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This Issue in the Journal

Prevalence of victims of torture in the health screening of quota refugees in New Zealand during 2007–2008 and implications for follow-up care
G E Poole, Grant Galpin

New Zealand annually accepts approximately 750 quota refugees from overseas for resettlement in New Zealand. The humanitarian nature of the quota composition consists of those who are determined by the United Nations refugee agency to be in high need of immediate protection, a large proportion of medical and disability cases, and women and children at risk. Quota refugees arrive in six intakes each year and participate in assessment and orientation for the first 6 weeks at the national Mangere Refugee Resettlement Centre. This paper describes the findings of screening for refugees with a history of torture during 2007–2008. There were 144 arriving refugees or 19.2% of the total found to have histories of torture during this period. The implications for future research, and follow-up care of people who have survived torture are discussed.

The use of the ‘rollie’ in New Zealand: preference for loose tobacco among an ethnically diverse low socioeconomic urban population
Vili Nosa, Marewa Glover, Sandar Min, Robert Scragg, Chris Bullen, Judith McCool, Anette Kira

Smoking parents of students from four South Auckland Intermediate Schools were asked if they smoke roll-your-own (RYO) cigarettes and why. Nearly half smoked only factory-made cigarettes. 38% smoked only RYO cigarettes. The most common reasons for smoking RYOs instead of factory-mades was the perceived lower cost of RYOs and that RYOs lasted longer (42%). Increasing the tax on RYOs to make sure they cost the same as factory-made cigarettes should lessen the potential use of RYOs as an alternative to quitting.

A cross-sectional study of opinions related to the tobacco industry and their association with smoking status amongst 14–15 year old teenagers in New Zealand
Judith McCool, Janine Paynter, Robert Scragg

We surveyed 31,459 Year 10 students’ attitudes towards the tobacco industry in New Zealand to determine if there was an association with smoking behaviour or susceptibility to smoking. We found that students who expressed tolerant attitudes towards the tobacco industry had a higher risk of being smoker or starting to smoke. Given the results of this survey there is clearly a need to reach teenagers at risk of taking up smoking and continuing to smoke with an effective counter-industry campaign.
Comparison of two modes of delivery of an exercise prescription scheme
Louise Foley, Ralph Maddison, Zanta Jones, Paul Brown, Anne Davys

Green Prescription (GRx) is a referral from a health professional for a patient to become more physically active. In Auckland, GRx is delivered either on the telephone or face-to-face. A comparison of the two modes of delivery (telephone vs. face-to-face) was conducted. This evaluation involved staff interviews, patient interviews and analysis of GRx records for the 2007 calendar year. Results indicated that the modes of delivery were similar in terms of costs as well as outcomes. However, the face-to-face mode of delivery was more popular with Maori and Pacific peoples. Providing a choice of GRx mode of delivery allows participants to choose based on their personal and cultural needs.

Voices of students in competition: Health Science First Year at the University of Otago, Dunedin
Madgerie Jameson, Jeffrey Smith

This article examines the experiences of students enrolled in Health Sciences First Year. Past and present students were interviewed to determine the similarities and differences in their experience. Students perceived the programme as stressful and demanding. The competitive nature of the programme limited students’ involvement in other university activities. Students learned the benefits of work/life balance.

An investigation into the health benefits of mindfulness-based stress reduction (MBSR) for people living with a range of chronic physical illnesses in New Zealand
Jillian Simpson, Tim Mapel

Mindfulness-based Stress Reduction is a programme developed in the US by neurobiologist Jon-Kabat Zinn, originally to help people with difficult to manage health problems. It is taught as 8 weekly classes and a full day retreat in which people learn more about stress and how best to manage this. It involves various exercises to develop mindfulness (living in the moment without judgement) including a lying down relaxation/meditation, meditation sitting in a chair and simple stretching exercises. This research, one of the first studies in New Zealand, aimed to find out how effective this approach is for New Zealanders. The study demonstrated that MBSR helps people not only cope with their chronic health problems but also improves their wellbeing.
Comorbidity among patients with colon cancer in New Zealand
Diana Sarfati, Lavinia Tan, Tony Blakely, Neil Pearce

This study aimed to investigate how common comorbidity was in a cohort of patients with bowel cancer in NZ; to identify factors associated with high levels of comorbidity in this group and to assess the extent to which comorbidity affects outcomes from bowel cancer. We used data from the NZ Cancer Registry to identify those with cancer and from hospitalisations to identify comorbid conditions. We found that nearly a third of bowel cancer patients had at least one comorbid condition. Comorbidity increased with increasing age as expected, and was more common among Maori and Pacific people, and those living in more deprived areas of NZ. We also found that comorbidity had a strongly negative effect on survival, and increased length of hospital stay.

What do specialists and GPs think about the introduction of colorectal cancer screening? A qualitative study
Gillian M Abel, Lee Thompson

GPs and specialists, whilst supportive of screening, are not convinced that there is the capacity in New Zealand to introduce a colorectal screening programme. A shortage of colonoscopists in New Zealand means that there is already a long waiting-list for people accessing colonoscopies in the public service. GPs are often in the position of advocating screening to patients and they are unconvinced about the value of the test which is likely to be used for screening (faecal occult blood test) feeling that there will be a number of false positives These will then require colonoscopic follow-up which will mean unnecessary anxiety will be engendered amongst their patients.
Inequities in health and the Marmot Symposia: time for a stocktake

Tony Blakely, Don Simmers, Norman Sharpe

Given the prospect of the general election in November, it is timely for a stocktake on what has been done, and what we should do next, to address inequities in health in Aotearoa New Zealand. To heighten the relevance of this stocktake, Sir Michael Marmot is being hosted by the New Zealand Medical Association (NZMA) next week (12 to 14 July 2011) for a series of activities and symposia (convened by the Heart Foundation, and University of Otago, Wellington) to discuss health inequities and ‘what next’.

Marmot has a long pedigree as one of the world’s leading researchers on, and advocates to reduce, health inequities. He chaired the World Health Organisation’s Commission on Social Determinants of Health, led the recent ‘Marmot Review’ of health inequalities in England and Wales, and has just finished his tenure as the President of the British Medical Association (BMA).

Following the BMA’s direct focus on health inequities, the NZMA is now currently making this a major focus of its activity, and has recently put out its position statement on health inequities. The hosting of a visit by Marmot is the next major step in the NZMA’s activity, with the purpose of increasing public and professional awareness of inequities in health and considering what concerted actions should occur next, especially those led by Government.

This paper builds on position papers or ‘fact and action sheets’ that the authors (and other colleagues) have prepared for two symposia during Marmot’s visit, with the purpose of generating discussion and debate. In particular, we focus on what we (i.e. New Zealand as a whole, through the actions of Government, civil society and professional groups) have done to address health inequities in recent decades, and what we should do next. To that end, and to stimulate debate, we have identified a top 10 list under each heading (Text Boxes 1 and 2).

We welcome debate on, and improvements to, our listings—especially ‘what to do next’ (Text Box 2). (Comments can be registered at www.uow.otago.ac.nz/HIRP-info.html.) In addition, as part of the symposia activities, participants will be invited to submit their own ideas on the next 10 most important steps this nation needs to take to reduce the unacceptable and unjust burden of health inequities.
Text Box 1. Ten things that have been done that address health inequities in New Zealand in recent decades

**Income inequality reduced slightly in the 2000s** following large increases in the Gini in the 1980s–1990s. But is perhaps now increasing again.

**Social welfare policies have been implemented** that in part at least are pro-equity, including *Working for Families* and (soon) Whanau Ora.

**Intersectoral activities have been implemented** that improve health and health equity have been implemented, e.g. retrofitting and insulation of housing stock (energy efficiency and health benefits) and Before School Check and the National Immunisation register.

**Many policies relevant to health include equity goals or purposes**, including the Health Strategy, Cancer Control Strategy and—more specifically—Reducing Inequalities in Health Strategy, He Korowai Orange and Ala Mo‘ui: Pathways to Pacific Health and Wellbeing 2010–2014. This has flowed through into programmes, research, health professional training (e.g. cultural competency), and use of health equity impact tools (e.g. HEAT).

**Māori health provider, and Māori development more generally**, has been a strong feature since at least the 1980s, including the development of Māori health providers and services. The Treaty of Waitangi and Māori health has been enshrined in legislation in the New Zealand Public Health and Disability Act 2000.

**An increasing focus on the needs of Pacific and other peoples** has grown in parallel with New Zealand’s increasingly multi-ethnic composition, e.g. growing numbers of Pacific providers.

**Tailored programmes and health service delivery at the DHB, PHO and other service provider level** focusing on Māori, Pacific Island and low socioeconomic people has resulted in increased immunisation rates, improved rates of smoking cessation, cardiovascular risk factor detection and better Type 2 diabetes management.

**Funding of health services according to deprivation and ethnicity**, as markers of need, is operationalized through various funding formulas.

**Research and monitoring on health inequalities**, from the development of deprivation indicators to the linkage of census and health data, by Government analysts to academic researchers, has improved our understanding of health inequalities and allowed tracking of progress. However, this activity is currently reducing.

**Targets and performance indicators** often include metrics by region, ethnicity and deprivation, although Ministry of Health Targets have not been reported by ethnicity or deprivation since 2008–09.
Text Box 2. Ten next most important actions to reduce health inequities in New Zealand

**Equitable and fair fiscal and social welfare policy**, including progressive taxation, comprehensive and fair social policy, and ensuring that everyone has a minimum income for healthy living. Policy needs to be proportionate to need—what is termed proportionate universalism in the Marmot Review, or a balance of targeting and universalism.

**Maintain and enhance social cohesion**, through ensuring all services are accessible by all. This requires a whole of government response and far better coordination among every branch of government, from Ministerial level to service delivery.

**Maintaining and enhancing investment in early childhood**, including the need to for there to be a visible leadership that champions child health and wellbeing. Child poverty rates need to be reduced. There needs to be greater coordination among services for children, and a visible cross-party agreement that determines the strategy for improving the environment in which children live.

**Aligning climate change, sustainability and pro-equity policies**, including programmes such as warm and healthy housing in deprived areas to environmental, health and health equity win-wins such as increased walkability of neighbourhoods and financial incentives that both reduce carbon emissions and increase healthy compared to unhealthy food production.

**Health equity needs to be widely understood**. It affects everyone, whether as a prospective parent, employer, employee, political leader or welfare beneficiary. Everybody working in a service delivery occupation needs to be able to alter their practice to reduce health inequities.

**Ill-health prevention that addresses risk factors contributing to health inequities**, including making New Zealand Smokefree by 2025 (as per Parliament’s response to Māori Select Committee), encouraging or ensuring healthy food formulation (e.g. salt content in breads and cereals, clear labelling of foods that are healthy and unhealthy, packages of taxes and subsidies to improve healthy eating), and stronger policies to tackle harmful alcohol consumption.

**Ensuring fair employment and safe and healthy workplaces**, extending to include greater access to work for beneficiaries and people with disabilities, a low unemployment rate, and strengthening of occupational health policies.

**Maintaining and enhancing Māori, Pacific and Asian policies and programmes**, including health promotion, screening and health care services models that are culturally specific or tailored.

**Ensuring health services are equitable**, including ensuring a strong equity focus in prioritisation of health resource allocation, quality improvement policies and programmes, and improved information systems. This means, among other things, transparent monitoring, smoothing out regional variations in access, and ongoing provider education and support.

**Health equity research needs to continue and focus on ‘what works’**, evaluating policies and programmes for equity impacts in processes and (eventually) outcomes such as mental health status and disease incidence.
What has been done to address health inequities in recent decades?

There have been many activities, policies and programmes that address health inequities in recent decades (Text Box 1). Many of these are around processes, such as policies that flow through to affect health services provision and day to day practice. Importantly, deprivation and ethnicity are now routinely used in funding formulae for DHBs and primary health care. The Māori development kaupapa since the 1970s, flowing through into Māori health providers and influencing mainstream health service practice, has been critical.

Pacific health provider development has also progressed in leaps and bounds. Many—if not just about all—major health promotion programmes and screening programmes include tailored components for Māori and Pacific audiences, for example Māori language components of Quit campaigns. The One Heart Many Lives Programme has been a particular success in heart health promotion focused primarily on Māori men. Specific tailoring of programmes for lower socioeconomic groups, in addition to Māori and Pacific (and Asian), is not as readily identifiable. Nonetheless, by using tools such as the New Zealand Deprivation Index to target more deprived places, activities such as service placement have been altered.

Whilst the recent Government has downplayed an explicit focus on inequities (e.g. initiatives such as “better sooner more convenient” and the push for integrated family health centres), it has been possible to retain likely pro-equity initiatives such as “services to increase access”, PHO funded and coordinated mental health services (such as Wellington’s Compass Health “Primary Solutions”), and the recent push on rheumatic fever prevention.

A big push has been made on research, monitoring and evaluation – although perhaps not as much on programme evaluation as is desirable. A big ticket item on intersectoral activity has been the retrofitting and insulation of New Zealand’s housing stock—especially among lower socioeconomic groups, and a programme that has enjoyed bipartisan support as a win-win addressing both health (including health services demand) and energy efficiency. However, it is challenging to identify other prominent intersectoral activities. Perhaps the concept of Whanau Ora will help in breaking down much of the current siloed thinking around the provision of healthy development and wellbeing.

Times change—and Governments change—as in demonstrated by visiting the Ministry of Health’s website on health targets (www.moh.govt.nz/healthtargets; visited 8 June 2011). Three out of the six targets (immunisation, quitting smoking, and better diabetes and cardiovascular disease services) are clearly relevant to reducing inequities in health. However, the targets are reported by DHB only—not by sociodemographics. You have to search the website archives back to 2008-09 to find targets reported by ethnicity.

Much of the health workforce is acutely aware of the need to address inequities, and likewise the backroom funders and planners, but ceasing routine reporting on trends by sociodemographics leads to invisibility of the issue, and eventual disappearance off policy and practice radars.
So what should we do next?

Progress has been made. The gap between Māori and non-Māori life expectancy has fallen back to 7–8 years—the same level as in the early 1980s, and less than its peak of a nearly 10-year gap in the late 1990s. But ongoing and concerted policy effort will be required if we are to see both good improvements in non-Māori life expectancy and even faster improvements in Māori (and Pacific) life expectancy so as to close gaps. (For those interested in closing gaps between New Zealand and other OECD countries, the answer is still likely to be the same—maximising reductions in inequities may be the best way to lift the average faster.)

Premature cardiovascular disease mortality has fallen approximately 80% since 1970—but more rapidly in relative terms among non-Māori so that the relative differences between Māori and non-Māori have actually increased during this period. Cancer inequalities are slowly growing, in part a function of tobacco influences on incidence but also generally worse survival among Māori across multiple cancers.

Diabetes, and its incubator obesity, and in turn its progenitor of obesogenic environments, is the growing curse of our times—and if unchecked will be a driver of widening inequalities. Mental health and youth converge as a major issue for New Zealand, as evidenced by our high youth suicide rates—again more so for Māori and lower socioeconomic groups. A recent comprehensive report by the Chief Scientific Advisor to the Prime Minister includes the following observation:

“New Zealand is a temperate, peaceful, ethical and developed nation in which children should flourish, yet it is actually one in which they experience some of the highest rates of adolescent morbidity and mortality in the OECD.” (p.54)

New Zealand is notorious for high child poverty rates and poor social outcomes (including health) among our children and youth—especially among a long tail of disadvantaged children and youth.

What to do? The above report also comprehensively canvasses the range of interventions in early childhood and adolescence to improve outcomes, and notes that many interventions that we currently fund are (based on evidence) likely to be ineffective. For example, single issue education campaigns in schools around drugs. Thus, improved programme evaluation, more skilful scaling up of interventions that appear successful at pilot stage, and redeployment of resources from ineffective to effective programmes, are all ways to increase our “bang for our buck”—and consistent with the ethos of the current political and financial climate.

Moreover, quality early child programmes are often even more effective among lower socioeconomic groups (e.g. family visiting programmes with structured skills development for parents to manage and enhance child behaviour). So, this is a potential win-win; redeployment of existing resources to more effective programmes that also reduce inequities.

Second, and building on the word ‘quality’ that is a priority of the current Government’s agenda (witness the Health Quality and Safety Commission), lifting the quality of health service delivery could be pro-equity. For example, there is some evidence of higher adverse events in healthcare for Māori, that may be addressed by quality systems.
Likewise, worse survival from cancer among lower socioeconomic groups and Māori hint at the likely role of improved access to health care as one way to reduce inequities in health status. As treatments continue to improve in effectiveness, the role of health services will probably increase in importance in the future. And inequalities arising from, or failing to be prevented by, health services are considered by most as being more of an inequity than an inequality (i.e. more unfair), and therefore of higher policy importance to tackle. That all said, the biggest gains in reducing health inequities are still likely to occur outside of the treatment arms of health services.

Tobacco is one—if not ‘the’ example. Making New Zealand tobacco-free is probably the single most important activity to reduce inequalities in health. And such a goal is no longer considered just the pipe dream of academics and radicals. Rather, the New Zealand Parliament (in response to Māori Affairs Select Committee Report) has committed to a goal of making NZ tobacco-free by 2025. We have estimated that achieving this goal, compared to 2006 smoking rates continuing unabated into the future, might result in 5 years gain in life expectancy for Māori, 3 years for non-Māori, and a 2-year reduction in the life expectancy gap—a triple win-win-win.

The future is also going to require joining up the sustainability, climate change and health equity agendas. This will be challenging. Nevertheless, substantial gains on multiple social bottom lines could be achieved simultaneously. For example, improving the walkability of neighbourhoods, reducing our reliance on the automobile, and shifting our agricultural production to a lower saturated fat and lower carbon/methane footing could generate many co-benefits.

The posturing and sabre rattling leading up to the next general election is now well underway. We are being fed a diet of austerity, echoing TINA (“There is no alternative”) of the 1980s. Some reprioritisation is possible, need not lead to widening inequalities, and may even be pro-equity.

For example, and deliberately off the two main Party’s manifestos, by far and away the largest expenditure on welfare benefits in New Zealand is that on superannuation—60% or $8 billion of the $13 billion total welfare expenditure budget in 2009. Yet the age of entitlement to government superannuation, 65 years, is the same as that in 1899 when life expectancy was 25 years less! And we live in a society with one of the highest child poverty rates in the OECD.

As a society we want to celebrate and protect the success of our superannuation scheme, but not to the point of gross inequity compared to younger (and more brown-faced, to be frank) people. Fair go—it is time that the age of entitlement for superannuation is lifted (as it has in other OECD countries), and allow some redistribution to other sections of our society, particularly younger people.

Thus it is indeed timely for a stocktake to address health inequities in Aotearoa New Zealand. We hope this Editorial will achieve the objective of stimulating debate. We encourage the public and health professionals to join in the discussion and debate at this opportune and crucial time about ‘what to do next’ to improve the health of all New Zealander’s, and reduce inequities.
Competing interests: None.

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Acknowledgements: We acknowledge the suggestions and comments on the ‘fact and action sheets’ underlying this editorial (and Text Boxes 1 and 2 abstracted for this Editorial) received from numerous colleagues.

Organisations supporting the visit of Marmot and related activities include: the NZMA; Heart Foundation; University of Otago, Wellington; School of Population Health, University of Auckland; Health Inequalities Research Programme, UOW; Public Health Association; New Zealand College of Public Health Medicine; and the Prior Centre.

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References:


Medically assessing refugees who may have been victims of torture

A Martin F Reeve

The current issue of the Journal contains an article written by experts describing the prevalence and effects of torture on refugees in New Zealand. However, often a non-expert may be called upon to assess the effects of torture on a refugee or someone in a similar situation, and should not be afraid to do so.

Usually an expert is not available, and any clinician who has had experience in general practice and/or emergency medicine in one capacity or another is capable of assessing a person who has been mistreated, providing a forensic report, and managing any follow-up needed.

Written guidelines are available, perhaps the best being the manual produced by the United Nations High Commission for Human Rights. Training is also available, and the Forum of Australian Services for the Survivors of Torture and Trauma (FASTT) network is a good starting point.

The clinician may not be used to dealing with people from refugee background, especially those who have been tortured, but their assessment follows the same principles as those for any one else who has suffered from trauma in the past. One important difference from usual examinations is that in most cases an interpreter will be needed.

A full assessment may take some time; it should take the usual course of asking for presenting complaints, taking a social history, including travel; past medical history and medications; family history; allergies; lifestyle history such as smoking, and asking set questions about each system, e.g. chest pain, dyspepsia. It is usually best to leave until last to ask about the causation of the presenting complaints; that is, the torture history, and their physical and psychological effects.

A routine physical examination follows, focusing on the areas which have been affected by torture, recording any findings. The recording can be written, diagrammatic, and if possible, photographic.

A vital difference between the assessment of a torture victim and most other assessments is the psychological dimension. The main aim of torture is to affect the victim psychologically in order, as the authors note, to obtain information, punish or to pursue political ends by terror and coercion.

Torture victims will often therefore present with overt psychological symptoms, but as the authors again note, present with symptoms which are often atypical and predominantly psychosomatic, particularly in those cultures where psychological symptoms are not recognised or accepted.
It can be a difficult clinical decision whether to investigate some ill-defined symptom intensively and hence reinforce the belief that it is physical in origin in the victim’s mind, or not investigate and perhaps miss a physical problem.

Another vital difference between torture assessment and others is the traumatic effect of obtaining and recording the torture history itself. This can affect:

- The victim, by recollection of traumatic events, particularly sexual abuse.
- The translator, who may have experienced similar mistreatment.
- The clinician.
- Third parties such as the victim’s lawyer, immigration officers and so on.

The “vicarious trauma” experienced by those hearing or reading the torture history can be difficult to deal with. Traumatic events in a person’s life, professional or personal, are commonly dealt with informally by interactions with colleagues, friends or family, but the nature of a torture history usually makes it impossible to share it with anyone else except a professional counsellor. Hence, those involved with victims of torture should themselves have access to counselling services.

The management of a torture victim involves organising appropriate investigations and referral to appropriate specialist services, especially psychological; in some areas the clinician will be fortunate in being able to refer to specialist torture/trauma counselling services. Management may also involve prescribing, and dealing with non-torture related conditions, including disease prevention such as vaccination, contraception, diabetes screening and so on. Finally, follow-up care should be undertaken or arranged.

A clinician may be requested to provide a forensic report, for example to support the victim’s application for asylum. In general, the clinician preparing a forensic report should:

- Use commonsense
- Be conscious of the limitations of physical assessment.
- Keep an open mind

Training in assessment and report preparation would be a great asset, but is not available to most people, but the effects of say, whipping, are predictable and the clinician may have had similar experience, for example in the assessment of child abuse.

The body’s tissues have a limited repertoire in response to trauma, and so it may be impossible to distinguish between an entrance bullet wound, a cigarette burn, or a localised skin infection. Often there is little or nothing to see, especially if time has passed since the events.

The true sequence of events may be difficult to obtain, due to misunderstandings, involuntary deceit such as memory lapse caused by the event itself, or deliberate deceit for personal gain.

The clinician may feel great sympathy for the victim, but the report should be dispassionate, and contain such phrases as “consistent with”, “typical of”—see the
Istanbul Protocol Manual.\textsuperscript{2} Other incidental findings such as those caused by accidental trauma should be recorded as they may support the victim’s credibility. The absence of any findings should be commented on and explained, as this is common, but non-professionals might take such absence as a sign that the victim is being deceitful.

If the report is for non-professionals, it should be in plain language, and any diagrams or photos attached, subject to the victim’s consent.

A recent conference in Auckland concerned with the Investigation and Documentation of torture, which was facilitated by visiting experts from the International Rehabilitation Council for Torture Victims (IRCT), was unfortunately poorly attended by doctors. It is hoped that in the future that clinicians who are or may be involved with victims of torture will have the opportunity to hear and learn from experts in the field.

\textbf{Competing interests:} None.

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\textbf{References:}


Prevalence of victims of torture in the health screening of quota refugees in New Zealand during 2007–2008 and implications for follow-up care

G E Poole, Grant Galpin

Abstract New Zealand annually accepts approximately 750 quota refugees from around the world for resettlement in New Zealand. The humanitarian nature of the quota composition consists of those who are determined by the United Nations refugee agency to be in high need of immediate protection, a large proportion of medical and disability cases, and women and children at risk. Quota refugees arrive in group intakes and participate in assessment and orientation for the first 6 weeks at the national Mangere Refugee Resettlement Centre in South Auckland. This paper describes the findings of screening for refugees with a history of torture during 2007–2008. There were 144 refugees or 19.2% of the new arrivals found to have histories of torture during this period. The implications for future research, and follow-up care of people who have survived torture are discussed.

Torture, according to United Nations Convention (2010), is defined as:

…any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him, or a third person, information or a confession, punishing him for an act he or a third person has committed or is suspected of having committed, or intimidating or coercing him or a third person, or for any reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent or acquiescence of a public official or other person acting in an official capacity. It does not include pain or suffering arising only from, inherent in, or incidental to, lawful sanctions.¹

Throughout human history, torture has been used as a means of exerting political control through terror, persecution and coercion. In the 21st Century, torture is universally acknowledged as an abhorrent practice and a war crime, prohibited under international law. Torture is almost universally considered unjustified, unethical and illegal under any circumstances, yet Amnesty International reported that it continues to occur in 65 out of 144 countries studied.²

The United Nation’s Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment was ratified by New Zealand in 1989. As part of fulfilling international humanitarian obligations, New Zealand annually accepts a quota of approximately 750 forced migrants referred by the United Nations High Commissioner for Refugees (UNHCR).³ All are provided with medical and mental health assessment and orientation during a stay of 6 weeks at the national Mangere Refugee Resettlement Centre (MRRC).

Quota refugees, in groups of approximately 125, arrive six times each year and spend the first 6 weeks in assessment and orientation at the national Mangere Refugee Resettlement Centre. Among the agencies is RASNZ (Refugees as Survivors New Zealand).
Zealand) which provides psychological, psychiatric and clinical screening and management of refugees with mental health problems.

At the MRRC, government and non-government agencies provide a comprehensive range of services from agencies including Immigration New Zealand, the Refugee Medical Centre operated by Auckland Regional Public Health, RASNZ, the specialist refugee mental health centre, AUT University Refugee Centre, and Refugee Services Aotearoa (RSA) working in practical settlement support.

The principal study on the health status of quota refugees in New Zealand has been reported by McLeod and Reeve (2005) and involved 2992 new arrivals who were screened and treated over a 10-year period. Infectious diseases included tuberculosis, parasitic or bacterial illness, and a relatively small proportion of HIV positive cases. Non-infectious conditions included iron and vitamin D nutritional deficiencies. There were 349 cases of female genital mutilation reported. An earlier study (Reeve 2002) reported that 20% of the refugee intake had been subjected to some form of significant physical mistreatment in detention.

Identified medical and mental health conditions are initially treated at the MRRC, with follow-up referral to clinics and community health services in multiple settlement centres. It is internationally recognised that victims of torture may constitute a significant proportion of general refugee populations and that survivors typically require substantial specialist treatment for rehabilitation and successful integration in the resettlement.

Given that survivors of torture, as a sub-group of refugees, can be expected to have more complex, and enduring community follow-up care requirements, their identification at an early stage of selection or arrival is an important part of the needs assessment phase.

Until 2007, there had been no systematic procedure at the MRRC for screening or identifying victims of torture. Although torture survivors had presented during treatment and were statistically recorded, there had been no systemic means of identifying them from the culturally and linguistically diverse groups of refugees arriving in each intake. Although it was previously recognised that a substantial proportion of the refugees arriving in the New Zealand quota had experiences of being subjected to torture, the actual numbers or the particular nature of the case histories had not been compiled or analysed prior to 2006. This paper reports on the findings from screening of refugees for 2007/8.

Methods

During the 2007–2008 intake period, arriving refugees were screened by the RASNZ clinical and research teams at the MRRC for not only trauma, but an indicated or verified history of torture. Pre-arrival screening included UNHCR case note records. During the pre-selection and selection mission phases of the quota intake process, refugees inside camps or accommodation centres are interviewed by UNHCR case officers and personal histories are taken. Further case notes are collected by Immigration New Zealand (INZ) case officers who interview refugees for possible inclusion in the quota intake. All case records indicating a history of torture were identified and confirmed upon arrival in New Zealand. Confirmation was through direct interviews with new arrivals, corroborated with UNHCR case note records, medical records, witness reports, and clinical observations.

Many newly arriving quota refugees also self-disclose a history of torture upon initial screening through mental health assessment and education groups operating at the MRRC during the first weeks
of orientation. These service users often self-refer to psychiatric assessment and treatment if they have a history of torture or trauma, or symptoms of Post-Traumatic Stress Disorder (PTSD), or other related mental health problems. A further group of refugees who may have been victims of torture are identified during medical screening by Auckland Regional Public Health and referred to RASNZ services.

Those who are identified via any of these means as having experienced torture, were further provided with psychometric assessment applying translated versions of the Harvard Trauma Questionnaire and the Hopkins Symptoms Checklist.

**Results**

Descriptive characteristics of all quota refugees screened at the MRRC during this period are shown below in Table 1 by origin of nationality. The corresponding characteristics of refugees identified as survivors of torture are shown in Table 2.

**Table 1. Statistical characteristics of quota refugees during 2007–2008 by national origin identified as victims of torture**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationality</td>
<td>Number</td>
<td>Proportion of refugee nationality</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>11</td>
<td>17%</td>
</tr>
<tr>
<td>Algerian</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Armenia</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Burundi</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bhutan</td>
<td>23</td>
<td>31%</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colombia</td>
<td>6</td>
<td>21%</td>
</tr>
<tr>
<td>Congo, Democratic Republic of</td>
<td>9</td>
<td>43%</td>
</tr>
<tr>
<td>Djibouti</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eritrea</td>
<td>4</td>
<td>5%</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>3</td>
<td>25%</td>
</tr>
<tr>
<td>India</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Indonesian</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Iran</td>
<td>4</td>
<td>36%</td>
</tr>
<tr>
<td>Iraq</td>
<td>23</td>
<td>26%</td>
</tr>
<tr>
<td>Mauritania</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Myanmar</td>
<td>31</td>
<td>12%</td>
</tr>
<tr>
<td>Nepal</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>Palestinian</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Rwanda</td>
<td>7</td>
<td>28%</td>
</tr>
<tr>
<td>Somalia</td>
<td>3</td>
<td>17%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>Sudan</td>
<td>9</td>
<td>30%</td>
</tr>
<tr>
<td>Turkey</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>144</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows the general refugee intake statistics by category, ages and gender.

Table 2. Statistical characteristics of all quota refugees during 2007–2008 by entry categories, age, and gender (N=750)

<table>
<thead>
<tr>
<th>Age</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>13–17</td>
<td>127</td>
</tr>
<tr>
<td>18–60</td>
<td>419</td>
</tr>
<tr>
<td>60+</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>391</td>
</tr>
<tr>
<td>Male</td>
<td>359</td>
</tr>
</tbody>
</table>

Table 3 shows the proportions of those demographics and categories identified as victims of torture (N=144)

Table 3. Statistical characteristics of all quota refugees during 2007-2008 intakes identified as victims of torture by entry categories, age, and gender

<table>
<thead>
<tr>
<th>Entry categories</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical / Disabled</td>
<td>73</td>
<td>50%</td>
</tr>
<tr>
<td>Protection</td>
<td>63</td>
<td>44%</td>
</tr>
<tr>
<td>Women at Risk</td>
<td>5</td>
<td>4%</td>
</tr>
<tr>
<td>Family Reunion</td>
<td>3</td>
<td>3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ages</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>5–12</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>13–17</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>18–35</td>
<td>63</td>
<td>44%</td>
</tr>
<tr>
<td>31–60</td>
<td>75</td>
<td>52%</td>
</tr>
<tr>
<td>60+</td>
<td>2</td>
<td>1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>9</td>
<td>6%</td>
</tr>
<tr>
<td>Male</td>
<td>135</td>
<td>94%</td>
</tr>
</tbody>
</table>

Origin of survivors—Of the 750 refugees arriving over the course of this annual period, 144 or 19.2% were identified as victims of torture under the UN definition. Table 1 shows that the largest numbers of those found to have suffered torture were from Bhutan, Afghanistan and Iraq. The highest proportions of victims relative to smaller intake numbers, however, were from origins in Nepal, Republic of Congo, and Sri Lanka.

