td>
<td>1,709</td>
</tr>
<tr>
<td>Others</td>
<td>2,368</td>
<td>1,311</td>
<td>1,057</td>
</tr>
<tr>
<td>Gender, % (male)</td>
<td>47.6%</td>
<td>45.6%</td>
<td>50.3%</td>
</tr>
<tr>
<td>NZDep, median (IQR)</td>
<td>5 (3–7)</td>
<td>5 (2–7)</td>
<td>6 (3–8)</td>
</tr>
</tbody>
</table>

ADHB - Auckland District Health Board.
CDHB - Canterbury District Health Board.
NZDep - New Zealand deprivation index.
IQR – Inter quartile range.

**Figure 1:** Non-attendance rate (%) based on age.
Figure 2: Non-attendance rate based upon ethnicity.

![Bar chart showing non-attendance rate by ethnicity](chart1.png)

The NZDep data were available for 56,099 (96%) patients. The median NZDep decile was 5 (IQR 3–7). Patients residing in socio-economically deprived areas were less likely to attend scheduled endoscopy appointments (Figure 3). The non-attendance rate for NZDep decile 10 residents (most deprived) was 11.8% when compared with 2.3% in NZDep decile 1 residents (OR 5.58, 95% CI 4.55–6.85).

The overall non-attendance rate for endoscopy appointment in the Auckland region was 7.2% compared with 2.7% in the Canterbury region \( (p<0.01) \). Annual non-attendance rates for ADHB and CDHB are shown in Figure 4. The non-attendance rates in ADHB were consistently higher than CDHB across all calendar years.

Predictors of non-attendance: multivariate analysis

Including all variables, age, gender, ethnicity, NZDep and DHB in a logistic regression model indicated that all were significantly associated with rates of non-attendance (Table 2). Māori (OR 3.0, 95% CI 2.63–3.42) and Pacific Peoples (OR 3.1, 95% CI 2.7–3.55) were significantly more likely to miss appointments when compared with...
Table 2: Univariate and multivariate binary logistic regression analysis of predictors associated with non-attendance.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Non-attendance (%)</th>
<th>Univariate analysis</th>
<th>Multivariate analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Odds ratio (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
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<tr>
<td>Ethnicity@</td>
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<tr>
<td>European</td>
<td>3.5</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>Asian</td>
<td>5.0</td>
<td>1.46 (1.29–1.65)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Māori</td>
<td>12.9</td>
<td>4.13 (3.65–4.67)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pacific Peoples</td>
<td>16.5</td>
<td>5.50 (4.85–6.25)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Others</td>
<td>5.1</td>
<td>1.50 (1.25–1.82)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age#</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20</td>
<td>5.0</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>21–30</td>
<td>8.5</td>
<td>1.75 (1.27–2.42)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>31–40</td>
<td>8.2</td>
<td>1.68 (1.22–2.31)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>41–50</td>
<td>6.6</td>
<td>1.32 (0.97–1.81)</td>
<td>0.08</td>
</tr>
<tr>
<td>51–60</td>
<td>5.0</td>
<td>1.00 (0.73–1.37)</td>
<td>1.00</td>
</tr>
<tr>
<td>61–70</td>
<td>3.6</td>
<td>0.70 (0.51–0.95)</td>
<td>0.02</td>
</tr>
<tr>
<td>71–80</td>
<td>2.0</td>
<td>0.39 (0.28–0.55)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>81–90</td>
<td>2.1</td>
<td>0.40 (0.28–0.59)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>&gt;90</td>
<td>3.1</td>
<td>0.59 (0.28–1.27)</td>
<td>0.18</td>
</tr>
<tr>
<td>Sex*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5.5</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>Female</td>
<td>3.8</td>
<td>0.69 (0.63–0.74)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>NZDep^</td>
<td>2</td>
<td>1.00</td>
<td>0.18 (0.15–0.22)</td>
</tr>
<tr>
<td>3</td>
<td>2.7</td>
<td>0.27 (0.22–0.32)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5</td>
<td>4.5</td>
<td>0.35 (0.30–0.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>7</td>
<td>4.4</td>
<td>0.35 (0.29–0.41)</td>
<td>&lt;0.001</td>
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<tr>
<td>9</td>
<td>4.7</td>
<td>0.37 (0.31–0.43)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>11</td>
<td>4.2</td>
<td>0.33 (0.28–0.39)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>ADHB**</td>
<td>2</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>CDHB</td>
<td>7.2</td>
<td>2.80 (2.58–3.04)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

CI – Confidence Interval
ADHB - Auckland District Health Board.
CDHB - Canterbury District Health Board.
NZDep - New Zealand deprivation index.
@ - OR for each ethnic group compared with Europeans.
# - OR for each age group compared with ≤20-year group.
* - OR for female patients compared with males.
^ - OR for each NZDep decile groups compared with NZDep decile 10.
^^ - OR for ADHB compared with CDHB.
Figure 4: Endoscopy non-attendance at CDHB and ADHB during 2012–2017.

Note: Data for year 2012 and year 2017 is incomplete.
(Year 2012: March–December, Year 2017: January–March).

European patients. On the other hand, Asian patients were more likely to attend endoscopy appointments when compared with Europeans (OR 0.88, 95% CI 0.77–1.0). Improved attendance rates were seen in patients between 60–89 years of age when compared with those in 10–19-year age group.

Gender remained a significant predictor of non-attendance, with male patients significantly more likely to miss appointments when compared with females (OR 1.43, 95% CI 1.32–1.56). Similarly, residence in deprived socioeconomic areas was associated with higher rates of non-attendance. Patients in the ADHB region were more likely to miss endoscopy appointments when compared with CDHB (OR 2.28, 95% CI 2.08–2.50).

Discussion

In this multi-centre observational study, we assessed non-attendance rates of outpatient endoscopy appointments and associated predictors at two of New Zealand’s most populous regions: Auckland and Christchurch. The most pertinent findings of our study are that patients of Māori and Pacific ethnicities, as well as those residing in deprived socioeconomic areas, were significantly less likely to attend outpatient endoscopy appointments. Patients in the CDHB area were more likely to attend endoscopy appointments when compared with the ADHB residents. Younger age and male gender were other significant predictors associated with low attendance rate.

Table 3: Comparison of four international studies on endoscopy non-attendance.

<table>
<thead>
<tr>
<th>Country</th>
<th>Current study</th>
<th>Adams et al</th>
<th>Laiyemo et al</th>
<th>Sola-vera et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
<td>New Zealand</td>
<td>Australia</td>
<td>US</td>
<td>Spain</td>
</tr>
<tr>
<td>Reported rate</td>
<td>4.6%</td>
<td>12.2%</td>
<td>21.7%</td>
<td>14.7%</td>
</tr>
</tbody>
</table>

ED - Emergency Department.
GP - General Practitioner.
SES - Socioeconomic status.
The percentage of non-attendance in our study was relatively low when compared with similar studies from North America, Europe and Australia. This is likely due to several reasons. The New Zealand healthcare model is predominantly a state-funded model with relatively limited access to alternate private healthcare. The ‘patient reminder’ protocol followed in these hospitals from previous studies were likely different. Nevertheless, some of the predictors of non-attendance across these studies are common including young age and lower socioeconomic status, as observed in the Australian and American studies.

During the study period (2012–2017), population screening colonoscopy for colorectal cancer was not provided by either of the DHBs. It is therefore important to highlight that our study predominantly included patients who were symptomatic, and thus more likely to harbour pathology. Non-attendance reflects a missed opportunity to investigate these symptomatic patients. In a sub-group analysis of non-attendees who later attended endoscopy procedure, 2.7% patients were diagnosed with neoplasm (data not shown). The observed non-attendance rate was higher in Māori and Pacific Peoples and patients from deprived socioeconomic background, further leading to widening health inequalities for the most vulnerable in our society.

One of the unexpected findings of our study was the significant variation in the attendance rates in the Canterbury compared with the Auckland region, even after adjusting the demographic variables. A possible explanation is the difference in reminder strategies used between the two DHBs. Patients who do not confirm attendance at CDHB are usually contacted a week before the due date, compared with one day at ADHB. This may provide more opportunity for patients, who may not have received prior written reminders/information, to organise time for the procedure. Adult private health insurance coverage in Auckland region is higher than Canterbury region (45% compared with 40%). Consequently, it is possible that more patients in the Auckland region may have sought private endoscopic investigations resulting in increased non-attendance at public hospital. However, this is less likely to be a significant confounder, as higher non-attendance rates were consistently seen across patients from all socioeconomic backgrounds.

Several limitations inherent to our study ought to be acknowledged. The study was retrospective in design. Some of the non-attendees may have organised endoscopy investigation in the private sector, however private healthcare data were not available to us. Private health insurance in New Zealand is generally paid by individuals personally and consequently, is more commonly available to people with higher household income. Majority of our non-attendance was seen in Māori and Pacific Peoples and those with deprived socioeconomic status, and thus non-availability of private healthcare data are unlikely to influence overall results.

Lastly, while our study has identified high-risk groups of patients likely to miss endoscopy appointments, it was not designed to address specific reasons for non-attendance (for example financial or cultural barriers). Further studies are required to elucidate reasons for non-attendance in these patients. Notwithstanding these limitations, our study remains the largest of its kind to be reported in the literature and the only from New Zealand. The main strength of our study is the long duration of observation, large sample size and different patient populations. It shows that, while both DHBs serve entirely different population groups, the predictors of non-attendance are similar.

**Conclusions**

This study has identified patient groups who are less likely to attend endoscopy appointments. Improving attendance by these groups is of great importance, not the least of which is to reduce current health disparities in New Zealand. Further studies are required to explore specific reasons for outpatient endoscopy non-attendance and identify targeted interventions to lessen health inequalities and optimise utilisation of health resources.
Competing interests:
Nil.

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URL:

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Early direct current cardioversion or ablation for atrial fibrillation or atrial flutter and acute decompensated heart failure

Fang Shawn Foo, Andrew Kerr, Ruvin Gabriel, David Heaven, Jen-Li Looi, Mayanna Lund, Jamie Voss, Timothy Sutton

ABSTRACT

AIMS: Guidelines recommend initial rate control in haemodynamically stable patients with atrial fibrillation (AF) or atrial flutter (AFL) and acute decompensated heart failure (ADHF). There is limited data on early inpatient rhythm control. We investigated the outcomes of patients managed with early TOE-guided DC cardioversion (DCCV) or ablation.

METHODS: We retrospectively analysed patients admitted to a single centre with AF or AFL and ADHF with LVEF≤40% that underwent inpatient TOE-guided DCCV or ablation. The primary endpoint was the one year composite outcome of mortality or rehospitalisation for heart failure.

RESULTS: We identified 79 patients, including 33 with AF (32 DCCV, one ablation) and 46 with AFL (22 DCCV, 24 ablation). The primary endpoint occurred in 20%. One-year mortality was 2.5%. There were significantly fewer rehospitalisations for arrhythmia or heart failure with AFL-ablation compared to AFL-DCCV (21% vs 64%, p=<0.01). Clinical recurrence of AF or AFL was 43%. At follow-up LV assessment, LVEF>40% was found in 75% (p=<0.01), including 87% of patients without known cardiomyopathy and 82% of patients in sinus rhythm.

CONCLUSION: Early inpatient DCCV or ablation for AF or AFL and ADHF had low mortality rates and rehospitalisation for heart failure with substantial improvement in LV function at follow-up.

Atrial fibrillation (AF) and atrial flutter (AFL) are common in patients with heart failure. Approximately one-third of patients admitted to hospital with acute decompensated heart failure (ADHF) are in AF at presentation. AF has been shown to be an adverse prognostic marker. Management options for AF include either rhythm or rate control strategies, however, a previous large multicentre randomised trial in patients with atrial fibrillation and heart failure failed to demonstrate superiority with either approach. This cohort of patients have a high rate of mortality and hospitalisation. Even with a rhythm control strategy, the rate of arrhythmia recurrence is high. In recent years, there have been several small clinical trials of catheter ablation for atrial fibrillation in patients with heart failure that have shown an improvement in markers such as left ventricular ejection fraction (LVEF) and quality of life. The recent CASTLE-AF trial in patients with symptomatic paroxysmal or persistent AF and heart failure demonstrated that catheter ablation of AF was associated with a significantly lower rate of the composite endpoint of death from any cause or hospitalisation for worsening heart failure compared to medical therapy.
However, there is a paucity of data on the optimal management strategy for inpatients that are hospitalised for AF or AFL and ADHF and current guidelines recommend an initial rate control strategy. Except for patients with haemodynamic compromise, immediate or very early cardioversion is generally avoided due to the high rate of early recurrence. Initial management with intravenous diuresis and vasodilators often improves the ventricular rates, although further treatment options for rate control may be limited due to the negative inotropic effects of beta blockers and calcium channel blockers. Intravenous digoxin or amiodarone are often used, but in patients with worsening heart failure or persistently poorly controlled ventricular rates, restoration of sinus rhythm may become necessary.

