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This Issue in the Journal

New Zealand Pacific peoples’ drinking style: too much or nothing at all?
J Huakau, L Asiasiga, M Ford, M Pledger, S Casswell, T Suaalii-Sauni, I Lima

This paper compares the alcohol consumption patterns of Pacific peoples living in New Zealand (from the 2003 Pacific Drugs and Alcohol Consumption Survey [PDACS]) with the alcohol consumption patterns (from the 2000 National Alcohol Survey [NAS]) of the general New Zealand population. The findings show that a smaller proportion of Pacific people drink alcohol (57%) than the general New Zealand population (85%). However, in general, Pacific drinkers consume larger annual volumes and double the typical-occasion amounts of absolute alcohol than drinkers in the general New Zealand population.

Raised plasma homocysteine levels in alcoholism: increasing the risk of heart disease and dementia?
G Robinson, S Narasimhan, M Weatherall, R Beasley

A raised blood level of the protein homocysteine is an increasingly recognised risk factor for heart disease and dementia. This study has identified that, in both male and female alcoholics, homocysteine levels are markedly raised with levels falling with abstinence from alcohol. These findings could help explain the increased risk of cardiovascular disease, stroke, and intellectual impairment with heavy long-term alcohol consumption. The authors concluded that the common problem of excessive drinking may be under-recognised as a cause of raised homocysteine levels.

Pacific women’s decisions about exercise adoption: utilising the stage-of-exercise-adoption model
D Kingi, A Towers, R Seebeck, R Flett

This study analysed the exercise adoption patterns of Pacific women in an effort to identify potential barriers to exercise for this population. Pacific women were asked to rate their exercise levels, the importance of the costs and benefits of exercise, their exercise self-confidence, and to identify potential barriers to exercise they faced. The results showed that those women facing more barriers, had lower exercise levels, lower exercise-related self-confidence, and poorer self-rated health. Two key areas for future health interventions are highlighted: community-based exercise programs and low-cost exercise regimes.
Factors affecting antenatal care attendance by mothers of Pacific infants living in New Zealand
P Low, J Paterson, T Wouldes, S Carter, M Williams, T Percival

Pregnant women are recommended to initiate their antenatal care during the first trimester (3 months) of their pregnancy, and to attend at least 6 visits to maximise the benefits of screening for complications and to monitor the health of mother and child. This study investigated the antenatal care attendance of 1365 biological mothers of a Pacific birth cohort. Findings showed that over a quarter (26.6%) of mothers initiated their antenatal care late, and 10.7% attended fewer than the recommended number of times. Multivariate analyses showed that late initiation of antenatal care and inadequate attendance were significantly associated with a number of factors including employment prior to pregnancy. The importance of antenatal care needs to be promoted among Pacific communities.

Soil-transmitted helminth infection, skin infection, anaemia, and growth retardation in schoolchildren of Taveuni Island, Fiji
M Thomas, G Woodfield, C Moses, G Amos

We surveyed 258 schoolchildren on the island of Taveuni, Fiji for health problems. We found intestinal helminth infections in 45% and scabies in 32% of children. The rates of these infections were lower in the two villages with a better water supply and infrastructure than in the other three more geographically isolated villages. Intestinal helminth infections did not appear to be a common cause of anaemia and therefore regular treatment to control these infections would probably only provide modest benefits.

Talking about TB: multicultural diversity and tuberculosis services in Waikato, New Zealand
C van der Oest, R Chenhall, D Hood, P Kelly

‘Talking about TB’ presents different refugee and minority groups’ views of tuberculosis in the Waikato Health District. The interviews focused on the cultural differences in the approach of minority populations to health issues and on the accessibility of health services to these population groups. Participants expressed their opinions about how health services, and more specifically about how tuberculosis health services could be improved. Important cultural differences between the minority populations were elucidated by community representatives that may determine the interpretation of symptoms and timing of presentation at medical services, the appropriate cultural processes to be followed in the consultation, and adherence to prescribed treatment.
Smoking cessation using mobile phone text messaging is as effective in Maori as non-Maori
D Bramley, T Riddell, R Whittaker, T Corbett, R-B Lin, M Wills, M Jones, A Rodgers

This paper describes a mobile phone-text-messaging programme to help people to stop smoking, which particularly targeted young Maori. The study was effective in recruiting a high number of Maori into the trial. The study found that the programme was successful in doubling self-reported quitting at 6 weeks, and worked as well for Maori as for non-Maori. This is important due to the high rates of smoking in Maori, and shows clear potential as a new public health initiative.
The health benefits of alcohol: yeah right

Jennie Connor

The recent Alcohol Advisory Council (ALAC) report on the health burden of alcohol in New Zealand\(^1,2\) emphasised the importance of the pattern of drinking, as well as the volume of alcohol consumed, as a major determinant of the health impacts in a population.

While the same weekly alcohol consumption can result from one or two drinks with dinner each day or 10 drinks every Friday night, the effects on disease and injury risk clearly vary. The differences in consumption patterns between Maori and non-Maori populations were estimated to account for large differences in the balance of benefits and harms from alcohol for the two populations, with the main mechanisms being increased injury rates and possible lack of cardiovascular disease benefit in Maori. While this study was limited to health outcomes that were ICD10-classifiable and largely physical, there are also very substantial social and mental health harms resulting from detrimental drinking patterns, which are generally characterised by irregular heavy drinking occasions.\(^3\)

In this issue of the Journal, Huakau et al present the first nationally representative survey of alcohol consumption patterns in Pacific people living in New Zealand.\(^4\) The methods used for the survey are broadly comparable with the previous surveys of Maori\(^5\) and a nationally representative sample.\(^6\) Comparisons made in Huakau’s article, between drinking behaviours in Pacific people and the nationally representative sample, show that while only about 50% of Pacific women and 60% of Pacific men drink any alcohol, volumes consumed by those who do drink are double those of average New Zealand drinkers. This and the other reported drinking behaviours combine to describe a pattern with serious implications for the health of Pacific drinkers and those around them. Indeed, the self-reported experiences of harm caused by one’s own or another’s drinking in their paper are an indication of the frequency of some of the harmful consequences.

In all of the measures that Huakau et al used to describe drinking patterns, the differences between Pacific people and the nationally representative sample are greater than the corresponding gaps for Maori.\(^5\) Therefore, given the findings of the ALAC report for Maori, we can expect the health impacts of alcohol consumption in Pacific people to be even worse. For Pacific drinkers, more frequent episodes of drinking to intoxication increase the risk of acute health effects—mostly unintentional injury, violence, and self-harm. Furthermore, the high average volumes of alcohol consumed would be expected to result in higher risk of alcohol-related chronic diseases, and this combined with the lower frequency of drinking means that any preventive effects for cardiovascular disease are unlikely to accrue.

The analysis of alcohol consumption and its effects at the level of New Zealand as a whole obscures important disparities between Maori and non-Maori populations,\(^1\) and any Maori/non-Maori analysis buries the experience of Pacific people into the heterogeneous population group ‘non-Maori’.
In the same way, the treatment of Pacific peoples as a single group in this analysis will be obscuring cultural differences between distinct Pacific populations. An understanding of these differences is needed for culturally appropriate public health responses to the way alcohol is being used in these populations. Such local initiatives must be backed up, however, with the evidence-based policy and enforcement strategies currently required for the New Zealand population at large.7

There is little dispute that drinking alcohol heavily and intermittently is potentially harmful, and has few if any health benefits. A more controversial question has been whether there are cardiovascular benefits from drinking frequently and heavily, as there are from drinking frequently and lightly.8 The various mechanisms thought to contribute to the cardiovascular benefits of alcohol when consumed regularly (predominantly improved lipid and coagulation profiles9,10) would be expected to benefit all frequent drinkers. Thus, a reduction in coronary disease in heavy frequent drinkers might be expected, even though these benefits would be outweighed by a higher incidence of both injury and chronic diseases.

However, the best epidemiological evidence to date suggests that this is not the case, and that the relationship between average volume of alcohol consumed and coronary disease is J-shaped, with a maximum benefit at around 20 g of alcohol per day (1-2 glasses of wine or cans of beer), some benefit up to about 70 g per day and an increase in risk above about 90 g per day.11 Effects on blood pressure and triglycerides have been implicated in the increased risk at high levels of consumption,10 as well as the detrimental effects of binge drinking episodes12 but the picture is far from complete.

The paper by Robinson et al in this issue of the Journal13 explores one of the mechanisms that may contribute to this observed population effect. Frequent drinking raises plasma homocysteine, and in heavy frequent drinkers this reaches a level that has been associated with increased risk of coronary disease. Although raised homocysteine has been described before in male alcoholics, their paper is the first to report the elevation of homocysteine and its fall following abstinence from alcohol in women.