Gender—The overwhelming majority (94%) were male with only 9 women reporting a history of torture. The women reporting torture had principally been subjected to systemic rape by militia or forced to witness the killing or torture of other family members.
Age—The overwhelming proportion of victims were men aged between 18 and 60. The small number of children and adolescents were not directly tortured but forced to witness torture, massacre, rape or related severe harm to family members.

Nature and types of torture inflicted—Psychological torture reported involved use of extreme stressors and situations such as sensory deprivation, mock execution, forced nudity, solitary confinement or violation of social norms and humiliation. Reported cases principally involved forced witnessing of torture or rape committed to other family members, friends or associates. Psychological torture can inflict severe suffering with no externally visible physical effects.

Of the 144 identified victims, 31% had been subjected exclusively to psychological torture, 63% exclusively physical torture and 21% reported experiencing both. Physical methods of torture reported included exposure to extreme cold, burning, beatings, physical suspension, forced painful posture, dehydration, starvation, simulated drowning, removal of teeth, damage of fingers, hands, feet or toes, rape, whipping, or simulated asphyxiation. No cases of use of electrical current in torture were reported in this group. During this particular initial intake of Nepalese refugees from Bhutan, the practice of chepuwa was first reported. Chepuwa is a Bhutanese technique of torture applying tight clamping of the thighs or legs with bamboo for extended periods of time.

Identity of the perpetrators—State-sponsored torture, inflicted by, or at the instigation of, or with the consent or acquiescence of officials or others in a similar capacity constituted the largest proportion of alleged perpetrators. Victims most frequently reported that perpetrators included military or police officers, agents, paramilitary guerilla forces, or, in a few cases, ethnic gangs during widespread genocide as occurred in Rwanda.

Discussion

The findings indicate that nearly one-fifth of the total quota refugee intake during the annual period studied had been survivors of torture. In a majority (73%) of cases there were multiple corroborating confirmations such as UNHCR notes, self-reporting, and test results or witnesses.

Validity of the sample is considered likely to be high on the basis that quota refugees are already accepted for entry and, unlike asylum seekers, have no possible secondary gain motives from falsely claiming a history of torture. For this reason, asylum seekers were not included in the study. Indeed, it is in our opinion more likely that quota refugees would underreport a history of torture. Survivors of torture may not initially reveal the history to their doctor because of fear, or due to overwhelming traumatic memories which have been repressed.

Torture experiences may have led victims to no longer view the world as a “safe, and benevolent place upon which they could have an impact” (p243). This outlook is likely to permeate all aspects of their lives, and impact on how patients view health providers.

Western health providers are likely to note physical complaints such as pain of often undetermined apparent psycho-somatic origin, headache, cardiopulmonary symptoms, sleep disturbances, nightmares, and impaired cognition and memory. Refugees and
migrants frequently do not manifest symptoms in the same way as people from Western backgrounds and may tend to express psychological distress in somatic complaints. However, a history of head injury and underlying neurological damage may require further investigation. There may also be a concurrent underlying cause of orthopedic, neurological, or lingering medical effects of past injury.

The most common long term mental health sequelae for torture survivors include post traumatic stress disorder (PTSD), with frequent comorbidity of anxiety disorder and depression. Torture often has profound and enduring effects on victims that may extend for long periods of time and manifest in different ways.

Recovery from torture will logically involve the re-establishment of basic trust and positive relationships. Taking a history from a survivor may be marked by his or her experience of having their beliefs and opinion, as extracted by an authority figure, leading to their persecution. Extra time and attention will need to be devoted to establishing rapport and developing trust with survivors.

Assessment and treatment processes are likely to be complex, requiring time to gain an understanding of the person and their family, culture and context. For former refugees and survivors, building trust with health practitioners, or others viewed as authority figures, may be challenging. In addition, many frequently require interpreters and may not understand or have not been exposed to Western health care practices or models of care.

The Istanbul Protocol was a landmark step in recognising the importance of effective process in securing the rights of torture victims to rehabilitation, reparation and protection. In 2003, the United Nations Commission on Human Rights drew the attention of governments to the principles of the Protocol as a useful and practical tool in addressing and preventing torture. This international standard contains detailed procedures, and practical steps for medical, mental health and legal specialists to recognise and document evidence that may assist in recovery and rehabilitation for survivors, as well as in bringing perpetrators to justice and for advancing future prevention of torture.

In New Zealand, Te Pou, the National Mental Health Workforce Centre, has recently published a practice guide for health practitioners working with refugees and migrants in a resource book, including an overview of psychopharmacological issues in treatment.

In 2003 the Ministry of Health produced a handbook for health professionals providing information about effectively communicating with refugee patients and about how and when trained interpreters should be involved in service delivery.

**Conclusion**

It is suggested that future research should further examine the proportion and characteristics of survivors of torture in UNHCR intakes in other years, and consider comparisons of health and settlement outcomes between survivors of torture and refugees who did not have those experiences. Given the relatively high proportions of survivors of torture in the New Zealand refugee quota composition, it is important for medical practitioners to be aware of some of the issues and special needs among this group of patients.
Traumatised refugees and survivors of torture have come to New Zealand to begin new lives. Medical practitioners have important roles in the successful resettlement process through assessment and case management leading to rehabilitation and recovery.

**Competing interests:** None.

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**References:**

The use of the ‘rollie’ in New Zealand: preference for loose tobacco among an ethnically diverse low socioeconomic urban population

Vili Nosa, Marewa Glover, Sandar Min, Robert Scragg, Chris Bullen, Judith McCool, Anette Kira

Abstract

Aim To examine the prevalence of and reasons for smoking roll-your-own (RYO) cigarettes in a population of South Auckland adults.


Result Just over a quarter (813; 27%) of parents were smokers. Most (82%) were Māori or Pacific peoples (47% and 34% respectively) of whom 47% smoked only factory-made (FM) and 38% smoked only RYO cigarettes. Exclusive RYO smoking was more common among European (53%) than Māori (40%), Pacific (38%) and Asian ethnic groups (23%). The most common reasons for preferring RYO over FM cigarettes were lower cost (50%), lasting longer (42%), and taste (8%). A few chose RYO because they perceived them to be less harmful (5%).

Conclusion Reducing the cost benefit of RYO should lessen the potential use of RYOs as an alternative to quitting. Health education campaigns are needed to counter incorrect beliefs surrounding RYO. Such programmes should include awareness in schools, churches and Pacific communities.

Despite several decades of comprehensive tobacco control efforts, tobacco use remains the largest preventable cause of death and disease in New Zealand (NZ). Population-wide tobacco control interventions appear to be most effective for groups with already low smoking prevalence. Increasing the cost of tobacco using tax has been found to be effective in reducing smoking in the general population. Youth are reported to be particularly price sensitive and lower socioeconomic status (SES) smokers may similarly be responsive to tobacco tax increases. Indicators of SES include income, occupation, education, access to a telephone, access to a car, income support received, living space and home ownership.

Large differences exist in smoking prevalence between ethnic groups and between socioeconomic groups, contributing to substantial health inequalities between ethnic and socioeconomic groups. In particular, Māori suffer from marked negative health and economic consequences of smoking. Māori have higher rates than non-Māori of cardiovascular disease (CVD), many cancers, a number of respiratory diseases, and adverse pregnancy outcomes all causally linked to smoking. Reducing smoking among Māori is therefore an important means to substantially reduce ethnic health inequalities.
Past tobacco tax increases resulted in a drop in consumption among smokers, and a corresponding shift to use of loose tobacco over the subsequent years. Whereas in 1990, only 16% of smokers exclusively used roll-your-own (RYO) cigarettes (‘rollies’), by 2005 41% of smokers were in this group. In 2009, nearly 60% of smokers used RYO, either exclusively or in combination with factory-made (FM) cigarettes. Nationally and internationally, the most likely reason for the shift to RYO cigarettes was price.

The excise tax was lower for RYO than FM cigarettes. Taste was also cited as a reason for switching from FM to RYO in a Scottish study. A recent national NZ cross-sectional study, asking participants to select from a list of reasons, found that the most common reasons for smoking RYO was lower cost (83%), taste (73%), and greater satisfaction (63%).

Type of tobacco used differs across groups. The NZ Tobacco Use Survey 2010 reported that RYO use is especially common among Māori and European smokers (71% and 61% respectively). There is also a correlation between RYO use and socioeconomic status, where the most deprived smokers are most likely to use RYO (70% for most deprived versus 48% for least deprived).

Previous research has found that Māori smokers from low SES areas have high prevalence of smoking RYO, but the reasons for smoking RYO has not been investigated for this specific group. Our study also differs from previous research by using open-ended qualitative questions, as opposed to choosing from a list of reasons for smoking RYO. This paper describes a cross-sectional survey of Māori and Pacific smokers from a predominantly lower socioeconomic area in South Auckland. The aim was to investigate tobacco type preference and reasons for smoking RYO.

**Methods**

The study described in this paper was part of *Keeping Kids Smokefree* (KKS), a quasi-experimental trial which aimed to assess the effect of a programme designed to change smoking behaviour and attitudes of parents of children aged 11 and 12 in order to reduce smoking uptake (described elsewhere). The data for this paper were drawn from parent questionnaires collected at the beginning or end of the school year for each year of the study. Parent in this study refers to the caregiver who filled out the questionnaire for their household. In brief, four low decile South Auckland schools were selected for their large rolls and high proportion of Māori and Pacific students. Decile indicates the extent to which the school draws its students from low socioeconomic communities. Decile 1 represents the most deprived 10% of the population, while decile 10 represents the least deprived 10% of the population.

Roll numbers across the intervention schools totalled about 1300 per year and 1600 across the control schools. The questions relevant to this paper were asked during year 1 follow-up (October–November 2007) and year 2 (February–March 2008) and 3 (February–March 2009) baseline. A total of 2,973 parents were surveyed. Parents were asked general demographic questions, such as ethnicity, what type of tobacco they smoked, preferred brand name and if they smoked RYO cigarettes to state why. Gender was not asked in the survey so this variable was not included in the analysis. We did not ask brand name in year 1 follow-up.

We used descriptive statistics for prevalence estimates and calculated the relative risks with 95% confidence intervals of smoking RYO using a log-binomial model in Stata version 9 software. The free-text responses were entered in to an Excel file and categorised according to themes using a general inductive approach. Answers with more than one reason were broken down into distinct meaning units, for example, if a participant had answered “cost and RYO last longer”, that was categorised under “cost” and “lasting longer”. Parents who had not provided ethnicity information or who smoked both RYO and FM were excluded from this analysis.
Ethics approval for the study was obtained from the University of Auckland Human Participants Ethics Committee.

Results

Of the 4222 households that were sent a questionnaire, 2,973 responded, making the response rate 70%. Of those who responded, 813 (27%) were smokers and responded to the question stating their preference for RYO or FM cigarettes and 382 responded to the question asking reasons for smoking RYO. 691 (23%) responded to the ethnicity question and of these there were 327 (47.3%) Māori, 236 (34.2%) Pacific people, 39 (5.6%) Asian and 89 (12.9%) European/Others participants.

Forty-seven percent (382) smoked only FM cigarettes, 38% (310) smoked only RYO and the rest (15%) smoked both. Tobacco type use varied by ethnicity (Table 1). Smoking only RYO was most common (53%) among European/others. For the other ethnic groups, FM use was more common than RYO. Using Māori and Pacific smokers as the comparator the relative risk of smoking RYO was significantly higher for European and others and significantly lower in Asians (Table 2).

**Table 1. Cigarette type by ethnicity (n=691)**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Factory</th>
<th>RYO</th>
<th>Both</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori</td>
<td>n</td>
<td>%</td>
<td>133</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>41</td>
<td>40</td>
</tr>
<tr>
<td>Pacific peoples*</td>
<td>n</td>
<td>%</td>
<td>117</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>50</td>
<td>38</td>
</tr>
<tr>
<td>Asian</td>
<td>n</td>
<td>%</td>
<td>28</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>72</td>
<td>23</td>
</tr>
<tr>
<td>European &amp; others</td>
<td>n</td>
<td>%</td>
<td>30</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>34</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>n</td>
<td>%</td>
<td>308</td>
<td>276</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>45</td>
<td>40</td>
</tr>
</tbody>
</table>

*Mostly of Samoan, Tongan, Niuean, or Cook Islands origin.

**Table 2. Relative risk of exclusively smoking RYO, by ethnicity**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>FM (%)</th>
<th>RYO (%)</th>
<th>Total</th>
<th>Relative risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Māori &amp; Pacific</td>
<td>250 (53.2%)</td>
<td>220 (46.8%)</td>
<td>470</td>
<td>1.00</td>
</tr>
<tr>
<td>Asian</td>
<td>28 (75.7%)</td>
<td>9 (24.3%)</td>
<td>37</td>
<td>0.52 (0.29, 0.92)</td>
</tr>
<tr>
<td>European &amp; others</td>
<td>30 (39.0%)</td>
<td>47 (61.0%)</td>
<td>77</td>
<td>1.30 (1.06, 1.60)</td>
</tr>
<tr>
<td>Total</td>
<td>308 (52.7%)</td>
<td>276 (47.3%)</td>
<td>584</td>
<td></td>
</tr>
</tbody>
</table>

**Reasons for smoking RYO**

Participants’ reasons for smoking RYO are listed in Table 3.
Table 3. Participants’ reasons for smoking RYO (n=382)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (cheaper)</td>
<td>192 (50)</td>
</tr>
<tr>
<td>Last longer</td>
<td>62 (42)</td>
</tr>
<tr>
<td>Taste</td>
<td>31 (8)</td>
</tr>
<tr>
<td>Less toxic/less harmful than FM</td>
<td>21 (5)</td>
</tr>
<tr>
<td>Perceived strength</td>
<td>16 (4)</td>
</tr>
<tr>
<td>Reduce overall smoking consumption</td>
<td>20 (5)</td>
</tr>
<tr>
<td>Smoke less with RYO (extra time factor – to roll)</td>
<td>3 (1)</td>
</tr>
</tbody>
</table>

Most participants, who had answered the question why they smoke RYO, stated that the reason for smoking RYO were because RYO “are cheaper” (192, 50%) and/or “last longer” (62, 42%):

“Roll-your-own cigarettes are cheaper.”

“Because some tailor made cigarettes are [sic] don't last long and roll-your-own may last up to 2 - 3 weeks.”

Of the participants who has stated that RYO last longer, 32 stated that smokers can determine how much tobacco is in a RYO cigarette (20%) and/or 14 stated that RYO only burn when actively smoked (9%):

“Because I can use less tobacco in one smoke.”

“Roll-your owns stop burning [sic] when you stop puffing on it, whereas tailor mades keep burning [sic] right to the butt.”

The taste of RYO was another relatively common category of responses (31, 8%) and perceived strength (16, 4%). Some participants thought RYO tasted stronger than FM and others said the taste was not as strong as FM cigarettes:

“Maybe, because they taste nice, you feel like you get better satisfaction from it.”

“The taste is a lot stronger than tailor made [sic].”

Some participants stated that RYO helped them reduce their overall smoking consumption (20, 5%). Similarly, others stated that they needed more cigarettes in one session if they smoked FM rather than RYO:

“I don't smoke as much, [as] if I smoked tailored made cigarettes.”

“If I smoke tailor made cigarettes it won't be enough with one (so) I will have another two cigarettes.”

Some participants thought they smoked less with RYO because of the extra time it takes to roll cigarettes (3, 1%):

“Because tailor made cigarettes are easy to smoke but when you roll-your-own cigarettes it takes a long time to roll it.”

Some participants said that the lower price of RYO enabled them to continue smoking instead of quitting smoking:

“It's the cheaper way for me to continue smoking.”

A small proportion of the participants (21, 5%) stated that they smoked RYO because they thought RYO were less toxic and therefore less harmful than FM:

“Roll-your-owns are less harmful than tailor made cigarettes. Tailor made cigarettes have more harmful chemicals.”

“There is not much tar in the roll-your-own cigarettes.”
Some participants were suspicious about what might be in FM cigarettes.  
“I don’t know what chemicals they mix with tailor made cigarettes.”

**Brand smoked most often**

Lower priced and discount tobacco brands, that is, brands of cigarettes which sold for at least NZ $1.50 less than a premium brand were the most commonly cited brands smoked, such as Holiday, Park Drive, Horizon and Port Royal (Table 4).

**Table 4. Brands used most often for roll-your-own (RYO) and factory-made (FM) cigarettes**

<table>
<thead>
<tr>
<th>Brand</th>
<th>RYO (n=253)</th>
<th>FM (n=251)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency for RYO brands n (%)</td>
<td>Frequency for FM brands n (%)</td>
</tr>
<tr>
<td>Holiday</td>
<td>73 (28.9)</td>
<td>83 (33.1)</td>
</tr>
<tr>
<td>Park Drive</td>
<td>38 (15.0)</td>
<td>–</td>
</tr>
<tr>
<td>Horizon</td>
<td>37 (14.6)</td>
<td>26 (10.4)</td>
</tr>
<tr>
<td>Port Royal tobacco</td>
<td>36 (14.2)</td>
<td>1 (0.4)</td>
</tr>
<tr>
<td>Winfield</td>
<td>12 (4.7)</td>
<td>33 (13.2)</td>
</tr>
<tr>
<td>Pall Mall</td>
<td>11 (4.4)</td>
<td>36 (14.3)</td>
</tr>
<tr>
<td>Benson &amp; Hedges</td>
<td>8 (3.2)</td>
<td>25 (10.0)</td>
</tr>
<tr>
<td>John Brandon</td>
<td>6 (2.4)</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>Dunhill</td>
<td>4 (1.6)</td>
<td>6 (2.4)</td>
</tr>
<tr>
<td>Rothmans</td>
<td>4 (1.6)</td>
<td>16 (6.4)</td>
</tr>
<tr>
<td>Pocket Edition</td>
<td>3 (1.2)</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>Marlboro</td>
<td>2 (0.8)</td>
<td>0</td>
</tr>
<tr>
<td>Drum</td>
<td>2 (0.8)</td>
<td>–</td>
</tr>
<tr>
<td>Longbeach</td>
<td>1 (0.4)</td>
<td>7 (2.8)</td>
</tr>
<tr>
<td>Freedom</td>
<td>1 (0.4)</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>Ashford</td>
<td>1 (0.4)</td>
<td>0</td>
</tr>
<tr>
<td>John Player &amp; Sons</td>
<td>0</td>
<td>1 (0.4)</td>
</tr>
<tr>
<td>Brand Unspecified</td>
<td>14 (5.5)</td>
<td>5 (2.0)</td>
</tr>
</tbody>
</table>

**Discussion**

RYO use has increased significantly in NZ as smokers have shifted from predominantly smoking FM cigarettes. Our findings support previous research that suggest price is a key reason for RYO use.\(^\text{16,17}\) However, taste and a belief that RYO might be less harmful than FM are other reasons for RYO use, which is also consistent with previous studies.\(^\text{17}\) Increasing the tax on tobacco is a public health intervention aimed at reducing smoking-related harm by driving down consumption and smoking prevalence rates.

Some smokers in this study believed that using RYO helped them to reduce their consumption. But, they also admitted that RYO enabled them to keep smoking rather than stop smoking altogether, which is similar to previous findings.\(^\text{15,16}\) It is possible that smokers compensate for the lower tobacco yield by self-up-regulating their nicotine intake through inhaling deeper.\(^\text{21}\) Unfortunately, this would work against any potential health benefits associated with reduced consumption.
In April 2010, the excise tax on tobacco increased by 10% with an extra 14% rise on RYO to remove the price-difference. However, the tax on RYO versus FM has only equalised if smokers continue to roll their cigarette at 0.7 grams. RYOs may still be cheaper relatively, but 14% more expensive than prior to the tax excise. It was argued that the price increase would result in greater benefit for youth and low income smokers as they were thought to be more sensitive to price. Participants in this study were drawn from a low socioeconomic area of South Auckland.

Like Young et al smokers in the Keeping Kids Smokefree study were high users of RYO, but use of RYO was relatively low, with around 53% smoking RYO in comparison to 73% in Young et al’s study. Our finding that European parents were more likely to use RYO than any of the other ethnicities, is somewhat inconsistent with previous studies which found that RYO use was highest among Māori. Potential reasons for this may be the lower socioeconomic status of the parents in the study. It could also reflect a cultural difference, that is, that Asian and Pacific smoking behaviour is still very much centred on FM smoking.

This study confirms that the myth that RYOs are less harmful persists to some extent. Darrall & Figgins found that RYO cigarettes produce higher levels of tar and nicotine than FM. There is an increased risk of oesophageal cancer and laryngeal cancer associated with RYO smoking. A recent NZ study concluded that RYO are at least as harmful as FM. Policies to counter popular misperceptions about RYO are needed, such as mass media campaigns to better inform smokers. One example of such campaigns is the “Smoking. Face the Facts” campaign, which has been promoting the fact that “Rollies are not a safer smoke” since mid-2009.

In our study, some participants thought that RYO contained fewer harmful chemicals than FM when in fact RYO contains far more additives than FM cigarettes. In 2006, 94% of the 130 tonnes of additives used in tobacco products was reported to be in hand-rolled tobacco. It is possible that loose tobacco could be mistakenly seen as less harmful because they are perceived to be more ‘organic’ and ‘natural’ than FM.

We found that participants in this study preferred RYO brands that were among the cheapest: Holiday, Park Drive and Horizon. This finding is consistent with previous research and supports that price is a key factor in choice of tobacco product.

One limitation of these results is that they are not based on a random sample, however, all parents of four schools were recruited. Participants were parents/caregivers of students from four low decile intermediate schools in South Auckland, limiting the generalisability of the results to other populations.

Future studies should monitor the use of RYO versus FM by ethnicity and SES. This could be done through the analysis of Action on Smoking and Health (ASH) Year 10 data on parents and children, as secondary schools all have decile scores which enable some measure of SES.

In conclusion, firstly, this study adds to the evidence that adults smoke RYOs mainly because RYO smoking is cheaper than smoking FM cigarettes. RYO and FM cigarettes in 2011 are more expensive in absolute terms due to recent price increases, and cigarette consumption and numbers smoking can be expected to decline markedly...
for both types of cigarette. Although the price gap has narrowed, recent tobacco excise changes mean a thin RYO cigarette is still 30% cheaper than a FM cigarette.

Recent sales show that the RYO fraction continues to increase, as FM smokers switch to RYO smoking instead of quitting.\(^{23}\) We conclude that if the recent shift in consumption from FM to RYO smoking is confirmed, tax on RYO cigarettes in 2012 may need to increase more than the 10% increase already legislated.

Secondly, the study shows a minority of smokers still believe RYOs are less harmful. We conclude that funding for campaigns that address this point, such as Face The Facts is still very much needed. Particularly, smokers need to know that loose tobacco is not somehow more ‘natural’ and therefore less toxic or harmful; neither is smoking loose tobacco in any way ecologically friendly or fitting with New Zealand’s clean and green image. Only stopping smoking altogether fits with the vision of Tupeka Kore / a smokefree country by 2025.\(^ {31}\)

Competing interests: None known

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**Acknowledgments:** Bachelor of Health Science students on placement: Sanya Marin & Rohit Bhattacharjee. Jeny Gautam, Research Fellow, Centre for Tobacco Control Research, University of Auckland, The schools: Weymouth, Manurewa, Papatoetoe and Kedgley Intermediate Schools. The project was funded by the Health Research Council of New Zealand.

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**References:**

   [http://www.moh.govt.nz/moh.nsfs/0/D7B3CF1EE94FEFB4C25677C007DDF96](http://www.moh.govt.nz/moh.nsfs/0/D7B3CF1EE94FEFB4C25677C007DDF96)


A cross-sectional study of opinions related to the tobacco industry and their association with smoking status amongst 14–15 year old teenagers in New Zealand

Judith McCool, Janine Paynter, Robert Scrugg

Abstract

Background New Zealand has been at the forefront of tobacco control and can boast an impressive range of tobacco control intervention. To date, tobacco control policy and interventions have directed very little attention to the tobacco industry because they concentrate on reducing demand for tobacco. In addition, the tobacco industry does not have a bold profile in the mass media. Given this low profile of the tobacco industry and the predominance of measures to reduce demand we were interested in teenage perceptions of the tobacco industry in New Zealand.

Methods A cross-sectional sample of 31,459 Year 10 students was obtained in 2006. Attitudes towards the tobacco industry and smoking outcomes were analysed using multivariate logistic regression.

Results Thirty-six percent of students disagreed that tobacco companies are responsible for people starting to smoke and 34% agreed that tobacco companies have equal right to sell cigarettes as other companies to sell their products. Female, Māori and students from low decile schools, who are all more likely to be smoking or have tried smoking, were more likely to show greater acceptance of the tobacco industry. Intention to smoke was associated with the belief that tobacco industry is not responsible for smoking initiation (odds ratio 1.7, p<0.001), and that the tobacco industry is legitimate and credible (odds ratio 2.9, p<0.001). Tolerant attitudes towards the tobacco industry were strongly associated with intentions to smoke and current smoking amongst teenagers.

Background

New Zealand has had a record of implementing effective tobacco control policies, including no advertising since 1976, a Smoke-free Environments Amendment Act 2003 which prohibits smoking in any public indoor areas including bars and graphic warning labels on cigarette packs. New Zealand has been committed to reducing smoking uptake and increasing smoking cessation. Smokers and young people at risk of smoking have been the target of a range of individual and community interventions which are components of a well-developed tobacco programme.

The tobacco industry however has received minimal critical attention and the public face of the tobacco industry in New Zealand has been somewhat obscure for a number of reasons. Promotion of tobacco products generally only occurs at the point of sale in dairies, petrol stations, supermarket, tobacconists and online. The tobacco industry has often used “front” groups when opposing public health policy measures and has rarely entered debates on tobacco control in the media. Finally when the tobacco
industry has appeared substantially it has been associated with “corporate social responsibility” (CSR) initiatives.  

British American Tobacco New Zealand (BATNZ) has been effective at presenting a picture of a company committed to CSR. Thomson’s critical analysis of tobacco industry documents showed that the health, social and economic costs associated with tobacco use were undermined through consistent use of “softening language” which draws attention away from unethical or deceptive behaviour. Another attempt to create an impression of corporate social responsibility was an article featured in Australian and New Zealand high circulation newspapers about how fun and exciting it was to work for the British American Tobacco, the article emphasized how employees felt well treated and thought their business had turned over a new leaf.  

What has been clear is that public perceptions of the company matter and that BATNZ may have been, until recently, successful at creating an impression of socially responsible company. Research conducted on public perceptions of the tobacco industry and the first tobacco litigation trial in New Zealand (Janice Poe versus BAT) found the majority of public supported the case presented by BAT (64%), and over half thought the tobacco industry were predominantly honest when they communicated with the public (55%). In addition, 65% did not support litigation of the tobacco industry as a means of paying for smoking-related illness and disability. A study of public attitudes towards the tobacco industry in Canada found a slightly higher prevalence of skeptical attitudes towards the tobacco industry. Under half of the Canadian sample (45%) did not support litigation of the tobacco industry to pay for smoking related illness and disability.  

Amongst youth, tolerant attitudes towards the tobacco industry and trust in the tobacco industry were associated with increased risk of occasional or regular smoking in Canada. Currently, little is known about how young people in New Zealand appraise the tobacco industry and whether or not this is associated with increased risk of smoking or susceptibility to smoking.  

It is possible that young people in New Zealand have low skepticism or are ambivalent about the tobacco industry in New Zealand as a result of the low mainstream profile of the tobacco industry. Understanding how young people perceive the tobacco industry may provide valuable insight into the social determinants of smoking uptake and a reason to implement counter-industry campaigns as a supplement to current tobacco control measures.  

We investigated young people’s attitudes towards the tobacco industry in New Zealand and whether or not they are associated with smoking behaviour or susceptibility to smoking.  

**Methods**  
A cross-sectional sample of Year 10 (14–15 years old) students was obtained in 2006 by inviting all New Zealand schools with Year 10 students to participate in a pen and paper survey about smoking. A spreadsheet of New Zealand secondary schools that have Year 10 students is available from the Ministry of Education.  

Schools that agreed to participate in the survey provided the total number of Year 10 classes within the school. The schools were then sent brief instructions; an information sheet and numbered questionnaires. School principals gave permission for teachers to supervise students while they
completed the anonymous self-administered questionnaires in class. To maintain confidentiality, teachers did not examine the surveys for completeness.

**Current smoking status and intention to smoke**—Smoking status and intentions regarding smoking were measured using four questions. The first was, ‘Have you ever smoked a cigarette, even just a few puffs?’ Students could respond either yes or no. The second question asked, ‘How often do you smoke now?’ The students were able to choose from ‘I have never smoked/I am not a smoker now’ or at ‘least once a day’ or ‘at least once a week’ or ‘at least once a month’ or ‘less often than once a month’.

Students who reply yes they have smoked a cigarette or had a few puffs to the first question but were not a smoker now or smoked less than once a month were considered experimenters. Students who replied with daily, weekly or monthly were defined as current smokers. So the three different categories of smoking status used were students who’ve never smoked experimenters and current smokers.

Intention to smoke was assessed using two questions developed and validated by Pierce and colleagues.15-17 “If one of your best friends offered you a cigarette, would you smoke it?” was the first question and “at any time during the next year (12 months) do you think you will smoke a cigarette?” was the second question. Both questions had the same four response options; definitely not or probably not or probably yes or definitely yes. If a student answered definitely not to both questions they were considered as having no intention to smoke and students who responded with any other options were considered susceptible to smoking.

**Tobacco industry awareness variables**—Tobacco industry awareness was measured by a modified Likert scale of responses; agree, disagree and don’t know, to a series of 6 statements.

- I support government laws that control what tobacco companies do
- I would trust what tobacco companies say about the harmful/health effects of smoking
- Tobacco companies are responsible for people starting to smoke
- Tobacco companies should have the same right to sell cigarettes as other companies have to sell their products
- Tobacco companies try to get young people to start smoking
- I would believe it if a tobacco company said they had made a safer cigarette.

Statements were grouped and the responses were summarized in order to minimize the number of logistic regression analyses conducted. The two statements which were most similar c and e were one group and d and f formed the second group based on the proximity of the pro-tobacco control responses following correspondence analysis (Figure 1). The responses were summarized such that agree indicates consistent, unambiguous agreement with strong tobacco control and a skeptical attitude towards the tobacco industry.

Ambivalent responses were those comprising don’t know responses or inconsistent responses to the statements. Disagree includes all those students with consistently tolerant or trusting attitudes towards the tobacco industry.