We sought to investigate the outcomes of inpatients with AF or AFL and ADHF managed with early inpatient transoesophageal echocardiogram (TOE) guided direct current cardioversion (DCCV) or ablation.

**Methods**

**Patient selection**

We retrospectively identified patients presenting to Middlemore Hospital between 1 January 2015 to 31 December 2016 with AF or AFL and ADHF with LVEF ≤40% on echocardiogram who subsequently underwent a TOE-guided DCCV or ablation. Middlemore Hospital, of the Counties Manukau District Health Board, is one of the largest hospitals in New Zealand, serving a population of over 500,000 people. All patients who underwent a TOE during this period were screened. Exclusion criteria included TOE for other indications, elective admissions for a TOE-guided DCCV or ablation, or patients who did not proceed to a DCCV or ablation due to thrombus on TOE or spontaneous reversion to sinus rhythm.

Three subgroups were identified for further analysis: AF, AFL managed with DCCV (AFL-DCCV) and AFL managed with ablation (AFL-ablation).

**Definitions and follow-up**

Clinical paper and electronic records for all patients were reviewed for the one-year period from successful TOE-guided DCCV or ablation. We utilised an average heart rate of greater than 90 beats per minute (bpm) during the 24 hours prior to TOE as a surrogate marker for persisting tachycardia potentially necessitating a rhythm control strategy. A heart rate of 90bpm was selected as this was the cut-off used by the early warning score system in our hospital.

Rehospitalisation for arrhythmia was defined as rehospitalisation for AF, AFL or bradyarrhythmias. Clinical recurrence of AF or AFL was defined as documented AF or AFL on ECG monitoring >24 hours after successful DCCV or ablation during subsequent hospitalisations, clinic attendances or LV assessments.

For follow-up LV assessment, we identified any repeat LV assessment (including transthoracic echocardiograms or cardiac MRI) undertaken within the first year (but at least four weeks after DCCV or ablation to allow time for improvement of LV function). If more than one LV assessment was undertaken during the first year, then the highest LVEF result was selected. Normal LV function = LVEF >50%, mild LV impairment = LVEF 40–50%, moderate LV impairment = LVEF 30–40%, severe LV impairment = LVEF <30%.

**Primary and secondary endpoints**

The primary endpoint was the one-year composite outcome of all-cause mortality or rehospitalisation for heart failure.

Secondary outcomes were rehospitalisation for arrhythmia or heart failure, sinus rhythm at 24 hours and clinical recurrence of AF or AFL in the first year. LV function on follow-up LV assessment was analysed by treatment subgroups and cardiac rhythm.

**Statistical analysis**

The logrank test was used to analyse the cumulative incidence plots of the primary endpoint. The chi-square test was used to analyse rehospitalisation for arrhythmia or heart failure, sinus rhythm at 24 hours, clinical recurrence of AF or AFL and anti-arrhythmic use. Wilcoxon signed rank test was used to analyse the paired before and after LVEF results, while the Fisher's exact test was used to explore the relationship between cardiac rhythm at follow-up LV assessment and improvement in LV function.
Results

A total of 362 patients underwent TOE between 1 January 2015 to 31 December 2016. We excluded 283 patients who did not meet the inclusion criteria.

In our final cohort of 79 patients, 33 patients had AF (32 underwent DCCV and one underwent ablation) and 46 patients had AFL (22 underwent DCCV and 24 underwent ablation) (Figure 1).

Baseline characteristics are shown in Table 1. In our cohort, the mean age was 60 with a mean BMI of 33kg/m². Eighty-two percent were male and 33% had a history of AF or AFL (of which 58% were persistent). There were 18% who had LVEF ≤40% on previous LV assessment (mean 2.4 years prior to admission) while 54% of patients had no prior LV assessment.

There was an average of five days from day of admission to day of TOE. Sixty-seven percent of patients had an average heart rate of greater than 90bpm during the 24 hours prior to TOE. Utilisation of rate control therapy prior to TOE was as follows: beta blockers 85%, calcium channel blockers 29%, digoxin 24%, amiodarone 52%.

Three patients moved to a different region and three were lost to follow. We believe three of those patients are still alive as data from regional electronic medication dispensing records indicate they are still collecting prescriptions.

Primary outcome

The primary outcome occurred in 16 patients (20%) in the overall cohort. This occurred in 27% of the AF subgroup. Event rates were lower in the AFL-ablation subgroup compared to AFL-DCCV but this was not statistically significant (8% vs 23%, p=0.57) (Figure 2). All-cause mortality at one year was 2.5%, with both patients coming from the AF subgroup.

Secondary outcomes

During the first year, 30 patients (38%) were rehospitalised on at least one occasion for arrhythmia or heart failure. This occurred in 33% of patients in the AF subgroup and was significantly less frequent in the AFL-ablation subgroup compared to the AFL-DCCV subgroup (21% vs 64%, p=<0.01) (Figure 3).

Sinus rhythm was maintained at 24 hours in 70 patients (89%). This was lower in the
Table 1: Baseline characteristics, treatment and medications of patients.

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>Overall (n=79)</th>
<th>AF (n=33)</th>
<th>AFL-DCCV (n=22)</th>
<th>AFL-ablation (n=24)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>60.0</td>
<td>57.5</td>
<td>62.6</td>
<td>61.4</td>
<td>0.26</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>33.0</td>
<td>33.6</td>
<td>32.8</td>
<td>32.4</td>
<td>0.85</td>
</tr>
<tr>
<td>Male (%)</td>
<td>82</td>
<td>82</td>
<td>82</td>
<td>83</td>
<td>1.00</td>
</tr>
<tr>
<td>Current smoker (%)</td>
<td>11</td>
<td>21</td>
<td>5</td>
<td>4</td>
<td>0.17</td>
</tr>
<tr>
<td>Ethnicity (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td>European</td>
<td>46</td>
<td>52</td>
<td>50</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Māori</td>
<td>27</td>
<td>24</td>
<td>23</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Pacific Island</td>
<td>23</td>
<td>18</td>
<td>23</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Previous AF/AFL (%)</td>
<td>33</td>
<td>36</td>
<td>41</td>
<td>21</td>
<td>0.30</td>
</tr>
<tr>
<td>Paroxysmal (%)</td>
<td>42</td>
<td>42</td>
<td>44</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Persistent (%)</td>
<td>58</td>
<td>58</td>
<td>56</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>38</td>
<td>30</td>
<td>55</td>
<td>33</td>
<td>0.16</td>
</tr>
<tr>
<td>Diabetes mellitus (%)</td>
<td>24</td>
<td>15</td>
<td>36</td>
<td>25</td>
<td>0.20</td>
</tr>
<tr>
<td>History of IHD (%)</td>
<td>19</td>
<td>18</td>
<td>32</td>
<td>8</td>
<td>0.15</td>
</tr>
<tr>
<td>Previous CVA (%)</td>
<td>4</td>
<td>0</td>
<td>9</td>
<td>4</td>
<td>0.18</td>
</tr>
<tr>
<td>Previous CHF (%)</td>
<td>15</td>
<td>18</td>
<td>14</td>
<td>13</td>
<td>0.86</td>
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<tr>
<td>Previous CRT/ICD (%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Previous LV assessment (%)</td>
<td></td>
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<td></td>
<td></td>
<td>0.17</td>
</tr>
<tr>
<td>Unknown</td>
<td>54</td>
<td>61</td>
<td>32</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>LVEF &gt;40%</td>
<td>28</td>
<td>18</td>
<td>50</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>LVEF ≤40%</td>
<td>18</td>
<td>21</td>
<td>18</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Days to TOE</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>0.13</td>
</tr>
<tr>
<td>HR&gt;90 24hr before TOE (%)</td>
<td>67</td>
<td>55</td>
<td>77</td>
<td>75</td>
<td>0.13</td>
</tr>
<tr>
<td>Inpatient rate-control medications (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta-blocker</td>
<td>85</td>
<td>94</td>
<td>91</td>
<td>67</td>
<td>0.02</td>
</tr>
<tr>
<td>Calcium channel blocker</td>
<td>29</td>
<td>33</td>
<td>32</td>
<td>21</td>
<td>0.56</td>
</tr>
<tr>
<td>Digoxin</td>
<td>24</td>
<td>36</td>
<td>27</td>
<td>4</td>
<td>0.02</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>52</td>
<td>64</td>
<td>50</td>
<td>38</td>
<td>0.15</td>
</tr>
<tr>
<td>Medications at repeat LV assessment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE-inhibitor</td>
<td>91</td>
<td>96</td>
<td>82</td>
<td>90</td>
<td>0.36</td>
</tr>
<tr>
<td>Beta blocker</td>
<td>91</td>
<td>96</td>
<td>88</td>
<td>84</td>
<td>0.36</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>38</td>
<td>48</td>
<td>12</td>
<td>47</td>
<td>0.03</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>46</td>
<td>52</td>
<td>53</td>
<td>32</td>
<td>0.32</td>
</tr>
<tr>
<td>Anticoagulation</td>
<td>89</td>
<td>93</td>
<td>82</td>
<td>90</td>
<td>0.57</td>
</tr>
</tbody>
</table>

BMI = body mass index, IHD = ischaemic heart disease, CVA = cerebrovascular accident, CHF = congestive heart failure, CRT = cardiac resynchronisation therapy, ICD = implantable cardioverter defibrillator, ACE = angiotensin converting enzyme.
AF subgroup (76%) compared to the AFL subgroups (98%), p<0.01 (Figure 4A).

Of the 70 patients who maintained sinus rhythm at 24 hours after successful DCCV or ablation, recurrence of AF or AFL was detected in 30 patients (43%) at one year. Recurrence rates were comparable in the overall AF group compared to the overall AFL group (44% vs 42%, p=0.88). There was a trend towards more recurrence in patients with AFL managed with DCCV compared with patients managed with ablation, but this did not reach statistical significance (57% vs 29%, p=0.06) (Figure 4B).

Follow-up LV assessment
There were 63 patients (80%) who had at least one follow-up LV assessment during the first year. Mean time to follow-up LV assessment was 5.3 months. On baseline echocardiography, 22% had moderate LV impairment and 78% had severe LV impairment. On follow-up LV assessment, 75% had LVEF >40%, p<0.01 (Figure 5A).

The improvement in LV function was even more pronounced in patients without pre-existing cardiomyopathy. Of the 54 patients without previously known LVEF ≤40%, 87% had LVEF >40% at follow-up.

Sinus rhythm at follow-up LV assessment was associated with better LV function compared to AF or AFL. Of the 50 patients in sinus rhythm, 82% had LVEF >40%, compared with just 46% of the 13 patients in AF or AFL, p=0.01 (Figure 5B).

There was no significant difference in distribution of LV function when analysed by AF, AFL-DCCV or AFL-ablation subgroups. There was also no difference in distribution...
of LV function in patients with rate-controlled or poorly rate-controlled AF/AFL at the time of repeat LV assessment or the subgroups with clinical recurrence of AF/AFL compared to those with no recurrence.

Medications at follow-up LV assessment
A high proportion of the patients in our cohort were on appropriate therapy for heart failure at follow-up. Ninety-one percent were on ACE-inhibitors, 91% were on beta-blockers and 38% were on spironolactone, which may account for some of the improvement in LV function.

Fifty-two percent were discharged on anti-arrhythmics. Amiodarone was the only anti-arrhythmic agent used. They were prescribed less frequently for the AFL patients (AF 73%, AFL-DCCV 55%, AFL-ablation 21%, p=<0.01). At 12 months, 27% of patients remained on anti-arrhythmics.

Discussion
An early rhythm control strategy in our cohort of patients hospitalised with AF or AFL and decompensated heart failure with reduced ejection fraction had a low rate of all-cause mortality and rehospitalisation for heart failure at one year. There were significantly fewer rehospitalisations for arrhythmia or heart failure in the AFL-ablation subgroup compared to the AFL-DCCV subgroup. Maintenance of sinus rhythm at 24 hours was almost 90%, but the rate of clinical recurrence during the first year was over 40%. Seventy-five percent of patients had significant improvement in LV systolic function to an LVEF >40%, particularly in patients without known LV dysfunction or patients in sinus rhythm at follow-up LV assessment.

