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This Issue in the Journal

Sociodemographic differences in prevalence of diagnosed coronary heart disease in New Zealand estimated from linked national health records
Simon Thornley, Wing Cheuk Chan, Sue Crengle, Tania Riddell, Shanthi Ameratunga, Suneela Mehta, Dudley Gentles, Sue Wells, Roger Marshall, Rod Jackson

Our findings highlight the considerable burden of heart disease among people over 50 years of age, Māori, Pacific and South Asian men and women. For doctors who see patients, this information supports raising heart disease risk calculations for people who identify as Māori, Pacific and South Asian peoples.

Unmet need of GP services in Pacific people and other New Zealanders
Megan J Pledger, Jacqueline Cumming, Mili Burnette, Jacob Daubé

This article tries to understand what factors are present when a person doesn’t go to see a GP when they think they need too. Things that are associated with last year unmet GP need are age, sex, ethnicity, educational level, deprivation level, self-rated health, asthma, spinal disorders, smoking and body mass index (BMI). Pacific People are more likely to have greater unmet need than Other New Zealanders, Part of the difference is because Pacific People are more likely to have greater deprivation and because Other New Zealanders are more likely to be in higher educational levels. Those with unmet GP need with greater deprivation cite financial constraints while those with high educational levels cite time constraints.

Throat swabbing for the primary prevention of rheumatic fever following health information
Janine Mardani, Lester Calder, Julia Haydon-Carr, Gordon Purdie, Nicholas F Jones

Health promotion efforts to raise awareness of the preventable nature of rheumatic fever and the importance of seeking help for sore throats are particularly important in high-risk communities like Flaxmere (in Hawke’s Bay). This paper found that health promotion interventions can increase throat swabbing of children in a high-risk community. Given that Māori and Pacific children are at greatest risk within communities like Flaxmere it is important that health promotion efforts are appropriate for Māori and Pacific families. The health promotion approach used in Flaxmere during 2009 had an equal impact on Māori/Pacific children and non-Māori/non-Pacific children. This suggests that the approach was effective for the most vulnerable populations.
Achieving equitable outcomes for Māori women with cervical cancer in New Zealand: health provider views
Melissa McLeod, Donna Cormack, Ricci Harris, Bridget Robson, Peter Sykes, Sue Crengle

Cervical cancer incidence, mortality and survival for both Māori and non-Māori women is improving in New Zealand. Health providers identified a number of developments in the management of cervical cancer which may have contributed to improved outcomes for cervical cancer including national social marketing campaigns; standard setting in screening, diagnosis and treatment; and Māori providers contributing to improved access for Māori women. Despite the improvement to date further effort is required to achieve equitable outcomes for Māori, particularly in the areas of prevention and early detection.

Students’ and teachers’ perceptions of the clinical learning environment in years 4 and 5 at the University of Auckland
Ralph Pinnock, Boaz Shulruf, Susan J Hawken, Marcus A Henning, Rhys Jones

The learning environment plays a critical role in how students learn. As our undergraduate medical curriculum is developed in response to an increasing number of students across multiple teaching sites, we considered it timely to review the clinical learning environment of medical students in the first two clinical years. The results of our study show that students’ perceive their learning environment positively. Our students’ perspectives compare very favourably with similar studies internationally. Students rate their teachers highly and perceive they have adequate opportunities to learn clinical skills in a supportive environment. In common with other studies our students are concerned about the amount of knowledge they need to acquire and the availability of support for students under stress as they enter, and during, the clinical years. The teachers feel confident to teach but are concerned about the time they available for teaching.

Leave provision for Canterbury District Health Board’s resident medical officers with sick leave analyses
John Morton

Resident Medical Officers (RMO) leave entitlements including annual (AL), sick (SL), bereavement, parental, special, medical education (MEL), jury service, union and conference leave (CL) are specified in the collective agreement between the New Zealand Resident Doctors’ Association and the Canterbury District Health Board (CDHB). This study reports an analysis of the leave taken, over a 12-month period by Canterbury District Health Board Registrars and House Officers.
What risk do consumers face when seeking medical advice from health food stores?
Llifon Edwards, Sarah Jefferies, Bridget Healy, Mark Weatherall, Richard Beasley, Philippa Shirtcliffe

This study sought to highlight the general risk that a consumer may face when they seek medical advice from someone promoting a complementary and alternative medicine (CAM) product. It is the third in a series by the Medical Research Institute of New Zealand that has found such advice to be wanting, especially from health food stores, and once again calls for better regulation of staff and CAM products. To provide safe and quality advice to consumers, staff who are promoting CAM products need to not only obtain relevant history but also give accurate information regarding possible interactions with current medications. They should also be prepared to refer back to mainstream medical services.
Health inequities are rising unseen in New Zealand

Don Matheson, Belinda Loring

The article by Fenton in this issue of the *New Zealand Medical Journal* raises very important issues for the New Zealand health sector.

The potential introduction of a scheme that allows public patients to access private medicines in a public hospital looks like a commonsense approach at first glance, but on closer examination it is clear that such schemes can seriously undermine health equity, as well as do longer term damage to the public health system. This example is the tip of the iceberg of equity issues that are currently impacting on the health of New Zealanders as a recent review of differences in survival from colon cancer demonstrates.

In times of tight budgets, the pressure to mount such schemes will intensify. Rationing systems will be subject to even more pressure as harder choices will have to be made. The scenario that played out around Herceptin (trastuzumab) in the lead-up to the previous New Zealand general election foreshadows the tensions that will become increasingly apparent. In the Herceptin case, the real anguish experienced by individuals with cancer overwhelmed notions of safety, benefit and fairness across the system as a whole, and undermined a well-established process that had previously been developed by PHARMAC to deal with such issues.

The notion of an egalitarian society, where everyone has a fair go, is deeply embedded in the New Zealand society. Indeed, a strong belief in fairness is behind calls for access to new treatments described in Fenton’s article. However, the irony is that many more New Zealanders die because we fail to provide them with access to the cheapest and most effective healthcare interventions, rather than because of lack of access to high-cost new treatments such as Herceptin. It is essential, therefore, that this fundamental social consensus is given expression at the policy level, and the impact on equity of different policy options is carefully considered.

Recent policy initiatives in the primary health care sector are also having an equity impact. For example, shifting secondary services to community settings in urban, well-served populations have been consistently shown to reduce efficiency and increase cost, with no improvement in health outcomes. In provincial settings it risks undermining the local hospital’s viability.

Delivering secondary services in community settings is only likely to be cost-effective when targeted at under-served, disadvantaged populations. Similarly, the consolidation of smaller general practices, and a broader range of other services, into one larger polyclinic or Integrated Family Health Centre, offers some benefits in terms of improved management of chronic conditions, however there is little evidence to suggest that these benefits outweigh the marked reduction in access that will occur from centralising primary level care.
Health systems are complex, and unexpected outcomes frequently occur from well-meaning policy initiatives. Unless equity is explicitly considered, even the best intentioned policies are likely to inadvertently widen rather than reduce health inequities. To not consider the impacts that new policies have on health inequities is now hard to justify.

Just as these tensions are playing out at the individual access to treatment level, a more profound health equity crisis is evolving (largely unseen) from the impact of other sectors. Indeed, the set of social conditions we are now experiencing closely resembles the set of social conditions in the late 1980s and early 1990s. The combination of rising unemployment, reduction in incomes for low-income families, and reduced access to social housing contributed to widening health inequalities between different population groups such as Māori and non-Māori and low and high income New Zealanders. This arrested (for several years) the historical movement that had been occurring for decades towards a more equitable society. Now that these same social conditions are upon us in 2011, the societal response remains unchanged, with little learning from previous experience.

Current responses suggest we only value equity as a goal when economic conditions are favourable, and are prepared as a society to countenance the reduction in life chances for the most vulnerable, including children, when resources are short. This is certainly unfair, but it also makes little economic sense—denying the potentially positive relationship between health equity and improved economic performance.

Health equity will not just “happen” without strong commitment from government backed by strong support from the health sector. A recent policy statement from the NZMA on health equity is an excellent starting point. The health sector can contribute by seeking to ensure equity in access for the entire population, not just access to more services for those who get through the door.

The health sector also has a strong advocacy responsibility. Health inequities cannot be addressed by the health sector alone, but no sector is better positioned and mandated to advocate for whole of government action to address this preventable and unjust burden of death and disability. The health sector will have difficulty in urging other sectors to consider the health equity impacts of their policies, without leading by example.

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The challenge of reducing socioeconomic and ethnic differences in cardiovascular disease

Ralph A H Stewart

In this issue of the *New Zealand Medical Journal*, Thornley and colleagues describe social and ethnic differences in the prevalence of diagnosed coronary heart disease (CHD) in New Zealand. The findings confirm well recognised trends.

Age-adjusted CHD prevalence was higher in Māori, Pacific peoples and (South Asian) Indians, and increased as socioeconomic resources decrease. The age-adjusted prevalence of CHD was highest in Indian men and in Māori women.

South Asians from Sri Lanka, Pakistan and Bangladesh are also likely to have high rates of CHD, but could not be identified from the New Zealand census data used for this study. The risk of future cardiovascular disease (CVD) is likely to have a similar pattern. Thornley therefore argue that Māori, Pacific and South Asian ethnicity should be included as a CV risk factor, and preventive efforts should target these groups.

While genetic differences are possible, the primary determinants of the ethnic and socioeconomic differences in CVD are differences in conventional cardiovascular risk factors. In the global ‘INTERHEART’ study nine factors explained ~90% of the risk of myocardial infarction in diverse ethnic and geographical populations. These were the low to high density lipoprotein cholesterol ratio (measured as LDL/HDL or ApoA/ApoB), smoking, hypertension, diabetes, obesity measured as waist-hip circumference, psychosocial stress, lack of exercise, a low intake of fruit and vegetables and a protective effect of modest alcohol consumption.

It is likely the same risk factors explain most of the socioeconomic and ethnic gradients in the prevalence of CHD. Smoking, diabetes, obesity, lack of exercise, hypertension, psychosocial stress and a poor diet are all more prevalent in lower socioeconomic groups and in Māori and Pacific peoples living in New Zealand. South Asians have higher rates of diabetes, central obesity and the metabolic syndrome, and are more likely to be sedentary.

While reasons for ethnic and socioeconomic differences in CVD risk are reasonably clear it is harder to define the strategies most likely to close gaps in the prevalence of CVD between these groups and other New Zealanders. Targeting preventive interventions to individuals at highest risk, because they have clinically evident CVD or a high risk based on the Framingham or similar risk equations has been widely adopted in NZ and internationally.

Statins, blood pressure-lowering medication, and aspirin in persons with known CVD, have been clearly shown to reduce the risk of cardiovascular events in large clinical trials. Preventive medications and lifestyle changes which include smoking cessation, regular exercise and a healthy diet are recommended for all patients with known CVD and for individuals known to be at high risk.
However there are important challenges. Framingham based risk equations have modest accuracy—the probability that a person who develops CVD will have a higher score than somebody who does not, the C-statistic, is about ~0.75, and a significant proportion of CV events occur in individuals judged at intermediate risk.\(^8\) In addition, while the benefits from preventive treatments and a healthy lifestyle accrue over years, about half of patients stop taking medications and the majority do not maintain lifestyle changes.\(^10\)

Finally the high-risk approach does not address the cumulative burden of CV risk factors in youth and middle age which ultimately determine increased CVD over the lifespan. Based on current risk factor trends, the ethnic and socioeconomic differences in CVD are likely to increase rather than decrease if only the individual high risk approach to prevention is used.

Health-related behaviours which increase CHD risk also increase the risk of diabetes, stroke, kidney disease, some cancers and possibly cognitive impairment. The presence of several adverse health behaviours in middle life can have huge effects on disability-free survival during the next 20 years.\(^11\) Ethnic and socioeconomic differences in health-related behaviours cluster, and in combination are likely to explain a substantial proportion of the socioeconomic and ethnic differences in health in New Zealand. Their impact can only partly be ameliorated by good medical care.

Whole population strategies which do not rely on individual motivation may be a more cost-effective approach to reduce the future burden of cardiovascular disease in New Zealand, and particularly in lower socioeconomic and higher risk ethnic groups. The most striking examples of effective population-wide interventions are those that target smoking.

In many countries a decrease in both smoking and the incidence of myocardial infarction has followed increases in tobacco taxation, labelling of packets with health warnings, restrictions to advertising and introduction of smoke free zones.\(^12\) Unfortunately for most of the last 10 years the overall prevalence of smoking in New Zealand has not decreased, and smoking rates remain high in more disadvantaged groups, and strikingly so in Māori women.\(^13\)

Population-wide strategies which promote a healthier diet and more regular exercise are also needed but are challenging to implement. In general, steps are needed to discourage consumption of salt, sugar, and saturated and trans-fatty acids, particularly in processed foods, to encourage greater consumption of vegetable oils, fruits, vegetables and other unprocessed foods, and to decrease portion sizes.\(^14\)

Possible approaches to combat obesity include removal of goods and services tax (GST) on fruit and vegetables, a health tax on drinks containing sugar,\(^15\) negotiated reductions in salt added to processed foods,\(^16\) and improved food labelling—for example with a traffic-light system (a red, orange or green indicator on the food package for salt, sugar and fat).\(^17\) To promote exercise urban plans could give priority to walking, cycling and public transport, which make it easier to exercise as part of usual daily life.

As with smoking, relying on individual choice and health education alone is unlikely to substantially improve health-related behaviours, but well designed population-
based interventions supported by education make it easier for individuals to follow a healthier lifestyle.

Behaviours which influence lifelong health are usually established during childhood and adolescence, so health education and interventions to promote healthier habits would logically start at school. In addition, inter-generational risk, mediated by epigenetic changes during fetal development, may be influenced by the mothers’ diet.\textsuperscript{18}

The dramatic increases in childhood obesity in New Zealand, which are predicted to influence population health for years into the future, and high and increasing rates of obesity overall,\textsuperscript{19} and particularly in Māori and Pacific peoples,\textsuperscript{20} should be a call to action.

In conclusion, while preventive treatments are very effective, population-wide initiatives to promote a healthier diet, regular exercise and to largely eliminate smoking will be needed to reduce the current high prevalence of CHD in Māori, Pacific and South Asian peoples.

Given the predicted future costs of healthcare\textsuperscript{21} and the adverse impacts of lifestyle related diseases on quality of life, simple population-wide interventions implemented now are likely to be very cost-effective.

The challenge, as with individual health behaviours, is to be willing to accept the uncertain benefit and short-term cost of individual interventions to achieve a large long-term gain from a broad strategy to promote healthier lifestyles.

**Competing interests:** None.

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Leveraging information from New Zealand statistical data: a first step to wisdom in transforming unmet need for general practice services

Susan M Dovey, Lik W Loh, Wayne K Cunningham

New Zealand is surely one of the most health data-rich countries in the world. The New Zealand Ministry of Health, overseen by Statistics New Zealand, is conscientious in meeting the World Health Organization (WHO) recommendation that every country should have a health survey programme to monitor trends in risk factors and non-communicable diseases.

In the last 10 years, 15 population surveys targeting mental health, nutrition, oral health, and tobacco, alcohol and drug use have been conducted in addition to the more general New Zealand Health Surveys conducted in 1992/93, 1996/97, 2002/03 and 2006/07. Other health surveys conducted for specific purposes have been of prisoner health and childhood immunisation coverage.

Together these surveys collect an enormous amount of robust data about the health of New Zealanders. Their data are used mainly for health service policy and strategy development, in ways that are inscrutable to the general public. Unlike other countries such as the United States, where there is a vigorous industry of health services research built on the analysis of data from public surveys, surprisingly little of New Zealand’s academic, non-government health research activity is applied to making sense of our own national datasets.

It is therefore a treat to have in this issue of the New Zealand Medical Journal a thoughtful and thorough analysis of the 2006/07 New Zealand Health Survey, measuring unmet need for general practice services. Without analyses such as Pledger et al have provided, New Zealand’s health surveys are just “data”—beautiful data, but essentially useless.

Thirty years ago the American systems theorist Russell Ackoff drew attention to the uselessness of data without the application of further effort beyond data collection. He conceived of a 5-level process by which “data” (dismissed as “symbols”) were converted to “wisdom”, the means by which the future is created. The other four categories relate to the present or the past. In between “data” and “wisdom” are “information”, “knowledge”, and “understanding”. Understanding is the process of appreciating why a circumstance arises and “knowledge” is about how it can be changed. The first step beyond “data [collection]” is achieved through processing the data to create “information”. This is what Pledger et al have provided for us.

The paper by Pledger et al gives readers information about who in New Zealand experiences unmet need for general practice services. Māori, Pacific and Asian people are oversampled in the Health Surveys so, unsurprisingly, many academic analyses of these data are dedicated to providing information about disparities between these
ethnic groups and other New Zealanders in various health-related dimensions (see, for example\textsuperscript{4,5}).

Pacific people are the focus and the analysis provides the information that although the groups of Pacific people and other New Zealanders are quite different in many health-related measures, there is no difference in their experience of unmet need for general practice services, until a range of related measures are taken into account. This is the beauty of the modelling approach taken here: it starts to go beyond “information” and towards “knowledge”, suggesting how differences between ethnic groups might operate. It makes reasonable sense that people who are unwell or living with higher levels of deprivation have more unmet general practice services need, and because Pacific peoples have greater representation in these two groups they are more likely to experience unmet need.

More unexpected is the finding that people with higher educational levels are also likely to express higher levels of unmet need and there is a counter-intuitive result with respect to asthma: Pacific peoples have more unmet general practice service need if they do not have asthma.

Conjecturing from a clinical viewpoint, it may be that Pacific peoples with asthma place a particular value on the illness experience of asthma that leads them to seek medical care; perhaps that is different from values placed on other types of illnesses. Pacific patients may visit their GP more frequently for asthma exacerbations rather than for preventative care. Furthermore, there appears to be a tendency for Pacific patients to utilise health services less optimally than other ethnic groups for asthma care, and to display less proficiency regarding their asthma management.\textsuperscript{6}

There is often a disparity between self-perceived asthma control and the actual level of control (Holt et al, 2003).\textsuperscript{7} People with higher educational levels may claim busyness as a reason for unmet need, also suggesting a particular set of values that underlies reported behaviours. This sort of ‘data-to-information’ study highlights the value of further research that attempts to answer the ‘why?’ question, adding to knowledge and understanding about the care of both groups and individual patients.

Researchers have an important role in transforming data into “information” and perhaps also “knowledge”. That is probably where their responsibilities end, however. Armed with this information and knowledge, clinicians, health care planners and policy-makers carry the burden of responsibility for carrying this knowledge forward into “wisdom”. Obviously this is no small task. Gauld et al have shown that New Zealand policy-makers are generally aware of determinants of health and that they try to take the research into account when forming policy but they are constrained in exercising “wisdom” by a lack of research about practical options for transforming the future.\textsuperscript{8} This then diverts attention back to researchers and research funding agencies.

If we really want to make a difference to the health of New Zealanders we—all of us—have to operate in greater synergy. It is good to have the excellent data that the Ministry of Health has collected, it is great to have the excellent information and knowledge that robust analysis from researchers such as Pledger et al, it is wonderful that we have people in policymaking positions who are disposed to use the research to make wise decisions. However, we still have unmet health services needs and health inequalities.
Perhaps an important way to resolve the research-policy gap to by supporting more applied research, that addresses not only the ‘what?’ but also the ‘why?’ questions and that is geared to providing use-able signals, or “wisdom” for transformative changes.

Competing interest: None.

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Reducing a striking health inequality

Jonathan Jarman

Nearly 40 years ago a tribe of Native Americans in Arizona decided to do something about the high levels of rheumatic fever and rheumatic heart disease in their communities.

Tribal members with no previous technical training worked in partnership with the local health provider, set up a streptococcal laboratory, and throat-swabbed children in schools. Teaching sessions using audiovisual techniques were held for groups of parents, teachers and the administrative staff of schools in the tribal area. Children with group A streptococcus were given either an injection of benzathine penicillin, or 10 days of oral penicillin or erythromycin.

Rates of acute rheumatic fever subsequently steadily declined over a 5-year period. But so did the incidence of group A streptococcal pharyngitis. A paper published in 1982 raised the question: was the decline in rheumatic fever in these Native American communities caused by the change in the “total streptococcal milieu”?\(^1\)

Despite the success of most developed countries and some developing countries in greatly reducing rheumatic fever, the numbers of cases in New Zealand remain high and in fact have been increasing in recent years.\(^2\) There are also striking differences between the disease burden in different ethnic groups in New Zealand with Pacific peoples 37 times and Māori 20 times more likely to be admitted to hospital with first time acute rheumatic fever than people of European/Other ethnicity in 2010 (Personal Communication, J Mardani, Ministry of Health 2011).

Why are there such striking disparities in New Zealand for a disease which is preventable? Jones suggests that there are three main pathways that contribute to ethnic inequalities in health:

- Differential access to the determinants of health or exposures leading to differences in disease incidence,
- Differential access to health care, and
- Differences in the quality of care received.\(^3\)

All of these pathways are likely to be drivers for the ethnic differences seen in rheumatic fever incidence in New Zealand. It is important to bear in mind that the main reason for rheumatic fever in New Zealand is untreated streptococcal throat infections.\(^4\)

The article by Mardani et al in this issue of *NZMJ*\(^5\) has shown that targeted health education for high-risk families can measurably increase throat swabbing rates for children with sore throats. The approach used in Hawke’s Bay should be replicated in all schools in communities where there are high levels of rheumatic fever in order to raise community awareness.
But will health education alone reduce rheumatic fever? Probably not, unless the other health inequality pathways are addressed at the same time. Making people aware of the importance of sore throats will make little difference to the large number of our children who are living in cold overcrowded homes. It will not improve their access to medical attention and will not ensure that they are correctly prescribed a course of 10 days of oral antibiotic which some will struggle to complete.

In 2010 there were 168 cases of acute rheumatic fever notified in New Zealand.\(^2\) One estimate is that the attack rate of acute rheumatic fever following an untreated group A streptococcal throat infection in school-aged children was 0.4%.\(^6\) This would mean there were at least 40,000 untreated streptococcal throat infections last year in New Zealand.

The answers for eradicating rheumatic fever are likely to be similar to the answers for eliminating the ethnic disparities seen in many other childhood diseases in New Zealand. The causal pathway with its differences in the determinants of health, lack of access to health services, and differences in health care received between ethnic groups is likely to be identical.

The first step is to make rheumatic fever a specific childhood health inequality indicator and make it a health target for district health boards (DHBs). External accountability for outcomes is an important strategy for improving the health of indigenous and vulnerable populations.\(^7\)

Leadership and funding is required from the centre. It is obvious that government departments, DHBs, hospitals, public health agencies, universities, non-governmental organisations (NGOs), and primary care providers all have a part to play, ideally in a coordinated approach.

Health education interventions such as those described by Mardani et al need to occur alongside interventions that can be shown to reduce streptococcal disease in communities. There needs to be a whole of health sector intolerance of incorrect or incomplete treatment of streptococcal pharyngitis and a focus on quality. But some of the most important traction for reducing health inequalities comes from the vulnerable communities themselves but only if they are involved as equal partners from the outset.

So far only one community in New Zealand has managed to eradicate acute rheumatic fever. The small community of Whangaroa in Northland worked in partnership with their public health unit and local general practice to carry out community education and school-based throat swabbing of children with sore throats. They used to have one of the highest notification rates of acute rheumatic fever in New Zealand. The last case from the area was in 2002—8 days after the intervention started.\(^8\)

\textit{Ehara taku toa i te toa takitahi, engari taku toa he toa takitini}  
(Our strength is not ours alone but that of our community)

**Competing interests:** None.

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Sociodemographic differences in prevalence of diagnosed coronary heart disease in New Zealand estimated from linked national health records

Simon Thornley, Wing Cheuk Chan, Sue Crengle, Tania Riddell, Shanthi Ameratunga, Suneela Mehta, Dudley Gentles, Sue Wells, Roger Marshall, Rod Jackson

Abstract

Aim To estimate sociodemographic differences in the prevalence of coronary heart disease (CHD) in New Zealand from linked health records.

Methods We combined records of hospital treatment for CHD, dispensing of selected anti-anginal drugs and mortality to estimate the national point prevalence of coronary heart disease in New Zealand in December 2008. Stratified estimates are presented by gender; age; Māori, Pacific, Indian and ‘Other’ (mainly New Zealand European) ethnic groups; and socioeconomic status.

Results Among a “health contact” population of adults (≥15 years), about one in twenty (6.5% of men and 4.1% of women) had indicators of a past diagnosis or treatment for CHD or both. Substantial differences in prevalence occurred by gender, ethnic group and socioeconomic status. For example, among New Zealanders aged 35 to 74 years, Indian men had the highest age-adjusted prevalence (7.78%; 95%CI 7.43 to 8.15), almost double the prevalence of ‘Other’ males. Among women, Māori had the highest adjusted prevalence (4.03%; 95%CI 3.89 to 4.17), just over twice that of ‘Others.’

Conclusion Major sociodemographic disparities in the national burden of CHD persist. Our results are similar to previous studies of ethnic disparities in CHD incidence, but also confirm concerns about the emerging CHD burden among South Asians. Indian males have the highest CHD prevalence of any gender-specific ethnic group. Of equal concern, Māori women have a similar prevalence to European males.

Coronary heart disease (CHD) caused almost 6000 deaths in New Zealand in 2006, over twice that from stroke, the second highest disease-specific cause of death. Given that half of these deaths occur in people with prevalent CHD, timely and accurate estimates of prevalence are required to allocate resources to the health sector and also to monitor the effect of prevention programmes. Annual CHD mortality data are readily available from routine data collections and provide one indicator of the population burden of CHD, but prevalence, which is a better indicator of the current burden of disease, is, to date, not well documented.

We sought to describe and compare the prevalence of coronary heart disease in New Zealand among different sociodemographic groups.
Methods

Denominator population—We linked routine national datasets to estimate the point prevalence of CHD in New Zealand residents. Every New Zealander now has a unique identifying code, the National Health Index (NHI) that is linked to most national health databases. The coverage of this indicator has increased substantially in recent years to over 94% from 2005. People with diagnosed CHD were identified from a denominator population, derived from linked, multiple, national health datasets (see below) to identify a ‘health contact population’ for New Zealand in 2008. This group became the denominator for all subsequent calculations. This method was preferred over using census population counts because variables for both numerator and denominator are derived from the same source, which avoids potential “numerator denominator bias”.

In New Zealand health datasets, a number of sociodemographic variables may be linked to individuals. Gender, age, ethnicity, and socioeconomic status of each participant were obtained as follows: ethnic group was taken from the 2nd quarter 2007 Primary Health Organisation (PHO) enrolment, using a prioritized method in the following order—Māori, Pacific, Indian and Other. Due to protocols of ethnicity data, other South Asian groups, such as Sri Lankans, Pakistanis and Bangladeshis cannot be accurately identified and are most likely to be recorded in the “Other” category (the majority of whom are New Zealand Europeans).

NZDep2006, an area-based, decile measure of socioeconomic deprivation, was drawn from the meshblock recorded in PHO enrolment data, or if unavailable, taken from hospital discharge records (which represented a larger area measure – census area unit). Gender and age were recorded in the hospital discharge diagnosis dataset. People coded with overseas addresses were removed from the analysis.

Appearance during 2008 in any of the following datasets defined the health contact, denominator population:

- general medical subsidy (from visit to a GP)
- last GP consultation
- hospital discharge
- pharmaceutical dispensing
- laboratory claims
- mental health service contact
- immunisation register
- PHO enrolment

People who died during this year were removed to simulate a point prevalence survey carried out on the last day of 2008. Individuals were therefore assumed to be alive on the 31st of December 2008. The health contact population included between 89% and 94% of the census derived population estimate for the years 2005 to 2008. The variation was likely to be due to differences in the recording of people from different datasets in different years, with some recording, such as PHO enrolment only done at three yearly intervals.

