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**If you pluck out the heart of
the flax bush, from whence
will the bellbird sing?**

**Survey of antimicrobial stewardship practices in public
hospitals in New Zealand district health boards**

**Successful publication by
medical students in New
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versus academic supervisors**

**Surveys show exposure to
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**Is your mental
health covered
by your health
insurance?**

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Successful publication by medical students in New Zealand: the role of clinical versus academic supervisors

Ibrahim S Al-Busaidi, Yassar Alamri, Tim J Wilkinson

Relatively little is known about factors that influence successful publication by medical students. This is the first study from New Zealand (and anywhere outside of the UK) to explore some of the academic sequelae of medical student research projects supervised by clinical academic supervisors. Contrary to previous research, findings from our study imply that clinical academic supervisors appear just as effective as non-clinical full-time researchers in supervising medical students involved in undergraduate research. Further research is required to examine the association between clinical supervisors and publication rates from other curricular and extra-curricular research activities.

The role of acromioplasty when repairing rotator cuff tears—no difference in pain or functional outcome at 24 months in a cohort of 2,441 patients

Elizabeth C Bond, Anthony Maher, Lynette Hunt, Warren Leigh, Matthew Brick, Simon W Young, Michael Caughey

This paper looks at whether or not acromioplasty (a decompression procedure) makes a difference in pain and functional outcome after repair of the rotator cuff tendons in the shoulder—a commonly performed procedure. We found no difference at 24 months regardless of whether or not acromioplasty was undertaken.

Orbital fractures treated in Auckland from 2010–2015: review of patient outcomes

Lanit Anand, Christopher Sealey

The purpose of this study was to review patient outcomes following repair of orbital fractures. Titanium was the most common material used, and was well tolerated. Complication rates (persistent double vision, numbness of cheek, sunken appearance of eye) compared favourably with results internationally.

Survey of antimicrobial stewardship practices in public hospitals in New Zealand district health boards

Sharon J Gardiner, Jane A Pryer, Eamon J Duffy

Antimicrobial resistance is a growing problem in New Zealand and means that antimicrobials are becoming less effective. Antimicrobial stewardship (co-ordinated strategies to help optimise the use of antimicrobials) can slow the progression of resistance. This survey shows that antimicrobial stewardship is in its infancy in New Zealand's public hospitals, with only around half of our DHBs employing dedicated pharmacists and doctors to help optimise antimicrobial prescribing. Practices to improve antimicrobial prescribing (eg, audit, teaching, guideline development) are highly variable from DHB to DHB. National co-ordination is needed to help DHBs develop effective programmes to help preserve antimicrobials for future use.

Unravelling the whāriki of Crown Māori health infrastructure

Heather Came, Keith Tudor

The Ministry of Health consistently acknowledges their *special relationship* with Māori, and the *strategic importance* of strengthening Māori health is critical to addressing health inequities. This paper, framed in terms of the Crown *Treaty of Waitangi* principles, ie, participation, protection and partnership, examines three decisions that threaten to unravel Crown Māori health policy infrastructure. These include the disestablishment of the Ministry of Health's policy team, Te Kete Hauora, revoking mandatory district health boards' (DHB) Māori health plans and reporting, and downscaling the requirements of DHBs to consult. These actions appear to breach *te Tiriti o Waitangi* and may be cited as such in the forthcoming WAI 2575 health hearing before the Waitangi Tribunal. The authors call for the Ministry of Health to embrace its Treaty obligations.

If you pluck out the heart of the flax bush, from whence will the bellbird sing?

Marewa Glover, Christina Severinsen, Suzanne Phibbs

A decade ago, Sir Michael Marmot wrote that in order to achieve health equity, we needed to move beyond the contemporary concentration on the immediate causes of disease to a focus on the “causes of the causes—the fundamental structures of social hierarchy and the socially determined conditions these create”.¹ Ten years later, Tobias asks if social rank is a risk factor whose time has come.² Evidence for the effect of social rank on mortality, he said, is “now impossible to ignore”. Tobias was referring to the Stringhini et al multicohort study and meta-analysis of 1.7 million men and women looking at socioeconomic status against the World Health Organization’s 25x25 goal (to reduce non-communicable diseases by 25% by 2025).³ Social rank is strongly associated with ethnicity in New Zealand and continuing, and for some diseases widening, ethnic disparities in health outcome.⁴

There is an increasing call for greater examination of “how society is structured” and supported via macroeconomic and social policy.⁵ However, this rhetoric is typically followed by regression to recommending ‘Western’-derived one-size-fits-all top-down public health strategies aimed at controlling single behaviours of recalcitrant individuals or groups, such as imposing fines for smoking in cars—a punishment that would disproportionately impact Māori women⁶ of whom 40% still smoke.⁷ The holistic Māori perspective or application of health equity assessment tools⁸ to project outcome by ethnicity and consider perverse outcomes such as increased criminal convictions due to thefts of tobacco are absented. Public health returns to a focus on single immediate causes of disease in a siloed way incommensurate with Māori solutions.

Reversion to a mono-cultural majoritarian decision-making policy environment that

simultaneously accepts the universality of Western perspectives and marginalises Māori ways of knowing is a form of institutional racism. Institutional racism, that is the patterned differential “access to material resources and power [which] advantages one section of the population while disadvantaging another”,⁹ is recognised by the Ministry of Health as a key determinant of health.⁹ Came has previously described how in such an environment, Māori health concerns are “managed” to the margins through inadequate consultation, the privileging of international research over successful local Māori-led initiatives and under-investment.⁹ Getting Māori health priorities on to the health agenda is made all the more difficult by low representation of Māori within senior management levels. High staff turn-over, and therefore loss of institutional (Māori) knowledge, stalls Māori health initiatives as Māori state actors and external stakeholders constantly have to re-engage and re-educate upwards.

To ensure Māori health and wellbeing improves and that health inequities are reduced, Durie says we must change the way in which the health system has been functioning.¹⁰ In this issue of the *Journal*,¹¹ Came and Tudor ask how can this occur when fundamental infrastructure designed to guide such change is systemically removed? They alert us to the disestablishment of the Ministry of Health’s Māori unit Te Kete Hauora—a unit ensuring partnership, Māori participation and the protection of Māori health. Further, they report that district health boards (DHB) are no longer required to develop a Māori health plan and they can scale back on consulting with their region’s Iwi (tribes) or Māori communities. Came and Tudor rightly question the Crown’s commitment to engagement with their Te Tiriti obligations through this undermining

and undoing of the whāriki (flax mat) of Māori health infrastructure. This, they argue, will have far-reaching implications for Māori health, and threatens progress towards achieving equitable outcomes for Māori.¹¹

We share their concerns that these structural changes signal a watering down of Crown accountability under Te Tiriti o Waitangi. In particular, the deregulation threatens system capacity and commitment to achieve positive change and uphold Māori aspirations. The removal of roles dedicated to leading and ensuring Māori input shows an increasing loss of accountability in DHB performance for Māori. Similarly, the removal of reporting mechanisms undermines the ability of the health system to embed and monitor Tiriti-based policy analysis and practice.

Perhaps the Ministry of Health believes Health Targets can more effectively deliver improvements in Māori health and reduction in health inequities? There is some evidence that aggregated targets may deliver improvements to overall population health while failing to improve the health of indigenous people.¹⁴ In New Zealand for example, cardiovascular, infant and maternal mortality have been trending

downwards, but this is happening more slowly for Māori and Pacific peoples. Intervention generated inequalities occur when there are disparities in service provision, response, access, uptake, compliance and long-term sustainability between socio-economic groups. Tobacco control is one area where intervention generated inequalities have emerged. While smoking rates have decreased across the population, Māori smoking rates have not statistically reduced over the last nine years.⁷ The low priority given to Māori public health initiatives combined with intervention-generated health inequalities arising from downstream initiatives that do not take into account structural determinants of health, illustrate the complexities associated with achieving Māori health gain and the need for robust Māori-centred policy-making frameworks.

Our title refers to a well-known whakatauki (Māori saying) that warns that if the heart of the flax bush is no longer, the Komako (bellbird) will have nowhere from whence to sing, warn or praise. With the loss of Te Kete Hauora and contractual requirements to plan to improve Māori health, the question remains: Who then will report on the potential of health interventions to, as proposed by Durie, shift a mauri that is languishing to a mauri that is flourishing?¹⁰

Competing interests:

Nil.

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Successful publication by medical students in New Zealand: the role of clinical versus academic supervisors

Ibrahim S Al-Busaidi, Yassar Alamri, Tim J Wilkinson

ABSTRACT

AIM: Relatively little is known about factors that influence successful research publication by medical students. We aimed to examine the impact of having a clinical supervisor (compared with full-time academic supervisors) on publication rates of Bachelor of Medical Sciences (BMedSc(Hons)) theses at the University of Otago Medical School.

METHOD: A secondary analysis of an existing dataset was conducted. Publications from undergraduate medical theses were previously identified using standardised criteria. Degree grade was obtained using a publicly available local search database.

RESULTS: Over a 10-year period (2002–2011), 36 (40.4%) out of 89 accepted theses resulted in 55 publications in peer-reviewed journals. There was a total of 137 supervisors (median 1 supervisor per student, range 1–3), 32.1% of whom were clinical supervisors (n=44). There were no statistically significant differences in the number of publications ($P=0.10$) or degree grades ($P=0.49$) between students who were supervised by clinical supervisors and those who were not.

CONCLUSION: Clinical supervisors appear just as effective as full-time researchers in supervising medical students undertaking an intercalated degree in terms of degree grade and research output. Future research should focus on examining the association between clinical supervisors and publication rates from other curricular and extra-curricular research projects, and focus on reasons behind our observed association.

The importance of early supervised exposure to undergraduate medical research and publishing is well-established.¹ Various efforts have been made to increase medical student participation in research. A recent review of the performance of a summer research programme for medical students over seven years found 42% of the 346 projects were published, with 30% of all participating medical students being co-authors of at least one peer-reviewed PubMed-indexed article.² Several other mandatory and elective research training programmes have been introduced around the world.¹

Although publication of medical student research findings in peer-reviewed journals is often favourably looked upon

by prospective employers and specialty programme directors,¹ relatively little is known about factors that influence successful publication by medical students. Recent research from the UK indicates that students with clinical academic supervisors (defined as researchers with a medical degree with or without research degree(s); ie, researchers with MB ChB or both MB ChB and PhD degrees) were more likely to obtain first class honours and produced significantly more peer-reviewed publications compared to students supervised by non-clinical academic supervisors.³ Potential reasons to explain this observation were, however, not explored by the authors, and the study relied on self-reporting of academic outcomes (degree grades and

publication success) by medical students. Furthermore, it is not known how generalisable this finding might be to other contexts.

We have recently shown that around a third of Bachelor of Medical Sciences with Honours (BMedSc(Hons)) theses at the University of Otago, New Zealand, are published.⁴ Although encouraged, publishing project findings in peer-reviewed journals is not required for the award of the degree.⁵ Assuming these medical students were similarly capable and motivated, we queried the significance of the supervisory milieu on influencing the rate of publication. This prompted us to examine the impact of having a clinical academic supervisor (compared with full-time non-clinical academic supervisors) on the publication rate and degree grade of BMedSc(Hons) theses at the University of Otago, New Zealand.

Methods

To examine the impact of supervisor-related factors on publication rates of undergraduate medical student research, we conducted a secondary analysis of an existing dataset. A detailed description of the methods used to generate this dataset has been previously published.⁴

In brief, a list of accepted BMedSc(Hons) research projects along with students' and supervisors' names was identified from the electronic Otago University Research Archive.⁶ BMedSc(Hons) theses accepted between 1 January 2002 and 31 December 2011 were included in the analysis. Using students' and supervisors' first and last names, PubMed and Google Scholar databases were searched in October 2015. Using October 2015 as the cut-off date allowed for a minimum of nearly four years from thesis submission to full-text journal publication, in keeping with findings from previous research on undergraduate medical student thesis publication.^{4,7} For a publication to be considered relevant, the student had to be a co-author, and the article title matched the topic of the thesis. Degree grade was obtained using the publicly available 'University of Otago Graduate Search database'.⁸

Statistical analysis

Data were presented as number (percentage), mean (\pm standard deviation) and median (interquartile range). An independent-samples Student *t*-test was used to determine differences between variables. Logistic regression analysis was used to test for associations. A *p* value of ≤ 0.05 was considered statistically significant. All statistical analyses were performed using the Statistical Package for Social Sciences software (SPSS Statistics®, version 22.0.0.0). Power analysis was calculated using G*Power software.⁹

Results

Over a 10-year period (2002–2011), a total of 89 theses were submitted and accepted (mean 8.9 theses per year, range 4–14). Overall, 36 theses (40.4%) resulted in 55 publications in peer-reviewed journals. There was a total of 137 supervisors (median 1 supervisor per student, range 1–3), 32.1% of whom were clinical academics ($n=44$).

There were no statistically significant differences in the number of publications ($t_{87}=1.19$, $p=0.1$) or degree grade ($t_{86}=-1.36$, $p=0.49$) between students who were supervised by clinical academic researchers and those who were not. The mean number of publications supervised by clinical academics was 0.41 publications per student, compared with 0.64 for the others. First-class theses supervised by clinical academics were 53% compared with 41% for the others; there was no correlation found between the number of supervisors per thesis and the number of publications ($r=0.13$, $p=0.3$) or the grade with which the degree is awarded ($r=0.11$, $p=0.22$).

Given the negative result, *post hoc* power analysis was conducted to investigate a type II error. With 89 theses and a type I error set at 0.05, a two-tailed *t*-test achieved a power of 0.83 to detect an effect size of 0.3.

Discussion

To our knowledge, this is the first study from New Zealand (and anywhere outside of the UK) to explore some of the academic sequelae of medical student

research projects supervised by clinical academic supervisors. Findings from our study imply that having a clinical academic as a supervisor does not appear to confer additional benefits to the degree grade or scientific output. This differs from findings from a recent large study from the UK, which found students supervised by clinical academic researchers were more likely to obtain first class honours and produce significantly more poster presentations and publications compared with students supervised by full-time non-clinical academic researchers.³ However, that study relied on self-reporting by students, whereas this current study relies on publications that are identifiable through standard databases.

Publishability of research relates to many factors, particularly the topic, the importance of the findings and academic rigour. In addition, it can be argued that publication success by medical students is dependent on student-factors (eg, is the student motivated to pursue publishing their findings?), supervisor-factors (eg, does he/she allocate sufficient time and enthusiasm to help the student-author?) and programme-factors (eg, does the research program adequately prepare students and reward supervisors for successful publication?).^{1,10} For example, applicants to competitive residency programmes are often well-aware of what “academic factors” (eg, peer-reviewed publications) are needed to increase their odds of acceptance.¹⁰ Supervisor-factors, on the other hand, cannot be easily extrapolated since, for example, the selection process of the mentors (eg, prior experience with medical students) is not obtainable. Furthermore, academic clinicians often face competing demands¹¹ of clinical care, teaching and/or research, which could potentially affect their effectiveness in

supervising the student’s project to fruition (ie, successful publication). It is possible there are interacting factors—for example, clinical academic supervisors may suggest topics that are inherently more publishable, they may attract more motivated students or they may be more motivated to see a project through from inception to publication. These are areas that could be explored in future research. In the meantime, we suggest the claim that academic supervisors are more likely to produce peer-reviewed publications compared to non-clinical academics³ is not one that is backed up by our findings.

Clinical academic supervisors did not provide additional benefit or disadvantage in terms of degree grade and research output. A number of reasons could explain this finding. First, the University of Otago is a research-intensive university, and often ranks highly for research quality in New Zealand.¹² This implies that University staff members (clinical and non-clinical) are equally likely to be actively involved in medical student research supervision and publication. Furthermore, a small number of students in our cohort were co-supervised by clinical and non-clinical researchers, which could potentially confound our findings.

Conclusion

Clinical academic supervisors appear just as effective as non-clinical full-time researchers in supervising medical students involved in undergraduate research. Future research should focus on examining the association between clinical academic supervisors and publication rates from other medical student research projects both curricular and extra-curricular, and could focus on reasons behind our observed association.

Competing interests:

Nil.

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The role of acromioplasty when repairing rotator cuff tears—no difference in pain or functional outcome at 24 months in a cohort of 2,441 patients

Elizabeth C Bond, Anthony Maher, Lynette Hunt, Warren Leigh, Matthew Brick, Simon W Young, Michael Caughey

ABSTRACT

AIM: The role of acromioplasty with rotator cuff repair remains unclear. This study aims to test the null hypothesis—that acromioplasty in conjunction with rotator cuff repair has no effect on improvement in pain or shoulder function at two years follow up.

METHODS: Data was obtained from a collaborative nationwide project between March 2009 and December 2010, and consisted of a total of 2,441 patients undergoing primary repair of superior rotator cuff tears. Multivariate analysis was performed to assess the effect of the inclusion of acromioplasty at the time of rotator cuff repair on visual analogue scale (VAS) pain scores and Flex Shoulder Function (Flex SF) scores at 24-month follow up.

RESULTS: On univariate analysis there was a significantly higher Flex SF score in the acromioplasty group (40.5) compared to the no acromioplasty group (38.7) and a lower mean pain score at 24 months in the acromioplasty group (1.44 vs 1.74). There was a significant difference in tear area and surgical repair technique between the two groups. On multivariate analysis there was no statistically significant difference in Flex SF or VAS pain scores between the two groups.

CONCLUSION: There was no difference in pain or function scores at two years following rotator cuff repair regardless of whether or not acromioplasty was performed. This paper represents the largest study to date comparing acromioplasty to no acromioplasty in the setting of cuff repair. It supports previous literature in showing no significant difference in pain or shoulder function between the two groups.

The concept of acromioplasty aiming to reduce extrinsic mechanical impingement was introduced by Dr Neer in 1972,¹ however, the exact role of acromioplasty when repairing rotator cuff tears remains unclear. Acromioplasty is commonly performed in conjunction with rotator cuff repair (RCR), with 94% of cases in this study utilising the technique despite a paucity of support in the literature.

Rising use of acromioplasty has been reported worldwide.² However, a number of recent randomised studies have failed to

show a benefit to performing acromioplasty in conjunction with rotator cuff repair,³⁻⁵ and current AAOS guidelines suggest that routine acromioplasty is not required at the time of RCR.^{6,11} The number of patients in these studies was relatively small, and it is possible they lacked sufficient power to detect a smaller clinical benefit to acromioplasty with RCR. This paper details the first large-scale registry data relating to RCR and aims to answer the clinical question as to whether acromioplasty at the time of RCR is associated with improved post-operative pain and functional scores.

A collaborative nationwide project was established to collect prospective function and pain outcome scores on patients undergoing RCR in 2009. To date, it forms the largest prospective cohort of RCRs. It presents multi-centre, multi-surgeon data and has the advantage of large patient numbers encompassing a wide range of orthopaedic practice from large academic institutions to smaller community hospitals. We used registry data to test the null hypothesis—that acromioplasty has no effect on improvement in pain or shoulder function at two years follow-up.

Materials and methods

The group collected information from 92 surgeons operating in various centres across the country between 1 March 2009 to 31 December 2010. All surgeons performing rotator cuff repairs in the country were invited to participate. The registry was approved by the National Ethics Committee and patient consent was obtained prior to data collection. Procedures included primary and revision repairs of full thickness rotator cuff repair. Patient recruitment occurred in the pre-assessment clinic or at time of surgery booking. A total of 2,571 patients were recruited. For the acromioplasty analysis, patients undergoing revision RCR and isolated subscapularis repairs were excluded, leaving a total study population of 2,441 patients. Follow-up for pain and shoulder function scores in this group was 71.3% at 24 months.

Pre-operative questionnaire

The pre-operative questionnaire was self-administered and collected baseline information, including age, gender, self-reported ethnicity, hand dominance, smoking status, recreational and occupational activity, duration of symptoms and whether the tear was trauma related. Pre-operative pain and Flex-Shoulder Function (Flex SF) questionnaires were also collected.

Shoulder function assessment

The Flex-SF score is a validated shoulder-specific functional assessment score, that is rated highly when compared to other shoulder scores.^{7,8} A lower score represents a greater disability. This questionnaire was self-administered pre-operatively.

Pain assessment

Pain levels were ascertained by a four question self-administered questionnaire about pain status over the preceding month. Patients were asked to grade (max 10) their “pain at its least”, “pain at its worst” and “average pain”. Patients were also asked if pain had disturbed their sleep more than once per night, once per night, almost once per night, a few times per week, less than once per week or never.

Operation day questionnaire

This questionnaire was completed on the day of surgery by the primary operating surgeon. It detailed specific intra-operative findings, surgical techniques and post-operative instructions. Limited bursectomy was defined as “enough clearance to perform surgery only”, extensive bursectomy was defined as “deliberate circumferential clearance of subacromial bursa”. The operative approach was considered arthroscopic when the entire repair was performed through arthroscopic ports; mini-open if the acromioplasty was done arthroscopically with no deltoid detachment; or open if the RCR was directly visualised and repaired through an incision with partial deltoid take-down.

Intra-operative findings were recorded, including which tendons were involved, tendon quality, tear size and presence of long head of biceps or labral pathology. Tears were classified as partial or full thickness. Tendon quality was reported as poor, thin, good (some deterioration) or very good (normal thickness). Tear size was reported in both the anterior-posterior (AP) dimension and extent of retraction. These were each estimated by the operating surgeon and classified into five categories, <1cm, 1.1 to 2.0cm, 2.1 to 3.0cm, 3.1 to 4cm, 4.1 to 5cm. Tear area was a multiple of AP tear size and tear retraction.