Elucidation of the mechanisms of alcohol-related health effects will continue, but there is no doubt that avoidable harm is resulting from our current patterns of drinking. A major shift in the drinking culture(s) of New Zealand would result in significant improvements in population health, but this is not going to be quickly or easily achieved, so policies should not be made on this assumption.14 However, there are a number of effective measures that have been shown to reduce the frequency of harmful drinking occasions and prevent their common consequences.

Examples of these evidence-based interventions that are being disregarded or under-utilised in New Zealand are: increasing alcohol taxes; limiting the density of outlets; raising the alcohol-purchasing age; lowering the legal blood-alcohol limit for drivers; setting a zero blood-alcohol limit for young drivers; and, most importantly, serious enforcement of the existing laws and regulations governing the supply and use of alcohol. Evaluations of alcohol education and media campaigns aiming to reduce alcohol-related harm have shown little evidence of effectiveness.7,14
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References:


Is this clinical trial fully registered? A statement from the International Committee of Medical Journal Editors

Catherine De Angelis, Jeffrey Drazen, Frank Frizelle, Charlotte Haug, John Hoey, Richard Horton, Sheldon Koizin, Christine Laine, Ana Marusic, John Overbeke, Torben Schroeder, Harold Sox, Martin Van Der Weyden

In September 2004, the members of the International Committee of Medical Journal Editors (ICMJE) published a joint editorial aimed at promoting registration of all clinical trials (www.nzma.org.nz/journal/117-1201/1054).

We stated that we will consider a trial for publication only if it has been registered before the enrolment of the first patient. This policy applies to trials that start recruiting on or after July 1, 2005. Because many ongoing trials were not registered at inception, we will consider for publication ongoing trials that are registered before September 13, 2005. Our goal then and now is to foster a comprehensive, publicly available database of clinical trials.

A complete registry of trials would be a fitting way to thank the thousands of participants who have placed themselves at risk by volunteering for clinical trials. They deserve to know that the information that accrues from their altruism is part of the public record, where it is available to guide decisions about patient care, and deserve to know that decisions about their care rest on all of the evidence, not just the trials that authors decided to report and that journal editors decided to publish.

We are not alone in pursuing this goal. The World Health Organization (WHO), through meetings in New York, Mexico City, and Geneva, has brought us close to the goal of a single worldwide standard for the information that trial authors must disclose. Around the world, governments are beginning to legislate mandatory disclosure of all trials. For example, among the bodies considering new legislation is the U. S. Congress, where the proposed Fair Access to Clinical Trials (FACT) Act would expand the current mandate for registration of clinical trials. Many other journals have adopted our policy of requiring trial registration.

These initiatives show that trial registration has become a public issue. But, as our deadline for registration approaches, trial authors and sponsors want to be sure that they understand our requirements, so that reports of their research will be eligible for editorial review. The purpose of this joint and simultaneously published editorial is to answer questions about the ICMJE initiative and to bring our position into harmony with that of others who are working toward the same end.

Our definition of a clinical trial remains essentially the same as in our September 2004 editorial: “Any research project that prospectively assigns human subjects to intervention and comparison groups to study the cause-and-effect relationship between a medical intervention and a health outcome.” By “medical intervention” we mean any intervention used to modify a health outcome. This definition includes drugs, surgical procedures, devices, behavioural treatments, process-of-care changes, and the like. We update our 2004 editorial to state that a trial must have at least one
prospectively assigned concurrent control or comparison group in order to trigger the requirement for registration.

Among the trials that meet this definition, which need to be registered? The ICMJE wants to ensure public access to all “clinically directive” trials -- trials that test a clinical hypothesis about health outcomes (e.g. “Is drug X as effective as drug Y in treating heart failure?”). We have excluded trials from our registration requirement if their primary goal is to assess major unknown toxicity or determine pharmacokinetics (phase 1 trials).

In contrast, we think the public deserves to know about trials that could shape the body of evidence about clinical effectiveness or adverse effects. Therefore, we require registration of all trials whose primary purpose is to affect clinical practice (phase 3 trials). Between these two extremes are some clinical trials whose prespecified goal is to investigate the biology of disease or to provide preliminary data that may lead to larger, clinically directive trials.

We recognise that requiring public registration of trials whose prespecified goal is to investigate the biology of disease or to direct further research might slow the forces that drive innovation. Therefore, each journal editor will decide on a case-by-case basis about reviewing unregistered trials in this category. Authors whose trial is unregistered will have to convince the editor that they had a sound rationale when they decided not to register their trial. The ICMJE will maintain this policy for the next two years. We will then review our experience.

Our September 2004 editorial specified the information that we would require for trial registration. Attendees at a recent meeting of the WHO registration advisory group identified a minimal registration data set of 20 items (Table 1). The WHO-mandated items collectively address every key requirement that we established in our September 2004 editorial.

The ICMJE supports the WHO minimal data set and has adopted it as the ICMJE’s requirement: we will consider a trial for publication if the authors register it at inception by completing all 20 fields in the WHO minimal data set. As individual editors, we will review the data in the registration fields when we decide whether to consider the trial for publication. We will consider a registration data set inadequate if it has missing fields or fields that contain uninformative terminology. If an investigator has already registered a clinical trial in a publicly owned, publicly accessible registry using the data fields that we specified in our 2004 editorial, we will consider that registration to be complete as long as each field contains useful information.

Acceptable completion of data fields is an important concern. It shouldn’t be, but it is. Many entries in the publicly accessible clinicaltrials.gov database do not provide meaningful information in some key data fields. A search conducted on May 4, 2005 (Deborah Zarin, M.D., personal communication) indicates that certain pharmaceutical-company entries list a meaningless phrase (e.g., “investigational drug”) in place of the actual name of the drug, even though a U.S. law requires trial registrants to provide “intervention name” (www.fda.gov/cder/guidance/4856fnl.htm).

Many companies and other entities are completing the data fields in a meaningful fashion. Data entries must include information that will be of value to patients and
health professionals; the intervention name is needed if one is to search on that intervention.

Table 1. Minimal Registration Data Set*

<table>
<thead>
<tr>
<th>Item</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique trial number</td>
<td>The unique trial number will be established by the primary registering entity (the registry).</td>
</tr>
<tr>
<td>Trial registration date</td>
<td>The date of registration will be established by the primary registering entity.</td>
</tr>
<tr>
<td>Secondary IDs</td>
<td>May be assigned by sponsors or other interested parties (there may be none).</td>
</tr>
<tr>
<td>Funding source(s)</td>
<td>Name of the organisation(s) that provided funding for the study.</td>
</tr>
<tr>
<td>Primary sponsor</td>
<td>The main entity responsible for performing the research.</td>
</tr>
<tr>
<td>Secondary sponsor(s)</td>
<td>The secondary entities, if any, responsible for performing the research.</td>
</tr>
<tr>
<td>Responsible contact person</td>
<td>Public contact person for the trial, for patients interested in participating.</td>
</tr>
<tr>
<td>Research contact person</td>
<td>Person to contact for scientific inquiries about the trial.</td>
</tr>
<tr>
<td>Title of the study</td>
<td>Brief title chosen by the research group (can be omitted if the researchers wish).</td>
</tr>
<tr>
<td>Official scientific title of the study</td>
<td>This title must include the name of the intervention, the condition being studied, and the outcome (e.g. The International Study of Digoxin and Death from Congestive Heart Failure).</td>
</tr>
<tr>
<td>Research ethics review</td>
<td>Has the study at the time of registration received appropriate ethics committee approval (yes/no)? (It is assumed that all registered trials will be approved by an ethics board before commencing.)</td>
</tr>
<tr>
<td>Condition</td>
<td>The medical condition being studied (e.g. asthma, myocardial infarction, depression).</td>
</tr>
<tr>
<td>Intervention(s)</td>
<td>A description of the study and comparison/control intervention(s) (For a drug or other product registered for public sale anywhere in the world, this is the generic name; for an unregistered drug the generic name or company serial number is acceptable). The duration of the intervention(s) must be specified.</td>
</tr>
<tr>
<td>Key inclusion and exclusion criteria</td>
<td>Key patient characteristics that determine eligibility for participation in the study.</td>
</tr>
<tr>
<td>Study type</td>
<td>Database should provide drop-down lists for selection. This would include choices for randomised vs. non-randomised, type of masking (e.g. double-blind, single-blind), type of controls (e.g. placebo, active), and group assignment, (e.g. parallel, crossover, factorial).</td>
</tr>
<tr>
<td>Anticipated trial start date</td>
<td>Estimated enrolment date of the first participant.</td>
</tr>
<tr>
<td>Target sample size</td>
<td>The total number of subjects the investigators plan to enroll before closing the trial to new participants.</td>
</tr>
<tr>
<td>Recruitment status</td>
<td>Is this information available (yes/no) (If yes, link to information).</td>
</tr>
<tr>
<td>Primary outcome</td>
<td>The primary outcome that the study was designed to evaluate Description should include the time at which the outcome is measured (e.g. blood pressure at 12 months)</td>
</tr>
<tr>
<td>Key secondary outcomes</td>
<td>The secondary outcomes specified in the protocol. Description should include time of measurement (e.g. creatinine clearance at 6 months)</td>
</tr>
</tbody>
</table>

*The data fields were specified at a meeting convened by the WHO in April 2004; the explanatory comments are largely from the ICMJE.
We recognise that clinical trial registries have many uses, but whatever the use, a worldwide uniform standard for a minimal database is necessary. We have participated in the WHO effort to establish a clinically meaningful trial registration process. The ICMJE supports this ongoing project. When it is complete we will evaluate the process, and if it meets our primary objectives, we will adopt it.