Numerator—Although much coronary artery disease is subclinical, and escapes medical attention, we focused on identifying individuals who had a clinical manifestation of their disease. From the “health contact” population, people were identified with diagnosed CHD if they had one or more of the following records indicating that they had received health care for this disorder:

- Hospital discharge diagnosis of coronary artery disease (in years 1991–2008 with diagnostic ICD 10 or corresponding ICD 9 codes presented in Table 1)
- One or more dispensing episodes for any of the following drugs used to treat CHD between 2007 and 2008:
  - glyceryl trinitrate
  - isosorbide dinitrate
  - isosorbide mononitrate
  - nicorandil
  - perhexiline
These two treatment records are referred to by “hospital diagnosis” and “drug dispensing” in what follows.

Table 1. ICD – 9/10 codes used to identify people with coronary artery disease

<table>
<thead>
<tr>
<th>Diagnosis or procedure description</th>
<th>ICD 9</th>
<th>ICD 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary heart disease</td>
<td>410x to 414x</td>
<td>120x to 125x</td>
</tr>
<tr>
<td>Coronary angioplasty or stent or</td>
<td>36.0x</td>
<td>3530400 to 3530501, 3531000 to 3531005</td>
</tr>
<tr>
<td>Percutaneous coronary intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CABG ( including re-do procedures)</td>
<td>36.1x to 36.2x</td>
<td>3849700 to 3850304, 9020100 to 9020103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3863700, 3845619, 3865308, 3850500</td>
</tr>
</tbody>
</table>

‘x’ refers to all next level subcodes

Statistical analysis—Sociodemographic variables, including age, gender, ethnicity and NZDep06, were treated as categorical predictors (age was stratified into 5-year intervals). We used logistic regression to adjust for the effects of these variables and derive comparable estimates using R software. Scaled rectangle diagrams, which are like scaled Venn diagrams, depicted the relative size and degree overlap between datasets.

Results

The health contact population, in 2008, was equivalent to 90% (3,842,402/4,268,900) of the estimated intercensus population. Our analyses were restricted to people over the age of 15 years, and comprised a total of 2,985,877 people (88% of the equivalent intercensus estimate of 3,385,550). The overall prevalence of CHD in our cohort was 5.8% (174,399/2,985,877). A scaled rectangle diagram illustrates how people with CHD were identified (Figure 1). The smaller, higher, square is proportional to the number identified by drug dispensing, with the larger square representing cases selected by hospital diagnosis.

Figure 1. Scaled rectangle diagram, showing overlap between databases used to identify people with CHD (by Drug-community dispensing; Diagnosis-discharge diagnoses)
Most of the CHD population was found by hospital diagnosis, with drug dispensing capturing an additional 22% (38,905/174,399) of the total. About one in three people identified with CHD (36%; 63,147/174,399) were located in both sources.

Table 2. Numbers and prevalence of people with CHD, by sociodemographic variables

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CHD* counts (column %)</th>
<th>Denominator counts (column %)</th>
<th>Crude CHD prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>174399</td>
<td>2985887</td>
<td>5.8</td>
</tr>
<tr>
<td>Female</td>
<td>77194 (44.3)</td>
<td>162354 (54.4)</td>
<td>4.1</td>
</tr>
<tr>
<td>Male</td>
<td>97205 (55.7)</td>
<td>1362633 (45.6)</td>
<td>6.5</td>
</tr>
<tr>
<td>Age category</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 to 19</td>
<td>112 (0.064)</td>
<td>271915 (9.1)</td>
<td>0.041</td>
</tr>
<tr>
<td>20 to 24</td>
<td>166 (0.10)</td>
<td>241430 (8.1)</td>
<td>0.069</td>
</tr>
<tr>
<td>25 to 29</td>
<td>209 (0.12)</td>
<td>221941 (7.4)</td>
<td>0.094</td>
</tr>
<tr>
<td>30 to 34</td>
<td>395 (0.23)</td>
<td>230813 (7.7)</td>
<td>0.17</td>
</tr>
<tr>
<td>35 to 39</td>
<td>1088 (0.62)</td>
<td>271827 (9.1)</td>
<td>0.40</td>
</tr>
<tr>
<td>40 to 44</td>
<td>2779 (1.6)</td>
<td>271986 (9.1)</td>
<td>1.0</td>
</tr>
<tr>
<td>45 to 49</td>
<td>5979 (3.4)</td>
<td>281474 (9.4)</td>
<td>2.1</td>
</tr>
<tr>
<td>50 to 54</td>
<td>10042 (5.8)</td>
<td>247884 (8.3)</td>
<td>4.1</td>
</tr>
<tr>
<td>55 to 59</td>
<td>14827 (8.5)</td>
<td>223096 (7.5)</td>
<td>6.6</td>
</tr>
<tr>
<td>60 to 64</td>
<td>20438 (11.7)</td>
<td>200806 (6.7)</td>
<td>10.2</td>
</tr>
<tr>
<td>65 to 69</td>
<td>23354 (13.4)</td>
<td>159935 (5.4)</td>
<td>14.6</td>
</tr>
<tr>
<td>70 to 74</td>
<td>24757 (14.2)</td>
<td>122970 (4.1)</td>
<td>20.1</td>
</tr>
<tr>
<td>75 to 79</td>
<td>26007 (14.9)</td>
<td>101091 (3.4)</td>
<td>25.7</td>
</tr>
<tr>
<td>80 to 84</td>
<td>23273 (13.3)</td>
<td>75968 (2.5)</td>
<td>30.6</td>
</tr>
<tr>
<td>85 plus</td>
<td>20973 (12.0)</td>
<td>62751 (2.1)</td>
<td>33.4</td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Māori</td>
<td>13143 (8.4)</td>
<td>348222 (11.7)</td>
<td>4.2</td>
</tr>
<tr>
<td>Pacific</td>
<td>5004 (3.2)</td>
<td>175047 (5.9)</td>
<td>3.2</td>
</tr>
<tr>
<td>Indian</td>
<td>2962 (1.9)</td>
<td>75604 (2.5)</td>
<td>4.5</td>
</tr>
<tr>
<td>Other</td>
<td>134625 (86.4)</td>
<td>2387014 (79.9)</td>
<td>6.3</td>
</tr>
<tr>
<td>NZDep06#</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 2</td>
<td>25460 (14.6)</td>
<td>552025 (18.5)</td>
<td>4.6</td>
</tr>
<tr>
<td>3 and 4</td>
<td>29232 (16.8)</td>
<td>541858 (18.1)</td>
<td>5.4</td>
</tr>
<tr>
<td>5 and 6</td>
<td>37206 (21.3)</td>
<td>599491 (20.1)</td>
<td>6.2</td>
</tr>
<tr>
<td>7 and 8</td>
<td>44519 (25.5)</td>
<td>650495 (21.8)</td>
<td>6.8</td>
</tr>
<tr>
<td>9 and 10</td>
<td>37202 (21.3)</td>
<td>623386 (20.9)</td>
<td>6.0</td>
</tr>
<tr>
<td>Missing</td>
<td>780 (0.45)</td>
<td>18182 (0.6)</td>
<td>4.3</td>
</tr>
</tbody>
</table>

*CHD – coronary heart disease; #NZDep06 – an area based measure of socioeconomic status.

The study population and crude prevalence estimates are summarised in Table 2. As expected, very few people developed CHD before the age of 35, and the proportion with CHD increases with age to one in three people aged over 85 years. As prevalence proportions by gender, ethnic group and socioeconomic status (NZdep06) are hard to interpret due to their different age structures, we present such data, by age group, in a series of figures (Figs 2–5).
Figure 2. Age-specific prevalence of cardiovascular disease, by gender.

Diagnosed CHD prevalence increased with advancing age up to age 80 to 84 years, and was higher in males than females in all age groups (Figure 2). At age 50-54 years CHD prevalence in males was just over 5% and in females was about 2.5%. By age 75 to 79 years this had increased to 30% in males and 22% in females.

CHD prevalence increased with higher deprivation across all age groups up to ages 75 to 79 years (Figure 3). From age 80 years prevalence levelled off or fell slightly in the most deprived quintile.
Figure 3. Age-specific CHD prevalence by socioeconomic status; lowess smoothed
CHD prevalence was highest in Indian males in all age groups (Figure 4). Māori males had the next highest prevalence up to age 74 years. Pacific men had the third highest CHD prevalence up to age 64 years after which ‘Other’ men (mainly New Zealand Europeans) had the third highest prevalence. Over age 75 years the prevalence of CHD in ‘Other’ men was higher than Māori men.

While CHD prevalence continued to increase almost exponentially in Indian and ‘Other’ men throughout the age range examined, it began to flatten out in Pacific men after about age 55 to 65 years and a similar pattern was observed in Māori men after age 65 to 75 years.
Among women (Figure 5), Māori had the highest CHD prevalence at all ages. Pacific women had the next highest prevalence up to age 55 years, when they were overtaken by Indian women. ‘Other’ women had the lowest CHD prevalence up to age 70 to 74 years, after which, they overtook Pacific women. The ethnic-specific prevalence patterns in women over the age of 80 years were unstable, although as with men, Pacific women aged over 85 years had the lowest CHD prevalence. Of note, Māori women had somewhat similar prevalence patterns to ‘Other’ men.
Figure 6 shows CHD prevalence in the highest and lowest socioeconomic quintiles for Māori and the ‘Other’ ethnic groups. Prevalence is higher among the least deprived quintile of Māori when compared to the most deprived ‘Other’ ethnic group, although this pattern is not observed after the age of 75 years.

We also estimated prevalence by ethnic group using logistic regression, and adjusting for age, in one analysis, and both age and deprivation in another (Table 3). In these analyses the substantial age differences in prevalence observed in Figures 2-6 are effectively averaged. The age-adjusted differences in prevalence between ethnic groups was attenuated after adjustment for socioeconomic status (Figure 3).
Table 3. Age and age & deprivation adjusted prevalences (logistic models) of CHD by gender and ethnic group, age 35 to 74 years

<table>
<thead>
<tr>
<th>Gender</th>
<th>Ethnic group</th>
<th>Age-adjusted prevalence (95% CI)</th>
<th>Age &amp; deprivation-adjusted prevalence (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>Māori</td>
<td>6.21 (6.05–6.38)</td>
<td>5.68 (5.53–5.84)</td>
</tr>
<tr>
<td></td>
<td>Pacific</td>
<td>5.04 (4.84–5.24)</td>
<td>4.49 (4.31–4.68)</td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>7.78 (7.43–8.15)</td>
<td>7.51 (7.17–7.87)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>4.20 (4.14–4.27)</td>
<td>4.28 (4.22–4.35)</td>
</tr>
<tr>
<td>Females</td>
<td>Māori</td>
<td>4.03 (3.89–4.17)</td>
<td>3.48 (3.35–3.60)</td>
</tr>
<tr>
<td></td>
<td>Pacific</td>
<td>2.42 (2.29–2.55)</td>
<td>2.01 (1.90–2.13)</td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>2.60 (2.41–2.81)</td>
<td>2.47 (2.29–2.67)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>1.70 (1.66–1.74)</td>
<td>1.75 (1.71–1.79)</td>
</tr>
</tbody>
</table>

Discussion

We present the first direct (not modelled from life tables) national estimates of diagnosed CHD prevalence, by sociodemographic status, undertaken in New Zealand. Such analyses were only possible because almost all New Zealanders now have a unique health identifier that can be anonymously and accurately linked to multiple health datasets.

As expected, CHD prevalence differed by age group with 6 to 7-fold increases in prevalence between ages 50 to 54 years and 75 to 79 years. Also, as expected, males had 1.5 to 3 times the CHD prevalence as females of the same ethnic group, with Indians experiencing the greatest gender difference.

Of note, Indian males had the highest prevalence of CHD in all age groups. Māori males had the second highest CHD prevalence, and of particular concern, in some age groups, Māori females had higher CHD prevalence than Pacific and ‘Other’ males. Similar to international studies, CHD prevalence was highest among people residing in more deprived areas. This effect would probably have been more marked if an individual (rather than the area based measure used here) marker of socioeconomic status was used. Part of the effect of ethnic group on CHD status is likely to be mediated through adverse effects on an individual’s socioeconomic position. Therefore, as we observed, controlling for area-based deprivation reduced, but did not fully account for, between-ethnic group differences in CHD prevalence.

Our results are strengthened by comprehensive coverage of routinely collected health data in New Zealand, which has improved substantially over the last three years. The method of estimating prevalence that we used obviates some of the limitations of community surveys. As a result of the low cost of data acquisition and near complete capture of health events, the analysis does not suffer from random error due to small numbers, or from responder bias common with health surveys (for example, the response rate of the latest New Zealand Health Survey was only 69%). Our health contact population was defined by at least one record of health-related care during 2008 which excludes about 10% of the census estimated population.

The omitted 10% may not require healthcare due to excellent health status, or alternatively, do not access healthcare (except in dire circumstances). Using the health contact population denominator, however, will reduce the potential for other bias, if
for example, individuals may be recorded in the denominator, but due to overseas travel or other reasons, are not able to be included in the disease (numerator) class if such an event occurs. Moreover, this approach prevents numerator-denominator bias related to ethnicity or deprivation classification as these variables were derived from the same, NHI linked, dataset for both the numerator and denominator in all calculations.

The prevalences that we have estimated are, however, defined as those in the “health contact” population, and need to be regarded as such. As the health contact population undercounts the actual census count population by about 10%, the prevalences among the entire population will be correspondingly lower, if the numerator captures all cases of CHD.

Limitations of the study include the lack of validity testing of our method. Whilst CHD diagnostic codes are likely to be reasonably accurate, our method of using drug dispensing, as an indicator of diagnosis, may result in some measurement error because some patients may be taking anti-anginal (particularly nitrate) drugs for either a therapeutic trial, when the diagnosis is not securely made; or for other indications, such as end stage liver disease. This group contributes <25% to the total estimate (Figure 1).

If we apply a more strict criterion for CHD diagnosis, based on at least two anti-anginal dispensing episodes, the total prevalence of CHD reduces to 5.2% in people aged over 15 years (about 25,000 fewer cases). Also, with routinely collected data, important clinical and behavioural characteristics are not captured, such as smoking status and blood pressure. Such data would considerably assist untangling why such inequalities exist. From experience in other health care datasets, recording of diagnosis information is less likely to be accurate in older age groups, and this phenomenon may partly explain the large variation in prevalence at this end of the age range.

Māori, in particular, have lower than expected prevalence in older age groups. Several explanations are possible. Firstly, fewer Māori and Pacific people may receive nitrate treatment, and, in support of this hypothesis, a separate analysis of the Counties Manukau population data showed no drop-off for Māori males when nitrates were excluded from the prevalence definition. Alternatively, higher case-fatality among Māori and Pacific people, as has been previously documented, may lead to this lower than expected prevalence. Such an issue will be studied in a future paper.

Due to the protocols which determine the way ethnicity data is collected in New Zealand, in our analysis, non-Indian South Asian groups (Sri Lankan, Bangladeshi, Pakistani) were unable to be distinguished from several ethnic groups likely to have lower prevalence of CHD, such as Japanese and Korean people (all classified as “Other Asian”). This poor classification of Asian ethnicity would have led to an under-estimate of the prevalence of CHD in South Asians if all Asians were included as South Asians. Therefore we limited our analyses of South Asians to the “Indian” ethnic group (which includes Fijian Indians).

A similar study, undertaken in 2007, documented the prevalence of a larger cluster of diagnoses - cardiovascular disease (CVD) - using a similar technique which combined historic hospital diagnoses and pharmaceutical use. This study reported CVD
prevalence that was about 20% higher than our CHD estimates in older age groups. In addition, Māori – non Māori disparities in CVD burden were greater than for CHD burden. In our study, Indian males had the highest age-adjusted CHD prevalence, whereas Māori men had the highest ethnic-specific CVD prevalence. In both the CVD and CHD analyses, Māori had the highest prevalence in women. Gender and deprivation effects appeared similar in the two studies when examined by age category.

The last published estimate of CHD prevalence was reported by Tobias and colleagues who analysed 2001-03 data and estimated CHD prevalence using multi-state lifetable modelling. In this study, incidence (from hospital diagnosis data) of CHD and mortality rates were used to mathematically derive prevalence. They reported overall male and female case numbers, that when combined with historic census data from 2003, gave a significantly lower overall CHD prevalence in the over 15 age group, compared to our calculations (Tobias male 3.8% and female 2.5%; compared to our male 6.5% and female 4.1%).

The modelling approach may have underestimated CHD prevalence or our approach over-estimated it, however, the difference could not be accounted for entirely by our definition of prevalence using the health contact population as a denominator. In the former paper, only people with primary discharge codes of CHD were included, while our study used both primary and secondary codes. In addition, we included people who were dispensed anti-anginal agents but without CHD-coded hospital discharge records, which accounted for about 22% of CHD cases in our analyses.

While our analyses are likely to better describe the current overall prevalence of CHD, both methods can be used to monitor change over time. Moreover the more restrictive approach taken by Tobias and colleagues is not prone to biases caused by changes in prescribing practice.

Our most important findings were variations found by ethnic group and gender on CHD prevalence. Differences in smoking prevalence may account for some of these observed patterns. Smoking prevalence among Māori was higher in women (50.3%) than men (42.5%) in 2006 census data while estimates of Asian smoking show much higher prevalence in males (16.3% male; 3.4% female).

The high prevalence of smoking among Māori is also likely to increase their case-fatality rate, which would tend to reduce prevalence but increase incidence. In addition to such risk factors, drug based primary prevention may differ between ethnic groups. For example, in the early 2000s, Māori were less likely to be screened for diabetes, and Māori people with diabetes were less likely to be treated with drugs that reduce the incidence of CHD events, such as statins and ACE-inhibitors, compared to other ethnic groups.

Our analyses have accounted for differences in socioeconomic deprivation, but we did not include the other data required to determine if the standard risk factors (e.g. blood pressure, lipids, diabetes, smoking status) explain the ethnic prevalence differences. The reason for the high rates of CHD found in Indian men deserves further investigation, with attention to issues that may vary based on country of origin, migrant status and time in New Zealand. Similar, relatively high, rates of disease in South Asians living in Britain have been recorded, which have been attributed to their
high prevalence of: diabetes, insulin resistance and raised serum triglycerides. Differences in diet may explain much of these high levels of risk factors, although exploring which nutritional element is responsible for these dramatic ethnic disparities in disease prevalence remains to be investigated.

From a public health perspective, our findings highlight the considerable burden of CHD in the community, particularly among people over 50 years of age; and in Māori, Pacific and Indian men and women. From a clinical perspective, this prevalence information supports the use of a risk adjuster for Māori, Pacific and Indian peoples in New Zealand guidelines for the enrolment, assessment and management of CVD risk. Future work is planned to more fully explore the clinical and policy implications of this study. From an equity viewpoint, our analyses highlight where limited cardiovascular health resources require allocation and primary prevention strategies should be targeted.

**Competing interests:** None.

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**References:**


Unmet need of GP services in Pacific people and other New Zealanders

Megan J Pledger, Jacqueline Cumming, Mili Burnette, Jacob Daubé

Abstract

Aim To compare the unmet need of GP services for Pacific peoples (mostly of Samoan, Tongan, Niuean, or Cook Islands origin) and Other New Zealanders (predominantly European New Zealanders, Māori, and Asian New Zealanders).

Methods The New Zealand Health Survey 2006/2007 sampled 12,488 people, aged 15+ years, living in private dwellings in New Zealand. Of these 1033 were Pacific peoples and 11,455 were Other New Zealanders. Self-reported unmet GP need in the previous 12 months was modelled using logistic regression with sociodemographic, health status and risk variables as covariates.

Results Age, sex, educational level, New Zealand individual Deprivation Index, self-rated health, spinal disorders and daily smoking were associated with unmet GP need. Ethnicity has two interactions in the model, one with asthma and the other with body mass index (BMI). The difference in unmet need between Pacific peoples and Other New Zealanders was explained in part by Pacific peoples being more likely to be in categories with more deprivation characteristics but countered by Other New Zealanders having a higher probability of having higher educational qualifications where there was also higher unmet need. Those with unmet GP need in the higher educational levels were more likely to say “they couldn’t spare the time”.

Conclusion Unmet GP need is associated with ethnicity, health need and financial and time constraints.

General practitioners (GPs) are an important gateway into the New Zealand health system. While providing care themselves, they also provide a pathway to more specialised services. When people are unable to access GP services, their health can be compromised.

Numerous studies in New Zealand have found that the health status of Pacific peoples (mostly of Samoan, Tongan, Niuean, or Cook Islands origin) to be worse than that of other New Zealanders. Part of the reason for this disparity could be due to delays or avoidance in seeking GP services when they are needed.

Published information derived from 2006/07 New Zealand Health Survey has already identified that there is clear divergence in unmet need for GP services between ethnicities. The Ministry of Health’s (2008) A Portrait of Health identified that reported unmet need for GPs among New Zealand adults, before and after adjustment for age, is significantly greater for Pacific peoples than European/Other. Amongst children, however, a further Ministry of Health report regarding the health of Māori and Pacific children found that after adjusting for age, there was no significant
difference between the prevalence of unmet need for Pacific children and non-Pacific children.  

Non-Ministry research surrounding the usage of GPs by Pacific peoples in New Zealand has largely focussed on rates of GP visitation (use) rather than the presence of unmet need.

Crampton and colleagues (2007) conducted a nationally representative survey of GPs and patient visits. Observational results showed that after adjusting for socioeconomic deprivation scores (NZDep2001), age, gender, and organisation type, average annual exposure to primary health care was higher among those selecting the ‘European’ ethnic group than the ‘Māori’, ‘Pacific’, or ‘Asian’ ethnic groups.

Similarly, an analysis of data routinely collected from GP practices in the Wellington region found that after adjusting for socioeconomic deprivation scores, age and gender, Māori, Pacific Island and Asian populations had lower (although Māori only slightly) doctor consultation rates than Europeans. Such data, however, only include those who used GP services over the study period and not the general population. It may be that some people are not using GP care at all.

National literature has previously linked some of the ethnic disparity in use of services to high cost. In the Health Utilisation Research article (2006), GP visitation figures were compared between groups with higher subsidy (children under six years of age) and those with lower subsidy (children six and over). Utilisation rates for children under 6 years of age were slightly higher for Pacific Islanders than Europeans, both before and after adjusting for deprivation, while for children over six rates of attendance were considerably lower for Pacific Islanders than Europeans, before and after deprivation adjustment. Similar results were shown for Māori and Asian populations. Cost therefore appears to limit access for Pacific peoples.

This paper looks at the level of unmet GP need in Pacific peoples and Other New Zealanders, the variables associated with this unmet need, and whether there are any differences between Pacific peoples and Other New Zealanders. It also looks at the reasons why people do not go to a GP when they need to and what they do instead.

Methods

Confidentialised, unit record data from the 2006/2007 National Health Survey were supplied by the Ministry of Health. This data set contains 12,488 respondents, aged 15 years and over, who were living in a private dwelling in New Zealand. The survey over-sampled Māori, Pacific and Asian peoples through a complex method of sampling; however, the survey has been weighted to produce a representative sample.

Estimates produced by these weights form unbiased estimates of the corresponding population values. The dataset also includes a set of 100 replicate weights which were created using the delete-group method. Each of these weights creates an estimate. The variance of these 100 estimates around the unbiased estimate gives the sampling variance of the unbiased estimate. For the purpose of this paper, SUDAAN software was used to do these calculations.

Respondents were asked a range of questions about doctor-diagnosed health conditions, health service use, risk factors and sociodemographics factors. Except for height and weight which were measured, the responses given were self-reported.

Respondents were asked which ethnic group/s that they belonged too. For the purposes of this study, anyone who reported any Pacific ethnicities were recorded as a Pacific Person and everyone else was recorded as an Other New Zealander.
Respondents were also asked whether they had needed to go to a GP in the last year but did not go. This was coded as 1 for those who said they had unmet need and 0 for those who did not and analysed using logistic regression. A selection of sociodemographic, health status and risk factors were selected as explanatory variables for the model.

The model was constructed in four steps. At the first step, a base model was constructed with age, sex and ethnicity and their interactions. The form of the model was found by using backwards selection. At the second step, all the explanatory variables were considered individually with the base model from step 1 in four ways:

1. By themselves,
2. As an interaction with age,
3. As an interaction with sex, and
4. As an interaction with both sex and age.

These results are displayed in a table to show which variables are important by themselves even if they are not part of the final model. At the third step, all the variables that were significant at the second step were put into the final model and backwards selection was used to reduce the model to its final form.

Results from the final model are reported as odds ratio and adjusted probabilities for each variable. Adjusted probabilities use the model to form probabilities based on the value of the coefficients in the model and the distributions of the explanatory variables. Variables that had interactions with age or sex were displayed graphically.

Finally, in the fourth step, a final series of models were run to look at what variables affect the difference in unmet GP need between Pacific peoples and Other New Zealanders. For each variable that had main effect only, the final model was run but with that variable removed and the change in the ethnic difference was recorded. If the ethnic difference changed by more than 10% then the variable removed was said to be a confounder for the ethnic difference and was therefore said to explain or accentuate some of the difference seen between Pacific peoples and Other New Zealanders.

Results

The variables considered in the model and their distribution by ethnicity appear in Table 1. The two groups, Pacific peoples and Other New Zealanders, appear to be most dissimilar for the variables age, household size, New Zealand Individual's Deprivation Index (NZiDep), Urban/Rural living, AUDIT score for alcohol consumption and body mass index (BMI).

At the first step, the base model formed was a main effects model with age, sex and ethnicity.

The results from the second step, the selected variables fitted individually with the base model, appear in Table 2. This shows which variables were significant by themselves, in interactions with age and with sex. Some of the variables that are important at this stage may not survive the model building process but can offer insight into unmet need.

Table 3 gives the results from the third step which gives the final form of the model. The variable which shows the greatest range in adjusted probabilities is NZiDep, with the most deprived having the greatest probability of unmet GP need. This is followed by age and then self-rated health; older people and those who are the most unwell have the greatest probability of unmet need.

In the model, higher education is also associated with a higher probability of unmet need.
Table 1. The variables considered in the model and their distribution with Pacific people and Other New Zealanders

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### Table 2. Significance results for variables fitted individually and in different combinations of age and sex with the base model

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**Notes**

1. Significance codes: *** = p<0.001; ** = 0.001< p< 0.01; * = 0.01 < p<0.05; # = 0.05 < p < 0.1; blank = 0.1 < p < 1
2. Variables combination marked with X were not examined as the numbers were too small
Table 3. Results from the final model of unmet GP need

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<td>1.00</td>
<td></td>
<td>0.08</td>
<td>(0.06, 0.10)</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
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<td></td>
<td>0.0000</td>
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<tr>
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<td>1.62</td>
<td>(1.28, 2.04)</td>
<td>0.07</td>
<td>(0.05, 0.08)</td>
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</tr>
<tr>
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<td>1.00</td>
<td></td>
<td>0.04</td>
<td>(0.04, 0.05)</td>
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<tr>
<td>Asthma * Ethnicity</td>
<td>0.0285</td>
<td></td>
<td></td>
<td></td>
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<td>Spinal Disorders</td>
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<td>Yes</td>
<td>1.41</td>
<td>(1.11, 1.79)</td>
<td>0.06</td>
<td>(0.05, 0.07)</td>
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<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td>0.04</td>
<td>(0.04, 0.05)</td>
<td></td>
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<td>Risk Variables</td>
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<td></td>
<td></td>
<td></td>
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<td>Daily Smoker</td>
<td>0.0011</td>
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<tr>
<td>Yes</td>
<td>1.41</td>
<td>(1.15, 1.72)</td>
<td>0.06</td>
<td>(0.05, 0.07)</td>
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</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td>0.04</td>
<td>(0.04, 0.05)</td>
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<td>Body Mass Index</td>
<td></td>
<td></td>
<td>0.0071</td>
<td></td>
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<tr>
<td>Under weight, normal</td>
<td>0.90</td>
<td>(0.68, 1.20)</td>
<td>0.04</td>
<td>(0.04, 0.05)</td>
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</tr>
<tr>
<td>Overweight</td>
<td>0.96</td>
<td>(0.72, 1.28)</td>
<td>0.05</td>
<td>(0.04, 0.06)</td>
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</tr>
<tr>
<td>Obese</td>
<td>1.00</td>
<td></td>
<td>0.05</td>
<td>(0.04, 0.06)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>0.98</td>
<td>(0.66, 1.45)</td>
<td>0.05</td>
<td>(0.03, 0.06)</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1: Variables are not given p-values if a higher level interaction exists.
The variables asthma and BMI have interactions with ethnicity. For Other New Zealanders, having asthma leads to a greater probability of unmet need, while having asthma leads to a lower probability of unmet need for Pacific peoples. For Other New Zealanders, BMI appears to cause no difference to unmet need, whereas for Pacific peoples, being overweight has a greater probability of unmet need than being underweight or normal weight.