Post-operative questionnaire

Flex SF and VAS scores were collected at 6, 12 and 24 months post-operatively.

Statistical analysis

Data was analysed using GenStat 18 (VSN International, UK) and Minitab 17.2 (Minitab Inc, USA) software with the assistance of a professional statistician (LH). Differences between groups were considered statistically significant when p values were less

than 0.05. A multiple linear regression model was used to control for potential confounders and included the variables age, gender, ethnicity, smoking status, tear area, surgical approach and repair technique. The effect of acromioplasty on improvement in VAS pain score and improvement in Flex SF score at 24 months was evaluated while adjusting for the other predictors listed.

Results

Of 2,441 patients included in this study, 2,293 (94%) had an acromioplasty performed and 148 (6%) had no acromioplasty at the time of RCR (Table 1). Twenty-four month follow-up data was obtained for 71.3% of Flex SF scores and VAS pain scores.

Demographics

1,892 (78%) patients were below the age of 65 years and 549 (22%) were over 65 years. There were 736 (30%) female patients and 1,705 (70%) male.

On univariate analysis there was no difference in mean Flex SF scores at 24 months for age, smoking status and surgical approach. The mean Flex SF score at 24 months was higher for males than females. Ethnicity also appeared to have an effect on the mean Flex SF scores, with Pacific Islanders having the lowest scores compared to Asians, Europeans and Māori (Table 2).

There was no difference in pain scores at 24 months for age, gender and surgical approach. Pacific Islanders have the highest

Table 1: Technical information from operation day questionnaire.

Surgical approach	Arthroscopic	418 (17%)
	Open	1,044 (43%)
	Mini-open	956 (39%)
	Not recorded	23 (1%)
Type of repair	Single row	970 (40%)
	Double row	1,284 (53%)
	Not recorded	187 (7%)
Fixation method	Bone tunnels	195 (8%)
	Suture anchors	1,753 (72%)
	Combination	350 (14%)
	Not recorded	143 (6%)
Associated acromioplasty	Yes	2,293 (94%)
	No	148 (6%)
Bursectomy	Nil	154 (6%)
	Limited	1,072 (44%)
	Extensive	1,195 (49%)
	Not recorded	20 (1%)
Distal clavicle resection	Yes	156 (6%)
	No	2,143 (88%)
	Not recorded	142 (6%)
Long head of biceps intervention	Left in situ	926 (38%)
	Tenodesis	392 (16%)
	Tenotomy	491 (20%)
	Not recorded	632 (26%)

Table 2: Univariate comparison of mean pain and functional scores by demographic variables.

	Flex SF (24 months)	VAS Pain (24 months)
Overall mean	40.3	1.5
Age		
<65 years	40.0	1.4
>65 years	40.5 (p=0.307)	1.5 (p=0.650)
Gender		
Male	40.8	1.5
Female	39.3 (p=0.001)	1.4 (p=0.149)
Ethnicity		
Asian	37.4	2
European	40.5	1.4
Māori	38.2	1.9
Pacific Island	33.8	2.6
Other	42.4 (p=0.023)	1.4 (p<0.001)
Smoking status		
Smoker	40.1	1.8
Non-smoker	40.1 (p=0.931)	1.4 (p=0.021)
Approach		
Open	40.1	1.5
Mini-open	40.7	1.4
Arthroscopic	40.5 (p=0.420)	1.4 (p=0.454)
Acromioplasty		
Yes	40.5	1.4
No	38.6 (p=0.029)	1.7 (p=0.005)

mean VAS pain scores compared to other ethnicities. There was a higher mean VAS pain score for smokers compared to non-smokers (Table 2).

Acromioplasty

The acromioplasty and no acromioplasty group were similar with regards to age, gender, ethnicity, smoking status, approach and fixation method (Table 3). Acromioplasty patients had a mean tear area that was significantly smaller than the mean tear area for those who didn't have acromioplasty (4.75 vs 6.97, p=0.00). There was also a statistically significant relationship between acromioplasty and repair technique (p=0.007) with fewer double-row repairs in the acromioplasty group (55% vs 65%) (Table 4).

There was no difference in mean pain scores for the acromioplasty and no acromioplasty groups pre-operatively, at six

months or at 12 months (Figure 1). On univariate analysis there was a small difference in mean pain scores for the acromioplasty and no acromioplasty groups at 24 months (Table 2). There were also higher mean Flex SF scores at each post-operative time point for the acromioplasty group (Table 2, Figure 2).

Multivariate analysis was performed controlling for age, gender, ethnicity, smoking status, tear area, surgical approach and repair technique with the effect of acromioplasty on improvement in VAS pain and Flex SF scores investigated using a multiple linear regression model. This analysis showed no difference at 24 months for improvement in pain (3.23 vs 2.95, p=0.379) or improvement in Flex SF score (16.19 vs 14.74, p=0.230) between acromioplasty versus no acromioplasty groups (Table 5).

Table 3: Demographic data by acromioplasty status.

	Acromioplasty (n=2,293)	No acromioplasty (n=148)
Age >65 years	515 (22.4%)	19 (12.8%)
Age <65 years	1,775 (77.4%)	129 (87.2%)
Not recorded	3 (0.2%)	0
Male	1,596 (69.6%)	110 (74.3%)
Female	698 (30.4%)	38 (25.7%)
Asian	20 (0.9%)	1 (0.7%)
European	1,058 (46.1%)	62 (42%)
Māori	69 (3%)	2 (1.3%)
Pacific Island	20 (0.9%)	0
Other	23 (1%)	0
Not recorded	1,102 (48.1%)	83 (56%)
Smoker	133 (5.8%)	8 (5.4%)
Non smoker	1,056 (46%)	58 (39.2%)
Not recorded	1,105 (48.2%)	82 (55.4%)
Approach:		
Open	996 (43.4%)	47 (31.8%)
Mini-open	884 (38.5%)	72 (48.6%)
Arthroscopic	392 (17.1%)	26 (17.6%)
Not recorded	22 (1%)	2 (1.4%)
Fixation method:		
Bone tunnels	194 (8.5%)	1 (0.8%)
Suture anchors	1,627 (70.9%)	124 (83.8%)
Combination	333 (14.5%)	17 (11.7%)
Not recorded	140 (6.1%)	5 (3.4%)

Table 4: Analysis by acromioplasty status.

	Acromioplasty	No acromioplasty	
Tear area	4.75cm ²	6.97cm ²	p<0.01
Repair technique	55% double row	65% double row	p=0.007

Discussion

This study showed that there is no difference in pain or functional outcome scores following RCR regardless of whether or not acromioplasty is performed. This paper represents the largest study investigating the effect of acromioplasty on outcome following RCR and includes 2,441 patients with follow up to two years post-surgery.

The extrinsic theory of rotator cuff failure was first postulated by Neer in 1972, and acromioplasty was advocated during rotator cuff repair to prevent impingement.¹ However, recently many

authors have challenged this hypothesis, as more advanced surgical and imaging techniques have implicated intrinsic pathology in the etiology of rotator cuff tears.^{2,5,9,10} Accordingly, the clinical value of acromioplasty has been questioned. Despite this, acromioplasty continues to be performed frequently in conjunction with arthroscopic RCR. This is likely due to both an ongoing belief that acromial impingement contributes to rotator cuff disease and the improvement in visualisation accorded by acromioplasty, when performing a RCR. Four randomised controlled trials and one systematic review have looked at the role of acromioplasty

Figure 1: Comparison of mean pain scores at different time points.

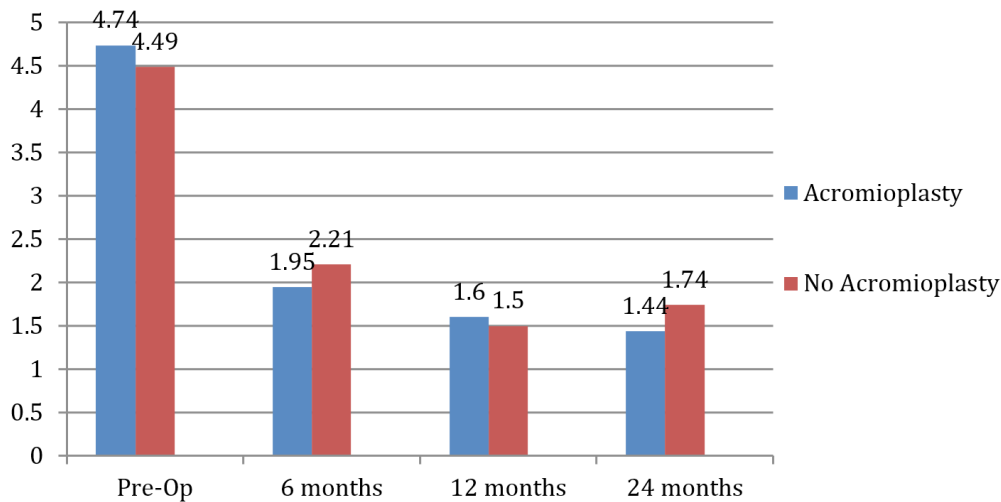
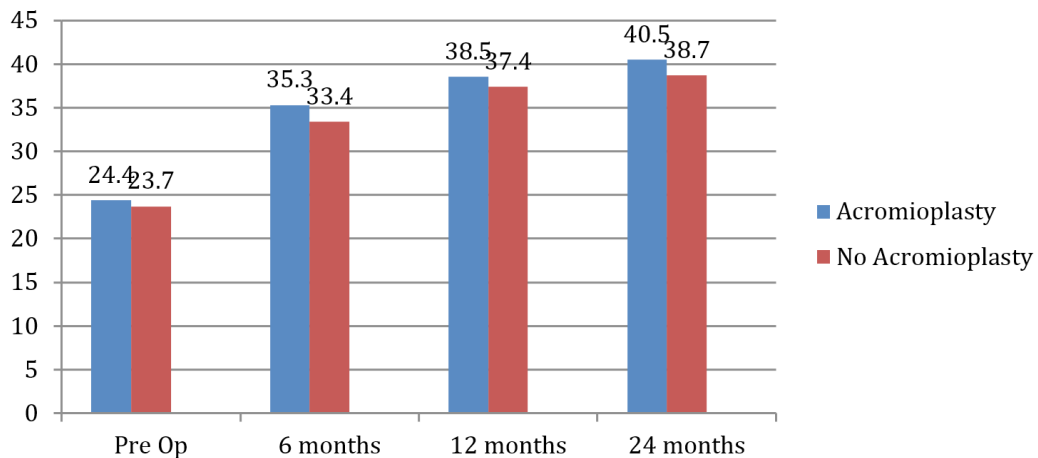


Figure 2: Comparison of mean Flex SF scores at different time points.



in association with RCR.^{4,5,9,11,12} Abrams et al⁵ performed a randomised controlled trial to compare the outcomes of patients undergoing arthroscopic rotator cuff repair for full thickness tears with or without acromioplasty. With a total study population of 114 (43 non-acromioplasty; 52 acromioplasty) and an 83% follow-up rate at two years, they demonstrated no significant difference in functional outcome

between the groups at any time point. Similarly, Gartsman et al¹² showed no significant difference in functional outcome with a randomised prospective trial and a minimum of one year follow up. Their study included 93 patients (46 non-acromioplasty; 47 acromioplasty) with full thickness supraspinatus tears and a type 2 acromion. In a randomised study of 86 patients (45 non-acromioplasty; 41 acromioplasty),

Table 5: Mean pain and function scores by acromioplasty status after multivariate analysis.

	Acromioplasty	No acromioplasty	
Pain (improvement in VAS pain score)	3.23	2.95	p=0.379
Function (improvement in Flex SF score)	16.19	14.74	p=0.23

MacDonald et al⁴ reported no functional difference between the groups at any time point up to 24 months, but did report a greater number of non-acromioplasty patients requiring reoperation compared to acromioplasty patients ($p=0.05$). Finally, Milano et al¹¹ have compared two groups of 40 patients with one group undergoing a subacromial decompression in conjunction with an arthroscopic repair of a full thickness rotator cuff tear. They concluded that subacromial decompression did not significantly alter outcome at two years.

Our study supports the findings of these trials in a larger registry-based cohort. Although there was a small difference with the acromioplasty group having superior outcomes with univariate analysis, but after controlling for potential confounding variables, we found no difference in pain or function regardless of whether or not acromioplasty is performed in conjunction with RCR. This adds weight to and is concordant with previously published literature.^{3,9} Data for this study was collected from 92 surgeons and therefore provides a real-world analysis.

In this study, the decision on whether or not to perform acromioplasty was based on individual surgeon's judgement, and reasons for the decision were not collected. We found no difference between the acromioplasty and non-acromioplasty groups with regards to patient factors and surgical approach. However, there was a higher number of large tears in the non-acromioplasty group. It may be that the decision not to perform an acromioplasty in patients with larger tears was to avoid anterosuperior escape of the humeral head and subsequent rotator cuff arthropathy. Similarly, there were more double row repairs in the non-acromioplasty group, and this likely reflected the higher number of larger tears in this group.

There are a number of limitations to this study. Firstly, the results of the current study must be considered taking into consideration the inherent limitations associated with registry data, which is not randomised or interventional. However, use of this cohort provided a large sample size and was collated from 92 surgeons using a range of approaches (arthroscopic, mini-open and open). There was a high percentage of follow up at 24 months post-operatively. Secondly, no information was collected regarding the reasoning behind the surgical decision-making and description of surgical findings. To counter this, attempts were made to standardise groupings of surgical data to make recording reproducible. Suggestions were made in the operating day form on how to group categories, but some categories, for example tendon quality, were difficult to standardise. Finally, despite the large number of patients in this study, the number treated without acromioplasty was relatively small. This perhaps reflects that despite recent data most surgeons still feel that acromioplasty is a standard part of rotator cuff repair and this may have contributed to the study being underpowered. However, the group is significantly larger than in previous studies. Although the surgical decision-making in this study was in 2009 and 2010, which predates the more recent articles on this subject. It may be that factors other than clinical outcome are important in the decision to perform an acromioplasty during RCR, such as surgical visualisation.

Conclusion

In this large registry study we found no difference in pain or functional outcome at two years regardless of whether or not acromioplasty was performed in conjunction with RCR. Acromioplasty at the time of RCR remains the choice of the operating surgeon.

Competing interests:

Nil.

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Orbital fractures treated in Auckland from 2010–2015: review of patient outcomes

Lanit Anand, Christopher Sealey

ABSTRACT

AIM: The purpose of this study was to review patient outcomes from surgical reconstruction of isolated orbital fractures, performed by the Auckland District Health Board (ADHB) Oral and Maxillofacial Surgery service (OMFS), from 2010 to 2015. In particular, we wished to assess titanium as an orbital reconstructive material and compare outcomes with the international literature.

METHOD: Hospital records for 103 adults (>18 years old) who underwent repair of isolated orbital fractures by the OMFS department at Middlemore Hospital, between 2010 and 2015, were reviewed. Information collected included patient characteristics, cause of injury, type of reconstruction material used and post-operative complications. Patients were then followed up by means of a verbal telephone questionnaire.

RESULTS: The majority of patients were male in the 18–30 year age group, with interpersonal violence being the leading cause of injury. Titanium was the preferred choice of reconstructive material. Seven patients required return to theatre to resolve post-operative complications. Sixty-four patients could be contacted by telephone (12 months to six years follow-up). Thirty patients, who could not be contacted by telephone, did attend clinic follow-up and were assessed from their hospital records (minimum of one month follow-up). Ten patients could not be contacted by telephone and had not attended clinic follow-up. Problems with diplopia, paraesthesia and cosmesis were within complication rates reported in the literature.

CONCLUSION: Patients with isolated orbital fractures, treated by the Oral and Maxillofacial Surgery Department in Auckland from 2010–2015, were reviewed. Titanium was the most commonly used reconstructive material and proved to be well tolerated. Complication rates were within international norms.

The orbit is exposed in the mid-face and is susceptible to trauma. The thin internal floor and walls are vulnerable to fracture.¹ Mechanism of internal orbital fractures remains controversial, but is likely to result from transmission of force from the thick orbital rims to the thinner orbital floor and walls, and from increased hydrostatic pressure within the orbit.²

Orbital fractures can be challenging to reconstruct. Successful surgery depends on correct assessment, careful dissection and proper selection and positioning of the reconstructive material. Surgery aims to correct diplopia and enophthalmos by recovering herniated soft tissue (fat and muscle) and restoring orbital volume and anatomical form.

Indications for surgical reconstruction of the fractured orbit include ‘white eye blow-out’ (painful restriction in ocular movement

due to entrapped and potentially ischaemic extra-ocular muscle),³ significant restriction of ocular movement, diplopia, enophthalmos and large defects likely to result in significant enophthalmos over time.⁴ The ideal material for orbital fracture repair remains controversial; titanium, polyethylene, combination of titanium and polyethylene, polydioxanone sheets (PDS) and bone grafts have all been used. Post-operative functional or aesthetic complications are relatively low.⁵ Persistent diplopia or enophthalmos can cause patients emotional stress and affect return to work.⁶

This study aimed to review outcomes for patients with isolated orbital wall and floor fractures reconstructed by the Oral and Maxillofacial Surgery (OMFS) service at Middlemore Hospital between 2010 and 2015, with particular attention to the utility of titanium as a reconstructive material.

Method

Request for patient information from the Middlemore Hospital Records Department was made. Theatre codes for repair of orbital fractures, with implant placement, from January 2010 to December 2015 were used to source the records. Only adult patients (>18 years old), whose primary operation was the repair of an isolated orbital floor or wall fracture, were included in this study. Patients who had orbital rim or other mid-face fractures were excluded.

Data collected included patient age and gender, cause of injury, site of fracture, type of reconstructive material used and any peri-operative complications.

All patients were then contacted by telephone and invited to complete a verbal questionnaire. Information was gathered about visual disturbance, paraesthesia, satisfaction with cosmetic outcome and return to work.

The Counties Manukau DHB Research Committee approved this study.

Results

Table 1 lists patient characteristics and etiological data. One hundred and three patients with orbital fractures were included

Table 1: Gender, age and etiological data.

Gender	
Male	86 (83%)
Female	17 (17%)
Age group (years)	
18–30	51 (49.5%)
31–49	39 (37.8%)
50–65	10 (9.7%)
>65	3 (2.9%)
Etiology	
IPV	47 (45.6%)
Sports	27 (26.2%)
Falls	15 (14.6%)
Accidental	7 (6.7%)
Workplace injury	4 (3.8%)
Motor vehicle accidents (MVA)	3 (2.9%)

in this study. The male to female ratio was approximately 5:1. The 18 to 30 year age group accounted for the majority of presentations. Interpersonal violence (IPV) was the leading cause of orbital fractures (45.6%), followed by sporting injuries (26.2%).

Table 2 shows information regarding fracture site location and the type of material used for reconstruction. Most fractures were located in the orbital floor (91.3%) with titanium being the material of choice for repair (84.5%). The type of titanium used was either a Synthese (Company) preformed plate or a cut-to-fit titanium mesh. In four cases, no plate was deemed necessary after surgical exploration.

Table 2: Fracture location and material used in reconstruction.

Fracture location (n=103)	
Orbital floor	94 (91.3%)
Orbital floor + medial wall	6 (5.8%)
Medial wall	3 (2.9%)
Type of reconstructive material used (n=103)	
Titanium	87 (84.5%)
• Synthese preformed plate	68/87 (78%)
• Cut-to-fit titanium mesh	19/87 (22%)
Polydioxanone (PDS™) sheet	6 (5.8%)
Polyethylene with embedded titanium (Medpor™)	6 (5.8%)
No plate required	4 (3.8%)

Table 3 contains the results of the verbal questionnaire conducted by telephone. A minimum of 12 months and maximum of six years had lapsed since surgery for all patients interviewed. From the 103 total patients, 64 were able to be contacted by phone and completed the interview. Forty-nine of these 64 patients were reconstructed with Synthese preformed plates, nine with cut-to-fit titanium mesh, three with PDS and four with Medpor™. The rate of persistent diplopia with each of these materials is presented in the table. Other occasional ocular problems included pain (3/64), epiphora (2/64) and light sensitivity (1/64).

All patients said they had either returned to work or could have. Four patients had either retired or had been unable to return

to work for unrelated medical reasons. Paraesthesia was assessed by asking patients to rate sensation compared to the normal side as a percentage; 'Mild' being 75% of normal, 'moderate' 50% of normal and 'profound' 25% or less of normal. 81% of patients had normal or 75% of normal sensation. 84.4% of patients were satisfied with their cosmetic outcome. Only two patients stated that they would seek further surgical treatment privately to improve their appearance.

Table 3: Questionnaire results.

Diplopia (n=64)	
No issues	55 (86%)
Persistent diplopia	9 (14.0%)
• Synthese preformed plate	3/49 (6.1%)
• Cut-to-Fit titanium mesh	2/9 (22%)
• PDS™	4/4 (100%)
Paraesthesia (n=64)	
None	41 (64.0%)
Mild (75% or more)	11 (17.2%)
Moderate (50%)	8 (12.5%)
Profound (25% or less)	4 (6.3%)
Cosmetic outcome (n=64)	
No concerns	54 (84.4%)
Enophthalmos	6 (9.4%)
Ectropion	3 (4.7%)
Cheek contour	1 (1.6%)
Would like further surgery to improve appearance	2 (3.2%)
Return to work (out of 60)	
Yes	60 (100%)

Of the 103 patients, seven patients required further surgery after initial repair. Three patients had implants removed for significant persistent diplopia; two Synthese preformed plates and one Medpor™. 2/87 (<2.5%) of patients reconstructed with titanium required removal of the implant. Neither of these patients had persistent diplopia following revision surgery (Information from hospital records. Neither patient could be contacted by telephone).