**Covariates**—Questions about age, gender, ethnicity, peer and parental smoking, and smoking in the home were also included in the survey because they are correlated with smoking behaviour or known predictors of smoking. Students may choose more than one ethnic group, therefore a priority system was used to classify any student choosing Māori as such, and then any Pasifika student (e.g. Samoan, Tongan) as such, followed by any Asian student as such, followed by New Zealand European then other. This order of prioritisation is also used for reporting of results from the New Zealand Tobacco Use Survey.18

Peer and parental smoking was calculated by asking, “Which of the following people smoke?” The response options were; mother, father, older brother or sister, best friend, other close friends and none of these.

Socioeconomic status was estimated using school decile. The school decile is based on the income of parents of students at the school. Students from decile 1 schools have parents with low incomes and students from decile 10 schools have parents with high incomes. School decile information is available from the Ministry of Education.19

**Statistical analysis**—all descriptive data and analyses were performed using Stata version 10 software (StataCorp, USA). A multiple correspondence analysis was used to determine the consistency of
responses to each question and how likely it is that each question is measuring a similar dimension of attitudes towards the tobacco industry. Multiple logistic regressions were used to examine the relationship between smoking intentions, confounding variables and each dimension of tobacco industry awareness identified by correspondence analysis.

Interactions between school decile, ethnicity, parental smoking and tobacco industry attitudes were also examined. The analysis also incorporated a school identity variable in order to account for clustering of the data by school.

Results

Sample characteristics—there were 31,459 questionnaires with completed responses on gender, ethnicity, smoking status, intention to smoke and tobacco industry awareness questions. The sample represents about half of all New Zealand Year 10 students in 2006. Fifty-seven percent of 515 eligible schools participated in the survey. Demographic, social and smoking characteristics of the sample are reported in Table 1.

Table 1. Demographic, social and smoking characteristics of the sample of 14–15 year old teenagers. The second column shows the percentage of never smokers who are susceptible to smoking and the third column shows the percentage of current smokers amongst the total sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Susceptible to smoking</th>
<th>Have never smoked</th>
<th>Current smoker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>N=17,924</td>
<td>%</td>
<td>N=33,275</td>
</tr>
<tr>
<td>Age</td>
<td>41</td>
<td>11,485</td>
<td>14</td>
<td>21,136</td>
</tr>
<tr>
<td>14 years</td>
<td>39</td>
<td>6382</td>
<td>15</td>
<td>12,420</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>8,438</td>
<td>18</td>
<td>16,824</td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>9,422</td>
<td>11</td>
<td>16,692</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NZ European</td>
<td>43</td>
<td>11,853</td>
<td>11</td>
<td>20,464</td>
</tr>
<tr>
<td>Māori</td>
<td>40</td>
<td>2,036</td>
<td>29</td>
<td>6,863</td>
</tr>
<tr>
<td>Pasifika</td>
<td>34</td>
<td>1,072</td>
<td>17</td>
<td>2,418</td>
</tr>
<tr>
<td>Asian</td>
<td>27</td>
<td>2,488</td>
<td>5</td>
<td>3,194</td>
</tr>
<tr>
<td>Other</td>
<td>35</td>
<td>394</td>
<td>8</td>
<td>596</td>
</tr>
<tr>
<td>Parent smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>39</td>
<td>12,959</td>
<td>8</td>
<td>19,901</td>
</tr>
<tr>
<td>One</td>
<td>42</td>
<td>3,400</td>
<td>19</td>
<td>8,327</td>
</tr>
<tr>
<td>Both</td>
<td>38</td>
<td>1,345</td>
<td>33</td>
<td>4,975</td>
</tr>
<tr>
<td>Peer smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>34</td>
<td>13,478</td>
<td>3</td>
<td>18,659</td>
</tr>
<tr>
<td>One or more</td>
<td>46</td>
<td>4,226</td>
<td>29</td>
<td>14,544</td>
</tr>
<tr>
<td>Smoking in the home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>1,492</td>
<td>30</td>
<td>4,907</td>
</tr>
<tr>
<td>None</td>
<td>39</td>
<td>15,024</td>
<td>10</td>
<td>24,990</td>
</tr>
<tr>
<td>Sometimes</td>
<td>44</td>
<td>1,305</td>
<td>23</td>
<td>3,503</td>
</tr>
<tr>
<td>School SES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>37</td>
<td>1,896</td>
<td>22</td>
<td>4,896</td>
</tr>
<tr>
<td>Medium</td>
<td>40</td>
<td>8,606</td>
<td>15</td>
<td>16,986</td>
</tr>
<tr>
<td>High</td>
<td>41</td>
<td>7,413</td>
<td>9</td>
<td>11,819</td>
</tr>
</tbody>
</table>
Multiple correspondence analysis—the multiple correspondence analysis indicate that there is generally good consistency of responses to the statements (a), (b), (c), (d), (e) and (f). The responses form three distinguishable clusters, don’t knows are with other don’t knows and the two clusters of agree and disagree groups match the logical sense in which the statements were asked (Figure 1)—i.e. in general responses of support for government laws that control what tobacco companies do clustered with not believing if the tobacco industry said they had made a safer cigarette. Therefore it is likely that each of the questions is measuring a single dimension of tobacco industry awareness and the comprehension of the questions is good. Responses to the two most logically similar questions (c) and (e) also cluster most closely together.

Figure 1. Graph showing results of multiple correspondence analysis of the responses to the six statements about the tobacco industry

Attitudes towards the tobacco industry—Student’s responses to questions about the tobacco industry indicated a high level of ambivalence towards tobacco industry and their conduct (Table 2). For example, over half of the sample, (53%) considered the tobacco industry to be honest about the effects of smoking on health but only 10% reported that they would believe it if a tobacco industry said they had made a safer cigarette. Interestingly, over half the sample also supported the notion that the government should have control over tobacco industry behaviour. Only a third of teenagers believed that tobacco companies should have the same rights as other companies have to sell their products. Just over one-third of teenagers agreed
that the tobacco industry tries to get young people to start smoking. A higher level of trust in the tobacco industry and lower support for government intervention was found amongst females, Māori and students from low decile schools.

Table 2. Table showing the percent of students who agreed with each statement about the tobacco industry by demographic factors

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I support government laws that control what tobacco companies do</td>
<td>54 %</td>
<td>14 %</td>
</tr>
<tr>
<td>I would trust what tobacco companies say about the harmful/health effects of smoking</td>
<td>53 %</td>
<td>24 %</td>
</tr>
<tr>
<td>Tobacco companies are responsible for people starting to smoke</td>
<td>36 %</td>
<td>33 %</td>
</tr>
<tr>
<td>Tobacco companies should have the same right to sell cigarettes as other companies have to sell their products</td>
<td>33 %</td>
<td>36 %</td>
</tr>
<tr>
<td>Tobacco companies try to get young people to start smoking</td>
<td>34 %</td>
<td>10 %</td>
</tr>
<tr>
<td>I would believe it if a tobacco company said they had made a safer cigarette</td>
<td>66 %</td>
<td>10 %</td>
</tr>
</tbody>
</table>

Logistic regression exploring tobacco industry awareness and intention to smoke

Positive attitudes towards, or trust in, the tobacco industry were significantly and independently associated with susceptibility to smoking and current smoking, adjusting for age, gender, ethnicity, peer smoking, parental smoking, smoking in the home and school decile (Table 3). There were no significant interactions between school decile, ethnicity, parental smoking and tobacco industry attitudes variables.

Students who disagreed that tobacco companies are responsible for people starting to smoke were almost twice as likely to be smoker or be susceptible to smoking in the future. Students who report that they agreed that tobacco companies are trustworthy were more likely to be smokers or be susceptible to uptake of smoking in the future.

Discussion

In this paper we measured young people’s attitudes towards the tobacco industry and smoking intentions and behaviour. Findings from the logistic analysis of cross sectional data from 31,459 students from New Zealand schools identified a significant positive association between susceptibility to smoking uptake and positive or tolerant attitudes towards the tobacco industry. About 10–30% of teenagers who expressed tolerant or uncritical attitudes towards the tobacco industry were at high risk of starting smoking or continuing to smoke. A considerable proportion of the sample was undecided or ambivalent about the tobacco industry. It is possible that this merely reflects the lack of public recognition of the tobacco industry in New Zealand or is the result of deliberate self protective mechanisms of the industry.
Table 3. Results of logistic regressions examining the outcome of intending to smoke versus definitely no intention to smoke or the outcome of being a current smoker versus having never smoked or being an experimenter

<table>
<thead>
<tr>
<th>Statements c) and e)</th>
<th>Definitely no intention to smoke</th>
<th>Susceptible to smoking uptake</th>
<th>Adjusted Odds Ratio*</th>
<th>95% CI</th>
<th>Never smoked or experimenter</th>
<th>Current smoker</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>3,673</td>
<td>2,276</td>
<td>1</td>
<td>Reference</td>
<td>5,877</td>
<td>487</td>
<td>1</td>
<td>Reference</td>
</tr>
<tr>
<td>Ambivalent</td>
<td>8,904</td>
<td>7,494</td>
<td>1.3</td>
<td>1.2-1.4</td>
<td>16,197</td>
<td>2,285</td>
<td>1.5</td>
<td>1.3-1.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>2,643</td>
<td>3,268</td>
<td>1.7</td>
<td>1.5-1.8</td>
<td>5,829</td>
<td>1,879</td>
<td>3.0</td>
<td>2.6-3.4</td>
</tr>
</tbody>
</table>

P<0.001

<table>
<thead>
<tr>
<th>Statements d) and f)</th>
<th>Definitely no intention to smoke</th>
<th>Susceptible to smoking uptake</th>
<th>Adjusted Odds Ratio*</th>
<th>95% CI</th>
<th>Never smoked or experimenter</th>
<th>Current smoker</th>
<th>Adjusted Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>6,723</td>
<td>3,419</td>
<td>1</td>
<td>Reference</td>
<td>10,062</td>
<td>445</td>
<td>1</td>
<td>Reference</td>
</tr>
<tr>
<td>Ambivalent</td>
<td>7,999</td>
<td>8,711</td>
<td>2.0</td>
<td>1.9-2.1</td>
<td>16,481</td>
<td>3,429</td>
<td>3.5</td>
<td>3.1-3.9</td>
</tr>
<tr>
<td>Agree</td>
<td>531</td>
<td>949</td>
<td>2.9</td>
<td>2.5-3.3</td>
<td>1,430</td>
<td>782</td>
<td>8.2</td>
<td>7.0-9.5</td>
</tr>
</tbody>
</table>

P<0.001

Statement c) Tobacco companies are responsible for people starting to smoke
Statement e) Tobacco companies try to get young people to start smoking
Statement d) Tobacco companies should have the same right to sell cigarettes as other companies have to sell their products
Statement f) I would believe it if a tobacco company said they had made a safer cigarette

* Other covariates in model were gender, age, ethnicity, parental and peer smoking, school SES (socioeconomic status) and smoking in the home
Previous research identified that young people may be reluctant to, or simply unable to provide a clear opinion on issues that they are undecided about. This is qualitatively different from having no awareness and opinion about the tobacco industry. Accordingly, it is possible that reporting an ambivalent position ensures personal integrity remains intact. This ambivalent proportion of teenagers was also at higher risk of smoking uptake or currently smoking.

**Limitations**—This was a cross-sectional study so we could not definitively assign cause and effect. Tolerant attitudes and lack of scepticism towards the tobacco industry either increased the risk of smoking uptake or arose as a result of current smoking or interest in smoking. Logistic regression analysis controlled for all other known predictors (mediators) but longitudinal analysis will be needed to determine whether ambivalent or positive perceptions of the tobacco industry are predictive of smoking intentions.

The items for measuring attitudes towards the tobacco industry were a collection of questions from different surveys and as such showed poor consistency.

The school response rate to this census survey (57%) was modest and was lower in 2006 compared to previous levels for the same survey (58–67%). Decreasing survey response rates is a global phenomenon. However, all deciles are represented and the sample is almost half of all New Zealand Year 10 students. Approximately 3% (1000) questionnaires included incomplete data, but does not compromise the integrity of the data set or analysis.

**Conclusion**—Tobacco counter-industry campaigns have had considerable success in increasing scepticism and negative attitudes towards the tobacco industry. Hershey and colleagues explored how counter-industry campaigns aired in the US impacted on smoking behaviour among youth. They observed that exposure to counter-industry messages altered attitudes towards the industry, reduced receptivity to promotion activities and hence reduced the likelihood of smoking. The Florida Truth Campaign was possibly the most successful of the anti-industry campaigns and has since attracted considerable recognition.

The Florida “Truth” campaign, which focused on anti-industry media, went national with the support of the American Legacy Foundation. Despite New Zealand’s relatively “quiet” tobacco industry presence they are a formidable enterprise, as acutely evidenced by the 2006 Pou versus BAT tobacco litigation trial. Within New Zealand, scepticism and lower tolerance of the tobacco industry seem to have increased in recent years amongst adults. Given the results of this survey there is clearly a need to reach teenagers at risk of taking up smoking and continuing to smoke with an effective counter-industry campaign.
Competing interests: Dr Judith McCool is a lecturer in global health, Dr Robert Scragg is an Associate Professor in Epidemiology and Biostatistics; both are employed at the University of Auckland funded on Vote: Education funding; Dr Janine Paynter is a research and policy analyst with Action on Smoking and Health (NZ).

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Acknowledgements: Funding for this study was provided by Health Sponsorship Council of New Zealand. The researchers also acknowledge the support of the New Zealand Youth Tobacco Monitor team—the staff and students of the schools who participated in this research.

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References:


Comparison of two modes of delivery of an exercise prescription scheme

Louise Foley, Ralph Maddison, Zanta Jones, Paul Brown, Anne Davys

Abstract

Aim Green Prescription (GRx) referrals from health professionals have been shown to be effective for increasing the physical activity levels of patients. Little is known about which methods of delivering the programme represents the best value for money. The purpose of this paper was to compare the cost and outcomes of two modes of delivery of a GRx programme. One mode offered phone support involving monthly telephone calls over a 3-4 month period to encourage physical activity participation. A second mode offered community support via weekly face-to-face support group meetings in which physical activities were offered.

Methods The evaluation involved staff interviews, patient interviews and analysis of GRx records for the 2007 calendar year.

Results There was a large rate of drop-out (68%) from GRx referral to registration. For those who registered, there was a clear preference for community support, and engagement of Māori and Pacific peoples was higher in this mode of delivery. The proportion (but not absolute number) of people who successfully completed their mode of delivery was higher with phone support. However, participants in community support self-reported a significantly greater number of days of exercise per week than those in phone support. The total expected cost per person for phone support was $102.07 and $108.15 for community support. A greater proportion of participants in community support were very satisfied overall with their mode of delivery.

Conclusion The two modes were comparable in cost and outcomes, though there was greater penetration of target ethnic populations in community support. Providing a choice of GRx mode of delivery allows participants to choose based on their personal and cultural needs.

Adult obesity has reached epidemic proportions in developed countries. Regular physical activity can both prevent and treat obesity, as well as reducing the risk of chronic disease.

International and New Zealand (NZ) guidelines for physical activity recommend adults perform a minimum of 30 minutes of moderate activity on at least 5 days of the week; however, most adults do not meet these guidelines.

Public health approaches to combat population-level inactivity include the development of primary care exercise prescription schemes, which offer support for initiating and maintaining a physically active lifestyle.

Exercise prescription schemes vary considerably regarding the mode of delivery and intensity of contact. Telephone counselling is a low-cost, pragmatic way to deliver an exercise intervention and a narrative review of the literature found support for its
benefit in promoting long-term physical activity in adults. Other schemes involve face-to-face contact and a supervised exercise programme.

A recent systematic review of primary-care initiated supervised exercise programmes found a significant increase in the number of sedentary people becoming moderately active when participating in these schemes. The combined relative risk was 1.20, indicating that for every 17 sedentary adults referred, one would become moderately active. However, compliance to the programme was typically poor and the absolute risk reduction was low.

Green Prescription (GRx) is a referral from a health professional (general practitioner or practice nurse) for a patient to become more physically active to improve their health. GRx delivery in the form of motivational telephone counselling over three months has been shown to be a cost-effective way of increasing physical activity among inactive New Zealanders. For every 10 sedentary adults referred, one became physically active and sustained this change for 12 months. Each GRx carried an associated cost of NZ$170 per patient, and the cost-effectiveness of this programme for increasing physical activity was favourable compared to other published interventions.

The success of GRx programmes hinge upon the extent to which patients adhere to the exercise schedule. Traditionally, GRx support has been provided via the telephone (referred to hereafter as phone support). This takes the form of monthly calls to participants over a 3–4 month period, whereby patients are assisted with goal setting, action planning, provided with information and are encouraged to participate in physical activity. But other modes might yield greater adherence and thus be more cost effective.

For instance, a second mode of delivery has recently been introduced in Auckland that provides group-based face-to-face support in a community setting (referred to hereafter as community support). This approach was developed as an attempt to better meet the needs of Māori (indigenous), Pacific, and low socioeconomic individuals, to assist participants to develop the skills and confidence necessary to make positive choices about physical activity and nutrition, and to reduce the barriers to regular participation in physical activity.

The long-term outcomes expected from the GRx initiative are that GRx participants sustain sufficient physical activity and nutritional changes for improved health outcomes, and that the re-designed GRx programmes and infrastructure are internally consistent, viable, sustainable, responsive to need, and have the capacity to service the demand for increased GRx referrals.

The purpose of this study was to compare the costs and outcomes associated with these two modes of delivery (community support and phone support). The specific objectives were to compare the two modes of delivery in terms of:

1. Outcome measures
   - Engagement (numbers referred versus numbers registered) and completion of programme.
• Penetration of high needs ethnic communities (Māori, Pacific, South Asian).
• Successful intermediate and long-term outcomes (self-reported increase in physical activity, improvement in health/body composition, positive wellbeing, and positive influences on the wider community).
• Client satisfaction and acceptability.

2. Cost of each mode of delivery.

Methods

Design
The evaluation consisted of a comparative process, cost, and outcome evaluation of the two GRx modes of delivery (community support and phone support). The evaluation involved one GRx contract holder in the greater Auckland area which covered two geographical regions (sites) (central and south).

GRx registration
Recruitment for the GRx occurred as follows: In areas where community support programmes are available, referred clients are first given the option of attending the community programme. If this is considered unsuitable, clients are offered phone support. If the client lives in an area where a community support programme is unavailable, they are given the option of phone support or travelling to the nearest community support programme. Registration for the community support mode of delivery occurs when the participant attends the community programme for the first time. Registration with the phone support mode of delivery occurs either during the initial phone contact with the client, or at an arranged second phone call.

Participants
Within these two geographical sites, all referred clients who were recorded on the GRx database within the 2007 calendar year were included in the analysis. A client satisfaction questionnaire was administered to participants who had initiated their respective mode of delivery within the calendar year. Cost data from this time period was provided by the GRx contract holder’s accounts and from interviews with GRx support staff.

Procedure

Process evaluation—The process evaluation identified engagement in the modes of the delivery and penetration of high needs ethnic communities.
To assess engagement, the following data were extracted from the database:
• Total number of referrals.
• Number/percentage of referrals responding to GRx-initiated contact.
• Number/percentage of referrals never responding to contact.
• Number/percentage of contacted referrals registered to each mode of delivery.
• Number/percentage of registered participants that successfully completed their mode of delivery.

To assess penetration of high needs ethnic communities, the total referrals and the participants who registered for a mode of delivery were separated into relative proportions of Māori, Pacific, South Asian, NZ European and Other.

Cost analysis—A resourced-based approach was used to assess the cost of each GRx mode of delivery. As no data was available on costs to participants or other health care providers, the analysis took the perspective of the funder. The cost of delivering the programmes was estimated by identifying the resources required for the initial contact required to register the individual for a mode of delivery.
(either phone or community), to deliver the programme by phone, and to deliver the programme in the community centres, and then applying a common price/cost to each resource unit.

The procedure followed individuals from the initial contact via telephone to the point of either refusal/no contact or registration via one of the two modes of delivery (Figure 1). The number of minutes required during each phase of the process (Table 1) was estimated from interviews with the GRx Manager. Unit costs and resources required to enrol in phone and community support are shown in Table 2.

Table 1. Average minutes required for registration into a mode of delivery

<table>
<thead>
<tr>
<th>Registration phase</th>
<th>Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process fax</td>
<td>10</td>
</tr>
<tr>
<td>Contact</td>
<td></td>
</tr>
<tr>
<td>Contact by phone</td>
<td>15</td>
</tr>
<tr>
<td>Don’t return call</td>
<td>10</td>
</tr>
<tr>
<td>Registration</td>
<td>40</td>
</tr>
<tr>
<td>No contact</td>
<td></td>
</tr>
<tr>
<td>Fail to reach, send letter</td>
<td>10</td>
</tr>
<tr>
<td>Call back – reject</td>
<td>10</td>
</tr>
<tr>
<td>Call back – accept</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 2. Unit cost ($NZ) of resources associated with delivering phone support and community support

<table>
<thead>
<tr>
<th>Resource</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff per hour</td>
<td>$20</td>
</tr>
<tr>
<td>Overheads</td>
<td>100%</td>
</tr>
<tr>
<td>Travel to registration in km</td>
<td>25 km</td>
</tr>
<tr>
<td>Price per km</td>
<td>$1 per km</td>
</tr>
<tr>
<td>Number registrants per session</td>
<td>8</td>
</tr>
<tr>
<td>Facility hire per hour</td>
<td>$30</td>
</tr>
<tr>
<td>Price community session per participant</td>
<td>$11.88</td>
</tr>
</tbody>
</table>

Figure 1. Pathways for registration of participants into a mode of delivery
The resources and costs of delivering the community support workshops are shown in Table 3. Three GRx patient support personnel (PSPs) were interviewed and asked to estimate the average time contacting new clients, registering new participants, delivering the different modes of delivery and following up registered participants in each mode of delivery.

The Accounts Manager provided information on the actual cost of providing programme support and development, as well as information used to estimate the cost of providing the community support workshops.

A meeting was then convened with the GRx contract holder to discuss the preliminary results, clarify assumptions and agree on key areas of uncertainty (i.e., overhead allocation). Information provided by the GRx Manager and participation records kept by support personnel were used to estimate the number of participants lost to follow-up and the time required for initial and follow-up contacts (Figure 2).

### Table 3. Cost of community support workshops

<table>
<thead>
<tr>
<th>Resource</th>
<th>Quantity/Time</th>
<th>Unit cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>0.4 hours</td>
<td>$20</td>
<td>$8</td>
</tr>
<tr>
<td>Facility</td>
<td>1 hour</td>
<td>$30</td>
<td>$30</td>
</tr>
<tr>
<td>Speaker</td>
<td>1 hour</td>
<td>$20</td>
<td>$20</td>
</tr>
<tr>
<td>Travel and set-up</td>
<td>2 hours</td>
<td>$20</td>
<td>$40</td>
</tr>
<tr>
<td>Petrol</td>
<td>25km</td>
<td>$1</td>
<td>$25</td>
</tr>
<tr>
<td>Stakeholder meeting (includes planning and delivery)</td>
<td>0.5 hours</td>
<td>$20</td>
<td>$10</td>
</tr>
<tr>
<td><strong>Total per session</strong></td>
<td></td>
<td></td>
<td><strong>$133</strong></td>
</tr>
<tr>
<td><strong>Cost per participant per session</strong></td>
<td></td>
<td></td>
<td><strong>$2.66</strong></td>
</tr>
</tbody>
</table>

### Figure 2. Contact after enrolment in a mode of delivery
Outcome evaluation—The outcome evaluation utilised a client satisfaction questionnaire to identify changes to intermediate and long-term outcomes in the modes of delivery. The intermediate outcomes were self-reported physical activity (number of days meeting physical activity guidelines per week) and improvement in health/wellbeing. The long-term outcomes were self-reported positive influence on the wider community to support sustained behaviour change.

Clients were asked to rate their overall satisfaction with the service received on a 5-point Likert scale ranging from “very dissatisfied” to “very satisfied”.

The questionnaire was administered to a random sample of past GRx participants. The survey was administered via telephone by GRx PSPs. To minimise response bias, each PSP was assigned to call participants from outside the geographic area they were primarily responsible for.

A total of 193 completed questionnaires were available for analysis; however, one was excluded as the mode of delivery was not specified. 138 and 54 questionnaires were analysed for community support and phone support respectively.

Analysis

Process evaluation—Descriptive statistics were provided for all variables of interest from the database extraction.

Cost analysis—Descriptive information was provided detailing the cost of programme delivery. A decision tree was conducted to identify the pathways that individuals followed to either become enrolled in the programme or not; and for those who enrolled in the programme, the pathways to either completing the programme or not adhering/stop attending.

The decision tree was populated with probabilities taken from the process and outcome evaluations when available. In cases where the information was not available, expert opinion was used. The analysis identified the resources associated with each stage of the process (e.g. minutes required to enrol an individual, travel time to and from the facility). Market prices and rates were used to assign a dollar value to the resource.

In order to examine the robustness of the findings, sensitivity analysis was performed on key parameters identified by the GRx Manager and staff. This included the cost of staff ($30 per hour as opposed to $20), the overhead rate (80% rather than 100%), the cost of running the workshops (increased by 75% to $15 per participant), and the percentage of participants lost to contact (assumed to be equal for phone and community).

Outcome evaluation—Descriptive statistics were provided for all variables of interest. Where mean (average) data were available, independent samples t-tests were used to compare the two modes of delivery on the outcomes of interest. Participants were given opportunity to comment (free text) on aspects of the respective GRx modes of delivery. These qualitative data were analysed using a general inductive thematic approach.

Results

Process evaluation

Of the 5441 referrals received in 2007, 3275 (60%) responded to initial contact by GRx PSPs. Just over 50% of referrals who responded to the initial contact in 2007 ultimately registered with a GRx mode of delivery. The majority opted for community support rather than phone support (Table 4).
Table 4. Mode of delivery selected by GRx referrals who responded to contact

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community support</td>
<td>1562</td>
<td>47.7</td>
</tr>
<tr>
<td>Phone support</td>
<td>164</td>
<td>5.0</td>
</tr>
<tr>
<td>Responded to contact but did not register</td>
<td>1549</td>
<td>47.3</td>
</tr>
<tr>
<td><strong>Total number responding to contact</strong></td>
<td>3275</td>
<td></td>
</tr>
</tbody>
</table>

Of the 5441 referrals received in 2007, 1431 (26.3%) were Māori, 1537 (28.3%) were Pacific, 294 (5.4%) were South Asian, 1480 (27.2%) were NZ European, and 699 (12.9%) were classified as Other. The ethnic composition of referrals that registered for a GRx mode of delivery is presented in Table 5.

Table 5. Ethnic composition of registered participants for community support and phone support

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Community support</th>
<th>Phone support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Māori</td>
<td>389</td>
<td>24.8</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>366</td>
<td>23.3</td>
</tr>
<tr>
<td>South Asian</td>
<td>102</td>
<td>6.5</td>
</tr>
<tr>
<td>NZ European</td>
<td>514</td>
<td>32.7</td>
</tr>
<tr>
<td>Other</td>
<td>201</td>
<td>12.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1572</td>
<td></td>
</tr>
</tbody>
</table>

At the time of the database extraction, 8.5% of community support and 27.4% of phone support participants had successfully completed their mode of delivery. However, because of the higher uptake in community support, the actual numbers of successful completers were 133 and 45 for community support and phone support respectively. The ethnic composition of participants who dropped out of a mode of delivery without completing the programme was similar to the overall ethnic composition of registered participants in each mode of delivery.

Cost analysis

The costs to registration were slightly more for phone support participants than community support (owing to the longer duration). However, total programme costs were higher for community support participants at $108.15 per person versus $102.07 for phone support (Table 6). The results from the sensitivity analysis are shown in Table 7. The analysis suggests the differences between the modes of delivery are fairly robust to changes in the key parameters. While increasing the cost of staffing serves to minimize the difference in the modes, changes in the parameters have relatively small effects (less than 5%).
Table 6. Total costs of programme delivery modelled on probability of participation in all parts of the respective programmes

<table>
<thead>
<tr>
<th>Variables</th>
<th>Probability of registering</th>
<th>Expected cost to point of registration</th>
<th>Total expected cost, including programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>All referrals</td>
<td>100%</td>
<td>$25.98</td>
<td>$46.62</td>
</tr>
<tr>
<td>Not registered</td>
<td>68%</td>
<td>$17.63</td>
<td></td>
</tr>
<tr>
<td>All registered</td>
<td>32%</td>
<td>$43.52</td>
<td>$107.54</td>
</tr>
<tr>
<td>Phone support registers</td>
<td>3%</td>
<td>$51.57</td>
<td>$102.07</td>
</tr>
<tr>
<td>Community support registers</td>
<td>29%</td>
<td>$43.33</td>
<td>$108.15</td>
</tr>
</tbody>
</table>

Table 7. Sensitivity analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Base case</th>
<th>Staff costs $30</th>
<th>Overheads 80%</th>
<th>Workshop costs increase 75%</th>
<th>Increase contact (2nd and 3rd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone support registers</td>
<td>$102.07</td>
<td>$149.10</td>
<td>$92.67</td>
<td>$102.07</td>
<td>$102.07</td>
</tr>
<tr>
<td>Community support registers</td>
<td>$108.15</td>
<td>$150.47</td>
<td>$99.68</td>
<td>$114.55</td>
<td>$110.37</td>
</tr>
<tr>
<td>Difference</td>
<td>$6.07</td>
<td>$1.37</td>
<td>$7.01</td>
<td>$12.48</td>
<td>$8.29</td>
</tr>
</tbody>
</table>

Outcome evaluation

The client satisfaction questionnaire was used to identify intermediate and long-term outcomes associated with each mode of delivery. On average, participants that completed questionnaires in the community support were 59.0 years (S.D 13.8), whereas those in the phone support were 59.8 years (S.D 14.24). There were no statistically significant differences in age between the two groups (95% CI -5.2 to 3.6, p=0.72).

Participants in community support reported participating in significantly more days per week of physical activity than those in phone support (3.65 versus 2.66 days, 95% CI 0.30 to 1.70, p=0.006). Both modes of delivery reported similar changes to various aspects of health.

The most common changes noticed were feeling stronger, having more energy, losing weight and generally feeling better. A small proportion of participants in both modes of delivery reported wider benefits of GRx in their family and the wider community, such as encouraging other family members to become active and joining community exercise groups. A greater proportion of participants in community support were very satisfied overall with their mode of delivery compared to phone support (66% versus 41%).

Discussion

The purpose of this study was to compare the costs and outcomes of two modes of delivering a GRx programme. This is the first study of its kind, and the findings suggest the two modes of delivery are associated with similar costs and outcomes.
Process evaluation

The process evaluation indicated a low level of uptake of GRx following referral. Irrespective of the mode of delivery only 32% of referrals registered with the GRx programme in 2007. Of those that were referred, 40% never responded to GRx-initiated contact. It is possible that the referred patients did not provide updated contact details, or were inappropriately referred (did not understand GRx process or changed their mind).

Future work is required to determine what factors contribute to the gap between referral and initiation of the programme. Of those who did respond to contact, a greater proportion opted to register for community support as compared to phone support. Community support programmes engaged a greater proportion of Māori and Pacific people compared to phone support (this was particularly evident for Pacific individuals). This higher level of engagement may be due to the emphasis on face-to-face contact, social support, collective involvement, and participation, which is more culturally appropriate.

For phone support, greater proportions were classified programme completers as compared to community support. However, because of the greater engagement in community support, the total number of participants who completed their programme was higher for this mode of delivery (133 in community support versus 45 in phone support). The differential proportions of those completing a programme may also be affected by the method by which participants report achieving this status. In phone support, participants are classified as programme completers if they complete their three calls and decline re-referral.

In community support, participants are classified as programme completers when they attend a graduation ceremony where a list of their achievements is read out in front of their peers. Because of this, there may be a tendency to over-report programme completion in the phone support group.