The adjusted probability for Pacific peoples having unmet GP need is 0.07 and for Other New Zealanders it is 0.05 with a p-value for the difference of 0.0487.

Variables were removed from the final model one at a time to see which variables had the greatest effect on this ethnic difference. Removing NZDep had the greatest effect on the ethnic difference as Pacific peoples are more concentrated in the higher levels of NZDep where there is greater unmet need. Removing educational qualifications had the next biggest effect but in the opposite direction. Other New Zealanders have a greater concentration of people at the higher levels of education qualifications, where there is greater unmet need, and this makes the difference between ethnicities smaller than would otherwise be unexpected.

Respondents were asked the reason why they did not go to the GP when they needed to. For Pacific peoples with unmet need, the most common reason was “that the GP cost too much” (33%; 95%CI 22–44) and for Other New Zealanders, the most common reason was “Couldn't get an appointment soon enough/at a suitable time” (29%; 95%CI 24–33). However, there were no significant differences between the two different ethnic groups for any of the 17 reasons given.

Those with higher educational levels had a higher probability of unmet need than those with lower levels. Those with no qualifications were more likely to say “that the
GP cost too much” (11%; 95%CI 6–16) compared to those with university qualifications (2%; 95%CI 0–5). Those with university qualifications were more likely to say “Couldn't spare the time” (21%; 95%CI 14–28) compared to those with no qualifications (7%; 95%CI 3–11). These were the only two reasons out of 17 given where there were significant differences between these qualification levels.

Those with higher levels of deprivation had a higher probability of unmet need than those with lower levels. Twenty nine percent (95%CI 24–33) of those with none or one deprivation characteristic who did not go to a GP gave as a reason that they “Couldn't get an appointment soon enough/at a suitable time” compared to 25% (95%CI 21–33, p=0.5767) for those with two or more deprivation characteristics.

The next most common reason for those with none or one deprivation characteristic for not going to a GP was that they “Didn't want to make a fuss” (20%, 95%CI 20–30) compared to 16% (95%CI 12–20) for those with two or more deprivation characteristics. For those with two or more deprivation characteristics, the most common reason for not going to a GP when there was a need was that it “Costs too much” (44%, 95%CI 38–51) compared with 16% (95%CI 12–21) of those with none or one deprivation characteristic.

Respondents were asked what they did instead of going to the GP when they needed to. The most common answer was “Nothing” for both Pacific peoples (36%; 95%CI 26–47) and Other New Zealanders (47%; 95%CI 42–51). The second most common reason was “Went to see the GP at a later date” for Pacific peoples (20%; 95%CI 9–32) and Other New Zealanders (12%; 95%CI 9–15). There was only one significant difference between Pacific peoples and Other New Zealanders in the reasons given which was “Took it easy/rested and relaxed more/got more sleep” which 8% of Pacific peoples identified (95%CI 1–16) compared to 3% of Other New Zealanders (95%CI 1–4).

Figure 2. The interaction between ethnicity and BMI in the model for unmet GP need
Discussion

There were three main themes associated with unmet GP need in the last year – there was higher unmet need in people who were unwell, people who had higher levels of individual deprivation, and people with higher educational qualifications. The latter two reflect different reasons for not being able to get to a GP—people with more deprivation characteristics are more likely to give financial reasons then those with fewer deprivation characteristics, while people with higher education levels are more likely to say they had time constraints.

These two variables also explained some of the differences between Pacific peoples and Other New Zealanders: Pacific peoples are more likely to have more deprivation characteristics which are associated with more unmet GP need. This concurs with pre-existing identified relationships between ethnicity, deprivation scores and avoidable mortality,\textsuperscript{10, 11} and the over-representation of Pacific peoples in regions of high deprivation.\textsuperscript{12}

On the other hand, Other New Zealanders are more likely to be in the higher educational categories where there is higher unmet need also. There is much pre-existing research into the positive relationship between higher education and better health status.\textsuperscript{13} That higher education levels could negatively impact on GP utilisation appears to be largely unstudied.

Previous international studies have shown that time constraints impact on use of GP services for certain populations: urban women have been shown to have greater unmet need due to time constraints than rural women in Australia.\textsuperscript{14} Such time constraints leading to unmet need have also been shown to not vary between disparate groups despite educational disparity. A study of unmet need for health care in immigrant communities in Canada found that the proportion of immigrants selecting ‘Too busy’ as a reason for unmet need was not statistically significantly different to non-immigrants, despite there being a (slightly) lower mean educational achievement ranking for non-immigrants than immigrants.\textsuperscript{15}

There are two variables where Pacific peoples and Other New Zealanders have different patterns of unmet GP need. First, Pacific peoples have more unmet need if they are overweight compared to normal/underweight people, while BMI does not appear to affect Other New Zealanders’ unmet GP need. Second, Pacific peoples have more unmet need when they do not have asthma but the converse is true for Other New Zealanders.

Prevalence of high BMI among Pacific peoples has been an identified issue for some time\textsuperscript{1, 2, 6, 12}, largely due to the presence of weight-related illness such as diabetes. Pacific peoples with diabetes have been shown to have a higher number of GP consultations than Europeans with the illness and have been shown to possess more of the adverse risk factors for diabetes complications than Europeans: such as being a smoker, having an HbA1c greater than 8%, and having microalbuminuria.\textsuperscript{4}

Diagnosed asthma in New Zealand has been associated with greater utilisation of GP services without factoring in ethnicity.\textsuperscript{16} The ethnic variation is somewhat counterintuitive as, in the past, it appears Pacific peoples have had greater unmet asthma need.\textsuperscript{17}
Confusingly, asthma rates among Māori and Pacific Islanders in New Zealand have been deemed considerably greater than for Other New Zealanders, while Ministry of Health data, however, have shown that medicated asthma rates are considerably lower for Pacific peoples than European/Other. Furthermore, the lack of longitudinal data from previous Health Surveys makes tracking changing rates of prevalence difficult.

**Conclusion**

This statistical study shows, using nationally representative data, variations in unmet GP need rates, for several reasons and affected by several variables, between Pacific peoples and Other New Zealanders. Health need has been shown to both positively and negatively affect the unmet GP need of Pacific peoples. Financial constraints predictably contribute to unmet need, while less predictably higher education and the associated time constraints (more prevalent in Other New Zealanders) also contribute to unmet GP need.

**Competing interests:** None.

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**Acknowledgements:** We thank the respondents of the New Zealand Health Survey 2006/07 for their participation in the survey.

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**References:**


Throat swabbing for the primary prevention of rheumatic fever following health information

Janine Mardani, Lester Calder, Julia Haydon-Carr, Gordon Purdie, Nicholas F Jones

Abstract

Aim To determine whether health promotion activities in March–August 2009 increased sore throat swabbing rates among Flaxmere (Hawke’s Bay, New Zealand) children aged 5–14 years, and in particular among Māori and Pacific children.

Method Monthly totals of Hawke’s Bay bacterial throat swabs for the period March–October 2008 and March–October 2009 were obtained. Using Poisson regression, the 2008 and 2009 test rates for Flaxmere children residing in the target area during the intervention were compared with non-Flaxmere children. Flaxmere test rates were determined for Māori or Pacific children and non-Māori non-Pacific children separately.

Results Flaxmere children had a higher pre-intervention bacterial throat swab rate, compared to non-Flaxmere children (6.0% vs 3.2%; p<0.001). The throat swab rate increased significantly for Flaxmere children during the intervention period, compared to both the previous year (1.6; 1.3–2.0) and compared to the increase observed among non-Flaxmere children (1.4; 1.1–1.8). Subanalysis among Flaxmere children found a significant increase in the throat swab rate of Māori and Pacific children (1.8; 1.4–2.4).

Conclusions A demonstrable increase in throat swabbing rates among high-risk Flaxmere children was observed following a combination of health promotion interventions. The increase in throat swabbing rates observed among Māori and Pacific children suggest that the intervention was effective for children with the highest risk.

New Zealand has high rates of rheumatic fever and subsequent chronic rheumatic heart disease by international standards. Both conditions are rare consequences of infection with group A streptococcus (GAS) bacteria. Primary prevention efforts for these diseases therefore focus on the identification and antibiotic treatment of GAS pharyngitis.

Rheumatic fever is concentrated among 5 to 14-year-olds, Māori and Pacific peoples and upper North Island areas. Māori and Pacific peoples have some of the highest documented rates of rheumatic fever in the world. In Hawke’s Bay most rheumatic fever cases in the period 2003–2008 were aged 5-14 years (85%) and of Māori ethnicity (78%).

The Hawke’s Bay rate of 30 cases of rheumatic fever per 100,000 population aged 5–14 years in 2003–2008 was double the national rate of 14 cases per 100,000 population aged 5–14 years for the same period. Within the Hawke’s Bay health district, rheumatic fever is clustered in the suburb of Flaxmere. The Flaxmere rate of
rheumatic fever was 139 cases per 100,000 population aged 5–14 years in 2003–2008.

National guidelines recommend implementing strategies to advance early detection and appropriate treatment of GAS pharyngitis in populations where rates of rheumatic fever exceed 20 per 100,000 population aged 5–14 years.\(^5\) Suggested strategies include health promotion efforts to raise awareness that rheumatic fever and rheumatic heart disease are preventable, treating households where GAS has spread and promoting sore throat management consistent with the New Zealand Guide for Sore Throat Management.\(^2\) Implementation of school-based programmes is also recommended for consideration at rates above 50 per 100,000 aged 5–14 years but to date this has not been funded in Flaxmere.

Primary prevention health information activities were undertaken in Flaxmere in 2009. We test the hypothesis that bacterial throat swab testing increased among Flaxmere children during and following targeted primary prevention health information activities. We also test whether this intervention was effective for Māori and Pacific Flaxmere children.

**Methods**

**Intervention**—Rheumatic fever primary prevention strategies in Hawke’s Bay in 2009 included:

- Commentary on rheumatic fever sent to all Hawke’s Bay general practices in the July edition of Hawke’s Bay’s Public Health Advice with a copy of the National Heart Foundation throat swabbing guidelines;\(^6\)
- Promotion of the “sore throats matter” message with Flaxmere-specific pamphlets at the Flaxmere Family Festival; and
- Following every notification of rheumatic fever in a school student, distribution to the school community of a pamphlet encouraging swabbing for sore throats.

The information stall at the Flaxmere Family Fun Day in March 2009 was staffed by public health staff who discussed sore throats and rheumatic fever prevention with visitors to the stall. English, Māori and Samoan pamphlets about rheumatic fever in Flaxmere and the importance of throat swabs were also available (Figure 1). An estimated 200 people visited the stall.

The Hawke’s Bay Public Health Unit received 5 rheumatic fever notifications in 2009. All notifications were for children aged between 5–14 years attending a primary school in Flaxmere (4) or a small rural school that borders Flaxmere (1) which some Flaxmere children attend. Within two weeks of each notification a rheumatic fever pamphlet was sent home from school with each child who attended the same school as the notified case (Figure 2). The pamphlet alerted family members to the recent rheumatic fever notification at school and recommended throat swabs for all sore throats in the household.

School pamphlets were sent home in March, April, July (2) and August with approximately 636 children given a pamphlet to take home once and 484 children given a pamphlet to take home twice. Approximately half (52\%) of Flaxmere children aged 5–14 years received at least one pamphlet during 2009.
Study population—Children resident within Hawke’s Bay District Health Board area, aged 5–14 years. Usually resident population counts, from the 2006 Census of Population and Dwellings were used to estimate population size.

The population was further defined by suburb of residence (Flaxmere, non-Flaxmere) and prioritised ethnicity (Māori or Pacific, vs non-Māori/non-Pacific).

Ethnicity was determined using the National Health Index record (for children from whom throat swabs were taken). Children with multiple ethnicities were reclassified into a single prioritised ethnicity using the prioritised ethnicity output method. Ethnicity was classified as non-Māori/non-Pacific for children whose NHI record included neither Māori nor a Pacific people ethnicity code, or where ethnicity was not specified.

Outcome measure—The records of bacterial throat swabs processed by Southern Community Laboratory and Hawke’s Bay Hospital Laboratory were obtained from the Hawke’s Bay Clinical Data Repository held by the District Health Board.

The intervention period was defined as March–October 2009. The same period in the preceding year (March–October 2008) was chosen for pre-intervention comparison.

No other laboratories were operating in Hawke’s Bay at this time.

Statistical analysis—Throat swab rates were compared using Poisson regression with terms for suburb, year, and testing the interaction of suburb and year. Analysis of the Flaxmere suburb was also conducted using terms for ethnicity, year and the interaction of ethnicity and year. Data analysis was performed using Stata v9.2 software (Stata Corp, College Station, Texas).

Findings with a p value <0.05 were considered statistically significant.

Results

The bacterial throat swab rate among 5–14 year olds was higher among Flaxmere than non-Flaxmere children during the pre-intervention period in 2008 (rate ratio 1.9,
95% CI: 1.6–2.3 p<0.0001) (Table 1). Increases in testing were observed in both Flaxmere and non-Flaxmere areas in 2009. The increase in throat swabbing in Flaxmere was significantly greater than the increase observed elsewhere in Hawke’s Bay.

**Table 1. Bacterial throat swabbing of Hawke’s Bay children aged 5–14 years; March–October 2008 and March–October 2009**

<table>
<thead>
<tr>
<th>Hawke’s Bay children aged 5–14 years (n)</th>
<th>Time period</th>
<th>Number of swabs</th>
<th>Throat swab test rate</th>
<th>Rate ratio (95% CI) p value</th>
<th>Ratio of rate ratios (95% CI) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flaxmere children (2163)</td>
<td>March–October 2008</td>
<td>129</td>
<td>6.0%</td>
<td>1.6 (1.3–2.0) p&lt;0.0001</td>
<td>1.4 (1.1–1.8) p=0.003</td>
</tr>
<tr>
<td></td>
<td>March–October 2009</td>
<td>207</td>
<td>9.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Flaxmere children (21447)</td>
<td>March–October 2008</td>
<td>678</td>
<td>3.2%</td>
<td>1.1 (1.0–1.2) p=0.048</td>
<td></td>
</tr>
<tr>
<td></td>
<td>March–October 2009</td>
<td>753</td>
<td>3.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Within Flaxmere, there was no significant difference in the throat swab rate between Māori/Pacific children and non-Māori/non-Pacific children during the pre-intervention period (Rate ratio 0.7, 95% CI: 0.5–1.0 p=0.061) (Table 2). Testing among Māori/Pacific children increased significantly between time periods, and testing among non-Māori/non-Pacific children did not increase significantly. There was a trend to a greater increase in testing between time periods among Māori/Pacific children than among non-Māori/non-Pacific children.

**Table 2. Bacterial throat swab testing of Māori and Pacific vs non-Māori non-Pacific Flaxmere children aged 5–14 years; March–October 2008 and March–October 2009**

<table>
<thead>
<tr>
<th>Flaxmere children aged 5–14 years (n)</th>
<th>Time period</th>
<th>Number of swabs</th>
<th>Throat swab test rate</th>
<th>Rate ratio (95% CI) p value</th>
<th>Ratio of rate ratios (95% CI) p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori / Pacific children (1626)</td>
<td>March–October 2008</td>
<td>87</td>
<td>5.4%</td>
<td>1.8 (1.4–2.4) p&lt;0.0001</td>
<td>1.6 (1.0–2.6) p=0.076</td>
</tr>
<tr>
<td></td>
<td>March–October 2009</td>
<td>159</td>
<td>9.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Māori non-Pacific children (537)</td>
<td>March–October 2008</td>
<td>41</td>
<td>7.6%</td>
<td>1.2 (0.8–1.8) p=0.46</td>
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</tr>
<tr>
<td></td>
<td>March–October 2009</td>
<td>48</td>
<td>8.9%</td>
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</tbody>
</table>

**Discussion**

In this study we found that throat swabbing increased in Flaxmere during the intervention period. The increase in throat swabbing among Māori and Pacific children in Flaxmere suggests that these health promotion interventions were an effective medium for this high-risk population group.
The findings support the use of the health promotion interventions employed and suggest monitoring of throat swabbing rates is a useful way to evaluate intervention effect. Further analysis of the rate of testing would assist in determining whether ongoing intervention is required or effective in maintaining testing rates. Analysis of swab results and rheumatic fever incidence rates would also assist in determining whether ongoing intervention is warranted.

The authors are not aware of other studies which examine the impact of rheumatic fever/sore throat information on throat swabbing rates. It is a study which can be conducted with relative ease in high incidence areas if laboratory data on throat swab results are readily accessible.

**Limitations**—The study could not include earlier time periods as reliable data prior to December 2007 are not available.

Although the study controlled for temporal trends that were likely to be independent of the intervention, the study cannot determine whether other events during 2009 may have influenced the increase in throat swabbing. We cannot be certain that our findings are not due to an increase in community incidence of sore throat in Hawke’s Bay (and in Flaxmere in particular) as a result of the very high-incidence influenza season or other causes.

It is possible that discussion with local schools and some local general practitioners about a proposed school-based throat swabbing programme for primary prevention of rheumatic fever in 2009 raised throat swab rates in Flaxmere only. However most of this discussion was at a management level only and limited to a few individuals. It could not be expected to have widely influenced community or GP behaviour.

The intervention included a number of components and the study was unable to determine whether any of these components may have been more effective than others.

Most of the intervention time period was concurrent with our health promotion activities. A longer study would be needed to determine whether gains from the interventions are sustained and whether repeated exposures to the interventions might lead to “message fatigue” and reduced responsiveness.

This one study provides only limited evidence of the effectiveness of this intervention strategy. Further studies are needed to replicate these findings.

**Conclusion**—The findings suggest that the provision of rheumatic fever information to high-risk families and general practitioners can measurably increase throat swabbing among high risk children with sore throats. In addition, the information used was effective for Māori and Pacific families. Further investigation of the impact of various health promotion activities on throat swabbing is needed.
Competing interests: None.

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1. Undertaken while on placement at the Public Health Unit, Hawke’s Bay District Health Board, Napier;
2. Public Health Unit, Hawke’s Bay District Health Board, Napier;
3. Department of Public Health, University of Otago, Wellington.

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References:

Achieving equitable outcomes for Māori women with cervical cancer in New Zealand: health provider views

Melissa McLeod, Donna Cormack, Ricci Harris, Bridget Robson, Peter Sykes, Sue Crengle

Abstract

Aim This study explored health provider views on changing survival disparities between Māori and non-Māori women, the management of cervical cancer in New Zealand, and achieving equitable outcomes from cervical cancer for Māori women.

Methods This research followed on from a cohort study of cervical cancer treatment and survival in New Zealand. Focus groups were undertaken with three provider groups in different regions working across the range of cervical cancer services. Focus group transcripts were analysed to identify key themes.

Results Providers were encouraged by the reported improvement in survival disparities between Māori and non-Māori women over time. The themes of discussion relating to cervical cancer management included: communication and education; screening; access to treatment; pathways through care; patient factors; and, system standards. Providers also suggested options for further improvements in the management of cervical cancer.

Conclusions The focus groups identified that despite improvements over time in cervical cancer disparities between Māori and non-Māori and in the management of cervical cancer, further effort is required to achieve equitable outcomes for Māori, particularly in the areas of prevention and early detection.

Since the introduction of a National Cervical Screening Programme (NCSP) in the early 1990s, there have been significant reductions in cervical cancer disease incidence and mortality in New Zealand. However, cervical cancer remains one of the most common cancers for Māori women.

For the 2000–2004 period, cervical cancer was the fourth most commonly occurring cancer and the fifth most common cause of cancer death for Māori females. There are inequalities in the incidence of, and outcomes from, cervical cancer in New Zealand, with higher mortality rates and lower survival for Māori women compared with non-Māori.

In order to better understand what might be contributing to disparate cervical cancer outcomes, a cohort study (for the period 1996–2006) was undertaken to investigate the potential role of treatment differences in the differential outcomes for cervical cancer for Māori and non-Māori women in New Zealand.

The study found there were substantial improvements in the disparities between Māori and non-Māori women in cervical cancer incidence, mortality and survival, and no differences by ethnicity in treatment at the same stage of disease. However, Māori
women remain at higher risk of cervical cancer and continue to be diagnosed with more advanced disease.

This study concluded that primary prevention and early diagnosis were key components of eliminating the remaining inequalities in cervical cancer between Māori and non-Māori women.³

This article reports the findings of focus groups that were undertaken to explore health service provider views on the cohort study findings (as outlined above) and, more broadly, on the management of cervical cancer in New Zealand and on achieving equitable outcomes between Māori and non-Māori women.

In the domestic context, there has been some qualitative research investigating the experiences of Māori patients and whānau (extended family) with cervical cancer services. These studies involved undertaking key informant interviews with women to explore the reasons for not attending for cervical smears despite being overdue.⁷⁻⁹ One of these studies included views from health professionals.⁷

Lovell et al (2007) interviewed 17 lay women (including four Māori participants) who had presented for an overdue cervical smear in one of three clinics in Manukau City. In addition, this study included views from nine individuals who were screening providers. Within the study many women found screening acceptable, and most of the identified reasons for delaying a smear could have been addressed by structural changes to the healthcare system. Barriers identified included the cost of a smear, concerns over exposing one’s body (particularly for Māori and Pacific participants), and gaps in understanding the purpose of screening.⁷

In another study, Buetow et al (2007) undertook in-depth interviews with six women (five Māori and one European) who had been overdue for a cervical smear within the preceding six years. The implications for practice from this research included the need to care for and respect the dignity of women having cervical smears, effective communication between the health provider and the woman, offering a regular smear-taker, the option of a female smear taker, and a place for women to wash before the procedure.⁸

Ratima et al (1993) collected screening histories from 46 Māori women with invasive cervical cancer. This study identified issues with access to primary care, referral of women with smear abnormalities and screening programme quality control.⁹

Despite having a critical role in the management of cervical cancer, health providers have rarely been participants in focus groups or subjects of key informant interviews. Providers have important perspectives on cancer care disparities, accompanied by institutional and contextual knowledge that can help in understanding how disparities occur. They also have the potential to identify areas for change or intervention, and act as champions or agents of change themselves.

This study will add to the literature by capturing the views and experiences of a range of health providers who work directly with patients with cervical cancer.

Methods
A qualitative study that investigated health provider views of cervical cancer disparities and management in New Zealand. It followed from a cohort analysis of Māori and non-Māori women with cervical cancer between 1996 and 2006. The cohort study is reported elsewhere.³
Participants—Three focus groups were undertaken in different regions: one with a range of health providers working in a region with a secondary care hospital (Region S); one with Māori health providers (Region M); and the third with health professionals working in a tertiary care hospital (Region T). Additionally, one key informant interview was completed for an individual who was unable to attend the tertiary provider focus group session (K). Participants worked across the range of cervical cancer services (Table 1).

In Region S (the secondary care region), a range of hospital and community health providers who provided care to women with cervical cancer were invited. All Māori providers with women’s health portfolios were invited from Region M. In Region T (the tertiary care region), a range of service providers working at a tertiary care level were invited, based on their availability.

Initial approaches to participants were made by phone, with information sheets subsequently forwarded. Consent forms, including consent to record the session, were completed prior to the commencement of the focus groups. Ethical approval for this study was granted by the Multi-Region Ethics Committee (MEC/05/07/085).

Two Māori researchers attended each focus group: one as presenter, the other as the facilitator. The focus groups began with a brief presentation of the cohort study results. Participants were then given an opportunity to ask questions relating to the cohort study. Following this, the focus group proper began. The facilitator gave an outline of the purpose of the focus group, set the ground rules for the session, and introduced the discussion points.

Five discussion points were covered in each focus group. A discussion guide was developed to standardise the wording of the discussion points, and to provide the facilitator with prompting questions should they be required. The questions were:

- Our study shows that survival disparities are decreasing between Māori and non-Māori women. Does this fit with what you see in practice?
- Based on your experience, why are/aren’t survival disparities decreasing?
- What is working well in the management of women with cervical cancer?
- What is not working well in the management of women with cervical cancer?
- How do we get equitable outcomes for Māori women with cervical cancer?

The sessions were recorded and transcribed, and subjected to thematic analysis, by the lead author. A thematic network was used to arrange the category codes into basic themes, organising themes and global themes for analysis. A second researcher, who did not attend the focus groups, performed thematic analysis on one of the focus group transcripts. Minor changes to the themes and thematic network were made with consensus decision between the two researchers.

Results

A total of 22 people participated across the three focus groups including both Māori and non-Māori staff working in a range of roles (Table 1).

The focus group participants were generally pleased and encouraged by the improvements demonstrated in the quantitative findings presented. In reflecting on their own experience, most noted that due to the small numbers of women they saw with cervical cancer it was difficult to know whether the pattern of disease had changed in their region since 1996.

Some who had worked in cervical cancer services for many years had noticed a reduction in the number of Māori women presenting, and also had an impression that survival had improved over this time period.

Table 1. Focus group participants

| Secondary focus group | Tertiary focus group (T) and Māori provider group (M) |
In relation to the management of cervical cancer in New Zealand, the issues discussed were broad ranging and included factors relating to the providers, the way services are delivered to Māori, and individual patient factors (Table 2).

Table 2. Provider perceptions of factors influencing disparities (positively or negatively) between Māori and non-Māori in cervical cancer

<table>
<thead>
<tr>
<th>Theme</th>
<th>Topics</th>
<th>Non-DHB staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication and education</td>
<td>National campaigns</td>
<td>Māori Provider</td>
</tr>
<tr>
<td></td>
<td>Health providers</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>Cervical Screening</td>
<td>Cost</td>
<td>DHB staff Gynaecologist</td>
</tr>
<tr>
<td></td>
<td>Acceptance of screening</td>
<td>Colposcopy Nurse</td>
</tr>
<tr>
<td></td>
<td>Patient dislike of smears</td>
<td>Gynaecology Outpatients Nurse</td>
</tr>
<tr>
<td>Access to treatment</td>
<td>Transport</td>
<td>Oncology &amp; Palliative Care Nurse</td>
</tr>
<tr>
<td></td>
<td>Economic/ financial</td>
<td>Specialists (2)</td>
</tr>
<tr>
<td></td>
<td>Cultural</td>
<td>Service Manager</td>
</tr>
<tr>
<td>Pathway of care</td>
<td>Provider groups (Māori providers and mainstream)</td>
<td>Community Nursing</td>
</tr>
<tr>
<td></td>
<td>Interlinking of services</td>
<td>DHB Māori Health Unit</td>
</tr>
<tr>
<td>Patient factors</td>
<td>Health status</td>
<td>Gynaecology Oncologist</td>
</tr>
<tr>
<td></td>
<td>Disease factors</td>
<td>Medical Oncologist</td>
</tr>
<tr>
<td>Standards</td>
<td>Treatment standards</td>
<td>Radiation Oncologist</td>
</tr>
<tr>
<td></td>
<td>PHOs</td>
<td>Radiation Therapist</td>
</tr>
<tr>
<td></td>
<td>Ethnicity data</td>
<td>Gynaecology Ward Nurse</td>
</tr>
</tbody>
</table>

Communication and education

There was consensus in the focus groups that the reduction in disparities between Māori and non-Māori women was in part due to greater awareness of cervical cancer and the cervical cancer screening programme. Multiple modes of communication were identified to have contributed to increased awareness including television advertisements, Māori providers, and improved communication between health providers and patients. The national advertising campaigns were seen as highly successful in raising awareness about cervical cancer.
From the colposcopy clinic perspective there has been a difference in the number of women presenting as a result of the advertising campaign by cervical screening. And that will eventually impact on earlier diagnosis (T5).