One patient with dystopia due to hyperglobus, the day following surgery, was returned to theatre for removal of a PDS implant and placement of a thinner titanium plate. No further problems were experienced.

One patient had a titanium implant removed the day following insertion because of malposition and pain. A decision not to place another implant was made. The outcome was uneventful.

One patient was returned to theatre for urgent decompression of a retro-bulbar haemorrhage. The implant was not removed and the patient made a full recovery.

One patient had ongoing problems with lower-lid retraction and required a dermis fat graft to correct this.

Table 4 describes the findings for the 39 patients who were unable to be contacted by telephone, but who attended outpatient follow-up. Patients with diplopia and paraesthesia were noted to be improving when last reviewed.

Table 4: Patients unable to be contacted by telephone.

Outcomes in patients unable to be contacted (n=39)	
No concerns	20 (51%)
Diplopia	5 (13%)
Paraesthesia	4 (10%)
Enophthalmos	1 (2.6%)
Did not attend follow up	9 (23%)

Discussion

Management of orbital fractures consumes a significant amount of hospital resources. Return to theatre is concerning to the patient and costly to the public purse. Clinical audit helps identify areas where change might reduce the need for second surgery and improve clinical outcomes.

The majority of fractures in this study occurred in males, 18–30 years of age, and as a result of IPV. These figures are in keeping with other maxillofacial trauma studies completed around New Zealand.⁷ Sporting injuries were the next major cause; unsurprisingly, rugby was the highest

contributor (63%). MVA accounted for only a small number of fractures consistent with a downward trend that has been noted in other western countries around the world.⁸

The main objectives of surgical management for isolated orbital floor or wall fractures are correction of diplopia and enophthalmos, without causing harm. Diplopia early post-trauma, due to swelling, is common and not in itself an indication for surgery; patients without an urgent indication for surgery (eg, 'white blow out') should be reassessed at 1–2 weeks. Persistent diplopia may not be correctable if it is due to injury to muscle itself rather than herniation or entrapment of muscle and fat. It can be difficult to determine the cause of persistent post-surgical diplopia. That said, published incidences of persistent diplopia following surgery ranges from 8–42%, with enophthalmos ranging from 7–27%.^{9–11} Unfortunately, most studies do not attempt to correlate outcomes with the type of reconstructive material used.

Titanium was the material most commonly used for the repair of orbital fractures in our study. This material is in widespread use in the management of fractures of the facial skeleton around the world, and a number of studies report high success rates.¹² Titanium is rigid yet malleable, biocompatible, has the potential to osseointegrate, has a low infection rate and provides strong support that does not weaken with time.¹³ Preformed orbital plates, such as were used in this study, assist with the restoration of orbital volume. Restoring orbital volume reduces enophthalmos.¹⁴

A potential problem associated with the use of titanium plates is the so-called 'orbital adherence syndrome'.¹⁵ This has been reported in a small number of patients and describes a brisk tissue reaction that results in adherence of the orbital contents to titanium mesh. It has been suggested that the ideal implant material should therefore be smooth, as opposed to a mesh.¹⁶

The results from our telephone questionnaire showed excellent medium- to long-term outcomes with the use of titanium preformed perforated plates. Only three of the 49 cases (6.1%) reconstructed with titanium preformed plates experienced persistent diplopia. The rate of diplopia

when cut-to-fit fine mesh was used was higher (22%) although the number of patients treated this way was small (nine). PDS outcomes were much less favourable.

Two of the three patients with persistent diplopia after reconstruction with titanium preformed plates required plate removal and replacement with an alternative material. This suggests that although persistent diplopia from use of titanium preformed plates is low, when it does occur, it can be significant. Although higher rates of diplopia occurred with the use of titanium mesh, none of the mesh required removal.

Medium- to long-term follow up for patients who could not be contacted by telephone was not possible. Early outcomes for these patients who attended follow-up were favourable, with either no concerns or improving diplopia recorded when last seen.

A systematic review by Gunarajah et al (2013),¹³ which evaluated the different materials used for orbital reconstruction, noted confounding variables such as observer bias, diverse surgical approaches and varied follow-up times as inherent weaknesses in a number of studies. Peng (2016) et al¹⁷ in a large and recent study compared titanium to high-density polyethylene (smooth surface) with embedded titanium mesh. Peng et al found the rate of diplopia between the two types of material, after 12 weeks of follow-up, to be very similar (Titanium 51.4%, Polyethylene with titanium 58.6%).

Correct placement of the orbital implant is clearly important. Intra-operative computed tomography (CT) imaging enables real-time assessment of orbital implant positioning. Implants can be viewed digitally in 3D and adjusted, in theatre, as required. This obviates the need for post-operative CT scanning and likely reduces the number of patients requiring return to theatre. Our cohort was treated prior to the introduction of this technology at Middlemore hospital.

Paraesthesia was described as profound by four patients interviewed. It is unclear as to whether this was related to the initial trauma or subsequent surgery.

The number of patients treated for isolated floor or wall orbital fractures by the OMFS service in the 2010 to 2015 period is likely to be under-represented in this study due to variations in coding by theatre staff.

By using a telephone questionnaire we were able to minimise study costs and improve patient participation. The results are a subjective yet valid means of assessing outcome. Objective clinical follow-up is also important and will form part of a planned larger prospective study.

Conclusion

This study confirms the utility of titanium as an orbital reconstructive material. Outcomes, for our patients with isolated orbital floor and wall fractures, reconstructed with titanium implants, compare favourably with those reported in the international literature.

Competing interests:

Nil.

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Survey of antimicrobial stewardship practices in public hospitals in New Zealand district health boards

Sharon J Gardiner, Jane A Pryer, Eamon J Duffy

ABSTRACT

AIMS: To determine what antimicrobial stewardship (AMS) practices exist in New Zealand public hospitals.

METHODS: A quantitative survey based on recommended components of hospital AMS programmes was sent to the 20 DHBs in June 2016.

RESULTS: Ten of the 20 DHBs had an AMS committee, nine had dedicated AMS pharmacist full-time equivalents (FTEs) and eight had lead clinician FTEs. Only one DHB met FTE recommendations for AMS pharmacists and two for clinicians (0.3 and 0.1 FTEs per 100 acute beds, respectively). All DHBs had conducted at least one antimicrobial audit in the preceding 12 months, most had their own antimicrobial guidelines (19/20) and prescribing policies (18/20), and 12 reported on antimicrobial usage by at least one metric (eg, defined daily doses). Staff education on AMS had been given at most DHBs in the previous year, but only three reported having AMS ward rounds. All DHBs had surveillance programmes for resistant organisms and most produced antibiograms (16/20). All reported barriers to implementation of an AMS programme.

CONCLUSIONS: Hospital AMS programmes are in their infancy in New Zealand, with wide variation in practices seen. National co-ordination is required to assist DHBs in developing effective programmes to improve antimicrobial use.

Antimicrobial resistance is a recognised threat to modern medicine,¹ and is a growing concern in New Zealand.² Antimicrobial stewardship (AMS), a collection of co-ordinated strategies that aims to optimise the use of antimicrobials (ie, right drug, right indication, right dose, right duration and right route), can slow further development of this threat. Hospital-based AMS interventions have the potential to reduce development of *Clostridium difficile*-associated diarrhoea, and colonisation or infection with resistant organisms (eg, vancomycin-resistant *Enterococcus faecalis*) as well as decrease mortality, length of stay and cost.⁴ Internationally, it is widely recommended that hospitals initiate AMS programmes, and advice is available to guide implementation.⁵⁻⁷

An international response to antimicrobial resistance is being co-ordinated by the World Health Organization through the Global Action Plan.¹ As a member state, New Zealand has committed to delivering a national plan, including implementation of AMS as a key objective, by May 2017.⁸ In 2013, the Health Quality and Safety Commission (HQSC) published a scoping paper on AMS, which provided qualitative feedback from key stakeholders around the country.⁹ Subsequently, AMS programmes have been implemented in some of New Zealand's public hospitals with reported data primarily confined to the volume of antimicrobials used.¹⁰ AMS requirements for hospital accreditation exist through the New Zealand Standard 8134.3:2008 for Infection Prevention and Control.¹¹ However, the

standard is a generic document to address basic principles and systems, and there has been no formal assessment across public hospitals of how AMS practices are being delivered. In order to formulate and deliver an effective plan, with appropriate resource planning for secondary care, it is necessary to understand the current status of AMS in New Zealand. This survey aimed to determine the structures, resources and practices in place for AMS in public hospitals currently. It was conducted on behalf of the Healthcare Associated Infections Governance Group (Ministry of Health, New Zealand).¹²

Methods

International recommendations for core components of hospital AMS programmes^{5,7} were used as the basis for survey development. The preliminary survey questions were organised under the headings of governance and personnel, audit and surveillance, and key AMS interventions. The survey design was largely quantitative, with multiple choice options available. Free text areas were included for additional comments as required. The intent was to capture the breadth of AMS activities in our public hospitals as succinctly as possible, while allowing opportunity for comment around key issues such as perceived challenges in implementing an AMS programme. The Healthcare Associated Infections Governance Group¹² provided input into the survey content, and it was piloted in three DHBs before finalising.

In June 2016, the Chief Executive Officers for each of New Zealand's 20 DHBs were invited to participate in this survey. They were asked to provide a single response for their respective DHBs by liaising with relevant parties such as infectious diseases (ID) physicians, pharmacists, clinical microbiologists and infection prevention and control (IPC) staff. PDF versions of the survey were provided to facilitate discussion between staff and at committees. However, it was requested that the final survey for each DHB be submitted electronically (SurveyMonkey Inc, Palo Alto, California, USA: www.surveymonkey.com). Non-responding DHBs were followed up over the subsequent three months to ensure a response was received for each DHB.

Results are presented descriptively and largely anonymously. However, details of key AMS resources (personnel) in each DHB are described by name, as are efforts around regional collaboration.

Results

Responses were obtained from all 20 DHBs, with most (85%) primary respondents being pharmacists (11/20) or ID physicians (6/20).

Governance and personnel

Committees

All DHBs reported having an IPC committee (20/20), most had a drugs and therapeutics committee (18/20), and half had a dedicated AMS committee (10/20) (Table 1). Eleven DHBs indicated that they had up to three additional committees relevant to AMS, most involving safety and/or quality (10 of the 16 additional committees across the 11 DHBs). Responsibility for hospital antimicrobial activities resided with the AMS committee (10/20), the IPC committee (5/20), the drugs and therapeutics committee (3/20) or the 'infection team' (1/20). One DHB (1/20) had no committee responsible for antimicrobial activities.

Membership of the 19 committees charged with responsibility for antimicrobial activities was diverse (Figure 1). Pharmacy (18/19), nursing (17/19), clinical microbiology (15/19), IPC (15/19) and ID (12/19) were most frequently represented. Most committees (16/19) had representation from pharmacy plus ID physician and/or clinical microbiologist, and around half (9/19) had all three disciplines present. Medical specialities other than ID and clinical microbiology were included in more than half of the committees (11/19), with general medicine being most frequently included (9/19) and other specialities including surgery having comparatively low representation (4/19) (Figure 1). Most of the committees (18/19) met at least two monthly (Table 1). Reporting pathways were not clear, but dedicated AMS committees (7/10) typically reported to the drugs and therapeutics committee and/or IPC committees as the initial 'upwards' step. The most frequent activities undertaken by the committees were empiric guideline development, audit and monitoring, and evaluation of antimicrobial use (occurring in 68–79% of committees) (Figure 2).

Table 1: Governance and personnel.

Committees	
Hospital-based committees concerned with AMS at each DHB*	
Infection prevention and control	20 (100%)
Drugs and therapeutics**	18 (90%)
Antimicrobial stewardship	10 (50%)
Additional committee or team relevant to AMS	11 (55%)
<ul style="list-style-type: none"> • Safety and/or quality (10 committees in eight DHBs) • Infection team (1) • Infection prevention & control subcommittee for antibiotic advice (1) • Medicines Governance committees (adults) (1) • Medicines Governance committees (paediatrics) (1) • Preferred Medicines List (1) • Medicines Utilisation Committee (1) 	
Committee primarily responsible for co-ordinating activities related to optimising antimicrobial use	
Antimicrobial stewardship	10 (50%)
Infection prevention and control	5 (25%)
Drugs and therapeutics	3 (15%)
Other committee relevant to AMS:	2 (10%)
<ul style="list-style-type: none"> • Infection team (1) • No committee (1) 	
Frequency of committee meetings	
Fortnightly	2 (10%)
Monthly	11 (55%)
Every two months	5 (25%)
Every three months	1 (5%)
Not applicable (no committee responsible for antimicrobial activities)	1 (5%)
Strategic plan	
Formal written strategic plan for AMS at the DHB	
No	15 (75%)
Yes	5 (25%)
<ul style="list-style-type: none"> • Reviewed annually (1), every two years (2), not known/unclear (2) • Signed off at corporate level (3) • Refers to New Zealand Health & Disability Infection Control standards NZS 8134.3.6:2008 Standard 6 for antimicrobial usage (3) 	
Budget	
Presence of a dedicated budget for AMS activities (excluding salaries)	
No	20 (100%)
Yes	0 (0%)
Policies	
Antimicrobial prescribing and management policy/guideline in place	
No	2 (10%)
Yes	18 (90%)
Regional AMS	
Involvement in regional AMS activities, eg, shared guidelines	
No	9 (45%)
Yes	11 (55%)

*One or more responses were able to be selected by respondent.

**One committee covered both drugs & therapeutics and quality & safety, and is included as a separate count for the respective committee types.

Lead clinicians and pharmacists

Eleven DHBs (55%) had a lead AMS pharmacist, with nine having dedicated salaried full-time equivalents (FTEs) for the role (Table 2). Six of the latter positions were full time (0.9–1.0 FTE), and three were part time (≤ 0.6 FTE). The six full-time positions resided in the six largest DHBs (based on bed number), ie, Canterbury, Auckland, Waitemata, Counties-Manukau, Waikato and Capital & Coast, and five of these DHBs also had tertiary hospitals. The seventh largest DHB and the remaining DHB to have a tertiary hospital (Southern) did not have an AMS pharmacist.

Fifteen of 20 (75%) DHBs had a clinician lead for AMS activities (Table 2). These clinicians were reported as specialists trained in ID (10/15), clinical microbiology (3/15), dual trained in ID and microbiology (1/15)

or general medicine (with experience in ID) (1/15). Eight DHBs had dedicated full-time equivalents (FTEs) for the clinician lead, these were all less than 0.4 FTE, with most (6/8) having no more than 0.2 FTE.

Figure 3 shows dedicated AMS pharmacist and lead clinician time in each of the 20 DHBs, expressed per 100 acute bed days (self-defined). Horizontal lines depict Australian recommendations for AMS pharmacist and lead clinician time.⁵ Accepting the challenges with defining acute beds, four DHBs met or exceeded recommendations for clinician time (Hawkes Bay, Hutt Valley, South Canterbury and Wairarapa), and one DHB approximated recommended pharmacist time (Hutt Valley). One DHB met recommendations for both pharmacist and clinician time (Hutt Valley).

Figure 1: Disciplines on committees responsible for antimicrobial usage.

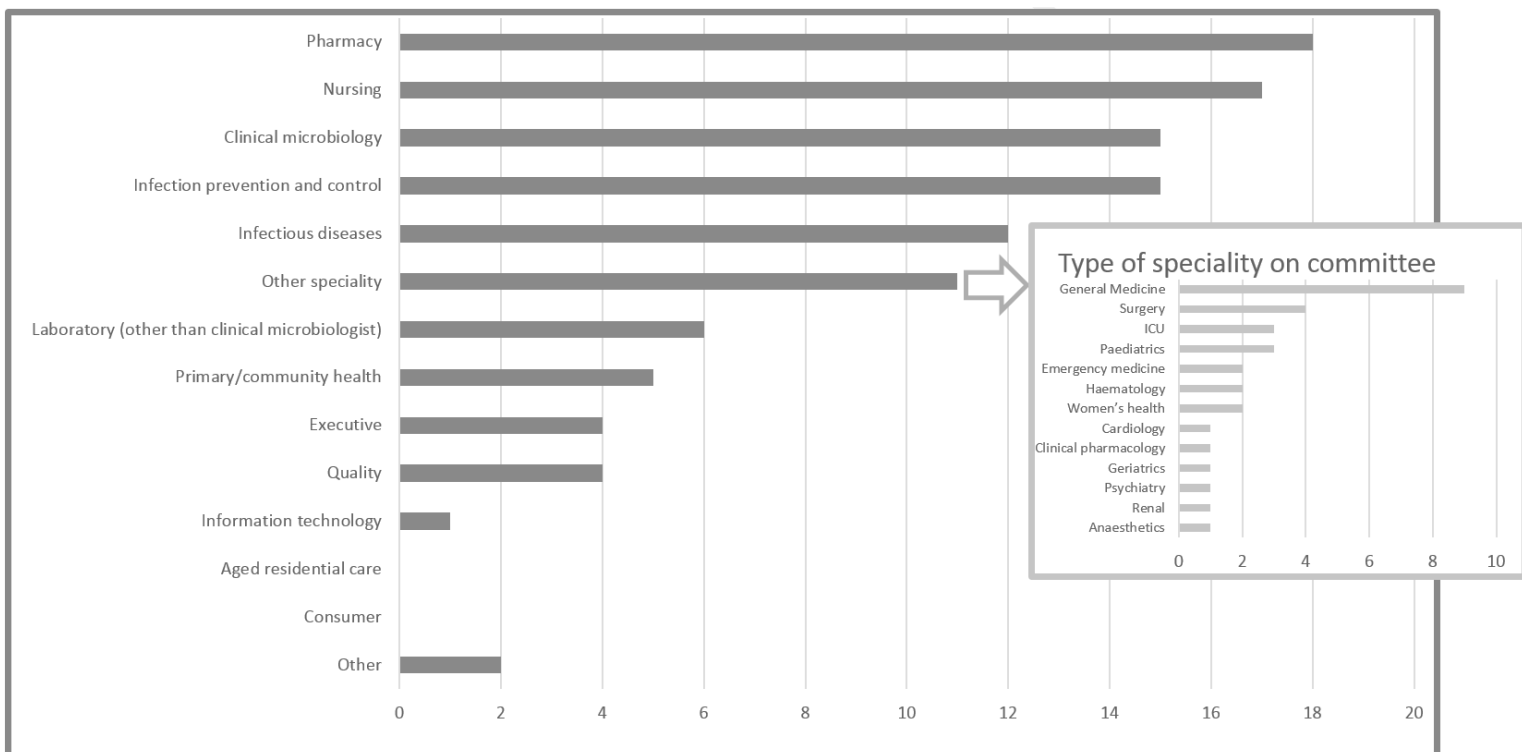
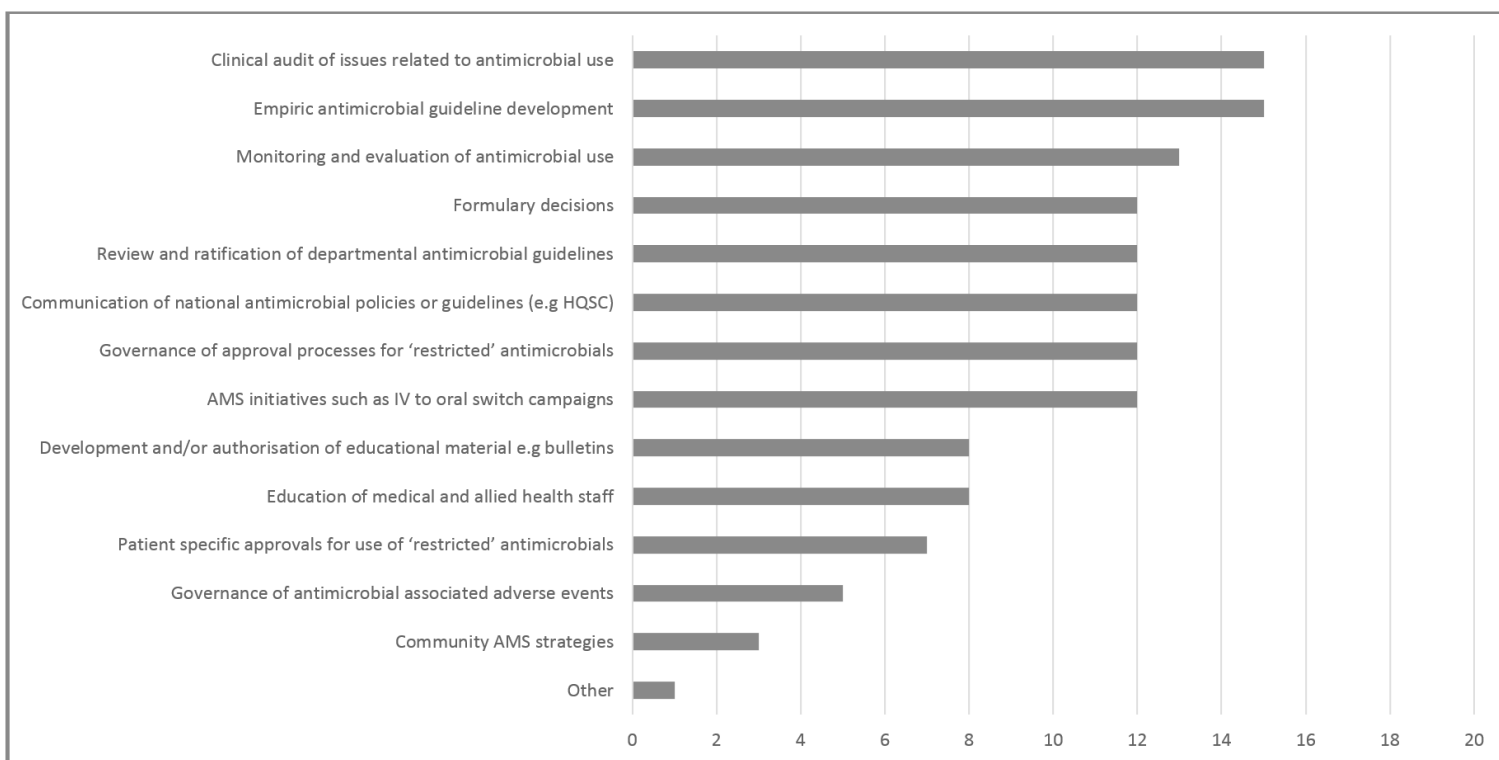


Figure 2: Types of activity undertaken by committee responsible for antimicrobial usage.