The annual all-cause mortality in the AF-CHF trial was 10%. ESC-HF Pilot, a
prospective multicentre observational survey across Europe, reported an all-cause mortality of 17.4% and a combined all-cause mortality or heart failure hospitalisation of 35.8% at one year in patients who had been acutely hospitalised for heart failure. In CASTLE-AF, the overall cohort had a one year all-cause mortality of 3.9–4.7%, with a combined all-cause death or heart failure hospitalisation of 12.5–17.1%. A recent prospective international multi-ethnic cohort study in Singapore and New Zealand determined an all-cause mortality of 19% at two years and a combined all-cause mortality and heart failure hospitalisation of 43% at two years in patients with heart failure with reduced ejection fraction.

In comparison, our cohort had a one year all-cause mortality rate of 2.5% and a combined all-cause mortality and heart failure hospitalisation rate of 20%. However, our cohort was a selected group of patients who were well enough to tolerate a TOE and subsequently undergo DCCV or ablation. Our cohort also had a 10-year younger mean age compared to those studies, with almost half the patients of Māori or Pacific Island ethnic groups. Despite the higher proportion of these two ethnicities residing within our catchment area, these groups were still over-represented. Previous reports from the HF registry in New Zealand have shown that Māori patients present with heart failure 17 years earlier compared to other ethnicities.

Given the significant improvement in LV function in our cohort, very few patients subsequently had an indication for primary prevention ICDs and only four cardiovascular implantable electronic devices were inserted during the first year, including one permanent pacemaker, one ICD, one CRT-P and one CRT-D.

Sinus rhythm at follow-up LV assessment appeared to be a predictor of better LV function, however the number of patients in AF or AFL at the time of repeat LV assessment was small. Clinical recurrence of AF or AFL was not a predictor of better LV function, however, patients from both groups had further attempts at rhythm control with either DCCV or ablation.

In patients without known LVEF ≤40% prior to the index admission, 87% of patients had a significant recovery in LV function. This suggests that most patients without known LV dysfunction who present with AF or AFL and ADHF have a rate-related cardiomyopathy, with rhythm control resulting in marked improvement in LV function.

Limitations
This was a retrospective analysis on a relatively small number of patients in a single centre with a comparatively short follow-up time.

Indications for an early rhythm control strategy were mixed. Although two-thirds of patients had a surrogate marker for persistent tachycardia as the reason for pursuing a rhythm control strategy, most of the remaining patients were likely to have been managed as such as they were young with presumed recent onset atrial arrhythmia that was clinically felt to be the main driver for their decompensated heart failure.

This analysis did not include patients that may have been too unwell to tolerate a TOE, or patients that were managed with a rate control strategy in hospital.

Given the limitations of our study, a larger prospective multicentre study, randomised to an early rhythm control or rate control strategy with longer follow-up would be needed to confirm our findings.

Conclusions
In our cohort, early TOE-guided DCCV or ablation for patients in AF or AFL with ADHF had low mortality rates and rehospitalisation for heart failure. The AFL subgroup managed with ablation had significantly fewer rehospitalisation for arrhythmia or heart failure compared to DCCV. LV function improved substantially at follow-up, particularly in patients in sinus rhythm or without known cardiomyopathy. This study adds to the growing evidence for rhythm control in patients with atrial arrhythmias and heart failure with reduced ejection fraction, but further confirmatory studies in hospitalised patients with ADHF are required.
Competing interests:
Nil.

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REFERENCES:
Nature and delivery of cardiac rehabilitation in New Zealand: are services equitable to other high-income countries?

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ABSTRACT

AIMS: To compare the nature and delivery of cardiac rehabilitation (CR) services within New Zealand by island (North vs South; NI, SI), and to other high-income countries (HICs).

METHODS: In this cross-sectional study, secondary analysis of an online survey of CR programmes globally was undertaken. Results from New Zealand were compared to data from other HICs with CR.

RESULTS: Twenty-seven (62.7%) out of 43 CR programmes in New Zealand (n=18/31, 66.7% respondents from NI) and 619 (43.1%) from 28 other HICs completed the survey. New Zealand CR programmes offered a median of 16.0 sessions/patient (interquartile range (IQR)=12.0–36.0; vs 21.6 sessions in other HICs, IQR=12.0–36.0, p=0.016), delivered by a team of 6.0 staff (IQR=5.5–7.0; vs 7.0 staff; IQR=5.0–9.0, p=0.012). New Zealand programmes were significantly less comprehensive than other HICs (p=0.002); within New Zealand, NI programmes were more likely to provide an initial and end-of-programme assessment, supervised exercise training and depression screening, compared to SI programmes (all p<0.05). New Zealand more often offered CR in an alternative setting (n=14, 58.3%), compared to other HICs (n=190, 36.5%), p=0.03).

CONCLUSIONS: CR programmes in New Zealand offer fewer sessions and have fewer elements compared to other HICs, and disparity exists in programmes across New Zealand. More investment is needed to ensure CR in New Zealand meets international guidelines.
New Zealand,\textsuperscript{9} it is the only assessment of CR delivery in New Zealand.\textsuperscript{10} Furthermore, no research has compared the nature and delivery of CR programmes within New Zealand, or with other countries around the globe. Benchmarking of CR services in New Zealand with comparable countries (ie, same country income classification, similar healthcare systems) is necessary to identify strengths and/or disparity of care, to inform future CR delivery.

Therefore, the purpose of this study was to compare the nature and delivery of CR programmes within New Zealand, and with those in other high-income countries (HIC), specifically with regards to: 1) volume indicators (ie, number of sessions, dose, annual volume etc.), 2) accepted indications, 3) types of healthcare professional on the CR team and healthcare professional with programme oversight, 4) elements delivered, 5) delivery of alternative models (ie, community-based), and 6) barriers to delivery. We also sought to examine whether differences were present between CR programmes in the North Island (NI) and South Island (SI) of New Zealand.

Methods

Design and procedure

This paper presents secondary analysis of a global survey of CR programmes; its methodology is described in detail, and the survey available elsewhere.\textsuperscript{11} Identified leaders of national CR societies/organisations were contacted via email to administer the survey to each programme in their country. The survey was administered between June 2016 and December 2017, via a secure web-based application (REDCap, Nashville, US). All CR programmes received two email reminders, sent at two-week intervals. Ethical review for this study was carried out by York University’s Office of Research Ethics (Toronto, Canada) and Mayo Clinic’s Institutional Review Board (Rochester, US); both institutions provided an ethics approval exemption given the study methodology. Informed consent was obtained via an online form.

Sample

All programmes globally identified as providing phase II CR (ie, outpatient services to patients following an acute cardiac event or hospitalisation) were included in the Global CR Program Survey Study. Forty-three CR programmes in New Zealand were invited to complete the survey. Programme location was categorised as NI or SI based on the city/town listed for each New Zealand programme.

Countries classified as HICs by the World Bank in North America and Europe, as well as Australia were included as a comparative group, due to their similarity in income and healthcare systems to New Zealand.\textsuperscript{12} Forty-three countries were included, of which 31 (72%) offered CR.\textsuperscript{11}

Measures

Development of the survey was based on previous national/regional surveys of CR programmes.\textsuperscript{13–15} Forced-choice response was used for most items and skip logic used where applicable to obtain further details.

The following variables were assessed: (1) locality of programmes (ie, urban [larger city, town], suburban [a residential district located on the outskirts of a city] or rural [located outside city/town]), (2) programme and volume-related indicators (ie, time to CR commencement, number of patients per annum), (3) dose of CR (in hours; ie, sessions per week x duration in weeks x duration of exercise sessions in minutes), (4) accepted indications (ie, myocardial infarction, as well as non-cardiac indications), (5) the types and number of healthcare professionals on CR team, and whom has programme oversight (ie, cardiologist, nurse, physiotherapist etc.), (6) the type and number of elements delivered (of 24; ie, initial assessment, patient education), (7) whether the programme offers alternative CR models (ie, home or community-based programmes), and (8) perceived barriers to delivery.

Statistical analysis

All statistical analyses were performed using IBM SPSS software, version 23.0 (IBM, Chicago, US). All initiated surveys were included. The number of responses for each question varied due to missing data (ie, respondent did not answer a question due to lack of willingness or potential inapplicability, use of skip logic); for descriptive analyses, percentages were computed with the denominator being the number of responses for a specific item.
Descriptive statistics were expressed as either mean ± standard deviation, median, interquartile range, (IQR, quartile 25th–75th percentile) or number and percentage. Differences (ie, New Zealand vs other HICs, and NI vs SI) in continuous variables were analysed using independent-sample t-tests, or Mann-Whitney U tests if data normality and/or homogeneity of variance were violated. Differences in categorical variables were analysed using Chi-squared tests. Due to the small number of New Zealand programmes, multi-level analyses could not be performed. The level of statistical significance was set at $p<0.05$.

Results

Responses were received from 27 (programme response rate = 62.7%) out of 43 New Zealand CR programmes. Eighteen (66.7%) responses were from NI (31 approached), and eight from SI (12 approached) CR programmes; one response was excluded from the NI vs SI analysis because no city/town was provided.

Twenty-eight out of 31 other HICs (country response rate = 90.3%) responded to the survey: Australia, Austria, Belgium, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the UK and the US. There were a total of 619 surveys initiated (programme response rate = 43.1%).

Nature of CR programmes

Comparison of programme characteristics and indications for CR are provided in Table 1 and 2. New Zealand (n=19, 73.1%) and other HIC (n=92, 61.5%; $p=0.468$) programmes were primarily based in urban locations; this was similar for NI (n=14, 77.8%) and SI (n=6, 75.0%; $p=0.813$) CR programmes. The time from hospital discharge to first visit was a median of 3.25 weeks and was not different from other HICs ($p=0.131$) or between the NI and SI ($p=0.291$).

New Zealand CR programmes see a median of 270 patients per annum, offering a median 2.0 sessions per week, for 8.0 weeks. Accordingly, median programme dose was 16.0 hours (IQR=12.0–36.0) in New Zealand, which was lower than other HICs (21.6 hours; IQR=12.0–36.0; $p=0.016$). There was no difference in CR dose between NI (16.0 hours; IQR=6.0–24.0) and SI (16.0 hours; IQR=6.0–18.0; $p=0.193$) CR programmes.

Revascularisation patients were universally accepted, with heart failure and stable coronary disease patients (which are also a guideline indication) accepted by ~90% and 70% of programmes, respectively (Table 2). New Zealand programmes were significantly less likely to accept myocardial infarction/acute coronary syndrome, ventricular assist device, rhythm device (ie, pacemaker) and cardiomyopathy patients, compared to other HICs. New Zealand CR programmes were more likely to only serve patients with cardiac conditions, compared to other HICs; other HICs had a greater proportion of programmes accepting patients with vascular claudication (n=208, 42.5% vs. n=3, 13.6% in New Zealand; $p=0.007$). NI programmes were more likely to accept high-risk primary prevention patients than SI programmes, and there was a trend towards more often accepting patients with other non-cardiac conditions such as stroke (n=4, 25.0%; $p=0.214$), diabetes (n=4, 25.0%; $p=0.214$) and lung disease (n=5, 31.3%; $p=0.152$), compared to SI programmes (all n=0, 0.0%).

Delivery of CR programmes

In New Zealand, CR programmes were most commonly overseen by nurses, followed by exercise physiologists and cardiologists (Table 1); conversely in other HICs, almost half of CR programmes were overseen by cardiologists, followed by nurses and other physicians. No differences were observed by island.

The number and nature of healthcare professionals on CR teams is shown in Table 3. New Zealand CR teams had fewer staff and most commonly comprised dietitians, pharmacists, nurses and physiotherapists. New Zealand CR programmes were more likely to include pharmacists, but less likely to have cardiologists, physiatrists, other physicians, nurse practitioners, psychiatrists, kinesiologists and administrative assistants/secretaries than other HICs. There were no differences by island.

Nationally, programmes had a median of 1.5 staff (IQR=1.0–2.0) present during exercise sessions (fewer than other HICs...
Table 1: Programme characteristics by island, nationally and in other high-income countries.