Communication with health providers was identified as having a strong influence on the experiences and outcomes of patients with cervical cancer. Both positive and negative aspects of communication between health providers and patients were identified by the participants. Participants noted that there continue to be situations where patients remained confused after interacting with health providers, for example, because of the language used or explanations given, or because patients may not feel empowered to ask questions.

Some of the women used to have lots of questions when they went to see their GP, and we used to say, well you know, they’d get in there and they’d come out and say I didn’t ask any of the questions, I was too embarrassed, I forgot (M3).

There were also situations identified where a negative interaction with a health provider was seen to result in patients disengaging from health services and not attending for appointments. This included situations where patients experienced general rudeness, or were made to feel guilty, e.g. made to feel guilty about being overdue for a smear when attending for one.

**Screening**

When the focus groups were asked their views on what needed to be done to improve cervical cancer outcomes for Māori women, the health providers generally commented that emphasis needed to be placed on activities at the prevention and early detection end of the cancer continuum.

It’s right at the beginning that we’ve got a lot of work to do. I mean prevention and early diagnosis has to be the way forward. We’re very lucky with cervical cancer that we can prevent and diagnose it early and I think we should be putting a lot of effort into doing that (K1).

A dislike of cervical screening procedures was cited as a common reason for not attending for cervical smears or colposcopy for all women. Some felt there had been improved acceptance by Māori women of cervical screening over time.

You know I’m talking about fifteen twenty years we’re ‘don’t go there that’s Tapu’. Now that’s been brought out in the public, some of them are talking about, you know, you’ve got to go for your smear (S6).

So where we are today it’s really awesome, but I think the thing that is still whakamā for all women, Māori, and Pacific, is the actual procedures of actually going there hopping on the bed (M1).

The cost of screening to the individual was also identified as a barrier.

I think more resources need to go in at a screening level. Because I think those inequalities of, you know, yeah just, income inequalities do count at a screening level (S2).

**Access to treatment**

Health providers identified a number of access issues relevant to the management of cervical cancer. Transportation was identified as an issue, particularly for women who lived further from a cancer centre. Some felt that although transportation was an issue, it did not necessarily influence a patient’s decision to accept or decline treatment and that there was some acceptance of the need to travel for treatment.
My impression is that most patients accept the need to go to other centres which doesn’t though take away the fact that that is quite an ordeal (S3)

Others argued that the financial cost of needing to travel long distances for treatment resulted in patients not attending scheduled appointments, or declining treatment altogether. It was also suggested that these financial pressures are likely to be increased in the current economic climate.

I would see as one of the problems in terms of disparities is access to treatment, and certainly with a recession and rising petrol costs and the time it takes and the levels of tiredness and fatigue that our patients feel, they are often barriers to people taking up treatment that probably would be just a matter of standard practice (S4)

Health providers talked about the culture of the health system as a barrier for some women. There was an acknowledgement that some effort had been made to support Māori women within the hospital system, and that this may have contributed to improved access to care.

I think too the support for the woman on the ward has improved over those ten years too as far as allowing their whānau to be there, stay the night, that type of thing. So I think that’s where that whole hospital thing is less threatening for them over those years as well (T3)

**Pathway of care**

In relation to pathways of care, providers discussed the role of both Māori providers and mainstream services, as well as the interlinking of services.

**Māori providers**—Participants generally agreed that Māori health providers and Māori staff had been successful in helping improve the accessibility of cervical cancer services for Māori women. This success was seen to relate to models of practice that worked to address issues with education and understanding, transportation, location and timing of clinics (such as offering marae-based clinics or late-night clinics), and support to navigate care pathways.

If you have that relationship, and most of us have built that up in our community, we may not have met these women but you know the ones referred to us from the GP if you’ve rung them up on the telephone, and you booked them into clinics, and you offer transport if they don’t have transport, you offer support and if they need you they can make contact with you (M3)

Another success of Māori providers was seen to be the training of Māori health promoters. Focus group participants identified the important role of having the ‘right’ people involved in the provision of care, including having people who are from or know the community.

Now I think that the decreasing disparities are exactly that, about communication, but having the right person communicating the message to that particular group of people and then just inclusively bringing them in and buddying up with them and through the service (S4)

**Mainstream providers**—There were a number of examples provided of mainstream services offering a more flexible way of operating to meet their patients’ needs including the provision of smoking cessation advice within a colposcopy clinic, provision of Māori colposcopy clinics, and fitting patients in for radiotherapy appointments even if they arrived at the wrong time.

We have two nurses now that do that so that if someone does smoke we’ve got someone right there rather than give them the card they might never ring up (T4)

The ways in which services worked with each other in the management of cervical cancer was raised. The secondary care focus group identified significant
improvements in the interlinking of cervical cancer services in their region. These improvements were partly possible because of the relatively small population of the region, and the limited number of healthcare professionals working with cervical cancer patients.

It makes life a lot easier and you can refer on and it’s a small population. I mean people get in fast to get their treatment and it’s much better service for them all the way round really and they can get that personal approach (S5)

However, the increased linking of services and open communication between them also raised concerns by a few participants about potential risks to patient confidentiality.

**Missed appointments**—A significant concern raised in all of the focus groups was the number of women who become lost within the system, at various points along the pathway of care.

There was concern that women who did not attend (DNA) appointments were not followed up as pro-actively as possible. Māori providers could see the importance of their involvement in assisting both DHB and primary care staff to contact Māori women labelled as DNA for DHB appointments. They gave examples of working with a local medical practice to follow up on DNAs and continuing to invite women for smears after three attempts had been made.

With those DNA’s for Māori women, who follows them up, and you know we could, we have the ability to work one on one with those people (M2)

In talking about the challenges of screening and follow-up of mobile populations, health providers identified that part of the solution was to take opportunities to screen this population as they arose, such as basing ‘satellite’ clinics at convenient locations or providing screening at public events. However, it was recognised that there were challenges in following up with screening results, and getting mobile patients to treatment.

We’ve taken a clinic closer to the venue and yeah we got the women, but once they left there it’s tracking them down to have follow up treatment or, you know, if they need to be, that again presented another problem because you couldn’t find them (S6)

**Patient factors**

Providers identified changes in patient factors over the time period as contributing to improved survival disparities over time, but also as important considerations in the management of cervical cancer and the equity of cervical cancer care. Some expressed the view that an improvement in general health status of Māori may have had some influence on improvements in cervical cancer survival and disparities.

Like foetal mortality rates, it’s just an indicator of better general levels of health, better nutrition, better generally raised standards that we’re seeing. Maybe it’s no specific thing we’re doing it’s a more generalised improvement (S3)

Changes in the management of co-morbid conditions and in the prevalence of risk factors, such as smoking were raised as positive developments. However, there was concern that smoking continued to play a significant role in the disparities between Māori and non-Māori women influencing both the incidence of cervical cancer and the efficacy of radiotherapy treatment.
I still think we’ve got a long way to go. And particularly with the smoking thing I don’t know how we do that but it’s such a pervasive thing because it does it increase the chances of cervical cancer but it may affect the treatment too (K1)

Standards

Treatment standards—Although national standards do not exist for treatment services for cervical cancer, participants noted a trend towards improved consistency of practice across the country, as a result of organisation of specialist providers. Some providers expressed the need to set treatment standards, to ensure that practice is consistent both within and across DHBs, and to be able to monitor. One provider noted that any standard that is developed needs to include consultation with Māori and with consumers more generally.

there’s a lot more now in terms of meetings and things going on and consistency… there’s quite an expectation now that all colposcopists will be attending those meetings and inevitably that creates sort of a homogenous approach…I think that has changed a lot in the last decade so you probably are seeing a greater similarity between the way that individual colposcopists now approach that problem (S3)

PHOs—Participants identified benefits associated with changes to the PHO structure, including improved cervical screening coverage reported in PHO performance indicators, generally improved care resulting from the application of clinical standards, smaller part charges for primary care consultations and greater flexibility in the choice of health professional providing services (e.g. nurse smeartakers).

Under our PHO rule they don’t have to see the doctor they can just see the nurse you know (M3)

The Māori providers identified challenges in trying to work across PHO boundaries and concerns about the capacity of health promoters within PHOs to respond effectively to the issues faced by such large and diverse groups.

I think having the PHO’s has made a difference but I also think having the PHO’s has also put some barriers there. Because the women don’t necessarily belong to our GP, to our PHO, so therefore do we work with them, don’t work with them, are we crossing over into someone else’s territory (M4)

Ethnicity data—The need for good quality ethnicity data to monitor Māori health and inequalities, and ongoing problems with its collection and quality were raised by some participants.

Discussion

Cervical cancer incidence, mortality and survival for both Māori and non-Māori women is improving in New Zealand. In addition, the disparities between Māori and non-Māori women in these outcomes are decreasing.

Health providers identified a number of developments in the management of cervical cancer that may have contributed to the improved outcomes for cervical cancer including national social marketing campaigns, standard setting in screening, diagnosis and treatment, and Māori providers contributing to improved access for Māori women.

A number of areas requiring further improvements in order to achieve equitable outcomes for Māori were identified. Additional effort is required to: improve patients’ navigation and understanding of the pathway of care; improve access to care; reduce
the cost of cervical smears; and improve communication between patients and whānau, and providers.

Many of the issues identified by health providers for achieving equitable outcomes for Māori and non-Māori women such as communication, cost, information and transport have been identified in other work in relation to cancer care more generally.\textsuperscript{12-14}

Focus groups were chosen as the primary method of data collection to capture both the opinions and interactions of different provider groups. This method is susceptible to social desirability bias, where participants refrain from expressing their true opinions in order to conform to the views of other participants. Ground rules were established emphasising respect, sensitivity and confidentiality in order to minimise this occurring.

This research included the views of a range of providers from a number of different DHB regions. There was considerable overlap in the issues identified, which are likely to be applicable across DHBs. There were also region specific issues identified that will vary according to the demographics of the population, geography and service availability within regions.

This research focused on the experiences of health providers, in order to identify areas for improving outcomes for Māori women with cervical cancer. Although outside of the scope of this project, capturing the experiences of Māori patients and whānau is critical to improve the responsiveness of services for this group. While some work has been done in this area,\textsuperscript{7-9} there remains a real need for more comprehensive work here.

Significant reductions in cervical cancer incidence and mortality have occurred for both Māori and non-Māori women since the introduction of the National Cervical Screening programme in 1991. The introduction of the HPV vaccine into New Zealand schools in 2009 marked another significant development in cervical cancer prevention.

It is imperative that the gains achieved to date are not lost, and we continue to reflect on and improve the National Cervical Cancer Screening programme in order to achieve equitable outcomes for Māori women with cervical cancer. Disparities in cervical screening coverage between Māori and non-Māori are significant and longstanding\textsuperscript{15,16} and are an area where gains can be made.

Engaging health providers is a critical step in working towards the achievement of equitable outcomes for Māori women with cervical cancer. Not only do they offer an important perspective on the systems within which they work, but are also potential drivers of change and improvement in these systems.

Both quantitative and qualitative findings indicate the importance of prevention and early diagnosis as the key areas of focus in order to eliminate the remaining inequalities in cervical cancer between Māori and non-Māori women. The significant gains to date indicate that, with continued effort, this is an achievable goal.
Competing interests: None.

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References


Students’ and teachers’ perceptions of the clinical learning environment in years 4 and 5 at the University of Auckland

Ralph Pinnock, Boaz Shulruf, Susan J Hawken, Marcus A Henning, Rhys Jones

Abstract

Aim As the undergraduate medical curriculum is developed in response to an increasing number of students across multiple teaching sites, it is timely to review the clinical learning environment of medical students in the first two clinical years.

Method University of Auckland students in year 4 and 5 completed the Dundee Ready Educational Environment Measure (DREEM). Clinical Teachers completed a shorter questionnaire on their perceptions of the clinical learning environment.

Results The students perceive their clinical learning environment positively and their perceptions compare favourably with similar studies internationally. The DREEM is reliable for and practical to use in the New Zealand undergraduate clinical learning environment. Learning site, year of study, clinical team, gender, age, or ethnicity did not influence students’ perceptions of their learning environment. Clinical teachers view their teaching positively but there seem to be concerns over the amount of time they have available for teaching.

Conclusion Students are concerned about the amount of knowledge they need to acquire and the availability of support for students under stress as they enter and during the clinical years. Clinical teachers are concerned about the amount of time they have available for teaching.

The learning environment plays a critical role in how students learn and in the quality of the learning outcomes. The learning environment for medical students has been extensively investigated with a view to identifying strengths and weaknesses, to monitor change at times of curriculum reform, to compare learning environments across teaching sites and to compare staff and students’ perceptions.

The learning environment of medical students in New Zealand is undergoing change. The way in which services are delivered is changing with an emphasis on shorter duration of admissions, increased patient acuity and greater use of ambulatory services. There is pressure on clinicians to increase patient outputs often at the expense of teaching.

In the next 5 years both the number of students and the sites in which they learn will increase. It is timely to review the clinical learning environment of medical students with the view to planning for the future.

The University of Auckland medical course consists of an initial 3 years in which students learn basic sciences around clinical examples followed by 3 years of clinical teaching. The sixth and final year of the course is a pre-intern year where students are encouraged to take on some of the roles of a first-year intern. A recent evaluation of this year suggests that it is more effective than pre-intern placements elsewhere. Our
study surveyed the learning environment of students in their first 2 clinical years (years 4 and 5).

The Dundee Ready Medical Education Environment Measure (DREEM) has been validated in a number of undergraduate medical learning environments but has not been used in New Zealand or Australia. The DREEM provides a detailed quantitative view of students’ perceptions but to explore these views further we also added an open-ended question at the end of the DREEM and conducted focus groups. These results are reported elsewhere.

Most studies of students’ perceptions of their learning environment have not considered the views of clinical teachers. This is surprising, given that change requires the understanding and support of teachers. Consequently, we felt it important to survey our teachers’ views using a brief questionnaire based on some of the themes in the DREEM.

We hypothesised that our students would consider the learning environment without consideration of the constraints and problems facing clinical teachers. In contrast, we expected the clinical teachers to be more aware of their limitations and be more focussed on time and resource needs.

Our aims were to:

- Gather and compare feedback on the clinical learning environment from students in their early clinical training (years 4 and 5).
- Assess whether age, gender, ethnicity, year of study, learning site, or clinical team influenced the students’ perceptions of their learning environment.
- Compare some of the teachers’ perceptions of the learning environment with those of the students.

**Methods**

**Study design**

**Students**—After gaining informed consent all medical students in years 4 and 5 were invited to complete the DREEM at the end of the first 3 months of their clinical attachments in 2009. The questionnaire was anonymous and students had the option of not completing all or some of the questionnaire. Student ethnicity was identified by self report using the New Zealand Census Classification. The questionnaire took 7–8 minutes to complete.

The DREEM consists of 50 items each scoring 0–4 on a 5-point scale. Negative statements are recorded in reverse and high scores on these items indicate disagreement i.e. a positive result. The questionnaire generates an overall score and subscale scores. Acceptable ranges of scores have been suggested. Any individual item with a mean score less than 2.0 is viewed with concern. In the questionnaire the items are listed randomly so that the subscales are not apparent.

**Clinical teachers**—The clinical teachers completed a six item abbreviated questionnaire based on some of the DREEM factors. Although the DREEM has also been used to assess teachers’ perceptions of the learning environment we considered that asking teachers to complete a 50 item questionnaire would result in a very low response rate.

**Ethics**

The study was approved by The University of Auckland Human Participant Ethics Committee.
Statistical analysis

Descriptive statistics were used to describe the students’ demographics, for comparison between the scores in this study and others in the literature and for comparison of the clinical teachers’ responses with the student DREEM measures.

A set of analyses were conducted including:

- Comparisons of the students’ perceptions across years 4 and 5 to check for difference and homogeneity.
- Evaluation of the students’ perceptions in relation to year of study, clinical team, site, age, gender and ethnicity.
- Comparison of the teachers’ response between those who had taught for more and those who had taught for less than 10 years.

The student t-test was used to compare the means and standard deviations of the DREEM individual and subscale scores. The supervisors' responses were analysed using the same method.

Results

Participants

276 of 344 (80.2%) of medical students responded. The response rate was slightly higher from year 4 students (83.7%) than from the year 5 (76.2%). The other demographic details are shown in Table 1.

Table 1. Participant details

<table>
<thead>
<tr>
<th>Variables</th>
<th>4th-years</th>
<th>5th-years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>N = 184</td>
<td>N = 160</td>
</tr>
<tr>
<td>Responded</td>
<td>n = 134   (83.7%)</td>
<td>n = 122   (76.2%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>78 (50.5%)</td>
<td>57 (46.7%)</td>
</tr>
<tr>
<td>Female</td>
<td>76 (49.4%)</td>
<td>65 (53.3%)</td>
</tr>
<tr>
<td>Age (average in years)</td>
<td>22.3 (SD = 2.7)</td>
<td>23.3 (SD = 2.6)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
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</tr>
<tr>
<td>European</td>
<td>48 (31.2%)</td>
<td>48 (39.3%)</td>
</tr>
<tr>
<td>Māori</td>
<td>5 (2.2%)</td>
<td>9 (7.4%)</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>9 (5.8%)</td>
<td>4 (3.3%)</td>
</tr>
<tr>
<td>Chinese</td>
<td>32 (20.8%)</td>
<td>16 (13.1%)</td>
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<tr>
<td>Indian</td>
<td>13 (8.4%)</td>
<td>9 (7.4%)</td>
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<tr>
<td>Other/unknown</td>
<td>44 (28.6%)</td>
<td>36 (29.3%)</td>
</tr>
</tbody>
</table>

In addition, 136 of the 197 (69%) clinical teachers completed a short questionnaire.

DREEM perceptions of the two students groups (years 4 and 5)

The results of the student perceptions to the questions in the DREEM questionnaire are shown in Table 2 (at http://www.nzma.org.nz/journal/124-1334/4658/Table.pdf). The results suggest that 10–items (4, 5, 14, 24, 27, 31, 38, 44, 48, and 50) are different (p<0.05). However it is acknowledge that type I or II error (false positive or negative) may be in effect for many of these differences. Nonetheless, the differences between the two groups on items 24, 27, and 44 are very large (p<0.0001) which minimises this error. In all these three items year 5 students rated their responses higher.
indicating that year 5 students had more workable learning strategies, were more prepared, and felt more supported than their year 4 counterparts.

**Internal consistency check of the DREEM**

The overall internal consistency Cronbach alpha was 0.93.

**Evaluation of DREEM perceptions in relation to clinical team, site, age, gender or ethnicity**

In terms of factors influencing perceptions there was no significant differences when individual items or subgroup scores were compared by clinical team, site, age, gender or ethnicity (data not shown).

**Comparison of mean scores of the DREEM subscales with the literature**

The findings below indicate that the students in this study are similar to other students being surveyed on four of the five factors. However, students in this group rated the items higher than the other students groups in relation to the factor ‘Perception of learning’. See Table 3.

**Table 3. Comparison of mean scores of the DREEM subscales with the literature**

<table>
<thead>
<tr>
<th>Range-reported in the literature</th>
<th>Perception of learning</th>
<th>Perception of teacher</th>
<th>Academic self-perception</th>
<th>Perception of atmosphere</th>
<th>Social self-perception</th>
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<tbody>
<tr>
<td>University of Auckland 2009</td>
<td>2.71</td>
<td>2.76</td>
<td>2.52</td>
<td>2.80</td>
<td>2.46</td>
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</table>

**Table 4. Clinical teachers' responses**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel confident to teach medical students</td>
<td>3.5</td>
<td>0.58</td>
</tr>
<tr>
<td>I have sufficient time to teach students</td>
<td>2.3</td>
<td>1.07</td>
</tr>
<tr>
<td>Learning objectives are clear</td>
<td>2.8</td>
<td>0.93</td>
</tr>
<tr>
<td>There are sufficient clinical learning opportunities for students</td>
<td>2.9</td>
<td>1.03</td>
</tr>
<tr>
<td>Feedback is given regularly</td>
<td>2.7</td>
<td>0.94</td>
</tr>
<tr>
<td>Students feel part of the team on the rotation</td>
<td>2.7</td>
<td>1.03</td>
</tr>
</tbody>
</table>

**Comparison between the clinical teachers abbreviated DREEM and the student DREEM measures**

The clinical teacher’s responses are detailed in Table 4. The clinical teachers items yielded a Cronbach alpha of 0.80 indicating good reliability. However, there were no differences in responses between teachers of year 4 and year 5 year students and
between teachers who had taught for less or more than 10 years (p>0.01 data not shown).

**Discussion**

The high response rate suggests that our results reflect the views of students in their first two clinical years of training. The response rate and time taken to complete the questionnaire show that the DREEM is practical to use in New Zealand. The lower response rate from the clinical teachers can be explained by pressure of access and time required to complete this questionnaire.

The assessment of the DREEM’s internal consistency exceeds the range reported in the literature (Cronbach alpha 0.84–0.90) and suggests that the DREEM is reliable for use in New Zealand.\(^5\,15\)

The students have identified a number of items with means of more than 2.8 and these can regarded as strengths. Students perceive that they are encouraged to be active learners and that their teaching is both stimulating and practical (items 1, 2, 4, 10, 31 and 43). Their teachers are regarded as knowledgeable and as good role models (items 13, 14 and 17). They feel relaxed in their clinical learning environment and able to ask questions (items 32, 35, 37, 38 and 43).

Three items (items 18, 28 and 44) have consistently been identified in other studies as areas of concern (mean scores of less than 2.0).\(^5\,14–16\) Two of these items were also identified as such in our study.

Though the students’ perceptions that they are unable to memorise all that is needed (item 28) could be due to the fact that no guidance is given in prioritising learning, it has also been suggested as reflecting an excessive volume of material to be learned. It has been shown that such perceptions are correlated with a risk of surface learning and in the long term less retention of knowledge.\(^5\)

Students in year 4 perceived that there was inadequate support for stressed students (item 44). For students in year 5 this was a less of a concern perhaps indicating that by the time students reach year 5 they have identified how to access support when they need it. Year 4 students need to be informed when they start their course how to access support should they become stressed. Posters could be placed in student areas to remind them of the availability of support services during the year.

Our students did not perceive lack of teacher feedback (item 18 mean 2.18) as a significant concern. However the mean for this item is relatively low and because feedback is such a powerful educational intervention this needs further consideration.\(^21\) In contrast the teachers indicate that they perceive that feedback is given regularly (mean 2.7). For any change to be effective this difference in views needs to be acknowledged.

For three items there were differences in mean scores between years 4 and years 5 (items 24, 27 and 44). Two of these relate to transition between years (item 24 and 27). This suggests that students in their year 4 require more assistance in transitioning between the preclinical and the clinical years of study. To address this, focus groups should be conducted to explore what support students would find beneficial as they transition from the preclinical to the clinical years.
The fact that the students’ perceptions were not influenced by the clinical team or the site in which they were learning has been suggested as indicating that the curriculum is delivered consistently across different learning sites. However lack of consistency in teaching and assessment across our teaching sites was identified as a significant concern in answers to the open-ended questions which we have reported elsewhere. This suggests that when using the DREEM it is important to include open-ended questions to offer students the opportunity to comment on aspects of the learning environment not specifically covered in the DREEM.

The desire for fewer lectures, more bedside teaching and more clinical exposure in the early years of training were also identified in the answers to the open-ended questions. These concerns would also not have been apparent if we had not added open-ended questions to the DREEM.

Gender differences have been reported in other studies with female students perceiving the learning environment as less supportive than their male counterparts. This is not the case with our students. Our mean subscale scores compare favourably with results published from other institutions.

The teachers’ confidence in their ability to teach is supported by the views of their students. The mean score of the subscale, students’ perceptions of their teachers was the second highest of all subscales. The teachers perceptions of the time they have available for teaching scored the lowest mean and this should be explored further.

There are two limitations to this study. Firstly, the teachers’ low response rate does not permit generalisation of our findings to all teachers at our school. Secondly the DREEM does not give any information on the reasons for the perceptions of students and teachers perceptions and these are important to make effective changes.

This study has provided some guidance on what needs to be addressed as our curriculum is developed to meet the needs of an increasing number of students. Further assessments of the learning environment will be needed once changes have been introduced to see whether they have been effective.

**Conclusion**

The DREEM is a reliable and practical tool for assessing the undergraduate clinical learning environment in New Zealand.

The learning environment of year 4 and 5 medical students at the University of Auckland is perceived positively by students irrespective of year of study, learning site, clinical team, ethnicity, age or gender.

Our students’ perspectives compares favourably with studies internationally.

Students are concerned about the amount of knowledge they need to acquire and the availability of support for students under stress as they enter, and during, the clinical years. Clinical teachers are concerned about the amount of time they have available for teaching. Further research needs to address these areas of concern.
Competing interests: None.

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8. The University of Auckland: Faculty of Medical and Health Sciences. Undergraduate study at the Faculty of Medical and Health Sciences; 2009 [updated 2009 July 2; cited 2009 November 24]; Available from: http://www.fmhs.auckland.ac.nz/faculty/undergrad/default.aspx
Leave provision for Canterbury District Health Board’s Resident Medical Officers with sick leave analyses

John Morton

Abstract

This study reports an analysis of the leave taken, over a 12-month period by Canterbury District Health Board Registrars and House Officers.

Resident Medical Officers (RMO) leave entitlements including annual (AL), sick (SL), bereavement, parental, special, medical education (MEL), jury service, union and conference leave (CL) are specified in the collective agreement between the New Zealand Resident Doctors’ Association and the Canterbury District Health Board (CDHB).

Table 1. RMO leave entitlements

<table>
<thead>
<tr>
<th>Type</th>
<th>Entitlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual leave</td>
<td>30 days per year for all RMOs</td>
</tr>
<tr>
<td>Medical Education Leave</td>
<td>6 weeks/year for employees on College or University courses. Maximum of 12 wks/course</td>
</tr>
<tr>
<td></td>
<td>Maximum of 2 weeks/year for employees doing medically-related diploma courses.</td>
</tr>
<tr>
<td></td>
<td>5 days per year for all RMOs in their second and subsequent years.</td>
</tr>
<tr>
<td>Conference leave</td>
<td>Registrars 5th year and higher—6 days conference leave per annum (conditions apply).</td>
</tr>
<tr>
<td>Sick leave</td>
<td>30 working days per year for years 1–4. Thereafter accumulated 30 days plus 9 days/year.</td>
</tr>
<tr>
<td>Other</td>
<td>Parental, special, jury service and employment relations leave—small demands.</td>
</tr>
</tbody>
</table>

Sick leave requires special attention because of its effect on productivity, not to mention the personal impact on those who are sick, their families, and their colleagues. “The right to absence when sick is a central part of the “contract” between employer and employee. Employers have moral and legal duties to prevent people from being made ill by the work they do: and most know that it makes business sense to support those who are sick, and help them return to work. We all want our people to be happy, healthy, and here. Equally, part of the bargain places a duty on staff not to be absent without good reason.”

A lack of awareness of the sheer quantum of RMO leave taken each year challenges team work, thwarts the maintenance of services and training, and impairs staff satisfaction.