We stated our requirements for an acceptable trial registry in the September 2004 editorial, and they remain the same. The registry must be electronically searchable and accessible to the public at no charge. It must be open to all registrants and not for profit. It must have a mechanism to ensure the validity of the registration data.

The purpose of a clinical trials registry is to promote the public good by ensuring that everyone can find key information about every clinical trial whose principal aim is to shape medical decision-making. We will do what we can to help reach this goal. We urge all parties to register new and ongoing clinical trials. If in doubt about whether a trial is “clinically directive,” register it. Don’t use meaningless phrases to describe key information. Every trial participant and every investigator should be asking, “Is this clinical trial fully registered?”

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New Zealand Pacific peoples’ drinking style: too much or nothing at all?

John Huakau, Lanuola Asiasiga, Michael Ford, Megan Pledger, Sally Casswell, Tamasailau Suaalii-Sauni, Ieti Lima

Abstract

Aims To describe the alcohol consumption patterns and related harms of some Pacific peoples (Samoan, Cook Islands Maori, Tongan, Niuean, Fijian, and Tokelauan) living in Aotearoa (New Zealand), and to draw comparisons with measures from the general New Zealand population.

Methods The Pacific Drugs and Alcohol Consumption Survey (PDACS) was carried out with 1103 randomly selected Pacific peoples aged between 13 and 65 years old who were resident in households throughout New Zealand. The survey used computer-assisted telephone interviewing (CATI) and computer assisted cell-phone interviewing (CACI). The interviews were carried out in 2002/03. We descriptively compare findings from the PDACS with those from the 2000 National Alcohol Survey (NAS).

Results Fifty-seven percent of Pacific peoples were drinkers (males 61%, females 51%), compared with 85% of the general New Zealand population (males 88%, females 83%). The average annual consumption of absolute alcohol was 21 litres for Pacific drinkers (males 28 litres, females 14 litres) compared with 11 litres for general New Zealand population drinkers (males 16 litres, females 7 litres). The typical occasional quantity consumed by Pacific drinkers was eight drinks (males: nine drinks, females: five drinks) compared with four drinks for drinkers in the general New Zealand population (males: five drinks, females: around four drinks). Thirty-three percent of Pacific drinkers consumed enough to feel drunk at least weekly (males 41%, females 25%) compared with 9% of drinker in the general New Zealand population (males 13%, females 6%). Eighteen percent of Pacific males and 10% of Pacific females reported being physically assaulted by someone who had been drinking compared with 8% and 5% of national males and females respectively. Twenty-three percent of Pacific males and 16% of Pacific females got drunk when there was an important reason to stay sober, compared with 8% and 5% of general New Zealand males and females respectively. Nineteen percent of Pacific males and 21% of Pacific females reported being involved in a serious argument after they had been drinking compared with 12% and 8% of general New Zealand males and females respectively.

Conclusions The proportion of Pacific drinkers is less than the proportion of drinkers in the general New Zealand population. However, Pacific drinkers consume larger annual volumes and typical occasion amounts of absolute alcohol than drinkers in the general New Zealand population. Pacific peoples drinking patterns appear to be more harmful with greater proportions of Pacific peoples reporting violence and injury from other peoples’ drinking, and greater proportions of Pacific drinkers reporting problems from violence and serious arguments as a result of their own drinking.
compared with the general New Zealand population and general New Zealand population drinkers.

Past New Zealand national and Auckland regional alcohol telephone surveys\textsuperscript{1–3} have provided only a limited picture about the pattern of alcohol consumption among some Pacific peoples because of the relatively small size of the Pacific population in New Zealand and because of their lesser access to telephones compared with the general New Zealand population drinkers.\textsuperscript{4}

In the \textit{New Zealand Drug Statistics 2001} publication,\textsuperscript{5} data on Pacific peoples from several annual Auckland surveys\textsuperscript{3} had to be combined to provide a brief picture about Pacific peoples’ alcohol use. Those findings showed that 59\% (n=760) of Pacific peoples living in Auckland had consumed alcohol in a previous year, with more males than females reporting that they had done so. The average quantity of alcohol consumed by males on a typical occasion varied between five to six drinks for those aged over 30 years, to nine drinks for those aged under 30 years. For females, the average quantity of alcohol consumed on a typical occasion varied between four to five drinks for those over 30 years, to five to six drinks for those under 30 years.

In 2003, it was decided to carry out a Pacific specific national survey to inform policy and practice. The \textit{Pacific Drugs and Alcohol Consumption Survey (PDACS)}\textsuperscript{6} sampled 1103 Pacific peoples using both telephone and cell-phone computer assisted interview survey methods. PDACS collected data over several months from a nationally representative sample of Pacific peoples with and without landline telephones. PDACS provides us with the most comprehensive picture to date of the alcohol consumption patterns of Pacific peoples living in Aotearoa (New Zealand).

In this paper, we outline Pacific peoples’ patterns of drinking and harm reported by this survey, and descriptively compare them with those of the general New Zealand population based on findings from the 2000 National Alcohol Survey (NAS).\textsuperscript{1} While some methodological differences exist, this comparison enables us to make cautious inferences about differences in potential levels of harm Pacific peoples face due to differences in their pattern of alcohol consumption compared with that of the general New Zealand population.

\textbf{Methods}

\textbf{Background—}Between November 2002 and July 2003, PDACS collected data from 1103 Pacific peoples aged 13–65 years about their patterns of alcohol-use as well as about related harm.

\textbf{Interviews—}The sample was interviewed using computer-assisted telephone interviewing (CATI) and computer assisted cell-phone interviewing (CACI) systems. The survey was translated into four Pacific languages (Samoan, Cook Islands Maori, Tongan, and Niuean) and interviewers who were fluent in one of these languages were available if required. Around 79\% of interviews were completed in English, 9\% of interviews in Samoan, 9\% of interviews in Tongan, 3\% of interviews in Cook Island Maori, and less than 1\% in Niuean.

The survey questionnaire was designed to provide comparable data to that collected in previous national alcohol surveys.\textsuperscript{1,2} The question format used allowed for collection of beverage and location specific data and has been shown to be a good measure.\textsuperscript{7} In the Pacific survey, one new location (that of celebrations) was added to the locations asked about, and some locations with lower consumption were excluded explicitly but implicitly included in the ‘other’ location category.

The alcohol measures included annual volume, frequency of drinking, quantity of alcohol consumed on a typical occasion, frequency of drunkenness, and experience of alcohol-related consequences in the previous 12 months from the respondents’ own and others’ drinking.
**Sampling**—The survey methodology involved sampling Pacific peoples aged 13 to 65 years from households with land-line telephones via CATI and from households without land-line telephones via CACI.

Households selected for the CATI survey were either selected using random digit dialling (RDD) or randomly selected from a list of published telephone numbers of households with people with ‘Pacific-seeming’ names (first names or second names) drawn from their electoral enrolment details (LEXICON).

Households selected for the CACI survey were selected from within clusters of households from mesh blocks within Statistics New Zealand Area Units via a systematic walk in a random direction from a random starting point. During these walks, the recruiter went door to door looking for Pacific households without a land-line telephone. Pacific members of such households were then given the opportunity to be interviewed using a cell-phone the recruiter was carrying. Hence there were three sampling frames used RDD, LEXICON, and CACI.

Call-backs were done at least 10 times for the RDD and the LEXICON methods, and at least three times for CACI on unidentified addresses to see if these were households with no land-line telephone that included Pacific peoples.

On average about one respondent per household was interviewed. The selection criteria used a combination of random numbers and a birthday question. The birthday question asked, “Who had the last birthday?”