<table>
<thead>
<tr>
<th></th>
<th>NZ (n=27)</th>
<th>Other HICs (n=619)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NI (n=18)</td>
<td>SI (n=8)</td>
</tr>
<tr>
<td>Weeks from hospital</td>
<td>3.0 (2.0–4.8)</td>
<td>3.5 (3.0–5.0)</td>
</tr>
<tr>
<td>discharge to first visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual volume (n)</td>
<td>270 (110–640)</td>
<td>220 (100–340)</td>
</tr>
<tr>
<td>Number of education</td>
<td>6.0 (6.0–8.0)</td>
<td>4.5 (3.0–6.0)</td>
</tr>
<tr>
<td>sessions/programme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of education</td>
<td>60 (60.0–60.0)</td>
<td>45 (30.0–60.0)</td>
</tr>
<tr>
<td>session (minutes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR programme duration</td>
<td>8.0 (6.0–9.0)</td>
<td>7.5 (5.0–10.0)</td>
</tr>
<tr>
<td>(weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sessions per week (n)</td>
<td>2.0 (1.0–2.0)</td>
<td>1.5 (1.0–2.0)</td>
</tr>
<tr>
<td>CR session duration</td>
<td>60.0 (60.0–60.0)</td>
<td>50.0 (40.0–60.0)</td>
</tr>
<tr>
<td>(minutes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients per session</td>
<td>10 (8.0–15.0)</td>
<td>15 (15.0–15.0)</td>
</tr>
<tr>
<td>(n)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CR programme overseen by**

- Cardiologist: 2 (12.5%) NI, 0 (0.0%) SI, 2 (8.3%) Total, 288 (49.7%) Other HICs

- Other physician (ie, internal medicine, physiatrist etc.): 0 (0.0%) NI, 0 (0.0%) SI, 0 (0.0%) Total, 70 (12.1%) Other HICs

- Nurse: 11 (68.8%) NI, 7 (87.5%) SI, 18 (75.0%) Total, 150 (25.9%) Other HICs

- Exercise physiologist: 3 (18.8%) NI, 0 (0.0%) SI, 3 (12.5%) Total, 17 (2.9%) Other HICs

- Other: 0 (0.0%) NI, 1 (12.5%) SI, 1 (4.0%) Total, 45 (7.4%) Other HICs

**Alternative models of CR offered**

- Yes: 9 (56.3%) NI, 4 (57.1%) SI, 14 (58.3%) Total, 190 (36.5%) Other HICs

- Community-based: 8 (88.9%) NI, 3 (75.0%) SI, 11 (78.6%) Total, 75 (39.5%) Other HICs

- Home-based: 6 (66.7%) NI, 1 (25.0%) SI, 7 (50.0%) Total, 108 (56.8%) Other HICs

NI = North Island; SI = South Island; NZ = New Zealand; HIC = high-income country; IA = initial assessment; CR = cardiac rehabilitation.

Data are presented median (IQR) or n (%). ^ = p<0.05 NI vs. SI; * = p<0.05 NZ vs. HIC; ** = p<0.005.

Note: Due to missing data, percentages are computed where the denominator is the number of valid responses from responding programmes.

(2.0; IQR=1.0–3.0; p=0.012)), overseeing 8.0 patients (IQR=4.0–15.0; vs other HICs, 9.0 patients; IQR=5.0–12.0; p=0.522) per one staff. In the NI, there was a median of 1.0 staff (IQR=1.0–2.0), with a median of 6.0 (IQR=4.0–12.0) patients per one staff during exercise. While in the SI, there was a median of 2.0 staff (IQR=2.0–2.0; p=0.276), with a median of 9.0 (IQR=8.0–15.0; p=0.236) patients per one staff.

As shown in Table 4, of the 24 elements assessed, New Zealand CR programmes offered a median of 17.0, which was significantly fewer than CR programmes in other HICs. Specifically, New Zealand CR programmes were significantly less likely...
Table 2: Indications for CR by island, nationally and in other high-income countries.

<table>
<thead>
<tr>
<th>CR</th>
<th>NZ</th>
<th>Other HICs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NI (100.0%)</td>
<td>SI (100.0%)</td>
</tr>
<tr>
<td>Coronary artery bypass graft surgery</td>
<td>16 (100.0%)</td>
<td>5 (100.0%)</td>
</tr>
<tr>
<td>Percutaneous coronary intervention</td>
<td>16 (100.0%)</td>
<td>5 (100.0%)</td>
</tr>
<tr>
<td>Valve surgery/repair or procedure</td>
<td>16 (100.0%)</td>
<td>5 (100.0%)</td>
</tr>
<tr>
<td>Heart failure</td>
<td>14 (87.5%)</td>
<td>5 (100.0%)</td>
</tr>
<tr>
<td>Post-myocardial infarction/acute coronary syndrome</td>
<td>15 (93.8%)</td>
<td>4 (80.0%)</td>
</tr>
<tr>
<td>Stable coronary artery disease, without a recent event or procedure</td>
<td>11 (68.8%)</td>
<td>4 (80.0%)</td>
</tr>
<tr>
<td>Heart transplant</td>
<td>9 (56.3%)</td>
<td>3 (60.0%)</td>
</tr>
<tr>
<td>Rhythm devices</td>
<td>11 (68.8%)</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>Arrhythmias</td>
<td>10 (62.5%)</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>High-risk primary prevention</td>
<td>11 (68.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>8 (50.0%)</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>Rheumatic heart disease</td>
<td>7 (43.8%)</td>
<td>2 (40.0%)</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>7 (43.8%)</td>
<td>1 (20.0%)</td>
</tr>
<tr>
<td>Ventricular assist devices</td>
<td>7 (43.8%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

Non-cardiac chronic diseases

<table>
<thead>
<tr>
<th>CR</th>
<th>NZ</th>
<th>Other HICs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>25% (4)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>Claudication</td>
<td>19% (3)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>Cancer</td>
<td>19% (3)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>25% (4)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>Lung disease</td>
<td>31% (5)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>None (ie, only cardiac chronic diseases served)</td>
<td>56% (9)</td>
<td>80% (4)</td>
</tr>
</tbody>
</table>

CR = cardiac rehabilitation; NI = North Island; SI = South Island; NZ = New Zealand; HIC = high-income country.

Data are presented n (%). ^ = p<0.05 NI vs SI; * = p<0.05 NZ vs HIC; ** = p<0.005.

to include an initial assessment, individual consultation with a physician, exercise stress or other functional capacity test, assessment of muscular strength, supervised exercise training, heart rate measurement training, resistance training and end-of-programme assessment, compared with CR programmes from other HICs. Domestically, initial assessment, supervised exercise training, resistance training and depression screening were significantly more prevalent in NI CR programmes, compared to the SI.

Alternative models of CR, particularly community-based programmes, were more commonly offered in New Zealand programmes, compared to other HICs (Table 1). There was a trend for more NI programmes to offer home-based CR, compared to SI CR programmes (p=0.164).

Delivery barriers

Similar to other HICs, lack of financial and human resources were the greatest barriers to CR delivery in New Zealand (Table 5). Barriers were consistent across the country. Other barriers reported by New Zealand respondents included transportation/access (n=4, 16.0%), and access to other multi-disciplinary staff/services (n=2, 8.0%) (ie, specialists, dietitians and psychologists).
Table 3: Types of healthcare professional on CR team by island, nationally and in other high-income countries.

<table>
<thead>
<tr>
<th></th>
<th>NZ</th>
<th>Ni</th>
<th>Si</th>
<th>Total</th>
<th>Other HICs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiologist</td>
<td>9 (52.9%)</td>
<td>2 (28.6%)</td>
<td>11 (44.0%)</td>
<td>386 (72.3%)</td>
<td>**</td>
</tr>
<tr>
<td>Physiatrist</td>
<td>1 (6.3%)</td>
<td>0 (0.0%)</td>
<td>1 (4.2%)</td>
<td>191 (36.7%)</td>
<td>**</td>
</tr>
<tr>
<td>Sports medicine physician</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>68 (13.3%)</td>
<td></td>
</tr>
<tr>
<td>Other physician</td>
<td>1 (6.3%)</td>
<td>0 (0.0%)</td>
<td>1 (4.2%)</td>
<td>201 (39.0%)</td>
<td>**</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>13 (81.3%)</td>
<td>5 (71.4%)</td>
<td>19 (79.2%)</td>
<td>422 (78.9%)</td>
<td></td>
</tr>
<tr>
<td>Nurse</td>
<td>13 (76.5%)</td>
<td>7 (100%)</td>
<td>21 (84.0%)</td>
<td>482 (89.8%)</td>
<td></td>
</tr>
<tr>
<td>Nurse practitioner</td>
<td>3 (18.8%)</td>
<td>0 (0.0%)</td>
<td>3 (13.0%)</td>
<td>185 (36.6%)</td>
<td>*</td>
</tr>
<tr>
<td>Psychiatrist</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>97 (18.9%)</td>
<td>*</td>
</tr>
<tr>
<td>Psychologist</td>
<td>7 (50.0%)</td>
<td>2 (33.3%)</td>
<td>9 (42.9%)</td>
<td>325 (61.4%)</td>
<td></td>
</tr>
<tr>
<td>Social worker</td>
<td>7 (43.8%)</td>
<td>4 (57.1%)</td>
<td>12 (50.0%)</td>
<td>254 (48.3%)</td>
<td></td>
</tr>
<tr>
<td>Dietitian</td>
<td>14 (87.5%)</td>
<td>6 (85.7%)</td>
<td>21 (87.5%)</td>
<td>447 (83.6%)</td>
<td></td>
</tr>
<tr>
<td>Kinesiologist</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>111 (21.5%)</td>
<td>*</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>13 (81.3%)</td>
<td>7 (100%)</td>
<td>21 (87.5%)</td>
<td>220 (42.2%)</td>
<td>**</td>
</tr>
<tr>
<td>Exercise specialist</td>
<td>8 (50.0%)</td>
<td>3 (50.0%)</td>
<td>11 (47.8%)</td>
<td>249 (47.8%)</td>
<td></td>
</tr>
<tr>
<td>Community health worker</td>
<td>2 (12.5%)</td>
<td>0 (0.0%)</td>
<td>3 (12.5%)</td>
<td>93 (18.0%)</td>
<td></td>
</tr>
<tr>
<td>Admin assistant/secretary</td>
<td>9 (56.3%)</td>
<td>2 (33.3%)</td>
<td>11 (47.8%)</td>
<td>370 (70.2%)</td>
<td>*</td>
</tr>
<tr>
<td>Total number of staff (/16)</td>
<td>6.0 (5.5–7.5)</td>
<td>5.0 (5.0–6.0)</td>
<td>6.0 (5.5–7.0)</td>
<td>7.0 (5.0–9.0)</td>
<td>*</td>
</tr>
</tbody>
</table>

CR = cardiac rehabilitation; Ni = North Island; Si = South Island; NZ = New Zealand; HIC = high-income country.
Data are presented median (IQR) or n (%). * = p<0.05 Ni vs Si; ^ = p<0.05 NZ vs HIC; ** = p<0.005.

Discussion
This study is the first to investigate the nature of CR delivery in New Zealand by island, and with those offered in other HICs. Overall, CR in New Zealand performed poorly over a number of metrics compared to countries with similar income levels. New Zealand programmes were less comprehensive, had fewer types and number of healthcare staff and provided a significantly lower dosage of CR per patient. Lack of financial resources was listed as one of the main barriers to CR delivery, which may be affecting the ability to deliver CR according to national and international guidelines.6,8,16,17 Discrepancies in CR delivery within New Zealand are also evident; Ni programmes are more likely to provide an initial and end-of-programme assessment, supervised exercise training, resistance training and screening for depression, compared to SI programmes. Conversely, New Zealand CR programmes accepted guideline-indicated conditions (except stable coronary artery disease) and were also more likely to offer CR in alternative settings, especially community, compared to other HICs.

Following a previous New Zealand CR audit,9 Benatar et al18 recommended New Zealand CR programmes initiate rehabilitation within one month of hospital discharge, as recommended by international guidelines.6 This study indicates that patient enrolment is now within this time frame. Time from hospital discharge to CR initiation is of critical significance; with every one-day increase in wait time, patients are 1% less likely to enrol in CR.19 Furthermore, for every one-day increase in wait time, the likelihood of improving fitness-related measures is reduced by 1%.20 To reduce the risk of non-attendance, New Zealand guidelines (published after data collection...
Table 4: Programme elements delivered by island, nationally and in other high-income countries.