Strategic plan, budget and antimicrobial prescribing policy

Five DHBs (25%) had formal written strategic plans for AMS (Table 1).¹¹ Most DHBs (18/20) had antimicrobial prescribing and management policies (Table 1), with the most frequently included topic being guidelines for antimicrobial prescribing (18/18) (Figure 4). Excluding salaries, no DHB had a budget specifically for AMS activities such as campaigns or information technology (Table 1).

Regional AMS activities

Eleven DHBs participated in regional activities, primarily shared antimicrobial guidelines. Three lower North Island DHBs (Capital & Coast, Hutt Valley and Wairarapa) had a working '3DHB' guideline, while the three Auckland metropolitan DHBs (Auckland, Counties-Manukau and Waitemata) had regional community guidelines and aimed for consolidation of hospital guidelines where possible. The five South Island DHBs (Canterbury, Nelson-Marlborough, South-Canterbury, Southern, West Coast) had formed a South Island Hospital Antimicrobial Guidelines Group to produce joint antimicrobial guidelines.

Barriers to implementing an AMS programme

Most DHBs (19/20) reported barriers to implementing AMS programmes, with inadequate resourcing (staffing, IT support, software, budget and time) as the key issue. Eleven DHBs explicitly stated staffing was a barrier, eg:

- *"No onsite infectious diseases consultant. No onsite microbiologist. No formal pathway for referral to these specialists. No formal medical lead for [AMS]. No dedicated pharmacist lead for [AMS]"*,
- *"No dedicated infectious disease FTE or pharmacy FTE towards antimicrobial stewardship"*.

Lack of senior clinician buy-in and/or challenges in reaching agreement was the second most common theme, eg:

- *"Drs are often confrontational when pharmacy ask for ID approval of restricted [antibiotics]"*,
- *"...many staff do not see AMS as a priority"*.

Table 2: Key AMS resources in each DHB (from largest to smallest based on total bed number).

DHB	Ministry of health data		DHB response					
	No. beds	Certified Public Hospital Providers* (No. beds)	Acute beds	Lead clinician**		Lead pharmacist		AMS Committee
				Y/N	FTE	Y/N	FTE	
Canterbury	1,463	Christchurch (811), Ashburton (48), Burwood (276)***, Hillmorton (144), Princess Margaret (52)***, Tuarangi (39), Kaikoura (21), Rangiora (16), Oxford (15), Waikari (11), Darfield (10), Ellesmere (10), Lincoln (7), Chatham Islands (3)	800	Y (ID)	0.1–0.2	Y	0.9–1.0	Y
Auckland	1,329	Auckland City (1,124), Auckland DHB X 3 Units – Mental Health (96), Buchanan Rehabilitation (40), Greenlane (31), Rehab Plus (28), Pitman (10)	800	Y (ID)	-	Y	0.9–1.0	Y
Waitemata	1,154	North Shore (670), Waitakere (283), Mason Clinic (106), Elective Surgery (30), He Puna Waiora (39), Wilson Centre (26)	830	Y (ID)	-	Y	0.9–1.0	Y
Counties Manukau	937	Middlemore (745), Manukau Surgery (78), Pukekohe (34), Auckland Spinal Rehabilitation (20), Tamaki Oranga (20), Botany Downs (12), Franklin Memorial (18), Papakura Obstetric (10)	900	Y (ID)	-	Y	0.9–1.0	Y
Waikato	904	Waikato (620), Henry Rongomau Bennett (97), Thames (52), Matariki (32), Rhoda Read (32), Tokora (21), Te Kuiti (16), Taumararua (14), Ward OPR1 (15), Puna Whiti (5)	600	Y (Mic)	-	Y	0.9–1.0	N
Capital & Coast	764	Wellington (484), Kenepuru (131), Porirua (118), Wellington (Mental Health) (29), Kapiti Health (2)	470	Y (ID/Mic)	0.1–0.2	Y	0.9–1.0	Y
Southern	710	Dunedin (400), Wakari (120), Southland (176), Lakes District (14)	465	Y (ID)	-	N	-	Y
Bay of Plenty	444	Tauranga (369), Whakatane (69), Opotiki (6)	350	N	-	N	-	N
Hawkes Bay	384	Hawke's Bay (364), Wairoa (12), Central Hawkes Bay (8)	400	Y (ID)	0.3–0.4	Y	0.3–0.4	N
Mid Central	358	Palmerston North (330), Horowhenua (28)	250	Y (ID)	-	Y	0.5–0.6	Y
Nelson-Marlborough	350	Nelson (191), Wairau (100), Mental Health Admissions (26), Tipahi St (13), Alexandra (12), Murchison (8)	165	Y (ID)	0.3–0.4	N	-	N
Hutt Valley	322	Hutt Valley (322)	210	Y (ID)	0.1–0.2	Y	0.5–0.6	Y
Northland	320	Whangarei (249), Kaitiaki (32), Bay of Islands (20), Dargaville (19)	300	Y (Mic)	0.1–0.2	N	-	N
Lakes	228	Rotorua (201), Taupo (27)	120	N	-	N	-	N
Taranaki	208	Taranaki Base (194), Hawera (14)	220	N	-	N	-	N
West Coast	161	Grey Base (114), Buller (32), Reefton Health (15)	78	Y (GM)	-	Y	-	N
Whanganui	172	Whanganui (172)	130	N	-	N	-	N
South Canterbury	133	Timaru (133)	131	Y (Mic)	0.1–0.2	N	-	Y
Tairāwhiti	115	Gisborne (115)	100	N	-	N	-	N
Wairarapa	85	Wairarapa (85)	75	Y (ID)	0.1–0.2	Y	-	Y

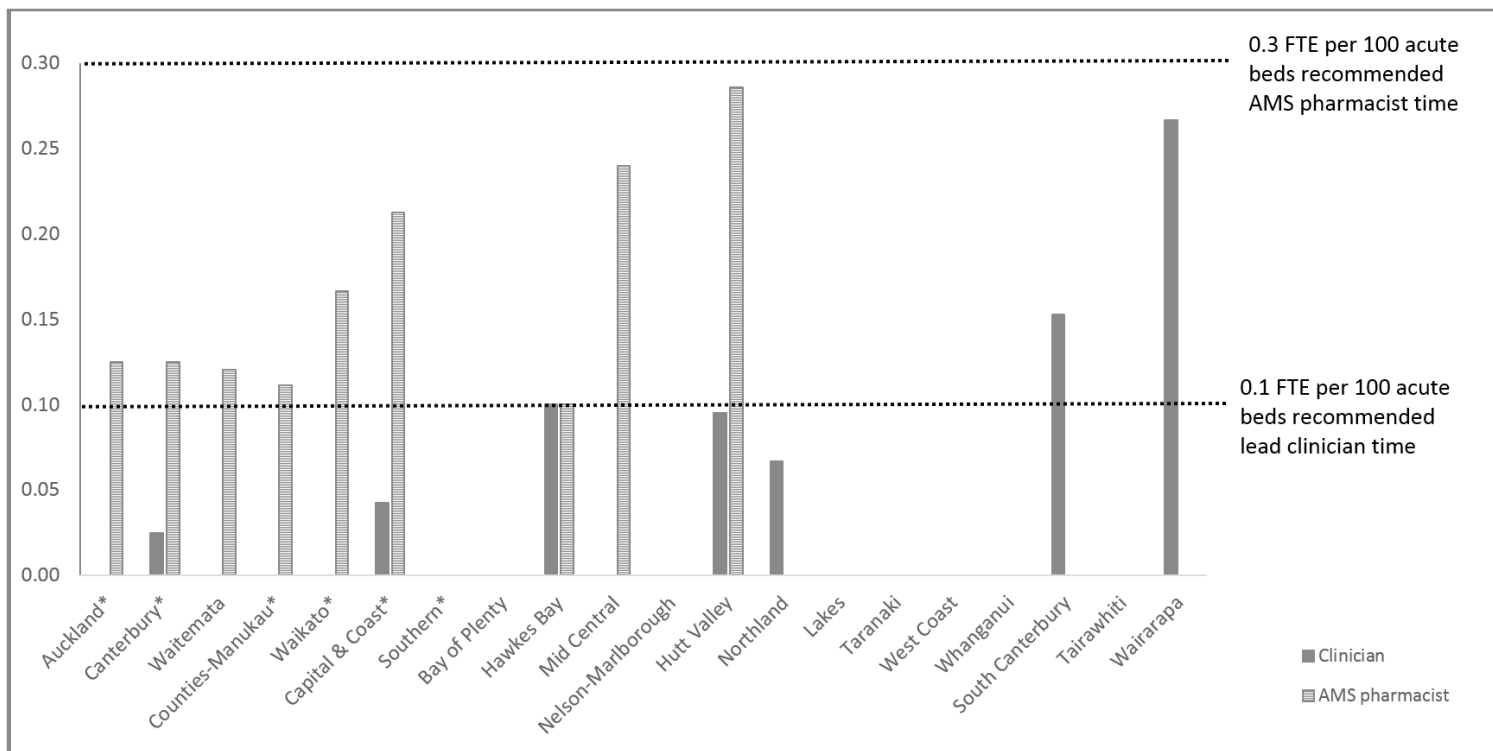
*www.health.govt.nz/your-health/certified-providers/public-hospital

**ID = infectious diseases physician, Mic = clinical microbiologist, GM = general medicine physician, N/G = not given.

***from inpatient occupancy data

Shaded area indicates DHBs with tertiary-level care hospitals.

Figure 3: Number of lead clinician and AMS pharmacist FTEs per 100 acute bed days.



Audit and surveillance

Twelve DHBs (60%) indicated they described antimicrobial usage by at least one metric, most commonly defined daily doses (11/12) and costs (8/12). Eight DHBs had regular reporting schedules of three, six or 12 monthly (Table 3). Most DHBs (16/20) produced an antibiogram (Table 3), but not all made these available to prescribers (13/16). All DHBs had defined surveillance programmes for multi drug-resistant organisms, surgical site infections and central-line associated blood stream infections, and most (75%) tracked cases of *Clostridium difficile* infections (15/20).

Key AMS interventions

Antimicrobial guidelines

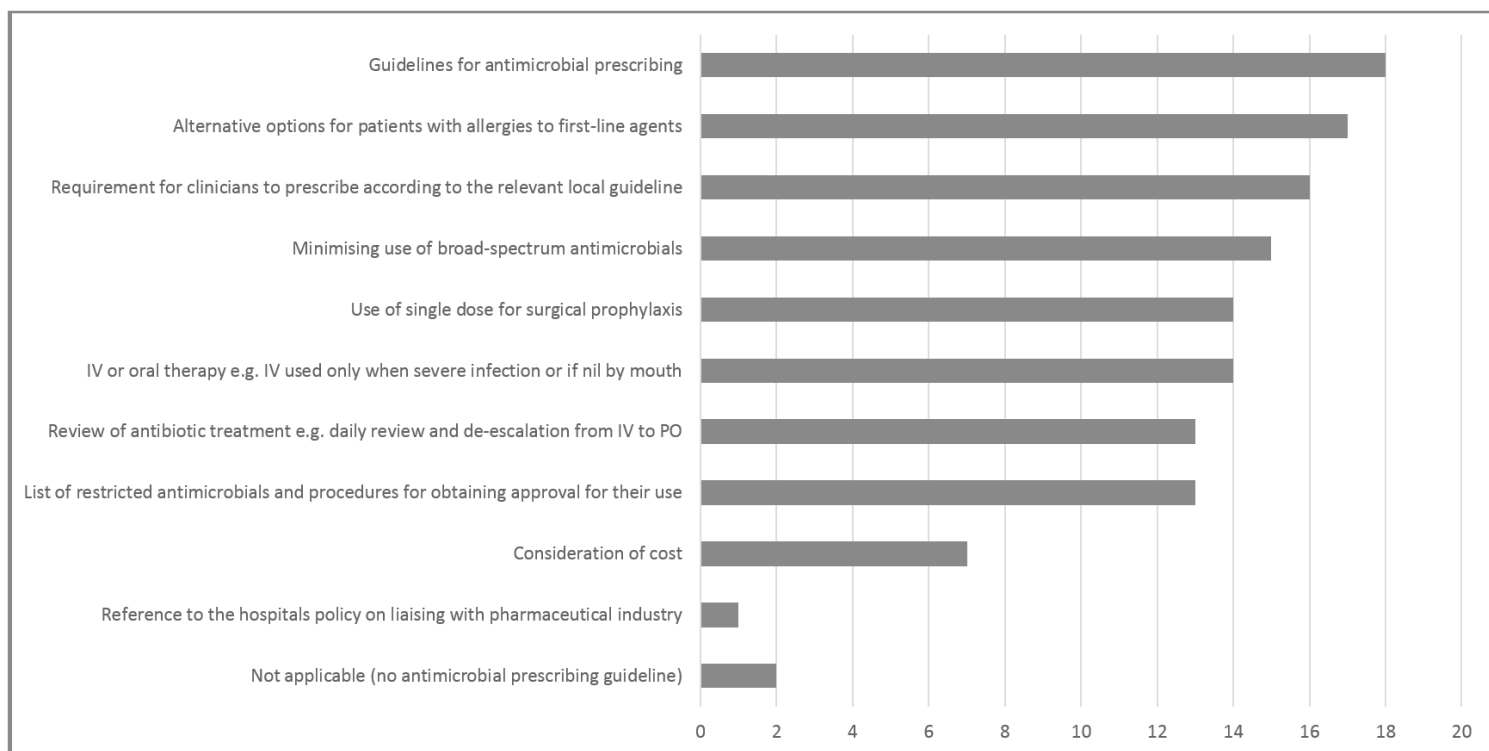
Nineteen DHBs had their own antimicrobial guidelines, with nine having all of the treatment guidelines listed, and most (19/20) having guidelines for meningitis, sepsis, skin and soft tissue infections, and community-acquired pneumonia (Table 4). Guidelines were reviewed every one (6/19), two (7/19) or three years (6/19), and were predominantly published on the intranet (19/19).

Audits

Nineteen DHBs (one DHB did not respond to this question) performed at least one antimicrobial audit in the preceding 12 months, with a median of three audits (range: one to five) undertaken. Six DHBs reported conducting point prevalence studies. The most frequently investigated indication- and antimicrobial-focused audits involved community-acquired pneumonia (six DHBs) and gentamicin (four DHBs), respectively. Nine audits were undertaken in eight DHBs on surgical prophylaxis, but it is unclear whether these were separate to the monitoring required as part of the Health Quality and Safety Commission (HQSC) Surgical Site Infection Improvement programme.

Restricted antibiotics

PHARMAC requires that some antimicrobials (eg, ciprofloxacin, vancomycin) have ID or clinical microbiology approval for use, via specific-patient consultation or through compliance with a DHB guideline. In the absence of a guideline, 11 DHBs allowed the restricted antimicrobial to be started without approval with endorsement required for continuation, three DHBs

Figure 4: Antimicrobial policy content.

required approval pre-initiation and three had a hybrid of these two courses of action (ie, prior approval within working hours but post-approval after hours). Three DHBs appeared to have different approaches, ie, “AMS review on a regular basis”, “theoretically requires clinical microbiologist consultation” or “not enforced, ad hoc by individual pharmacists”. In terms of access to restricted antimicrobials, most DHBs (17 of 19 that responded to this question) dispensed restricted antimicrobials for specific patients, with some having ward stocks in high use areas such as intensive care. In these DHBs, after-hours access to restricted antimicrobials is via emergency drug cupboards (or similar) or the on-call pharmacists. Two DHBs implied restricted antimicrobials were more readily available as ward stock.

Other AMS interventions

Three DHBs reported having AMS ward rounds (Table 5), although only two of these appeared to be distinct from an ID consult and bacteraemia service. Both of these sites involved an AMS pharmacist and at least one ID doctor or clinical microbiologist, with rounds undertaken one to four times weekly. Referrals were received from

doctors or pharmacists, with other triggers for review, including use of specific antimicrobials (eg, carbapenems).

Other AMS interventions (Table 5) included a policy for the indication to be documented on the drug chart (4/20), or the requirement to review appropriateness of antimicrobials at a specific time post-prescription (8/20). No feedback was sought within the survey on the likely compliance with these guidelines but no DHB included audit of these policies among the audits undertaken in the preceding 12 months (Table 5). Education on AMS activities was reported to be given to clinical staff (mainly doctors and pharmacists) in the preceding 12 months at 17 DHBs, with grand grounds (12/17), regular teaching slots (11/17) and electronic bulletins (8/17) the most common format for information (Table 5). Seven DHBs (35%) had provided direct personalised communication about how to improve antimicrobial prescribing.

Nine DHBs provided additional comments with two-thirds signalling enthusiasm to undertake AMS activities, but a struggle to obtain sufficient resources, eg:

- “We would love to do more formal AMS work but major restriction is time. We

Table 3: Audit and surveillance.

Metrics	
Metrics used to describe antimicrobial use (consumption)*	
Number of grams of antimicrobials used (Defined Daily Dose, ie, 'DDD')	11 (55%)
Direct expenditure on antimicrobials (purchasing costs)	9 (45%)
Counts of antimicrobials administered to patients per day (Days of Therapy, ie, 'DOT')	1 (5%)
Not done	8 (40%)
Frequency of reporting on antimicrobial use (eg, as costs or DDDs) to hospitals or clinical areas	
Monthly	0 (0%)
3 monthly	2 (10%)
6 monthly	2 (10%)
12 monthly	4 (20%)
Never	8 (40%)
Other	4 (20%)
<ul style="list-style-type: none"> • Only when requested (2 of 4) • Work in progress (2 of 4) 	
Antibiogram (cumulative antimicrobial susceptibility report)	
Available at the DHB	
No	4 (20%)
Yes	16 (80%)
How is the antibiogram disseminated*	
DHB intranet	9 (45%)
Hardcopy, eg, booklet or bulletin	3 (15%)
E-mail	7 (35%)
Poster	0 (0%)
Not applicable	4 (20%)
Multidrug resistance organisms and healthcare associated infections	
Defined and documented surveillance programmes at the DHBs*	
Monitoring of MDRO occurrence, eg, methicillin resistant <i>S. aureus</i>	20 (100%)
Surgical site infection	20 (100%)
Central-line associated bloodstream infection	20 (100%)
<i>Clostridium difficile</i> infection	15 (75%)
Catheter associated urinary tract infection	3 (15%)
None	0 (0%)
Other	3 (15%)
<ul style="list-style-type: none"> • Hospital-acquired <i>S. aureus</i> blood stream infection (2 DHBs) • Hospital-acquired blood stream infections (1 DHB) 	

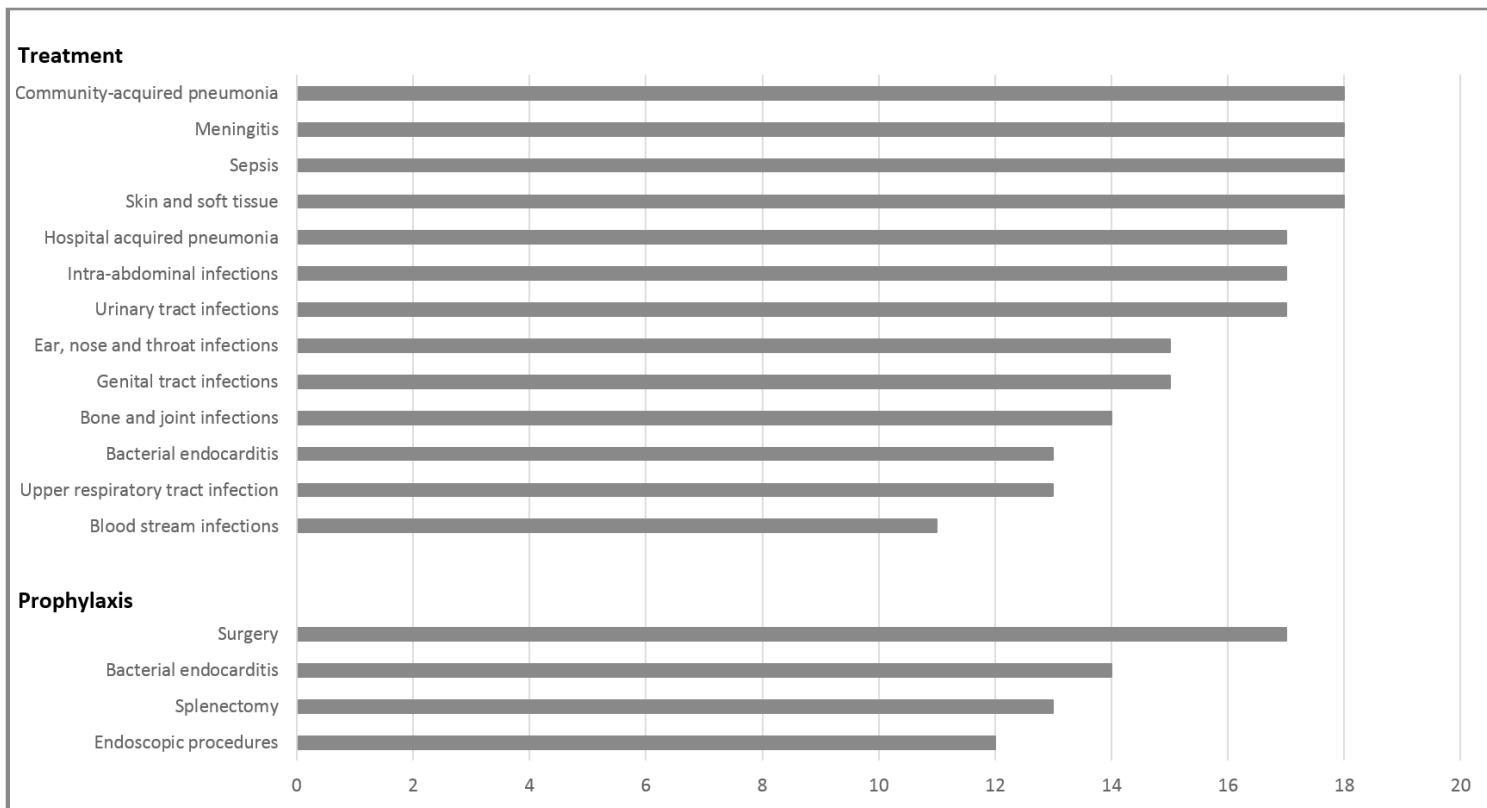
*One or more responses were able to be selected by respondent.