Halfway through the survey, the question changed to: “who had the last birthday?” and “who will have the next birthday?” This change in procedure was made because it was found that the first person contacted was volunteering inappropriately to do the survey. If there was only one Pacific person in a household their probability of selection was adjusted to be 50%.

At the end of the interview a detailed enumeration of the household was made, including ethnic groups to which each member belonged, and then independent random numbers were used to select other members from that household to be interviewed. (The enumeration procedure was not carried out at the beginning of the interview (as is commonly done) because of concern that with this particular population such a procedure would reduce the response rate.)

Selection probabilities at this stage were modified so that people from smaller ethnic groups; for example, Niueans had a higher probability of being interviewed than those from the larger ethnic groups such as Samoan. The goals here were to have enough numbers for Pacific ethnic-specific information as well as obtaining a representative sample of Pacific peoples.

Post-stratification weighting was necessary because different Pacific peoples had different chances of being selected for the survey. The weighting took into account: RDD/LEXICON/CACI sampling frame, household selection, individual selection within each household, compound ethnicity, and census size of each ethnic group (as smaller Pacific ethnic groups were over-sampled). More detail about the weighting is presented elsewhere.

Of the 1103 respondent interviews, 388 were RDD, 610 LEXICON, and 105 CACI. The response rate varied according to the sampling frame used. The response rate for the RDD was 60%, the response rate for the LEXICON was 77% and the response rate for CACI was 44%. The survey had an overall composite response rate of around 66%.

Table 1 shows that the sample is representative of the national Pacific population as the weighted data reasonably matches the gender and age profile of the national Pacific population enumerated in Census 2001.

**Analysis**—The data were analysed using SAS\textsuperscript{8} and SUDAAN\textsuperscript{9} statistical software following the same procedures for calculating measures of alcohol consumption as used for the 2000 NAS. Small changes in the questions were taken into account in producing derived variables. Where gender and age differences are reported, they are statistically significant at the 5% level.
Table 1. Sample profile shown by gender and age group

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Group (years)</th>
<th>Sample Numbers</th>
<th>Sample % Unweighted</th>
<th>Sample % Weighted</th>
<th>% Census 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13-17</td>
<td>77</td>
<td>7.0</td>
<td>8.7</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>18-20</td>
<td>57</td>
<td>5.2</td>
<td>5.8</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>21-29</td>
<td>99</td>
<td>9.0</td>
<td>9.3</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>30-34</td>
<td>53</td>
<td>4.8</td>
<td>5.0</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td>108</td>
<td>9.8</td>
<td>8.4</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>45-54</td>
<td>74</td>
<td>6.7</td>
<td>6.0</td>
<td>6.2</td>
</tr>
<tr>
<td>Female</td>
<td>13-17</td>
<td>73</td>
<td>6.6</td>
<td>7.0</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>18-20</td>
<td>59</td>
<td>5.3</td>
<td>5.0</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>21-29</td>
<td>150</td>
<td>13.6</td>
<td>13.2</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>30-34</td>
<td>63</td>
<td>5.7</td>
<td>4.4</td>
<td>6.6</td>
</tr>
<tr>
<td></td>
<td>35-44</td>
<td>107</td>
<td>9.7</td>
<td>9.1</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td>45-54</td>
<td>81</td>
<td>7.3</td>
<td>7.9</td>
<td>6.3</td>
</tr>
<tr>
<td></td>
<td>55-65</td>
<td>59</td>
<td>5.3</td>
<td>6.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1103</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Results

Table 2 displays various measures relating to patterns of alcohol consumption for the 2003 PDACS and 2000 NAS surveys.

Percentage of drinkers—In 2003, Table 2 shows that over half (57%) of the Pacific respondents were drinkers; more males (61%) than females (51%) drank. In comparison, 85% of the general New Zealand population were drinkers in the year 2000; similar proportions of males and females drank.

Annual consumption—In 2003, Table 2 shows that the average annual volume of absolute alcohol consumed by Pacific drinkers was 21 litres of per annum, and males consumed more alcohol annually than females. In comparison, the average annual amount of absolute alcohol consumed by drinkers in the general New Zealand population was 11 litres in 2000, with males consuming more alcohol annually than females.

Frequency of drinking—In 2003, Table 2 shows that (on average) Pacific drinkers drank approximately two to three times per week, and that Pacific male drinkers (on average) drank more often than Pacific female drinkers. In comparison, drinkers in the general New Zealand population drank approximately three times per week of whom male drinkers drank more often than female drinkers.

Typical quantity—In 2003, Pacific drinkers’ average quantity of alcohol consumed on a typical occasion was 8 drinks (1 drink is equal to 15 ml of absolute alcohol—thus 8 drinks is equivalent to 120 ml of absolute alcohol), while Pacific males drinkers’
consumed an average of 9 drinks and Pacific female drinkers’ an average of 6 drinks on a typical occasion. In comparison, the general New Zealand population drinkers’ average quantity of alcohol consumed on a typical occasion was 4 drinks (61 ml of absolute alcohol) in 2000; of whom males drinkers consumed an average of 5 drinks, and female drinkers an average of 3½ drinks on a typical occasion, respectively.

Table 2. Patterns of alcohol consumption: the 2003 Pacific survey and 2000 National survey compared

<table>
<thead>
<tr>
<th></th>
<th>Proportion of drinkers (%)</th>
<th>Average annual volume (litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Males Females</td>
<td>All Males Females</td>
</tr>
<tr>
<td>2003 PDACS</td>
<td>57 61 51</td>
<td>21 28 14</td>
</tr>
<tr>
<td>2000 NAS</td>
<td>85 88 83</td>
<td>11 16 7</td>
</tr>
<tr>
<td></td>
<td>Average annual frequency (n)</td>
<td>Average typical occasional quantity (ml)</td>
</tr>
<tr>
<td></td>
<td>All Males Females</td>
<td>All Males Females</td>
</tr>
<tr>
<td>2003 PDACS</td>
<td>133 167 93</td>
<td>120 142 96</td>
</tr>
<tr>
<td>2000 NAS</td>
<td>168 203 136</td>
<td>61 72 52</td>
</tr>
<tr>
<td></td>
<td>Proportion drinking enough to feel drunk at least weekly (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Males Females</td>
<td></td>
</tr>
<tr>
<td>2003 PDACS</td>
<td>33 41</td>
<td></td>
</tr>
<tr>
<td>2000 NAS</td>
<td>9 13</td>
<td></td>
</tr>
</tbody>
</table>

|                      | Drinking in own home         | Occasional quantity |
|                      | Proportion (%)               | Frequency (n)        |
|                      | Males Females                | Males Females        |
| 2003 PDACS           | 72 58                       | 62 48                |
| 2000 NAS             | 91 89                       | 109 85               |

|                      | Drinking in other people’s homes | Occasional quantity |
|                      | Proportion (%)                  | Frequency (n)        |
|                      | Males Females                  | Males Females        |
| 2003 PDACS           | 65 66                         | 34 26                |
| 2000 NAS             | 86 84                         | 26 21                |

|                      | Drinking at pubs, hotels, and taverns | Occasional quantity |
|                      | Proportion (%)                  | Frequency (n)        |
|                      | Males Females                  | Males Females        |
| 2003 PDACS           | 44 39                         | 55 36                |
| 2000 NAS             | 61 51                         | 34 17                |

NAS=National Alcohol Survey; PDACS=Pacific Drugs and Alcohol Consumption Survey.

Frequency of ‘drinking enough to feel drunk’—In 2003, a third (33%) of Pacific drinkers consumed enough to feel drunk at least once a week, with more males (41%) than females (25%) reported doing so. In comparison, 9% of the general New Zealand population drinkers consumed enough to feel drunk at least once a week; and again, more males (13%) than females (6%) reported doing so.

Location of drinking—In 2003, 72% of Pacific male and 58% of Pacific female drinkers drank in their own home, on average once per week. On such a typical occasion, Pacific males had 11 drinks and Pacific females had 8 drinks. In comparison, around 90% of male and female general New Zealand population drinkers drank in their own home in 2000, on average twice per week. On such a typical occasion, males had 6 drinks and females had 3 to 4 drinks.
Around 65% of Pacific male and female drinkers had alcohol at other peoples’ homes on average less than once per week, and on such an occasion (in other people’s homes) Pacific males had 12 to 13 drinks and Pacific females had 9 drinks. In comparison, around 85% of male and female general New Zealand population drinkers drank in other peoples’ homes in 2000, on average once per week; of whom (on a typical occasion) males had 6 drinks and females had 4 drinks.