<table>
<thead>
<tr>
<th>Programme Element</th>
<th>NZ</th>
<th>Other HICs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NI (n, %)</td>
<td>Total (n, %)</td>
</tr>
<tr>
<td>Initial assessment</td>
<td>17 (100.0%)</td>
<td>545 (98.9%)*</td>
</tr>
<tr>
<td>Individual consultation with a physician</td>
<td>7 (43.8%)</td>
<td>347 (63.0%)**</td>
</tr>
<tr>
<td>Individual consultation with a nurse</td>
<td>14 (82.4%)</td>
<td>475 (86.7%)</td>
</tr>
<tr>
<td>Exercise stress test</td>
<td>4 (25.0%)</td>
<td>343 (62.8%)**</td>
</tr>
<tr>
<td>Other assessment of functional capacity</td>
<td>7 (43.8%)</td>
<td>448 (82.7%)**</td>
</tr>
<tr>
<td>Assessment of strength (ie, handgrip)</td>
<td>2 (14.3%)</td>
<td>231 (42.7%)*</td>
</tr>
<tr>
<td>Exercise prescription</td>
<td>13 (81.3%)</td>
<td>534 (97.1%)**</td>
</tr>
<tr>
<td>Physical activity counselling</td>
<td>16 (100.0%)</td>
<td>545 (98.6%)</td>
</tr>
<tr>
<td>Supervised exercise training</td>
<td>16 (100.0%)</td>
<td>544 (98.7%)*</td>
</tr>
<tr>
<td>Heart rate measurement training for patients</td>
<td>10 (62.5%)</td>
<td>510 (93.2%)**</td>
</tr>
<tr>
<td>Resistance training</td>
<td>13 (81.3%)</td>
<td>510 (93.2%)**</td>
</tr>
<tr>
<td>Management of cardiovascular risk factors</td>
<td>16 (100.0%)</td>
<td>538 (98.2%)</td>
</tr>
<tr>
<td>Prescription and/or titration of secondary prevention medication</td>
<td>11 (68.8%)</td>
<td>415 (75.5%)</td>
</tr>
<tr>
<td>Nutrition counselling</td>
<td>16 (100.0%)</td>
<td>525 (95.3%)</td>
</tr>
<tr>
<td>Depression screening</td>
<td>16 (100.0%)</td>
<td>516 (93.8%)</td>
</tr>
<tr>
<td>Psychological counselling</td>
<td>14 (87.5%)</td>
<td>472 (85.7%)</td>
</tr>
<tr>
<td>Smoking cessation interventions</td>
<td>12 (80.0%)</td>
<td>434 (78.8%)</td>
</tr>
<tr>
<td>Vocational counselling/support for return-to-work</td>
<td>11 (68.8%)</td>
<td>375 (68.9%)</td>
</tr>
<tr>
<td>Stress management/relaxation techniques</td>
<td>14 (87.5%)</td>
<td>497 (90.4%)</td>
</tr>
<tr>
<td>Alternative forms of exercise (ie, yoga, dance, or tai-chi)</td>
<td>6 (37.5%)</td>
<td>185 (34.1%)</td>
</tr>
<tr>
<td>End of programme re-assessment</td>
<td>13 (81.3%)</td>
<td>507 (92.7%)**</td>
</tr>
<tr>
<td>Electronic patient charting</td>
<td>6 (37.5%)</td>
<td>239 (57.7%)</td>
</tr>
<tr>
<td>Communication to primary care provider</td>
<td>14 (87.5%)</td>
<td>489 (90.2%)</td>
</tr>
<tr>
<td>Follow-up after outpatient programme</td>
<td>10 (66.7%)</td>
<td>349 (63.9%)</td>
</tr>
<tr>
<td>Total number of CR elements per programme (/24)</td>
<td>18.0 (14.0–20.0)</td>
<td>19.0 (17.0–20.0)*</td>
</tr>
</tbody>
</table>

CR = cardiac rehabilitation; NI = North Island; SI = South Island; NZ = New Zealand; HIC = high-income country. Data are presented median (IQR) or n (%). ^ = p<0.05 NI vs SI; * = p<0.05 NZ vs HIC; ** = p<0.005.
in this study) also recommend at least one patient engagement within the first week (ideally in-hospital, or by phone) to initiate risk factor modification and early adoption of a cardioprotective lifestyle prior to CR commencement.16

Australia,17 and more recently New Zealand,16 have defined aspects of CR that should be mandatory in all programmes. Unfortunately, CR programmes in New Zealand were significantly less comprehensive than other HICs; lessons could potentially be learned from programmes in Europe (ie, Netherlands, UK, Italy, Germany) that are among the most comprehensive in the world.11 One component agreed to both nationally and internationally,8,16,17 is the need for initial and end-of-programme assessments. In this study only approximately 90% and 60% of New Zealand CR programmes provide an initial assessment and end-of-programme assessment, compared with 99% and 93% in other HICs, respectively. In the NI, 100% of programmes offer an initial assessment, while only 75% in the SI. Initial assessments are integral for establishing the patient's current physical and psychological status, and guide the formulation of a treatment plan, prioritising mutually agreed clinician and patient goals, and set out strategies for achieving these goals. Furthermore, end-of-programme assessments provide crucial information on progress and provide direction for future long-term secondary prevention plans. Noteworthy were the low rates of functional capacity assessment for both NI and SI CR programmes, indicating few services offer individually-tailored exercise prescription.

Previous meta-analyses and international guidelines state that the higher the dose of CR, the better the outcome,21,22 with data indicating that the minimum effective dose is 12 sessions and optimal dose 36 sessions.22 New Zealand patients do not receive the optimal dose and generally receive six sessions fewer than in other HICs. This indicates that New Zealand patients are disadvantaged with too few sessions. Programme dose is highest in the Americas,23 and hence New Zealand CR programmes could perhaps learn from their models.

While New Zealand has among the best density of CR globally, with one CR position for every two incident ischaemic heart disease cases/year (fourth best capacity globally),24 there are still relatively low patient uptake rates; geography is thought to be an important factor.18,25 New Zealand CR programmes have attempted to address this potential barrier with almost 60% of CR programmes offering CR in alternative settings, almost double that of other HICs. Technological advancement and utilisation of mobile technology (mHealth) are other novel strategies that in the future may promote patient uptake in the New Zealand context.26,27 Similarly, utilisation of community-based exercise-CR programmes have been shown to be safe and effective for improving physical and mental health in New Zealand,28,29 while also increasing uptake and long-term adherence to CR in Māori.30

Future directions
Future research is necessary to assess the efficacy of programmes and patient outcomes. While it is evident that aspects of

Table 5: Barriers to delivery by island, nationally and in other high-income countries.

<table>
<thead>
<tr>
<th></th>
<th>NZ</th>
<th>NI</th>
<th>SI</th>
<th>Total</th>
<th>Other HICs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of patient referrals</td>
<td>2.6 ± 1.4</td>
<td>3.4 ± 1.2</td>
<td>3.0 ± 1.4</td>
<td>3.1 ± 1.5</td>
<td></td>
</tr>
<tr>
<td>Lack of equipment</td>
<td>2.7 ± 1.4</td>
<td>3.1 ± 1.6</td>
<td>3.0 ± 1.4</td>
<td>2.4 ± 1.3</td>
<td></td>
</tr>
<tr>
<td>Lack of space</td>
<td>2.9 ± 1.6</td>
<td>3.3 ± 1.8</td>
<td>3.0 ± 1.6</td>
<td>2.8 ± 1.4</td>
<td></td>
</tr>
<tr>
<td>Lack of human resources</td>
<td>3.3 ± 1.5</td>
<td>4.0 ± 1.1</td>
<td>3.4 ± 1.2</td>
<td>3.2 ± 1.4</td>
<td></td>
</tr>
<tr>
<td>Lack of financial resources</td>
<td>3.7 ± 1.2</td>
<td>4.3 ± 1.5</td>
<td>3.8 ± 1.4</td>
<td>3.5 ± 1.4</td>
<td></td>
</tr>
</tbody>
</table>

Note: scores range from 1 = Definitely not an issue, 5 = Major issue.
NI = North Island; SI = South Island; NZ = New Zealand; HIC = high-income country.
Data are presented mean ± SD. No differences (ie all p>0.05) were found for barriers by island or NZ vs Other HICs.
programmes in New Zealand are inferior to those offered in other HICs, it is not known whether this translates to poorer patient outcomes following CR. Audit and publication of data from a newly established CR database will for the first time provide insight into the effectiveness of CR within the New Zealand context. This survey did not focus on CR uptake in indigenous populations, which is important and warrants future investigation. In particular, it is not known how well traditional models of CR are meeting the needs of Māori in New Zealand; a model encompassing the concepts of Te Whare Tapa Whā may be a more effective model for Māori and should be explored. Lastly, while patient uptake is relatively high in New Zealand, it remains unclear how to engage those who are least likely to attend; novel interventions are necessary to target this group.

Limitations

As is normal with web-based surveys, the programme response rate in this study was low (40%), which limits the generalisability of findings. Second, despite respondents being informed that their responses were confidential, it is possible that respondents answered in such a way to reflect better provision of CR. Third, caution should be used when interpreting some results due to low sample sizes (in particular for the SI vs NI comparisons), and the large variability in some programme characteristics (ie, programme duration). Finally, multiple comparisons were performed, which increases the chances of Type 1 error.

Conclusion

New Zealand outperforms other HICs in terms of delivery of community-based CR, which enables more patients to access CR services. However, New Zealand CR programmes offer fewer sessions to patients, and these contain fewer elements: SI programmes in particular are less likely to offer initial and final assessments, depression screening and supervised exercise training, compared to NI programmes. Work needs to be done to address the disparity of CR programmes across New Zealand and more investment is needed to ensure CR in New Zealand meets international guidelines.
Competing interests:
Nil.

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URL:

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25. Stewart R. More flexible approaches are needed


Can direct-to-consumer advertising of prescription drugs be effectively regulated?

Joel Lexchin, David B Menkes

ABSTRACT

The government of New Zealand is currently considering a new Therapeutic Products Regulatory Scheme that includes how direct-to-consumer advertising (DTCA) of prescription drugs should be regulated. This article reviews three different types of possible regulation of DTCA: government regulation, industry self-regulation and a mixture of the two. Recent studies demonstrate that DTC ads in the US continue to be misleading and contain minimal if any educational value, despite governmental regulatory efforts by the Food and Drug Administration. Other regulatory models are equally unsuccessful at controlling DTCA. Available evidence suggests that DTC ads are commonly misinterpreted as trusted public health messages and are more likely to affect vulnerable subgroups of New Zealanders. Taken together with the international evidence that regulation has consistently failed to prevent the inappropriate promotion of prescription medicines, these findings suggest that DTCA is more likely to cause harm than benefit and should be banned.

New Zealand and the US are the only two developed countries where direct-to-consumer advertising (DTCA) of prescription drugs is legal. In New Zealand, DTCA developed because the Medicines Act 1981 did not specifically prohibit the practice; in the US, it was enabled by a 1982 ruling by the Food and Drug Administration (FDA) that DTCA did not inherently violate FDA administrative law and regulations. In 1985 the FDA announced that it had sufficient power to adequately regulate DTCA while protecting public health.

The New Zealand government has undertaken a number of reviews of DTCA. Following a 1998 inquiry, the government decided to keep a watching brief on DTCA and observe the effects of industry self-regulation before deciding on further action. The second review occurred in 2000 and, despite a majority of submissions supporting a ban or significant tightening of regulations, DTCA was once again allowed to continue. A third review took place in 2006, again with public consultations. More than half of the submissions taking a policy position advocated for a ban, but legislation allowed DTCA to continue. According to the Minister of Health at the time, Annette King, the new proposed regulatory scheme would have better controls to ensure that consumers were provided with balanced and truthful information. King acknowledged that the Labour government would have preferred an outright ban but there was not sufficient support in parliament to achieve this. (The legislation, part of an effort to harmonise the regulation of medicines between Australia and New Zealand, was ultimately scrapped.)

The draft Therapeutic Products Bill, currently out for consultation, includes yet another effort to solicit public opinion about banning or regulating DTCA. The consultation document proposes to continue to allow DTCA subject to regulation by an independent authority, the nature of which is yet to be decided.
This review focuses on the extent to which DTCA can be adequately regulated and examines three options for doing so: direct government regulation, a mixture of government and industry self-regulation, and industry self-regulation alone. The first model applies in the US and Canada, the second reflects how both DTCA and promotion to doctors is controlled in New Zealand. There are no examples of pure industry self-regulation of DTCA and so we also briefly consider the extent to which industry self-regulation of pharmaceutical promotion to physicians has been successful in Sweden and the UK.