This study reports a detailed analysis of 1 year’s RMO leave, aiming for better understanding by both the providers and the recipients of leave, and for the development of a monitoring process for the better management of RMO sick leave.
The study population

The study population was the 547 RMOs employed by the District Health Board in the period from 24/11/08 to 28/11/09, identified from the workforce information system in the Human Resources department. The 52-week study period correlates with the employment cycle.

Leave cover provision

Cover provided from departmental resources—The departments of Anaesthesia, Obstetrics & Gynaecology, Emergency, Older Persons Health, and Paediatrics provide House Officer cover as shown in Table 2, without recourse to the Resident Medical Officers (RMO) Unit, from the relief capacity included in the departmental staffing establishment.

Table 2. Cover provided from departmental resources

<table>
<thead>
<tr>
<th>Service</th>
<th>Departmental relief establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>5</td>
</tr>
<tr>
<td>Emergency</td>
<td>14</td>
</tr>
<tr>
<td>Obstetrics &amp; Gynaecology</td>
<td>11</td>
</tr>
<tr>
<td>Older Persons’ Health</td>
<td>8</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

Cover provided from the RMO Unit resource—RMOs employed by the CDHB are expected to do a stint at relief duties, usually for three months, providing cover for colleagues who are on leave, and the RMO Unit budget provides remuneration for 25 House Officers and 13 Registrars whilst they are relieving colleagues. Since many CDHB RMOs have had previous experience in the UK & Ireland where doctors going on leave are required to arrange their own cover, their ability to compare both experiences is valued, and will be the subject of another communication.

Medical Education Leave (MEL) is granted by the Resident Medical Officers Unit (RMO Unit) for (a) vocational training for applicants registered in a training programme for leave approved by the supervisor and, (b) for RMOs who in their second and subsequent years of employment have an entitlement to 5 days for medical education leave each year, to attend any training or even interviews.

When an RMO advises that they will be off duty on sick leave (SL) the Unit ascertains whether they are on a long day (0800–2300 hours), where relief provision is mandatory, and records the SL on the sick plan. If the RMO is from one of the departments listed in (1) above the service manager of the department is advised. Otherwise the Unit provides a reliever when possible, but if no reliever is available the ward and the service manager are informed to facilitate internal cover where possible. A medical certificate is not a mandatory requirement for SL of less than 3 days duration.

When an RMO submits an annual leave request form the RMO Unit checks that a reliever is available, enters the leave details on the work plan, and if relief is available
and the Clinical Director of the service approves the leave, final confirmation is provided to the RMO and entered in the leave spreadsheet. The confirmation is copied to Payroll, the service, and the RMO and filed in the RMO Unit. For those services that cover leave internally the leave notification comes to the RMO Unit for final confirmation, entry onto the work plans and leave spreadsheet and notification to Payroll, the service, and the RMO.

**Methods**

The data about the leave taken by the 547 RMOs employed by the CDHB from 24/11/08 to 28/11/09 was provided by the CDHB workforce information system of the Human Resources department. These data include all leave taken by the 380 Registrars and 167 House Officers who were employed during the study period. Leave data relating to employees who left the CDHB during this period is included according to their occupational status at the time they left. However, if a Registrar or House Officer changed to another occupational type outside this range (e.g. SMO) their leave is not included here.

The data with respect to leave requests, information about the leave granting process, and applications that were declined was provided by the RMO Unit.

A literature search was conducted for definitions of sick leave, the history of sick leave provisions, monitoring sick leave, comparative national and international rates, and attendance management.

**Measures of absence**—The traditional method of expressing the level of sickness absence is the absence percent rate i.e. the percentage of paid hours taken in sick leave, but the time lost may consist of a small number of people absent for long periods, or a large number absent for short periods. Consequently, comparison of absence rates can give rise to false conclusions if elementary indices such as number of absences and duration are not included. Measures of absence frequency provide a better indicator of short-term absence than the absence percent rate.

The absence percent rate for CDHB staff, including RMOs, was provided by the HR department. The Bradford points scoring assessment of short term sick leave absences—which the burden placed on staff covering unplanned absences, the financial costs associated with sickness absence, and the impact of frequent absences on the quality of patient care, provide a sound rationale for monitoring absences on sick leave.

The Bradford scoring used in this study measures irregularity of attendance, with the score calculated from $S \times S \times D$ where:

- $S$ is the number of occasions of absence on sick leave in the 52 weeks and
- $D$ is the total days of absence on sick leave in the 52 weeks.

So, for example, employees with 14 days absence in one rolling 52-week period, distributed differently, the score can vary enormously.

- One absence of 14 days is 14 points ($1 \times 1 \times 14$)
- Seven absences of 2 days is 686 points ($7 \times 7 \times 14$)
- Fourteen absences of one day each is 2744 points ($14 \times 14 \times 14$)

The Bradford score provides an impartial benchmark that allows comparisons over time and whilst it can discourage “sickies” (an informal Australian expression for a day of sick leave from work, whether sick or not; Collins English Dictionary), it should not be used in isolation. Combining measures of absence frequency and duration indicates whether an individual’s sickness absence record comprises a few or many spells of short or long duration. A high Bradford score should be a trigger for a supervisor to discuss the reasons for absenteeism which may be legitimate, e.g. clause 21.6.1 of the contract allows for leave on pay as a charge against sick leave when the employee must stay at home to attend to a member of the household who through illness becomes dependent on the employee.

In addition to monitoring trends in sickness absence Bradford scoring can identify the trigger points that are necessary to determine when supervisor counselling, to identify the reasons for frequent absences, is required.
Measuring the cost of sick leave—The direct cost of sick leave was estimated as the product of the average hourly rate of pay multiplied by sick leave hours taken. Since cross cover gets paid at variable rates it was estimated at $100/hour when provided by locums. The hidden costs of rework, and the impacts on patient safety and quality, being hard to measure, are not included here, but may well be greater than the direct costs.

Results

Tables 3 shows the sickness percent absence rates for CDHB staff groups and Table 4 provides a summary of the types and extent of Registrar and House Officer leave. Time-in-Lieu days (leave days taken to compensate for public holidays worked) were taken (Table 5) in addition to that shown in Table 4.

Table 3. CDHB percentage sickness absence rates: 1 April 2009–31 March 2010

<table>
<thead>
<tr>
<th>Occupation Type</th>
<th>Full Time Equivalents</th>
<th>Sick Leave %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrars</td>
<td>267.8</td>
<td>1.7</td>
</tr>
<tr>
<td>House Officer</td>
<td>129.2</td>
<td>2.9</td>
</tr>
<tr>
<td>Senior Medical</td>
<td>376.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Nursing</td>
<td>2938.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Allied Health</td>
<td>667.1</td>
<td>3.8</td>
</tr>
<tr>
<td>Other clinical</td>
<td>701.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Non clinical</td>
<td>1399.3</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Total CDHB</strong></td>
<td><strong>6480.3</strong></td>
<td><strong>3.5</strong></td>
</tr>
</tbody>
</table>

Table 4. Summary of RMO leave taken—calculated in hours

<table>
<thead>
<tr>
<th>Occupation Type</th>
<th>Annual Leave</th>
<th>Sick Leave</th>
<th>Leave without pay</th>
<th>MEL leave</th>
<th>Other</th>
<th>Total Leave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrars</td>
<td>48,423.19</td>
<td>10394.64</td>
<td>1498.44</td>
<td>18,540.00</td>
<td>1288.00</td>
<td>80,144.27</td>
</tr>
<tr>
<td>House Officers</td>
<td>18,943.16</td>
<td>6092.00</td>
<td>258.95</td>
<td>1129.50</td>
<td>244</td>
<td>26,667.61</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>67,366.35</strong></td>
<td><strong>16,486.64</strong></td>
<td><strong>1757.39</strong></td>
<td><strong>19,669.50</strong></td>
<td><strong>1532</strong></td>
<td><strong>106,811.89</strong></td>
</tr>
</tbody>
</table>

Table 5. Lieu days taken—calculated in days

<table>
<thead>
<tr>
<th>Lieu days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registrars: 605</td>
</tr>
<tr>
<td>House Officers: 250</td>
</tr>
<tr>
<td><strong>Total: 855 days</strong></td>
</tr>
</tbody>
</table>

Leave requested or declined—The RMO Unit received 2200 requests for leave during the study period and 59 (2.7%) of these applications were declined. Sick leave taken without the submission of a request form is not included in the 2200. The declined requests included 40 from House Officers and 19 from Registrars. 18 declined requests were from departments that provide internal cover, as shown in Table 6, and the RMO Unit does not record the reason for these declinations.
Table 6. Declined requests for leave

<table>
<thead>
<tr>
<th>Service</th>
<th>Relief establishment</th>
<th>Leave requests declined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Emergency</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Obstetrics &amp;</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Older persons health</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Paediatrics</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

Most of the requests declined by the RMO Unit were for periods when relief capacity was exhausted, and especially when less than 28 days notice was given. Figure 1 shows details of House Officers’ sick leave.

Figure 1 The number of episodes of sick leave taken by House Officers: the duration of episodes, and the total hours of sick leave required for each duration

Thus most episodes of House Officer sick leave were of short duration – 76% were for one day.

Table 7. Types of House Officer sick leave

<table>
<thead>
<tr>
<th>Classification</th>
<th>Present employees hours</th>
<th>Ex-employees hours</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>PANI—Pandemic Illness¹</td>
<td>3,662.25</td>
<td>8.00</td>
<td>8.00</td>
</tr>
<tr>
<td>SICK—Sick Personal</td>
<td>2,293.75</td>
<td></td>
<td>5,956.00</td>
</tr>
<tr>
<td>ACCN—Non Work Related Accident²</td>
<td>40.00</td>
<td></td>
<td>40.00</td>
</tr>
<tr>
<td>DISC—Sick Discretionary³</td>
<td>88.00</td>
<td></td>
<td>88.00</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>3,790.25</strong></td>
<td><strong>2,301.75</strong></td>
<td><strong>6,092.00</strong></td>
</tr>
</tbody>
</table>
Sick leave taken at the employers request without reduction of employee entitlement; In NZ the employer remunerates the employee for the first five days after a non-work related accident before the responsibility falls to the Accident Compensation Commission; Sick leave paid by the employer over and above the employee’s entitlement e.g. after an illness exhausts the entitlement.

Thus House Officers attributed 97% of their sick leave to personal illness. No work related accidents were reported.

Figure 2 shows details of Registrars’ sick leave

Figure 2. The number of episodes of sick leave taken by Registrars: the duration of episodes, and the total hours of sick leave required for each duration

Thus 84% of Registrar sick leave was of one or two days’ duration: 53% for one day, and the Registrars attributed 87% of their sick leave to personal sickness.

The relationship between the first day of episodes of sick leave and days of the week and any relationship with official holidays were investigated.

Chart 1. First day of sick leave by day of the week
The first day of episodes of sick leave was commonly a Monday, but no relationship was found with public holidays. Only six (4.7%) of the 129 RMOs who worked over fifteen consecutive weekends took sick leave on the following Monday.

**Chart 2. Bradford Scores Range – Registrars**

The chart illustrates how most Registrars have low scores, but there are very high scores at the tail end which require further investigation. The 24% of the Registrars who had Bradford scores greater than 100 accounted for 66% of Registrar sick leave.

**Chart 3. Bradford Scores Range – House Officers**
The chart illustrates that as with the Registrars most House Officers have low scores, but there is a broader tail and some of the very high scores require further investigation. The 31% of the House Officers who had Bradford scores greater than 100 accounted for 70% of the House Officer sick leave.

**Discussion**

When RMOs indicated late in the day that sickness would prevent them from working the night shift, it was difficult to provide cover, and those left to do the work were irate to discover that the “sick” one was attending a party that night. A staff member took sick leave on five consecutive Mondays for skiing weekends when holiday leave, requested at short notice, was not provided. Anecdotes like these, and record keepers’ observations that team work was seriously disrupted by unplanned leave, taken by some, necessitated measurement of the absenteeism rate, and some clues as to whether the absenteeism was innocent or culpable.

“Innocent absenteeism” refers to employees who are absent for reasons beyond their control: like sickness and injury; it is blameless, cannot be remedied and should not be subjected to disciplinary measures. E.g. A score of 5904 resulted from malignant disease with appropriate medical certification, and another high score was attributable to convalescence from an injury, with staged return to work. “Culpable absenteeism” refers to employees who are absent without authorization for reasons which are within their control e.g. an employee who is on sick leave even when he/she is neither sick nor caring for a sick dependent.  

In this study Bradford scoring revealed how some RMOs were taking frequent short term sick leave (commonly on Mondays), but whether or not that was innocent or culpable cannot be determined without further information about the reasons for taking the leave, and that requires prospective study. That the percentage sick leave rates for RMOs was relatively low reveals how that measure can mask the frequency of short term absences. Because RMOs work shifts and rotations, the disruption caused by frequent short term absences affects morale and efficiency more than the uncommon long term absences for which cover can be arranged.

Because hospital employees’ sickness absenteeism affects morale and efficiency the subject has been well studied, and the fundamentals of management have been known
for many years. The Hadassah Medical School in Jerusalem was recording and responding to data about it by 1985.5

The direct cost of CDHB RMO sick leave for the 2008 -2009 year was greater than one million dollars.

**A monitoring process for sick leave management**—This study found that the Human Resource Department’s detailed data base provided a powerful insight into the nature of an attendance problem and represented a vehicle through which practical solutions can be targeted9 at the disruption caused by frequent short term absences.

Collecting and analysing absence data cannot by itself, reduce levels of absence, unless there is leadership from senior managers, and the Human Resources department, who must establish systems for the supply of scoring data to the individuals in departments who will become responsible for counselling employees with high scores.

The HR data should be linked to software programmed to routinely measure individuals’ Bradford scores. Software is commercially available6. A trigger score e.g. 50 points in six months should be established, at which point the supervisor should interview the employee to explore the reason for the frequent absences. If these are legitimate support should be provided, but otherwise a warning should be given, advising that potential employers often seek information about applicants’ attendance records.

A detailed protocol has been published by New South Wales Health7 and other useful guidelines are available.8 Individual institutions in the UK public sector which have seriously addressed the sick leave issue have succeeded in reducing culpable absenteeism.2

Senior managers and clinical leaders require regular, reliable sick leave monitoring for workforce planning and maintenance, and Bradford scores would be more useful than percent absent rates.

Making employees aware of the Bradford scoring policy can reduce absenteeism, and it is expected that the policy outlined above would ensure that sick leave is an insurance against illness and accident rather than an entitlement equivalent to holiday leave.

**Competing interests:** None.

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**Acknowledgments:** Mark Henare and Timi Boddington of the Human Resources Department provided the raw data, and a summary of leave taken, and Christchurch Hospital Business Analyst Graeme McQueen established the Bradford scoring system.

I also appreciate the constructive criticism from an anonymous NZMJ reviewer.

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References:


What risk do consumers face when seeking medical advice from health food stores?

Llifon Edwards, Sarah Jefferies, Bridget Healy, Mark Weatherall, Richard Beasley, Philippa Shirtcliffe

Abstract

Aim There is currently no specific legislation to regulate either complementary and alternative medicine (CAM) products or the majority of those promoting them. This study sought to highlight the general risk a consumer may face when they seek help/advice from a pharmacy or health food store (HFS).

Methods 21 HFS, matched with pharmacies, were visited by a researcher complaining of tiredness, who stated he had been taking warfarin over the previous 2 months. The name, manufacturer and retail price of any products recommended were recorded immediately after leaving the premises. Paired contingency table analysis was used.

Results A pharmacy was significantly more likely to advise the consumer to consult a doctor (13/21) than a HFS (3/21) with a difference in marginal proportions of 47.6% (95%CI 22.5–72.7), p=0.006. A HFS was more likely to recommend more products, and only about one-quarter gave appropriate advice regarding possible interactions with warfarin and management of anticoagulation compared with two-thirds of pharmacies.

Conclusion To provide safe and quality advice to consumers, those promoting CAM products need to obtain relevant history and give accurate information regarding possible drug interactions and be prepared to refer back to mainstream medical services. Better regulation of CAM products and those promoting them is called for.

Effective regulation of the complementary and alternative health sector serves the public interest by protecting consumers from unsafe or inadequately trained practitioners, and from products that are unsafe or make misleading claims.¹

Most complementary and alternative medicine (CAM) products—also referred to as traditional medicine or TM—are currently marketed as dietary supplements. In New Zealand they can be obtained from pharmacies, health food stores (HFS), homeopathic pharmacies and supermarkets as well as practitioners and non-shop based retailers. CAM products are regulated by an array of legislation, such as the Medicines Act 1981 and the Food Act 1981, depending on whether they are defined as medicines, dietary supplements or food; which category a product falls into may depend on either the product or the desire of the manufacturer.

Currently, there is no specific legislation to regulate CAM practitioners (with the exception of chiropractors) although there are a number of regulatory provisions such as the Health and Disability Commissioner Act 1994. However retail assistants in these stores are not required to hold any formal training or qualifications in CAM.
Since the 1990s the use of CAM has surged worldwide with herbal and other complementary products increasingly being used to treat a variety of medical conditions. Indeed, the latest New Zealand Health Consumers’ Survey in 1997 reported that approximately 50% of the surveyed population had tried at least one form of CAM.\(^2\) In the United States, the 2007 National Health Interview Survey, which included a comprehensive survey of CAM use, showed that approximately 38% of adults use CAM.\(^3\)

A common misperception among patients taking CAM is that these remedies are “natural”, safe and do not interfere with any conventional medicines they might take.\(^4,5\) However, not only are there risks of product contamination, adulteration and toxicity from herbal ingredients, but most significantly a risk of interactions with conventional drugs.\(^6\) This particularly applies to drugs with a narrow therapeutic index such as warfarin and of all the published interactions between CAM and conventional medicines, warfarin is one of the most common conventional drugs involved.\(^5\)

Thus, the ability to provide accurate advice regarding the safe use of CAM products by those promoting them is important especially with regards to CAM-drug interactions. Few studies have investigated advice from HFS but in general, the advice given has been found wanting.\(^7\)

The key issue that this study sought to highlight was the general risk that a consumer may face when they seek help/advice from someone promoting a CAM product. This was related to both the lack of an appropriate referral (to mainstream medicine) in the setting of a potentially serious adverse event from warfarin, and the inherent risks in taking CAM products that may interact with warfarin with potentially significant adverse effect.

**Methods**

**Study design**—This study was conducted over a 4-week period between May and June 2010. Twenty-one HFS and 21 pharmacies were visited by a 30-year-old male researcher. The HFS were identified by a search of the Yellow Pages telephone directory and were matched with pharmacies on the basis of the closest geographical location to the HFS.

The researcher approached the retail assistant with complaints of tiredness, and difficulty concentrating at work. He would state that he had been taking warfarin over the past 2 months for treatment of a pulmonary embolus, which occurred following a long distance flight back from Europe. He asked for recommendations to assist with these symptoms.

If specifically asked, the researcher stated that he was an otherwise fit and healthy 30-year-old, that he had not been to see his general practitioner (GP) with regards to these symptoms, that he did not have a history of anaemia or abnormal bleeding, ate a well balanced diet, was married, did not feel that he was depressed, and currently worked in an office job doing clerical work.

The investigator was specifically not allowed to ask if any recommended preparation would interact with warfarin, nor for any advice regards what he should do about continuation of the warfarin whilst taking the remedy or awaiting a GP appointment.

This scenario was chosen because tiredness is a common complaint with many potential causes. Warfarin is a commonly used drug, with a narrow therapeutic index and so interactions with CAM products are of particular relevance. In this setting, it is imperative that a referral to the GP is made to further investigate the possibility of occult bleeding.

As warfarin is well recognised to interact with a large number of drugs (with the potential of both increasing and decreasing its effect), we were also looking for some recognition of a potential impact on anticoagulant control.
The researcher would record the name, manufacturer and retail price of any products recommended for purchase immediately after leaving the premises. The ingredients of each product were then confirmed by Internet search for the product.

An interaction between a product and warfarin was considered to be a potential issue if the product contained a substance that has been specifically identified as affecting INR (the standard measure of anticoagulant effect), the metabolism of warfarin, or other related comment such as “may increase the bleeding risk”. Possible interactions were checked using a standard pharmacological text and a further text specialising in herb-medicine interaction. Advice was defined as appropriate if the client was advised to have more frequent blood test monitoring or notify the anticoagulant clinic or see their doctor.

The study was approved by the Wellington Regional Ethics Committee.

**Statistical analysis**—Paired contingency table analysis was used to examine the agreement between the matched pairs in advice between pharmacies and health food stores. Statistical analysis was by an exact McNemar's test and a confidence interval for the difference in marginal proportions, representing the proportion of pharmacies that gave particular advice versus the proportion of matched health food stores that gave advice. A statistically significant McNemar's test means the marginal proportions of the contingency table are different.

The number of matched pharmacies/health food stores was based on an earlier study comparing the advice from HFS assistants with that of pharmacy assistants given to an individual presenting with symptoms suggestive of moderate to severe asthma who should be referred to a medical practitioner. Based on this, it was calculated that the study would need to have 19 store/pharmacy pairs to have 80% power to detect the difference.

**Results**

21 pharmacies and 21 HFS in the greater Wellington area, matched for location, were visited. In 10 of the pharmacies retail assistants requested pharmacists to either talk to the investigator or check product safety on their behalf and another three suggested consulting with a doctor or the pharmacist. The investigator was advised by retail assistants in all the HFS apart from one in which he was advised by a qualified naturopath.

**Consumer was advised to consult his doctor if symptoms not improving or before starting a recommended product**—A pharmacy was significantly more likely to advise the consumer to consult a doctor (13/21, 61.9%) than a HFS (3/21, 14.3%), with a difference in marginal proportions of 47.6% (95% CI 22.5 to 72.7), p= 0.006

**Number of products recommended**—A total of 32 different preparations were recommended, 15 by pharmacies and 34 by HFS (Table 1). A HFS was more likely to recommend more products (none or one product 9/21, 42.9%) than a pharmacy (19/21, 90.5%), with a difference in marginal proportions of 47.6% (95% CI 26.3 to 69.0), p= 0.002.
Table 1. Various products recommended by health food stores (H) and pharmacies (P), grouped according to main components

<table>
<thead>
<tr>
<th>Multivitamin products</th>
<th>Herbal</th>
<th>B-complex and other</th>
<th>Oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s Multi (H)</td>
<td>Astrafore (H)</td>
<td>B-50 complex (H)</td>
<td>Flaxomega (H)</td>
</tr>
<tr>
<td>Men’s Care Multi (H)</td>
<td>Quercetin Complex (H)</td>
<td>B-Max (3H)</td>
<td>Complete Omega (H)</td>
</tr>
<tr>
<td>Centrum (H, P)</td>
<td>Ginseng (H)</td>
<td>B-100 (H)</td>
<td>Arctic Cod Liver Oil (H)</td>
</tr>
<tr>
<td>B Stress Free (H)</td>
<td>Hi-Q (2H)</td>
<td>Mega-B (H,P)</td>
<td></td>
</tr>
<tr>
<td>Go Adrenal Support (2H)</td>
<td>Fatigue Fighter (H)</td>
<td>Ener-B (P)</td>
<td></td>
</tr>
<tr>
<td>CAA (H)</td>
<td>Memory Booster (H)</td>
<td>Berocca (P)</td>
<td></td>
</tr>
<tr>
<td>Ultra-B (H)</td>
<td>Hairy Lemon (P)</td>
<td>Go-B Complex (P)</td>
<td></td>
</tr>
<tr>
<td>Men’s Ultivite (H)</td>
<td>Spirulina (7H)</td>
<td>Vitamin C (P)</td>
<td></td>
</tr>
<tr>
<td>Multi for Men (H, P)</td>
<td></td>
<td>L-tyrosine (H)</td>
<td></td>
</tr>
<tr>
<td>Executive B (4P)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ultra-Life (2P)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age Wise Men’s Daily (P)</td>
<td></td>
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</tr>
</tbody>
</table>

Note: More than one product was sometimes recommended. Where a product was recommended by more than one H or P this is indicated by a number in front of the letter.

Advice regarding potential interactions with warfarin and management of warfarin—A pharmacy was significantly more likely to make no product recommendation or make a recommendation for a product with no interaction with warfarin (13/21, 61.9%) than a HFS (4/21, 19.1%), with a difference in marginal proportions of 42.9% (95% CI 14.6–71.1), p=0.023.

Similarly, a pharmacy either did not recommend a product or recommended a product with the correct advice regarding warfarin management in 14/21 cases (66.7%) compared with a HFS 5/21 (23.8%) with a difference in marginal proportions of 42.9% (95%CI 11.7–74.0), p=0.03. Table 2 summarises those products that contain ingredients that may interact with warfarin.

Table 2. Products recommended that contain ingredients that may interact with warfarin

<table>
<thead>
<tr>
<th>Products containing Vitamin E (α-tocopherol): may increase INR and caution advised even at recommended doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s Multi, Spirulina, Men’s Care Multi, Centrum, B Stress Free, CAA, Complete Omega, Arctic cod liver oil, ultra B, Men’s Ultivite, Multi for Men, Executive B, Ultra-Life, Age Wise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products containing Schizandra chinensis* (may increase metabolism of warfarin) and/or Ginseng# (may decrease effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go Adrenal Support#, Ginseng#, Hi-Q#*, Fatigue Fighter##, B Stress Free#, Hairy Lemon#, Age Wise#</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products containing Ginkgo biloba (may increase bleeding risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Q</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Products containing Vitamin K (reduces effectiveness of warfarin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s Ultivite, Multi for Men, Age Wise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products containing flax oil or fish oils (increase bleeding time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flaxomega, Complete Omega, Arctic cod liver oil</td>
</tr>
</tbody>
</table>
Discussion

This study shows that there is a significant difference in the advice offered by pharmacies and HFS regarding management of tiredness in someone taking warfarin with nearly two-thirds of the former appropriately recommended referral to mainstream health services compared with less than 15% of HFS.

Similarly, about two-thirds of pharmacies gave good advice regarding adverse interactions between products and warfarin and regarding warfarin management compared with about one-quarter of HFS.

This study is the third in a series looking at the appropriateness of advice given by pharmacies and HFS and calling for better regulation of staff and CAM products.\textsuperscript{11,12} In the first scenario, which involved a new presentation of moderate to severe asthma, 92% of pharmacy staff recognised the severity of the condition and appropriately referred the consumer to a medical practitioner compared to only 35% of HFS.

A number of products were recommended, particularly by the latter, without any evidence of benefit. In the second scenario, involving a new presentation of severe hypertension, 96% of pharmacy staff recommended an immediate visit to a medical practitioner compared with 4% of HFS staff. Again a number of products were sold that were unlikely to be effective in severe hypertension.

Thus the findings of this paper are broadly in keeping with these studies although it is worth noting that about one-third of pharmacies did not offer sound advice.

A number of studies have examined the issue of co-ingestion of CAM and warfarin. Using postal questionnaires to general practice patients on warfarin, Smith et al found that 19.2% of patients were taking one/more herbal remedies; in 79% this had not been discussed with their doctor.\textsuperscript{6} Ramsey et al studied patients attending an anticoagulation clinic to start warfarin.\textsuperscript{5} Of 631 patients, 26.9% were using some form of CAM and 58% of these were using a product that could interact with warfarin. Shalansky et al completed a prospective longitudinal study amongst those prescribed warfarin for at least 4 months.\textsuperscript{13} Forty-three percent reported taking at least one CAM product with possible warfarin interactions. Similarly in their survey of hospital inpatients and outpatients on warfarin, Leung et al reported that 44.3% were using CAM.\textsuperscript{14}

The major strength of this study was that it used one researcher to present a standardised scenario to 21 matched pharmacies and HFS allowing for a matched analysis. The investigator had to document the content of the conversation immediately after leaving, potentially introducing some recall bias however in practice this was not a major issue. It was also a hypothetical situation so there were no outcomes to monitor.

Ingredient lists for all products were available using a simple internet search, and all ingredients apart from one bacteria in one supplement were checked using authoritative reference texts.