Forty-four percent of Pacific male and 39% of Pacific female drinkers drank at pubs, hotels, or taverns on average once per week, and males had 9 drinks and females had 7 to 8 drinks on a typical occasion. In comparison, 61% of male and 51% of female general New Zealand population drinkers drank at pubs, hotels, or taverns, on average once per week for males and less than once per week for females; and males drank 6 drinks and females drank 4 drinks on a typical occasion.

Table 3 contains measures of alcohol related harms including harms reported as a result of other peoples’ drinking and problems reported from own drinking.

### Table 3. Alcohol-related harms: the 2003 Pacific survey and 2000 National survey compared

<table>
<thead>
<tr>
<th>Harms from other people’s drinking</th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Males (%)</th>
<th>Females (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical assaults</td>
<td>18</td>
<td>10</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Motor vehicle accident</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sexual Harassments</td>
<td>5</td>
<td>10</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Other accidents causing injury or major damage</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problems from own drinking</th>
<th>Males (%)</th>
<th>Females (%)</th>
<th>Males (%)</th>
<th>Females (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felt alcohol effects next day</td>
<td>48</td>
<td>48</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>Unable to remember actions after drinking</td>
<td>30</td>
<td>27</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Felt alcohol effects at Work/Study/Household</td>
<td>24</td>
<td>22</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>Got drunk when there was a reason to stay sober</td>
<td>23</td>
<td>16</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Had serious argument after drinking</td>
<td>19</td>
<td>21</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Ashamed of actions while drinking</td>
<td>18</td>
<td>24</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Had physical fight because of your drinking</td>
<td>15</td>
<td>11</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Felt alcohol effect on work performance</td>
<td>14</td>
<td>9</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Stayed intoxicated for several days</td>
<td>11</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Taken alcohol drink first thing in morning</td>
<td>8</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Had your hands shake a lot in morning after drinking</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Told to leave because of your drinking</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Away from work because of your drinking</td>
<td>8</td>
<td>9</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Drinking/Driving &amp; had motor vehicle accident</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

NAS=National Alcohol Survey; PDACS=Pacific Drugs and Alcohol Consumption Survey.

**Problems from other people’s drinking**—In Table 3, findings from the 2003 PDACS show that Pacific men (18%) were more likely than Pacific women (10%) to have reported being physically assaulted in the past 12 months by someone who had been drinking. Pacific women (10%) were, however, more likely than Pacific men (5%) to have reported being sexually harassed by someone who had been drinking.
In comparison, the 2000 NAS findings show that 8% of males and 5% of females reported physical assaults; 2% of males and 1% of females reported being in a motor vehicle accident; and 3% of males and 10% of females reported sexual harassment in the past 12 months as a result of other people’s drinking.

**Problems from own drinking**—Table 3 shows that close to 50% of Pacific drinkers had felt the effects of alcohol (at least once in the previous 12 months) after drinking the night before. Moreover, close to 30% of Pacific male and female drinkers were unable to remember some of their actions while drinking; around 25% of Pacific male and 16% of Pacific female drinkers got drunk when there was an important reason to stay sober; around 20% of Pacific male and female drinkers had a serious argument after drinking; 15% of Pacific male and 11% of Pacific female drinkers got into a physical fight because of their drinking, and 11% of Pacific male and 8% of Pacific female drinkers reported staying intoxicated for several days.

The 2000 NAS showed that 55% of male and 45% of female drinkers felt the effects of alcohol after drinking the night before; 21% of male and 15% of female drinkers were unable to remember their actions after drinking; 8% of male and 5% of female drinkers got drunk when there was an important reason to stay sober; 12% of male and 8% of female drinkers had a serious argument after drinking; 5% of male and 3% of female drinkers had a physical fight because of their drinking; and 4% of male and 2% of female drinkers stayed intoxicated for several days in the previous 12 months.

**Discussion**

The 2003 Pacific Drugs and Alcohol Consumption Survey study is important for several reasons. Firstly, it is the first nationally representative survey of the alcohol consumption patterns of Pacific peoples in Aotearoa (New Zealand); secondly, the sample size is large enough to test for differences across gender and age groups; and thirdly, the similarity in methodology with the 2000 NAS has allowed for some descriptive comparisons to be made.

PDACS 2003 has shown that Pacific male drinkers tended to consume more alcohol annually than Pacific females drinkers apart from the 18–20 and 35–44 year aged groups where both sexes consumed similar annual amounts. In general, Pacific drinkers aged 18–20, 21–29, and 30–34 consumed more alcohol annually than their 13–17, 35–44, 45–54, and 55–65 age groups. The finding that males tended to consume more alcohol than females, and younger age groups consumed more alcohol than older age groups, is common to most populations (including the general New Zealand population.

The main findings were that the proportion of Pacific drinkers is less than the proportion of drinkers in the general New Zealand population. Forty-three percent of Pacific peoples abstained from drinking alcohol (during the previous year) compared to 15% of the general New Zealand population. However, Pacific drinkers consumed larger annual volumes of absolute alcohol and higher quantities of absolute alcohol (on a typical occasion) than general New Zealand population drinkers.

The lower proportion of drinkers among Pacific peoples may be a result of alcohol not existing in the Pacific Islands prior to first contact with Europeans and due to the fact that the acceptability of drinking alcohol within Pacific cultures is low. Large
quantities of alcohol being consumed on a typical occasion is similar to findings from qualitative research. Previous research has concluded that alcohol plays a social role similar to that of food in Pacific societies. Like food, alcohol brings people together and as such alcohol is drunk in groups with a generous quantity of alcohol available because the quantity of alcohol represents the generosity of the group towards its members. And just like food, alcohol is usually consumed until a person is full or until it is finished.

Compared to general New Zealand population drinkers, higher proportions of Pacific drinkers reported occasions of being in physical fights, having serious arguments, staying intoxicated for several days, and getting drunk when there was an important reason to stay sober (as a result of their own drinking). However, the proportions of Pacific drinkers who reported feeling the effects of alcohol the next day and while at work, study, or doing household duties was similar to the proportions reported by general New Zealand population drinkers.

In addition, compared to the general New Zealand population, higher proportions of Pacific peoples reported being involved in motor vehicle accidents, other accidents that caused serious injury and physical assaults (as a result of other people’s drinking).

The 2003 PDACS and the 2000 NAS differ in some of their methodology. The 2000 NAS did not have a CACI sampling frame so only those households with land-line telephones were interviewed. However, previous research has indicated that alcohol measures for the general New Zealand population are not affected by the absence of non-telephone households in the survey (as land-line telephone ownership is high). In order to achieve a sufficient sample of Pacific peoples in PDACS, three sampling approaches were used. While each had its limitations, the combination of the three provided a reasonably representative sample.

The PDACS interview schedule included very similar questions, and the CATI interviewing procedure was identical. Details about the measures obtained and the CACI interviewing procedure are available in previously published material.

We must also take care when making comparisons between the 2003 PDACS and the 2000 NAS because (as previously mentioned) there were some differences in measures between the two surveys. The main difference in measures was the addition of celebrations as a location where alcohol was drunk. Celebrations were included given the known importance of this location for Pacific drinkers. An artefact of the inclusion of this location may be an increase in consumption measures. However, celebrations accounted for only 4% of the total volume of annual alcohol consumed for Pacific drinkers (2% for males and 5% for females) and therefore it is unlikely that the inclusion of this location is responsible for the large differences seen in annual consumption and typical occasional quantity between Pacific drinkers and general New Zealand population drinkers.

The 2000 NAS is the most current available data that is comparable to the PDACS, but the 2003 alcohol environment was different compared to 2000 because there was approximately 6% more total alcoholic beverage available for consumption and this needs to be considered when interpreting differences. Finally, comparison with data
from the Auckland-only sample of Pacific drinkers collected in the 1990s showed similar levels of consumption.

In conclusion, we are confident that (compared with the general New Zealand population) these findings show that relatively fewer Pacific peoples drink alcohol, although those who do drink consume larger annual amounts of absolute alcohol and quantities of absolute alcohol on a typical occasion.

Indeed, that finding coupled with the measures of self-reported harm show that Pacific peoples’ drinking patterns are more harmful (both to themselves and others) than those of the general New Zealand population.

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**Acknowledgements:** We thank the Public Health Intelligence group of the Ministry of Health as well as the Ministry of Pacific Island Affairs for their funding of the PDACS. We also thank the CATI and CACI interviewers and supervisors and the Pacific peoples for their participation in the survey.

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**References:**


Raised plasma homocysteine levels in alcoholism: increasing the risk of heart disease and dementia?

Geoffrey Robinson, Seshasayee Narasimhan, Mark Weatherall, Richard Beasley

Abstract

Background Raised plasma homocysteine levels, which may contribute to the increased risk of cardiovascular disease and dementia associated with alcoholism, have been observed in alcohol-dependent male subjects.