Quality of DTCA in the US

Television advertising
Studies looking at the three main forms of DTCA—broadcast advertising, print advertising and sponsored websites—have each found that the quality of information that they contain is seriously flawed. By far, the largest amount of money is spent on television advertising, about US $4 billion out of a total of $6.5 billion. A review of DTCA ads airing on television between 2008–2010 concluded that 46/84 (55%) of the most frequently made claims were potentially misleading. An earlier analysis of television ads found that while 82% made some factual claims and 86% made rational arguments for product use, only a quarter described the causes of the condition, risk factors or prevalence. Without an understanding of why health problems develop, patients are unable to develop strategies to modify lifestyle and other risk factors. In addition, more than half of the ads portrayed the product as a medical breakthrough whereas in fact only about 11% of new drugs offer a substantial therapeutic improvement over existing products.

Two more recent papers show continuing significant deficiencies in pharmaceutical ads; one included all English-language broadcast DTC ads for prescription drugs that aired in the US from January 2015 to July 2016. No ads described drug risks quantitatively, whereas drug efficacy was presented quantitatively in 25 (26%) ads. Thirteen (13%) ads, all for diabetes medications, suggested off-label uses for weight loss and blood pressure reduction, despite off-label advertising being prohibited by the Food and Drug Administration (FDA). Few ads were fully compliant with FDA guidelines. In the most recent paper, Applequist and Ball examined 61 ads that were broadcast during prime time in the US on four major cable television networks from July to October 2016. The ads largely showed how products can enable users to undertake more recreational activities and only 7% of ads presented alternatives to product use. Overall, despite existing regulations, televised American DTCA continues to promote prescription drugs inappropriately; it is apparent that the purported educative and public health role of such ads has taken a back seat to companies’ commercial agendas.

Print advertising
Ads in magazines generally demonstrate the same problems as broadcast ads. In 67 unique drug ads that appeared in 1998 and 1999, two-thirds used emotional appeals and almost 90% described the benefits of the medication with vague, qualitative terms while only 13% used hard data. None of the ads mentioned cost. Ads for bleeding disorders in a patient-directed magazine devoted twice the amount of text to benefits as compared to risks/adverse effects, and the information about the latter was more difficult to read. Based on appraisals by experts, only slightly more than one-third of the ads presented the claims fairly and accurately.

Website advertising
DTCA websites were found to describe benefits on the homepage 82% of the time, whereas risk information was two clicks away in 75% of cases. While most websites had a direct link to benefit information in the main navigational button set on the homepage, only 8% of websites provided the same tool for risk information. Industry-funded mental health websites were significantly more biased towards genetic and other biological causes of illness and towards medication than were sites that were financially independent of the industry.

Failure of government regulation of DTCA in the US
The available evidence, summarised above, shows that effective regulation of DTCA has been virtually impossible to achieve in the US. Furthermore,
the number of FDA violation letters is decreasing despite a growth in the volume of DTCA without any evidence that the quality of DTCA has improved. The reason for this decline is unclear but may relate to the under-resourcing of the FDA’s Office of Prescription Drug Promotion which now receives nearly 100,000 promotional material submissions annually. As of 2008 when the volume of promotion received by the FDA was three quarters of the present total, there were only 50 full-time staff and a budget of US $9 million.

Government regulation of DTCA in Canada

The Food and Drug Regulations prohibit advertising of prescription drugs to consumers that mentions both the name of the product and its indication, but starting in 1996 Health Canada has allowed ‘help-seeking’ advertising, where a condition is named and consumers are advised to see their doctor about a treatment. Since November 2000, ‘reminder advertisements’ for prescription-only medicines targeting the general public have been legal. A reminder ad is a form of DTCA that states the name of the product, but does not mention its indication or make health claims; this form of advertising now appears on television, billboards, in print advertising, and Canadian internet sites. A case study looked at 10 examples of DTCA involving eight different drugs that appeared to contravene the policy on DTCA and where complaints had been made to Health Canada. Complaints often took years to be addressed and overall, Health Canada adopted a narrow approach to enforcement and ignored broader concerns such as off-label promotion, targeting of vulnerable groups and poor safety profiles of products. Only one enforcement tool was used, namely negotiation with the responsible company; fines, sanctions, requirements for remedial action or prosecutions have not been used.

Mix of government and industry self-regulation of DTCA and promotion to doctors in New Zealand

Regulation of DTCA

There are two laws that specifically deal with medical advertising: the Medicines Act 1981 and the Medicines Regulation 1984. In addition, DTCA also needs to comply with the general provisions in the Fair Trading Act 1986, administered by the Commerce Commission. Besides legislative regulation, there are also two self-regulatory systems. The self-governing Advertising Standards Authority (ASA), an amalgam of media and communication agencies and advertisers, has developed the ASA Therapeutics Products Advertising Code, while Medicines New Zealand, a lobby for research-based pharmaceutical companies, covers DTCA in its Code of Practice.

Anyone can file a complaint about an advertisement with Medsafe, the New Zealand regulatory authority, but neither Medsafe nor the Commerce Commission proactively monitor DTCA; whatever monitoring is done only takes place after the ads have appeared. Moreover, the limited resources available to both organisations makes it very unlikely that there is any significant level of examination of ads. As of 2001, the Ministry of Health could not recall ever having prosecuted a company for violating provisions about DTCA and in fact, at that point, it was referring complaints to the ASA as this was considered “more cost effective than prosecution”.

All DTCA in New Zealand needs to go through the Therapeutic Advertising Pre-vetting System (TAPS) before it can appear in any media. TAPS was established by the Association of New Zealand Advertisers (ANZA) in 1999 to assist advertisers, advertising agencies and the media to comply with the ASA Advertising Code of Practice for therapeutic products and services. There is no information about how the TAPS examiners are selected and there is no regular prospective monitoring of the system. ASA has set up the Advertising Standards Complaints Board (ASCB) to handle complaints about DTCA but ASCB has no authority to impose penalties on advertisers. Although four of the members of ASCB come from the public, they are appointed by the ASA, which is itself an industry body. In the past, the executive director of the ASA said that the organisation preferred voluntary compliance and an educational approach: “We concentrate on changing future behaviour rather than punishing past conduct.”
Non-members of Medicines New Zealand who file a complaint with its Code of Practice Standing Committee are required to pay a fee of NZ $7,500. Although members of the public can apply for a fee waiver there is nothing in the Code that guarantees that such a waiver will be granted and the prospect of having to pay that amount may discourage people from complaining. The maximum penalty for violating the Code is NZ $80,000, which may be considered to be the price of doing business.

Failure of regulation of promotion to physicians

Like DTCA, promotion to physicians in New Zealand is covered by a mixture of government legislation and industry self-regulatory codes developed by the ASA and Medicines New Zealand. Ma and Parkin analysed pharmaceutical advertisement claims targeting health professionals that were supported by randomised controlled trials (RCTs) cited in the advertisements. One in five times, the published paper did not support the promotional claim. Of 78 cited RCTs, only 14% had a low risk of bias, while 49% had an unclear risk and 37% had a high risk. Their conclusion was that a high proportion of advertisements failed to meet the regulatory requirement that required claims to be “valid and...substantiated”.

Industry self-regulation of promotion to prescribers in Sweden and the UK

Two of the strongest European self-regulatory codes are reputed to come from industry associations in the UK and Sweden. An analysis of antidepressant advertisements in Swedish medical journals between 1994 and 2003 concluded that companies failed to provide reliable drug information and that this failure may be attributable to lax oversight, combined with the temporal lag between advertisement and censure, and low fines for violations. The ability of the self-regulatory codes in both countries to adequately monitor and control promotion was further called into question by an examination of complaints and rulings for the period 2004–2012. Fines for code violations averaged in total €447,000 and €765,000 per year in Sweden and the UK, respectively, equivalent to about 0.014% and 0.0051% of the total annual sales revenues of all pharmaceuticals, respectively. According to the authors, the prevalence and severity of breaches demonstrates a discrepancy between the ethical standard implicit in industry codes and the actual conduct of industry.

Can DTCA be effectively regulated?

In light of the evidence presented about the problems of government, mixed, and self-regulation of DTCA, and considering the vigorous and evolving promotional strategies used by the pharmaceutical industry, it is unrealistic to expect that a revised regulatory system in New Zealand could ensure that commercially-driven DTCA can serve the public interest by presenting realistic and unbiased drug information.

The consultation document is equivocal about whether in sum DTCA has positive or negative effects, but as Gleeson and Menkes note “Drugs promoted via DTCA are often early in their product lifecycle and sometimes subsequently manifest serious harms leading to market withdrawal”. What happened with rofecoxib (Vioxx) is a prime example of what Gleeson and Menkes refer to. It was introduced onto the American market in 1999 and one year later, Merck spent $160 million on DTCA to drive its use. By the time it was pulled from the market in late 2004, the estimate is that in the US it was responsible for 88,000–140,000 excess cases of serious coronary heart disease.

Conclusion

Further evidence regarding the impacts of DTCA on the health of New Zealanders indicates that these ads are commonly misinterpreted as trusted public health messages and are more likely to affect vulnerable subgroups who are ‘at-risk’, ie, with poorer self-reported health status, older, less educated, lower income and ethnic minorities and those with unhealthy lifestyles. Taken together with international evidence that regulation has consistently failed to prevent the inappropriate promotion of prescription drugs, these findings suggest that DTCA is more likely to cause harm than benefit and should be banned.
Competing interests:

In 2015–2018, Joel Lexchin was a paid consultant on three projects: one looking at indication-based prescribing (United States Agency for Healthcare Research and Quality), a second to develop principles for conservative diagnosis (Gordon and Betty Moore Foundation) and a third deciding what drugs should be provided free of charge by general practitioners (Government of Canada, Ontario Supporting Patient Oriented Research Support Unit and the St Michael’s Hospital Foundation). He also received payment for being on a panel that discussed a pharmacare plan for Canada (Canadian Institute, a for-profit organisation), a panel at the American Diabetes Association, for a talk at the Toronto Reference Library and for writing a brief for a law firm. He is currently a member of research groups that are receiving money from the Canadian Institutes of Health Research and the Australian National Health and Medical Research Council. He is member of the Foundation Board of Health Action International and the Board of Canadian Doctors for Medicare.

David Menkes serves on two New Zealand Government committees relevant to pharmacotherapy, and has been active in the International Society of Drug Bulletins (ISDB).

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Mirror-image confusion: successful giant hiatus hernia repair in situs inversus totalis
Cheyaanthan Haran, Nicholas Fischer, Thomas Oliver, Mark Grant

We report a laparoscopic giant hiatus hernia repair for intermittent episodic central abdominal pain and vomiting in a patient with situs inversus totalis (SIT). A 72-year-old gentleman with a known diagnosis of SIT initially presented to his general practitioner with abdominal pain and vomiting. His symptomatology progressed to coffee ground vomit and a weight loss of 22 kilograms. A chest x-ray and CT scan demonstrated SIT (Figure 1), and a gastroscopy demonstrated a large mixed, sliding and paraoesophageal hiatus hernia with associated Grade A oesophagitis and partial gastric outflow obstruction. He proceeded to elective laparoscopic giant hiatus hernia repair with Nissen fundoplication. The laparoscopic procedure was performed using five ports placed in a mirror-image configuration to the conventional procedure, with the patient in the modified lithotomy position. Careful consideration was given to the oesophageal hiatus as this was formed by the right and left pillars of the left crus of the diaphragm. A Nathonsons liver retractor was placed to the patient’s left shoulder. The mirror image repair was successful and without complication (Figure 3).

The gentleman commenced on free fluids immediately post-operatively and was successfully discharged on the second post-operative day with no early post-operative complications. At four weeks he progressed to a soft diet, and at the three-month follow up he was symptom-free of his initial central abdominal pain or vomiting and reported no dysphagia. He was subsequently discharged from General Surgery.

Figure 1: CT scan demonstrating SIT.

Note: “Right” ventricle is analogous to the left ventricle.
Situs inversus totalis is a rare autosomal recessive condition affecting approximately 0.003% of the population. The condition involves complete transposition of the heart and the intra-abdominal organs. The relationship between the organs is unchanged, thus the condition is commonly diagnosed incidentally after a thorough clinical examination or radiological imaging. It is not uncommon for delayed diagnosis of SIT in patients with abdominal pain. The gentleman presented in this case report experienced symptoms for three years until diagnosis.

Laparoscopic procedures are considered more difficult in patients with SIT because of the mirror-image anatomy. The current literature describing giant hiatus hernia in SIT is minimal but has been successfully reported. Laparoscopic cholecystectomy is well-described via published case reports given the incidence of gallbladder pathology requiring laparoscopic surgery is greater than that of a hiatus hernia. Other examples of published reports include laparoscopic gastric resections, laparoscopic Roux-en-Y gastric bypass, colorectal resections and nephrectomy.

Figure 2: Laparoscopic caudal view.