The World Health Organization (WHO) actively recommends the regulation of all complementary and herbal medicine practitioners and all herbal products, particularly
in situations where the practice of complementary medicine brings economic benefit.\(^{15}\) This is to ensure the quality of the service received and thus to protect the public from potential harm.

In 2008, the WHO Congress on Traditional Medicine resulted in the Beijing Declaration. This identified six articles including that governments should formulate national policies, regulations and standards as part of comprehensive national health systems to ensure appropriate, safe and effective use of traditional medicines and that governments should establish systems for the qualification, accreditation or licensing of traditional medicine practitioners.

In New Zealand, an extensive review of CAM was undertaken between 2002 and 2004 by the Ministerial Advisory Committee on Complementary and Alternative Health. This recommended that CAM consumers should be further protected through statutory regulation of high risk CAM modality practitioners (chiropractors and osteopaths), and self regulation of low risk CAM practitioners.\(^{16}\)

In December 2003, the Australian and New Zealand Governments signed an agreement to establish a joint regulatory scheme for therapeutic products including CAM with the aim of safeguarding public health through regulation of the quality, safety and efficacy of therapeutic products. However negotiations were suspended indefinitely in 2007 following controversy about the proposal to include complementary medicines within the scope of the joint scheme.

In March 2010 a consultation paper was released by the Ministry of Health regarding the development of a Natural Health Products Bill with an expectation that the Bill would be enacted in 2011. Two of the key principles on which proposed legislation is based include that natural health products should be regulated separately from food and medicines, and that suppliers should be able to make low level health claims for products supported by evidence.\(^{17}\) However it does not address the issue of training of HFS (or pharmacy) assistants.

Discussion of all the issues involved in the regulation of CAM is outside the scope of this paper. However, at the crux of these is the fact that CAM is fundamentally a different paradigm to medical science. Consequently there is significant variation in views about how much and what training should be needed to attain regulation status including how to incorporate the intuitive skills and individualised approaches to providing health care that are key aspects of CAM practice.

A “consultation” is not defined in the Medicines Act but interaction between any practitioner and patient is covered by the Code of Health and Disability Services Consumers Rights 1996. It could be argued that a dialogue whereby there is an attempt to establish the patient’s ailment with the aim of making recommendations constitutes a consultation and that there should be an attempt to ascertain any additional circumstances that mean particular treatments should not be administered.

Of course it could also be argued that consumers need to have some skills to carry out their own evaluation if choosing to seek advice in this setting, or alternatively that the doctor who prescribed the warfarin is responsible for ensuring appropriate patient awareness/education.
With regards to efficacy of the products recommended there is also ongoing debate about what level of proof is required to assure the public that a (any) form of health treatment is safe and effective. With regards to potential warfarin-CAM interactions, nearly all the available information is based on in vitro data, animal studies and case reports and definitive cause-effect relationships have not been proven.  

**Conclusion**

To provide safe and quality advice to consumers, staff who are promoting CAM products need to not only obtain relevant history before recommending various products but also give accurate information regarding possible interactions with current medications and be prepared to refer back to mainstream medical services. 

This study showed that this was responsibly done by the majority of pharmacies, although (perhaps surprisingly) a third were found wanting, and by only a minority of HFS. Once again we recommend the implementation of a formal training programme for HFS staff and pharmacy retail staff and better regulation of CAM products to reduce the risk for the consumer. 

**Competing interests:** None. 

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**References:**


Mind the Gap: ethical issues of private treatment in the public health system

Elizabeth Fenton

Abstract

The funding of expensive new cancer treatments is a difficult health policy issue in New Zealand and around the world. Since the public health system cannot afford to fund every new treatment, complex decisions must be made about which treatments to fund publicly, and whether and how to make unfunded treatments available to people who may wish to fund them themselves. One recent proposal is that unfunded treatments be made available to patients privately through the local public hospital. Although ultimately declined by the health minister, this proposal merits serious debate, since it is likely to continue to attract attention as a policy option.

While the integration of public and private delivery systems has clear benefits for patients with the means to purchase additional treatments, its overall effect may be to exacerbate existing inequities in the New Zealand health sector. This paper briefly explores the wider ramifications of such schemes as part of the ongoing public discussion that should inform the development of health policy on this issue.

The Southern District Health Board recently proposed a pilot scheme in which patients seeking treatments that are approved for use but not funded through the public health system can receive those treatments in a public hospital, provided that they pay for the treatments, and any additional incurred costs, with their own funds. The goal of this scheme was to “bridge the gap” between the treatments that the public health system can afford or decides to fund, and the treatments that patients want to receive.

Given the recent surge of extraordinarily expensive cancer drugs on the pharmaceutical market, it is not surprising that the primary focus of this scheme (as of similar “top up” schemes in Canada and the United Kingdom) was the provision of cancer treatments, which are, in many cases, outside the reach of publicly-funded health care systems. Since schemes like Bridging the Gap propose novel partnerships between the private and public health systems, and are likely to continue to emerge in policy discussions, care must be taken to explore the ethical issues they raise, particularly issues of fairness and equity.

Bridging the Gap

The scheme proposed for the Otago-Southland region was motivated by the unavailability in the public health system of new and often expensive cancer treatments. There are two principal reasons for this unavailability. First, some of these treatments are not government funded and so are not available through the public health system in which these patients may already be receiving treatment. Patients who want to access these treatments pay the cost of the drugs themselves and the
costs of administering the drugs in a private setting. Second, private facilities in the relevant geographic area are unable to administer the treatments, so that patients who wish to receive them must travel away from home. For those patients for whom the drugs are an addition to the regimen they are already receiving, travelling to another centre is not only costly but may lead to fragmentation of care; for other patients their health may make such travel impossible or very difficult.

Bridging the Gap proposed that currently unfunded drugs be made available to patients willing to fund them in a designated ward in the public hospital. The principal benefit of such public-private integration of care is that it obviates the need for patients who are already receiving treatment in the public system to fragment their care and incur the full costs of treatment in order to receive drugs that they are willing to fund themselves. In addition, it addresses what proponents see as one of the principal equity issues in access to this form of care, namely that patients who live in areas well served by private facilities have access to additional self-funded treatments without needing to travel, while those living in rural or less populated areas have to go without or travel long distances.

The argument in favour of such schemes assumes that patients ought to have access to the currently unavailable drugs; it is claimed that their unavailability represents an “unmet need” for patients. This argument assumes that patients’ lack of access to these drugs is in some way unfair or unjust, but it is not clear that lack of access to these treatments is always an issue of justice. To see why this is the case I will consider two arguments in support of the case that lack of access is unjust. I hope to show that these arguments are unpersuasive and that attempts to rectify the supposed injustice through schemes like Bridging the Gap could exacerbate rather than address existing inequities in the health system as a whole.

Availability and public funding of expensive cancer treatments

The first argument that lack of access to unfunded cancer treatments is unjust locates the injustice in the government’s failure to fund the treatments through the public health system, thereby making the treatments available to everyone. On closer inspection, however, the reasons for this lack of funding make it far from clear that it is an issue of justice. Public health systems have limited resources, and cannot afford to fund every treatment that is available on the market. They must try to ensure that the resources they have are used to produce as many health benefits as possible, while striving to distribute those benefits equitably throughout the population. To this end, agencies like PHARMAC evaluate new treatments to ensure that, if purchased by the government, they are getting good value for money.

While this strategy is open to criticism, both moral and political, it is important to remember that no health system can afford to pay for every treatment that every patient may want. In order to be fair to all users, the system must evaluate not only the financial costs of a new treatment, but also its opportunity costs—those treatments that must be foregone in order to fund the new treatment.

It is sometimes argued that the failure to fund new cancer treatments puts New Zealand out of step with other countries, and places the patients in the public health system at a disadvantage. This argument assumes, however, that availability in other
countries is a matter of settled consensus, when in fact it may mask significant controversy about whether these treatments ought to be available.

In the United States for example, where government health programs are legally prohibited from using cost or cost-effectiveness measures as a factor in decision-making, oncologists and others have questioned whether many of the new cancer drugs offer sufficient health benefits to justify the prices patients, insurers, and the government are being asked to pay.\textsuperscript{2,7,12,15}

There is no doubt that New Zealand could spend a higher proportion of its GDP on health, and a higher proportion of its health budget on cancer care. Such increases might temporarily provide funds for a specific service or treatment, but are not a permanent solution for difficult resource allocation problems. No matter how large the health budget, if it is limited at all, as it must be to ensure sufficient public funds for other social goods, there remains the problem of deciding how to allocate that budget fairly.

In order to be fair to all users of the health system, treatments that are less cost-effective, or too costly, sometimes have to be foregone. The alternative is to provide all treatments, no matter how small their benefit or how high their cost, to all patients who want them. Since this alternative is neither rational nor ethical when resources are limited,\textsuperscript{2} the unavailability of certain treatments is not unjust.

**Availability and impact of private health services**

Since the unavailability of expensive cancer treatments in the public health system is in some cases justified, we can now turn to the second argument claiming that lack of access to unfunded treatments is unjust. This argument might concede that the government cannot and ought not to fund every available drug, but argues that it is unjust that patients willing to pay for additional services are unable to access those services for reasons that are outside their control, such as a lack of access to private facilities.

This argument takes the existence of the private health sector for granted, and is concerned with the way in which access to that sector is distributed. To be sure, when access to a good is determined by factors that are arbitrary or morally irrelevant, questions of fairness are rightly raised. But there is an important prior question about whether the existence of private health care, which is accessible only to the wealthier members of the community, itself raises issues of justice that might be exacerbated by programs that seek to integrate private health care into the public system.

In New Zealand, as in many other countries, a private health care system exists alongside the public system. In favour of this two-tier arrangement it is argued that provided everyone has equal access to an adequate package of core health care benefits, allowing some to pay to access more and better care is not unfair or unjust. In fact, this protection of people’s liberty to spend their own “legitimately held” wealth on beneficial goods or services may itself be a requirement of justice.\textsuperscript{10} Moreover, since governments cannot afford to pay for every possible drug or intervention, some health services simply will not be available in the public sector. The private sector provides those with greater wealth the ability to purchase what they cannot receive in the public sector.
On the other hand, it can be argued that a two-tier health system is fundamentally inequitable, since it allows some to access more and potentially better health care based on ability to pay, rather than on morally relevant characteristics such as medical need or capacity to benefit from treatment. This may result in health inequalities between rich and poor. Importantly, however, some inequalities are more morally troubling than others.

If the public health system is maintained at a sufficiently high level, ensuring that everyone has access to at least a “decent minimum” of health care, then the inequalities engendered by the existence of a private health care system will occur at the “top” rather than at the “bottom”—i.e., above rather than below the point of access to a “decent minimum” of health care. These inequalities are less worrisome from the point of view of justice than inequalities between those who have access to no or very little health care and those who have access to full health care.

Nevertheless, two-tier health systems do raise important moral concerns. In particular, it is misleading to characterise private services as merely an “add on” or “top up” to what is offered in the public sector. Rather, the interaction between the two tiers of the system is complex and can negatively affect the viability of the public sector, either by draining resources or by reducing pressure on the government to maintain the core benefits package at an appropriately high standard. In addition, where a private system exists, use of the public system by the wealthier classes may decrease, which not only reduces support for the public system, but also threatens the stability of its funding and the extent to which improvements in services are lobbied for.

Allowing the purchase of additional private health care is not simply an innocuous bow to personal liberty, but a potential threat to the integrity of the public health system as a whole. A further concern is that in dual private-public health delivery systems the public system inevitably underwrites and subsidises the private system, as happens when patients opting for private care require further services that only the public system can provide. In such cases private patients do not pay the real cost of treatment in the private system, with those costs being passed on to the public, tax-funded system.

New Zealand’s ongoing support for or tolerance of a two-tier health system suggests that it is willing to tolerate the inequalities that are part and parcel of that system. It is not clear, however, that tolerance of a largely separate private health care system extends to the provision of private health care wherever and whenever is most convenient for the patients. It is important to ask, then, whether the integration of private care into the public system, through schemes like Bridging the Gap, introduces particular forms of harm or disadvantage that exacerbate levels of inequality that people have previously been willing to tolerate.

**Equity between patients**

With respect to individual users of the public health system, it might be argued first that public patients are disadvantaged by such integration schemes to the extent that they receive fewer health benefits than private patients. This is not necessarily the case, however, since the treatments the private patients are paying for may not deliver more or better health benefits.
Second, it might be argued that public patients will be harmed by the diversion of important resources to private patients, particularly resources such as bed space and nursing care that carry opportunity costs. This is an important harm, but one that could be limited by the way in which the scheme is arranged. For example, the scheme could be limited to patients already receiving treatment in the public system, such that additional treatment requires no resources that would not have been used anyway.

Alternatively, private patients could be admitted only when bed space permits, or, in principle at least, the treatment could be priced far enough above cost to ensure that resources are not removed from the public system, and may even be added to it. While this is possible in principle, in practice charging too high a fee would defeat the purpose of the scheme, creating a potential gap between the cost to the system of providing the service and the fees patients are charged to use it. A risk thus remains that this scheme will harm other patients in the system by diminishing resources available to them.

Third, it might be argued that public patients being treated for cancer will be psychologically harmed by the knowledge that other patients in the hospital with the same illness are being treated differently simply because they have the financial resources to purchase additional treatments. This is a significant source of potential harm. Commentators on a similar scheme in Canada noted that such differential treatment within the public system “could be considered an insult to human dignity.”

In the United Kingdom a commissioned report on the proposed “top up” scheme for the National Health Service (NHS) argued that allowing differential care within an NHS hospital, while the most convenient and inexpensive option for the private patient, is “by far the most overtly inequitable option” for other patients in the hospital receiving standard NHS care. It is principally for this reason that the report recommends against integrating private care into NHS hospitals.

A potential solution to this equity issue, suggested in the Bridging the Gap proposal, is that patients receiving self-funded drugs be treated in a separate ward in the hospital. Under this arrangement patients receiving different treatment for the same condition would not confront each other in the same ward, thereby, it is suggested, lessening the extent to which the non-paying patient will feel “let down” by the public health system.

It is not clear, however, that the visibility of private fee-paying patients is the principal equity issue raised by such schemes. As has already been noted, in all public health systems resource limitations mean that some treatments must be foregone when they have been judged to be not good value for money compared with other possible uses of resources, or are simply unaffordable for the health system. These are difficult judgements to make, which is why they are entrusted to agencies like PHARMAC in New Zealand and NICE in the UK that strive for careful, objective and transparent decisions.

While sometimes unpopular and controversial, these decisions are in one important sense fair: they take into account the needs of all users of the health system, and so effectively share the burden of health care rationing across all users of the system. When private health care is integrated into the public system, the fairness of this...
rationing process is undermined, since not all users of the system share equally the burden of limited resources.

Patients who self-fund additional treatments that they then receive in the public system receive the benefits of that system, but they do not share in its costs—that is, its opportunity costs, what it must sacrifice in order to provide a good level of service for everyone.

The unfairness and inequity between private and public patients receiving different care in the public system is not that one sees the other receiving different care; rather, it is unfair that the fee-paying patient enjoys the benefits but does not bear the burdens of public health care. Although treating private patients in a separate ward may reduce the psychological stress on non-paying patients, it does little to remove the inequity created by their differential treatment.

**Health system implications**

In addition to the disadvantages for other users of the public health system, schemes like Bridging the Gap have important implications for the health system as a whole.

First, such schemes could increase health sector costs. In part this is because patients who want these additional treatments are often willing to pay high costs for relatively small benefits. This both disincentivises pharmaceutical companies from pricing their drugs in line with their value,¹ and undermines the ability of agencies like PHARMAC to negotiate with drug companies for lower prices.¹¹

If pharmaceutical companies know that patients are willing to pay their high prices privately, they may be tempted to bypass the public sector altogether. Since PHARMAC’s negotiating power generates significant savings for the New Zealand health sector,⁶ such schemes could lead to higher costs without increased health benefits. Moreover, the increased availability of the treatments, and the perception that their use in the public sector is an endorsement of their effectiveness¹¹ may increase pressure on the government to fund high-cost cancer treatments that have been judged, by a careful deliberative process, to be not cost-effective for the public health sector. Such spending increases will mean less money available for other important health services.

Second, the existence of a private health care system can provide governments with a reason not to expand or even to reduce the package of core benefits available through the publicly funded system. It is important, then, that when new treatments become available schemes like Bridging the Gap do not act as disincentives for inclusion of those treatments into the publicly funded system.

These concerns thus pull in different directions, emphasising the complexity of the interaction between the two tiers of a public-private health system. On the one hand, integrating private health services into the public system might force the government to spend money on additional, possibly unaffordable, treatments for one disease, thereby exacerbating inequities in the system between disease groups and potentially reducing the efficiency of the health system as a whole. On the other hand, such integration might push advanced cancer treatment into the realm of private health care, thereby creating or exacerbating inequalities between rich and poor patients with the same disease.
This last point is an especially troubling one. As the background material for Bridging the Gap noted, cancer is the leading cause of death in New Zealand. It is also true, but was not mentioned in the document, that cancer affects some population groups more than others.

A recent study showed significant differences in mortality from colon cancer between Maori and non-Maori, due in part to unequal access to health services for Maori. To the extent to which schemes like Bridging the Gap will further increase those differences, both in access to services and in health outcomes, by making more treatments available to those who can afford to pay, their claim to be meeting “an unmet need” for patients is unpersuasive.

The greater unmet need that public hospitals should be striving to meet is that of equitable access to their services for everyone, but particularly for those who are disadvantaged and at risk of worse health outcomes. To this end, making room for the provision of treatments that are distributed on the basis of ability to pay should be given lower priority than addressing those unjust health disparities that already exist.

Competing interests: None.

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Managing obstructive sleep apnoea and achieving equity: implications for health services
Sarah-Jane Paine, Ricci B Harris, Kara M Mihaere

Abstract
Sleep occupies a third of life, and poor sleep has wide-ranging consequences for health, safety, and well-being. Recent research suggests significant inequalities in sleep health between Māori and non-Māori adults in New Zealand including self-reported sleeping problems and obstructive sleep apnoea syndrome (OSAS). This paper will outline a series of studies that were designed to assess how many people were affected by OSAS in Aotearoa/New Zealand and specifically sought to prioritise the needs of Māori. It will discuss a number of issues related to the diagnosis and treatment of OSAS in New Zealand and present strategies for reducing inequalities in sleep health.

There are a wide range of causes for inadequate sleep, ranging from intrinsic problems with sleep regulatory mechanisms, through disturbances associated with other physical and mental health problems to social pressures and demands (e.g., having to work non–standard hours¹). Currently, more than 80 different sleep disorders have been identified.² The most commonly diagnosed and treated sleep disorder in New Zealand and internationally is Obstructive Sleep Apnoea (OSA).³ OSA is part of a spectrum of sleep-related breathing disorders which is primarily categorised by repetitive episodes of airflow reduction (hypopnoea) or cessation (apnoea) due to upper airway obstruction during sleep. OSA accompanied by excessive daytime sleepiness is referred to as obstructive sleep apnoea syndrome (OSAS).² Symptoms typically include loud snoring interrupted by breathing pauses, and aetiological risk factors include age, obesity, male gender, smoking, and alcohol consumption.⁴ The international literature reports that OSAS is common in adults, affecting 2% of women and 4% of men.⁵,⁶ Evidence from sleep clinics in New Zealand indicates that Māori patients often present with more severe OSAS.⁷,⁸ OSAS is associated with increased risk of high blood pressure, heart disease and stroke, excessive daytime sleepiness, and motor vehicle accidents,⁴ all of which disproportionately affect Māori.⁹ The prevalence of obesity, one of the strongest risk factors for OSAS, is higher in Māori than non-Māori.¹⁰

The authors have been involved in a number of community based studies examining the prevalence of sleep problems and sleep disordered breathing, with a particular focus on inequalities between Māori and non-Māori. This paper presents an overview of findings from these studies with a focus on OSAS and discusses the implications for prevention, diagnosis and treatment of OSAS.
Prevalence of OSAS and sleep problems for Māori and non-Māori in New Zealand

Recent New Zealand evidence indicates that Māori have a higher prevalence of OSAS than non-Māori. Results of a national survey on OSAS symptoms and risk factors (5500 participants of Māori descent, 4500 non-Māori, 30–50 years, response rate 71.4%), found that the population prevalence of OSAS symptoms (snoring always, observed apnoeas and excessive daytime sleepiness) was significantly higher among Māori men and women compared with non-Māori (all p<0.001). In addition, Māori men had a significantly larger mean neck size than non-Māori men (41.98 cm vs 40.15 cm, p<0.0001), as did Māori women compared with non-Māori women (36.16 cm vs 34.34 cm, p<0.0001). Neck size (an indicator of central obesity) is a risk factor that has been shown to correlate more closely to OSAS than Body Mass Index.

In this national survey, ethnicity was not an independent predictor of reporting snoring always. However, for observed apnoeas there was an interaction between ethnicity and smoking whereby Māori ethnicity was a significant predictor but only among non-smokers. Increasing neck size was an independent predictor for reporting observed apnoeas and snoring always.

In a parallel study, 364 adults in the Wellington region (Māori=169, non-Māori=195) were monitored overnight in their own homes, using portable recording equipment (MESAM IV) to assess breathing disturbances during sleep. Breathing disturbances were defined as the average number of ≥4% O2 desaturations per hour of sleep, plus bursts of snoring or >10/min increase in heart rate (the respiratory disturbance index or RDI). OSA was defined at three thresholds of RDI (≥5, ≥10, ≥15) and OSAS was defined as OSA (≥5, ≥10, ≥15) with the addition of daytime hypersomnolence (i.e. a score of >10 on the Epworth Sleepiness Scale).

In this community study, the prevalence of OSA at all RDI thresholds was higher among Māori than non-Māori. In particular, Māori were significantly more likely to have more severe respiratory disturbances (RDI≥10: 10.9% vs. 3.3%, p=0.02; and RDI≥15: 6.5% vs. 1.5%, p=0.03). Māori also had higher prevalence estimates of OSAS (RDI≥5 plus excessive daytime sleepiness); (Māori men=4.4%; non-Māori men=4.1%, Māori women=2.0%, non-Māori women=0.7%). These prevalence estimates are conservative, because the monitoring technology used did not permit reliable identification of hypopnoeas which are usually included in the RDI.

In this study, the higher risk among Māori reduced and became non-significant after adjusting for well-recognised risk factors such as increased body mass index and large neck size.

These results support clinical observations that suggest a higher prevalence of OSAS amongst Māori. Ethic inequalities in sleep disordered breathing have previously been reported (e.g.). In the study presented here, OSA prevalence estimates for Māori were closer to the estimates for the Wisconsin Cohort and the Australian population study, whereas prevalence estimates for non-Māori were significantly lower.

Results of a national survey which focussed on insomnia symptoms (response rate 72.5%) showed that Māori were more likely to report chronic sleep problems (lasting
more than 6 months) than non-Māori (28.6% versus 24.6%, p=0.033). In this study people who reported a chronic sleeping problem were more likely to report that their general health, quality of life, concentration, and memory were only fair or poor, that their ability to cope with minor problems, or to accomplish daily tasks was impaired, and that they had difficulty with interpersonal relationships. These findings remained significant after taking into account demographic and socioeconomic factors.

Socioeconomic deprivation, unemployment, and night work were also associated with reporting chronic sleeping problems. These factors are disproportionately higher among Māori and may contribute to inequalities in sleep problems, as well as having an independent effect.

**Diagnosis and treatment of OSAS in Aotearoa/New Zealand**

Specialist diagnostic and treatment services for sleep problems in Aotearoa/New Zealand are currently very limited. Most are hospital-based and focus on sleep-related breathing disorders, primarily OSAS. The New Zealand branch of the Thoracic Society of Australia and New Zealand (TSANZ) has highlighted a need for increased funding, servicing, and consistency of specialist sleep services nationwide, and that decision making at the national level is required to address these issues.

Recent research confirms that current services will be unable to meet the needs of the population, which are expected to increase with the increase in obesity. The prevalence studies presented here were designed to assess the needs of Māori as well as the overall population. It is important that current services and the continued development of services meet Māori needs given the higher risk of OSAS among Māori patients.

Polysomnography (PSG) is the accepted gold standard for the diagnosis of sleep-disordered breathing. PSG consists of monitoring brain electrophysiological activity, eye movements, muscle tone, heart rate, respiration, blood oxygen levels, and leg movements. However it has been criticised as a method of evaluation because it’s high cost limits accessibility. In New Zealand, gold standard diagnostic services (fully attended overnight PSG) are only offered through hospital clinics in major centres. A range of more limited diagnostic studies are also undertaken by these clinics and some other services in smaller centres.

As the general public and health care professionals have become more aware of the importance of sleep disordered breathing, demand for diagnosis and treatment has increased, and a number of alternative diagnostic methods have been developed based on portable monitoring devices. These differ in the number of signals recorded, from the same signals as attended PSG, to only a single oximetry channel.

More limited screening criteria can be used to prioritise patients with a high pre-test clinical probability of OSA, for split-night PSG studies. These utilise the first half of the night to evaluate the presence of OSA and the second half to implement treatment (nCPAP), thus increasing the through-put of specialist services and reducing waiting lists.

In New Zealand, a primary care model has been proposed to facilitate appropriate referral of snorers to specialist sleep services. This model provides guidance on the classification of snorers, based on the patient’s level of daytime sleepiness (i.e. a score
>10 on the Epworth Sleepiness Scale) and nocturnal hypoxaemia (measured using pulse oximetry).

The appropriateness of this model has been debated (see reference 23) with the need for more evaluation of this model as a screening tool for OSA raised. However, it illustrates a type of approach that could potentially improve referral and promote more effective use of publically funded specialist services. Increased management of OSA at the primary care level, including involvement of Maori health providers, with support from specialist services may enable services to better meet the growing population needs.

Services in New Zealand are also hindered by the lack of a systematic nationwide approach to the management of sleep disorders. There are marked variations among DHBs in the funding allocated for Continuous Positive Airway Pressure, or CPAP, machines, and also differences in terms of the type of clinical problems that services are being asked to investigate. The quality of services offered also varies. The TSANZ and the Australasian Sleep Association (ASA) have established an accreditation process to foster quality care in the management of sleep disorders, however accreditation of services is currently voluntary. On the other hand, the underdeveloped state of current services offers an opportunity to develop services tailored to population needs.

Rapid advances in sleep disorders medicine have lead to the development of treatment services in many countries being driven primarily by perceived business opportunities. New Zealand has lagged behind in the provision of services, but the epidemiological evidence to date provides a unique opportunity to take an evidence-based approach to the development of services targeted to reach those most in need, as well as contributing to the health of all New Zealanders.

Untreated OSAS imposes significant economic and social costs, including costs of treating medical conditions that may be exacerbated by OSAS, diminished work productivity due to direct effects of OSAS or due to complications of associated co-morbidities, and the cost of accidents. Reference 24-26 A New Zealand based economic evaluation indicates that treatment of OSAS is relatively cost-effective in terms of the cost per Quality-of-Life-Year gained. Reference 27

The total annual societal costs of OSAS were conservatively estimated at $40 million, or $419 per case. The incremental net cost of treating OSAS was estimated at $389 per case treated. The net direct medical cost per QALY gained with successful treatment of OSAS was $94. Between 1998/99 and 2004/05, new funding decisions by PHARMAC, who routinely use cost-effectiveness analyses, have averaged $6,865 per QALY gained. In comparison, investment in the provision of OSAS treatment would be very cost-effective. Reference 27

Primary care plays an important role in the identification of OSAS. However, overseas research indicates that OSAS is grossly under recognised in this setting with primary care physicians relatively under informed about the clinical features and medical and social ramifications associated with OSAS. Reference 28 Should this also be the case in New Zealand, many New Zealanders with sleep disorders may be undiagnosed, misdiagnosed or inappropriately treated or referred. Tools have been developed which
may help primary care physicians in recognising sleep disorders, but few have been validated.