Methods In this study, we measured plasma homocysteine levels in 20 female and 31 male alcoholic subjects admitted to hospital for detoxification. Nutritional status and clinical factors that might predict plasma homocysteine levels were assessed by measurement of red cell folate, vitamin $\text{B}_{12}$, blood alcohol, and liver function tests.

Results The median (interquartile range) plasma homocysteine level on admission was 15.4 $\mu$mol/L (11.1 to 19.7), with 27 (53%) subjects having a raised homocysteine level, greater than 15 $\mu$mol/L. There was no difference in admission plasma homocysteine levels between the male and female subjects (difference, male versus female 1.9 $\mu$mol/L, 95% CI=2.4 to 6.0, p=0.4). Red cell folate, vitamin $\text{B}_{12}$ levels, and blood alcohol level on admission were not significant predictors of admission homocysteine level.

Conclusion Severe alcohol dependence is associated with markedly raised plasma homocysteine levels in both females and males. The common condition of alcohol dependence may be an under-recognised risk factor contributing to raised plasma homocysteine levels and the associated risk of vascular and intellectual impairment.

Factors responsible for the increased risk of cardiovascular disease and dementia associated with alcoholism remain the subject of extensive research, as preventive measures are sought to reduce the considerable morbidity and premature mortality from alcoholism. With the demonstration of an increased risk of coronary artery disease, cerebrovascular disease, peripheral vascular disease, and dementia associated with raised plasma homocysteine levels, the possible contributing role of homocysteinemia in the long-term outcomes in alcoholism now requires consideration.

In 1993, it was first reported that male patients hospitalised for detoxification after severe alcohol abuse have high levels of plasma homocysteine. These findings were confirmed in subsequent studies of chronic alcoholics in whom plasma homocysteine levels were markedly higher than non-drinkers, were negatively correlated with blood alcohol level, and fell within days of withdrawal of alcohol.

Anticipated correlations between raised plasma homocysteine in alcoholism and deficiencies of folate, vitamin $\text{B}_{6}$, and $\text{B}_{12}$ levels have not been consistently reported. The association between alcohol intake and raised plasma homocysteine levels has also been observed in moderate alcohol consumption, with plasma homocysteine levels increasing over a 6-week period in individuals drinking 30 g of...
alcohol per day.9 However, these studies were undertaken almost exclusively in males, and as a result, it is uncertain whether this association also exists in females.

The main objectives of this study were to:

- Determine whether alcohol-dependent female subjects had raised plasma homocysteine levels;
- Confirm the decrease in plasma homocysteine levels associated with detoxification; and to
- Assess whether any such decrease occurred in both women and men.

The secondary objective was to examine the role of potential, readily available predictors of plasma homocysteine levels (including folate and vitamin B₁₂ status) on admission to hospital.

**Methods**

Consecutive adult patients, referred to Kenepuru Hospital (Porirua, Wellington region, New Zealand) for alcohol withdrawal, were approached to participate in the study. All patients were required to fulfil the Diagnostic & Statistical Manual (DSM) IV criteria for alcohol dependence, and have a positive alcohol breathalyser reading upon admission.

Exclusion criteria were patients on vitamin supplementation prior to admission and patients readmitted during the study period of February to December 2002. In addition, patients with medications and disorders (renal impairment, thyroid) known to influence homocysteine were excluded by serum creatinine, T₄, and thyroid stimulating hormone. This opportunity sample was based on all patients available while the consent and specimen collector (SN) worked for the detoxification service.

On admission, patients were venesected for measurement of plasma homocysteine (fasting), red cell folate, vitamin B₁₂, blood alcohol, and liver function tests. The plasma homocysteine level (non-fasting) was measured again on discharge. In terms of vitamin supplementation during the admission, patients received thiamine and Multivite (vitamin A, thiamine, riboflavin, nicotinamide, ascorbic acid, and vitamin D).

The homocysteine specimen was collected in an EDTA tube, sent immediately on ice to be centrifuged at 4000 rpm for 10 minutes, and the serum frozen at -20°C. Samples were analysed fortnightly by the Wellington Hospital Laboratory by Fluorescent Polarization Immunoassay using the Abbott IMx homocysteine assay. The red cell folate and vitamin B₁₂ assays were undertaken using the Abbott AxSYM apparatus.

The difference between admission and discharge plasma homocysteine levels had a skewed distribution, and the primary analysis used non-parametric tests: the Mann-Whitney test to compare the sex differences for the admission and change in homocysteine levels, and the Wilcoxon signed rank test for the overall change between admission and discharge homocysteine levels.

For the gender differences in possible predictors of homocysteine levels, normality assumptions were met and simple t-tests were used. For the secondary analysis, admission plasma homocysteine levels also had a skewed distribution and exploratory data analysis suggested a negative reciprocal transformation best met normal statistical assumptions for a multivariate regression exploring possible predictors. SAS version 8.2 and Minitab version 13.32 were used as statistical software.

The study was approved by the Wellington Ethics Committee and all subjects gave written informed consent.

**Results**

There were 51 consecutive patients of whom 20 (39%) were female. No eligible patients declined consent for the study. The characteristics of the patients are shown in Table 1. Eight patients had a red cell folate below the reference range (350 to 1600 nmol/L) and one patient had a mean vitamin B₁₂ level below the reference range (160
to 700 pmol/L). Forty patients had a gammaglutamyl transferase above the reference range (7 to 35 U/L).

Table 1. Characteristics of patients admitted to hospital for alcohol detoxification (n=51)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Median (interquartile range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>45.1 (11.2)</td>
<td>44.0 (39.0 to 53.0)</td>
</tr>
<tr>
<td>Blood alcohol (mg/100ml)</td>
<td>158.2 (130.6)</td>
<td>155.3 (46.1 to 234.6)</td>
</tr>
<tr>
<td>Mean cell volume (femolitres)</td>
<td>95.2 (6.8)</td>
<td>96.2 (89.5 to 99.3)</td>
</tr>
<tr>
<td>Vitamin B$_{12}$ (pmol/L)</td>
<td>358.1 (148.3)</td>
<td>314.0 (227.0 to 464.0)</td>
</tr>
<tr>
<td>Red cell folate (nmol/L)</td>
<td>595.3 (255.8)</td>
<td>578.0 (374.0 to 759.0)</td>
</tr>
<tr>
<td>Gammaglutamyl transferase (U/L)</td>
<td>329.6 (499.7)</td>
<td>116.0 (41.0 to 327.0)</td>
</tr>
<tr>
<td>ALT (U/L)</td>
<td>68.8 (58.5)</td>
<td>46.0 (25.0 to 99.0)</td>
</tr>
<tr>
<td>AST (U/L)</td>
<td>103.3 (101.0)</td>
<td>65.0 (36.0 to 143.0)</td>
</tr>
</tbody>
</table>

ALT=Alanine aminotransferase; AST=Aspartate aminotransferase; SD=Standard deviation.

The distribution of plasma homocysteine levels on admission and discharge by sex is shown in Table 2. A plot of the change in plasma homocysteine levels from admission to discharge by sex is shown in Figure 1, on which the upper limit of the reference range, 15 µmol/L, is shown. On admission, 27 (53%) patients had a plasma homocysteine level that exceeded this limit, and 47 (92%) patients had a drop in homocysteine levels by the time of their discharge from hospital, which occurred a mean of 5 days after admission. At discharge, 14 (27.5%) patients still had a plasma homocysteine level above the reference range.

Table 2. Homocysteine levels (µmol/L) on admission to, and discharge from, hospital (by gender)

<table>
<thead>
<tr>
<th>Time</th>
<th>Total median (IQR)</th>
<th>Male median (IQR)</th>
<th>Female median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission</td>
<td>15.4 (11.1 to 19.7)</td>
<td>17.4 (10.9 to 26.1)</td>
<td>14.9 (11.9 to 17.3)</td>
</tr>
<tr>
<td>Discharge</td>
<td>11.1 (8.8 to 15.1)</td>
<td>12.1 (8.7 to 15.1)</td>
<td>10.2 (9.0 to 15.7)</td>
</tr>
<tr>
<td>Admission minus</td>
<td>−3.5 (−6.3 to −1.7)</td>
<td>−3.7 (−1.7 to −13.7)</td>
<td>−3.4 (−1.8 to −5.6)</td>
</tr>
</tbody>
</table>

IQR=Interquartile range.

The Mann-Whitney test for the difference (male versus female) in admission plasma homocysteine levels was 1.9 µmol/L (95% CI: -2.4 to 6.0), p=0.4. The Wilcoxon signed rank test gave an estimated difference in homocysteine levels between admission and discharge of -4.5 µmol/L (95% CI -3.0 to -7.0), p<0.001.