Cost analysis

Overall the costs associated with the two respective modes of delivery were comparable ($108.15 per person for community support, and $102.07 for per person phone support). Because of the additional time involved the costs to registration are slightly more for phone support than community support. However the costs associated with conducting the community support programmes were greater which resulted in higher total programme costs for community support participants compared to phone support, with a $6 differential. The costs per person were similar to a previous estimate of $170 per person for telephone-based support in a different region of New Zealand.9

The findings need to be considered in the context of the assumptions presented in the analysis. It is clear that each mode of delivery has pros and cons in terms of overall engagement and for targeted populations and those who are discharged as independently active. However, given the similar costs it is also important to provide potential participants with a choice of delivery, which best meets their personal and cultural requirements.
Outcome evaluation

The positive effects of community support on self-reported regular physical activity participation supports previous research, which highlights the importance of face-to-face support and social support to assist sedentary New Zealanders to increase their physical activity.10

When the current guideline for physical activity was considered, a greater proportion of those in community support exercised on five or more days of the week compared to phone support (35% versus 20%). However physical activity was based on a self-report measure, and there is inherent bias associated with this approach.

Participants in both modes of delivery self-reported positive changes to their health. The desire for social support may also partially explain why a greater number of participants in community support were very satisfied overall with their mode of delivery compared to phone support.

General discussion

Findings from this evaluation must be considered in relation to its limitations and constraints. The before-after study design limits the generalisability of results. Data were only reviewed for the 2007 calendar year which may have biased results; however to address this we did examine the database for the 2006 calendar year for comparison and found similar results.

The disproportionate numbers of participants in the phone versus community support programmes may further limit the generalisability of these findings to the geographical location evaluated. To address this, it is recommended that a similar evaluation is conducted at different locations within NZ, which would permit comparability and help to inform future expansion costs. A final consideration is the unequal numbers of questionnaires returned in the outcome evaluation for the two modes of delivery. Again, this is a function of the greater number of registrations into community support programmes.

Future research may wish to focus on extension of the results reported here that were outside the scope of the current project. For example, a full analysis of the impact of the GRx services on the physical activity environment (including but not limited to affordable rates at gyms and increases in the availability of activities appropriate to beginners). Another option would be to model the long-term impact of increasing physical activity on primary and secondary care costs (medication, hospital visits etc).

In conclusion, the two modes were comparable in cost and outcomes, though there was greater penetration of target ethnic populations in community support. Providing a choice of GRx mode of delivery allows participants to choose based on their personal and cultural needs.
Competing interests: None.

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References:

Voices of students in competition: Health Science First Year at the University of Otago, Dunedin

Madgerie Jameson, Jeffrey Smith

Abstract

Aim The experiences and adjustments of students enrolled in Health Science First Year (HSFY) at the University of Otago (Dunedin, New Zealand) were explored to understand students’ response to competition. The paper highlights the expressions of past and present HSFY students’ impressions of the programme, their experiences, coping strategies and the lessons they learned from the programme.

Methods Qualitative data were collected from past (n=15) and present (n=20) HSFY students who wanted to pursue medicine. Eight semi-structured interview questions were used to answer four research questions that aimed to answer the following: students’ impressions of HSFY, students’ experiences of HSFY; students’ adjustments to HSFY, and lessons learned from HSFY. The interviews were analysed using narrative analysis to gain a greater understanding of their experiences and adjustment.

Results The results indicate students perceive the programme as demanding and stressful. The highly competitive nature of the programme inhibited their engagement and involvement in other aspects of university life. Students identified their experiences as successes and challenges. In terms of adjustment, students used cognitive restructuring, self regulation and social support. Students learned that they need to balance academic and social life because spending too much time almost exclusively on academics didn’t enrich their first year at university.

Conclusion The nature of the learning environment impacts on students’ holistic development. The competitive nature of the programme elicited undue stress on students. However, they had to employ strategies to help minimise the impact of stress on their functioning.

The first year of university is perceived as a defining moment for students because their experiences and adjustment during that year influence the quality of their university life.¹⁻⁸

During that year many students are leaving the family home for the first time and they have to adapt to a new lifestyle and cope with the academic demands of university. Researchers assert that the students’ perceptions of their experiences of and adjustment to university during their first year can make a significant impact on academic self-efficacy,⁹⁻¹¹ wellbeing,¹² and performance.³

Literature on “the first-year experience” suggests that students’ who are able to deal with their challenging university experiences during the first year exhibit positive behaviours during their years at university and display a high level of resilience.¹³,¹⁴
Other educators expressed concerns about the students who are unable to deal with the challenging first-year experience. The researchers conclude that students who do not display resilience suffer academically which in turn may jeopardise their success at university and their emotional wellbeing.

Research has suggested that the new generation of students who apply for admission into first-year university are familiar with the rigorous selection process. It is expected that students who wish to enrol at university, especially medical school, are faced with a competitive admissions process.

Although there is ample research on the challenges faced by students who apply to competitive universities for admissions there is far less work on students whose first year at university is the basis for admission into a programme beginning in the second year.

This paper explores students’ experiences of and adjustments to Health Science First Year (HSFY) at the University of Otago, who wish to pursue the study of medicine. The students are already enrolled in first year but they are competing for selection into second year medical school.

Selection is competitive because there are more students than places available in second year medical school. During the time of this research, approximately 1800 students were enrolled in HSFY; of these 750 applied for 190 places in medical school. Selection into medical school is based on how well students perform during their first year.

HSFY is an intensive programme developed by the University of Otago. It is one of the avenues for students to enter second year medical school. This programme provides students with the prerequisites to enter the following second year health sciences professional programmes, dentistry, medical laboratory science, medicine, pharmacy and physiotherapy.

A limited number of students are selected into the second year programme (dentistry 54, medical laboratory science 60, medicine 190, pharmacy 120, and physiotherapy 120). Therefore, students who are considered for selection into second year medical school must meet and exceed the academic threshold set by the university. Students are required to successfully complete the core academic courses as well as the ‘Undergraduate Medical Admissions Test (UMAT)’.

The preliminary courses for selection into second year professional programmes are very challenging. Besides the normal first-year experiences, HSFY students have to deal with a highly competitive first-year programme. The literature identifying the life events of first-year students is pertinent but it does not directly address the experiences of the students who are in a competitive academic programme during their first year at university.

The aim of the project reported here was to examine the perceptions, values, beliefs, and meanings students constructed during their first year in a high stakes university programme.
The research questions this project sought to address were:

1. What were students’ impressions of their first year in a high stakes learning environment?
2. How did students describe their experiences of HSFY?
3. What mechanisms were utilised by students to help them deal with any challenges they encountered during their first year at university?
4. What lessons were learned from the first-year experience?

Methods

Participants—For this study, a purposeful sample of a cross-section of students enrolled in Health Sciences. A total of 35 students were interviewed. All the interviewees were present and past HSFY students who wanted to pursue medicine. To represent as much variation as possible, the students selected were at various stages of the professional programme. All students enrolled in the programme were invited to be a part of the research. One hundred HSFY expressed interest in the research. Students were given a brief description of the research and they were asked to participate. In the end, 20 present HSFY students and the remaining 15 students were at varying stages of the professional programmes consented to be interviewed. Of the 15 students, 5 students were pursuing other health science programmes; pharmacy and physiotherapy. These 5 students wanted to pursue medicine but were not selected because they did not meet the academic threshold. The other ten students were at varying levels in medical school, from second year to final year medicine.

Measures and procedure—Eight semi-structured questions were used in the interview to gain a greater understanding of the experiences, motivations and issues of concern of past and present HSFY students. To provide a context for the interviews students were asked to describe their impressions of HSFY. This was pertinent to provide a framework for subsequent questions on their experiences, personal adjustment and development during the year. Other follow-up questions were posed to clarify their descriptions and to encourage further elaboration of the students’ responses. The questions typically took the forms of “could you tell me a little bit more about that?” , “what do you mean by that?”; “Can you give me an example?” In a number of cases the follow-up questions opened up avenues for exploration that the original questions did not. The interviews were an average of 30 minutes in duration. All interviews were recorded and transcribed verbatim. The data was entered into multiple text files using NVivo software (QSR V 7, 2005).

Data analysis—The data were analysed using qualitative narrative analysis. Narrative analysis helps the researcher understand the context of the participants’ experiences and the meanings that were brought forward. The meanings of their experiences were placed within the context of HSFY. Using the narratives in the context of first-year experiences in a competitive environment the expression of students’ personal narratives within their reality; what was told and why it was expressed were explored. A simple contingency table chi square test was performed on the data to determine whether the students who were currently in their first year of HSFY saw the programme as fundamentally different from those who made it successfully and are now looking back at it.

Results

The four research questions were analysed on a question-by-question basis. The outcomes will be illustrated using direct quotations from the respondents and graphical representation of the major themes that emerged.
Question 1: What are students’ impressions of HSFY?—Students identified a variety of issues that were prominent during the year. Students’ impressions were grouped into eight major themes; competitive, the various choices available in the programme, the heavy workload, stressful, different from high school, large class size, challenging and limited interactions between lecturers and students.

Table 1 illustrates the themes that emerged from students’ impression of university and the similarities between the past and present HSFY students.

### Table 1. Students’ impressions of HSFY

<table>
<thead>
<tr>
<th>Impressions</th>
<th>Present HSFY</th>
<th>Past HSFY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Competitive</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Good course</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Heavy workload</td>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>Stressful</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Different from high school</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Large class size</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Challenging</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Limited interactions between lecturers and students</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Concerns related to the competitive nature of the programme the heavy workload, and large class sizes were common among past and present students. Other views raised by respondents included the issues related to the difference between high school and university, the quality of the teaching and learning experience.

A number of students, however, highlighted the importance of the programme for future career paths. Although students felt the competition, the challenge and the heavy workload, they enjoyed the content and found the programme an interesting one.

Students’ gave very explicit descriptions and they made a number of observations about the programme. Students expressed concern that the competition demanded more effort than they expected. They needed to ensure that they attained and exceeded the academic threshold needed to be considered for selection into second year medicine.

I think that Healthsci [sic] is pretty competitive because you need to study and you need to compete for limited places in the professional course. Last year we had 1660 students. One of the things about Healthsci is that many people want to get in that is why we have so many students here working hard because everyone wants to get in (2nd year medical student).

In this competitive environment every mark gained or lost is important. One final year medical student remarked that the competition was so intense that she was even concerned about a fraction of a mark. She remarked that every mark counts because half a mark will determine selection into medical school.

I remember missing .5 of a mark in a Chemistry assignment and I panicked. Point five of a mark is important. Imagine me crying about half a mark. Every mark counts because someone would get a fraction of a mark more than you and he would get into med school and you won’t (Final year medical student).
Students remarked that the workload was stressful. They contended that the volume of work they had to cover in first year had an impact on the quality of the work they were able to produce and their wellbeing.

HSFY was like putting your head into a bucket of cold water, mind numbing. It appeared hard due to the amount of knowledge we are expected to learn. I knew it was going to be incredibly intense and very demanding. People told me that before I enrolled. I find it interesting but I am very worried about the amount of work I have to do (Present HSFY student).

The large number of students enrolled in the programme was also mentioned as significant in HSFY. Students perceived that the large class size was related to the competition and the intensity of the programme. They stated that the competition would be acute and therefore they had to work harder than they anticipated. Social comparison was also evident in the responses.

Students questioned their ability to secure the grades needed to secure a place in second-year medical school. The thought elicited stress.

Wow, there are so many people doing this course! It looked like it would be tough in terms of getting high grades to get selected into 2nd year medicine. There are so many smart people. When they first told us there were 2300 HSFY students, I really felt sick. (Present HSFY student).

I guess when I first came to university I did not actually know anything so my impressions of HSFY was HUGE!!! Like the first day the lines course approval was like Oh my God! Do I have to compete against all of them? It was a bit scary for me. I was really scared. You know how health science gets bigger and bigger every year and the line gets longer and longer. Have you seen the Course approval line? (3rd year medical student).

Transition from high school and university was seen as an issue for students. They identified fundamental differences between the two. Students stated that they were not adequately prepared for the transition from high school to university.

It was quite different from high school you have lots of time to revise so it is not that high pressure. At university there are so many subjects going on all the time it seems like it is more every day. When exams come there are so many things to memorize. Sometimes I felt like I couldn’t handle it because it is too much. It is quite stressful especially when you are trying to get high marks to get into medicine (2nd year pharmacy student).

Students’ perceived high school seemed more relaxed because they felt that their teachers provided additional support when they struggled with their studies. At university they did not feel that sense of support. Instead they had to come to terms with self directed learning. They also realised that it was all up to them to get extra support if needed.

Very full on! You go from high school which is low keyed and casual where you do work but at a relaxed pace with a lot of practice questions and plenty of opportunities to get further explanation from the teacher if something is not understood. At university you get thrown in the deep end you are required to pay full attention. You attend lectures up to 7 hours a day (for me including labs). Then, on top of that, you are required to understand it all and keep up will all the SDLs (self-directed learning), online tests, reading and revision (Present HSFY student).
The stress of HSFY was evident when students perceived that they were unable to keep up with the workload, they were not sure what was expected of them in the highly competitive environment.

The stress comes when you just can’t find the time to do it all and yet some people seem to be coping rather well. I had to keep on top of the entire workload. But I suppose it will just take getting used to and finding my own personal learning style (Present HSFY student).

Health sciences was quite stressful and very competitive. I had to study a lot. I think stressful is the main thing I can say about health sciences is very, very stressful. That is what that stands out in HSFY (5th year medical student).

One student identified gave an overview of the programme and identified all the common themes highlighted. The most striking observation was the behaviour of the students in competition.

My impressions of the HSFY itself, it seemed a like people were almost pitted against each other from the start. Not in the brawly type manner but in a quite subtle way. First they come [and] get the good seats, [and] people [were] going to the wrong lectures because it suited them. People were, and still are, pushy and inconsiderate. There is no feeling of camaraderie amongst students, this only refers to the majority, of course there is a very kind and considerate, sadly minority.

The first thing really that struck me was the arrogance of a lot of students, especially in the way streams were ‘hijacked’ to suit them. So the “people side” of my first impressions weren’t very good. But as far as lecture content went, I was ‘captivated from the start’. The programme was very organised from the get go, the lecture handouts were well structured with helpful diagrams where necessary, and this was great. Blackboard was up and running early and the organisation side seemed really good (Present HSFY student).

**Question 2: How do students describe their experiences of HSFY?—Students’ described their experiences as either as successes or challenges.**

**Successes**—Six major themes emerged from the narratives; doing well in exams, making friends, the quality of teaching, independence from home, learning how to cope with pressure, and interesting things to do. Table 2 displays the range of responses elicited from students’ descriptions of their successful experiences.

**Table 2. Students’ successful experiences of Health Science First Year (HSFY)**

<table>
<thead>
<tr>
<th>Successful experiences</th>
<th>Present HSFY</th>
<th>Past HSFY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination results</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Making friends</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Quality of the teaching</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Independence from home</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Taught how to cope with stress</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Interesting things to do</td>
<td>6</td>
<td>40</td>
</tr>
</tbody>
</table>

Overall, students described the learning environment, making new friends and academic achievements as common areas of success. Students attributed their successes to diligence, enthusiasm and social support.

Exams, I guess getting good exam results was pretty rewarding. When I looked at the results I did the work and came out right I am on track. I studied a lot. I studied but at the same time I
had a side track where I went and blow steam out. I had good friends who were older than me and past HSFY students, who’d been there and done that, and so they helped me along (second year medical student).

Notwithstanding the competition, students applauded the quality of the lecturers and tutors.

I made a lot of friends in the college and also I met some great lecturers, they are very helpful. We have tutorial groups, the tutors are very nice as well because they are usually senior students who have been through the health science and they know how we feel. They can teach us how to cope with the pressure (Final year medical student).

The past HSFY students did not list independence from home and learning to cope with pressure as a successful experience.

I had a very good relationship with my parents but it was just really fun to move out and exciting just the whole general thing about student life and stuff. It was cool come down trying something new. Living on hall with your friends was really fun (first-year student)

It has taught me lots about competition and how to deal with competition and sort of keeping your cool. You can see what everyone else around you is up to and you have to keep concentrating on what you are doing. You keep going with that and you keep your mind on the end product. What you are going for and stick with that. I think that you need that focus (first-year student)

Challenges—Nine themes emerged from the students narratives on their experiences that described their challenges; examinations, getting used to university life, keeping up with the workload, not knowing what the lecturers expect from students, trying to balance academic and social life, getting caught up with other students issues, missing friends and family, getting motivated, and the competition. Table 3 gives a brief indication of the challenging issues highlighted.

Table 3. Students’ challenging experiences

<table>
<thead>
<tr>
<th>Challenging experiences</th>
<th>Present HSFY</th>
<th>Past HSFY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Examinations</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Getting used to university life</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Keeping up with the workload</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Not knowing what the lecturers expect from students</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Balancing academic and social life</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Personal challenges</td>
<td>12</td>
<td>60</td>
</tr>
<tr>
<td>Missing home and friends</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Getting motivated</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Competition</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

Keeping up with the workload was a major challenge for students. Students were overwhelmed with work and at the same time they had to deal with the living in proximity with other students who were experiencing personal issues. One student remarked that this was a major challenge for her.

Besides workload, there were issues of just living in close proximity. You get caught in other people’s issues. I think people do not realize how much it influences how well you do. It’s easy to say that you did well or you did not do well. However, if you had to look at the environment that you live in I think it kind of influence a lot more than people recognize. There are issues about them being away from home, their own self-destructive behaviour and
it can actually rub off on a lot of people. Sometimes you have to wear other student’s issues. A lot of things are going on and because you are living in such close proximity you feel you are responsible as well (Present HSFY student).

Just being enrolled in HSFY was a challenge for some students.

Just the fact of being in Health science was a challenge. The other first years they seem more relaxed in general and everyone is sort of teasing you saying “dirty Healthsci, you dirty Healthsci go and study” (Present HSFY student).

Other variations in expressions of their experiences were expressed as the termination of romantic relationships.

One week before my exams were to start, my boyfriend of 19 months tried to dump me over the phone … I spoke to him on the phone for 5 hours to try and hear his point of view and get mine across (2nd year physiotherapy student).

I had some boy problems and this was annoying and very stressful because I got too distracted and wasn’t focused enough in my studies! At the start I couldn’t focus on anything but after this I decided that Health Sci is more important—there is always more time in life for boys (Present HSFY student).

Question 3: What mechanisms were utilized by students to help them deal with any challenges they encountered during their first year at university?—Students employed a number of strategies to deal with their challenges. Three major themes emerged from the data, cognitive restructuring (consciously changing negative thought patterns), self regulation and social support. Table 4 illustrates the strategies employed by students to handle the challenges of HSFY.

<table>
<thead>
<tr>
<th>Coping strategies</th>
<th>Present HSFY</th>
<th>Past HSFY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Cognitive restructuring</td>
<td>12 (60)</td>
<td>6 (40)</td>
</tr>
<tr>
<td>Self regulation</td>
<td>16 (80)</td>
<td>13 (86)</td>
</tr>
<tr>
<td>Social support</td>
<td>14 (70)</td>
<td>8 (53)</td>
</tr>
</tbody>
</table>

Students indicated that they had to look at HSFY from another vantage point. This helped them deal with the competition and the workload

Sometimes I had so much to do and it felt like everything was on top of me and I had to get so much work done. Sometimes I had no idea how I would get it done. Many times I sat down and thought about it… I’ve got to do this. I just sort it out and I knew that I had to just keep going step by step and I’d get there eventually. I also had to ensure that I did not get completely engulfed in stuff. I look at the stuff in a healthy perspective taking a step back and I did what I had to do (2nd year medical student).

Students employed a number of self regulatory practices to help them deal with the workload. They kept records and monitored their progress, set educational goals and employed time management strategies.

I find it [would] help me if I [would] write down my schedule at the start of the week allotted time for things I have to do during the week. I just made sure that I knew what I had to do and allow time to (Present HSFY student).
Well I made up my mind that during the week I won’t watch any television and keep to my schedule. I learnt that it’s important to not overload yourself, set realistic short term goals and try stick to my daily planner. If I plan it well then I shouldn’t feel over worked–its hard though with the amount of work I have to fit in (3rd year medical student).

Students also indicated that the support they received from their friends and family helped them cope with the rigours of HSFY.

I had really good friends on hall especially those who were not doing HS [health science] and they know how stressful HS is. So during the course they were giving me support and even with those who were doing health science although we were competing with each other we tried to help one another as much as possible so in a way it was very good (Final year medical student).

Students dealt with social comparison issues by becoming focused on their studies and ignoring the other students who seem to distract them.

Just close your ears eventually whatever they are just talking crap. They just sit there and go la la do you know this do you know that? I go “no I don’t know” (laughs). I say to them “I’m so not listening to you” and they go like “oh my God I’m going to fail I’m going to fail it’s so hard it’s so hard! It gets to you. They study all the time every time. I’m not that kind of person I can’t just study all my whole life. I’m quite social and stuff. If you ask me to just sit there and study for the whole week I can’t actually. I just close my ears don’t let people pressure me (Present HSFY student).

**Question 4: What lessons were learned from the first-year experience?**—Clearly students indicated that HSFY was a major learning curve. Six themes emerged from students’ responses, time management, and perseverance, assess support, know how university works, put off starting romantic relationships, and do not pay attention to grades other students are getting. Table 5 illustrates the major lessons students learned during the year.

**Table 5. Lessons learned during HSFY**

<table>
<thead>
<tr>
<th>Lessons learned</th>
<th>Present HSFY</th>
<th>Past HSFY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Time management</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Work hard to achieve goals</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Do not pay attention to other students grades</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Romantic relationships can wait</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Know how the university works</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>Access support from friends and family</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

Students acknowledged that when they learned to manage their time effectively, they were able to deal with the heavy workload.

I learned that I had to manage my time. I am trying hard (laughter). I still have not improved on it but a little bit I am working on it I guess. I managed to sort of kinda like control my mind to get down studying. Last year in high school I say to myself I can’t be bothered now. I did it when I was in the mood. But this year it is different with Health Sci. I tell myself I have to do it now and make myself do it. It’s like I had to train my mind that way (2nd year medical student).
The students understood that procrastination is not the best way of handling such a competitive programme. They stated they had to learn to be on top of their work at all times and not to let the work ‘pile up’.

I learned that in Health sci you must not slack around in first half of each semester. It is a good chance to get on top of things. In the first semester I slack off because it was my first time at university adjusting to life and stuff and the third term it was UMAT. I did not really want to do any school work it was just like UMAT prep UMAT prep. Those two times I did not do anything cause me to fall behind. I had to end up catching up at the last minute before a test and it’s not really like the best way to do it (Present HSFY student).

Perseverance was another important lesson learned. Students spoke about other students who dropped out of the course because they felt intimidated by other students who seemed more capable or because they did not do well in a particular course.

I learned that I keep trying because people give up. I’ve seen a lot of people drop out they just think well this is too hard and can’t do it. Persevere you will get there in the end no matter what it takes. It is a year and you will get here if that is what you really want. Students gave up because of the pressure or they got a bad mark during midterm and they dropped out. A lot of them dropped out after chem. (Chemistry). Because chem. was tough (Present HSFY student).

A number of students indicated that they learned that they should seek help when needed.

Go to lectures! I made sure that I went to lectures and took notes; I paid attention to what the lectures said. If I did not understand something I was not afraid to ask for help. I discovered that here was lots of help available I just had to ask (Present HSFY student).

Another lesson learned was to understand the demands of university, especially a competitive learning environment.

Study hard it is completely different from high school teachers do not give you the answers you have to find out for yourself. You have to take the initiative to go and ask the people. Use the discussion board that is placed on the website where you can communicate with the other students and ask for answers. Study group will be good it lets you know what everyone else is for information and stuff like that. At school you would normally get exams with answers but not uni they don’t give you the answers (exams without answers). You can do the exams but you do not know whether you are right or not. This is another thing you can get over by having a study group and you have a better chance of getting it right (2nd year medical student).

Other variations in learning experience saw students learning that they had to change their own perceptions of themselves. One student remarked that she came into university as a straight “A” student from her high school. She quickly learned that she was amongst other “A” students and she was no longer the best of the lot but was now among the best.

I am human and I definitely ate a lot of humble pie this year my friend and I both came into Health Sci as A students. We aced everything at high school. I came at this knowing that it was difficult but with absolute certainty that I would achieve it. I was really, really disappointed that I did not achieve my goal getting into medicine. I thought like wow that’s amazing and maybe I’m not as bright as I thought I was. I was dealing with other ‘A’ students from all over. I was gone from a big fish in a small pond to a very, very small fish in a big river or an ocean (2nd year pharmacy student).

Students learned that social comparison can be defeatist. They had to get on with the work and do not pay attention to the other students achievements.

Not to pay too much attention to what people are doing how they are doing it and what kind of marks they are getting. Concentrate on what I am doing and see how I can improve myself.
Do what is best for me. What’s best for other people is not necessarily be what is best for me (Present HSFY student).

Students acknowledged the programme was stressful and demanded considerable attention. They also realized that they are first-year university students so they need to enjoy their first year at university do not get consumed with HSFY.

I learned that HSFY very competitive and it is a stressful year but I should not get too hung up on the stressful events and take it as my first year of being at university. I was my first year I should have had fun. Also be heavily involved in good effective time management. I see student who did not study as much as I did who had lots of fun got into medicine. They managed their time wisely and they were a good position to complete their papers well and to get good marks. I learned to do the readings and stuff that are recommended because the top exam questions that will give good marks do often come from extra reference material (3rd year pharmacy student).

Discussion

This research examines students’ perceptions of and personal adjustment in a high-stakes educational programme. The results suggest that first-year university can be daunting for some students.25,26 In addition, students enrolled in highly competitive programmes are confronted with the added issue of high stakes examinations which determine their future careers. This added pressure elicits behaviours that were not expressed in the first-year experience literature.

Students’ impressions of HSFY were varied. To begin, a large number of students found aspects of HSFY stressful and demanding. Students described the number, frequency and nature of the examinations as daunting. They claimed that the number of exams in close succession left little time to socialize. HSFY took all of their time. Students also felt intimidated by the large number of students enrolled in the programme which lowers the probability of them getting into the programme of their choice.

It is clear from the students’ responses of their experiences and personal adjustment that they have encountered a number of experiences highlighted by previous research.4,5,18 The results suggest that the students’ perception of their experience affected the quality of the university life. The use of reflective questions seems to get students thinking about their first year and their role in their learning. This was most apparent in past HSFY students. They were also able to give definitive responses on their ability to deal with the same issues if they were presented in the future. The results also suggest that there were no fundamental differences between the present and past students’ perceptions of their experiences and adjustment to a competitive first-year university programme.

The students acknowledged that they need to make a smooth transition from high school to university because it is important to understand what is expected at university. The study identified a number of concerns experienced by the students about the nature and scope of the role of students in a high stakes environment. Students on the whole were pleased with the quality of the lecturers and tutors.

The findings indicate that students were able to identify their successes and failures and used a variety of coping mechanisms to handle their challenges. They also attributed their successes to personal or collective effort and little or no mention of innate intellectual ability. They acknowledged that they have the ability to make the
marks needed to be selected into second year but it is not how well you do but how well you do in relation to others.

Thus hard work was more important than just being smart. It is also apparent in this research that the high stakes environment influences social life. It was apparent that students would have liked to spend more time socialising with friends as they perceived the other first-year students were having more fun the they did. However, competition and the workload inhibited their social life.

**Conclusion**

In this paper students discussed their experiences of and adjustment to a highly competitive first-year university environment. The results show that the nature of the environment impacts on the holistic development of students; even years later students recall in similar detail their experiences and adjustment to those who were presently enrolled in the programme. The students perceived the selection process as daunting but were able to identify strategies that they employed to minimise the stress associated with the competition.

**Competing interests:** None.

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**References:**


An investigation into the health benefits of mindfulness-based stress reduction (MBSR) for people living with a range of chronic physical illnesses in New Zealand

Jillian Simpson, Tim Mapel

Abstract

Aim To establish the efficacy of Mindfulness-based Stress Reduction (MBSR) for people with chronic health problems in managing symptoms and coping with their illness in an Aotearoa/New Zealand context.

Method Twenty-nine participants completed a wait-list control study. Physical and psychological health and well-being were measured before, after and 6 months after the 8-week training programme using a variety of internationally recognised screening tools.

Results Statistically significant improvements were demonstrated in almost all categories measured.

Conclusion MBSR demonstrated health benefits for chronic illness sufferers. An economical and effective adjunctive therapy for decreasing morbidity associated with chronic illness in New Zealand, MBSR provides both clinicians and patients with an additional option for the better management of chronic illness.

Mindfulness can be defined as bringing one’s complete attention to the experiences occurring in the present moment, in a non-judgemental and accepting way. The Mindfulness-based Stress Reduction (MBSR) programme was developed by Dr Jon Kabat-Zinn, a neuro-biologist within the Massachusetts Medical School in 1979.

His programme helps people with a range of physical illness not able to be managed effectively by medical treatment and is delivered across the English speaking world. Other forms of Mindfulness-based approaches have been incorporated into the management of a range of psychiatric disorders. For example, Dialectical Behaviour Therapy is used for people with borderline personality disorder, Mindfulness-based Cognitive Behavioural Therapy for those with relapsing depression and Acceptance and Commitment Therapy for a diverse range of psychiatric conditions.

A growing body of research evidence suggests that MBSR is effective in alleviating suffering and improving the ability to cope in relation to a broad range of chronic illnesses as indicated by MBSR study meta-analyses. However no published research to date has demonstrated similar results in Aotearoa/New Zealand.

MBSR was first introduced in New Zealand in 2005 by Jim Carmody, a psychologist with the University of Massachusetts Medical School who trained 40 health professionals to offer MBSR courses. A Waikato based group of psychologists undertook MBSR research within New Zealand (as yet unpublished). Our research aimed to replicate the Waikato study however, our team was comprised of a female
nurse who was part of the 2005 training and a male counsellor with more than 20 years experience of mindfulness practice.

**Method**

**Research question**

Is MBSR training and practice effective (compared with waitlist controls) in reducing physical signs and symptoms and psychological distress associated with chronic health problems in a New Zealand study sample?

**Research aims**—To evaluate the effectiveness of MBSR training in a New Zealand population in: 1) reducing physical signs and symptoms; 2) producing positive change in relevant medical markers of disease; 3) increasing coping ability; and 4) decreasing psychological difficulties (e.g. depression, anxiety) associated with chronic illness.

**Study design**—This was a wait-list control study. Random assignment was used to allocate participants to either the first or second intervention groups.

**MBSR research intervention**

The MBSR course consisted of eight 2½ hour night classes over a period of 8 weeks with a full day semi-silent retreat on a Sunday between weeks 6 and 8. It was aligned with the curriculum of the MBSR courses presently taught through the University of Massachusetts Medical School. Participants were taught three principle mindfulness techniques: body scan meditation, sitting meditation and gentle yoga. In addition, they learnt about stress management, communication, healthy diet and lifestyle, coping with difficult emotions, and participated in a range of exercises. Participants were provided with a workbook and CDs to support their classroom learning and 45–60 minutes of home practice 6 days of the week.