Note: “Right” triangular ligament of liver and “right” lobe of liver are analogous to left triangular ligament of liver and left lobe of liver respectively.

Figure 3: Laparoscopic view of the completed giant hiatus hernia repair and Nissen fundoplication.
The current literature does not describe the naming convention used for the anatomical variations in SIT. For example, Figure 2 depicts the “right” triangular ligament of liver and “right” lobe of liver, which are in fact analogous to the left triangular ligament of liver and the left lobe of liver respectively. To ensure safe operating and effective intraoperative communication between all theatre staff it is imperative that the operation, as a team, is carefully planned pre-operatively by using the correct referred anatomical terms. The aim is to avoid intraoperative confusion during a difficult stage.

Further, it is essential the primary surgeon and their assistants mentally rehearse the procedure pre-operatively. Other pre-operative preparations and considerations should be given to port placement and operative ergonomics, which is essential for safe and effective surgery in SIT.

After careful pre-operative consideration of mirror image anatomy, set up changes, surgeon and port positioning, a laparoscopic repair and Nissen fundoplication of a giant hiatus hernia in SIT is safe, and should still be regarded as the gold standard.

Competing interests:
Nil.

Acknowledgements:
Signed informed patient consent was obtained.

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REFERENCES:
Firearms and lead
Marie Russell, Deborah Read, Hera Cook

Lead absorption is a notifiable disease under the Health Act 1956 in New Zealand. Lead (Pb) “…is a cumulative toxicant that affects multiple body systems, including the neurologic, hematologic, gastrointestinal, cardiovascular and renal systems. Children are particularly vulnerable to the neurotoxic effects of lead, and even relatively low levels of exposure can cause serious and in some cases irreversible neurological damage.”

Lead can affect people of any age and is especially harmful to pregnant women and unborn babies as well as children, who are at greater risk than adults because of their physiology and behaviour.

Lead that is ingested or inhaled travels to the bloodstream and accumulates in bones and teeth, from where it may be released back into the bloodstream.

Lead absorption is an under-recognised public health issue. According to the World Health Organization, there is no known safe level of exposure. In New Zealand a blood lead level greater than or equal to 0.48 micromoles per litre (µmol/l) must be notified to the local medical officer of health.

Among adults, certain occupations and activities involve lead exposure. Lead absorption from lead-based paint on older houses during renovation or painting may be well-known but risks from firearms are less familiar. Notification data for 2014–2017 show that firing ranges were the second most common identified non-occupational source of lead exposure for each year.

Lead exposure from firearms

Lead exposure from firearms can occur through several pathways. Firstly, much ammunition contains lead, and there is also lead in the primer that ignites when a firearm is fired; these sources release fumes and particles close to the face and may be inhaled. Lead particles can be transferred to the mouth and ingested if, after shooting, the shooter smokes tobacco, eats or handles affected equipment, clothing etc. People who make their own ammunition are also exposed when melting and moulding lead. Careful hygiene and protective equipment is required to mitigate these risks.

Secondly, at firing ranges, and indoor ranges in particular, everybody present, including the shooters, spectators and range workers, are exposed to the lead dust and particles produced by shooting, in the air and on surfaces. Workers at firing ranges may be exposed while cleaning or clearing out bullet traps, unless care is taken with hygiene and protective clothing. Clothing taken home and handled by someone else, for example, when laundering, also puts that person at risk.

Thirdly, consuming lead-shot meat is a potential risk.

“Eating meat harvested with lead projectiles increases serum lead levels, and while it has been suggested that the tissue from around the wound channel can be discarded to reduce lead exposure, there are an average of 356 metal fragments in a deer carcass after being shot with a lead projectile from a rifle. This is an impossible number of fragments to pick out by hand, especially because some of these fragments are microscopic.”

Using non-lead ammunition is recommended. We note that in California from 1 July 2019, non-lead ammunition must be used when shooting wildlife.

Lead affects other animals and the environment. Poisoning of wild fowl through ingestion of lead fragments led to Fish & Game New Zealand requiring duck hunters to use non-toxic shot within 200 metres of open water, and to phase out lead shot altogether by 2020. Other environments, such as pasture, have been contaminated. Farm animals have also suffered with lead-contaminated feed from firing ranges.
Children and firearms

Given children’s susceptibility to lead, it is concerning that shooting sports continue in some schools and that firearms organisations encourage children to join in shooting and hunting, while retailers continue to market firearms to children. Air rifles, which operate by compressed air or other gas, are overwhelmingly considered a beginner’s or child’s gun. Plastic shot is available but lead pellets are very frequently used. According to New Zealand Customs Service, in the five years 2012–2016, 130,869 airguns were imported, along with 97,855 rifles and 39,991 shotguns. These imports continue to add to a civilian armoury estimated to be at least 1.5 million firearms.

Research, regulation and education needed

The last New Zealand study of lead exposure at indoor firing ranges (1993) found lead exposure there was a ‘significant problem’. Research carried out at the University of Otago, Wellington, in 2016–2018 found widespread denial among firearms community leaders that lead is an issue for shooters’ health. Several informants cited ‘evidence’ from Hayes and from a European Conference organised by lead ammunition manufacturers and the World Forum on Shooting Activities as proving no issues of concern, and on the contrary, suggesting a conspiracy against firearms and their owners. Shooters’ representatives who did accept that lead might be a problem believed that the ventilation systems at indoor firing ranges solved the issue.

Even New Zealand Police seems not to recognise lead as an issue. In its brochure Beginning with airguns Police does not mention lead, and advises:

“To get the most fun out of your airgun, in a safe and responsible way, set up a properly constructed range in your backyard or basement.”

We advise against using an enclosed space such as a basement for a range.

While the science of lead is clear, there are socio-political issues to address; in New Zealand, this includes some shooters’ denial or minimisation of risks from lead, and resistance to the changes needed to protect themselves and their children. The active involvement in the gun lobby of firearms and ammunition retailers and dealers motivated by profit muddies the scene. Healthy public policy about firearms and lead would mean tighter regulation, inspection and mitigation measures at firing ranges, mandatory advice to firearms owners applying for a licence, and public information campaigns about risk and mitigation measures.

Competing interests:
Nil.

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URL:
REFERENCES:
George Salmond died peacefully at home on 2 April 2019 at the age of 81. While he first specialised in older people’s medicine, George was a health polymath, and public health, broadly construed, was his abiding passion.

George combined data and evidence with compassion and people. He humanised data. George started working for the Department of Health in 1971. As head of the Department’s Management Services and Research Unit he carried out numerous projects, including the Porirua project—this was pivotal for him in illustrating the inverse care law graphically—those with most need for health services received the least, and those with least need received the most. Also, he worked with epidemiologist Judy Reinken who produced the Health and Equity score—work that foreshadowed the subsequent production of NZDep.

George was a strong, principled and wise leader of the health system as Director General of Health (1986–1991), working with four Ministers of Health: Michael Bassett, David Caygill, Helen Clark and Simon Upton, and it was his principled approach to this most senior of roles that led him to resign from the position in 1991. ‘Free and frank’ advice had to be evidence-based. George's time as Director-General was marked by a number of dominating issues: AIDS; the Cartwright inquiry; the Mason inquiry; the Gibbs report into the structure of the health service. The large department underwent two major restructurings, and district offices and hospital boards became area health boards.

George was also an inspirational and influential academic leader. In 1993 he was appointed as Director of the Health Services Research Centre at Victoria University of Wellington (1993–1999). The Centre has gone from strength to strength over the past 25 years. George led the Health Research Council application that resulted in the funding of the original NZDep91 research project. In this and much of his research he was greatly supported by his wife Clare, a skilled statistician.

George was also an internationalist. In all, he attended six World Health Assemblies (WHAs), and he was a member of the New Zealand delegation to the International Conference on Primary Health Care, Alma...
Ata, USSR, in 1978. This was one of the most significant health conferences of all time—primary healthcare was the means by which ‘Health for All’ was to be achieved by the year 2000. George was always acutely aware of the significance of Alma Ata, and it strongly foreshadowed aspects of the subsequent primary care reforms in New Zealand.

His key achievement internationally was his contribution to the World Court Project that ruled on the legal status of nuclear weapons. He was perfectly suited for this role given his detailed knowledge of how WHAs worked. So when George had left the Ministry of Health he joined in the International Physicians for Prevention of Nuclear War (IPPNW) delegation in Geneva. The delegation included George and Erich Geiringer from New Zealand, and the team leader, Ann Marie Janson, from Sweden. The first attempt to get the WHA to ask the World Court for clarifications regarding the legal status of nuclear weapons in 1992 failed to gain sufficient support. They tried again in 1993 again with an effort that involved very intensive advocacy in Geneva that faced strong opposition from the nuclear-armed states. This time they succeeded and the WHA did ask an advisory opinion from the World Court. After three years, in 1996 the World Court findings were announced, and these clearly supported the illegality of the threat to use, and use of, nuclear weapons except in extreme circumstances where the very survival of the state would be at stake. Without George’s knowledge of the workings of the WHA, and his contribution to the on-the-ground diplomacy, it is possible that this World Court ruling may not have eventuated. He certainly felt that this was his biggest contribution to public health in his lifetime.

George’s contribution to the profession over the years has been huge and he has held many leadership positions—from the early days of the formation of the New Zealand College of Community Medicine, through the time as the New Zealand Regional Committee of the Australasian Faculty of Public Health Medicine, and on to the establishment of the New Zealand College of Public Health Medicine in its current form. In 2017 George was awarded a Companion of the New Zealand Order of Merit for his services to Health.

The Public Health Association awarded George Salmond its Public Health Champion award in 2001 for his involvement in public health over more than 40 years.

In his so-called retirement George became a trustee of the Hamilton-based Wise Trust, with national reach overseeing a variety of mental disability related services. From 2000 to 2013 he chaired the board of the Blueprint Trust (now Blueprint NZ Ltd)—a private training organisation within the Wise group that provides a range of education and training services mainly, but not exclusively, for the mental health sector. He was also on the board of Te Pou Ltd from 2007 to 2014—this is also in the Wise group and supports organisations to develop their workforce. He was a member of the governmental Health Workforce Advisory Committee set up in 2001.

Despite filling many different roles in the country’s health sector, perhaps the most telling detail about this man is that he said he felt most happy in one of his earliest roles, in Porirua. His later devotion to meetings every Thursday morning at a café there, passionately discussing the current healthcare issues and the access of lower socioeconomic families to good healthcare, was an ongoing demonstration of his loyalty and commitment to connecting our sector with its communities.

With his inspiration and leadership, and his commitment to equity, over four-plus decades George Salmond made an incredible contribution to public service and public health in New Zealand and internationally.

George is dearly missed by his wife, Clare Salmond, and his three children.

Author information:
This obituary was written by Peter Crampton, Nick Wilson, Helen Bichan and John Martin, with input from his family.

URL:
Ronald Rutherford Elvidge

2 March 1923–30 March 2019

Ron Elvidge, obstetrician, gynaecologist and All Black captain died recently, aged 96.

Ron attended John McGlashan College in Dunedin. There he was Head Prefect in years 1939 and 1940. He was swimming, boxing and fives champion, runner up in cross country, broke numerous athletics records and was a member of the first XV and first XI at the age of 14.

In the following years he pursued and tried to balance both rugby and medical studies, sometimes with difficulty. During the war he was a member of the Otago Medical Corps. He gained a NZ University Rugby Blue.

From 1942 to 1950 he played 30 games for Otago, for a time captaining the team that held the Ranfurly Shield for 18 games. Thus earning his god-like status as reported in the Otago Daily Times. “When Elvidge walks down the street he turns more heads than Bing Crosby would”. He also played 19 games, including nine tests for the All Blacks, as captain on seven occasions.

His most memorable game, an event that would appear to come straight from the “Boys Own” magazine, was the third test against the British Lions in 1950, an era when replacements were not allowed. The All Blacks were trailing 3-0, and were down to 14 players when Ron left the field with a serious shoulder injury and a deep cut to his head. “With his arm hanging loose and experiencing great pain” he returned to the field playing in a roving role. He received the ball, dived through a fierce tackle and scored a try that won the match and the series for New Zealand. That was his last game of rugby.

He graduated MB ChB in 1948, did his house surgeon years in Dunedin, including time in Sir Bernard Dawson’s Department of Obstetrics and Gynaecology, thus sparking his interest for specialisation. He enjoyed participating in the hospital culture even to the extent that in the role of Father Christmas he drove his sleigh, a baby Austin car, around the ground floor wards, but had to walk the upper floors with his bag of goodies.
In 1950 he went to England to begin specialist training in O&G, with residencies in, Shrewsbury, Edgeware General Hospitals and Oxford. There he was greatly influenced by the renowned New Zealanders, John Stallworthy and Bill Hawksworth. He passed his MRCOG in 1956.