There is clearly also a need for effective public health approaches aimed at prevention and mitigation of OSAS and other sleep problems. These include measures to reduce OSAS risk factors such as obesity, smoking, and inequalities in wider determinants of health, as well as the need for measures that mitigate societal impacts on sleep such as shift work. This has implications not only for the health sector but also for other sectors and industry groups. In addition, widespread education of health professionals and the general public is important. An integrated approach, which prioritises Māori needs, is required for the prevention and management of sleep problems.

### Sleep health inequalities

Māori have on average the poorest health status of any ethnic group in New Zealand, with disparities existing across a range of health, mortality and morbidity indicators, including self-reported sleeping problems.

Māori are also disproportionately affected by a number of risk factors and negative health consequences associated with sleep problems. Disparities in sleep problems may also impact on other health inequalities between Māori and non-Māori such as motor vehicle accidents, workplace injuries, cardiovascular disease, and general health and quality of life.

Ethnic disparities in health more widely signal differential access to the goods, services and opportunities of society. They represent unequal access to political, economic, social, and environmental determinants of health and to timely, effective, appropriate, high quality health care. Such disparities can be conceptualised not only in terms of need but as historical and contemporary breaches of the rights of Māori—human, civil, political, and social and the rights of indigenous peoples (from 9).

It is acknowledged that the current health system is unable to meet the needs of the total population with regards to the diagnosis and treatment of OSAS. However, within the health sector, the goals are not just to improve the health of the overall population, but to reduce inequalities.

To reduce disparities in sleep health, additional work is needed to develop diagnostic and treatment services that are accessible and appropriate for Māori communities. That disproportionate numbers of Māori patients present at clinics with more severe OSAS (e.g. 7) raises concerns about accessibility of services and possibly differential referral.

In addition, a number of clinics are private services, which may result in financial barriers. In 2003, approximately half of specialist sleep services available in New Zealand were privately funded, requiring patients to pay a substantial amount. This is of particular concern given that Māori are over-represented in the most deprived deciles and in lower socioeconomic groups, 9. The mix of public and private services overall may contribute to increasing disparities in OSAS, if they are generally more accessible to non-Māori.

Previous research supports the need for increased sleep services overall in Aotearoa. However, if these services continue to be more accessible to non-Māori, disparities
could paradoxically increase. There is evidence of differential quality of care by ethnicity in other areas of health in New Zealand which also needs to be considered. 9 Service development must ensure that Māori needs are met in order to address both population needs and inequalities, and that such development is monitored adequately to assess this.

In addition to a lack of services is the need for further education on sleep and its impact on health.3 This should include information on ethnic inequalities in New Zealand and the greater risk among Māori.

It is important to consider the disparities in sleep health in the wider context of ethnic inequalities in health. Prevention, and diagnostic and treatment services designed to meet Māori needs and address inequalities could help reduce the health effects of sleeping problems and thereby other health disparities. In addition, addressing factors underlying disparities in other areas of health is likely to reduce disparities in sleep problems. These include addressing structural inequalities and wider determinants of health (e.g. socioeconomic disparities, discrimination) and individual level risk factors.9

A project is currently underway that will provide information on publically-funded service provision for the screening, diagnosis and treatment of OSA in New Zealand. It will include a stock-take of current services and present a framework for service provision that includes an integrated model of care that could improve Māori sleep health. Importantly, this information will be useful for monitoring equity of access and outcomes among Māori and non-Māori in Aotearoa/New Zealand.

**Conclusion**

Sleep occupies a third of life, and poor sleep has wide-ranging consequences for health, safety, and well-being. Recent research conducted by the authors suggests significant inequalities in sleep health between Māori and non-Māori including self-reported sleeping problems and obstructive sleep apnoea syndrome. To reduce these disparities, additional work is needed to develop diagnostic and treatment services that are accessible and appropriate for Māori communities. An integrated approach to the prevention and management of sleep problems in New Zealand is needed. The higher risk among Māori of the development of sleep problems and their negative consequences indicates Māori needs should be prioritised.

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References:


A left atrial myxoma presenting as angina
Andrew King, David Adlam, Rebecca Inglis, Christopher Hayes, Nicos Spyrou

Clinical
A 59-year-old female was referred to our Unit with a 6-month history of exertional chest tightness and dyspnoea. She had no cardiovascular risk factors apart from hypercholesterolaemia, and her 12-lead resting ECG was normal. She managed 4:23 on the Bruce Exercise Tolerance Test before this was stopped due to chest tightness and up-sloping ST changes.

A presumptive diagnosis of angina was made and a coronary angiogram performed. This excluded coronary artery disease as a cause for her symptoms. However, an area of atypical vascularisation of the left atrium was noted (Figure 1, circled).

Figure 1. Angiogram

A transthoracic echocardiogram demonstrated a large mass arising from near the mitral valve which prolapsed into the left ventricle during diastole (Figure 2, arrowed).
The diagnosis of a left atrial myxoma was hypothesised and she proceeded to surgery. A 4 × 5 cm tumour was excised without complications and histological examination confirmed a myxoma. She had an excellent postoperative recovery and at follow-up is symptom-free.

**Discussion**

Atrial myxomas are rare with an incidence at autopsy of 75 per 1,000,000. Approximately 80% are found in the left atrium. Most commonly, they present with a classical triad of embolic, obstructive and constitutational manifestations. However, occasionally they can present with angina.\(^1\) This is hypothesised to occur as a result of vascularisation of the myxoma exerting a coronary steal effect leading to myocardial ischaemia.

These symptoms typically resolve on surgical removal of the tumour, as they did in our patient.

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**Reference:**

Pathognomonic rash

Ramesh Pandey, Catherine Greengrass, Nikša Drinkovic

Clinical

A 38-year-old man presented to the emergency department with a 2-day history of a worsening rash affecting his elbows, right lateral pelvis region and left medial malleolus. The rash was itchy, swollen, hot and burning. He denied any new medications.

On examination, the rash was mostly confluent, irregular in shape and ranged in size from 3 cm in diameter to 15 cm in diameter. Some edges were raised and well circumscribed. The lesion on the ankle had a target-like appearance. There were no axillary, cervical or inguinal lymphadenopathy. There was no mucosal involvement.

Figure 1. Photograph of rash on right lateral pelvis and hip region

Figure 2. Photograph of left ankle showing a “target sign”-like rash

What is the diagnosis?
Answer

Idiopathic erythema multiforme minor. This is a self-limiting immune-mediated response with the pathognomic target-sign lesion. The patient was treated with prednisolone and an antihistamine for symptom relief.

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Does health evidence support or undermine our regulatory approach to air quality?

A trio of papers on air pollution in New Zealand (NZ) appeared in a recent issue of this *Journal*¹–³ and were commented on in the accompanying editorial by Simon Kingham.⁴ Subsequently the authors wrote responses to the editorial,⁵–⁷ focussing on supposed flaws in the approach of the WHO, EU, USEPA and NZ Government in converting epidemiological evidence into policy.

However, in our view, the original papers and the responses to Kingham are based on a selective and incomplete understanding of the epidemiological evidence and do not justify major changes to current policy.

In their paper *How toxic are fine particles emitted from home fires in Christchurch, New Zealand?* Palmer & Mann¹ assert that NZ-based research undermines this country’s regulatory approach to managing the health risk arising from poor air quality. This is because regulation ascribes equal weighting in toxic effect to particles arising from wood smoke as from any other source, despite the HAPINZ study⁸ identifying an apparent seasonal difference in effects of PM$_{10}$ on daily mortality. The evidence for this seasonal difference is limited to a single study in a single location and should be interpreted with caution.

Given the substantial physico-chemical differences between woodsmoke and other urban particles it is highly plausible that they are involved in different biological responses leading to different health endpoints. However, as Kingham⁴ illustrates, international research on this issue is not currently consistent, hence the ‘persistence’ of all the world’s leading authorities (WHO, EU, USEPA) continued precautionary assumption of equal toxicity until we have strong evidence to the contrary.

Palmer & Mann finish their paper by stating “Lowering concentrations of PM$_{10}$ by reducing the emissions from home fires may not ameliorate the adverse effects from to [sic] PM$_{10}$ pollution.” This sounds like a testable hypothesis, given that such reductions in wood fire emissions and PM$_{10}$ are currently happening in Christchurch and other NZ towns ([www.mfe.govt.nz/environmental-reporting/air/air-quality](http://www.mfe.govt.nz/environmental-reporting/air/air-quality)). We should monitor any resulting changes in health, by repeating previous analyses using the most recent available data.

Hoare² objects to what he considers the over-stating of the mortality effects attributed to PM$_{10}$ by both Kingham and the HAPINZ study. A recent cohort study⁹ suggests that in NZ, the long-term effects of air pollution on mortality are similar to those found in overseas studies.

Evidence of the effects of air pollutants on morbidity continues to emerge and research continues to show that the mortality risk posed by PM$_{10}$ is substantial, even in towns and cities with much lower concentrations than Christchurch. A systematic review of triggers for (non-fatal) myocardial infarction¹⁰ found PM$_{10}$ to be an important factor. The triggers with the greatest population attributable fraction were
exposure to traffic and a 30 μg m⁻³ change in PM10, whilst a change of 10 μg m⁻³ was “still within the range of the public health relevance of other known triggers.”

Moller⁷ argued that Kingham’s editorial “…implicitly supported the current orthodoxy in regard to air pollution and employed arguments which were found to be dubious in the papers of Hoare, Moller and Palmer.” These three papers did indeed discuss uncertainties and limitations in fashioning policy out of epidemiological evidence—the HAPINZ study was far from perfect but was not methodologically flawed. Neither Palmer, Moller nor Hoare offered any quantitative solutions likely to provide greater effectiveness or efficiency compared to the current regime.

We agree that the health risks posed by low indoor temperatures are substantial and important, particularly for disadvantaged communities.¹¹,¹² However, given political will, we believe that Christchurch can be redesigned using clean, affordable and efficient technologies that provide healthy environments for all—both indoors and out.

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Hand hygiene practices at a hospital entrance after the 2009 influenza pandemic: observational study over one year

One of the measures that public health authorities support for the control of pandemic influenza is the promotion of hand washing and respiratory hygiene. There is some evidence for such advice according to a systematic review, which described two studies of hand washing in child care and school settings. These studies reported benefits, but both were considered to be at “high risk” of bias in the systematic review.

Another review included eight studies (which were also considered to be of “poor quality”), though the pooled result did indicate benefit i.e. “hand cleansing can cut the risk of respiratory infection by 16% (95%CI: 11–21%)”. More recently an intensive hand hygiene campaign in schools was found to reduce laboratory-confirmed influenza (reduced by 50%, p<0.0001), along with other infectious diseases in the children.

We have previously reported on the use of a hand sanitiser by the public and hospital staff in a hospital entrance foyer in New Zealand, both during the 2009 influenza pandemic and then four months afterwards. Here we report on the ongoing usage data obtained over four post-2009-pandemic seasons.

Methods—The same method was used as in the previous studies. That is, two observers collected data on a standard form on use of the hand sanitiser station in the entrance foyer of the major regional public hospital in New Zealand’s capital city (Wellington). The additional data collection occurred in the first month of subsequent seasons on a weekday (Wednesday to Friday, see Table 1).

During this additional data collection period there were no apparent changes to the arrangement of the hand sanitiser station (a table with two dispensers and signage) or its promotion by the hospital authorities. Furthermore, there were no national hygiene promotional campaigns during winter 2010 in New Zealand, although there was some additional media publicity around H1N1 pandemic influenza. Inter-observer variation was not re-assessed as the first study had shown this to be minimal.

Ethical approval for this work was obtained through the ethics approval process of the University of Otago.

Results and Discussion—For the four post-pandemic observations, usage of the hand sanitiser remained significantly lower than during the pandemic in August 2009 (Table 1). This finding reinforces the view that the public’s hand hygiene behaviour is influenced by perceptions of risk during influenza pandemics (even for the 2009 pandemic with its relatively low case-fatality proportion). Nevertheless, other factors such as declining use with habituation may be relevant, particularly for hospital staff (since the hand sanitiser was first introduced during the height of the 2009 pandemic).

Out of the four post-pandemic seasons, usage was highest in winter 2010. It is possible that this reflects a typical pattern of increased public concern around hygiene each winter. However, it could also partly reflect concern around the second wave of
the H1N1 influenza pandemic. This resurgence resulted in some additional hospitalisations, deaths and media publicity in New Zealand.

It is unclear to us if the routine promotion (outside pandemic periods) of hand sanitiser usage to people entering a hospital is likely to be a cost-effective health sector intervention. Nevertheless, in principle it seems desirable from an infection control perspective and because it may raise public awareness about hygiene in general and of how infections can be spread (both to patients in the hospital from visitors/staff and vice versa). If so, then the current level of usage found in this study (10% for the four post-pandemic seasons) should ideally be raised further. Possibilities for achieving this include: (i) arranging the hand sanitiser station at the entrance/exit of the hospital so that people are funnelled directly past it and there are more prominent visual messages to use it; and (ii) routinely running national-level hygiene campaigns at the start of the winter influenza season (possibly combined with influenza vaccination promotion).

When considering data for the four post-2009-pandemic seasons (Table 2), it appears that usage was significantly higher when entering, as opposed to leaving, the hospital (as we found during the pandemic in August 2009). This is perhaps not surprising as the hand sanitiser positioning and promotional material is clearly targeted only to those entering the hospital. Usage was also significantly higher in the morning, compared to other times of the day (Table 2). These findings collectively would be consistent with greater use of hand sanitiser by staff on their way to work in the hospital in the mornings.

Sanitiser users were also more likely to be female (albeit of borderline significance), and usage was significantly higher among children (though numbers were small). The pattern for children may possibly reflect hygiene education in New Zealand schools since we observed that some of the children went to the sanitiser first and then the adults with them followed them to it.

This follow-up study provides additional evidence that it is feasible to systematically observe hand sanitiser use in a hospital setting. However, the observational nature of the study imposes various limitations as we were not able to accurately determine the age of individuals (or other demographic characteristics such as ethnic affiliation). Also we could not ascertain who were members of the public (probably the majority) or who were staff of the hospital or of the adjoining medical school. The sampling was also limited to a single day in each season and involved only one hospital setting, therefore limiting its generalisability.

A possible priority for future work is to better clarify the effectiveness and cost-effectiveness of hand sanitisers in hospital entrances in reducing infection risk and influencing public/health worker awareness of infection risk. Other work could also explore how different sanitiser positioning and promotional material could be used to enhance uptake in such settings.

Use of other technologies could also improve data collection e.g., automatic counters on sanitiser dispenser devices, counters on entrances/exits and even use of closed-circuit television (although for the latter safeguards would be essential to protect civil liberties). A more in-depth study could interview a sample of sanitiser users and non-
users to obtain demographic and occupational information and explore their knowledge and attitudes towards hand hygiene behaviour.

Table 1. Hand sanitiser usage in the entrance of a regional public hospital during the 2009 influenza pandemic and in the four seasons after the 2009 influenza pandemic in New Zealand

<table>
<thead>
<tr>
<th>Season / date</th>
<th>Used hand sanitiser (N)</th>
<th>Walked near hand sanitiser station (N)</th>
<th>% Usage (95%CI)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the 2009 pandemic – winter (August)</td>
<td>449</td>
<td>2492</td>
<td>18.0 (16.6–19.6)</td>
<td>Data published elsewhere²</td>
</tr>
<tr>
<td>Summer 2009 (9 December)</td>
<td>61</td>
<td>743</td>
<td>8.2 (6.4–10.4)</td>
<td>Data published elsewhere³</td>
</tr>
<tr>
<td>Autumn 2010 (5 March)</td>
<td>61</td>
<td>758</td>
<td>8.0 (6.3–10.2)</td>
<td></td>
</tr>
<tr>
<td>Winter 2010 (11 June)</td>
<td>92</td>
<td>632</td>
<td>14.6 (12.0–17.5)</td>
<td>Second wave of H1N1 in NZ (relatively little impact)</td>
</tr>
<tr>
<td>Spring 2010 (16 September)</td>
<td>79</td>
<td>749</td>
<td>10.5 (8.5–12.9)</td>
<td></td>
</tr>
<tr>
<td>All 4 post-pandemic observations</td>
<td>293</td>
<td>2882</td>
<td>10.2 (9.1–11.3)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Characteristics of hand sanitiser usage and users in the entrance of a regional public hospital during the four seasons after the 2009 influenza pandemic in New Zealand (see Table 1 for data collection dates)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Used hand sanitiser (N)</th>
<th>Walked near hand sanitiser station (N)</th>
<th>Usage (%)</th>
<th>Risk ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>All observations</td>
<td>293</td>
<td>2882</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td><strong>Direction of movement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entering the hospital</td>
<td>160</td>
<td>1405</td>
<td>11.4</td>
<td>1.4 (1.1–1.7)</td>
</tr>
<tr>
<td>Leaving the hospital</td>
<td>117</td>
<td>1426</td>
<td>8.2</td>
<td>Reference (1.0)</td>
</tr>
<tr>
<td>Unclear “milling around”</td>
<td>16</td>
<td>51</td>
<td>31.4</td>
<td>3.8 (2.5–6.0)</td>
</tr>
<tr>
<td><strong>Time of day</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morning (8.30–9.00 am)</td>
<td>97</td>
<td>757</td>
<td>12.8</td>
<td>1.4 (1.1–1.8)</td>
</tr>
<tr>
<td>Midday (12.30–1.00pm)</td>
<td>105</td>
<td>1132</td>
<td>9.3</td>
<td>1.0 (0.8–1.3)</td>
</tr>
<tr>
<td>Afternoon (3.50–4.20pm)</td>
<td>91</td>
<td>993</td>
<td>9.2</td>
<td>Reference (1.0)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>187</td>
<td>1688</td>
<td>11.1</td>
<td>1.2 (1.0–1.6)</td>
</tr>
<tr>
<td>Male</td>
<td>106</td>
<td>1194</td>
<td>8.9</td>
<td>Reference (1.0)</td>
</tr>
<tr>
<td><strong>Age-group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child</td>
<td>11</td>
<td>58</td>
<td>19.0</td>
<td>1.9 (1.1–3.3)</td>
</tr>
<tr>
<td>Teenager</td>
<td>2</td>
<td>29</td>
<td>6.9</td>
<td>0.7 (0.2–2.6)</td>
</tr>
<tr>
<td>Adult</td>
<td>280</td>
<td>2795</td>
<td>10.0</td>
<td>Reference (1.0)</td>
</tr>
</tbody>
</table>

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References:

Against anterior cruciate ligament reconstructions—and response by orthopaedic surgeon

The Accident Compensation Corporation (ACC) promotes the surgical treatment of anterior cruciate ligament (ACL) ruptures (ACC1331 Diagnosis and management of soft tissue knee injuries best practice guideline). This is despite evidence showing that more than 80% of such injuries will heal without treatment (J Comput Assist Tomogr 1996 Mar-Apr;20[2]:317), and despite the Cochrane Library finding no randomised trials to support modern methods of Anterior Cruciate Ligament reconstruction (Cochrane Library 2005 Issue 2:CD001356).

Last year ACC spent more that $10 million on ACL reconstructions which at best was a waste of money but more worryingly may well have predisposed a generation of young knees to future pathology. It is time for the Ministry of Health to proscribe this procedure. It is of no benefit to the patient, so why is it being done?

Primum non nocere (first, do no harm).

Nicholas Cooper
General Practitioner
Epsom, Auckland

Response by orthopaedic surgeon

Anterior cruciate ligament ruptures are a common injury, especially in our young sporting population, and if left untreated they often lead to chronic instability. Full thickness midsubstance tears rarely heal.\textsuperscript{1,2} Instability is the commonest indication for ACL reconstruction, improving knee function in greater than 90% with the majority of patients\textsuperscript{3,4} returning to aggressive sporting and working activities, especially those activities that involve twisting or rapid change of direction.

ACL rupture is rarely an isolated event and is often associated with significant damage to the articular surface and underlying bone as shown in early MRIs of the acutely injured knee. To suggest that ACL reconstruction in isolation is responsible for the development of long-term osteoarthritis is not substantiated in the literature\textsuperscript{4} and ignores the severity of the injury.

The Knee Society of the New Zealand Orthopaedic Association has worked closely with ACC to develop guidelines for treating patients with ACL ruptures, which fit with ‘best practise’. This collaborative effort has improved the access and quality of care for those patients with incapacitating instability secondary to ACL rupture.

To suggest that the Ministry of Health should proscribe this procedure is both inappropriate and misinformed.

Gary Hooper
Orthopaedic Surgeon
Christchurch
References:


Why so many stillbirths?

Recent adverse publicity in the New Zealand Herald\(^1\) reporting "NZ has one of the highest rates of stillbirth among developed countries" will be of little comfort to prospective parents or their caregivers. Unfortunately Professor McCowan's comments "that NZ's rate is very comparable to (that of) other countries with a similar model of care" failed to make headlines.

Every stillbirth is a tragedy. The latest Perinatal Mortality Report (2008 – 4th report of PMMRC October 2010), notes that 70% of stillbirths were antepartum, 27% were "unexplained", fewer than half had postmortems and a third were not investigated. The Report sets out factors such as smoking and obesity but fails to address details of the antenatal care or to generically identify those responsible for it.

Since 1990 the obstetric paradigm has changed from general practitioner to independent midwife care of pregnant women. This was a social and medical "experiment" and should have been closely monitored in order to establish whether the changes created worthwhile advantages for mothers and the community. Available data indicate that coincident with the change there have been significant increases in cost, caesarean sections, perinatal referrals and decades of static perinatal mortality.

Postnatal care has fallen to its lowest ebb ever. What are the measurable advantages of the new model? Younger obstetricians say they see themselves as "ambulances at the bottom of the cliff," with many preventable emergencies. Improved data collection should answer these questions.

The Aim of the NZ Obstetric Society in 1927 was "To correlate the efforts of individual workers and to provide scientific study of obstetrics." In stating that Aim, Doris Gordon and colleagues were emphasising the team approach to obstetrics and objective measurement of results.

Few general practitioners are likely to practise obstetrics in the future and the bulk of work will be done by midwives. Lingering doubts that our stillbirth rate and other adverse quality parameters may reflect the new obstetric model need to be put to rest.

Identifying shortcomings in obstetric care and closer obstetrician-midwife relationships should reduce the stillbirth/perinatal rates and improve services for pregnant women.

Professor Ronald W Jones
Clinical Professor of Obstetrics and Gynaecology
National Women’s Hospital, Auckland

Reference:
Response to letter from Prof Shaun Holt calling for doctors not to practice homeopathy

If New Zealand doctors would like a genuine and factual account of the current scientific studies on homeopathy they can find it at the research section of the British Faculty of Homeopathy website.¹

This organisation is the registering body for medical doctors practising homeopathy in the UK and the website contains full references to published meta-analyses and randomized controlled trials where homeopathy has been shown to be more effective than placebo. Seven conditions are listed where positive results have been replicated. These are childhood diarrhoea, fibromyalgia, influenza, osteoarthritis, seasonal allergic rhinitis, sinusitis and vertigo. There are also references to reproduced experiments on the in vitro biological effects from high potency/ultra molecular dilutions.

These facts run contrary to the misleading comments of Prof Shaun Holt who has embarked on a thinly veiled campaign against homeopaths and homeopathy. Last year he accused homeopaths of attempting to take money from earthquake victims in Christchurch, calling them “appalling and shameless”.²

In reality, homeopaths had shown admirable public-spiritedness by setting up a free clinic to treat victims for trauma and shock. The homeopathic medicines prescribed were also free-of-charge having been donated by homeopathic pharmacies and the homeopaths themselves.

In his letter (NZMJ 15 April 2011), Prof Holt unwisely tries to bolster his argument with reference to the “unclaimed” prize of US $1 million for anyone who can prove homeopathy. This prize was put up by skeptic magician James Randi. Holt insinuates that because the prize has never been paid out this somehow invalidates homeopathy. This is an example of the fallacious thinking that skeptics themselves rail against. Professor George Vithoulkas a homeopath from Greece set up an experiment at an Athens hospital to compete for the prize only for Randi to back out and renege on the agreement when the application was underway.³

Prof Holt’s sole attempt to refute homeopathy with a scientific study is to cite a systematic review of homeopathy authored by his co-signatory Prof Edzard Ernst. Ernst along with Prof Michael Baum are shrill campaigners against homeopathy in the UK and are “happy to admit that our minds have closed down on homeopathy”.⁴ Maybe this bias could be seen as a competing interest.

These are actually very exciting times for homeopathy. In 2008, 2.3 million Cubans were given doses of a homeopathic preparation of Leptospira bacteria in an effort to protect them from the infection. The trial was a resounding success in what was the largest research study of homeopathy ever undertaken.⁵

A doctor at the Royal London Hospital for Integrated Medicine has shown how children on the autistic spectrum can have marked improvement after homeopathic
One of the best introductions to homeopathy has been written by an ex-NASA computer scientist whose autistic son became neurotypical after homeopathic treatment.

For some, homeopathy may seem implausible but it works in situations where the placebo effect is an improbable explanation. There is enough positive *in vivo* and *in vitro* research to merit further investigation of it’s potential to relieve human (and animal) suffering, not to mention the positive testimonies of millions of people worldwide. For this reason it deserves much more than the denialism of a closed mind.

Clive Stuart
Registered Homeopath, Tauranga

References/websites:

Melanoma Summit highlights best practice and priorities for action

Nearly 200 GPs, surgeons, dermatologists, nurses, pathologists, health promoters, oncologists and researchers, along with people affected by melanoma, gathered in Wellington in March for the second national Melanoma Summit. Hosted by MelNet, the Melanoma Network of New Zealand, the Summit featured leading Australian speakers, presentations about New Zealand innovations and workshops on prevention, clinical management and research.

The Summit gave professionals working in melanoma the opportunity to hear about current best practice, strengthen collaboration between disciplines, and identify priorities for reducing the incidence and impact of melanoma in New Zealand.

Melanoma rates increasing

Opening the Summit on behalf of the Minister of Health, Dr Jackie Blue MP observed that melanoma doesn’t always get the attention it warrants despite being the fourth most commonly registered cancer in New Zealand.\(^1\) In 2007 (the most recently published data), 2,173 people were diagnosed with melanoma in New Zealand (accounting for 11.1 percent of all cancer registrations).\(^1\)

Although incidence and death rates in Australia and New Zealand often are considered equivalent, data reported by Dr Mary Jane Sneyd of the University of Otago show otherwise. In contrast with Australia, where melanoma incidence has plateaued in some ages, New Zealand’s incidence rates have not. Furthermore, our melanoma death rate in women for 2003-2007 was 40% higher than in Australia (Sneyd MJ 2011, oral communication 11 March), and we’ve seen an increase in the incidence of thicker melanomas – those associated with a poorer prognosis.\(^2\) Māori and Pacific peoples develop more thick melanomas than expected, likely to be due in part to more aggressive lesions.\(^2\)

Key issues in prevention

While sun exposure in childhood is recognised as conferring a higher relative risk of melanoma than sun exposure in later life,\(^3\) evidence presented by Professor Bruce Armstrong of the University of Sydney suggests that sun exposure increases the risk of melanoma, regardless of age. In his view Australian differences in patterns of sun exposure between women and men after the age of 50 are responsible for rates among older men being three times those of women.\(^4\) Risks associated with sunbed use also were highlighted, with an Australian study showing that sunbed use before the age of 30 increased the risk of melanoma by 75%.\(^5\)
Role of primary care

Nearly a third of Summit delegates were general practitioners and practice nurses, reflecting the role of primary care in melanoma prevention and diagnosis. In the workshop on prevention, Dr Tony Reeder from the University of Otago reported preliminary findings of their study showing GPs require clarity around balancing sun protection advice with adequate levels of vitamin D.