The Mann-Whitney test gave an estimated difference (males minus females) for the change in homocysteine levels of -3.0 µmol/L (95% CI: -2.9 to 1.5), p=0.7. There were no differences between female and male subjects for the possible predictors of plasma homocysteine levels on admission (including blood alcohol, vitamin B$_{12}$, and folate levels).
Multivariate regression analysis, using the transformed admission homocysteine level, showed no association between admission homocysteine levels and sex, age, red cell folate, vitamin B₁₂, blood alcohol, liver enzymes, or mean red cell volume.

**Discussion**

In this study we have identified that plasma homocysteine levels are markedly increased in female as well as male alcoholics admitted to hospital for treatment of alcohol withdrawal. With abstinence from alcohol, the homocysteine level fell within a few days; however at discharge, just over one-quarter of patients still had a raised homocysteine level.

Consistent with previous reports in male alcoholics, there was no clear correlation between plasma homocysteine levels and nutritional status (including folate and vitamin B₁₂ levels). Vitamin B₆ and glycine betaine assays were not available for inclusion in this study, and it is possible that they may have influenced plasma homocysteine levels. In addition, our results did not point to any other predictive factors for raised plasma homocysteine levels (such as the presence of liver disease, age, or blood-alcohol level on admission).
The findings of no sex differences for the decline in plasma homocysteine levels and no predictive factors for admission homocysteine levels should be accepted with caution as (due to the small numbers in our study) we may have lacked statistical power to detect small but clinically meaningful differences. Indeed, it is possible that some of the individual variability in plasma homocysteine levels may be due to genetic factors such as the methylene tetrahydrofolate reductase (MTHFR) variant. These findings are consistent with animal studies in which high-dose alcohol feeding together with vitamin supplementation has been shown to lead to hyperhomocysteinaemia. Furthermore, it has been proposed that chronic alcohol excess prevents the conversion of homocysteine to methionine by inhibiting methionine synthetase.

The subjects included in our study were an ‘opportunity sample’ of patients presenting to an alcohol detoxification unit and clearly represent the most severe end of the spectrum of alcohol dependency. However, only moderate alcohol consumption in healthy individuals has also been shown to increase plasma homocysteine levels. In their study, the equivalent of 3 standard drinks per day for a period of 6 weeks increased plasma homocysteine levels (irrespective of the type of beverage consumed). However the increase in plasma homocysteine levels was of a lesser magnitude than that observed in our study. As a result, these findings would suggest a gradation of risk of homocysteinaemia, dependent on the amount of alcohol consumed.

Our findings are intriguing when the disorders associated with alcoholism are considered in which hyperhomocysteinaemia has been recognised as a risk factor. The most important are cardiovascular diseases in which raised plasma homocysteine levels could potentially contribute to the J shaped curve of cardiovascular mortality with increasing alcohol consumption. Raised plasma homocysteine levels may also contribute to the increased risk of stroke and dementia observed in alcoholics. Indeed, there is a recent report of a correlation between raised plasma homocysteine levels and hippocampal atrophy in alcoholics as defined by magnetic resonance imaging (MRI) scanning.

In our study, it is possible to estimate the magnitude of risk associated with the raised plasma homocysteine levels observed in these individuals with severe alcohol dependency. The relationship between homocysteine and risk of vascular events appears to be linear (or log linear) in much the same way that increasing blood pressure and cholesterol are related to vascular disease. A plasma homocysteine level >15 µmol/L is associated with an increased risk of fatal and non-fatal atherosclerotic vascular disease in the coronary, cerebral, and peripheral circulations, with relative risks of 1.7, 2.5, and 6.8 respectively. Using an alternative method of assessing the risk, it has been calculated that a 5 µmol/L increase in plasma homocysteine level is associated with an increase in vascular risk of about one-third, which is of similar magnitude to an increase in plasma cholesterol of 1.5 mmol/L. In a long-term study specifically investigating the association between homocysteine and dementia, a plasma homocysteine level of >14 µmol/L nearly doubled the risk of Alzheimer’s disease. As a result, our observation that just over one-half of subjects
with severe alcohol abuse have levels >15 µmol/L would suggest that with ongoing heavy alcohol consumption they are at a markedly increased risk of vascular disease and dementia due to their raised plasma homocysteine levels.

We conclude that severe alcohol dependence is associated with markedly raised plasma homocysteine levels in both females and males. Furthermore, we consider that the common condition of alcohol dependence may have been under-recognised as a factor contributing to raised plasma homocysteine levels and (as a consequence) increased risk of vascular disease and potential intellectual impairment. Unfortunately it is yet to be determined whether folic acid supplementation will lower the high plasma homocysteine levels in heavy alcohol drinkers, as has been demonstrated in non-alcoholic individuals.

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**References:**


Pacific women’s decisions about exercise adoption: utilising the stage-of-exercise-adoption model

Denise Kingi, Andy Towers, Renée Seebeck, Ross Flett

Abstract

Aims To analyse the exercise patterns of Pacific women utilising the stage-of-exercise-adoption model, and to investigate how the pros and cons of exercising, exercise self-efficacy, self-reported health, and sociodemographic barriers to exercise influence exercise adoption.

Methods A non-random questionnaire survey of 106 Pacific women living in the North Island of New Zealand.

Results Thirty percent of the sample was sedentary, 34% were participating in some exercise, and 35% were exercising regularly. The balance between pros and cons of exercise, exercise self-efficacy, self-rated health and levels of barriers reliably differentiated respondents at extreme stages of exercise adoption. In addition, two specific barriers to exercise (not having friends who exercise, and being unsatisfied with current income) were associated with reduced exercise self-efficacy.

Conclusions A large number of Pacific women are sedentary, but analysis of the factors associated with exercise adoption level and exercise-related self-confidence provides a platform for future intervention. Exercise adoption interventions tailored specifically to Pacific women should focus on broader community-based systems that include peer-group participation, and emphasise inexpensive options for exercise.

Ethnic differences in health behaviours (including physical exercise) have been comprehensively investigated in recent times.1–4 Specifically, concern is growing over the health behaviours of women of ethnic minority populations, given that women consistently exercise less than men, and women of ethnic minorities exercise less than women of European descent.1

In New Zealand, Pacific women have almost twice the rate of ischaemic heart disease, three times the risk of lethal stroke, and higher rates of diabetes and chronic obstructive pulmonary disease than any other female group.5 Regular physical exercise is a recommended preventative measure for all of these conditions, yet Pacific women are also less physically active and are far more likely to be overweight or obese than any other group of women.5

One way in which health promoters can redress this health imbalance is to identify the barriers to exercise adoption that these women face. This allows specific interventions to be aimed at reducing these barriers and increasing exercise adoption. This study provides the initial step in this process by examining the motivational and cognitive processes underlying (and barriers related to) exercise adoption in Pacific women.

This study utilised the transtheoretical model of behaviour change as a framework for understanding exercise adoption.6 The transtheoretical model has successfully been employed as a stage-of-exercise-adoption model and provides a clear framework for
investigating intentional exercise behaviour change.7–9 Rather than conceptualising exercise adoption as an ‘all-or-nothing’ process, the model considers behaviour change as residing on a 5-stage continuum, starting with a precontemplation stage (not intending to exercise) and ending in the maintenance stage (sustaining the exercise behaviour over time). Movement through these 5 stages is not necessarily linear, but may be cyclical in pattern as individuals may remain focused at certain stages while others relapse into earlier ones.

An individual’s position on the stages of exercise adoption model is reflective of their decisional balance, which involves weighing up perceived pros (benefits) and cons (costs) of exercise. Unless the pros of exercise adoption exceed the cons, a person will not adopt or continue exercise routines. Several studies show that for precontemplators and contemplators, the cons of exercise outweigh the pros; for those in preparation the pros and cons are in balance; and the pros outweigh the cons for those in action and maintenance.7,10,11

In addition to decisional balance, stage membership is also reflective of individuals’ self-efficacy evaluations concerning their ability to undertake exercise behaviour.9,11,12 Individuals high in self-efficacy have greater confidence in performing a given behaviour, and therefore attempt exercise adoption with more effort, and persist longer when facing de-motivating factors.

The current study also utilised Andersen’s13 behavioural model of health utilisation as a framework for understanding how individual and wider sociodemographic factors might impact on exercise decision-making. We conceptualised exercise adoption as a function of three sets of characteristics: predisposing factors (demographics, social status, health beliefs/knowledge), enabling factors (personal and community resources) and perceived need for exercise. This study also investigated whether self-rated health would differentiate Pacific Island women on different stages of exercise behaviour change.