Ron married Prue Browne and in 1956 they returned to New Zealand where Tim, James and Jo were born. He joined the oldest Auckland O&G specialist practice with Tom Plunkett, Alastair Macfarlane and Bruce Grieve. Obstetrics was Ron's forte. Within a very short time he had the busiest practice in Auckland; every expectant father wanted his child delivered in the large, safe hands of the ex-All Black captain.

He also obtained a visiting position at St Helen's Hospital and a short time later at National Women's Hospital he joined the “B” team with visiting specialists, Bruce Grieve, Bernie Kyle and Ian Ronayne. He enjoyed and was proud of his team at NWH and contributed to postgraduate teaching. Ron performed his private gynaecological surgery at Rawhiti Hospital in Mt Eden where he learned laparoscopy skills in the late 1970s.

In the mid-1970s Ron gave the writer half of his obstetric practice and so started another long happy association. Many families much appreciated the care and attention the partners gave to arranging adoptions of babies born in their practice.

Ron became a Fellow of the RCOG 1972, served on the College Council 1976–79, and apart from that involvement he strenuously avoided hospital politics and committees. He had other quirks too, such as writing abbreviations in the margins of his clinical record—most not appropriate for publication. A favourite one was UTC—’Uncle Tom Cobley and all’—referring to the growing demand for the father to be present at the delivery of his baby.

Forty years of a new happy life started in 1978 when he and Dawn Ulrich married. Three years later they moved to a lifestyle block and set up a kiwifruit orchard but Ron continued in practice in the city until retirement in 1988. Then more time was given to social golf and bridge, community activities, U3A groups studying cosmology, geology and world religions, meeting old colleagues, enjoying a Saturday rugby match and holidaying at his bach in the Bay of Islands.

His was a life to be celebrated, a life of achievement and courage, generosity and humility.

Author information:
This obituary was written by Ron Jones and Dawn Elvidge.

URL:
How long does a hip replacement last?

Total hip replacement is a common and highly effective operation. All hip replacements would eventually fail if in situ long enough and it is important that patients understand when this might happen.

These researchers have performed a systematic review and meta-analysis on this topic with a search of MEDLINE and Embase. They identified 140 eligible articles reporting 150 series, and included 44 of these series (13,212 total hip placements). National joint replacement registries from Australia and Finland provided data for 92 series (215,676 total hip replacements). The 25-year survival rate of hip replacements from the case series was 77.6% and from the joint replacement series it was 57.9%.

The researchers conclude that, assuming that estimates from national registries are less likely to be biased, patients and surgeons can expect a hip replacement to last 25 years in around 58% of patients.

*Lancet* 2019; 393:647–54

Apixaban to prevent venous thromboembolism in patients with cancer

Patients with active cancer have an increased risk of venous thromboembolism, which results in substantial morbidity, mortality and healthcare expenditures.

This randomised, placebo-controlled trial assessed the efficacy and safety of apixaban treatment to prevent thromboembolism in cancer patients who were assessed to be at an elevated risk for this complication. Five hundred and seventy-four appropriate patients were randomised—half were treated with apixaban 2.5mg twice daily and the other half received placebo.

The investigators report that apixaban therapy resulted in a significantly lower rate of venous thromboembolism than did placebo among intermediate-to-high-risk ambulatory patients with cancer who were starting chemotherapy. As might be expected, the rate of major bleeding was higher in the apixaban group.


Clopidogrel plus aspirin versus aspirin alone for acute minor ischaemic stroke or high-risk transient ischaemic attack

Current guidelines for the management of acute ischaemic stroke and transient ischaemic attack recommend antiplatelet therapy.

Usually the guidelines recommend the use of a single agent, most commonly aspirin. In this paper the authors review and meta-analyse the use of aspirin together with clopidogrel. Three eligible trials involving 10,447 participants were identified.

Pooled data from these three trials established a benefit of dual antiplatelet therapy started within 24 hours of presentation in reducing the absolute risk of recurrent stroke by about 2%. The risk of serious extracranial bleeding was uncommon. Stopping the dual treatment within 10 days is likely to maintain the full benefits and minimise harms.

*BMJ* 2018; 363:k5108

URL:
The McKinnon Medical Registration Case

June 1919

Pursuant to a direction from the Medical Board the Registrar-General refused to register the applicant as a medical practitioner on the ground that he was “not of good fame or character” within the meaning of s. 8 (2) (b) of the Medical Practitioners Act, 1914. The evidence on which this conclusion was based was that as an officer in the Customs Department the applicant had been concerned in a series of frauds upon the Department. There were 60 such cases altogether, and on indictments for theft and conspiracy covering six of the cases the applicant had been tried and acquitted. Evidence of some or all of the other charges was before each of the three juries which tried him. The applicant applied for an order directing the Registrar-General to register him.

Held (dismissing the application), that though the applicant had not been convicted of a crime, evidence which proved that he had been guilty of wholesale and systematic dishonesty justified the action of the Board.

Application for an order directing the Registrar-General to register applicant as a medical practitioner.

The applicant was employed as a landing-waiter in the Customs Department at Christchurch from the year 1910 up to February, 1912. It was his duty in this capacity to examine invoices and entries for the Customs, and it was found that the Department had been, in some 60 cases, defrauded by means of false entries which he had passed. He was tried three times for theft and conspiracy in respect of six of these cases, but two of the juries acquitted him and the third disagreed. Evidence of some or all of the other cases of fraud was submitted at each trial.

Affidavits were made on behalf of the Registrar-General by two of the participants of the frauds showing how they were affected, and stating that the applicant had taken part in them. The applicant put in no denial of the charges, but he filed several affidavits which testified to his general
good fame and character. The applicant who since his trial had been admitted as a medical practitioner in England, had applied for registration in New Zealand, but the Medical Board considered that he was “not of good fame or character” within the meaning of the Medical Practitioners Act, 1914, and the Registrar-General dismissed his application.

The chief relevant provision of the Medical Practitioners Act, 1914, is s. 8 (2) which reads as follows:—

8. (2). Notwithstanding anything in the last preceding sub-section, no person shall be entitled as of right to be registered under this Act, if he is not a fit person to be so registered by reason of the fact that—
(a) He has been at any time convicted of any offence punishable by imprisonment with hard labour for a term of two years or upwards; or
(b) He is otherwise not of good fame or character.

Sir John Findlay, K.C., and Hunter, for applicant:—

Two main questions emerge: (1) What is the meaning of the words “otherwise not of good fame or character?” and (2) will the Court enquire into charges on which an applicant has been acquitted? It is suggested that the applicant participated in other frauds than those on which he was acquitted, but all these were before the jury as evidence of system. The question whether it was a case of fraud or of negligence was before the jury, and they must have found that it was negligence. Moreover, the charges were stale when made, and are more stale now that over six years have elapsed since before this Court. It was not competent for the jury to pronounce any opinion as to his guilt or innocence in connection with these 60 charges.

The other contention made by counsel for the applicant was that the meaning of the words “good fame or character,” was the general fame which he enjoyed where he resided and that that was sufficient. Regarding his general fame or character five witnesses have sworn affidavits—Mr. Nordon, Mr. Selig, Mr. Baxter, Mr. England and Mr. Williams. Mr. England is an architect, and all he says is that the applicant is a person of “good fame and character.” Mr. Nordon says also that he is a person of good fame and character, that he has found him to be of steady and temperate habits, and honourable in all his dealings. Mr. Nordon is apparently a secretary, but it is not stated what he is a secretary of. The next is Mr. Selig, who is manager of a newspaper, who says the applicant is a man of steady and temperate habits, hardworking, and a good husband and father, and a person of good fame and character. Mr. Baxter, who is a chemist, says he found the applicant to be strictly honourable, and that he is a person of good fame and character. Mr. Williams, a merchant, who is now a sergeant in the forces, says the applicant is a person of good fame and character. None of them refer to the charges against applicant, and it does not appear they knew of those charges or not. The Court must assume that no reputable citizen who had read the evidence produced before this Court could for one moment have said that the applicant was of “good fame or character.” The evidence is not mere statements by witnesses. The applicant's 60 certificates that he has compared the invoices are before the Court, and they are unexplained, and the Court must presume that they cannot be explained.

The outstanding fact is that the applicant himself has not filed any affidavit denying the charges made against him, or offered any explanation as to how he, as landing-waiter, passed 60 false Customs entries and certified that he had examined the invoices produced in connection with these false entries. There is the fact also that he has not contradicted the affidavit of McCormick to the effect that McKinnon was a party to the frauds and received a share of the plunder obtained by means of these frauds. It was argued that the Court was not entitled to investigate these cases, but was bound to consider only the applicant's general fame and character in the town in which he lived. We are of opinion that the whole object of the legislation is to prevent undesirable persons of bad character obtaining the position of registered medical practitioners. A medical practitioner is armed with great powers under the law. He can give medical certificates as to death; he has to give evidence as to the mental ability of testators and others in the making of wills, and other matters; and it is certainly undesirable that a man who has committed
breaches of trust, thefts, and frauds, should the acts were committed. We submit further that the words “of good fame or character” refer not to a particular offence, but to a well-founded general reputation: Leader v. Yell (1); In re Jones, Ex parte Lloyd (1). As to giving evidence of particular instances when character is in question, see Oggers on Libel (2), R. v. Rowton (3), and Halsbury’s Laws of England (4). It was never intended that a man should be debarred forever from earning his livelihood. If he is refused registration here it might be a reason for striking him off the register in England.

The Solicitor-General (Salmond, K.C.) for the Registrar-General:—

Sir John Findlay has not sought to deny the truth of the affidavits filed by the Registrar-General, but relies on two legal contentions, both of which are unsound. As to the acquittal, the answer is that he was acquitted on six charges only; and he has never been tried on any of the 60 accusations now made. He could be indicted tomorrow, and the previous acquittal would not even be relevant on such an indictment. As to the question of character, it is a man’s real and actual character that is meant, not his general reputation. Even if the contention is right the fact that a man has been extradited and tried three times for a long course of fraud is enough to make him a man of bad repute, whatever a jury may have found. I do not suggest that every young man who commits a crime is permanently disqualified, but this is a crime of dishonesty and breach of trust. A man in the medical profession must be a man of honour and trust. He is entitled by his registration to occupy many positions in which honour and honesty are primarily required. The statute-book is full of matter in which the working of the law depends on the honour of the medical profession.

Sir John Findlay in reply.

May 10th—Stout, C.J., delivered the judgment of the Court:—

After quoting sections 8 (2) and 15 of the Medical Practitioners Act, 1914, and reviewing the evidence at length, Their Honours proceeded:—On behalf of the applicant it was argued that, as the whole of the 60 cases referred to by Mr. Cordery were before the jury on the last trial when McKinnon was acquitted, this ought to be treated as an acquittal, not only with regard to the three cases included in the indictment, but also with regard to the 60 cases. We cannot accept this view of the matter. The verdict of the jury, even with regard to the three cases included in the indictment, does not amount to more than this: that on the evidence before them the jury were not satisfied that McKinnon was guilty with regard to those three cases, and the verdict cannot be treated as in any sense an adjudication of the 60 cases now be placed in such a position as that of a medical practitioner which is in many respects one of trust.

We are of opinion that the Court is not limited in dealing with the character of an applicant to saying whether or not he has been convicted of a crime. If the evidence before the Court makes it clear that the applicant has been guilty of wholesale and systematic dishonesty such as that charged against the applicant here, then he certainly is not of good fame and character. The evidence before the Court has established quite clearly that these charges against the applicant are true and we hold, therefore, that he is not of good fame or character, and that the Medical Board was justified in giving the direction which it did to the Registrar.

The application is dismissed, and the applicant is ordered to pay £10 10s. for costs to the Registrar-General.

Application dismissed.


URL:

NZMJDigest
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Vaping and the Smokefree 2025 goal

Child poverty, child wellbeing and the wellbeing budget

Inequities in access to medicines are too staggering to ignore

From the frontline: Crossing bridges
Bullying, Pink Shirt Day and support
Ways to protect your business and staff

NZMJDigest
http://www.nzma.org.nz/publications/nzmjdigest

The NZMA publishes the e-magazine NZMJDigest 10 times a year. It contains news and views from the profession and the NZMA, including the NZMA Chair’s editorial, along with highlights from and links to the New Zealand Medical Journal.

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