**Participants and recruitment**

We aimed to recruit 40 participants with 20 people in each intervention group and used a variety of strategies including the DHB staff Intranet and staff meetings, letters to GPs and the media. Half of the participants were referred by GPs and half were self-referred. Potential participants made phone contact and were triaged to ensure they met the entry criteria, knew what the MBSR training involved, and were available for either intervention group. Entry criteria were:

- Stable chronic health problem (such as irritable bowel syndrome; chronic fatigue syndrome, hypertension, cardiac problems; pain etc.)
- Outpatient (able to travel to the hospital venue)
- 20+ years old
- Good command of English language
- Willing to work co-operatively in a group setting
- Willing and physically able to participate in MBSR training and regular practice, and to keep MBSR practice records
- Prepared to complete measures of psychological and physical health.

Exclusion criteria were:

- Hearing, visual, and/or physical impairment or disability which would prevent full participation in MBSR training, regular practice, and/or keeping MBSR practice records
- Currently acutely physically or mentally ill
- Known to have a psychotic illness or personality disorder
- Drug and/or alcohol dependent
- Already has a regular meditation practice.
After a 3-month recruitment process (May–July 2008) researchers met for screening interviews with 37 potential participants. Thirty-six participants were then randomised (by staff not directly involved in the research) into the first or second intervention group.

Four people who consented to participate did not for a variety of reasons, leaving 32 to commence the training. One person withdrew from Group 1 and two people withdrew from Group 2 after commencement.

Measures—The two principal researchers conducted screening interviews and provided the MBSR course. In this role they administered the self-assessment screening tools which were then coded independently so that the researchers were blinded to the identity of the participants. Statistical analysis of the coded questionnaires was conducted by other members of EIT’s research staff.

If more than 1 month had elapsed between initial screening and when the participant commenced their MBSR programme, the participant was re-screened prior to commencing training. This occurred for some in Group 1 and all in Group 2.

A range of seven measures were used to assess participant health and wellbeing prior to beginning the training, at the end of the 8-week training and 6 months after completion, mirroring the Waikato study and providing comparison with other MBSR studies internationally.5,8–12

- **Short Form 36 Health Survey (SF-36).** A 36 item self-report survey which assesses physical and mental health and any changes over time.
- **Depression Anxiety Stress Scales (DASS).** Focuses on self-report statements concerning depression, anxiety and stress experienced over the previous week.
- **Kentucky Inventory of Mindfulness Skills (KIMS).** Comprises a 39 item self-report inventory designed to measure the four facets of mindfulness: Accepting without Judgement, Acting with Awareness, Describing, and Observing.
- **Pain Visual Analogue Scale (VAS).** A simple one question tool in which participants rate the severity of their pain on average over the last week from 0 to 10.
- **Pain Catastrophising Scale (PCS).** This tool measures the degree to which participants dwell on, magnify or feel helpless about their pain e.g., ‘catastrophising’.
- **Patient Global Impression of Change (PGIC).** A one question screen which asks participants to “rate the change in your quality of life over the last month”.
- **Six-Month Follow-up Questionnaire.** This was developed by the Waikato researchers to evaluate aspects of the study which would otherwise have been missed.

Only the first five measures were used at the screening interview. All screening questionnaires and the PGIC scale were used after course completion and at the 6 month follow up while the 6-Month Follow-up Questionnaires were completed only at that time. Returned questionnaires were coded by administrative staff prior to data entry, so that researchers were blinded to participant identity.

Follow-up

Informal follow-up took place a month after course completion. Participants were invited back to a meeting 6 months after the end of the MBSR course.
Results

Demographic data—29 people completed the research and of these 21% were male and 79% female; the mean age was 51 and ranged from 33 to 67; most of the participants identified as being NZ European (93%) with only one participant being Maori and one being of Indian descent (3.6%).

Quantitative measures—All data was analysed collectively for both groups and then separately for each group. For brevity only combined group scores are presented here as the results for both groups were similar. Group 1’s results were sometimes stronger than Group 2, but at baseline Group 1’s morbidity tended to be slightly higher.

Depression Anxiety Stress Scale (DASS)—To test the effectiveness of the MBSR training paired T-tests were performed. Significant improvements (or score decrease) were observed in depression, anxiety and stress scores between baseline and post-training with no significant changes in scores occurring between post training and follow-up (Table 1).

Table 1. The effect of MBSR training on depression, anxiety and stress scores (a negative result indicates an improvement [or decrease] in the score)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pair of scores (mean ± SE)¹</th>
<th>Mean score difference</th>
<th>N</th>
<th>P-value²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>B (13.5 ± 2.22), PT(4.4 ± 1.01) PT(4.1 ± 1.00), FU(5.3 ± 1.35)</td>
<td>-9.1 ± 1.93 1.3 ± 1.30</td>
<td>25</td>
<td>&lt;0.001 0.340 (0.002)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>B (9.2 ± 1.16), PT(4.8 ± 0.80) PT(4.8 ± 0.80), FU(4.8 ± 0.82)</td>
<td>-4.4 ± 0.92 0.0 ± 0.87</td>
<td>28</td>
<td>&lt;0.001 0.968 (0.001)</td>
</tr>
<tr>
<td>Stress</td>
<td>B (16.5 ± 2.00), PT(8.6 ± 1.08) PT(8.8 ± 1.11), FU(9.0 ± 1.20)</td>
<td>-7.9 ± 2.03 0.2 ± 1.15</td>
<td>28</td>
<td>0.001 0.873 (0.011)</td>
</tr>
</tbody>
</table>

¹B: baseline score, PT: post training score, FU: follow-up score
²A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

On average, participants scored depression, anxiety and stress in the mild range prior to MBSR training. All three indicators fell into the normal range post-training with this level being maintained at 6 months.

Kentucky Inventory of Mindfulness Skills (KIMS)—Table 2 indicates significant increases in all scores between baseline and post-training. However if a Bonferroni correction is applied, the significant result is lost for ‘describing’, ‘acting with awareness’ and ‘non judging’. The latter two however, tend towards significance (P<0.100).
Table 2. The effect of MBSR training on scores for observation, describing, acting with awareness and non judging. A positive difference indicates an increase in the score over the time period indicated.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pair of scores (mean ± SE)¹</th>
<th>Mean difference</th>
<th>N</th>
<th>P-value²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe</td>
<td>B(39.1 ± 1.77), PT (46.0 ± 1.43)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (46.1 ± 1.43), FU (46.9 ± 1.11)</td>
<td>7.0 ± 1.88</td>
<td>29</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8 ± 1.32</td>
<td>29</td>
<td>0.537</td>
</tr>
<tr>
<td>Describe</td>
<td>B(25.8 ± 1.23), PT (28.3 ± 1.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (28.3 ± 1.15), FU (29.9 ± 1.12)</td>
<td>2.5 ± 0.97</td>
<td>29</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 ± 0.69</td>
<td>29</td>
<td>0.032</td>
</tr>
<tr>
<td>Act Aware</td>
<td>B(28.0 ± 1.25), PT (31.5 ± 1.14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (31.5 ± 1.44), FU (30.6 ± 0.57)</td>
<td>3.6 ± 1.12</td>
<td>29</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.9 ± 1.31</td>
<td>29</td>
<td>0.499</td>
</tr>
<tr>
<td>Non judge</td>
<td>B (25.7 ± 1.39), PT (30.5 ± 1.61)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (30.5 ± 1.61), FU (31.4 ± 1.56)</td>
<td>4.8 ± 1.49</td>
<td>29</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.9 ± 1.40</td>
<td>29</td>
<td>0.526</td>
</tr>
</tbody>
</table>

¹B: baseline score, PT: post training score, FU: follow-up score
²A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

Scores indicate a significant increase in participants’ ability to observe their experience with detachment, a critical component of being mindful. There is also improvement in participants’ ability to respond to their experience in a non-judgmental way and to act with awareness rather than react in habitual ways.

Pain Visual Analogue Scale (VAS) & Pain Catastrophising Scale (PCS)—Scores indicate that overall, there were significant decreases for each of the variables between baseline and post-training all of which persisted once a conservative Bonferroni correction was applied (Table 3). No other significant differences were detected between post-training and follow-up.

Table 3. The effect of MBSR training for pain, rumination, magnification and helplessness scores. A negative result indicates a decrease in the score over the time period indicated.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pair of scores (mean ± SE)¹</th>
<th>Mean difference</th>
<th>N</th>
<th>P-value²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>B (3.8 ± 0.50), PT (2.6 ± 0.47)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (2.5 ± 0.44), FU (2.6 ± 0.48)</td>
<td>-1.2 ± 0.28</td>
<td>22</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1 ± 0.38</td>
<td>25</td>
<td>0.917</td>
</tr>
<tr>
<td>Rumination</td>
<td>B (5.3 ± 0.82), PT (3.1 ± 0.67)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (3.3 ± 0.66), FU (2.1 ± 0.46)</td>
<td>-2.2 ± 0.58</td>
<td>28</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1.2 ± 0.50</td>
<td>28</td>
<td>0.026</td>
</tr>
<tr>
<td>Magnification</td>
<td>B (3.8 ± 0.57), PT (2.1 ± 0.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (2.1 ± 0.45), FU (2.0 ± 0.39)</td>
<td>-1.7 ± 0.45</td>
<td>28</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.2 ± 0.40</td>
<td>28</td>
<td>0.658</td>
</tr>
<tr>
<td>Helplessness</td>
<td>B (6.3 ± 1.13), PT (3.3 ± 0.71)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT (3.3 ± 0.71), FU (2.7 ± 0.74)</td>
<td>-3.0 ± 0.87</td>
<td>28</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.6 ± 0.65</td>
<td>28</td>
<td>0.361</td>
</tr>
</tbody>
</table>

¹B: baseline score, PT: post training score, FU: follow-up score
²A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

Not all participants engaged in the study had medical conditions that were associated with physiological pain e.g. hypertension, post myocardial infarction, asthma, tinnitus.
and were asked to comment from the perspective of overall discomfort in their lives. However, the majority of participants did have conditions which gave rise to physical pain e.g., fibromyalgia, arthritis, irritable bowel syndrome, post cerebral vascular accident, eczema, migraine headaches, cancer.

Overall, participants’ experience of pain/discomfort lessened as a result of the MBSR training. The significant positive changes around rumination, magnification and helplessness indicate that participants were better able to manage pain. This may interrelate with positive improvements in psychological health.

**Short Form 36 Health Survey (SF-36)—** Scores for physical function, role physical, role emotional, social functioning, mental health, energy/vitality, pain, and general health were analysed. To test the effectiveness of the MBSR training paired T-tests were performed. Significant increases were observed for each of the variables between baseline and post-training but once the Bonferroni correction was applied for multiple comparisons the significant differences observed for role physical, role emotional and pain were lost (Table 4). No significant changes were detected between post-training and follow-up (Table 4).

### Table 4. The effect of MBSR training for physical function, role physical, role emotional, social functioning, mental health, energy/vitality, pain, and general health. A positive difference indicates an increase in the score over the time period indicated

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pair of scores (mean ± SE)</th>
<th>Mean difference</th>
<th>N</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Function</td>
<td>B(72.0 ± 4.31), PT(79.1 ± 3.5), FU(81.3 ± 4.31)</td>
<td>7.1 ± 2.10</td>
<td>29</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.2 ± 2.69</td>
<td>26</td>
<td>0.235</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.042)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Physical</td>
<td>B(34.5 ± 6.8), PT(57.8 ± 7.56), FU(67.0 ± 7.82)</td>
<td>23.3 ± 7.54</td>
<td>29</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.7 ± 7.76</td>
<td>28</td>
<td>0.179</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.085)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Emotional</td>
<td>B(57.1 ± 8.20), PT(83.3 ± 6.3), FU(81.5 ± 6.25)</td>
<td>26.2 ± 8.97</td>
<td>28</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-1.2 ± 9.16</td>
<td>27</td>
<td>0.894</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.132)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Functioning</td>
<td>B(51.7 ± 4.69), PT(76.6 ± 4.75), FU(79.8 ± 4.28)</td>
<td>24.9 ± 4.80</td>
<td>29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.6 ± 3.53</td>
<td>28</td>
<td>0.320</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&lt;0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Health</td>
<td>B(58.5 ± 3.87), PT(78.2 ± 2.11), FU(76.0 ± 2.6)</td>
<td>19.7 ± 3.51</td>
<td>27</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2.8 ± 2.47</td>
<td>26</td>
<td>0.273</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&lt;0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy/Vitality</td>
<td>B(38.5 ± 3.77), PT(59.3 ± 3.25), FU(59.4 ± 3.77)</td>
<td>20.7 ± 3.55</td>
<td>27</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.2 ± 4.18</td>
<td>27</td>
<td>0.965</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&lt;0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>B(57.9 ± 5.21), PT(69.3 ± 4.54), FU(70.6 ± 4.54)</td>
<td>11.5 ± 3.99</td>
<td>29</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.0 ± 4.71</td>
<td>28</td>
<td>0.677</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.114)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Health</td>
<td>B(46.7 ± 4.63), PT(61.8 ± 4.68), FU(63.7 ± 4.26)</td>
<td>15.1 ± 3.62</td>
<td>29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.9 ± 3.65</td>
<td>28</td>
<td>0.608</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(&lt;0.005)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 B: baseline score, PT: post training score, FU: follow-up score
2 A conservative Bonferroni correction has been applied to each significant P value and the corrected P values are given in brackets.

As a result of their MBSR training, participants’ reported that their physical and social functioning had improved along with their mental health, energy and vitality, and overall general health. Their ability to function in their physical and emotional roles was less significant. Interestingly their pain as captured within the SF36 did not show...
significant improvement though the VAS and PCS screens did indicate significant change had occurred.

Patient Global Impression of Change (PGIC)—The PGIC score, only applied at post MBSR training and at 6 month follow-up indicate that all participants thought their health had improved immediately after their training. At the 6 month follow-up 70% of participants’ health had continued to improve (Table 5.1). These results are consistent with the two international meta-analyses.5,6

Table 5.1. Post-training and 6-month follow-up responses to the Global Impression of Change survey

<table>
<thead>
<tr>
<th>Response</th>
<th>Post Training</th>
<th></th>
<th>Six-month follow-up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>A little worse</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>10.3</td>
</tr>
<tr>
<td>No change</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>20.7</td>
</tr>
<tr>
<td>A little better</td>
<td>5</td>
<td>17.2</td>
<td>4</td>
<td>13.8</td>
</tr>
<tr>
<td>Better</td>
<td>11</td>
<td>37.9</td>
<td>9</td>
<td>31.0</td>
</tr>
<tr>
<td>Much better</td>
<td>13</td>
<td>44.8</td>
<td>7</td>
<td>24.1</td>
</tr>
</tbody>
</table>

Limitations of study—The study is limited by using only subjective participant data. Biological measures, such as salivary cortisol levels, other blood test results, blood pressure measurement etc. would have added a rich source of objective data, but was beyond the scope and budget of this study.

The participant group was small, with 29 participants completing all phases of the research. However, despite the small sample size, statistically significant results were evident.

Demographically the sample was not representative of the general New Zealand population and also has a higher proportion of female participants—80%. It may be that MBSR is more acceptable to women, or that women are more likely to engage in self-help activities than men.

Detailed qualitative data analysis is to be reported in the New Zealand Journal of Counselling.13

Conclusion

People with chronic physical health problems in New Zealand often receive sound evidence based medical treatment to help them with their symptoms and thus improve their quality and length of life.

This study demonstrates that motivated individuals can achieve even greater gains, perhaps lessening their need for medical intervention, through specific education aimed at helping them cope with their health problem/s, and improving self care and self efficacy.
Competing interests: None.

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Acknowledgements: Hawke’s Bay Medical Research Foundation funded this study. We also thank Philippa Thomas, Jeannette Shennan, Wendy Tuck, Helen Conaglen, and Jill Bell, Psychology Centre, Waikato for sharing their MBSR research and enabling us to replicate their study; Drs Richard Meech and Malcolm Arnold, of the Hawke’s Bay DHB, for their advice, recruitment assistance, and the use of their premises; colleagues at the Eastern Institute of Technology for facilities and support; Bob Marshall and Dr Rachel Forrest for statistical analysis; Professor Kay Morris Matthews for supervisory oversight; and Dr Sally Abel for support with MBSR teaching.

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References:

7. Carmody J. Mindfulness training for health professionals: Background reading on mindfulness in clinical setting. [Handout]. University of Massachusetts Medical School; 2005.
Comorbidity among patients with colon cancer in New Zealand

Diana Sarfati, Lavinia Tan, Tony Blakely, Neil Pearce

Abstract

Aims To identify patient factors that are associated with a higher risk of comorbidity, and to assess the impact of comorbidity on risk of in-hospital death, length of stay and 5-year all-cause survival among a large cohort of patients with colon cancer in New Zealand.

Methods Comorbidity data were collected from patients who were diagnosed with colon cancer and admitted to public hospitals during 1996–2003. The comorbidity measures included all conditions listed in the Charlson Comorbidity Index, as well as a predetermined list of additional conditions. We examined predictors of higher comorbidity scores. We also measured the impact of comorbidity on in-hospital death, length of stay and 5-year all-cause survival using logistic, linear and Cox proportional hazard regression models to adjust for confounding by sex, age, ethnicity, extent of disease and area level deprivation.

Results There were 11,524 patients included in the study. 7.5% of females and 10.3% of men had Charlson scores of three or more. Higher comorbidity scores were associated with increasing age, and were more common among males, Māori and Pacific people, those with unknown extent of disease and those living in the most deprived quintile of New Zealand. Those with Charlson scores ≥3 had a higher risk of in-hospital death (OR=4.8; 95% CI 3.5–6.6), longer lengths of hospital stay (0.14 days 95% CI 0.08–0.2) and lower 5-year survival HR= 2.0; 95%CI=1.8–2.3) compared with those with a score of 0.

Conclusion This study confirms that comorbidity is common among colon cancer patients in New Zealand, and has an adverse and independent effect on outcomes related to mortality and length of hospital stay.

Comorbidity is the coexistence of diseases or conditions with a disease of interest. Studies in other countries have found that regardless of the primary disease in question, comorbidity is associated with poorer quality of life, longer and more expensive hospital stays, and poorer survival. There has been little work published on the prevalence or impact of comorbidity among patients in New Zealand.

A paper by Davis et al involved a hospital notes review of 1575 patients from the Auckland region in which screeners identified comorbid disease using the Charlson comorbidity index. Māori ethnicity, and living in more deprived areas were associated with comorbidity, which in turn was associated with a range of adverse outcomes including length of stay and inpatient mortality. However, the authors were not able to adjust the analyses for primary diagnosis other than through major diagnostic category of primary condition (e.g. circulatory system, digestive system). This is important because primary diagnosis is likely to have strongly confounded the
relationships between risk factors, comorbidity and adverse outcomes. Other studies have investigated the role of comorbidity in mediating cancer related outcomes.\textsuperscript{6–8}

The study reported here uses routine data to focus on both the factors that predict comorbidity, and the impact of comorbidity measured using in-hospital death, length of stay and 5-year all-cause survival, among patients in the New Zealand context.

This study was carried out among a large group of patients admitted to hospital for surgical resection of colon cancer. We selected colon cancer for several reasons. First, for a subset of those with colon cancer, we had specific study data available to validate the comorbidity information held in routinely collected administrative datasets.\textsuperscript{9}

Second, there is evidence that comorbidity affects outcomes from colon cancer both through the additional physiological burden of disease among those with comorbidity, and indirectly through the impact of comorbidity on treatment decisions.\textsuperscript{6} Third, colon cancer affects mainly older people among whom comorbidity is relatively common.\textsuperscript{10} Finally, colon cancer is not strongly associated with risk factors that are simultaneously risk factors for other major causes of comorbidity and death (such as cardiovascular disease).

This paper therefore aims to address three key questions. Firstly, how common is comorbidity in a large cohort of colon cancer patients in New Zealand? Secondly, what factors predict higher levels of comorbidity in this cohort? And finally, to what extent does comorbidity predict in-hospital death, length of stay and 5-year survival for patients admitted for surgical resection of colon cancer?

\textbf{Methods}

Patients were identified from the New Zealand Cancer Registry with a primary tumour in the colon (ICD-10-AM site codes C18-C19 excluding 18.1) and morphology consistent with adenocarcinoma, diagnosed between 1996 and 2003. Patients were ineligible if they were less than 25 years of age at diagnosis, were normally resident outside New Zealand, had a previous diagnosis of colon cancer, or were diagnosed after death.

Routine hospital discharge data coded to ICD-9-CM-A were obtained from New Zealand Health Information Service in 2005. We treated the first admission for surgical resection of colon cancer as the index admission. Where a patient did not receive surgical resection, we treated the first hospital admission with colon cancer as primary diagnosis as the index admission. Those without such an admission were excluded from the study. We used both principal and secondary diagnosis fields to identify comorbid conditions using an 8-year lookback period, this being the longest possible time for lookback for the earliest cancer registrations.

We identified all conditions included in the Charlson comorbidity index, as well as some additional conditions, listed in Table 1. The Charlson index was developed in 1987 using data from a cohort of 607 medical patients, and validated with a population of breast cancer patients.\textsuperscript{11} Nineteen conditions are allocated a weight of 1 to 6 depending on the adjusted relative risk of 1-year mortality, and summed to give an overall score. A score of 0 indicates that none of these conditions were present, and higher scores indicate higher levels of comorbidity.

We used the Charlson index scores either uncategorised (when used as a dependent variable in regression) or categorised into 0, 1, 2 or 3+ (when used as a predictor of the outcome variables), and we also investigated the roles of specific comorbid conditions.

We used the Deyo et al\textsuperscript{12} system which provides a method of translating the Charlson index which was originally constructed using medical notes review for use on administrative data using ICD coding. The algorithm was modified to take account of the fact that we collected data on additional conditions to those included in the Charlson Index (Table 1).
We followed the approach of Deyo et al., except that we included non-colorectal malignancies in our definition of comorbidity if they were listed in index or prior hospital discharges.

Table 1. Diagnostic codes used for mapping

<table>
<thead>
<tr>
<th>Diagnostic category</th>
<th>ICD-9 codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myocardial infarction</td>
<td>410.x, 412*</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>428.x</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>441.x*, 443.9*, 785.4*, V43.4*, procedure 38.48</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>430-437.x, 438*</td>
</tr>
<tr>
<td>Dementia</td>
<td>290.x*</td>
</tr>
<tr>
<td>Chronic respiratory disease</td>
<td>490-496*, 500-505*, 506.4*</td>
</tr>
<tr>
<td>Connective tissue disease</td>
<td>710.0-710.1*, 710.4*, 714.0-714.2*, 714.81*, 725*</td>
</tr>
<tr>
<td>GI ulcer disease</td>
<td>531.x-534.9*</td>
</tr>
<tr>
<td>Mild liver disease</td>
<td>571.2*, 571.4*, 571.5*, 571.6x*</td>
</tr>
<tr>
<td>Diabetes (mild to moderate)</td>
<td>250.0x-250.3x*, 250.7x*</td>
</tr>
<tr>
<td>Hemiplegia or paraplegia</td>
<td>342.x*, 344.1*</td>
</tr>
<tr>
<td>Moderate or severe renal disease</td>
<td>582.x*, 583.0-583.7*, 585*, 586*, 588.x*</td>
</tr>
<tr>
<td>Diabetes with end organ damage</td>
<td>250.4x-250.6x*</td>
</tr>
<tr>
<td>Any malignancy (except colon or rectal) including lymphoma or leukaemia</td>
<td>140.x-152.x*, 155.x-172.0*, 174.x-195.8*, 200.x-208.x*</td>
</tr>
<tr>
<td>Moderate or severe liver disease</td>
<td>572.2-572.8*, 456.0-456.21*</td>
</tr>
<tr>
<td>Metastatic solid tumour</td>
<td>196.x-199.1</td>
</tr>
<tr>
<td>AIDS</td>
<td>042.x-044.x</td>
</tr>
<tr>
<td>Angina‡</td>
<td>411.1*, 413.0*, 413.1*, 413.9*</td>
</tr>
<tr>
<td>Essential hypertension‡</td>
<td>401.x</td>
</tr>
<tr>
<td>Cardiac arrhythmias‡</td>
<td>426.x-427.x</td>
</tr>
<tr>
<td>Previous pulmonary embolism‡</td>
<td>415.1</td>
</tr>
<tr>
<td>Cardiac valve disease‡</td>
<td>394.x-397.0*, 424.0-424.3*</td>
</tr>
<tr>
<td>Inflammatory bowel disease‡</td>
<td>555.x*, 556.x*</td>
</tr>
<tr>
<td>Other neurological condition‡</td>
<td>332.x-336.x*, 340.x*, 341.x*, 343.x*, 345.x*, 358.x*, 359.x*</td>
</tr>
<tr>
<td>Major psychiatric conditions‡</td>
<td>295.x*, 296.x*, 298.0*</td>
</tr>
</tbody>
</table>

* included in definition of a comorbidity if they are listed either in the index or prior hospital discharge; other codes only included if they are recorded prior to index admission
‡ not included as part of Charlson Comorbidity Index
§ includes multiple sclerosis, Parkinson’s disease, other abnormal movement disorders, epilepsy, spinocerebellar disease, anterior horn disease, other diseases of spinal cord, other demyelinating diseases of CNS, cerebral palsy, myoneural disorders, muscular dystrophies.

Extent of disease for each individual was categorised into local, regional, distant and unknown based on data from the Cancer Registry. We also collected demographic details of patients; age (in five categories), sex, ethnicity (Māori, Pacific, Asian and NZ European/Other) and small area deprivation using the NZ Deprivation Index (NZDep) aggregated into quintiles.
Mortality data were obtained by linking study patients to the New Zealand national mortality database, with follow-up to the end of 2005. Patients whose deaths were not recorded in the mortality database were assumed to be still alive at the end of follow-up.

**Analysis**—First, we assessed the prevalence of comorbidity in this cohort, and identified factors associated with its occurrence. We calculated counts and age/sex standardised proportions of Charlson comorbidity scores, and individual comorbid conditions. We examined multivariate (including age, sex, ethnicity, NZ Deprivation quintiles and extent of disease) predictors of higher Charlson comorbidity index scores using linear regression with a log transformation for the uncategorised Charlson scores.

Second, we investigated the impact of comorbidity on risk of in-hospital death, length of stay and 5-year all-cause survival. We first assessed the effects of comorbidity on these outcomes in age and sex adjusted models, and then adjusted additionally for ethnicity, NZ deprivation quintiles and extent of disease. We developed separate models for comorbidity measured using the Charlson co-morbidity score (categorised as 1, 2 and 3+) and the individual conditions listed in Table 1.

**In-hospital death**

Multivariable logistic regression was used to investigate in-hospital death, using either the index admission if it was the surgical resection of colorectal cancer or admission for primary resection occurring within 3 months of the index admission. All other admissions were excluded from analyses (N=1311).

**Length of stay**

The effect of comorbidity on length of hospital stay was examined using linear regression, with log transformation of length of stay data. The same subset of data used in the analysis of in-hospital death was used for this analysis. The estimated parameters provide a (logged) measure of unit change in the outcome variable for every unit increase in the independent variable, e.g. if $\beta = 0.14$ in a regression of length of stay against Charlson score, then every standardised unit increase in Charlson score (e.g. increase of 1) is predicted to result in $\exp(0.14)=1.15$—i.e. a 15% increase in days of length of stay.

**5-year all-cause survival**

Cox proportional hazards models were used to investigate 5-year all-cause survival. Hazard ratios (HR) are interpreted in the same way as relative risks with a HR>$1$ meaning that those with a given comorbidity score or condition have higher mortality and therefore poorer 5-year survival than those without the specified comorbidity.

**Ethics**—Approval for this study was granted by the New Zealand Multi-Region Ethics Committee.

**Results**

A total of 11,524 patients met the eligibility criteria for the study. Table 2 shows the characteristics of the cohort. The cohort comprised approximately equal numbers of males and females, was predominantly non-Maori non-Pacific non-Asian, and more than 80% were aged 60 years or older.

**Prevalence and predictors of comorbidity**—Table 3 shows the counts and age-sex standardised proportions for Charlson scores. As expected there was a highly skewed distribution of comorbidity scores with the majority of individuals having a Charlson score of 0. Males were somewhat more likely to have a Charlson score of 3 or more compared with females (10.3% compared with 7.5%).
Table 2. Characteristics of cohort

<table>
<thead>
<tr>
<th>Patient factors</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>11524</td>
<td>100.0</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5477</td>
<td>47.5</td>
</tr>
<tr>
<td>Female</td>
<td>6047</td>
<td>52.5</td>
</tr>
<tr>
<td>Prioritised ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maori</td>
<td>324</td>
<td>2.8</td>
</tr>
<tr>
<td>Pacific</td>
<td>80</td>
<td>0.7</td>
</tr>
<tr>
<td>Asian</td>
<td>119</td>
<td>1.0</td>
</tr>
<tr>
<td>Euro/other</td>
<td>11001</td>
<td>95.5</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25–50yrs</td>
<td>643</td>
<td>5.6</td>
</tr>
<tr>
<td>51–60yrs</td>
<td>1392</td>
<td>12.1</td>
</tr>
<tr>
<td>61–70yrs</td>
<td>3209</td>
<td>27.9</td>
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<tr>
<td>71–80yrs</td>
<td>4028</td>
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</tr>
<tr>
<td>&gt;80yrs</td>
<td>2252</td>
<td>19.5</td>
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<tr>
<td>NZDeprivation quintile</td>
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<tr>
<td>missing</td>
<td>607</td>
<td>5.3</td>
</tr>
<tr>
<td>1</td>
<td>1405</td>
<td>12.2</td>
</tr>
<tr>
<td>2</td>
<td>1980</td>
<td>17.2</td>
</tr>
<tr>
<td>3</td>
<td>2486</td>
<td>21.6</td>
</tr>
<tr>
<td>4</td>
<td>2945</td>
<td>25.6</td>
</tr>
<tr>
<td>5</td>
<td>2101</td>
<td>18.2</td>
</tr>
<tr>
<td>Extent of disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>2847</td>
<td>24.7</td>
</tr>
<tr>
<td>Regional</td>
<td>5828</td>
<td>50.6</td>
</tr>
<tr>
<td>Distant</td>
<td>2271</td>
<td>19.7</td>
</tr>
<tr>
<td>Unknown</td>
<td>578</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Charlson scores increased with age, and Māori and Pacific people had higher scores than Asian or NZ European/Other (e.g. the proportions with Charlson scores of 3 or more were 17.7%, 17.1%, 10.3 and 10.1% respectively). Increasing extent of disease was related to an increasing proportion of individuals with a Charlson score of 3+, although the group with unknown extent of disease had considerably higher Charlson scores than any other group (proportions with Charlson scores of 3+ were 8.8%, 9.5% and 12.0% for those with localised, regional and distant disease respectively. 18.8% of those with unknown extent of disease had Charlson scores of 3+).

Table 3. Charlson scores by sex, age, ethnicity NZDeprivation quintile and extent of disease; numbers age and sex-standardised * proportions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Charlson Scores**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>N %</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4200</td>
</tr>
<tr>
<td></td>
<td>3532</td>
</tr>
<tr>
<td></td>
<td>344</td>
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<tr>
<td></td>
<td>456</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>25–50yrs</td>
<td></td>
</tr>
<tr>
<td>51–60yrs</td>
<td>587</td>
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<td></td>
<td>1147</td>
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<td></td>
<td>155</td>
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<td>4208</td>
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<td>293</td>
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<td>&gt;80 yrs</td>
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<td>3900</td>
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<td></td>
<td>348</td>
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<tr>
<td>Extent of disease</td>
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<tr>
<td>Local</td>
<td></td>
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<tr>
<td>Regional</td>
<td>1901</td>
</tr>
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<td></td>
<td>3900</td>
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<td></td>
<td>348</td>
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<tr>
<td>Distant</td>
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<td></td>
<td>311</td>
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NZMJ 8 July 2011, Vol 124 No 1338; ISSN 1175 8716
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Table 4 shows the comorbidity counts and age-sex standardised prevalence for conditions with a prevalence greater than 5%. Prevalence was greater for males than females for all conditions, with the exception of essential hypertension. For all conditions, prevalence tended to increase with age, although fewer individuals had diabetes in the >80 yrs age group than in the 71–80 yrs age group. Those with unknown extent of disease had notably higher prevalence of all conditions. Prevalence of essential hypertension and diabetes was greater among Maori and Pacific patients than Asian and NZ European/Other.