Table 4: Antimicrobial guidelines.

Guidelines	
Presence of DHB specific antimicrobial guidelines	
Yes	19 (95%)
No	1 (5%)
Frequency of DHB guideline review	
Every year	6 (30%)
Every two years	7 (35%)
Every three years	4 (20%)
Other	2 (10%)
<ul style="list-style-type: none"> • last review 3–4 years prior, involved in regional guidelines (1) • ‘as required’ (1) 	
Not applicable	1 (5%)
Resources used to develop DHB guidelines*	
Local microbiology and antimicrobial susceptibility patterns	16 (80%)
Therapeutic Guidelines of Australia ‘Antibiotic’	14 (70%)
Expert opinion	15 (75%)
Key consensus guidelines, eg, Infectious Diseases Society of America	13 (65%)
The Sanford Guide to Antimicrobial Therapy	12 (60%)
UpToDate	11 (55%)
New relevant research published on the topic	11 (55%)
BPAC (NZ) Antibiotics–choices for common conditions	9 (45%)
Other, eg, another DHB’s guideline	11 (55%)
Not applicable (no guidelines)	1 (5%)
Presentation of guidelines to clinical staff*	
DHB intranet	19 (95%)
Lanyard cards (eg, summary of key guidelines)	7 (35%)
Hardcopy	5 (25%)
Mobile devices – PDF (1), mobile friendly internet site (1), ‘App’ (3)	4 (20%)
Internet	2 (10%)
Posters (eg, summary of key guidelines)	2 (10%)
Other – e-book (1), verbal education sessions, eg, grand rounds (2)	3 (30%)
Not applicable	1 (5%)
Antimicrobial guidelines encouraged for use at DHB*	
Your own DHB’s guidelines	19 (95%)
BPAC (NZ) antibiotics – choices for common conditions	3 (15%)
Another DHB’s guidelines – ADHB (1), CCDHB (1), CDHB (3), Waikato (2)	5 (25%)
Starship hospital guidelines	3 (15%)
Sanford guide to antimicrobial therapy	2 (10%)
UpToDate	2 (10%)
Therapeutic Guidelines of Australia ‘Antibiotic’	0 (0%)

*One or more responses were able to be selected by respondent.

Figure 5: Guidelines for empiric treatment and for prophylaxis in place in the 20 DHBs.



would welcome a requirement for AMS activities and better still FTE for DHBs as has been developed in Australia. It would be beneficial if such requirements are implemented at clinician level as well as organisation level to encourage buy in from senior clinicians in denial of the role of AMS and specialist knowledge and skills of the infection service” and

- “The pharmacy department are keen to play a role in AMS, however, find that we do not have the manpower to provide an efficient service. Being a small DHB we do not have a specialist ID consultant on site and therefore find it challenging to question the use of unnecessary antibiotics.”

Discussion

No other class of drugs has revolutionised medicine as much as the antimicrobials. However, their ability to prevent and cure infection is diminishing, with the burgeoning emergence and spread of resistant organisms. New Zealand has been relatively insulated from this issue, but the

last two decades have seen a clear increase in the prevalence of resistant organisms, which can cause infections that are harder to treat, resulting in prolonged hospital stays, increased mortality and greater healthcare costs. One of the key drivers for resistance is antimicrobial use, both appropriate and inappropriate. International research¹³ and local studies^{10,14} indicate that New Zealand has high antimicrobial use compared with other developed countries, and that this primarily resides within the community sector and is increasing. This increase in use of antimicrobials in New Zealand contrasts with the decrease seen in the UK,¹⁵ which has a national strategy and programme in place for antimicrobial resistance and AMS. New Zealand must follow suit.

This survey of AMS practices in New Zealand public hospitals provides an opportunity to compare current activities against international best practice. Overseas authorities advise that AMS programmes are implemented in all acute care hospitals,^{5,16} with recommendations for core components of successful programmes outlined in key documents.⁷ In order to be accredited in

Table 5: AMS interventions (n=20 DHBs, unless otherwise specified).

Presence of AMS ward rounds (exclude ID consults, bacteraemia services)	
No	17 (85%)
Yes	3 (15%)
Policy requiring documentation of the indication for antimicrobial use on the drug chart	
No	16 (80%)
Yes	4 (20%)
Procedure for review of appropriateness of antimicrobials at specified time frames post-prescription	
No	12 (70%)
Yes	8 (40%)
Direct personalised communication about how to improve antimicrobial prescribing	
No	13 (65%)
Yes	7 (35%)
Methods of providing education on AMS activities to clinical staff in previous 12 months (n=18)*	
Grand rounds	12 (67%)
Regular teaching slots, eg, for undergraduate students	11 (61%)
Bulletins – electronic	8 (44%)
Bulletins – hardcopy	4 (22%)
Local AMS intranet/internet site	4 (22%)
Other – irregular teaching (1), intranet (1), medical staff orientation (1)	3 (17%)
Not done	1 (6%)
Disciplines provided with AMS education (18 responses)*	
Registered medical officers	16 (89%)
Pharmacists	15 (83%)
Nurses	13 (72%)
Senior medical officers	12 (67%)
Nurse prescribers	5 (28%)
Midwives	3 (17%)
Pharmacist prescribers	2 (11%)
Dentists	1 (6%)
Other – medical students (1), GPs (1), medical & nursing students (1)	3 (17%)
Not applicable	1 (6%)

*One or more responses were able to be selected by respondent.

Australia,¹⁷ hospitals should have “safe and appropriate antimicrobial prescribing [as] a strategic goal of the clinical governance system” with

1. presence of an AMS programme,
2. availability of antibiotic guidelines,
3. monitoring of antimicrobial usage and resistance,
4. ongoing efforts to improve AMS.

More specific clinical care standards, such as appropriate microbiological sampling, timely review of antimicrobial prescriptions and patient education support this.¹⁸

If current practice in New Zealand is compared against Australian hospital accreditation requirements, then a starting place is whether or not we have AMS programmes in place. At the core of a successful AMS programme is the personnel, which should, in the New Zealand context, include both an AMS pharmacist and a lead clinician (ideally an ID physician or clinical microbiologist) at a minimum. Funding for AMS pharmacists in nine of our DHBs and for lead clinicians in eight DHBs (four DHBs had both) is positive and signals some leadership support. However, only one of our DHBs met Australian recommendations for number of pharmacist and clinician FTE per 100 acute beds,⁵ suggesting that even DHBs with dedicated staff are underpowered to achieve the mission of effective AMS. Perhaps the greater issue is that a number of DHBs lack any suitable access to either an ID physician or a clinical microbiologist, and struggle to have any AMS activity at all.

It is reassuring that half of our DHBs have dedicated AMS committees. Tasking other committees (eg, drugs and therapeutics) with antimicrobial activities is probably reasonable in smaller DHBs provided that appropriate staff are present and sufficient time and thought is dedicated to the subject. Support from national or regional centres would encourage this development. Pleasingly, almost all DHBs (18/20) had a policy for antimicrobial prescribing in place (although compliance with these policies is not known), but only five had a formal strategic plan for AMS. The lack of strategic plans is perhaps understandable given there is no national strategy or direction to tie into and poor access to data to identify areas to improve.

All but one DHB (ie, 95%) stated that they have their own antimicrobial guidelines. Current New Zealand standards¹¹ indicate that antibiotic guidelines should be consistent with local resistance data, discourage use of certain antibiotics and have clear recommendations for dose, timing and duration of surgical prophylaxis. Sixteen of the DHBs (80%) used local microbiology and susceptibility patterns to inform guideline development, and surgical prophylaxis guidelines were reported present in 17 DHBs. Australian standards¹⁹ indicate that clinicians should have access to national guidelines. Unlike Australia, which has five times the population and nearly 30 times the land mass, New Zealand does not have national guidelines due to issues such as lack of funding, resourcing and central commitment to support this work. A move towards regional guidelines is, however, a positive step that will facilitate prescribing consistency. It will also allow more accurate comparisons of prescribing practice between DHBs and help identify opportunities for learning from AMS interventions that improve prescribing.

Monitoring of antimicrobial usage and resistance is the third of four action points in the Australian national standards. All of our 20 DHBs reported monitoring for antimicrobial resistant organisms, but this is not surprising given that they are driven by national standards “surveillance shall be conducted on multi-resistant organisms”¹¹ and supported centrally by the Institute of Environmental Science and Research (ESR) and the Health Quality and Safety Commission (HQSC). Antimicrobial usage was understandably less well-monitored, with no standard or central support, with only 12 DHBs (60%) describing monitoring antimicrobial usage in some form. Clear national guidance on the format of data collection and co-ordination of activities is required to facilitate this process. There is inter-DHB willingness to standardise process with collaborative work on antimicrobial usage already published.¹⁰ However, this work only investigates one aspect of antimicrobial use (inpatients) and consideration of other aspects of hospital antimicrobial use (eg, outpatient home IV therapy, discharge scripts) must also be considered with input from PHARMAC and the Pharmaceutical Collection database.

The fourth point in the Australian national standards relates to ongoing efforts to improve AMS. New Zealand's early development with AMS programmes shows via this survey that all DHBs have areas to improve on.

This paper is the first to describe quantitatively the extent of AMS activities in New Zealand public hospitals. It signals some positive steps, with dedicated AMS committees in half of our DHBs and employment of AMS pharmacists in nine DHBs. However, it is clear that our national standards for antimicrobial use in healthcare require updating to reflect international best practice and to ensure AMS, which is still very much in its infancy in New Zealand hospitals, becomes a priority

for our DHBs. There does need to be some flexibility in how AMS programmes look across New Zealand, to reflect variation in size of hospitals and DHBs, however, core elements can be established and agreed. Further, it is important to recognise that the bulk of human antimicrobial use in New Zealand does not reside with hospital inpatient prescribing. Emphasis must focus upon community antimicrobial use. The introduction of AMS programmes into New Zealand hospitals in recent years is positive, but is merely a start of the efforts required in New Zealand. To meet international standards for AMS and promote appropriate use of DHB resources and engagement with primary care, national leadership with government commitment to funding and resourcing is required.

Competing interests:

Nil.

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Unravelling the whāriki of Crown Māori health infrastructure

Heather Came, Keith Tudor

ABSTRACT

New Zealand's central government, and more specifically the Ministry of Health, consistently acknowledges their *special relationship* with Māori and the *strategic importance* of Māori health, and certainly, strengthening Māori health is critical to addressing systemic health inequities. This paper, framed in terms of the Crown principles attributed to the *Treaty of Waitangi*, ie, participation, protection and partnership, examines three structural decisions that threaten to unravel the whāriki (foundational mat) of Crown Māori health policy infrastructure. These include the disestablishment of the Ministry of Health's policy team, Te Kete Hauora, revoking mandatory district health boards' (DHB) Māori health plans and reporting, and downscaling the requirements of DHBs to consult. These actions appear to breach the Articles of te *Tiriti o Waitangi* and may be cited as such in the forthcoming WAI 2575 kaupapa health hearing before the Waitangi Tribunal. The authors call for the Ministry of Health to embrace its Treaty obligations, and to protect and reinstate the whāriki of Māori health infrastructure.

Despite the special relationship between the Crown—including its agencies, such as the Ministry of Health—and Māori in this country, systemic health inequities between indigenous and settler populations persist.¹ Historically, these inequalities may be traced back to the advent of colonisation, land alienation, policies of assimilation, neo-liberalism and legislation such as the *Tohunga Suppression Act 1907*.

In more recent times this has been represented by the omission of any reference to the *Treaty of Waitangi* in the *Health Practitioners Competence Assurance 2003*, an omission that was justified at the time by the Ministry of Health (the Ministry) which claimed that the *New Zealand Public Health & Disability Act 2000* made adequate provision for the Crown's Treaty responsibilities.²

Te Tiriti o Waitangi was New Zealand's first health policy, which formalised a partnership between hapū (sub tribes) and the Crown, and it articulated the terms and conditions of non-Māori settlement. *Te Tiriti* consists of four articles which acknowledge kāwanatanga (governorship), tino rangatiratanga (Māori sovereignty), ōritetanga (equitable outcomes) and wairuatanga

(spiritual freedom).³ Influenced by the writings of Durie, we see health as a taonga (treasure), which was guaranteed protection under Article 2.⁴

Influenced by decades of activism by Māori, challenging the Crown to engage with their Treaty responsibilities, the *New Zealand Public Health & Disability Act (NZPHDA) 2000* requires (under part 1(4)) those working in the health sector recognise and respect the principles of the *Treaty of Waitangi*. The principles they are referring to are those identified by the Royal Commission on Social Policy, that is: participation, protection and partnership.⁵ Under part 5(3)c of the *NZPHDA* there is a specific requirement for district health boards (DHBs) to reduce health disparities by improving health outcomes for Māori, and part 3 outlines requirements around Māori participation.

These Treaty principles and a commitment to Māori health is reinforced in the policy document *He Korowai Oranga*.⁷ Likewise, the current *New Zealand Health Strategy* purports to pursue *equitable outcomes* for all New Zealanders while acknowledging the *special relationship* between the Crown and Māori, and the need to *recognise and respect* Treaty principles.⁸

In terms of Crown Māori health infrastructure, since the Hunn Report,⁹ Māori health within central government has been led by an Interdepartmental Committee on Māori Health, later the Standing Committee on Māori Health, then the Ministerial Advisory Committee, which co-existed with the Ministry's internal Māori health unit—Te Kete Hauora (TKH).¹⁰ These structures were complemented with ongoing engagement with Māori communities and later investment in Māori health providers.

The Ministry has pursued the advancement of health equity and, more specifically, Māori health through i) policy advice from TKH within the Ministry, ii) the requirement of DHBs to consult with Māori and iii) the requirement to develop and report on annual Māori health plans and iv) investment in Māori providers.^{11,10} These pathways have been the whāriki (foundational mat) of Crown Māori health infrastructure. TKH has been a structural mechanism to ensure Māori voice in health policy. Māori health plans have been a key public accountability measure for tracking performance in relation to Māori health. Structurally, the requirement to consult has enabled some Māori input into DHB planning processes. Māori providers have provided a Māori-led option for contracting clinical and public health services.

In March 2016, Te Kete Hauora, the Māori health business unit within the Ministry, was disestablished.¹² In November 2016, the requirement of DHBs to submit and report on annual Māori health plans was revoked and the requirements for DHBs to consult with Māori were downsized.¹³ The authors argue that the whāriki of Crown Māori health infrastructure is being quietly unravelled. Drawing on the Crown's own Treaty principles, this paper explores these potentially far-reaching decisions.

The disestablishment of Te Kete Hauora—non-participation

The principle of participation highlights the Crown's obligation to ensure Māori participation within the health sector, beyond being an end-user of a service. The Royal Commission on Social Policy interpreted participation as encouraging Māori involvement in the planning and design of health policy, and the delivery of health services. This principle was used to enable

the development of specialist Māori health providers.

TKH was established in 1993 as a business unit and later a directorate within the Ministry of Health to provide specialist policy advice on and to address inequalities and inequities in Māori health status.¹⁴ Subsequently, it has been an important structural mechanism for Māori participation in health policy and decision-making. TKH has been a unique Māori voice within the Ministry, providing Māori health expertise and cultural input.

At an operational level, a report commissioned by the Ministry, the Navigate report,¹⁵ noted that “the knowledge of experienced Māori staff is critical to the work of the Ministry in achieving its [Treaty] commitments” (p. 2). This report confirmed that most Māori staff felt culturally compromised within the Ministry. Māori staff reported a lack of support and understanding about Māori ways of working and for uniquely Māori issues. Navigate reported Māori staff were concerned at “the entrenchment of negative views of Māori in the fundamental conceptualisation underlying policies and procedures” (p. 8).

At a macro-level, Deputy Director General Māori Health—Ria Earp, former head of TKH credited the team with encouraging acceptance of the importance of Māori health and reducing inequities within the health sector.¹⁶ Earp explained:

“[TKH] have been building the evidence that Māori need more effective, culturally appropriate services. Māori worked hard over many years to convince government of the necessity for specific, Māori-run social services that would incorporate Māori cultural approaches and would be based on the three key Treaty of Waitangi principles of partnership, participation and protection (p.21).”

Wenn concurred and described TKH as integral to the Ministry in its capacity to develop new policy, analyse proposals and ensure its advice was acted on appropriately.¹⁷ She maintained that TKH “addressed Māori concerns at a macro-level, and with which Māori were comfortable” (p. 61).

Teresa Wall, another former head of the TKH, asserted that “all the work of the Ministry should be aimed at this one goal of

improving Māori health”¹⁸ (p. 11). She also noted that TKH had picked up a monitoring role to assess whether this goal was being achieved and they were actively providing advice about how to strengthen Māori health outcomes.

On 1 March 2016, the Ministry disestablished TKH.¹² Under the new structure there is a solitary Chief Advisor Māori Health who contributes as their capacity and political access permits. Little information is publicly available in relation to this major restructuring. From the new Ministry organisational chart, those TKH staff that remained were dispersed across the Ministry.

The disestablishment of TKH has parallels beyond the health sector. Writing about tertiary education, Potter and Cooper¹⁹ identified a pattern of what they termed ‘white-streaming’, ie, the generalising of designated Māori positions. Their study, commissioned by the Tertiary Education Union, revealed a widespread pattern of disinvestment in Māori designated roles in favour of generalised roles across teaching, student and staff support, and research positions. Staff reported their distress in the changes: many had resigned or wanted to, and reported lower job satisfaction and the loss of collegiality. There was often no rationale given for the restructuring, but it seems to be diluting concentrations of Māori intelligence and downsizing commitment to positive Māori outcomes.

Revoking district health board Māori health plans—unprotective

Kingi described the principle of protection as the Crown’s duty actively to eliminate health inequities at all levels.²⁰ He argued this principle requires positive interventions to improve Māori health outcomes. Traditionally this principle has been addressed through targeted approaches, for instance, in public health, health promotion and primary health.

Māori health plans have been widely used within the health sector as a mechanism for prioritising protecting and monitoring Māori health outcomes. Through these plans, organisations can declare their intentions, commitments and progress towards improving Māori health against defined measures and indicators. The monitoring of

these are a powerful public accountability measure. Likewise, by releasing information publicly, organisations can learn from each other about critical success factors or ineffective approaches.

For some years, the Ministry has held a mandatory requirement for DHBs to produce stand-alone Māori health plans.¹³ These plans were to detail DHBs’ commitment to the Ministry’s priority areas such as immunisation, mental health, rheumatic fever and oral health. In developing these plans, DHBs had the opportunity to engage with local stakeholders, including Māori health providers and iwi, to align planning to reflect Māori aspirations.