Although GPs complete the majority of skin examinations, only a small number of GPs are thought to be trained in and routinely use dermoscopy in clinical practice. According to Professor Peter Soyer of the University of Queensland, dermoscopy is more accurate than clinical examination based upon four recent meta-analyses.

Optimism for targeted therapies

Until recently, advances in molecular biology leading to targeted therapies for many types of cancer have eluded melanoma. For this reason, there was intense interest in the address by Professor Richard Kefford of the Westmead Institute for Cancer Research at Sydney University. According to Professor Kefford, approximately 50% of all patients with metastatic melanoma have BRAF V600E gene mutations that are associated with cell growth and proliferation. Results of recent clinical trials involving BRAF inhibitors, including RG7204 (PLX4032) and GSK2118436, offer the potential to shrink metastatic tumour growth, thereby extending life expectancy and quality of life.

Communication vital for patients

Communication and access to information are among the most important needs for melanoma patients, according to Lisa McFadyen of Melanoma Patients Australia and participants of the Melanoma Foundation workshop. Waitemata DHB has developed a melanoma communication pack comprising a customisable toolkit and patient journal to help address these needs. The Australia New Zealand Melanoma Guidelines implementation plan recommends that the pack be piloted and rolled out for use around New Zealand.

Priorities for action

Summit participants identified the following priorities for action to reduce the burden of melanoma in New Zealand:

- Fully implement the 2010 Melanoma Guidelines Implementation Plan
- Ban access to sunbeds/solaria for those under the age of 18 years and unsupervised sunbed operations
- Increase investment in epidemiological research in New Zealand to identify why our mortality rates are high and our incidence rates increasing, clarify the relative contribution of risk factors in New Zealand, and explain diverging trends compared to Australia
- Address gaps in the delivery of patient services in terms of communication and information through development of the melanoma communication toolkit
• Improve melanoma data collection
• Develop a national coordinated research strategy to ensure a more cohesive approach
• Seek ways to improve communication between researchers, clinicians and the public.

**MelNet Establishment Committee:**

• Mr Gary Duncan, Plastic Surgeon (Co-chair)
• Associate Professor Graham Stevens, Radiation Oncologist (Co-chair)
• Dr Chris Boberg, General Practitioner
• Mr Richard Harman, Surgeon
• Professor Mike Eccles, Researcher
• Betsy Marshall, MelNet Coordinator
• Iain Potter, Health Sponsorship Council CEO
• Professor Marius Rademaker, Dermatologist

Email: melnet@melanoma.org.nz

**References:**

Contribution of hepatitis B vaccination programmes initiated by Alexander Milne and Dr Christopher Moyes to the decline in prevalence of hepatitis B infection in pregnant women in the Midlands region of the North Is, New Zealand

In his recent article, Michael Addidle demonstrates a decline in the prevalence of hepatitis B infection from the late 1990s in the antenatal population of the Midlands region, particularly among women less than 20 years of age. Prior to the introduction of hepatitis B vaccination, this region had pockets of high prevalence with a marked ethnic differential in infection rates.

In the early 1980s serosurveys conducted by Alexander (Sandy) Milne and Dr Christopher Moyes in the eastern Bay of Plenty found the disease was endemic among children aged 0–15 years, and the prevalence of chronic hepatitis B infection among Maori was five times higher than among Europeans (12.0% vs 2.6% respectively). In Kawerau, where Milne recruited almost all the townspeople in a population-based study in 1984, 42% of the population showed evidence of past infection (54% of non-Europeans and 33% of Europeans). Infection rates among children were even more striking.

Addidle suggests that the downward trend in the prevalence of hepatitis B infection among antenatal women, noticeable from 1997 onwards, is most likely the result of the Health Department infant and preschool immunisation programme introduced in early 1988. However, Milne and Moyes’ contributions to reducing the rates of infection in this region should not be overlooked. In the early 1980s the Health Department was reluctant to consider the introduction of childhood hepatitis B immunisation, citing the high cost of the vaccine and uncertainty over prevalence rates among New Zealand children.

In late 1984, Milne pioneered the use of low-dose plasma-derived hepatitis B vaccine (2mcg rather than 10mcg) to reduce the cost of a community-funded childhood immunisation campaign in Kawerau. With the enthusiastic support of residents, he immunised more than 95% of the susceptible preschool, primary and intermediate children. Community-funded programmes for children in the Bay of Plenty followed in late 1985. In all, more than 8000 children completed courses of low-dose hepatitis B vaccine, which was subsequently used in the Health Department immunisation programme from 1988–89. During the late 1980s, Milne and Moyes continued to promote community-funded immunisation for school-aged children in central and northern North Island districts.

From February 1988 the Health Department programme provided universal infant hepatitis B immunisation and a ‘one off’ immunisation programme for preschoolers throughout the country. Uptake among preschoolers was lower than anticipated, however; less than 60% of preschool children were fully immunised (60% of non-Maori and 35% of Maori). The 1992 regional immunisation coverage survey, which
included infant hepatitis B immunisation, indicated that the Central-North RHA had lower levels of coverage at 2 years of age than other RHAs. Nationally, lower overall immunisation coverage was found among Maori (45%) and Pacific children (53%).

While coverage rates improved during the 1990s, uncertainties over the accuracy of coverage data remained until the introduction of the national immunisation register in 2005. Addidle provides data which suggests that the ongoing immunisation programme is having a positive impact in the Midlands region. To complete the picture, however, some recognition should be given to the earlier part played by Milne and Moyes in reducing hepatitis B virus infection rates.

Deborah Jowitt
Clinical Nurse Specialist
Infection Prevention and Control, Whangarei Hospital
Whangarei, Northland

References:
5. Moyes CD. A National Programme to Control Hepatitis B in an Endemic Area. Cambridge University; MD thesis;1990:115.
6. ibid;129.
Three Deaths from Exophthalmic Goitre (Graves' Disease)

Excerpt from article “On Goitre” by Dr Colquhoun published in NZMJ 1910 Feb;8(33):17–71.

Case I.—Female, schoolmaster’s daughter; died aged 16. Had exhibited symptoms for two years; protrusion of eyes, nervous, restless, thin, etc. The final stage, which lasted three months, was ushered in by an epileptiform seizure, after which she was confined to bed practically all the time; fatal result by gradual exhaustion.

Case II.—Male, died aged 16; farmer’s son. Ill only five or six months. First symptoms noticed were that he was weak and easily fatigued, with prominent eyes, thick neck, etc. He just gradually grew weaker, thinner and more wasted, with some sickness, although he was always ready for his meals. He was never entirely confined to bed, and just gradually died of exhaustion. Family history: This boy’s father and the mother of another case of the series were cousins.

Case III.—Surfaceman’s daughter, female; died aged 17 years. Ill altogether two years, but would never allow there was anything the matter with her. Almost from the commencement of her illness she developed an insatiable craving for cold water, of which she drank unlimited quantities. She became very nervous, the palpitation was very pronounced, and the exophthalmos was enormous; so much so that she couldn’t close her eyes at all, which became very inflamed, and hypopion developed, which I had to open. She practically couldn’t be kept in bed at all; then she developed pneumonia and dysentery, and died in 10 days. Family history: Mother very nervous, and one brother now insane.
Proceedings of the Waikato Clinical School Biannual Research Seminar, 10 March 2011

The evolution of a Waikato community heart failure service – the first year

AJ Bell¹, V Gibbons², G Devlin¹, R Fisher¹, K Buswell³, M Davis¹ R Lawrenson²

¹Waikato District Health Board
²Waikato Clinical School, University of Auckland
³Te Kuiti General Practice

Late 2009, a community based Integrated Heart Failure Service was commenced in Waikato in two rural pilot sites. The aim of the service was to improve, jointly with primary and secondary care, the diagnosis and management of HF in the community.

Data was collected on patients with a coded primary care diagnosis of heart failure. Each patient was assigned to a pathway considered appropriate to the severity of HF. The service was evaluated with the aim to optimise evidence based management of HF.

During 2010, 407 patients with a diagnosis of heart failure had baseline data collected (50% male, 54% NZ European and 31% Māori). The median age at HF diagnosis was 66.5 years; Non Māori 70 years and Māori 61 years. Only one in three at baseline had a BNP test and/or echo within a year of their diagnosis. Of the 270 who have been assessed by the service; 132 (50%) had a clinic review, 14% had HF but no input was required, and 20% did not have a HF diagnosis. Of the 132 reviewed in their local rural clinic (99% attendance rate); 98% had an echo performed within a week prior to their review (65% of whom had not had a previous echo), and two thirds had their medication optimised.

This service has improved diagnosis and management of heart failure in the community. It has increased access to Echo for primary care and has aided improved access for patients to heart failure services.

Is an unpredictable food supply bad for your health?

AL Jaquiery¹²; T Postelnik³; V Alderson-Wallace³; F Bloomfield²³; C Wall³.

Waikato Clinical School¹, Liggins Institute² and Faculty of Medical and Health Sciences³, University of Auckland

Obesity and type 2 diabetes are increasing health problems in lower socioeconomic groups. Shift workers also have a higher rate of metabolic disease compared with the non-shiftworking population. Eating patterns that vary unpredictably from day to day may affect metabolism in ways that contribute to the development of adverse health outcomes. This may be a particular problem for young children, who are dependent on others to provide their meals, and in whom appetite regulating pathways may still
be developing. We report two studies: the first investigating the metabolic effects of an unpredictable food supply in juvenile lambs; and the second, a pilot study looking at eating patterns in health care workers on rotating shifts.

**Methods:** 1. Prepubertal female lambs were randomly assigned to receive, for 6 weeks, maintenance feed given twice daily in equal portions (C; n=24), or the same weekly amount in aliquots of variable size at unpredictable times (U; n=20). Pre and post intervention, glucose and insulin tolerance were assessed by intravenous glucose tolerance test (IVGTT) and insulin tolerance test (ITT), and areas under the curve (AUC) calculated. Groups were compared using t test and repeated measures ANOVA. Values are mean±SEM. 2. Volunteer nurses and junior doctors on shift work at Rotorua Hospital were recruited and filled out a 2 week food diary, questionnaire on shift work and had basic body measurements taken. Data were analysed for: variation in meal and snack frequency between different shift types and days off, variation in energy and nutrient intakes between different shift types and days off, and relationships between snack/meal frequency, energy intake and BMI.

**Results:** 1. Mean weight gain was approximately 17% in both groups (C 5.6±0.6kg; U 5.1±0.4kg). Post intervention, IVGTT glucose AUC was increased in the U group by 20%, with failure to return to baseline concentrations in the second hour (glucose AUC C 832±32, U 987±18 mmol.min.l⁻¹, p<0.001); insulin response was significantly decreased (RM ANOVA change over time x group p=0.001). This was not associated with start or current weight or total weight gain. Insulin tolerance was not different between groups. 2. Nurse participants had mean BMI of 30.2 kg/m², with 75% overweight or obese. Meal frequency across shifts was variable in approximately half the participants. Sugar intake as % total energy was twice RDI on all shifts in both nurses and female junior doctors, while male junior doctors had increased sodium intake (150% RDI). Junior doctors had variability of both snack and meal frequency variability across shifts.

**Conclusion:** An unpredictable food supply in young animals impaired glucose tolerance during a period of rapid growth even when food quality was high and weight gain not excessive. This may have significant public health implications particularly for societies in which food insecurity is prevalent. Erratic eating patterns are also observed in shift workers, and are likely to contribute to their increased risk of metabolic syndrome. Health workforce planning should include further study into this potentially remediable health issue.

**Growing up in New Zealand: Before we are born**

**Atatoa Carr P, Morton SMB, Grant C, Robinson E, on behalf of the Growing Up in New Zealand research team.**

Growing Up in New Zealand is a longitudinal study that aims to determine developmental trajectories, across multiple levels of influence and over time, for the current generation of New Zealand children.

All pregnant women due to give birth between April 25th 2009 and March 25th 2010, from the Auckland, Counties Manukau and Waikato DHB regions were eligible to participate in Growing Up in New Zealand and this paper describes cross-sectional
data gained from the first data collection wave: face-to-face interviews with approximately 7000 recruited cohort families. Outcomes relating to pregnancy behaviour, access to services, and intentions for the child after birth (such as for breast feeding, childcare and immunisation) highlight the importance of the antenatal period for population health and equity, and the ability for this study to provide population relevant evidence.

Growing Up in New Zealand is unique: collecting data from both parents, starting antenatally, and including significant numbers of Māori, Pacific and Asian children as well as European and other New Zealanders. Furthermore, a conceptual framework that is grounded in lifecourse epidemiology provides this study with a comprehensive picture of child development to contribute to policy (and community) development now and into the future.

**Effects on quality of life of prostate cancer brachytherapy: a look at patient outcomes**

D de Jong, HM Conaglen, LK Tyrie, C Hartopeanu, JV Conaglen

Sexual Health Research Unit, Waikato Clinical School, Hamilton.

Prostate cancer is now the most common cancer found in men. Although many types of prostate cancer are slow growing, a significant percentage is fast growing and aggressive, necessitating treatment. This study investigated the impact of prostate cancer treatment, specifically radiotherapy in the form of brachytherapy with adjunct beam therapy, as well as the impact of androgen deprivation therapy (ADT), on quality of life.

The study analysed data from 161 men, aged between 48 and 84 years, with various grades of prostate cancer, who underwent brachytherapy. Participants’ quality of life was measured over a period of approximately 2 years using the EORTC-QLQ30, The EORTC-QLQPR25, and the IPSS. We also examined the impact of ADT on these quality of life and symptom measures.

Several aspects of quality of life are affected. Physical function, role function and social functioning decreased significantly over time. A sub-set analysis showed there are differences in short and long term effects with respect to aspects of quality of life. We also found that ADT contributes to worsened short term function but not longer term impact on some aspects of quality of life. In addition ADT affected IPSS scores during treatment, but these effects varied with age group.

This analysis of the two year effects of this treatment raises questions relating to the longer term impact of the therapy. Since the literature is inconclusive on some aspects of longer term impacts, the data collection for this treatment group is ongoing.
Services Under Challenge: an exploratory study of critical success factors in meeting high and complex needs of people in mental health care

J Kidd & D Lampshire, Waikato Clinical School, University of Auckland, New Zealand.

This project emerged from concerns about service users with ‘high and complex’ unmet needs often presenting repeatedly to mental health, ED and medical services, or being brought in by police. This group are frequently very hard to engage with care teams and treatment. Given the paucity of research and plethora of expert opinions and government inquiries that address this area, we chose a broadly focused methodology to discover what happened in services that deliberately changed their delivery for the benefit of this group of service users.

Data collection involved 39 semi-structured interviews (16 with service managers and keyworkers, and 23 with service users). Participating services included three DHB providers and five non-government organisations across the middle and upper North Island. Data were inductively analysed using themes.

The key findings from this research are a) the successful services were not clinically focused, instead interpersonal and inter-agency relationships are prioritised, with the goal of improving the social determinants of distress/mental illness; b) indicators of success included the quality of the service user-carer relationship, achieving personal goals, evidence of engagement with treatment, and reduced reliance on inpatient or acute services; c) what may be clinically perceived as a complex conglomerate of problems is likely the combination of two quite different concepts – mental distress symptomology and loss of well-being.

This exploratory study suggests that a focus on the social determinants for mental health may be important in order to achieve engagement with treatment and positive mental health outcomes for this complex, high need population.

A study of the complications of Testosterone Undecanoate (Reandron™) Replacement Therapy for male hypogonadism in a cohort of 214 men

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Three monthly IM injections with 1000mg testosterone undecanoate (TUD) is the current gold standard for treatment of male hypogonadism. The early literature recommended no alteration of dose with 10-14 weekly intervals and no significant increase in erythrocytosis, prostatic disease or dyslipidaemia with testosterone undecanoate, which have been reported adverse effects associated with previous injectable testosterone esters. This has not been the local experience of our Endocrine Unit at Waikato Hospital or in recent studies.
We performed a retrospective analysis of all 214 adult patients with male hypogonadism treated with testosterone undecanoate for >12 months since 2008 at Waikato Hospital.

Following one year of TUD treatment >70% had trough testosterone levels in the normal range (9-30nmol/L). Dose alteration was required in 23% (n=49) from the standard 1000mg and 33.3% (n=72) required dosing intervals outside the recommended 10-14 weeks. Erythrocytosis (Hb > 175g/L and/or Hct > 0.52) developed in 20% (n=43) requiring alteration of treatment. Additionally 24.6% (n=28) had a significantly elevated PSA (>4µg/L or increase >1.4µg/L) with 6.1% (n=13) requiring urology input. There was no significant reduction in mean HDL (p=0.334), or significant alteration in mean LDL (p=0.375) or mean TG (p=0.948). Significant other adverse effects were reported in 3.3% (n=7).

Testosterone undecanoate replacement in male hypogonadism was associated with a significant rate of erythrocytosis and prostatic disease in our cohort, and required significant dosing and interval changes contrary to the early literature and consistent with recent data.

Biochemical Markers of Cardiac Dysfunction Predict Mortality in Acute Exacerbations of COPD

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Retrospective studies suggest that plasma levels of NT-proBNP and cardiac troponin T are often elevated in patients with acute exacerbations of COPD and are associated with increased mortality. We investigated these cardiac biomarkers in an unselected cohort of patients admitted to hospital with exacerbations of COPD.

Consecutive patients with physician diagnosed COPD exacerbation but without clinical evidence of acute cardiac disease admitted to a public hospital over a one year period were studied prospectively. NT-proBNP and troponin T were measured on admission. The primary end-point was all-cause mortality at 30 days.

Elevated NT-proBNP (>220pmol/L) was present in 65/244 patients (27.5%) and significantly predicted 30 day mortality (OR=9.0, p<0.001). Elevated troponin T (>0.03µg/L) was found in 40/241 patients (16.6%) and also predicted 30 day mortality (OR=6.3, p<0.001). These associations persisted after adjusting for other clinical and laboratory predictors of mortality (PaCO2, BMI, CURB65 score). NT-proBNP and troponin T levels appeared to have additive associations with mortality: 30 day mortality among patients with abnormalities of both NT-proBNP and troponin T was 15 fold higher than among patients with normal values.

Elevated levels of NT-proBNP and troponin T are strong predictors of early mortality among patients admitted to hospital with acute exacerbations of COPD independently of other known prognostic indicators. The pathophysiological basis for this is
unknown, but indicates that cardiac involvement in exacerbations of COPD may be an important determinant of prognosis.

**Yield of transthoracic echocardiogram (TTE) in identifying cardiac source of embolism (CSOE) in patients with ischaemic cerebrovascular accident (ICVA)**

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Although the yield of TTE in identifying major CSOE is low at 3%, AHA/ASA guidelines recommend TTE is reasonable when no cause for ICVA has been identified. We aimed to provide local data to test if our population might have a different risk profile.

2131 patients presented to Waikato Hospital with a CVA from 1/11/2005 to 25/11/2010, of whom 610 with an ICVA were referred for a TTE. TTE reports were reviewed for presence of major and minor CSOE.

Mean age was 68±14(SD) years and 358(58%) were male. 598(98%) suffered an ischaemic stroke and 2% a transient ischaemic attack. TTE was performed 4±5 days after the ICVA. Major CSOE were identified in 41(6.7%) patients and minor CSOE in 158(26%). Of major CSOE, 26 (4.3%) patients had left ventricular (LV) ejection fraction <35%, 12 (2.0%) had mitral stenosis (MS), 2 (0.33%) LV thrombus and 1 dilated cardiomyopathy (0.16%). No atrial thrombus was detected. Of minor CSOE, 60(10%) had mitral annular calcification, 60 (10%) had calcific aortic stenosis, 10(1.6%) had mitral valve prolapse, 7(1.1%) suspected patent foramen ovale, 7(1.1%) LV aneurysm, 5(0.8%) atrial septal aneurysm, 2 atrial septal defect, 2 slow echo contrast, 3 aortic aneurysm, 2 aortic plaque.

In this population TTE detected major CSOE more frequently than in the international literature (6.7 vs. 3%). The frequency of MS appeared high (2.0 vs. 0.0 to 0.2%). Selection bias may partly explain the higher overall frequency of CSOE but not the disproportionately higher frequency of MS.

Conflict of interest: NIL

**Correlation between expression of Mu opioid receptor transcripts in blood and postoperative pain**

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Following surgery there is great variability in the amount of pain experienced by patients\(^1\). Mu opioid receptors are the primary site of action of opioid analgesic drugs. The Mu opioid receptor is encoded for by the gene OPRM1 that encodes a number of
pharmacologically different Mu opioid receptor subtypes that are produced by a mechanism known as alternative splicing. Mu opioid receptor expression is not limited to the nervous system. For example the transcript variant MOR-1O has been shown to be expressed in human peripheral blood lymphocytes\(^2\). The peripheral marker hypothesis proposes that neurotransmitter expression in peripheral immune cells may reflect the level of expression in the brain. To test this hypothesis we used quantitative real time PCR to measure the level of expression of the Mu opioid receptor transcript variant MOR-1O in whole blood in 50 adult patients undergoing moderately painful surgery. We correlated the level of MOR-1O expression with the severity of postoperative pain and analgesic use – measured in the post-anaesthesia care unit immediately after the surgery, and also the next day.

Expression of the Mu opioid receptor transcript MOR-1O was successfully quantified relative to the reference gene PPIB for 50 patient samples. Low MOR-1O expression was found to be associated with a higher mean pain level upon awakening, \((p = 0.046)\) and trended towards higher total PACU and PCA morphine administration.

**Fig. 1.** Error bar charts showing A) VRS score upon awakening, B) Total morphine administered in PACU and C) Total self administered morphine (PCA), at low (1) and high (2) MOR-1O expression.

This research has identified a putative association between low MOR-1O expression in peripheral blood and higher pain levels following surgery.

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Online access to personal health information: a pilot study in severe mental illness

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Mental health consumers often want to access their medical records, yet doing so is often challenging and frustrating. E-health has the perceived advantages of cost efficiency, improved access, and better service provision, but this is yet to be convincingly demonstrated in severe mental illness. We aimed to test how a new software (Smartmed Medifile) affects access to medical records, and perceived benefits of such access.

We recruited participants with severe and enduring mental illness through a specialist mental health pharmacy, and via a consumer-led mental health provider. Clinicians were required to confirm patients’ suitability and safety to participate. Participants completed demographic and other questionnaires and, at a subsequent visit, were interviewed and trained to use the software, with which they could view HoNOS scores, medication details, treatment plans and lab results. Kaupapa Māori research methods were used to ensure effective collection of data from Māori participants; these included a focus on individual and collective Māori identity in relation to accessing and sharing information. We also interviewed key workers and associated clinical staff regarding their experiences of and attitudes toward facilitated consumer access to medical records.

Recruitment proved difficult. After 8 months of vigorous advertisement to over 600 eligible patients, 19 consented to participate, and of these only 4 completed the protocol of 6 months access. A majority of those withdrawing did so due to worsening mental health. Software problems also caused delays and contributed to some withdrawals. Participant access to Medifile pages was generally limited, though prescription drug pages received most hits and one participant visited his medication page 24 times in one month. Qualitative data indicated that participants were interested in two key pieces of information not available in the Medifile: access to progress notes, and details about acute illness episodes involving the Mental Health Act and involuntary hospitalisation. Participants also expressed interest in a more interactive programme, including the option of direct communication with their health care team. CMHT key workers were ambivalent about the project; some declined to provide information about the study to patients, and expressed concerns about risks to patients of improved access.
Access to health information is an acknowledged priority by health planners, practitioners, and patients. Despite stated interest in access to health information, recruitment to this study was difficult, with identified obstacles at the organisational, practitioner, and consumer levels. Although the Medifile system is easy to use and visually attractive, patients with severe mental illness appear to have limited use for the system as presently configured. Despite refinements in facilitating access, mistrust of researchers and a clinician culture of protecting consumers from 'too much information' is likely to retard adoption of such technology.
Pyelonephritis in pregnancy—some antibacterials to be avoided

Pyelonephritis occurs in 1–2% of all pregnancies and is one of the most common indications for antepartum hospitalisation. The majority of cases are in the 1st trimester and putative causes include progesterone and compression of ureters and bladder by the enlarging uterus. This review points out that parenteral antibacterials and intravenous hydration are imperative.

Penicillins and cephalosporins are generally safe but use of aminoglycosides in pregnancy should be avoided, if possible. Tetracyclines should not be used as they can chelate calcium in fetal structures and in utero exposure may result in tooth discoloration and inhibition of bone growth. While fluoroquinolones achieve high renal concentrations, there is a risk of fetal arthropathy when administered to the pregnant patient so they should not be used.

Drugs & Therapy Perspectives 2011;27:13–17.

Treatment of periodontal disease during pregnancy

The issue reviewed in this study is whether the treatment of periodontal disease with scaling and root planing during pregnancy is beneficial to the foetus, in particular there is a reduction in the rate of preterm birth? Quite an important issue as periodontal disease is known to be associated with an increased risk of preterm birth.

This report reviews 11 studies involving 6558 pregnant women with periodontal disease who were randomised to either treatment with scaling and root planing or no treatment. The primary end point was the incidence of births <37 weeks of gestation and no significant difference was found between the treated and untreated patients. So, the dental problem should be treated on its merits without the expectation of improvement in the preterm birth rate.

BMJ 2010;341:7017.

Possible uses for a new highly sensitive troponin assay

Troponin T (cTnT) and troponin I are the biomarkers recommended for diagnosis of a myocardial infarction (MI) and in the assessment of patients with the acute coronary syndrome. A new precommercial highly sensitive cTnT assay can detect 10-fold lower concentrations. These researchers have used it in a study involving patients who have no known coronary artery disease or known risk for cerebrovascular disease.

Nearly 10,000 participants aged between 54 and 74 years of age were entered in the study and their health and disease status study over the following decade was monitored. They report that cardiac troponin, measured with a novel highly sensitive cTnT assay, was detectable in the majority of middle-aged individuals without prevalent cardiovascular disease. Furthermore, even slight elevations were strongly associated with death, especially coronary artery death and heart failure.
hospitalisation. Interesting, but are there any benefits from this knowledge? Maybe statin and aspirin treatment, but debatable. Maybe better not to know.

Circulation 2011;123:1367–76.

Patients with atrial fibrillation (AF)—treatment with apixaban rather than warfarin?

Vitamin K antagonists such as warfarin have been shown to prevent stroke in patients with AF by about 60%. However, because of the well known risk of significant haemorrhage many such patients are deemed unsuitable for warfarin treatment.

Apixaban, a novel factor Xa inhibitor, may be an alternative treatment for such patients and this prospective randomised study assigned over 5500 such patients to either apixaban 5mg twice daily or aspirin (81–324mg per day). The primary outcome was the occurrence of stroke or systemic embolism and apixaban proved to be superior without any significant increase in haemorrhagic events. So superior that the trial was prematurely terminated.

Right, so apixaban is better than aspirin. What we really need to know is how it would measure up head-to-head with warfarin. Restricting the dose of aspirin to less than 100mg/day might also have given a better perspective.


Monotherapy or combination therapy when initiating treatment of hypertension?

This controversy is further reviewed in this report which compares treatment with a combination of aliskiren, a novel oral renin inhibitor and the calcium channel blocker amlodipine versus each drug used alone. Patients were randomly assigned (1:1:2) to treatment with 150mg aliskiren plus placebo, 5mg amlodipine plus placebo, or 150mg aliskiren plus 5mg amlodipine. At 16 weeks all patients received combination therapy with 300mg aliskiren plus 10mg amlodipine.

You will not be surprised to learn that the combination therapy patients achieved their target blood pressure sooner than the monotherapy patients. However at 24 weeks there was no difference. The authors conclude that routine initial reduction in blood pressure (>150 mmHg) with a combination such as aliskiren plus amlodipine can be recommended and this is endorsed by an editorial writer. Please note “a combination such as” because aliskiren is not widely available. Also 14% of patients on the combination had treatment withdrawn because of adverse effects—oedema hypotension and postural hypotension.