Maori also had a greater proportion with chronic respiratory disease, and Pacific had greater proportions with cerebrovascular disease and congestive heart failure. NZ European/Other had the greatest prevalence of cardiac arrhythmia and angina. The prevalence of recorded essential hypertension and chronic respiratory disease increased with increasing deprivation, while for other conditions no clear patterns were evident by deprivation group.

When we investigated the relationship between covariates and Charlson scores using multiple regression analysis, we found that increasing age, ethnicity (Māori and Pacific), sex (male), extent of disease and NZ deprivation (quintile 5) were all significantly associated with higher Charlson scores even after adjustment for other variables in the models (results available from authors).

**Impact of comorbidity on outcomes**—Tables 5a and 5b shows the odds ratios, parameter estimates and hazard ratios with 95% confidence intervals for regression models examining in-hospital death, length of stay and 5-year survival respectively. The Charlson scores were significantly associated with increased risks of in-hospital death with odds ratios monotonically increasing with increasing Charlson scores (Table 5a).

For individual conditions, there were significantly increased odds of in-hospital death for those with chronic respiratory disease, cardiac arrhythmia, previous myocardial infarction and cerebrovascular accidents, while those with recorded essential hypertension and angina had significantly decreased odds of in-hospital death (Table 5b).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Essential Hypertension</th>
<th>Chronic Respiratory Disease</th>
<th>Diabetes</th>
<th>Cardiac Arrhythmia</th>
<th>Myocardial Infarction</th>
<th>Angina</th>
<th>Congestive Heart Failure</th>
<th>Cerebrovascular Accident</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
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<td>N %</td>
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<tr>
<td><strong>Sex</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>959</td>
<td>15.9</td>
<td>569</td>
<td>9.4</td>
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<td>8.9</td>
<td>457</td>
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<td>585</td>
<td>10.7</td>
<td>569</td>
<td>10.4</td>
<td>580</td>
<td>10.6</td>
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<td></td>
</tr>
<tr>
<td>Maori</td>
<td>59</td>
<td>18.2</td>
<td>54</td>
<td>16.7</td>
<td>62</td>
<td>19.1</td>
<td>24</td>
<td>7.4</td>
</tr>
<tr>
<td>Pacific</td>
<td>14</td>
<td>17.5</td>
<td>6</td>
<td>7.5</td>
<td>16</td>
<td>20.0</td>
<td>3</td>
<td>3.8</td>
</tr>
<tr>
<td>Asian</td>
<td>13</td>
<td>10.9</td>
<td>5</td>
<td>4.2</td>
<td>15</td>
<td>12.6</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Euro/Other Euro/Other</td>
<td>1714</td>
<td>15.6</td>
<td>1089</td>
<td>9.9</td>
<td>1014</td>
<td>9.2</td>
<td>1006</td>
<td>9.1</td>
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<td></td>
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<tr>
<td>25-50yrs</td>
<td>25</td>
<td>2.2</td>
<td>17</td>
<td>2.6</td>
<td>20</td>
<td>3.1</td>
<td>2</td>
<td>0.3</td>
</tr>
<tr>
<td>51-60yrs</td>
<td>113</td>
<td>8.1</td>
<td>80</td>
<td>5.7</td>
<td>93</td>
<td>6.7</td>
<td>30</td>
<td>2.2</td>
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<tr>
<td>61-70yrs</td>
<td>419</td>
<td>13.1</td>
<td>276</td>
<td>8.6</td>
<td>314</td>
<td>9.8</td>
<td>174</td>
<td>5.4</td>
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<tr>
<td>71-80yrs</td>
<td>770</td>
<td>19.1</td>
<td>480</td>
<td>11.9</td>
<td>466</td>
<td>11.6</td>
<td>454</td>
<td>11.3</td>
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<tr>
<td>81+yrs</td>
<td>484</td>
<td>21.5</td>
<td>301</td>
<td>13.4</td>
<td>214</td>
<td>9.5</td>
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<td>16.7</td>
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<td></td>
</tr>
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<td>1</td>
<td>185</td>
<td>13.2</td>
<td>119</td>
<td>8.5</td>
<td>121</td>
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<td>144</td>
<td>10.2</td>
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<td>2</td>
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<td>14.1</td>
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<td>9.4</td>
<td>183</td>
<td>9.2</td>
<td>169</td>
<td>8.5</td>
</tr>
<tr>
<td>3</td>
<td>385</td>
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<td>9.5</td>
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<td>216</td>
<td>8.7</td>
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<td>511</td>
<td>17.4</td>
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<td>11.1</td>
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<td>9.8</td>
<td>268</td>
<td>9.1</td>
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<tr>
<td>5</td>
<td>360</td>
<td>17.1</td>
<td>234</td>
<td>11.1</td>
<td>243</td>
<td>11.6</td>
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<td>9.5</td>
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<tr>
<td>Missing</td>
<td>80</td>
<td>13.2</td>
<td>51</td>
<td>8.4</td>
<td>43</td>
<td>7.1</td>
<td>40</td>
<td>6.6</td>
</tr>
<tr>
<td><strong>Extent of Disease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Distant</td>
<td>323</td>
<td>14.2</td>
<td>203</td>
<td>8.9</td>
<td>203</td>
<td>8.9</td>
<td>168</td>
<td>7.4</td>
</tr>
<tr>
<td>Local</td>
<td>467</td>
<td>16.4</td>
<td>282</td>
<td>9.9</td>
<td>273</td>
<td>9.6</td>
<td>283</td>
<td>9.9</td>
</tr>
<tr>
<td>Regional</td>
<td>878</td>
<td>15.1</td>
<td>563</td>
<td>9.7</td>
<td>563</td>
<td>9.7</td>
<td>494</td>
<td>8.5</td>
</tr>
<tr>
<td>Unknown</td>
<td>132</td>
<td>22.8</td>
<td>106</td>
<td>18.3</td>
<td>68</td>
<td>11.8</td>
<td>92</td>
<td>15.9</td>
</tr>
</tbody>
</table>

* conditions with a prevalence of 5% or greater in the cohort ** age and sex standardised to the age and sex structure of the cohort population
Table 5a. Odds ratios, parameter estimates and hazard ratios (95% CI) for regression models with Charlson scores and covariates predicting in-hospital death, length of stay or 5-year survival respectively

<table>
<thead>
<tr>
<th>Charlson Score*</th>
<th>In Hospital Death</th>
<th>Length of Stay</th>
<th>Survival over 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratios</td>
<td>Parameter Estimates (β)</td>
<td>Mortality hazard Ratios</td>
</tr>
<tr>
<td></td>
<td>Model 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Model 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Model 3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>1</td>
<td>2.41 (1.79, 3.24)</td>
<td>2.51 (1.87, 3.39)</td>
<td>0.03 (-0.02, 0.08)</td>
</tr>
<tr>
<td>2</td>
<td>3.43 (2.36, 4.98)</td>
<td>3.52 (2.41, 5.13)</td>
<td>0.02 (-0.05, 0.09)</td>
</tr>
<tr>
<td>3+</td>
<td>4.52 (3.32, 6.14)</td>
<td>4.81 (3.52, 6.58)</td>
<td>0.14 (0.08, 0.20)</td>
</tr>
</tbody>
</table>

* Charlson score = 0 is reference group; <sup>a</sup> adjusted for age (6 categories) and sex only; <sup>b</sup> adjusted for age (6 categories), sex, ethnicity, NZ deprivation quintiles and extent of disease.

Table 5b. Odds ratios, parameter estimates and hazard ratios (95% CI) for regression models with comorbidity conditions and covariates predicting in-hospital death, length of stay or 5-year survival respectively

<table>
<thead>
<tr>
<th>Comorbid Conditions&lt;sup&gt;c&lt;/sup&gt;</th>
<th>In Hospital Death</th>
<th>Length of Stay</th>
<th>Survival over 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratios</td>
<td>Parameter Estimates (β)</td>
<td>Mortality hazard Ratios</td>
</tr>
<tr>
<td></td>
<td>Model 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Model 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Model 3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Essential Hypertension</td>
<td>0.73 (0.53, 1.00)</td>
<td>0.72 (0.52, 0.99)</td>
<td>-0.11 (-0.17, -0.04)</td>
</tr>
<tr>
<td>Chronic Respiratory Disease</td>
<td>2.32 (1.74, 3.09)</td>
<td>2.40 (1.79, 3.22)</td>
<td>0.21 (0.13, 0.28)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.00 (0.69, 1.45)</td>
<td>1.01 (0.69, 1.46)</td>
<td>0.17 (0.10, 0.25)</td>
</tr>
<tr>
<td>Cardiac Arrhythmia</td>
<td>1.30 (0.92, 1.84)</td>
<td>1.42 (1.00, 2.02)</td>
<td>-0.05 (-0.14, 0.04)</td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td>2.19 (1.59, 3.03)</td>
<td>2.20 (1.59, 3.06)</td>
<td>0.13 (0.05, 0.22)</td>
</tr>
<tr>
<td>Angina</td>
<td>0.62 (0.41, 0.95)</td>
<td>0.59 (0.38, 0.90)</td>
<td>-0.01 (-0.10, 0.07)</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>1.20 (0.81, 1.78)</td>
<td>1.19 (0.80, 1.78)</td>
<td>-0.04 (-0.15, 0.07)</td>
</tr>
<tr>
<td>Cerebrovascular Accident</td>
<td>2.10 (1.37, 3.20)</td>
<td>2.12 (1.38, 3.25)</td>
<td>0.00 (-0.12, 0.12)</td>
</tr>
</tbody>
</table>

* adjusted for age (6 categories) and sex only; <sup>a</sup> adjusted for age (6 categories), sex, ethnicity, NZ deprivation quintiles and extent of disease; <sup>c</sup> only comorbidities with prevalence>5% reported. Other conditions included in model include peripheral vascular disease, dementia, connective tissue disease, GI ulcer disease, mild liver disease, hemiplegia/paraplegia, renal disease, any malignancy, moderate to severe liver disease, metastatic solid tumour, previous pulmonary embolism, cardiac valve disease, IBD, other neurological conditions, major psychiatric conditions; Bolded estimates are statistically significant
The associations with length of hospital stay were less clear, with a significant association only seen among those with Charlson scores of 3+, compared with 0. That is, people with a Charlson score of 3 or more had a 15% (95% CI 8%-22%) increase in length of stay (exp(0.14)=1.15). Those with chronic respiratory disease, diabetes and previous myocardial infarction had significantly longer length of stays compared to those without the specified condition, while those with recorded essential hypertension had significantly shorter stays.

There was a monotonic increase in mortality rate (hazard) reflecting poorer all-cause 5-year survival with increasing Charlson scores. Some individual conditions were associated with higher 5-year mortality, particularly congestive heart failure (HR =1.25 95% CI 1.11-1.42), previous myocardial infarction (HR =1.22 95% CI 1.10-1.37) chronic pulmonary disease (HR =1.20 95% CI 1.17-1.41) and cardiac arrhythmia (HR =1.15 95% CI 1.03-1.29). However, a diagnosis of angina was associated with a significantly lower 5-year mortality rate (HR=0.88 95% CI= 0.78-0.99).

**Discussion**

In a large cohort of patients with colon cancer, we found that comorbidity was common, associated with increasing age, and among males, Māori and Pacific people, those with unknown extent of disease at diagnosis and those living in the most deprived quintile of New Zealand. Comorbidity was associated with a higher risk of in-hospital death, longer lengths of hospital stay and lower 5-year survival.

In some respects these results are self-evident; those who are sicker have poorer outcomes. However there has been very little work specifically investigating the impact of comorbidity among patients in the New Zealand context.6-8

Comorbidity affects nearly every aspect of health care both for the individual patient with comorbidity, and for health care providers managing such patients. Comorbidity has been shown to affect treatment choice, risk of complications, quality of life, mortality, and health care resource use.2-6 It is therefore important to understand the patterns and impact of comorbidity in New Zealand.

Our results are largely consistent with other research. For example, many studies have found that comorbidity is common among patients with cancer generally, and colorectal cancer specifically.6,16–28 The highly skewed distribution of comorbidity scores with only a small minority of patients scoring 3 or more is consistently seen.17 Not surprisingly, Charlson scores were higher and all individual conditions were more common among older people; as has been reported previously, comorbidity was higher among males, Māori and those living in more deprived areas.5

Many studies have found that mortality risk increases, and survival decreases, with increasing global comorbidity score.4,6,11,16,18,28-37 The magnitude of this association varies depending on the setting of the study, the methods used to measure comorbidity, and the timing of mortality or survival (e.g. in-hospital death, 1-year or 5-year mortality/survival).

Fewer studies have investigated the role of comorbidity with length of hospital stay, and the results are somewhat less consistent. Generally however, those with higher comorbidity have longer stays in hospital.30,37,38 Of note is that the rules relating to the
coding of comorbid conditions in New Zealand state that comorbid conditions should be coded if they co-exist or arise during a given episode of care and if they affect patient management in a way that might extend length of hospital stay. This approach is likely to result in an emphasis on the most active and clinically important conditions, and of course introduces some circularity to the argument that routinely recorded comorbidity affects length of stay.

The patterns for individual conditions were somewhat variable, although most individual conditions adversely affected one or more of the outcomes we investigated. Recorded essential hypertension and angina were notable exceptions to this rule, in that patients with these conditions had significantly better outcomes than others. This finding is consistent with other studies and is likely to be due to a type of information bias where those who have major, potentially life-threatening conditions are less likely to have conditions that are common and less serious recorded. As a result, those that do have these latter conditions, paradoxically, tend to be healthier than those with other comorbidities, and as a result have better outcomes.

Another interesting finding is that those with unknown extent of disease are considerably more likely to have a Charlson score of 3+, and more likely to have most of the individual conditions than those with recorded extent of disease. It seems likely that one of the reasons that these patients have not been staged is that they may be too unwell to be treated for their cancer, which is consistent with what is often anecdotally assumed.

Strengths and weaknesses of this study—The main strengths of this study are that it is based on a large cohort of patients, we restricted the study to those with a specific diagnosis to minimise confounding due to primary condition, and we used both individual conditions and a global measure of comorbidity (Charlson comorbidity index) to measure comorbidity.

The key weakness of the study was that we used routinely collected administrative data to identify comorbidity in the patients. Generally data obtained directly from medical notes is considered superior, however collecting such data is time-consuming and difficult. Also, while comorbidities tend to be more common if data are collected from medical notes, these data are not complete or error-free, nor are administrative data a subset of these data.

In a previous publication we compared data collected from medical notes to those obtained from routine data sources and found that while there were differences between these data sources, both provided reasonable risk adjustment within multivariable models.

We used the Charlson comorbidity index which is a well-established method of measuring comorbidity. However, there are issues with using this index. It was developed over 20 years ago on a relatively small group of patients in the US. It includes some conditions which are unlikely to have a major impact on outcomes currently (e.g. peptic ulcer disease), it excludes some that are likely to have an impact (e.g. non-cerebrovascular neurological conditions), and it assumes that the impact of multiple conditions is additive on a relative scale. However, to date no gold standard measure of comorbidity has been developed.
We have also only included patients with colon cancer for the reasons outlined in the introduction. These findings are probably generalisable to other patient groups, but it is not assured.

The findings of this study support the importance of comorbidity in terms of health service and patient impact. It is the first study in New Zealand to have used routinely collected comorbidity data for this purpose. These initial analyses suggest that general comorbidity, measured by Charlson scores, is strongly associated with in-hospital death, length of stay and 5-year survival. The relationships among individual comorbid conditions and these outcome variables are less consistent, although most major comorbid conditions were associated with a negative effect on one or more of the adverse outcomes we measured.

Further research is needed to confirm the impact of comorbidity on other groups, and to investigate whether the measurement of comorbidity can be improved in New Zealand.

Competing interests: None.

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Acknowledgements: The authors acknowledge Peter Crampton for helpful suggestions on an earlier draft of this paper. The study was funded by the Cancer Society of New Zealand (grant 05/16). The Cancer Society of New Zealand had no role in the study design; in the collection, analysis or interpretation of data; in the writing of the manuscript or the decision to submit the manuscript for publication.

The Centre for Public health Research is supported by a Programme Grant from the Health Research Council of New Zealand.

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References:


What do specialists and GPs think about the introduction of colorectal cancer screening? A qualitative study

Gillian M Abel, Lee Thompson

Abstract

Aim To explore the views of GPs and specialists on colorectal cancer (CRC) screening.

Methods Qualitative study using semi-structured interviews of 15 GPs and 11 specialists investigating views on the proposed introduction of CRC screening in New Zealand.

Results Both GPs and specialists in this study, whilst agreeing on the overall merit of a population screening programme for CRC in New Zealand, argued that there were not sufficient resources to warrant the implementation of such a programme. There was also little support, especially by the GPs, for the faecal occult blood test, which is likely to be the screening test if implemented.

Conclusions The concerns of GPs and specialists need to be addressed if a screening programme for CRC is introduced in New Zealand. GPs undoubtedly would have to be the advocates of this programme to their patients and therefore they will have to be convinced of the value of this exercise.

Colorectal cancer (CRC) is second only to lung cancer in being the most common cause of cancer registration and deaths in New Zealand and with an ageing population, the absolute number of people with CRC in New Zealand is expected to increase.1

CRC fits most of the World Health Organization criteria for a population screening programme.2 In 1997, the New Zealand National Health Committee convened a working party to look at population screening and at that time recommended that such a programme not be considered because of inadequate resources within New Zealand, as well as the fact that they considered that the benefit would only be a modest one and that there was potential for harm.3 Instead, New Zealand opted for surveillance guidelines4 which would identify those at increased risk of CRC who could then be referred for surveillance colonoscopy.

People identified for surveillance colonoscopy have, however, experienced long waiting periods before being tested because the current health services cannot meet the existing need5. Despite this current pressure on public health services, the Ministry of Health’s Bowel Cancer Team have continued to discuss the issue of CRC screening with health providers and the Government is now committed to introducing a 4-year bowel screening pilot in 2011 to determine whether a bowel screening programme should be rolled out nationally.6

The proposed screening test is the immunochemical faecal occult blood test (FOBT) with those testing positive going on to colonoscopy.
The aim of this paper is to explore the views of GPs and specialists on CRC screening. To date, no other New Zealand study has questioned health professionals in-depth on their attitudes and perceptions towards surveillance and screening for CRC. This highlights the importance of this research as their buy-in would have an impact on implementation and uptake of such interventions in New Zealand.

Research done in Australia suggests that medical practitioners are supportive of CRC screening programmes, particularly if provided through general practice. Studies have shown that GP involvement has an impact on uptake of screening, although Federici et al qualify this claim by pointing out that whether GPs are effective in improving compliance depends upon whether they are willing to be involved.

Beliefs about the effectiveness of the different screening tests for CRC also play a role, with a US study finding that there are significant concerns regarding the accuracy of the FOBT, although in the Australian context, several studies indicate increasing sympathy with FOBT over time.

As well as concerns regarding the role of GPs and the accuracy of the FOBT, there have also been concerns expressed by medical professionals about the increased demand on already over-stretched public health services.

Methods

The data analysed in this paper were obtained from in-depth, semi-structured interviews with 15 GPs and 11 specialists, who included general surgeons, gastroenterologists and medical oncologists. Participants were from the three largest cities in New Zealand: Auckland, Wellington and Christchurch, and were selected purposively for inclusion in the study to reflect the diversity of socioeconomic patient lists.

All participants received a $50 book voucher in appreciation of their time. Ethical Approval for the study was granted by the New Zealand Health and Disability Multi-region Ethics Committee.

The in-depth interviews were carried out by three experienced interviewers and were digitally recorded and transcribed. Participants were asked questions about their thoughts on a population-based screening programme, the surveillance guidelines for CRC, screening, advice to patients at different levels of risk for CRC and referrals for colonoscopic investigation.

Each of the three interviewers had the same semi-structured interview guide to ensure that they all covered the same topic areas. Questioning on the topic of FOBT was conducted in a general way and participants were not pointed towards any particular type of test to make comment on. This allowed for the potential for participants to raise differences in test types.

A thematic analysis was undertaken which is a method used extensively in qualitative research to identify, analyse and report patterns in data. Meaning is sought in the accounts and/or actions of participants, taking into account how the broader social and political context impinge on these meanings. The transcripts were all read prior to the start of coding.

The data collected were sorted into datasets, which are extracts from all the data divided into topics of particular analytical interest. The data in each dataset were read and re-read and coded for features of specific interest. The coded segments of the transcripts were sorted into overarching themes and sub-themes and then refined.

Results

The majority of specialists and GPs thought that in theory a population-based CRC screening programme was a good idea, yet they saw this as being idealistic. They perceived such a programme to be unrealistic primarily due to lack of resources and they also had concerns about what they perceived to be the low sensitivity and
specificity of the FOBT. Another concern held by the GPs in relation to both the above mentioned themes was the possibility of engendering anxiety in their patients.

Resourcing a screening programme—Lack of resources include a concern by both groups about the shortage of colonoscopists in the public system to cope with a population screening programme, and a concern by the GPs regarding the lack of financial compensation when they are likely to have to bear the responsibility of promoting and monitoring the screening programme.

If a population-based screening programme was to be introduced, specialists perceived that it was the GP’s job, as the ambulance at the bottom of the cliff, to communicate risk of CRC to patients and recommend screening. Specialists saw themselves as just there to deal to people at the bottom of the cliff:

GPs actually, I think, are where all screening programmes—the hub of all screening programmes in reality, effective screening programmes—are managed. That’s what they do. It’s their job. I’m the ambulance at the bottom of the cliff. GPs basically are to stop them falling over the cliff, and that’s what screening’s about. So it has to be run through GP programmes. GPs will run the databases, their electronic data systems should talk to the government systems, patients should be sent out reminders that they have their thing, just like you do with breast cancer, cervical cancer screening. All those things, the tools are there. They’re already using them. (Sp4)

The GPs agreed that they were the best source to deliver information on screening to their patients; however, they were concerned about the lack of resources to carry out this role as there were not the financial resources to do so:

For anything to be rolled out effectively, General Practice has to be involved, but for General Practice to be involved, there has to be financial recognition of that. It will not work if it’s rolled out just through public health. (GP4)

I don’t know how that would work. Because, no, unless the screening’s done away from General Practice, you know, if we would be asked to coordinate it and invite patients for it and to look at the results that come back and make decisions on who needs what, then obviously that’s an expense to us that we wouldn’t do unless someone is paying us. (GP7)

But notwithstanding financial issues, GPs were concerned about bringing up the topic of screening for other reasons, including a reluctance to increase patient anxiety:

I have to sit down and talk to people about the risks of not having the screening as opposed to screening and their anxiety. (GP1)

On the whole, women come out of there, we’ve scared them shitless, we’ve subjected them to all this, our agenda of screening, we’ve frightened them, then they come back there and told that they’re all right, and they feel so grateful. They feel so relieved that they forget that it was us bloody doctors who’ve put them through it all in the first place. (GP5)

Screening was also a difficult concept for some GPs to explain to patients especially when they were not convinced of the benefits of screening:

So you’ve got to be very clear that if you’re going to make somebody worried or going to concern them about something, you are doing it with the best interests at heart and that they are going to get some benefit from this. And if you’re just going to worry them, well we’ve got a whole worried population in all sorts of ways. (GP1)

Both groups argued that there would be insufficient resources to deal with the many anticipated follow-up colonoscopies:

Oh great idea, great idea (screening programme), but a lot of work for someone, who has to tease through what’s the best screening to offer, and I would, I would be hugely concerned if it was offered before we could deliver the next step. That would worry me a lot. So it’s a lot of
gear and it needs to be rolled out very slowly…. well it, you can’t throw money at it, that’s out at the moment, and it, if for example, if you did fund a screening policy that identified those people with faecal occult bloods who are positive, you’d then want to offer them a colonoscopy. We need more colonoscopists. (Sp11)

Both GPs and specialists identified the increasingly long waiting list in the public system for people requiring colonoscopies at present, which would be compounded after the introduction of a screening programme:

Well considering they can’t, can’t get timely colonoscopy done for symptomatic patients, surely the whole idea of it really just makes me feel absolutely awful. The idea of having this raised expectation that this is all going to be set up for them, and there’s going to be a huge focus on this. Either it won’t fly because they just haven’t got the resources to put it in, or they’re going to take resources away from somewhere else. That’s a huge concern, and I can’t see that happening. And so if you have a situation where you can’t actually do anything about the positive faecal occult bloods or have to wait for months… (GP6)

In response to their concerns about resourcing, specialists and GPs argued that it would be more beneficial to have a targeted screening programme aimed only at those at increased risk or rather than a recall system, provide a one-off colonoscopy to people at the age of 50:

In fact that could be a strategy for the country obviously, having a one-off screen at 50. I know people get bowel cancer at 25 and so on and so on, but on a population base it’s unlikely, or very rare. (Sp3)

So it’s probably better addressed in the first instance to the at-risk group, just because of the logistics of trying to redress the system. (Sp10)

Colonoscopy was seen as the gold-standard test of choice for CRC screening, especially by specialists:

Well faecal occult bloods are positive … So that’s not accurate, um and there are false negatives, um which means if they come back negative, that person will decide he doesn’t need screening by the gold standard, which is colonoscopy. So you’ve missed a whole chance and you’ve lost… (Sp5)

This specialist argued that colonoscopy was a preferred choice of screening tool to the FOBT because of the greater specificity it provided.

Test sensitivity and specificity—As mentioned previously, the screening test proposed in New Zealand is the immunochemical FOBT with individuals testing positive going on for colonoscopic investigation. The immunochemical FOBT has a higher sensitivity and specificity than the guaiac FOBT.

Participants were asked about FOBT screening in general, not specifically on their thoughts on guaiac and immunochemical FOBTs. Most GPs did not differentiate between the two and talked about FOBT tests in general having a low specificity and sensitivity:

I don’t generally do faecal occult bloods. It’s a waste of time. If they’re negative, you’re still going to have to investigate them cause of the 50% false negative rate. So there’s little point in stuffing around doing that if they’ve just got to have a colonoscopy. (GP6)

Few specialists, too, differentiated between the different types of FOBT:

(FOBT) generates some, generates more colonoscopies than truly needed, so it’s, you know, it’s not specific. (SP6)
One specialist acknowledged that there were different types of FOBT but was unsure about which one would be used in the proposed screening programme, implying that neither was optimal:

So I suspect that faecal occult blood testing in one form or another, be it guaiac or be it immunohistochemistry, the issue’s unresolved there. I think that’s probably the way we’re going to go, but I suspect that with a bit of luck in 10, 20 years time we’ll actually do testing for mutagens within the stool and we’ll be able to detect it better that way. (SP4)

Similar to the discussion on screening with patients, GPs were concerned about the heightened anxiety false positives would engender in their patients which reinforced in their minds the lack of merit in doing an FOBT:

I mean inevitably you get a lot of false positive screening tests that subsequently turn out to be negative on colonoscopy, so yes, it can create a lot of anxiety. (GP7)

Some GPs argued that FOBTs did not feature in their decision-making about referral for screening but “if the person has got risk factors, they need the screening whether or not the faecal occult blood’s positive or not” (GP11). Many GPs instead indicated that they would currently refer patients for CT colonography as a first step instead of FOBT as they perceived the sensitivity and specificity of that test to be superior to FOBT:

CT colonogram, yeah, I’ve certainly made a lot of use of that test since it became available. And as a screening tool, well it’s supposed to be, it’s supposed to have a high, you know, a very high sensitivity and specificity for diagnosing bowel cancer. And it’s quite good at picking up polyps as well. Of course if you pick up a polyp, those people have got to then go on and have a colonoscopy. (GP7)

There was a lot of support by GPs for CT colonography whether or not their patients were drawn from low or high socioeconomic areas. It was seen as less invasive and risky than colonoscopy with no likelihood of perforation, more reliable in picking up abnormalities than FOBT and, in addition, would pick up other abnormalities which both FOBT and colonoscopy would miss.

The specialists, on the other hand, did not see this as an advantage and as well as being concerned about the risk of radiation, argued that the increased cost to the screening programme through picking up other abnormalities was not warranted.

CT colonography obviously offers a possibility, but the issues with that, I think, is the CT, is the radiological dose, if you’re giving to a huge, you know, whole population, and one of the things that could end up making a screening programme really expensive is the picking up of other things that you didn’t expect that you then feel obliged to follow, so like adrenal tumours or the like. I mean some people could see that as a good trade off, they’re picking up things that you might not otherwise, but it adds quite a cost to your screening programme. (SP1)

The holistic nature of general practice and the relationship of trust between patient and GP meant that the concerns of GPs regarding the merits of particular tests were not echoed by those of the specialists. This may have implications in the implementation of a CRC screening programme in New Zealand.

Discussion

The study findings generally support those international studies which indicate that GPs are supportive of screening, have concerns about the accuracy of FOBT, may not be convinced that capacity exists to introduce the programme and have concerns
about screening engendering worry for patients which is a concern also supported in the literature in relation to mammographic screening. But, significant effort is likely to be required to ‘sell’ a screening programme to New Zealand GPs and specialists that has as its point of entry the FOBT.

GPs, especially, perceived the sensitivity and specificity of FOBT to be low but it is most likely that these perceptions were based on the guaiac FOBT which until recently has been the standard test used in New Zealand. The proposed screening programme in New Zealand would make use of the newer immunochemical FOBT which has a higher sensitivity and specificity for detecting left-sided CRC and also does not require the dietary restrictions called for by older tests.

The fact that participants were not questioned directly on the different types of FOBT is a potential limitation of the study, but their responses do also highlight the need for up-to-date information on contemporary forms of FOBT. It may also be the case, as has been found elsewhere, that GPs become more confident about the use of FOBT over time.

The GP advocates for and acts in the best interests of their patients. Family GPs, because of the ongoing relationship with their patients and their families, develop a relationship of trust and it is more likely that their advice on risk and need for screening would hold more weight than information from an unknown other.

In order for GPs to have some confidence in advocating screening to patients, they obviously need to be convinced that the process is worthwhile. The issue of the role of GPs in the implementation of a screening programme for CRC and the potential increase in their workload and responsibilities as a result, needs to be addressed.

The concerns of both GPs and specialists surrounding resourcing in relation to the physical availability of colonoscopic services also need to be addressed. This is particularly important in the case of the GPs as it became clear from the other participants (members of the public) in the wider research project of which this is a part, that they still very much respect the advice of their family doctor. In giving this advice, GPs are cognisant of not wanting to unnecessarily engender patient anxiety and because of their ongoing relationship, are concerned to do the best for their patients.

If GPs are to have confidence in promoting the programme, then they need to be convinced that it will work for their patients.

Competing interests: None.

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References:


**Herpes rugbiorum: a review on scrum pox and rugby player guidelines**

Yassar A S Alamri

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**Abstract**

Sports, especially contact ones, have long been associated with an increased risk of contracting a communicable disease. Viral infections, in particular, have had an increased attention, due to their adverse effects on athletes’ performance. As world sport events have now become more organised and diverse, athletes are now exposed to a wider range of pathogens. With the upcoming Rugby World Cup in 2011 taking place in New Zealand, team-doctors should keep a ‘careful’ eye on potential infectious outbreaks and make sure to adhere to guidelines accessed through fact sheets.