For the 2017/18 DHB annual planning process, the requirement for developing a Māori health plan was revoked by the Ministry without consultation.²¹ Several DHBs raised concerns about the loss of accountability, the increased risk of poorer Māori health outcomes and the lack of clarity around evaluation.²² One noted the changes would undermine Trendly^{beta}, an innovative web-based resource that enabled Māori and others to monitor and bench-mark DHB performance in relation to Māori health.²³

The Ministry’s response to the DHBs was that the Māori health indicators could be incorporated within the annual plan, though detail around specific action should not be included.²² Furthermore, it confirmed that, where measures could be disaggregated by ethnicity, there would be no differential targets; however, such disaggregation itself undermines the the ability of DHBs to address inequity. Nevertheless, regardless of Ministry requirements, a number of DHBs may continue to develop Māori health plans because they feel it is the tika (correct) thing to do in order to maintain their relationships with Māori (DHB colleague, personal communication, 20 December 2016).

Downscaling consultation in DHB annual plans—the lack of partnership

DHB annual planning processes are of strategic importance as they determine where the bulk of Vote Health is invested. These plans are expected to be aligned to detailed Ministry guidelines;^{21, 24} DHBs need to undertake consultation, the plans are

reviewed by the Minister of Health and, if they are satisfied, funding released.

The 2017/18 guidelines are highly prescriptive and include a strict word count in a new streamlined process,²⁵ and the previous requirement to consult²¹ has been dropped from the new guidelines. However, we anticipate that, again, some DHBs will formulate a Māori health plan and engage with their partners.

Well-planned consultation can build on knowledge and experience, test assumptions and produce workable solutions. Both the Ministry and DHBs have statutory obligations to consult with Māori through the *New Zealand Public Health & Disability Act 2000*. The Ministry has published consultation guidelines, which emphasise the special relation between Māori and the Crown and the importance of the Treaty principles, and confirm that implicit in the Treaty principles is the requirement to consult on matters that affect Māori.²⁶

Kingi²⁷ argued that the principle of partnership refers to the obligation of the Crown to include Māori in the design of legislation, policies and strategies. This principle is a response to concerns that for instance, generic planning and interventions do not address the specific cultural, social and economic determinants of Māori health, ie, their ill-health. Cultural knowledge and expertise are therefore important in the development of health policy where Māori are part of the target population.²⁸

Came reported senior Māori leaders' many concerns about Crown consultation processes.²⁹ These included tight (and therefore disrespectful) timeframes, the (biased) framing of questions, the restriction of who was included in the consultation process (which, by definition, undermines the principle of partnership), how consultation was conducted (ie, along lines decided by Pākehā, and not observing Māori tikanga (customs and correct protocols)) and, critically, what happened to the contributions afterwards. Decades into their careers, some leaders reported that Crown officials were just not listening, and they noted that recommendations from key health hui from the 1980s and 1990s still remain unaddressed.

A recent report by the Controller and Auditor-General revealed a plethora of problems with existing DHB reporting on

Māori health,³⁰ in which context, we suggest that the removal of requirements to report on this aspect of our nation's health only supports a lack of accountability, and ultimately greater inequity.

Implications for practice

The three decisions made by the Ministry of Health and as outlined in this paper contradict the recommendation of Cram's study of health equity—and inequity—commissioned by the Ministry of Health.³¹ The study, which drew on nearly 50 key stakeholders from across the health sector as well as international literature on indigenous and minority health, recommended that organisations make explicit organisational commitments to Māori health. Cram proposed setting targets, monitoring progress and collaboration, and advocated for the normalisation of equity analysis through the use of tools and frameworks such as the *Health Equity Assessment Tool*.⁶ Echoing Cram's analysis, we suggest that the decisions reviewed in this paper set back progress towards health equity, especially in the context of *te Tiriti o Waitangi*, as the revoking of the requirements under scrutiny suggest either that health equity has been achieved—which it has not; or that the requirements are not important—which they are. Moreover, such deregulation, in our view, also represents another breach of *te Tiriti o Waitangi*.

Te Tiriti o Waitangi is the founding document of the colonial state of New Zealand and should be considered during the development of all social and economic policy. Through the WAI 2575 kaupapa claim,³² the Waitangi Tribunal has identified approximately 100 health-related deeds of claim since 1840 related to Crown Ministers' and/or Crown Officials' breaches of *te Tiriti*. The three decisions outlined in this paper appear to be further breaches of *te Tiriti*, specifically in reducing the participation of Māori stakeholders in matters that concern their health; in being less protective of Māori health; and in discouraging the participation of Māori for Māori health.

However, while it is tempting to reiterate the importance of the principles of participation protection and partnership,

these principles are part of the problem in that they were defined by Crown agencies without their Treaty partner. Over the years, various politicians and academics have named or claimed as many as 54 principles of the Treaty.³³ Like others, the authors recognise the Māori text of *te Tiriti o Waitangi* as the founding document of the colonial state of New Zealand, a recognition that is in line with the principle of *contra proferentum*, whereby the indigenous language version of a treaty takes preference over any version written in the language of the coloniser(s).

The Ministry of Health seems to be stepping away from their obligations in

relation to Māori health. Te Kete Hauora, mandatory Māori health plans and reporting, consultation with Māori have all been key elements in the whāriki of Crown Māori health infrastructure in this country.¹⁰

³⁴ The health sector needs structures, leadership and support to address the complex challenges of health inequities. Structural mechanisms to ensure Māori input at all levels of decision-making, and accountability mechanisms such as planning and reporting to monitor progress towards health equity are basic Treaty responsiveness measures. To address health inequities, we need Māori-led solutions and a health bureaucracy responsive to its Treaty obligations.

Competing interests:

Dr Came is co-chair of STIR: Stop Institutional Racism—this is a nationwide network of activist scholars and public health practitioners committed to eliminating institutional racism in the health sector.

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Visual symptoms and rapid cognitive decline: Heidenhain variant of Creutzfeldt-Jacob Disease

Karim M Mahawish, Christopher Kabban, Holly Wilson

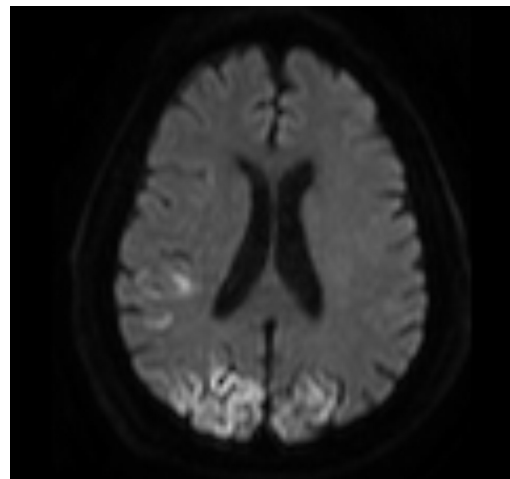
Creutzfeldt-Jacob Disease (CJD) is a rare, progressive and usually fatal prion disease and one of a number of causes of rapidly progressive dementia. Subtypes include familial CJD (inherited gene defect), iatrogenic CJD (transmission during neurosurgical procedures) and variant CJD (transmission of prions from bovine spongiform encephalopathy). Sporadic CJD is the most common form and is thought to arise spontaneously. The main presenting features of CJD are cognitive decline, ataxia and myoclonus. Visual complaints are common and may be the initial presenting symptom in a subset of patients. When these occur in patients who subsequently develop other characteristic features of CJD and specific MRI changes, this is termed the Heidenhain variant of CJD.¹

Case report

A 72-year-old woman presented with a two-month history of altered vision and reduced mobility. The visual disturbance was initially described as spots 'like flies' affecting her entire visual field. Subsequently she experienced a loss of spatial awareness with inability to judge distances resulting in falls and difficulty reaching for and picking up items. An initial review by an optometrist identified no abnormality. In the weeks leading up to her admission, cognitive decline was becoming apparent, with difficulty remembering appointments, names and repetitive conversations, though she was still capable of managing her own financial affairs. During her admission, she was noted to have difficulty positioning limbs, co-ordination and difficulty with transfers. Two weeks following her admission, her vision deteriorated further, with reduced visual acuity and stationary objects appearing to move.

Her past medical history included diabetes and hypertension. There was no family history of note and she had not undergone neurosurgical interventions previously. Admission medication included metformin 850mg BD and amlodipine 5mg OD. Clinical examination revealed a bitemporal hemianopia and binocular reduced visual acuity. Admission electrocardiogram demonstrated atrial fibrillation. An MRI brain showed bilateral abnormal high signal in the subcortical regions of the occipital and parietal lobes on diffusion weighted imaging suggestive of acute ischaemia (Figure 1).

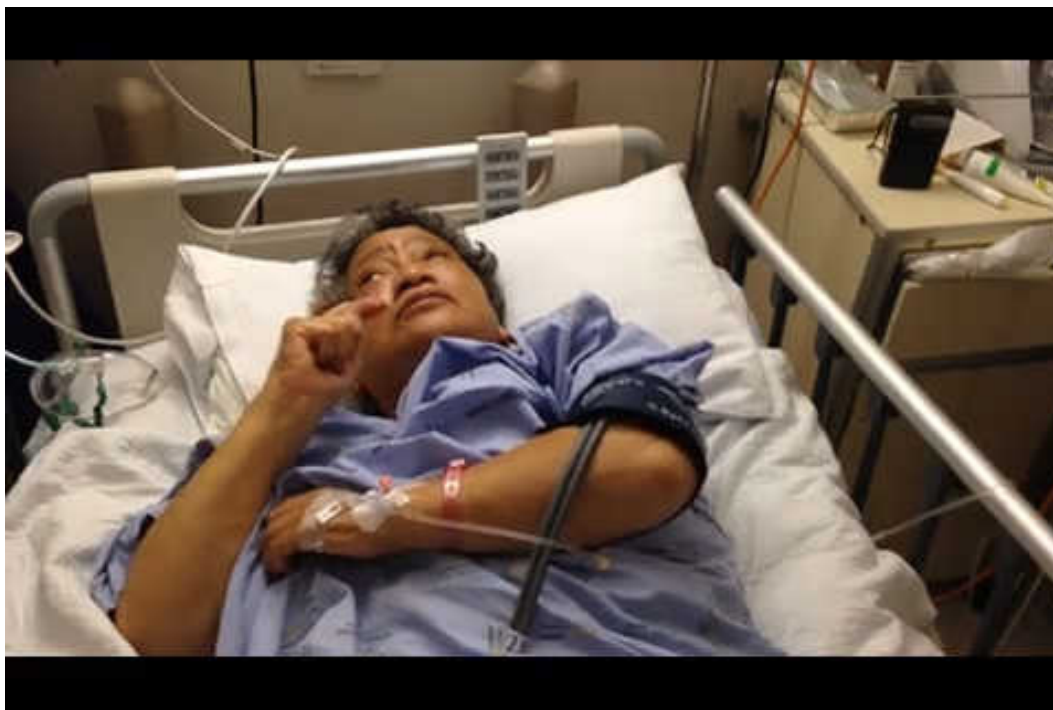
Figure 1: MR DWI demonstrating cortical ribboning in the occipito-parietal lobes bilaterally.



The patient was treated for ischaemic strokes secondary to atrial fibrillation and commenced on dabigatran 150mg BD. At the time of discharge, she was mobile with a frame and the assistance of one and was relocated to rest home-level care.

She was referred to hospital four months later for rapidly deteriorating cognition and behaviour and jerking limb movements. She had become aggressive towards family,

Video 1: Patient demonstrating multifocal myoclonic jerks.



paranoid and experiencing distressing visual hallucinations which included reptiles, animals and children. Cognitive and visual impairment and distress limited physical examination, however, she was noted to have increased tone and multifocal myoclonic jerks (Video 1) and vision limited to perception of hand movement.

An electroencephalogram demonstrated theta and delta slowing with a paucity of alpha frequency activity consistent with a moderate diffuse encephalopathy. A lumbar puncture was performed, which showed a normal white cell count but an elevated protein (0.77g/L). Cerebrospinal fluid was positive for protein 14-3-3 and coupled with the previous MRI findings were highly suggestive of Heidenhain variant of CJD. The patient was commenced on quetiapine and her agitation resolved once the dose was increased to 50mg BD. The patient was deemed to be in the palliative stage of her illness and was discharged to a nursing home, passing away two weeks later.

Discussion

Visual symptoms are the presenting feature of the Heidenhain variant of CJD and was first described in 1929.¹ Patients often initially present to an optometrist, with early preservation of cognition. Current sCJD classification recognises six major variants, each with distinctive clinic-pathological features with genotypic determination at the polymorphic codon 129 in the prion protein. Heidenhain variant has been linked to the MM1 or MM1 + 2C type.² Though there is a broad overlap of symptoms, there are clinico-pathological differences within the subtypes of CJD, summarised in Table 1. Protein 14-3-3 describes a migratory pattern of CSF proteins seen on electrophoresis and is 93% sensitive for CJD.³ MRI findings of restricted diffusion in the occipital lobes are a common finding in this form of CJD but may be easily mistaken for other pathologies such as stroke. Final confirmation of the diagnosis requires autopsy, which was declined by the family.

Table 1: Differences in subtypes of CJD.

	sCJD	HvCJD	vCJD
Early features	Great diversity in presenting features	Visual defects, hemi-anopia, hallucinations, agnosia, abnormal colour/spatial perception	Psychiatric symptoms including anxiety and depression
Predominant features	Dementia, myoclonus, Ataxia	Visual hallucinations, myoclonus, dementia	Mood and behavioural abnormalities, paraesthesias, dementia
Mean age of onset	65 years	65 years	26 years
Mean duration of illness before death	4.5 months	5.7	14 months
Neuropathological findings	Diverse pathological changes more marked within limbic system and basal ganglia ⁴	Gliosis and neuronal loss and spongiform vacuolisation in occipital lobe gray matter ⁵	Florid plaques of kuru and spongiform change most severe in the thalamus, but also prominent in the cerebral cortex and cerebellum ⁶

Competing interests:

Nil.

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Adherence to uptake of magnesium sulphate for neuroprotection in preterm births <30 weeks at Christchurch Hospital

Jane Pang

The prevalence of preterm birth is increasing and while survival of infants born preterm has improved, the prevalence of cerebral palsy has also risen. To date, several large and recent meta-analysis and randomised trials have confirmed that administration of magnesium sulphate (MgSO_4) reduces overall neurological impairments and disabilities in surviving preterm infants. On the basis of these studies, Christchurch Women's Hospital issued (13 June), a guideline in the use of antenatal MgSO_4 prior to preterm birth for neuroprotection of the foetus, infant and child. The guideline recommends a loading dose of 4g over 20–30 minutes followed by a maintenance dose of 1g per hour up to 24 hours or until birth, whichever comes first. The purpose of this study is to assess adherence to our local guideline of using MgSO_4 for neuroprotection in preterm births <30 weeks gestation. As a secondary objective, examining maternal safety, compliance to close clinical monitoring (blood pressure, heart rate, respiratory rate, oxygen saturations, reflexes, urine output) as per protocol while on infusion and reasons for non-compliance with the protocol were examined.

This is a retrospective study and includes women admitted for preterm labour and induced preterm birth for delivery between 24–29⁺⁶ weeks of gestation regardless of parity and mode of delivery at Christchurch

Women's hospital between 1 November 2014 and 31 January 2016. Exclusion criteria were major fetal abnormalities, stillbirth, termination of pregnancy and incomplete medical records. The time interval from decision to administration and from administration to delivery were calculated. In terms of maternal safety, side effects were recorded and compliance towards protocol were assessed.

Forty women delivered between 24–29⁺⁶ weeks gestation from 1 November 2014 to 31 January 2016. After 10 women (eight stillbirth, one severe fetal anomaly and one incomplete medical record) were excluded, 30 women were included in the study. Of these, 25 received MgSO_4 (83.3%), and 19 (76%) of these women who received MgSO_4 proceeded to delivery within 24 hours following commencement of infusion. Table 1 shows the median and shortest time frame from decision to administration of MgSO_4 and administration to delivery. Five of 30 women (16.7%) were not administered MgSO_4 ; all of them delivered, with one delivered within 30 minutes on arrival (rapid delivery). The remaining four had an admission to delivery interval >8 hours (range 8–480 hours). If we excluded women with relative contraindications, meaning who delivered immediately upon hospital arrival (n=1), 86.2% (25/29) of women received MgSO_4 .

Table 1: Median and shortest time frame from decision to administration of MgSO_4 and administration to delivery.

	Decision to administration	Administration to delivery
Median	0.92 hours	7.5 hours
Min	1 minute	35 minutes

Table 2: Maternal monitoring during MgSO₄ administration.

	Prior to MgSO ₄ infusion (n=25)	10 mins after MgSO ₄ implementation (n=25)	Hourly monitoring while on MgSO ₄ infusion (n=23)
BP % (n)	13 (52%)	18 (72%)	17 (74%)
HR % (n)	14 (56%)	18 (72%)	16 (70%)
RR % (n)	13 (52%)	18 (72%)	17 (74%)
Oxygen sats % (n)	13 (52%)	18 (72%)	17 (74%)
Reflexes % (n)	8 (32%)	11 (44%)	8 (35%)
Urine output % (n)	25 (100%)	25 (100%)	23 (100%)

In our study, only a mere 20% of women had full clinical monitoring (prior to, 10 minutes after loading dose and hourly while on MgSO₄). Also, only 35% of women had their reflexes monitored while on MgSO₄ infusion.

This study has confirmed that it is feasible to translate the trial findings of MgSO₄ administration for neuroprotection of preterm infants into clinical practice with 83.3% (25/30) receiving MgSO₄ before preterm delivery, and 76% of these women who received MgSO₄ followed with delivery within 24 hours. However, four of these women had an admission time of >8 hours (range 8–480 hours). This reflects the complexity of clinical decisions when managing women at risk of preterm birth where these decisions need to be deferred until delivery is clearly imminent or indicated. Two ways to improve

the administration of MgSO₄ for preterm birth are to increase awareness of the guideline and familiarity with the process of administration. Hence, emphasis needs to be placed on the need for continued education for reinforcing knowledge, particularly in the context of frequent staff “turn over”. To help in reinforcing knowledge, a few trials have highly recommended a need for visual reminders (posters) around the hospital and birthing suite to constantly remind staff. Last but not least, maternal monitoring in our daily practice is suboptimal, hence should be interpreted as an alert to necessity of special attention to clinical monitoring rather than argument against use of MgSO₄. Ongoing education regarding benefits of MgSO₄ use, importance of clinical monitoring and ongoing study of uptake are also essential to ensure that current standards are at least being maintained, if not improved upon.

Competing interests:

Nil.

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A cautionary perspective on the utility of the RoPE score in cryptogenic stroke patients with a patent foramen ovale

Ken Jin Boon, Paul Bridgman

Our data from New Zealand leads us to question the report by Prefasi et al regarding patent foramen ovale (PFO) prevalence across strata of the Risk of Paradoxical Embolism (RoPE) score.¹ Their data is of interest, but we feel that they have drawn conclusions that cannot be supported by the data. The RoPE score uses age and three vascular risk factors (diabetes, hypertension, smoking) to estimate the PFO attributable risk for stroke in patients who have documented cryptogenic stroke (CS) and who have then been shown to have a PFO.² Higher scores represent PFOs that are more likely to be clinically significant.

Prefasi states that their study provides an external validation of the RoPE score, suggests that the score is robust and supports a cut-off point of >7 for identifying

PFO with significant attributable risk.¹ Their conclusions are based around 30 patients with a RoPE score of ≤ 7 of whom three had PFOs.

Our data illustrates the danger in drawing conclusions of this nature. We present data from 139 patients, aged 22 to 69, presenting for transthoracic echocardiographic bubble study for investigation of CS between 1 January 2014 and 30 November 2016.

Our data included older patients than Prefasi and therefore many more PFO patients with a RoPE score of ≤ 7 . We have 50 as against the three in the Prefasi report. Thereby we show that there can be significant attributable risk in patients even with lower scores (predominantly the older patients).

Table 1: PFO prevalence and attributable fraction.

RoPE score	PFO present N=64	No PFO N=75	PFO prevalence %	Attributable fraction %
1	0	0	0	0
2	0	0	0	0
3	1	2	33.33	33.32
4	4	6	40.00	50.00
5	11	21	34.38	36.38
6	17	18	48.57	64.70
7	17	13	56.67	74.51
8	7	10	41.18	52.39
9	6	4	60.00	77.78
10	1	1	50.00	66.67

RoPE – Risk of Paradoxical Embolism, PFO – patent foramen ovale.

In their initial description, Kent et al noted that a very low RoPE score could not rule out a PFO-related stroke with certainty.² Our data supports that statement and reminds us that caution should be exercised when interpreting small data sets.

The RoPE score is not intended to be applied in patients with CS until they have a documented PFO. It should only be calculated for patients once they have met

criteria for CS and have been shown to have a PFO. Clinicians should be aware of the pitfalls when using it to influence the decision on whether a PFO should be closed, or treated as a potential innocent bystander. Ultimately in New Zealand and elsewhere, the decision on closure should be made after consideration of a wide range of clinical factors and informed discussion with the individual patient.

Competing interests:

Nil.

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Surveys show exposure to smoking in cars among Year 10 children is not decreasing: time for the Government to act

Richard Edwards, Dalice Sim, Jude Ball, Janet Hoek, R Beaglehole, Andrew Waa

The health effects of secondhand smoke (SHS) for children include increased risk of Sudden Infant Death, respiratory tract infections, exacerbations of asthma and 'glue ear'.¹ Levels of SHS in cars are very high, making SHS exposure in cars a particularly severe health hazard.² Many countries, including the UK and states and provinces in Australia, Canada and America, have introduced legislation to prohibit smoking in cars where children are present.