*Herpes rugbiorum* or *Herpes rugbiaforum* (HR) is a skin infection commonly seen in rugby players and in athletes who participate in close contact sports. It is also known as ‘scrum pox’ since it is more easily transmitted during facial skin contact while scrumming. However, it has mistakenly also been called ‘Herpes gladiatorum’, ‘mat herpes’ and ‘mat pox’, all of which rather refer to a similar skin infection seen in wrestlers. With the increase in range of sports and participants, it is almost inevitable that every type of infectious disease can be contracted whether directly or indirectly. Early recognition of the characteristics of a sport-specific infection can prevent outbreaks and the subsequent waste of human and financial resources.

HR infection is mostly caused by *Herpes simplex* virus type 1 (HSV-I), although it can also be caused by bacteria, such as Streptococcus pyogenes, in which case it results in impetigo and the condition is referred to as ‘scrum strep’. HSV-I resides dormant in the trigeminal ganglion; and hence HR is easily confused with *Herpes zoster*. Therefore, it is important for primary care physicians and dermatologists to be able to recognise this disease in order to prevent misdiagnosis and subsequent outbreaks among rugby players and their close contacts. Outbreaks of HR have repeatedly been reported in the medical literature warning from the contagiousness of this disease. However, no solid epidemiological studies have been published to date.

With few exceptions, HR seems to predominantly infect rugby players whose position is within the scrum (i.e. forwards). This is because of the repeated skin-to-skin abrasion that occurs several times, each of which is about 30 to 45 seconds long, during scrummaging in rugby games.

Figure 1 shows the distribution of rugby players during a scrum. However, all reported cases have occurred to players within the same team, and there have not been any reports of cases in which the infection has spread between members of two opposing teams. This might be due to the fact that infected players are generally less likely to be allowed to participate in such games by coaches. However, it is also likely...
that there had been a report bias in that members of other teams might not have been investigated prior to reporting an outbreak within a team.

**Figure 1. Distribution of rugby players during a scrum, adapted¹**

HR generally presents with vesicular rash, extreme fatigue and malaise, cervical and axillary lymphadenopathy, fever and loss of appetite. Subsequent attacks may manifest with similar vesicular eruptions which can be preceded by sensations of pain, burning, itching or parasthesia.

Table 1 compares the general presentation HR to *Herpes zoster* (caused by *Varicella zoster* virus). The vesicular lesions are usually distributed on the face, scalp, trunk, arms and head; and are often mistaken for impetigo, acne, tinea corporis or varicella. Table 2 provides a list of differential diagnoses for HSV infections.
Table 1. HSV-1 (Herpes rugbiorum) infection compared to VZV (Herpes zoster) infection \(^5,6\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Herpes rugbiorum</th>
<th>Herpes zoster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>Athletes in sports requiring close physical contact</td>
<td>Incidence increases with age (&lt;5% in those younger than 14)</td>
</tr>
<tr>
<td>Sex predilection</td>
<td>Almost all reported cases are of male athletes (close-contact females can be affected)</td>
<td>Equal incidence in males and females</td>
</tr>
<tr>
<td>General symptomatology</td>
<td>Vesicular rash, fever, malaise, fatigue, lymadenopathy</td>
<td>Burning, throbbing or stabbing pain (typically confined to same dermatomal distribution) and pruritic rash.</td>
</tr>
<tr>
<td>Location of skin lesions</td>
<td>Clustered at site of contact (often face and torso)</td>
<td>Unilateral dermatomal distribution (commonly CNV(_1), thoracic or lumbar dermatomes)</td>
</tr>
<tr>
<td>Transmissibility</td>
<td>Very contagious</td>
<td>Herpes zoster is not transmissible (however, can result in chickenpox if in direct contact with non-immune individual)</td>
</tr>
</tbody>
</table>

Potential complications include ocular and neurological complications as a consequence of cutaneous lesions. These consist of dendritic keratitis with subsequent corneal scarring, conjunctivitis, sacral ganglionitis, urinary and bowel retention and meningitis. \(^1\)

Table 2. Differential diagnosis for HSV infections \(^5\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Differential diagnosis</th>
<th>Can also consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious</td>
<td>Chancroid; Syphilis; Hand-Foot-and-Mouth disease; Chickenpox; <em>Herpes zoster</em></td>
<td>Herpangina; Infections of other Herpesviridae members (CMV; EBV; HHV6; HHV7 and HHV8)</td>
</tr>
<tr>
<td>Other</td>
<td>Aphthous stomatitis; Erythema multiforme</td>
<td>Fixed drug eruption</td>
</tr>
</tbody>
</table>

Polymerase chain reaction (PCR) testing of vesicular fluid or Tzank smear of scrapings from the base of the vesicles can aid in the diagnosis of HR. Laboratory confirmation may not always be needed, however.

The New Zealand Rugby Union (NZRU) has developed guidelines as for when infected players can return to play. \(^7\) These guidelines have been adopted from the National Collegiate Athletic Association’s (NCAA) and the National Federation of High Schools’ guidelines (NFHS).

The following NZRU recommendations must be met before a player can return to the team: free of systemic symptoms; no new blisters or skin lesions for 72 hours; no moist lesions (i.e. all lesions should be crusted with firmly adherent crust); on appropriate antiviral medication for at least 120 hours; not to cover or hide active lesions. However, keeping a good overall hygiene and maintaining “gentlemen’s agreement”, which prevents players with infectious skin diseases from playing, should always be a target for coaches and players. \(^8\)

Antiviral drugs that block viral DNA synthesis, such as acyclovir and valacyclovir, have been reported to be effective against HR. \(^4\) These drugs attenuate clinical manifestations of the virus resulting in less pain and quicker resolution of the
vesicular lesions. The recommended doses of acyclovir for adult patients include oral acyclovir 200 milligrams (mg) 5 times daily or 400 mg 3 times daily for 5 to 10 days or until symptoms improve.\textsuperscript{4,9,10} The same regimen should also be used for recurrent infections.\textsuperscript{7}

As with all infections, prevention is better than treatment. Early recognition and diagnosis of HR and the immediate quarantine of infected players are the best practices of prophylaxis. The Skinner vaccine (also known as S'MRC) utilises inactivated intracellular subunit of HSV-1 infected cells.

In a reported outbreak of HR among a British rugby club players, the vaccine has been shown to be effective for both prevention and post-exposure prophylaxis.\textsuperscript{4}

**Competing interests:** None.

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**References:**

Smoke-free prisons in New Zealand: maximising the health gain

Jeny Gautam, Marewa Glover, Ainara Scott, David Welch

Abstract

A total smoking ban in prisons comes into effect from July 2011. The ban, introduced by the Corrections Minister, Judith Collins, aims to provide a healthier environment for prison staff and inmates through the elimination of secondhand smoke. Overseas experience has shown that simply banning smoking will not necessarily result in prisoners giving up, nor will it result in the maintenance of abstinence by those who do stop smoking during incarceration. In order to reap maximum health gains from the total smoking ban in prison policy, comprehensive cessation support for all inmates needs to be provided to ensure that they quit during incarceration and continue to abstain from smoking upon release.

Prison arguably presents an ideal opportunity to quit smoking as its restricted environment reduces the possibility of accessing cigarettes and exposure to tobacco marketing. Smoking is deeply embedded in prison culture, and prisoners commonly use tobacco as a form of currency.\(^1\)

The 2005 prison health survey found that three-quarters of prisoners in New Zealand smoked, which is three times higher than the general population.\(^2\) Tobacco smoking is the most common current risk factor among prisoners, associated with the development and/or complications of asthma, heart disease, chronic obstructive pulmonary disease, diabetes, and cancers.\(^2\)

As at September 2010, Māori inmates make up half (50.9%) of the prison population.\(^3\) Given that Māori are an ethnic group with high smoking prevalence,\(^4\) the prison smoking ban provides a unique opportunity to support cessation among them, and reduce the growing disparity in tobacco-related morbidity and mortality between Māori and the rest of the New Zealand population. The prison smoking ban could also assist reduction of smoking among the socioeconomically deprived and women of childbearing age.

Smoke-free prisons reduce risks of fire,\(^5\) lessen the grounds for costly legal action by guards (for exposure to secondhand smoke in the workplace),\(^5\) and reduces the risks of infectious disease outbreaks which are accelerated by active and passive smoking.\(^6\) Therefore, helping inmates to quit successfully during incarceration will not only fulfil the main aim of the total smoking ban, to eliminate active and passive smoking, but it should improve prisoners’ health.

Maintenance of abstinence upon release would have health benefits for the community as 35% of female and 12% of male sentenced inmates were recorded as having child custodial dependents at the time of their imprisonment.\(^7\) As a result, the children of returning inmates who have maintained abstinence would be protected.
from the adverse effects of secondhand smoking as well as reduced potential supply of cigarettes and a reduction in modelling of smoking behaviour.

What can be learned from overseas experience?

Total smoking bans in prisons have been implemented in parts of Australia, the United Kingdom (UK) and the United States (US). Studies from these areas demonstrate that simply implementing a total smoking ban in correctional institutions will not necessarily stop inmates from smoking.

In one US study, three-quarters of the inmates continued smoking to some extent even after the ban. The suggested reason for this high rate was lack of strict enforcement. A study of correctional employees in another state found that a complete ban was supported by about half of non-smoking staff and only 15% of staff who were themselves smokers.

A New South Wales health survey of young people (males and females under 18 years) in custody found high rates of current smoking (58%) among juvenile offenders, despite smoking being illegal while in custody. In another US study, about a quarter of female inmates reported smoking despite the ban.

At correctional facilities where smoking has been banned, a black market in tobacco has developed. Tobacco is a readily accessible legal product in public therefore making it easy to smuggle into prisons. In a survey of seven US states that implemented total bans on smoking, five observed an increase in contraband tobacco.

Furthermore, prison staff tended to be the major source of tobacco products. There are a range of negative consequences which result from a tobacco black market. The price of black market cigarettes was higher, but inmates were willing to purchase the product even if it meant accumulating debt, trading hygiene items, or sexual favours.

Consequently, tensions related to black market regulation and payment were observed between inmates and between inmates and staff. More inmates faced loss of privileges, such as parole eligibility and access to rehabilitation programs, for violating tobacco policies.

Overseas studies have found that even if inmates stop smoking due to smoking bans, a vast majority relapse when they are released back into the community. In interviews of former smokers from a tobacco-free correctional facility, over 97% relapsed within six months of being released. The facility provided information on the risk of smoking via written materials and videos, and basic advice on cessation. Correctional facility medical directors estimated that the percentage of inmates who relapse upon release ranged from 76% to 100%.

If smoking bans do not eliminate inmate smoking while in prison, and have little impact on the likelihood of inmates remaining smoke-free upon release, the proposed policy will fail to render any health benefits other than reduction of passive smoking. Therefore, in order to gain maximum health benefits, the provision of comprehensive cessation support for prisoners is advised.
Where no cessation aids were provided in correctional institutions with bans, all of those institutions had thriving tobacco black markets. The reliance on the black market for nicotine is a natural consequence when no support is given to inmates to cope with smoking abstinence, especially because most incarcerated smokers have high nicotine dependency and are likely to experience high levels of stress from withdrawal symptoms.

The provision of comprehensive cessation support may reduce the conceptualisation of the black market as ‘help’ for inmates dealing with their addiction. Moreover, if cessation intervention rather than punishment were given to those caught smoking contraband cigarettes, this would provide an additional support for those still struggling with their addiction to nicotine.

Current situation in New Zealand

The Department of Corrections has confirmed that currently, in New Zealand, prisoners are offered an 8-week course of nicotine replacement therapy (NRT) patches. Once the smoking ban is implemented, NRT in the form of both patches and lozenges will be made available to prisoners. Current distribution of resources supporting smoking cessation (posters, pamphlets) will continue throughout prison units after the ban.

Prison nurses and health staff as well as staff ‘Workplace Champions’ will be available to provide advice about quitting smoking to prisoners. ‘Workplace Champions’ are prison site staff who have volunteered to support their colleagues and prisoners by being able to answer questions about quitting (Dr Brendan Anstiss, personal communication, 2011).

Areas for action

The recent New Zealand Smoking Cessation Guidelines states that medication and multi-session support form the most effective cessation support for the general population. Medication includes an array of options ranging from NRT to Bupropion, Nortriptyline and Varenicline. Multi-session support is recommended with a minimum of four follow-up contacts via telephone or face to face (individually or in a group).

The availability of both patches and lozenges to prisoners is a positive step towards providing comprehensive cessation support, if prisoners are entitled to use both types of NRT simultaneously. Research shows that using a faster acting form of NRT (lozenges, chewing gum, nasal spray, and inhalers) in combination with nicotine patches increases smokers’ chance of successfully quitting and achieving long-term abstinence from smoking.

Having prison nurses, and prison health and site staff provide advice would contribute to the provision of comprehensive cessation support, if they were trained to provide multi-session support as outlined in the New Zealand Smoking Cessation Guidelines. Provision of multi-session support via telephone, as provided free by Quitline, is not feasible for prisoners as they have limited access to telephones (Dr Brendan Anstiss, personal communication, 2011). Similarly, prisoners do not have access to the Internet thus prohibiting use of web-based quitting services which are
cost-effective for the general smoking population (Dr Brendan Anstiss, personal communication, 2011).

Aspects of behavioural support which have been proven to be effective in helping people to stop smoking in the long term (at least six months) include: giving practical help in planning strategies and support; setting a target quit date; assessing the degree of nicotine dependence to help guide treatment; recommending/prescribing stop-smoking medication; and arranging follow-up consultations with the aim of seeing people for at least four cessation support sessions. If prison nurses, and prison health and site staff have to provide advice without any training, they may fail to provide adequate support.

Given the overrepresentation of Māori in New Zealand prisons and that Māori are a priority group for tobacco control, we recommend the use of Māori smoking cessation training providers such as Te Hotu Manawa Māori, or local Aukati Kai Paipa (Māori smoking cessation providers) to train and support the prison staff. These organizations are experienced in culturally appropriate cessation delivery which typically involves whānau (extended family) and uses culturally relevant health models. They can provide skills in how to effectively work with Māori. Delivering cessation support in a culturally appropriate manner should increase its acceptability and accessibility resulting in better and higher uptake of cessation support.

Along with the provision of comprehensive cessation support, the implementation of smoking bans in prisons requires monitoring and evaluation. The Department of Corrections is conducting an extensive evaluation of the policy implementation and impact, including surveys of staff and prisoners and systems tracking cessation product use. Given that the Government has agreed to the goal of making New Zealand essentially a smoke-free nation by 2025, the smoke-free prison policy provides an excellent opportunity to investigate the impacts of reducing supply at an individual and community level.

Further research could investigate changes in smoker identity as a result of the ban. This is an important question for our future as a smoke-free nation if we are relying on current smokers willingly relinquishing their identity as a smoker. It would be useful also to assess indoor quality before and after the ban as change in concentration of particulate matter 2.5 (which are released from burning cigarettes) would usefully validate observed changes in smoking prevalence.

Once comprehensive cessation support is in place, it is important to evaluate its effectiveness in assisting prisoners to quit smoking. It may be that cessation support based on the general population may not be as effective for prisoners. Prison populations have higher proportions of groups who are socioeconomically disadvantaged, mentally ill, or substance dependent. Cessation programmes may need to be modified to meet their needs. Evidence-based information obtained through evaluation should feed this process for optimal results.

Furthermore, it is advised to provide ongoing cessation support for ex-prisoners who have successfully quit during incarceration. The prison population represents hard-to-reach high risk groups in terms of health. By ensuring that ex-prisoners continue to maintain their smoke-free status, they not only continue to experience the health
benefits but their whānau and community will also benefit from positive role-modelling and the elimination of secondhand smoke.

A support programme, delivered around the time of release, could focus on assisting prisoners to avoid relapse to smoking post-release. An education programme, on how best to support recent quitters, for the families of prisoners could enhance whānau support to stay smoke-free.

Conclusion

Total smoking bans in New Zealand prisons will be implemented in July 2011 to reduce passive smoking among non-smoker prison staff and inmates, and added health benefits could be obtained. Smoking bans can have unintended consequences if implemented without the provision of comprehensive cessation support for prisoners to quit their addiction to nicotine.

Although the Department of Corrections is planning to provide cessation support through the availability of nicotine patches and lozenges, and by having prison nurses, health and site staff provide advice on quitting, this falls short of recommended levels of comprehensive cessation support.

Furthermore, it is crucial to assess the impact of the policy through monitoring and evaluation of both smoking prevalence and the extent of enforcement of the ban. In addition, the proposed comprehensive cessation support needs to be evaluated to get an understanding of how it can be better tailored to prisoners.

Competing interests: None.

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References:


Constriction “Band-Aid” syndrome causing digital ischaemia

Jonathan Heather, Marcus Bisson

Abstract

A case report is presented in which the use of a “Band-Aid” adhesive dressing in a child for a trivial finger wound led to the development of full thickness necrosis requiring terminalisation of a digit.

Case report

A 3-year-old girl presented to the Hutt Hospital Hand Clinic 2 weeks after a small glass laceration to the tip of her index finger. The wound had been dressed by her parents with a longitudinal and a circumferential “Band-Aid” brand adhesive dressing (Johnson & Johnson) (Figure 1).

Figure 1. “Band-Aid” brand adhesive dressing was used to cover an initially trivial finger injury
After initially complaining of pain, she refused to have the dressing removed despite multiple attempts by her parents until nearly 2 weeks, when the tip of the finger to the distal interphalangeal joint level had developed full thickness necrosis (Figure 2) without evidence of infection.

A further week of clinical observation was allowed for full demarcation of the necrotic tissue. Subsequently the finger developed some discharge and a course of oral flucloxacillin was started.

The finger was debrided by terminalising just proximal to the distal interphalangeal joint and primarily closed with local tissue. The stump went on to heal without further incident.

**Figure 2. Full thickness necrosis of the right index finger tip resulting from use of the dressing**
Figure 3. The finger was debrided and went on to heal

Discussion

A number of cases in the literature describe digital ischaemia following the application of tubular elastic dressings\textsuperscript{1–3} however this is the first report to our knowledge describing finger ischaemia from an adhesive “Band-Aid” type dressing. Other unusual causes of finger tourniquet include the hair-tourniquet, most commonly described in infants\textsuperscript{4}.

The most significant factor in our case was the patient’s age and difficulty cooperating with timely removal of the dressing. The use of multiple layers with one of these being circumferential is also likely to be significant in elevated dressing pressures with loss of perfusion to distal tissues, as has been described with previous reports.\textsuperscript{1}
No warning about avoiding circumferential application of such plasters was evident on the packaging and non-medically trained individuals may not be aware of the potential risks with this.

In addition, adhesive dressing removal may be facilitated by the application of peanut oil$^5$ or alcoholic hand steriliser.$^6$ These simple steps may have avoided such a disastrous complication of an initially trivial wound.

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**References:**

Left main stem stenosis in the unstable patient—for ewarned is forearmed

Michael Liang, Damian J Kelly, Gerard Devlin

Abstract

Recognition of clinical and electrocardiographic features suggestive of significant left main coronary artery disease is important, particularly in patients presenting with an acute coronary syndrome. These include hemodynamic instability and widespread ST segment depression, which are well known. In addition, ST segment elevation in lead aVR, a less recognised finding associated with severe left main disease, may be present.

Acute coronary syndromes involving an unstable lesion in the left main coronary artery (LMCA) often lead to rapid clinical deterioration and may present with sudden death. Recognition of clinical and electrocardiographic features suggestive of impending LMCA occlusion is vital to ensure prompt triage and management.

Case report

A previously well and independent 85-year-old lady complained of sudden onset of retrosternal chest pain at rest. Medical history included permanent atrial fibrillation for which she was anticoagulated with warfarin. The initial electrocardiogram showed ST-segment elevation maximal in leads aVL and aVR but also present in the precordial leads V1 and V2, with gross infero-lateral ST-segment depression (Figure 1A). Troponin T was elevated at 0.03 ug/L (<0.03 µg/L).

The ST segment changes and chest pain resolved promptly following sublingual nitroglycerin and supplementary oxygen. A diagnosis of non-ST elevation myocardial infarction was made and the patient was admitted to the coronary care unit for medical management which included aspirin and clopidogrel. Heparin was not initiated because of an international normalised ratio (INR) of 4. Three hours later she experienced recurrent severe pain associated with fall in blood pressure to 78/40 and severe ischaemic ECG changes.

Urgent coronary angiography revealed a critical left main coronary artery (LMCA) lesion (Figure 1B). A 3.5×15 mm Driver (Medtronic Inc, Minneapolis, MN) stent was directly implanted, and post dilated to 4.5 mm in diameter with a very acceptable angiographic appearance. (Figure 1C).

A bare-metal stent was implanted due to the need for long-term warfarin anticoagulation. Following stent insertion there was complete resolution of pain and ECG changes, and her blood pressure normalised at 120/80 mmHg. The patient was discharged on day 4 post-intervention.
Figure 1. (A) ECG showing ST-segment elevation in lead aVR, aVL, V1 and V2 with widespread ST-segment depression in the inferolateral leads. (B) A coronary angiogram showing proximal 95% left main coronary artery occlusion (arrow). (C) Post-percutaneous coronary intervention with a bare-metal stent (arrow)

Discussion

Severe LMCA stenosis is an uncommon finding during angiography in patients presenting with acute coronary syndrome (ACS). Sudden severe haemodynamic deterioration may result due to transient obstruction of the entire left coronary circulation.

Cardiac catheterisation in the setting of ostial LMCA disease is not without risk and may provoke acute left coronary closure due to catheter-induced plaque disruption. While LMCA disease in patients presenting with stable angina has traditionally been treated with coronary artery bypass surgery, there is accumulating evidence on outcomes following percutaneous coronary intervention (PCI).

Kang et al described similar mortality following LMCA PCI with drug-eluting stents (DES) compared to CABG although the risk of repeat procedures remains higher following PCI.$^{1,2}$
Recognition of clinical and electrocardiographic features suggestive of significant LMCA disease is an important adjunct to routine clinical risk stratification, allowing cardiac catheterisation in to be expedited while minimising the risks of intervention.

Typical ECG findings in severe LMCA stenosis or occlusion include ST-segment elevation in lead aVR with either widespread ST-segment depression or anterior ST elevation.3–6 Yamaji et al described an aVR ST-segment of >0.05 mV elevation present in 88% of the LMCA obstruction group compared with 46% in the left anterior descending artery.4

During LMCA occlusion the ST-segment elevation often seen in aVR is thought to be due to ischaemia in the basal anterior septum, the summed vectors of which result in a surface rendering of ST-segment elevation due to aVR functioning as a “cavity-lead”.5 These ECG findings in conjunction with clinical features of haemodynamic instability should lead to a high-index of suspicion of LMCA obstruction in unstable ACS patients.

In summary, acute LMCA ACS is frequently associated with haemodynamic instability and high mortality. Patients presenting with this life threatening manifestation of coronary artery disease require urgent invasive assessment and prompt revascularization. Recognition of the clinical syndrome which is associated with transient severe ECG ischemia ± haemodynamic lability is vital to facilitate rapid and appropriate referral for urgent coronary angiography.

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**References:**

A rare case of brachial artery fibromuscular dysplasia (FMD)

David R Lewis, Timothy Buckenham, YiQian (Estella) Yeo

Clinical presentation

A 65-year-old lady was referred to vascular clinic with bilateral upper limb pain during activities such as vacuuming, washing and hanging clothes. She did not have any symptoms of ischaemic rest pain or neurological symptoms. She is a non-smoker and did not have any of the usual cardiovascular risk factors. On examination, it was difficult to palpate her radial pulses, but her hands were warm with normal capillary refill. A duplex ultrasound of both arms showed 70–75% stenosis of her proximal brachial arteries.

She eventually chose to proceed with percutaneous balloon angioplasty as treatment. Upon reviewing her angiographic findings, a smooth stenosis of the axillary artery and an unusual appearance of the left profunda brachii artery were identified. It has a “string of beads” appearance, which is indicative of fibromuscular dysplasia (Figure 1). It was suggested that FMD might be the underlying cause of her bilateral brachial stenosis.

Figure 1. "String of beads" appearance of profunda brachii (circled) and narrowing of proximal brachial artery are evident.

Discussion

Fibromuscular dysplasia (FMD) is a non-atherosclerotic and non-inflammatory vascular condition that causes arterial stenosis. It is most commonly seen in renal arteries, and to a lesser extent in internal carotid arteries and subclavian arteries.¹

Brachial artery involvement is relatively rare. To date, there are only five known cases of bilateral brachial artery stenosis.¹⁻⁵ Ninety percent of patients with FMD are female.¹ The aetiology of FMD is uncertain. Definitive diagnosis of FMD is by
histological examination. However the typical “string of beads” appearance makes diagnosis with angiography highly accurate.\(^2\)

In this case the strictures in the brachial arteries were smooth, raising the possibility of FMD of the intimal type, which does not give the string of beads appearance. As our patient had no risk factors for atherosclerosis, no history of radiation treatment or inflammatory markers to suggest arteritis, and given the bilateral symmetrical distribution in a site unusual for atherosclerosis, a possibly unifying diagnosis of FMD was suggested.

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**Reference:**
Once-daily amoxicillin for Group A Streptococcal (GAS) sore throat as the other first-line option: a clarification of the NZ sore throat guidelines

We wish to highlight that oral amoxicillin is as valid a first-line treatment for GAS pharyngitis as oral penicillin V in the National Heart Foundation sore throat management guidelines for New Zealand.\(^1\,^2\)

Oral penicillin V 500 mg bd for adults, and 20 mg/kg/day for children (in 2-3 divided doses) is long-established in the international literature and guidelines as first-line treatment for Group A Streptococcal pharyngitis.\(^1\,^2\) However, once-daily oral amoxicillin has emerged as a good alternative, with at least three studies\(^3\,^4\,^5\) finding ten-day oral courses of once-daily amoxicillin and penicillin V (2- to 4-times daily) to be equivalent for GAS pharyngitis. Further details of these studies can be seen in the National Heart Foundation’s sore throat guidelines.\(^2\,^7\)

While it is very effective, oral penicillin has appreciable disadvantages. It is less palatable\(^6\,^8\) and needs to be given on an empty stomach, three or so times each day, all which can cause considerable difficulties for many patients and caregivers. Conversely with once-daily amoxicillin, although its evidence for GAS eradication comes from hundreds not thousands of patients,\(^9\) a single dose without coordinating around mealtimes will suit many patients and families and may help substantially improve adherence. Many families will find it more convenient to take the antibiotics with their food, and the amoxicillin option avoids trying to dose children with a worse-tasting medicine multiple times throughout the day while strictly on an empty stomach.

Once-daily amoxicillin has now been added as a treatment alternative in some other GAS sore throat treatment guidelines internationally, such as the American Academy of Pediatrics’ Red Book\(^10\) and those of the American Heart Association.\(^11\)

Oral amoxicillin can be given for 10 days at a dose of 750 mg once daily for children weighing <30 kg, and 1500 mg once daily for children weighing >30 kg\(^2\) (which equates to 15 ml per day of 250 mg/5 ml oral liquid, or three 250 or 500 mg capsules, depending on weight).

Previous communication in the Journal\(^1\) may have inadvertently understated the positive role of once-daily amoxicillin in GAS eradication and thus rheumatic fever control. As pointed out previously in the Journal,\(^1\) there is a need for some caution with amoxicillin and it will not be suitable for all cases of GAS pharyngitis. It should not be used when infectious mononucleosis (IM)/ Epstein Barr Virus (EBV) is suspected (see footnote *), or if a chance a patient may miss any daily dose (for those at high risk for rheumatic fever). However, amoxicillin still has some important advantages. In line with guidelines elsewhere,\(^10\,^11\) we encourage its use in the New Zealand epidemic setting\(^12\) alongside oral penicillin as the first-line options.
Note: These antibiotic recommendations only apply to symptomatic pharyngitis (not asymptomatic carriers of GAS).

Acknowledgement: Scott Metcalfe, PHARMAC, reviewed and helped revise earlier drafts.

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Footnotes:  
* As pointed out previously in the Journal,¹ there is a need for some caution with amoxicillin and it will not be suitable for all cases of GAS pharyngitis. It should not be given either:

1. If there is doubt that it will be taken every day.¹³  
   This is due to the risk of rheumatic fever developing from improperly treated GAS pharyngitis theoretically in association with less frequent dosing schedules; or

2. If infectious mononucleosis (IM)/ Epstein Barr Virus (EBV) rather than GAS is suspected as the cause of sore throat.¹⁴  
   Giving amoxicillin in infectious mononucleosis may cause a rash, with or without induced sensitivity to amoxicillin.¹² If infectious mononucleosis is suspected, then erythromycin is safer than amoxicillin for treating pharyngitis. If a rash occurs in this setting, it is not inherently harmful, and does not add to morbidity. It can be hard to diagnose infectious mononucleosis, although the triad of lymphadenopathy, splenomegaly and exudative pharyngitis in a febrile patient is often suspicious.¹⁵ Extreme tiredness may be an early sign in teenagers.

The table below may help practitioners diagnose suspected infectious mononucleosis¹⁶‡:
Table: Clinical manifestations of infectious mononucleosis in children and adults

<table>
<thead>
<tr>
<th>Sign or symptom</th>
<th>Frequency (%)</th>
<th>age&lt;4 yrs</th>
<th>age 4+ yrs</th>
<th>adults (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>lymphadenopathy</td>
<td>94</td>
<td>95</td>
<td>93-100</td>
<td></td>
</tr>
<tr>
<td>fever</td>
<td>92</td>
<td>100</td>
<td>63-100</td>
<td></td>
</tr>
<tr>
<td>sore throat or tonsillopharyngitis</td>
<td>67</td>
<td>75</td>
<td>70-91</td>
<td></td>
</tr>
<tr>
<td>exudative tonsillopharyngitis</td>
<td>45</td>
<td>59</td>
<td>40-74</td>
<td></td>
</tr>
<tr>
<td>splenomegaly</td>
<td>82</td>
<td>53</td>
<td>32-51</td>
<td></td>
</tr>
<tr>
<td>heptomegaly</td>
<td>63</td>
<td>30</td>
<td>6-24</td>
<td></td>
</tr>
<tr>
<td>cough or rhinitis</td>
<td>51</td>
<td>15</td>
<td>5-31</td>
<td></td>
</tr>
<tr>
<td>rash</td>
<td>34</td>
<td>17</td>
<td>0-15</td>
<td></td>
</tr>
<tr>
<td>abdominal pain or discomfort</td>
<td>17</td>
<td>0</td>
<td>2-14</td>
<td></td>
</tr>
<tr>
<td>eyelid oedema</td>
<td>14</td>
<td>14</td>
<td>5-34</td>
<td></td>
</tr>
</tbody>
</table>

*used with permission

By contrast, the clinical features of patients at high risk of GAS and developing subsequent rheumatic fever are in the sore throat guidelines’ algorithms at [http://www.nzma.org.nz/journal/122-1301/3746/algorithms.pdf](http://www.nzma.org.nz/journal/122-1301/3746/algorithms.pdf) (comprising risk factors and clinical signs) and Appendix F ‘Differential diagnosis of pharyngitis’ (page 47) of the sore throat guidelines.2


References:


Plain packaging for tobacco in New Zealand: local evidence and arguments

The New Zealand Government has articulated the goal of a smokefree nation by 2025, a development that arose out of a recent Maori Affairs Select Committee Inquiry.

Given the scale of the tobacco epidemic, the ideal response would see adoption of decisive endgame solutions, such as a sinking lid on tobacco sales until these end. However, politicians face constraints that limit scope for decisive action (e.g., industry pressure, coalition arrangements, distraction with short-term issues-of-the-day). These mean an incremental approach to tobacco control is a more likely pathway in the near future, until the pressure for endgame solutions is much stronger.

Legislation currently before Parliament to eliminate tobacco retail displays represents an important incremental step. This legislation will bring the country in line with Australia, Canada and some EU nations. Another increasingly salient measure is plain packaging of tobacco products, and New Zealand has an opportunity to introduce legislation that would parallel Australian regulators’ intentions, and signs of the New Zealand Government’s interest in this area are promising and important.

The international literature documents the effectiveness of plain packaging, and provides both a logical and empirical platform for supporting its introduction.

Plain packaging has two main benefits for public health:

- The removal of, or minimisation of, brand elements that promote the product;
- Facilitating more effective dissuasive packaging via larger pictorial health warnings (PHWs) and unattractive colours.

According to a recent review, the international evidence base for PHWs is now strong. Furthermore, New Zealand data also document the effectiveness of PHWs, their value in making smokers more aware of the Quitline number on tobacco packaging, and their role in prompting use of the Quitline. Australian survey data illustrate the effectiveness of PHWs that substantially overlap in theme and pictorial content with the current New Zealand warnings (see elsewhere for a head-to-head comparison).

This background alone should justify action on plain packaging in New Zealand, but we summarise additional local evidence and arguments for this intervention below (Table 1).
### Table 1. New Zealand evidence and arguments concerning plain packaging of tobacco products

<table>
<thead>
<tr>
<th>Topic area</th>
<th>Detail on the evidence and arguments</th>
</tr>
</thead>
</table>
| **Evidence from NZ studies** | Recent research with young adult NZ smokers reported that: “Plain packs that feature large graphic health warnings are significantly more likely to promote cessation among young adult smokers than fully or partially branded packs.” Other research work with young NZ adults reported that: “Our findings emphasize the continuing importance of tobacco branding as a promotion tool, even when communicated only by packaging.” … “The results support measures such as plain packaging of tobacco products to reduce exposure to these overt behavioral cues.” Preliminary findings from focus group interviews with 14–15 year-olds also suggest that plain packs: increase attention to graphic warnings; increase overall perceptions of smoking harm; and reduce the social appeal of smoking.

Much earlier research with NZ adolescents reported that: “The presentation of health warnings in the context of plain packs achieved a significantly greater recall rate as opposed to brand packs.”

**Survey data on public support**

A Health Sponsorship Council survey provided national data showing that “over half the respondents supported plain (unbranded) packs, with significantly more agreeing to this than disagreeing.” It also found that almost 70% of Pacific peoples, 68% of those in households of six plus people and 60% of parents and caregivers supported this move. Lower levels of support (39% agree, 52% disagree) come from national survey data of smokers, possibly because smokers can be conflicted by regret around smoking and wanting to quit, versus the convenience of selecting a preferred brand.

**Arguments in 2011 (up to end of May)**

A number of submissions to Parliament’s Health Select Committee argued for plain packaging e.g., that NZ and international research suggests that tobacco packaging is an important advertising medium and that the removal of brand imagery and replacement with larger PHWs would decrease the attractiveness of smoking and promote cessation attempts. Similarly, that: “tobacco products be required to sold in plain packs (no logos, only specified type fonts, colours, shapes etc) and the format of products such as cigarettes be specified (colour, shape, printing, etc).” This was also noted in commentary on the Government’s response to the Maori Affairs Select Committee Report.

**Arguments in 2010**

We identified some submissions to the Maori Affairs Select Committee arguing for plain packaging along with arguments in publications which included NZ authors.

**Arguments in 2009**

An article on pack colouring argued that “government-mandated generic (plain) packaging would remove the opportunity to communicate misleading claims and so would afford the highest level of consumer protection”. Likewise, in work on misperceptions by NZ smokers concerning “light” cigarettes, and roll-your-own cigarettes.

**Arguments in 2008**

Among a range of interventions, an Editorial in the NZMJ recommended plain packaging, as did a commentary on reducing harm from marketing. Similarity for work on light cigarettes in NZ, and concerning pack colouring.

**Arguments in 2007 and earlier**

Arguments for plain packaging were made in the context of potentially deceptive brand names and around pack colouring. Prior to 2007, arguments relating to plain packaging in NZ were much less frequent, but they do go back to 1992.

**Counter-arguments**

The three major tobacco companies in NZ have all actively worked against plans for plain packaging in the Australian context (with some of their claims being described as “exaggerated and misleading”). One company has implied that the price of tobacco could be dropped in response to the asserted problem of plain packs facilitating more counterfeiting. Internet-based video clips opposing plain packaging and with tobacco company endorsement have recently appeared (e.g., on YouTube: “No Nanny State”, http://www.youtube.com/watch?v=SYbRumBfMpU). So have dedicated web sites: “I deserve to be heard!”: https://www.ideservetobeheard.com.au/).

In summary, experimental studies from New Zealand are consistent with international evidence that tobacco branding communicates as tobacco promotion. Brand images
mislead, suggesting freedom, leisure and cost-less pleasure. Permitting branding that communicates these aspirational attributes breaches New Zealand’s obligations as a signatory to the Framework Convention on Tobacco Control Treaty (FCTC article 13).

New Zealand research also documents how plain packaging could promote cessation among smokers, and aligns with international studies that conclude this measure would also deter initiation, particularly when combined with larger PHWs and dissuasive pack colouring. National surveys show that most of the public and a reasonable proportion of smokers support the introduction of plain packaging of tobacco products in New Zealand.

The tobacco industry’s opposition to plain packaging illustrates the likely effect this measure would have on tobacco sales and industry profits. The issue has been described as passing the industry “scream test”, indicating likely benefit for public health. Finally, there is no logic in normalising a toxic product by allowing it to masquerade behind a glamorous identity, particularly when national and international evidence illustrate the gains that could be made by stripping this pretence bare.

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Competing interests: Although we do not consider it a competing interest, for the sake of full transparency we note that the authors have undertaken work for health sector agencies working in tobacco control.

References:


   http://www.wnmeds.ac.nz/academic/dph/research/HIRP/Tobacco/posters/Li%20et%20al%20-%20GHWs%20&%20knowledge.pdf

   http://www.wnmeds.ac.nz/academic/dph/research/HIRP/Tobacco/posters/Li%20et%20al%20-%20graphic%20warnings%20PA%202-5.pdf


   http://www.wnmeds.ac.nz/academic/dph/research/HIRP/Tobacco/itcproject.html


Antipyretic therapy for influenza infection—benefit or harm?

The recent pandemic of a novel influenza A (H1N1) strain, in the absence of widely available specific influenza treatments, has refocused attention on the management of associated symptoms such as fever.

Guidelines recommend that antipyretic treatment with paracetamol or ibuprofen is routinely administered to children and adults who develop an influenza-like illness during an epidemic or pandemic.\(^1\) This recommendation is qualified by the acknowledgement that there is little scientific evidence for this approach but that experience suggests that it may help and is unlikely to cause harm.

We propose that this recommendation may not be based on the balance of available evidence, which suggests that the use of antipyretic treatment may increase the risk of an adverse outcome in influenza infection. This evidence can be considered in three parts: what effect temperatures within the physiological febrile range have on the influenza virus, what effect fever has on host defences against influenza infection, and what effect antipyretic treatment has on outcomes in influenza infection in humans and animal models.

**Influenza virus and temperature**—Human tropic influenza viruses are temperature sensitive, with inhibition of replication at temperatures within the physiological range of fever induced by influenza.\(^2-4\) Influenza viruses replicate in the upper respiratory tract at temperatures between 33 and 37°C, with inhibition of replication and structural damage to the influenza virus at 38 to 41°C.

In an animal model, the restriction of viral replication with highly temperature-sensitive influenza strains was more pronounced in the lungs than nasal turbinates, an effect attributed to the higher temperature of the lungs.\(^5\)

In humans, the virulence of an influenza virus is determined by its temperature sensitivity, whereby infection by strains with a shut-off temperature of ≤38°C result in mild symptoms and those with a shut-off temperature of ≥39°C are more symptomatic.\(^2\)

These observations suggest that antipyretic treatment would reduce the febrile response which would otherwise inhibit influenza viral replication, thereby potentially worsening the duration and severity of the illness.

**Fever and host defence**—There is substantive evidence that fever is a phylogenetically ancient host response to infection which may result in survival benefit, and that antipyretic treatment may increase the risk of mortality due to different viral, bacterial and parasitic infections across different animal species.\(^6\) In response to infection, fever is associated with a wide range of potentially beneficial and detrimental effects.
Relevant to influenza, temperatures within the febrile range increase the proliferative response of lymphocytes and macrophages to infection, enhances cytotoxic T cell activity, and the production and activity of cytokines such as interferon.\textsuperscript{7,8}

**Antipyretic treatment in influenza infection**—A recent systematic review has identified that there have been no double-blind placebo-controlled randomised clinical trials of the effect of antipyretic therapy on influenza infection in humans.\textsuperscript{9} Clinical studies have either lacked a placebo group, a virologic diagnosis of influenza or randomisation of antipyretic treatment. As a result, there is little evidence by which to assess the effect of antipyretics on the duration or severity of influenza infection in humans.

By contrast, there are data from controlled studies of the effects of antipyretics and mortality due to influenza in animals, as quantified in the recent systematic review and meta-analysis.\textsuperscript{9} This identified from eight studies that antipyretic treatment increased the risk of mortality in animal models of influenza infection, with a fixed effect pooled odds ratio of 1.34 (95\% CI 1.04 to 1.73). This was observed in studies of aspirin, paracetamol and diclofenac, suggesting a class effect of antipyretics.

Clearly, the findings from the animal studies are poorly generalisable to humans, as the influenza viruses were laboratory-adapted for virulence to achieve a high mortality rate in the animal models used. Furthermore, most of the animal studies included in the meta-analysis utilised mouse models, which generally but not always, have a fall in temperature with influenza infection. This further limits generalisability, particularly in regard to the potential mechanisms of the effect of antipyretic treatment on temperature-sensitive influenza infection.

In contrast with the above findings, a recent study in a mouse model of influenza infection has demonstrated that paracetamol markedly decreases the airways infiltration of inflammatory cells, reduces pulmonary immunopathology and improves overall lung function.\textsuperscript{10} This reduction in immunopathology and morbidity did not adversely affect the induction of virus-specific adaptive responses. These data support the utility of paracetamol for reducing morbidity associated with influenza infection, although similar limitations of generalisability to human infection apply.

**Conclusion**—We conclude that there is an insufficient evidence base to support the use of antipyretics in the treatment of fever from influenza infection. The limited evidence that does exist suggests that the administration of antipyretics may have the potential to increase the severity of influenza illness and the risk of mortality. We suggest that randomised controlled trials of the effect of antipyretics in the treatment of influenza are undertaken as an urgent priority.

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Acknowledgement: The Medical Research Institute of New Zealand influenza research programme is funded by the Health Research Council of New Zealand.

References:
Comment on Government response to air pollution articles

Uncertainty should lead to moderation in regulations or they will be seen to be unreasonable. There is uncertainty in relation to air pollutants. The biological plausibility for harm is most consistently demonstrated in pathophysiological studies testing SO\textsubscript{2}, ozone, and NO\textsubscript{2}, but epidemiological studies assessing these three pollutants have also given variable results.

It is difficult to claim causality for the association of a small excess in mortality with increased levels of ambient PM\textsubscript{10} because of the presence of other pollutants, the frequent association with cold weather which precipitates acute episodes in those with cardiac and respiratory disorders, and the fact that most studies do not reflect the important indoor environment. Given this, claims of a large estimated number of deaths caused by PM\textsubscript{10} appear alarmist and a misapplication of the statistics.

The social and economic consequences of the current National Environmental Standards Regulations applying to all urban areas are broad. They may also have an influence on the redevelopment of Christchurch by focussing planning in relation to air pollution away from the important influences of industry and transport.

Currie and Hunt\textsuperscript{1} give very confident support to the PM\textsubscript{10} theory. Their confidence is not shared by Paul Solomon,\textsuperscript{2} U.S. Environmental Protection Agency, Chair 2010 AAAR Air Pollution and Health Conference. “Although associations have been identified between pollutants...(CO, Lead, NO\textsubscript{2}, PM\textsubscript{2.5}, PM\textsubscript{10}, ozone and SO\textsubscript{2})….and adverse health effects, considerable uncertainty remains regarding….approaches to understanding relationships between air pollution and health effects….which components and sources are most toxic…the mechanisms of actions of the pollutants and causal relationships….This holds true especially for PM because it is composed of many components with significant spatial and temporal variation.”

Our government’s efforts to improve domestic insulation are to be applauded. The enforced replacement of older wood burners with new ones may be an expense with little public benefit and conversion to electrical heating may reduce our energy security. Unfortunately the current regulations in relation to PM\textsubscript{10} make these changes inevitable.

In relation to the causation of ill-health by PM\textsubscript{10} questions concerning biological plausibility, the strength of the association and alternative explanations remain. As a consequence it must be doubtful whether the regulations are reasonable, their basis robust, and whether some of the costs which follow from them are justified.

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References:


Off-label treatment—and response

In their editorial (10 June 2011) doctors Glue and Gale say that Medsafe “...recommends use of written consent if an off-label treatment has minimal supporting evidence, if there is equivocal evidence for safety or efficacy, or if the treatment is experimental.”

Actually Medsafe does not recommend anything. They remind doctors what the law requires. Under the *Code of Health and Disability Services Consumers’ Rights* written informed consent must be obtained if:

(a) the consumer is to be a part of any research; or
(b) the procedure is experimental; or
(c) the consumer will be under a general anaesthetic; or
(d) there is a high risk of bad effects on the consumer.

Unfortunately, the Code does not define “experimental” or “high risk”. The Medsafe document does attempt to characterise “experimental” in the context of making a decision whether to obtain written informed consent. Experimental off-label use is where:

- There is minimal evidence to support this use;
- The evidence of the efficacy or safety of the medicine used in this manner is equivocal; or
- The use is part of a clinical trial.

Who decides whether evidence is “minimal” or “equivocal”? Unfortunately Medsafe leaves that decision to the doctors without any guidance. It would seem prudent for any doctor considering off-label prescribing to obtain written informed consent every time.

Mike McAlevey
Standard Nine
Consumer Networking Service of the Otago Mental Mealth Support Trust

Response from Glue and Gale

The letter from Mike McAlevey questions if there needs to be written consent for off-label use of quetiapine, citing the Code of Health and Disability Services. He suggests that it would be wise for patients to give written, informed consent every time quetiapine is used for an indication it is not licensed for.

This highlights the issue of what a labelled indication really means for a drug. An approved indication (a label) identifies that regulatory approval has been given for use of a drug in a disorder, based on review of a dossier of clinical trial data. The effort and expense of compiling and filing a dossier means that this is only undertaken by...
pharmaceutical companies. Therefore the absence of a labelled indication for a drug may reflect strategic or commercial considerations rather than lack or absence of efficacy.

Doctors are advised to prescribe within the bounds of accepted practice and clinical guidelines, and by implication, inform patients when they are not. In the situation where a treatment is novel and/or there is no evidence base to support it, the use of written informed consent would be appropriate because of the experimental nature of the intervention. However, when there is an evidence base, in our view the usual rules of good prescribing practice apply. Physicians can access a number of resources including the Cochrane Collaboration and the U.S. Preventive Services Task Force websites to provide evidence-based support for clinical decision making for prescription medications.

For example, there have been recent Cochrane reviews on the use of atypical antipsychotics (including quetiapine) in depression and anxiety disorders. Given the extent of the evidence available, including high quality randomized controlled trials and meta-analyses, we consider quetiapine use in these disorders is no longer experimental.

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References:


Teaching of musculoskeletal medicine in New Zealand

The article by Pasley et al\textsuperscript{1} and comment by Theis\textsuperscript{2} highlight the need for changes in the teaching of musculoskeletal medicine (MSK) in New Zealand.

In 2010, we (Brown et al\textsuperscript{3}) studied responses to a web-based questionnaire sent to trainee general practitioners (GPs) to assess their opinions on the adequacy of their undergraduate MSK education in New Zealand. Like Pasley et al\textsuperscript{1} (GP response rate 25%), we achieved a low response rate to our questionnaire, despite several reminders (93 responses from 275 eligible doctors—i.e. a rate of 33.8%).

Taking this limitation into account, our results confirmed Theis’s opinion\textsuperscript{2} that the MSK training of undergraduates needs improvement. Our respondents perceived their knowledge of MSK conditions as inadequate for their needs: nearly half thought the time allocated to MSK was far too short, and they felt less well prepared in MSK than in General Medicine, General Surgery and Paediatrics. Suggestions for improvement included spreading their exposure to MSK training over all 3 final clinical years at medical school and increasing the time supervised by GPs and others besides hospital specialists (e.g. sports medicine doctors and physiotherapists).

Both Pasley et al\textsuperscript{1} and Theis\textsuperscript{2} cite direct health costs for New Zealand to be over $563 million per annum for arthritis alone. Bossley and Miles\textsuperscript{4} have calculated the direct and indirect costs of all MSK conditions (e.g. arthritis, osteoporosis, MSK injuries and chronic MSK pain). They have collected data from ACC (medical and physiotherapy statistics), Ministry of Social Development (MSK-related benefits), national disability and joint replacement registry data, GP visits, pathology tests, imaging and pharmaceutical costs.

Combining all these, they conservatively estimate total costs of MSK conditions to New Zealand as $5570 million per annum which is at least 25% of total annual health costs: it also represents 11% of New Zealand’s GDP (compared to 7.7% of GDP for the costs of MSK conditions in the US\textsuperscript{5}). If indirect and hidden costs (pain, loss of productivity, family care and psychosocial factors) are included, overseas studies suggest this cost is doubled to $11 billion annually.

The Bone and Joint Decade (BJD)\textsuperscript{6} spanned the period 2000–2010: the organisation formed to promote it is still active world-wide. It aims to highlight the importance of MSK conditions due to the rapid ageing of populations and the increasing injury rate in motor vehicle accidents globally. Two current aims of the New Zealand organisation are to improve the training of MSK for NZ doctors, physiotherapists and other health professionals, and to have the NZ government recognise MSK conditions on its list of health priorities.

The UK, Australia and WHO’s European region have recognised these disorders as nationally important. Our government needs to follow the lead taken by these countries with similar health priorities to ours.

The recent Report on the Musculoskeletal Workforce Service Review to Health Workforce New Zealand\textsuperscript{7} recommends that the conservative management of MSK...
disorders, including chronic MSK pain, should be a core competency for all GPs and physiotherapists. By improving management of MSK disorders in primary care, they believe that unnecessary referrals for secondary care will be reduced, and the savings made will assist the NZ Health service to maintain quality and meet increased demand.

As Pasley et al\(^1\) indicate, approximately half of all senior doctors in New Zealand are working in General Practice. We agree that it is therefore logical to aim the undergraduate curriculum in MSK predominantly to those disorders which GPs deem most important. To better satisfy the needs of GPs though, a higher profile needs to be given to their education in the management of MSK disorders - not only at undergraduate level in our medical schools, but also in the post-graduate GP training scheme run by the Royal College of General Practitioners.

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References:


Keep the focus on contaminated poultry to further curtail New Zealand’s campylobacteriosis epidemic

This letter was prompted by a recent paper in the Journal on the epidemiology of campylobacteriosis by Nelson and Harris, which we consider distracts from the key issues related to the control of this disease. We also wish to provide an update on the recent decline in campylobacteriosis incidence in New Zealand following successful food safety interventions targeting contaminated poultry.

In their paper, Nelson and Harris query “…the popular assumption that poultry is the primary source for human campylobacteriosis…”. They also question whether the decline in human cases could be associated with the recently implemented “chicken health scheme”.

There is however overwhelming evidence that contaminated poultry has been the dominant source for human campylobacteriosis in New Zealand for many years. In particular, multilocus subtyping techniques have shown that poultry-associated subtypes of Campylobacter are the main contributors to sporadic campylobacteriosis in this country. On the basis of this evidence, public health professionals have advocated for more rigorous controls on foodborne pathways of campylobacteriosis, particularly poultry.

The recent decline in New Zealand’s campylobacteriosis epidemic is further evidence of the dominant role of poultry as the major source. This decline occurred during the second half of 2007, with the 2008 notification and hospitalisation rates >50% lower than the annual average rates for 2002–2006 (Figure 1).

Our research indicates that this improvement is almost certainly attributable to the implementation of food safety interventions aimed at reducing Campylobacter contamination of poultry, and provides evidence of the success of these interventions.

In their paper, Nelson and Harris also query the timing of this decline in relation to the implementation of Campylobacter control strategies aimed at poultry. They ask the question “If chicken-consumption is truly the source for most cases, why did rates generally decrease in 2007, before the chicken health scheme began…?”. In fact, the New Zealand Food Safety Authority (NZFSA, now the Ministry of Agriculture and Forestry) introduced its first ‘Campylobacter in Poultry Risk Management Strategy’ in August 2006, prior to the decline in human cases. This strategy outlined a range of voluntary and regulatory interventions to reduce Campylobacter contamination of poultry, which were implemented progressively through 2007 and 2008.

It is important to note that the “chicken health scheme” referred to by the authors was a public health intervention to improve human not animal health, with Campylobacter being a commensal in chickens and not affecting animal health.
From April 2007, poultry processors were required to report *Campylobacter* contamination levels on poultry at the end of primary processing to NZFSA’s National Microbiological Database. From April 2008, mandatory *Campylobacter* performance targets were introduced, with NZFSA setting maximum limits for *Campylobacter* contamination on poultry carcasses at the end of primary processing.  

Even before these requirements were in place, the poultry industry had begun monitoring *Campylobacter* levels, with the proportion of poultry carcasses with detectable *Campylobacter* counts decreasing from 63.3% in October 2006 to 39.8% in November 2007. Therefore, the timing of the decline in human campylobacteriosis is consistent with the implementation of food safety interventions targeting poultry.

Source attribution modelling (based on multilocus subtyping of *Campylobacter*) provides probably the most definitive evidence that the decline in human campylobacteriosis can be largely attributed to a reduction in infection arising from poultry (Figure 2). In the pre-intervention period, over 70% of human cases were attributable to poultry, whereas in the post-intervention years, 2008 through to 2010, this estimate declined to 50%, due to an absolute decline in poultry attributable cases. Despite the relative increase in the contribution of ruminant sources to human cases, poultry remains the most important source of human infection in the Manawatu (the sentinel site for the source attribution study).
Campylobacter is a multi-host pathogen, which amplifies in food-producing animals and wildlife without any evidence of disease in animals. This characteristic provides challenges for the control of human campylobacteriosis. However, there is a clear hierarchy in the relative importance of sources of human disease, with poultry sources identified as being the greatest contributor to human cases. On this basis, we do not think it is justifiable for authors such as Nelson and Harris to argue that the epidemiology of campylobacteriosis in New Zealand is a complex mystery or that there is an unknown “substantial underlying factor” driving our epidemic.

Now that the burden of disease from contaminated poultry has reduced we are beginning to develop a picture of other sources and vulnerable groups. Such groups include children living in rural areas as we have previously reported. More research is underway in New Zealand, in addition to the extensive literature already published, examining the contribution of other, albeit less important, sources. An updated Campylobacter Risk Management Strategy has also been released.

New Zealand still has one of the highest campylobacteriosis rates among developed countries, and source attribution studies continue to show that poultry remains the dominant source. This situation suggests that ongoing efforts are required by poultry
producers, with the support of regulators and researchers, to further reduce the disease burden from this source.

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References:


The treatment of functional diseases of the stomach: part 1

(By Dr. W. M. McDonald, Dunedin)

Excerpt of an article that appeared in NZMJ May 1912;9(42).

We ought, perhaps, to have some diffidence in opening a discussion on a subject which is so trite and, I am afraid, to many so uninteresting as dyspepsia, but there is no doubt that digestive disorders are largely on the increase in New Zealand.

The art of preparing food has never been a strong point with the British race. Voltaire accused us of being a nation with 70 religions and only one sauce. We have dropped overboard some of the religions, but we have not increased the number of sauces, and New Zealand, partly from this inherent tendency and partly from the exigencies of our country life, has developed into a place where the art of cooking is practically unknown to the great bulk of the inhabitants.

In country districts the staple foods consist of mutton, bacon, bread, tea and pickles. Even on such a dietary, if it were carefully prepared, if the meat was not over-baked and if the tea was freshly made from fresh water, it would be quite easy to avoid dyspepsia and even to enjoy one's meals. But nothing is more common than to see good food spoiled by bad cooking, and as these articles of diet are prepared in the average household, it is practically impossible to avoid some form or other of digestive disorder, decay of the teeth or neurasthenia, all of which conditions are alarmingly on the increase in New Zealand. No scientific farmer would dream of treating his stock on these lines, no one who wished to raise good fowls or dogs or horses would begin by selecting the most unsuitable food for them.

If some of the people who are so active in the crusade against alcohol would devote a little attention to this matter they would be doing far more for race culture than they are doing at present. It is a common assertion of these extremists that prohibition would empty our gaols and hospitals. If there is any part of our hospitals where one would expect to find the evil effects of alcoholism it is in the male medical wards and I recently made some investigations amongst the male medical patients in the Dunedin Hospital. All the patients were quite frank in their answers and the results were very striking. In all 22 patients were examined.

Five of them, or 23 per cent. were teetotallers; Of these two had suffered from indigestion, one had appendicitis, one had pleurisy, and one had consumption.

In the second class were the very temperate men. They said that they did not care for alcohol, that they rarely touched it or that they were almost teetotallers. These numbered 13 or 59 per cent and three of them were chronic dyspeptics.

Of the remainder No. 1, aged 59, said that he had knocked about bars as a young fellow but had been strictly temperate ever since. He had suffered for years from indigestion. No. 2 occasionally had a few drinks on coming to town but was teetotal in the intervals.
The remaining two were the only ones in the whole number who could be classed as alcoholics, i.e., 9 per cent. One of them had a week’s burst regularly twice a year and the other said that he had always had a few drinks every day. He suffered from indigestion before he learnt to drink. The result showed that 9 per cent were alcoholic and that 30 per cent were dyspeptic.

This simply confirms what is, I am sure, the ordinary experience of all, that the abuse of food is a much more commoner fault than the abuse of alcohol and from what we know now of the way in which functional disease of the stomach tends to become organic, hyperacidity passing on to ulceration and ulceration passing on to cancer, I think I am justified in affirming that this question of the abuse of food is one that demands the serious attention of our profession.

If alcohol is slaving its thousands, bad cooking is slaying its tens of thousands. Putting disease out of the question altogether I think one would be justified further in affirming that a great deal of the crime and insanity of this country are due to the way in which people overbake their mutton and overstew their tea.
The regulation of herbal medicines in Europe—but not UK

To protect consumers, the European Parliament and Council adopted the Traditional Herbal Medicinal Products Directive, which requires all herbal medicinal products to meet standards of quality, safety and efficacy before they can be registered and marketed in the European Union (EU). This became the rule from May 1, 2011 and it was noted that imports from China to the EU would be significantly affected. Seems to be a good public health measure but not unexpectedly disliked by herbalists and possibly their clients.

What was unexpected was that the UK Secretary of State for Health Andrew Lansley made the decision to sidestep the directive by exploiting a derogation in the legislation to enable practitioners in the UK to continue to supply unlicensed herbal medicines. Or was it unexpected—another example of politicians ignoring facts and bowing to pressure from industry?


Medical journals and drug advertising

A topic much discussed over recent years. Everyone talks about it but no one does anything. Until recently, when a journal decided to stop accepting pharmaceutical advertisements. An editorial in a recent edition of *Emergency Medicine Australasia* (doi:10.1111/j.1742-6723.2010.01393) says that the journal’s move is a response to growing evidence about the detrimental effects of the drug industry in medicine. The “detrimental” effects are aired at some length and some comments from elsewhere approved the move. No doubt there will be contrary views to follow and we await with interest.

BMJ 2011;342:884.

Warfarin or dabigatran for stroke prophylaxis in atrial fibrillation

It is known that warfarin can lower stroke incidence by about 60% in those patients who have non-valvular atrial fibrillation. It is also known that warfarin is under used because of fears of haemorrhage and the need for INR monitoring.

Dabigatran which binds to thrombin offers an alternative and a randomised trial found that dabigatran etexilate 110mg twice daily was noninferior to and 150mg twice daily was superior to warfarin therapy in the prevention of ischemic stroke. Both doses of dabigatran were superior to warfarin in terms of major bleeding (NEJM 2009;361:1139-51).

In this commentary the reason why the US Food and Drug Administration (FDA) favours the higher drug dosage is discussed. It acknowledges that the higher dosage has a higher haemorrhage rate (3.3% vs 2.9%) but feels that this is balanced by the better stroke prevention of the higher dose.
The authors state that “most people would agree that the irreversible effects of strokes and systemic embolic have greater clinical significance than non-fatal bleeding”. Hard to disagree. Since dabigatran is cleared primarily by the kidneys, patients with impaired renal function could potentially benefit from a lower dose. However, the authors feel that even in this group the 150mg dose has a superior benefit-risk profile. As Pharmac is listing this drug from 1/7/11 we will no doubt have much more discussion.


**False positive blood cultures**

Blood cultures are very important in the management of the seriously septic patient. However, false-positive cultures often cause serious interpretation problems, leading to the use of inappropriate or unnecessary antibiotics, additional testing and consultation and increased length of stay, all of which increase health care costs. The introduction of closed vacuum culture bottles has not eradicated false-positive results so attention is focussed on skin contamination from the patient or the venesector.

This study compares the false-positive blood culture rates between cultures taken by operators who wear sterile gloves and those who do not. It involves 10,520 blood cultures taken by interns in general medical wards and the intensive care unit. Half of the patients were randomised to each cohort – ie the venesector wore sterile gloves or not. It appears that the use of sterile gloves while drawing blood for culture reduced the contamination rate by almost one half compared with usual practice. Seems logical and worth considering as routine practise.


**Treatment of nasal polyposis**

Chronic rhinosinusitis with nasal polyposis is a common problem resulting in nasal blockage, facial pain and hyposmia. Intranasal steroids are often used and in some are very successful. This report from a Scottish rhinology clinic looks at another strategy. Sixty adults with this diagnosis were randomly assigned to receive 2 weeks of therapy with oral steroids or placebo, followed in both groups by sequential steroid nasal drops and spray. The oral steroid was prednisolone 25mg/day.

At 6 months the researchers reported that initial oral steroid therapy followed by topical steroid therapy seems to be more effective than topical steroid therapy alone in decreasing polyp size and improving olfaction. They noted that those taking oral steroid had a transient suppression of adrenal function and increase in bone turnover after 2 weeks, with a return to baseline at 10 and 28 weeks. They caution that their study was on patients referred to their specialty clinic and the applicability to patients in primary care is uncertain. We wonder whether a smaller dose or oral steroids might be as effective.

University of Otago Faculty of Medicine
Freemasons Postgraduate Fellowships in Paediatrics and Child Health for 2012

The above Fellowships or Scholarships are open to University graduates who intend long term to pursue work in Paediatrics or Child Health within New Zealand. The Fellowships include full-time salary for one year with provision for a further year.

Applications close on **15 July 2011** with the Department Manager, Department of Women’s & Children’s Health, Dunedin School of Medicine, PO Box 913, Dunedin 9054, from whom further details may be obtained (**wch.admin@otago.ac.nz**).