In 2010, the Māori Affairs Select Committee (MASC) recommended the Government should investigate legislation to ban smoking in cars carrying children.³ In response, the Government acknowledged the heightened degree of risk to children from SHS exposure in cars and agreed to consider options (with an emphasis on non-legislative options) for extending smokefree restrictions to vehicles.⁴ In October 2015 a petition presented to Parliament by Patu Puauahi Tai Tokerau/Smokefree Northland prompted a Health Select Committee investigation and subsequent recommendation that the Government introduce legislation or other measures to ban smoking in cars carrying children under the age of 18 years.⁵

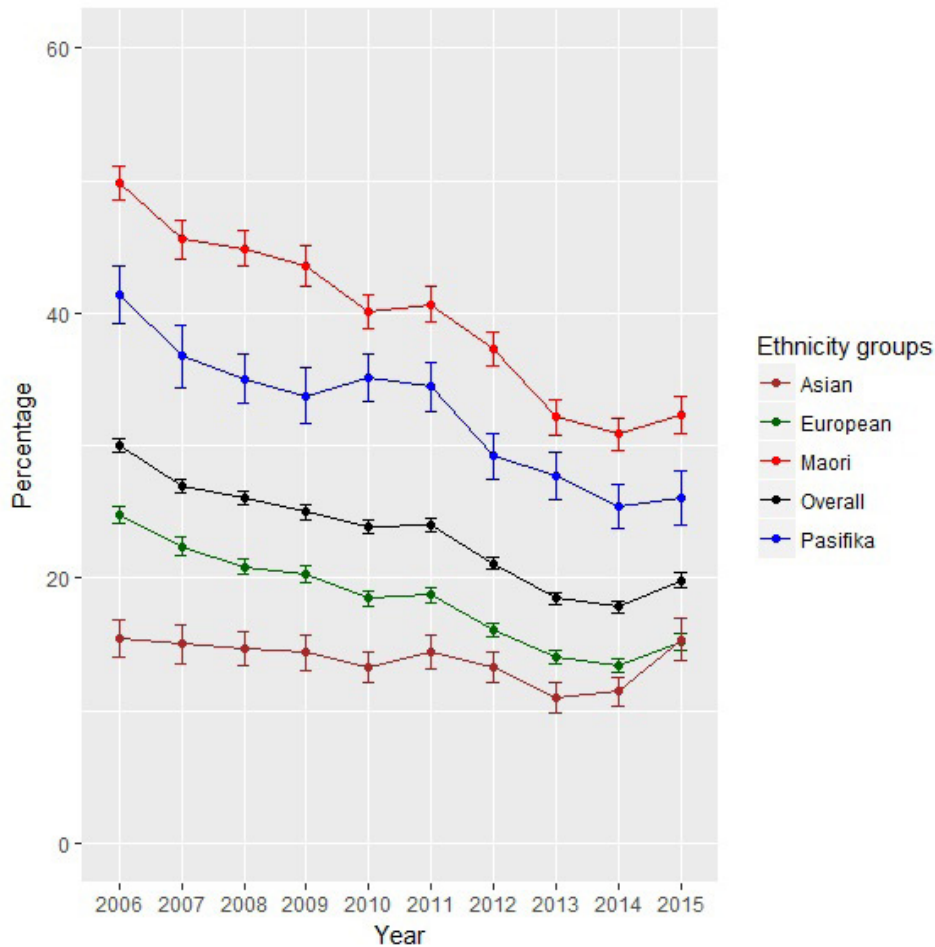
The Government's response on 2 March 2017⁶ acknowledged the serious health risks of SHS and stated that "*protecting children from the harms of second-hand smoke exposure is important and needs to be taken seriously by all those concerned*". However, the Government announced it would not be introducing legislation on the grounds

that "*present initiatives are sufficient to deter smoking in cars carrying children under the age of 18 years*".

However, the only sustained national non-legislative intervention was a mass media campaign that ran from 2006–2008. Since the MASC report there has been intermittent implementation of the previous campaign in 2012 and 2013, and occasional local or regional initiatives supported by community partnership grants. Previous research found that 14–15 year-old students continued to be heavily exposed to SHS in cars in 2012, with 23% reporting exposure in the last week, and higher among priority groups students.⁷ There is no published evidence we are aware of that demonstrates exposure of children to smoking in cars has declined subsequently, and hence no evidence to support the Government's claim that current initiatives are 'sufficient'. In order to help provide the required evidence, we report an analysis of recent trends in SHS exposure in cars incorporating updated (2013–2015) data from the ASH Year 10 surveys.

Methods and results

The surveys between 2006 and 2015 included between 19,000 and 29,500 students who were asked whether, in the past week, others had smoked around them in a car or van (except in 2011—see footnote Figure 1). Figure 1 shows trends in the proportion of students reporting exposure in the last week for all students and stratified by ethnicity.

Figure 1: Proportion (percentage) of Year 10 students exposed to smoking in cars* 2006–2015.

Error bars represent 95% confidence intervals.

*In 2011, students were asked for the number of days they were exposed to smoking in a car in the last week. Students reporting exposure on one or more days were coded as exposed and others as non-exposed.

Exposure among all students declined from 30.0% in 2006 to 24.0% in 2011, and to 18.5% in 2013. The decrease was less in 2014, and by 2015 had increased slightly to 19.8%. An increase between 2014 and 2015 occurred in all ethnic groups. There was a marked increase in exposure from 11.0% in 2013 to 15.3% in 2015 among Asian students. Compared to European students, exposure was consistently greater among Māori and Pacific students, and least common among Asian students, except in 2015. In 2015, 32.3% of Māori and 26.0% of Pacific students reported exposure smoking in cars in the last week. If the exposure reported in 2015 in the survey applied to all Year 10 students, then we estimate that 11,787 14–15 year-olds were exposed to smoking in cars each week in that year.

Data were available on frequency of exposure from the 2011 survey. A previous analysis demonstrated that among Year 10 students reporting any exposure to smoking in cars in the last week, 56% reported in-vehicle exposure on three or more occasions. This figure was higher for Māori students (63%) and students from lower decile schools (61%).⁷

No data are collected on exposure among younger children so numbers exposed must be estimated using assumptions. Statistics New Zealand estimates the 0–14 year-old population was 915,300 as at June 2015,⁸ so even if the average prevalence of exposure across the full age range were only *half* that reported by Year 10 students in 2015, over 90,000 children are exposed to smoking in cars each week.

Policy implications

These findings suggest that exposure to SHS through smoking in cars continues to be a significant health hazard for many thousands of school students and children in New Zealand, particularly for Māori and Pacific children, who bear a disproportionate burden of SHS-related illness.

Because the recent decline in exposure halted between 2014 and 2015, and our findings suggest may even have increased, the Government's assertion that current initiatives are sufficient to protect children is clearly incorrect.

We encourage the Government to reconsider its decision and introduce a

smokefree cars legislation in order to protect children from the adverse health effects of SHS exposure and help reduce inequalities in health among children. To maximise the impact of a new legislation, the Government should also re-institute health promotion campaigns to educate the public, particularly people who smoke, about the importance of not smoking in cars, and to inform about and set out the rationale for the new legislation. This approach will ensure that the legislation is well understood, reduce the need for enforcement and, most importantly, maximise compliance and protection of children from secondhand smoke.

Competing interests:

Nil.

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Better organ donation education

Rhonda M Shaw

In the media and in educational material promoting organ donation we are constantly told that “organs are in short supply”, and that there is an urgent need to address the shortfall. From a medical perspective, the lack of availability of organs for transplantation is a problem, as the shortage of solid organs and body tissue is regarded as a threat to our healthcare system. In New Zealand, various strategies have been adopted aside from publicity campaigns to increase the supply of transplantable organs. These include paired kidney exchange schemes, policy implementation around donor compensation and the removal of disincentives to ease the financial burden for living donors. More radical suggestions include ideas about presumed consent and opt-out systems, directed “altruistic” donation and the use of expanded criteria and marginal donors. A recent initiative is the reintroduction of donation after circulatory determination of death, or donation after cardiac death (DCD). DCD was recently endorsed by the Ministry of Health in the 2016 *Review of deceased organ donation and transplantation rates*, which states that “increasing the number of DCD donors could be an avenue for increasing New Zealand’s overall donation rates”.

Many New Zealanders agree with organ donation as an abstract good, but most people who register their assent to donate organs on their driving licence application will have only a vague understanding of what deceased donation entails. This is not simply a reflection of public ignorance; it is also a consequence of information disclosure. When New Zealanders tick “yes” to donating their organs on their driver’s licence, it is nowhere clarified in the application process that deceased donation can occur through two main pathways: donation after brain stem death (DBD) and DCD. Nor is it explained to the prospective donor that these pathways entail different experiences for them and for the donors’ family.

Additionally, unlike the UK system, which asks prospective donors which organs they would be prepared to donate after death, the New Zealand driver’s licence application asks no such questions. When I recently renewed my driver’s licence for a 10-year period in February 2017 at an inner-city Transport Agency, there were no organ donor information brochures on display or available upon request (I was sent a brochure in the mail with my renewal notice).

While all proposals to increase the supply of transplantable organs raise ethical issues, DCD raises questions around the determination of death and the difficulty of establishing an irreversible loss of consciousness as part of the DCD pathway. It thus has implications for the way we think about dignified death, and, depending on the circumstances of a person’s death, issues around the consent process. Admittedly, public information disclosure that speaks plainly about the timing of death and what donation and transplantation operations entail may be too much information for many people. Nevertheless, failure to distinguish DBD and DCD does not adequately meet informed consent criteria. If the New Zealand healthcare system does value autonomy, then the public should be entitled to information about what DCD involves. Such information is not only important in jurisdictions that already have or seek to move to opt-out systems (eg, France in January 2017), it is necessary given the time-critical manner required to facilitate DCD processes surrounding the withdrawal of cardiorespiratory support. Being required to make quick decisions about DCD, in an emergency or with little time to consider the pros and cons of the process, may make families vulnerable. It does not help, as Marck and colleagues indicate in a survey of 648 Australian healthcare providers, that many medical professionals working in this domain are also unfamiliar with processes involving DCD.¹

People outside the medical profession are largely unaware of these issues, yet they raise concerns that prospective donors and their families are entitled to consider prior to checking the box on the driver's licence application form to indicate consent to deceased donation. I do not oppose organ donation; my concern regarding DCD rests with the informed consent process. There are documents available in Australia and New Zealand for members of the public to find out about DCD; for example, The DCD Plain Language Statement published in 2010 by Australian Organ and Tissue Authority and the 2010 ODNZ Annual Report. The new-look ODNZ website also includes information about what organs people can

donate. However, unless people know that the DCD pathway exists, they are unlikely to search for and read these documents. Now DCD is once again an option, we risk 'suboptimal consent' as bioethicists such as Kirby contend,² if members of the public are not sufficiently informed when they check the box on their driver's licence application saying 'yes' to organ donation. At the very least, in addition to stating what organs they are prepared to donate, prospective donors should be able to indicate which organ donation procedure they consent to, from a range of available options, at the time of signing their driver's licence or joining an organ donation registry.

Competing interests:

Nil.

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Screening for sub-clinical stress cardiomyopathy and disaster ultrasound provision in the Kaikoura earthquake

Paul G Bridgman, Andrea M Judd, Steve C White

On 14 November 2016, a magnitude 7.8 earthquake struck the township of Kaikoura. All road access was cut, isolating the 3,500 residents of the district and approximately 1,000 tourists. The earthquake was also felt strongly 184 kilometres away in Christchurch, population 366,000. In the next 36 hours, seven cases of earthquake-induced stress cardiomyopathy presented to Christchurch Hospital. Christchurch Hospital had previously seen case clusters of stress cardiomyopathy, following earthquakes of both September 2010 and February 2011. When it became clear that we were seeing a third case cluster of stress cardiomyopathy in Christchurch we hypothesised that there might be sub-clinical cases closer to the epicentre in Kaikoura. The hospital in Kaikoura is ordinarily staffed by four family physicians. Telephone contact was made on 15 November and we arranged to fly in a cardiac sonographer and portable echo machine the next day. Utility connections to the hospital were not functioning but there was an emergency electricity generator to provide wall outlet power for the plug-in portable ultrasound machine that we had available. In our previous case clusters of earthquake stress cardiomyopathy, all of the cases had been women aged over 50 years. We therefore sought to perform a five loop very limited LV function study on asymptomatic Kaikoura women over that age. Point of care and focused assessment with sonography for trauma (FAST) scans can have a very important role in emergency care, particularly in disaster situations. The scan that was performed was in some ways similar to a point of care or focused

ultrasound scan as routinely performed in many emergency departments, but it is important to note how it differed. Our scan was a limited comprehensive scan for left ventricular function, rather than an emergency department scan protocol designed to exclude a wide range of cardiac pathologies. Our images were digitally archived to DVD and then reported by an experienced echocardiologist in Christchurch.

Prior to sending the sonographer, we approached the local university and hospital research offices and found that there are no local pathways for emergency ethical approval. We have subsequently obtained retrospective approval from the Health and Disabilities Ethics Committee as an observational study.

The sonographer drove with his portable machine from Nelson to Christchurch airport in order to fly in on a small fixed wing aircraft. There was only one seat available so we could not send in an administrator or additional person to organise subjects for the sonographer. The sonographer was met at Kaikoura airstrip and transported to the medical centre. The medical centre was operating under extreme conditions. During the day a major evacuation of tourists to a navy ship that would transport them to Christchurch was undertaken. The medical centre provided a room for the sonographer. All women aged over 50 who presenting to the medical centre for other reasons were scanned as well as all female staff who were of that age. Having worked through those two patient groups the sonographer visited the marae

that was operating as an emergency centre, but there was no suitable scanning environment at that site.

During the day a total of 26 women without cardiac symptoms were screened for left ventricular wall motion abnormalities. All gave verbal consent. No cases of takotsubo cardiomyopathy or incidental abnormalities were found. The average age for the women scanned was 61 years with a range of 45 to 86 years. Although not currently credentialed for it, our sonographer was also trained in general ultrasound. During the course of the day, medical centre staff, who were aware of this, had the sonographer scan a possible ruptured tendo-achilles, veins for a DVT, a leg for a possible foreign body, a possible PE case and also an acute coronary syndrome case. With the navy evacuation underway the number of people in town dramatically decreased during the day. By 15:30 it was felt there would be low yield in the sonographer continuing in Kaikoura and the opportunity of a seat on a plane out had arisen. He therefore returned to Christchurch.

By nature, echocardiography research in disaster settings has to be opportunistic. We learnt a number of things from our experience. Subclinical takotsubo or stress cardiomyopathy was not found in 26 women screened. The clinical case rate in Christchurch following the Canterbury

earthquakes was low, of the order of 1:2,500 older women, but disasters dramatically alter patterns of presentation to emergency departments and relatively little is known about stress cardiomyopathy. It was of interest to look for a sub-clinical form with echocardiography. A team of two people may have been able to operate more efficiently for recruitment for research purposes than the single sonographer. Having a second person whose role was specifically to organise subjects in a timely manner may have increased efficiency and the number of people able to be screened.

Perhaps the major finding from our experience is that it was very helpful that the cardiac sonographer sent also had general ultrasound skills as in the disaster setting there was a clinical requirement for point of care general sonography. When future natural disasters occur in New Zealand in places such as Kaikoura, the emergency medical response should consider the inclusion of point of care ultrasound. Staff availability, equipment compatibility and internet connection if required for remote reporting will mean that provision would need to be on a situation specific basis. In our case the service was provided by a Nelson-based sonographer with coordination and support from a Christchurch-based Cardiologist. A quality disaster medical response should include consideration of ultrasound availability.

Competing interests:

Nil.

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Is your mental health covered by your health insurance?

Samantha Ernst, Gabrielle Jenkin

While New Zealanders face a 40% lifetime prevalence of a mental illness diagnosis¹ and a third have private health insurance,² little is known about health insurers' coverage of mental health conditions and their treatment. To get an idea of what is happening in this area we examined readily available policy documents from five main health insurance providers in New Zealand (those listed by Consumer NZ³ and the Health Funds Association of New Zealand).⁴ Using search terms based on common mental health conditions (listed on the Mental Health Foundation of New Zealand website)⁵ and in relevant literature, we examined policy coverage and wording around mental health treatment and benefits, exclusion statements and disorder-specific statements.

We found 36 policies for the five insurers. Just over half of these policies provided for some mental health cover (see Table 1).

Out of all the plans, 55% (n=20) provided for psychiatric consultations, 11% (n=4) provided for clinical psychologist consultations and 36% (n=13) provided for psychiatric hospitalisations. One provider

(company D) did not cover any treatment, except under specific conditions. Further, company B offered benefits for counselling and psychological support only for policy holders undergoing treatment for cancer or cardiac surgery, and company D offered benefits only where they were related to post-cancer treatment care and support.

Visiting a private psychiatrist in New Zealand can cost between NZ\$160 per hour⁶ to around NZ\$330 per hour.⁷ Of eight plans provided by company A, five paid in-full for one initial psychiatric consultation, and one plan paid a benefit of NZ\$500 per year. Under company B's 13 plans, only three policies covered psychiatric consultations, and the benefits differed slightly with one plan covering NZ\$600 per year and the other two plans covering NZ\$200 per year. Company C's benefits ranged across six different plans: from a minimum of NZ\$650 to a maximum of NZ\$750 per year. Finally, company E's psychiatric consultation benefits ranged from NZ\$100 to NZ\$150 per visit for up to three visits per year; however, these benefits only applied after five years' continuous cover.

Table 1: Health insurance cover: five main providers.

Company	Psychiatric consultation	Clinical psychologist consultation	Psychiatric hospitalisation	Total number of plans examined
A	6 ^a	0	0	8
B	3	1	3	13
C	6	3	6	8
D	0	0 ^c	0	2
E	5 ^b	0	4	5
Total	20	4	13	36

^aPsychiatrist consultation for an initial assessment of mental health is covered for the first consultation only.

^bPsychiatric consultation benefits apply after five years' continuous cover in any plan option.

^cOffers psychologist consultations, therapy and counselling for specifically post-cancer treatment care and support.

Hourly fees to see a clinical psychologist start around NZ\$120.⁶ Under company B's most prestigious plan, consumers can access clinical psychologist benefits for up to NZ\$300 per year. Three of company C's plans provided coverage for clinical psychologist consultations: either \$100 per year with an optional Module for two different policies, or NZ\$150 per visit up to NZ\$600 per year in the other plan.

All three of company B's plans with psychiatric hospitalisation benefits covered NZ\$330 per night, to a maximum of NZ\$1,650 per admission. Company C had six hospital plans that covered for psychiatric hospitalisations for a minimum of NZ\$2,250 to a maximum of NZ\$3,500 per year. Lastly, company E's psychiatric hospitalisation admission benefits applied only after five years' continuous cover and ranged from NZ\$2,000 to NZ\$2,750 per year. As a reference, the Ashburn Clinic, a psychiatric health care centre in Dunedin, charges a minimum fee of \$2,905 on admission to inpatient care, which does not cover individual appointments with psychiatrists or psychotherapists.⁷

Exclusions

Our analysis revealed that every company had a general mental illness exclusion statement rejecting pre-existing or newly diagnosed psychiatric disorders from

coverage. These statements included exclusions of any 'psychiatric, psychological and/or neurodevelopmental disorder', 'a psychiatric, behavioural, psychological or developmental condition' and 'mental health healthcare services'.

Specified mental health disorder exclusions

When addressing mental health, some policies named specific disorders (Table 2).

Of the 36 health insurance plans examined, dementia/Alzheimer's was the most commonly mentioned mental health condition (94.4% of plans), followed by any substance use disorder (77.8%), ADD/ADHD (69.4%) and any eating disorder (36.1%). All plans specifically excluded coverage for any injury or illness relating to suicide and self-harm; however, plans had different ways of describing such behaviours. Stress, bipolar disorder, post-traumatic stress disorder and schizophrenia or any other psychotic disorders were not mentioned in any of the policy documents.

These results provide a snapshot of the limited benefits provided by the main health insurers for mental health conditions and care in New Zealand. Although our investigation was limited to the readily available health insurance policies of five companies, these were the most popular

Table 2: Number of plans that explicitly named specific mental health conditions.

Company	Number of policies (n)	Dementia/Alzheimer's	Any substance use disorder	Self-inflicted injury	ADD/ADHD	Attempted suicide	Any eating disorder	Intentional or deliberate self-injury	Depression	Suicide	Autism spectrum disorders	Tourette syndrome	"Whether sane or insane"	Any anxiety disorder
A	8	8	0	0	8	8	0	8	0	8	8	8	0	0
B	13	13	*13	13	10	8	13	3	*10	0	0	0	3	*1
C	8	6	8	8	0	0	0	0	0	0	0	0	0	0
D	2	2	2	2	2	0	0	0	0	2	2	2	0	0
E	5	5	5	5	5	0	0	0	0	0	0	0	0	0
Total	36	34	28	28	25	16	13	11	10	10	10	10	3	1

*These conditions were included in a plan with special conditions.

according to our sources. We recognise that insurance underwriting is complex and that companies are balancing risk of claims against income. However, it is notable that the available cover is negligible compared to that available for many other common health problems. To provide a more comprehensive picture of the role of

health insurers in the provision of mental health care in this country, we think it would be useful to conduct similar research examining life and employment protection insurance, and other aspects of insurance cover and costs (ie, premium calculations and pay-outs).

Competing interests:

Nil.

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Ear candling action overdue

Lance Gravatt

In 2010, the FDA and Health Canada acted against manufacturers of ear candles.¹ These actions have included import alerts, seizures, injunctions and warning letters. The authorities warn consumers of the potential risks:

- burns to the face, ear canal, eardrum and middle ear
- injury to the ear from dripping wax
- ears plugged by candle wax
- bleeding
- puncture of the eardrum
- delay in seeking needed medical care for underlying conditions such as sinus and ear infections, hearing loss, cancer and temporomandibular joint (TMJ) disorders. (TMJ disorders often cause headache and painful sensations in the area of the ear, jaw and face).

In 2017, The American Academy of Otolaryngology—Head and Neck Surgery Foundation (AAO-HNSF) has published a supplement to this issue of Otolaryngology—Head and Neck Surgery, featuring the updated Clinical Practice Guideline: Earwax

(Cerumen Impaction).² These guidelines state that ear candling is “contraindicated” with Grade C evidence based on systematic reviews and randomised trials.

However, in New Zealand we do not have to look far to find ear candles readily available in most retail pharmacies, health shops and online. For example, Happy Ears claim “ear candles have been used for centuries and is considered a painless, inexpensive and non-invasive way to potentially remove ear wax that is easy to use in the privacy of your home.” “It is considered a painless, harmless and totally relaxing experience.” A pair of Happy Ears - Ear Candles costing \$18.00 online.³ It is of concern that these products remain available to consumers in New Zealand and carry no warnings. For a therapeutic intervention that carries a greater risk of harm than chance of proven benefit, the regulatory response would be to prohibit promotion and supply. At the very least ear candles should carry a prominent consumer warning as stated by AAO-HNSF:

“Ear candling or ear coning is NOT a safe option for earwax removal.”⁴

Competing interests:

Nil.

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Dishonest use of a document with intent of obtaining pecuniary gain

Charge

On 21 and 22 November 2016, the Health Practitioners Disciplinary Tribunal heard a charge of professional misconduct laid by a Professional Conduct Committee (PCC) appointed by the Medical Council of New Zealand against Dr Preechapon Tovanaronte, medical practitioner of Christchurch (the doctor).

The charge consisted of four particulars alleging that:

- For some five months between November 2011 and April 2012, the doctor claimed payment from the Accident Compensation Corporation (ACC) for sums totalling \$3,553.44 for treatment of patients that he had not undertaken and/or for which he was not entitled.
- Between November 2011 and April 2012, without authorisation the doctor copied and removed confidential electronic patient records from Canterbury District Health Board (CDHB) for the purposes of seeking personal payment from ACC.
- Some two months later in June 2012, the doctor claimed payment from ACC for treatment of patients who had participated in the Christchurch Marathon on 3 June 2012, again being treatment he had not undertaken and/or treatment for which he was not entitled to receive payment.
- Some two years later, between May and September 2014, the doctor conducted private medical aviation examinations in a publicly funded clinic run by the CDHB, which included seeking payment from patients and using CDHB facilities or resources when he was not entitled to do so.

The PCC submitted there was repeated and sustained dishonest conduct in respect of each of the particulars and that this conduct amounted to misconduct under section 100(1) (a) and/or (b) of the Health Practitioners Competence Assurance Act 2003.

The hearing proceeded by way of an agreed summary of facts and the doctor acknowledged that his conduct amounted to professional misconduct under both sections of the Act.

Finding

The Tribunal found there was misconduct by the doctor in respect of each of the four particulars of the Charge and that each individual particular was misconduct likely to bring discredit to the medical profession. Taken cumulatively, it found all four particulars amounted to misconduct as both malpractice and negligence and acts, which were likely and in fact did bring, discredit to the medical profession. The Tribunal found there was a significant element of dishonesty in the doctor's actions and did not accept that the doctor's youth or inexperience was any excuse.

Penalty

The Tribunal censured the doctor and ordered the doctor's registration be suspended for three months commencing on 31 January 2017. The Tribunal imposed conditions on the doctor's practice for a period of three years, imposed a fine of \$5,000 and ordered the doctor to pay \$50,000 towards the costs of and incidental to the prosecution and the hearing. The Tribunal strongly recommended that the doctor apply for and/or continue with the General Practitioner Training Programme, which was referred to during the hearing.

The Tribunal directed publication of its decision and a summary.

The full decision of the Tribunal can be viewed on: hpdt.org.nz/Default.aspx?Tabid=494

URL:

<https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2017/vol-130-no-1458-7-july-2017/7304>

Self-prescribing without appropriate oversight and/or monitoring

Charge

On 3 August 2016, the Health Practitioners Disciplinary Tribunal considered a charge laid by the Professional Conduct Committee against Dr Diana Craig, medical practitioner of Auckland (the doctor).

The charge alleged that the doctor wrote prescriptions for controlled drugs or drugs of dependence in the names of individuals who she knew were not the intended recipients of the drugs; self-prescribing without appropriate oversight and/or monitoring; withholding information about her use of drugs of dependence and despite receiving a warning from the Medical Council, continued to prescribe drugs of dependence or abuse in the names of friends and family members.

The hearing proceeded on an agreed summary of facts basis.

Finding

The Tribunal was satisfied that the charges were made out and professional misconduct had been established in this case that warranted disciplinary sanction.

Penalty

The Tribunal censured the doctor; imposed conditions on her practice and ordered that she pay a total of \$18,467.47 as a contribution to costs of the Tribunal and PCC.

The full decision of the Tribunal can be found on the Tribunal's website at: <http://www.hpdt.org.nz/Default.aspx?tabid=498>

URL:

<https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2017/vol-130-no-1458-7-july-2017/7305>

Doctor failed to maintain controlled drugs register

Charge

On 10 to 13 October 2016, the Health Practitioners Disciplinary Tribunal considered a charge laid by a Professional Conduct Committee (PCC) against Dr Nicholas Cooper, medical practitioner of Auckland (the doctor).

The charge alleged that the doctor wrote prescriptions in the names of patients which were not intended for them; inappropriately and/or excessively prescribed pethadine, Kenacort and diabetes testing strips; kept inaccurate and/or inadequate medical records and failed to maintain an accurate Controlled Drugs Register.

The hearing proceeded on an agreed summary of facts basis with evidence given at the hearing on matters that remained in issue.

Finding

The Tribunal was satisfied that some, but not all, of the charges were made out. Those that were established related to inaccurate record keeping, the Controlled Drugs Register and inappropriate prescribing.

The Tribunal found that none of the particulars of the charge established

involved conduct that amounted to malpractice and noted that the doctor's conduct did not involve the type of serious illegal or immoral conduct usually seen as "malpractice" under s100(1)(a) of the Act.

In considering if the established particulars met the threshold for misconduct, the Tribunal found that there was no dishonest motive or any personal gain for the doctor from his actions. The only particular that met the misconduct threshold related to failing to maintain an accurate Controlled Drugs Register.

Penalty

The Tribunal noted that this case would not set any material precedent for further cases given it related to the doctor's individual circumstance, which it regarded as being unique.

By way of penalty, the Tribunal ordered the doctor to pay a total of \$10,000 as a contribution to the costs of the Tribunal and the PCC.

The full decision of the Tribunal can be found on the Tribunal's website at: <http://www.hpdt.org.nz/Default.aspx?tabid=501>

URL:

<https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2017/vol-130-no-1458-7-july-2017/7306>

Doctor compromised safety and care of patient

Charge

On 31 January and 1 to 3 February 2017, the Health Practitioners Disciplinary Tribunal considered two charges laid by a Professional Conduct Committee (PCC) appointed by the Medical Council of New Zealand against Dr S, medical practitioner (the doctor).

Charge 1 alleged that the doctor failed to review a patient admitted under his care either adequately or at all, potentially compromising her care and safety and that the conduct amounted to professional misconduct in that it amounted to malpractice or negligence and/or brought or was likely to bring discredit to the profession.

Charge 2 alleged that the doctor failed to return to the hospital to supervise and provide adequate support to the registrar who was performing a Hartmann's procedure on a patient and this conduct potentially compromised the care and safety of the patient. The PCC alleged that the conduct amounted to professional misconduct in that it amounted to malpractice or negligence and/or brought or was likely to bring discredit to the profession.

The matter proceeded by way of a defended hearing and the doctor denied both charges of professional misconduct.

Finding

In respect of the first charge, the Tribunal was satisfied that on the balance of probabilities, the doctor did not adequately review the patient and that the prolonged failure to conduct a review over five days placed the conduct squarely into the realm of negligence. The Tribunal was further satisfied that, in a general sense, the failure to review the patient did potentially compromise her care and safety but that in this case, the patient's care was not in fact compromised as her care was adequate.

In the circumstances of this case, the Tribunal was not satisfied that the doctor's conduct was so seriously negligent or likely to bring discredit to the profession as to warrant a disciplinary sanction. It found that the doctor did have discussions with the registrar at least twice during the period, which established a plan for conservative management of the patient. The doctor also had some involvement in reviewing x-ray results and attempting to seek the input of a physician and the opinion of the clinical head of the department of general surgery. The doctor was also extremely busy over the period managing the workloads for two other doctors. However, the Tribunal does not in any way wish to be taken as sanctioning such conduct.

In respect of the second charge the Tribunal found that the doctor did fail to return to the hospital, and to supervise and provide appropriate support to the registrar while she was performing a Hartmann's procedure, and these were serious failings which did potentially compromise the care and safety of the patient. The operation was a complex one and should not have been performed by a surgical registrar for the first time without supervision by a consultant surgeon. The Tribunal found the conduct amounted to professional misconduct and warranted disciplinary sanction.

Penalty

The Tribunal censured the doctor and ordered him to pay \$20,000 as a contribution to the costs and expenses of the Tribunal and the PCC.

The Tribunal directed publication of the decision and a summary subject to suppression orders made.

The full decision of the Tribunal can be found on the Tribunal's website at: <http://hpdt.org.nz/Default.aspx?Tabid=509>

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Stewart James Hastie

8 March 1957–15 May 2017



Stewart Hastie was born in Christchurch on 8 March 1957. He was educated at Redcliffs School and Christchurch Boys High School. He did medical intermediate at the University of Canterbury before spending two years at the University of Otago Medical School. He completed his degree at the Christchurch Clinical School and graduated MB ChB in 1980. He did junior hospital jobs at the Christchurch hospitals and embarked on his O&G career at Christchurch Women's Hospital. During his training he completed diplomas in O&G, and in child health.

He went to the UK in 1985, initially to the Queen Mother's Hospital in Glasgow where he completed his MRCOG that year. After Glasgow, he spent further time in Shrewsbury, before returning to Christchurch as tutor specialist in 1988. In July the following year, he was appointed as a specialist at Waikato Hospital, Hamilton. Here he hit the ground running at speed.

With his colossal energy and drive, he eventually set up a successful private practice in addition to his public work. An early innovator and adaptor, he loved gadgets of all sorts, and this extended to computers, cars, phones and new surgical techniques. He was a keen and well liked teacher of medical students, SHOs and trainee registrars. He was elected FNZCOG in 1989 (later FRANZCOG with the amalgamation of the Australian & New Zealand Colleges in 1998) and FRCOG, also in 1998.

He was the key medical person in the evolution of assisted reproductive technology in Waikato. As part of Fertility Associates, IVF started initially at the Anglesea Clinic, then with the availability of public funding, at Waikato Hospital. With expansion of numbers, the clinic returned to Anglesea Clinic. From 50 cycles per year, the clinic grew to over 400 cycles per year, and the staff grew from four to over 20.

He represented his school in swimming and lifesaving, and was a schoolboy provincial hockey representative. He was a keen mountaineer and a yachtsman. He was South Island International Moth junior champion in 1974. In later years, he participated in a number of coast to coast multisport races, crossing the South Island from the West Coast to the beach near Christchurch, running, kayaking and cycling. A serious water skiing injury prevented his participation in more strenuous activities, and his aquatic enthusiasms were confined to model boat building, an interest he had for many years.

Stewart participated in the usual activities associated with the practice of medicine, local postgraduate and regional O&G societies. He was never at his happiest at

committee work. With his energy, a huge grin, engaging personality and a sense of humour, he built a large and successful practice, and was a much admired and respected colleague. He joyfully described himself as “Hastie by name, hasty by nature”, but although quick to make up his mind, his decisions were well considered, accurate and precise.

His last three years were marred by health issues. He had just stopped his public hospital commitments, took ill and was admitted to Waikato Hospital where he died on 15 May 2017. A large funeral was testament to his following among health colleagues and the community.

He is survived by his wife Vicky, children Rebecca, Sarah and Marc, and three grandchildren.

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Ian Alisdair Robertson

1940–2017



Ian Robertson aged 76 years died at his home in Villiers St, Arrowtown after a long illness. He leaves his wife of 55 years, Patricia (nee Thomson), four sons, Broughton, David, Michael and Timothy, and a daughter, Melanie. His grandchildren and many close friends mourn his passing.

Ian was born in Mali in Africa, the eldest son of Scottish parents. He was schooled in Canada and received his secondary education at Nelson College. He was educated at the Otago Medical School and graduated in 1964, later obtaining a Diploma of Obstetrics, which he made good use of as one of New Zealand's last GP obstetricians.

Most of his practising life was spent in Shirley, a suburb of Christchurch. He worked as part of a four doctor practice, the Shirley Medical Centre, and his wife Tricia often worked with the staff as a registered nurse.

He built a large urban practice comprised of obstetrics and paediatrics; he was both respected and revered by his patients who

came from all walks of life. In addition to his years of service to his patients and community, Ian made a really significant change to New Zealand medical life, and I am indebted to our colleague Dr Phil Airey for the following contribution.

Tribute to Ian Robertson

Ian had a seminal role in the development of the general practice environment, which exists in Christchurch and the surrounding area today.

General practice in the early 1980s was very different from today. Advertising was unethical beyond a small entry in public notices, medical records were commonly handwritten on 8x4 inch cards, electronic pagers had yet to be superseded by cell phones, computers if used were largely used for administration—the internet did not exist. The Cartwright enquiry, patients' rights and the rise of entrepreneurs had disrupted the profession's complacency. However, bureaucracy was pleasantly minimal.

After-hours arrangements were haphazard. In Christchurch, it was better than in many places. Groups of 10 or so GPs would arrange a roster, patients would phone their usual practice and be directed by a phone answering machine or answering service to the doctor on call, who provided the service and collected the fee. The usual GP might or might not be notified of the clinical findings.

Ian, who at that time handled Practice & Premises for the Canterbury faculty of Royal New Zealand College of General Practitioners, had knowledge of a superior format used in Edinburgh. He discussed the situation with an accountant, Euan Hilson, when on holiday and also with Neville Bullock (a pharmacist who thought the urgent pharmacy could relocate to the proposed building) and set about obtaining at his own expense several adjacent properties and proceeded to gather the support of GPs, which he did with his special blend of charm, whimsy and diplomacy. He made no secret of his indebtedness to “Yes Minister” and “Doctor Dolittle” for his philosophy.

Once a “critical mass” of support had been obtained, a “guild” was established (Ian thought it sounded superior to company) and directors appointed. The pharmacists undertook to pay for and use half of the building.

GPs were invited to invest in the project to acquire more property and shares issued. The certificates appropriately featured a Doctor Dolittle decoration of the “Push-mi-Pullyu”, a gazelle-like creature with a head at each end of its body.

Early directors’ meetings were all attended by an accountant and a lawyer who ensured sound governance, and the after-hours surgery commenced operation in a house on one of the properties. An architect, David Childs, designed the new building and it was occupied in 1988.

So the scene was set for cohesiveness in the Christchurch GP community—a GP-led operation on a sound commercial footing. The Pegasus Medical Group followed this format with several of the early after-hours directors involved in its formation. This has now morphed into Pegasus Health, which is less GP-led.

Ian would have felt that in “Yes Minister” fashion, the GPs have lost this round to the bureaucrats.

In conclusion, Ian dedicated much time and energy to his patients and medicine, but his greatest love was always his wife and family.

His immense energy, collegiality and integrity serve as a reminder to us that there are many pathways we can follow.

Ian was a lovely man.

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Vitamin D supplements and respiratory tract infections

What is the overall effect of vitamin D supplementation on risk of acute respiratory tract infection, and what factors modify this effect? This controversial subject is reviewed in this report.

The authors have performed a systematic review and meta-analysis of 25 trials of vitamin D supplementation and the incidence of acute respiratory infection. Over 11,000 participants were involved and there was a risk reduction of infection in all age groups (odds ratio 0.88) receiving vitamin D. The benefit was greater in those who were very deficient in vitamin D.

A commentator noted the results but felt that there was insufficient evidence from the review to institute supplementation in the general population as there was only a 2% absolute reduction in respiratory infection.

BMJ 2017; 356:i6583 & *BMJ* 2017; 356:j456

Bystander efforts and one-year outcomes in out-of-hospital cardiac arrest

Survival after out-of-hospital cardiac arrest has increased in several countries after improvements in bystander interventions and post-resuscitation care.

In this paper from Denmark, the long-term functional outcome of the survivors is documented. Two thousand eight hundred and fifty-five patients who were 30-day survivors over an 11-year period were included. 10.5% had brain damage or were admitted to a nursing home, and 9.7% died during the one-year follow-up period. Bystander CPR and defibrillation both significantly increased over the study period.

The conclusions reached by the researchers were that bystander CPR and defibrillation were associated with risks of brain damage or nursing home admission and of death from any cause that were significantly lower than those associated with no bystander resuscitation.

N Engl J Med 2017; 376:1737–47

Recommendations about starting inhaled corticosteroid treatment for mild asthma

Low-dose inhaled corticosteroids (ICS) are highly effective for reducing asthma exacerbations and mortality. Conventionally, ICS treatment is recommended for patients with symptoms on more than two days per week, but this criterion has scant evidence.

These researchers speculate that this restriction is invalid and designed a study to elucidate. Over 7,000 appropriate patients, including 58% who had 0–2 symptoms per week were randomised to receive budesonide inhaled once daily or placebo.

The results of their study lead them to conclude that “low-dose ICS leads to substantial risk reduction in mild asthma, both for exacerbations and for decline in lung function, in patients with infrequent baseline symptoms who would not previously have been considered for ICS treatment”.

Lancet 2017; 389:157–66

URL:

<https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2017/vol-130-no-1458-7-july-2017/7308>

Shortage of Doctors

Statement by Health Minister



IN CAMP. Soldier: I hear strange sounds in my ears, doctor. Doctor: Well, where would you expect to hear them? (Observer, 22 January 1916). Alexander Turnbull Library, Wellington, New Zealand. /records/27585254

A statement regarding the medical services of the country was made recently by the Minister of Public Health (Hon. G. W. Russell).

“The question of the mobilisation of the medical service is assuming a very important aspect.” said Mr. Russell. “The medical profession up till the present has done splendidly in accepting the call to the colours, and many practitioners have at great sacrifice thrown up their practices and joined the forces, either for work in this country at the camps, and on the Medical Boards, on the hospital ships, or with the forces in the field. As regards medical service for the civilian population, the

position is now becoming very acute. From various parts of New Zealand there is a call for medical service owing to the depletion of those districts of doctors by medical men having joined the forces. Up till the present there has not been any necessity to conscript medical men for military service, nor do I think there will be any need to consider the question in the future. The fact of a man being a medical man does not give him exemption under the Military Service Act, but in every case where the attention of the Public Health Department has been drawn to the fact that a medical man has been drawn in the ballot, we have assisted in the appeal to secure the exemption of the man by the Military Service Board.”

“The real question that arises is, how can the medical services of the country be maintained in view of the shortage of doctors? Some of the leading hospitals have lately been reduced to the direst straits on account of the shortage of qualified medical men. Recently we had to obtain the services of two medical students from Dunedin in order to carry on the work of Christchurch Hospital. These facts, and the shortage of doctors in some of the country districts, point to the absolute necessity of the medical services in New Zealand being mobilised and some control exercised throughout the period of the war as to the location of medical men. So far as the large cities are concerned, owing to the large institutions they possess, they will probably be able to win through, although the medical men in practice in the cities are, of course, feeling the pressure of the large amount of additional work entailed upon them owing to the absence of so many of their professional brethren. This is not at all the position in other districts. For example, the other day I received word from the Westland Hospital Board that there was only one doctor on that part of the coast to cover 300 miles of country.”

“I have been in conference with the executive of the British Medical Association, and I understand that a meeting is to be held shortly in Wellington at which matters of this nature will be discussed with a view to possible action in the future. It appears to me that it will be necessary for the State by legislation to take power to place medical men in districts which are without medical

service. The financial arrangements arising out of this compulsion will require to be very carefully considered. In England the policy of compulsion has been in force for some time past, the medical authorities taking power to remove men from the district in which they reside and to place them in other districts in which there may be a shortage. In these cases the men who remain are, I understand, required to pay a proportion of their receipts to the men who are removed, the idea being that the increased emolument arising from the fact that the work is distributed among a smaller number of doctors makes it fair to adjust the receipts in some way. If the State should at length have to take power to order the location of medical men, it could not be done arbitrarily. A board would have to be set up upon which the medical profession, the Public Health, and possibly also the Defence Department would have to be fully represented. And the State would have to guarantee an adequate income to the practitioner, an income certainly not less than is paid to doctors holding commissions in the New Zealand Medical Corps. I hope to have the assistance of the B.M.A at this conference during the coming month in considering the matter before legislation is brought down. I am aware that many medical men are totally opposed to anything in the way of compulsion, but while the war is on it becomes necessary in the interests of the State that many principles of action should be applied that would never be considered for one moment in normal times.”

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