Previous research shows that subjective ratings of health are positively related to exercise and health care practices,14,15 and that low levels of self-rated health may even act as a barrier to exercise behaviour change.16

The specific hypotheses in the current study are that:

- Women in the highest stage of exercise adoption will perceive greater levels of pros of exercise, and have greater decisional balance, self-efficacy, and self-rated health scores than women in the initial stages of exercise change.

- Women in the highest stage of exercise adoption will perceive less cons of exercise and lower levels of barriers to exercise than women in the initial stages of exercise adoption.

**Method**

**Respondents**

The non-probability convenience sample consisted of 106 Pacific women residing in New Zealand. Age ranged from 20 to 51 years (mean=31 years, SD=9.2). Forty-eight percent (n=52) of the sample identified themselves as Samoan, 22% (n=24) indicated they were Tongan, 14% (n=15) Cook Island, 4% (n=4) Niuean, 2% (n=2) Fijian, and 8% (n=9) belonged to some other Pacific Island ethnic group.
Measures

Stages of adoption—An 8-point scale in the shape of a ladder was used to measure stage of exercise adoption. Each rung had a number ranging from 0 to 8, and 5 rungs had written labels that were reflective of the 5-stages of exercise adoption and served as anchor points:
- 0 rung was labelled *I currently do not exercise and do not intend to start exercising in the next 6 months* (precontemplation),
- 2 was labelled *I currently do not exercise but I am thinking about starting to exercise in the next 6 months* (contemplation),
- 4 was labelled *I currently exercise some, but not regularly* (preparation),
- 6 was labelled *I currently exercise regularly but have only begun doing so within the last 6 months* (action), and
- 8 was labelled *I currently exercise regularly and have done so for longer than 6 months* (maintenance).

Respondents were instructed to select the rung that most accurately described their current exercise behaviour. Exercise was defined as activities which increase your heart rate (such as brisk walking, jogging, swimming, aerobics, biking, rowing) and the term regular exercise was defined as exercising three or more times a week for at least 20 minutes each time.

Each anchor represented the minimum requirement for membership at each stage. Thus, a respondent indicating a ‘3’ on the ladder was classified as a contemplator (equal to rung 2) because the minimum requirements for membership in the preparation stage (rung 4) had not been met. Research shows a Kappa index of reliability over a 2-week period of 0.78 for the stages of exercise adoption measure.

Decisional balance—An existing decisional balance measure was slightly modified to reflect Pacific perspectives in this study. For example, *I would feel more comfortable exercising in church organised activities* was considered a potential pro, and *I would not enjoy exercising by myself* was considered to be a potential con of exercising.

A 19-item measure was composed of a 12-item pro scale measuring the benefits of exercising, and a 7-item con scale measuring the costs of exercising. Items were rated on a 5-point Likert scale, ranging from (1) *not at all important* to (5) *extremely important*. High scores on the pro and cons scales indicated high benefits and high costs of exercise respectively. Pro and con items were mixed so as to minimise response acquiescence. To provide a standard metric, the pros and cons indices were converted to T-scores (M=50, SD=10). A decisional balance index was calculated by subtracting the T-score means of the con items from the T-score means of the pro items. Cronbach’s alpha reliability scores for the pros and cons scales in the present study were 0.76 and 0.92 respectively.

Exercise self-efficacy—An 8-item scale, similar to that used in previous research, was used to assess exercise self-efficacy. Items assessed levels of confidence that respondents could perform exercise regularly, even in the face of several potential de-motivating factors (e.g. criticism, tiredness). Items were rated on a 5-point Likert scale ranging from (1) *not at all confident* to (5) *very confident*.

A mean total score was calculated by scoring across items. Higher scores indicated greater self-efficacy for exercise. In the present study a Cronbach's alpha reliability of 0.94 was found for this measure.

Self-rated health—Self-rated health status was assessed using a 7-item scale ranging from (1) *terrible* through to (7) *excellent*.

Barriers to exercise—In accordance with Andersen’s behavioural model, this study identified nine potential sociodemographic and resource-related barriers to exercise. Respondents were allocated a score of ‘1’ if they indicated on the questionnaire that they:
- Had one or more children,
- Did not have a telephone,
- Did not have a motor vehicle,
- Had some or a great deal of worry about their health,
- Had some, very little, or no control over their health,
- Were either dissatisfied or very dissatisfied with their overall standard of living.
Had just enough money to get along on or can't make ends meet,
Had no family who exercised regularly, or
Had no friends who exercised regularly.
A maximum 'barriers to exercise' score of '9' was obtainable for each respondent. A high score indicates more perceived barriers.

**Procedure**

Women of Pacific descent, aged between 20–60 years and living in Wellington, Auckland, Rotorua, or Palmerston North were approached through acquaintance networks of the first author (DK) and invited to complete a questionnaire. Respondents were told that the questionnaire concerned attitudes about (and motivation to) exercise in Pacific women, and were informed that the questionnaire would take around 15 minutes to complete. The study was conducted in accord with the Massey University Code of Ethical Conduct for Research involving Human Respondents (see [http://humanethics.massey.ac.nz/code.htm](http://humanethics.massey.ac.nz/code.htm)). A mechanism for receiving feedback about the results of the study was outlined to respondents.

**Results**

Forty-one percent of the women in this study had at least an undergraduate degree while only 9% had no school qualifications. Employment status indicated 44% were employed full time, 15% part time, and 32% were students; 50% of the sample was single, 36% married, and the remainder either divorced or widowed. Fifty-six percent had no children, and 46% had attended church in the last 7 days.

A large portion of the sample owned a motor vehicle (85%), had a telephone (89%), and 59% were born in New Zealand. No significant differences in demographic categories across the stages of exercise adoption were revealed.

Thirty percent of the sample was sedentary (precontemplation and contemplation), 34% were participating in some exercise (preparation), and 35% were exercising regularly (action and maintenance). This compares favourably to recent national statistics that claim that up to 42% of Pacific Island females are sedentary.

Results of one-way ANOVAs showed mean total scores on all scales differentiated Pacific Island women across the stages of exercise adoption. Table 1 presents the means and standard deviation statistics for all scale scores by stage-of-exercise adoption.

Scheffé post-hoc comparisons between the stages and the pro and con scale scores revealed no significant differences between the groups, but significant differences were revealed between stages and the decisional balance index.

Respondents in the maintenance stage had significantly higher decisional balance scores that those in precontemplation. Post-hoc analysis also revealed that compared to respondents across all stages of the model; those in the precontemplation stage scored significantly lower, while women in the maintenance stage had significantly higher, self-efficacy scores.

Post-hoc analysis on self-rated health scores revealed that respondents in the maintenance stage rated their health more highly than respondents in either the precontemplation, contemplation, or preparation stages. Finally, barrier scores for respondents in the precontemplation, contemplation, and preparation stages of exercise adoption were significantly higher than those scores for respondents in the maintenance stage.
Table 1. Means, standard deviations, and univariate F scores for the pros, cons, decisional balance, self-efficacy, self-rated health, and barriers to exercise scale scores by stage-of-exercise-adoption

<table>
<thead>
<tr>
<th>Stage of exercise adoption</th>
<th>Precontemplation</th>
<th>Contemplation</th>
<th>Preparation</th>
<th>Action</th>
<th>Maintenance</th>
<th>Univariate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro (T score)</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Precontemplation</td>
<td>41.67</td>
<td>(9.68)</td>
<td>52.68</td>
<td>(8.49)</td>
<td>50.07</td>
<td>(9.78)</td>
</tr>
<tr>
<td>Contemplation</td>
<td>48.04</td>
<td>(6.89)</td>
<td>54.33</td>
<td>(9.86)</td>
<td>51.83</td>
<td>(9.56)</td>
</tr>
<tr>
<td>Preparation</td>
<td>-8.05</td>
<td>(7.69)</td>
<td>-1.90</td>
<td>(12.14)</td>
<td>-2.00</td>
<td>(7.29)</td>
</tr>
<tr>
<td>Action</td>
<td>1.38</td>
<td>(0.52)</td>
<td>2.30</td>
<td>(0.78)</td>
<td>2.87</td>
<td>(0.80)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>4.25</td>
<td>(1.36)</td>
<td>3.67</td>
<td>(1.65)</td>
<td>4.49</td>
<td>(1.07)</td>
</tr>
<tr>
<td>Barriers to exercise</td>
<td>3.73</td>
<td>(1.74)</td>
<td>3.30</td>
<td>(1.87)</td>
<td>3.19</td>
<td>(1.37)</td>
</tr>
</tbody>
</table>

M=Mean; SD=Standard deviation; * p < 0.05; **p < 0.01; ***p < 0.000
The proportion of barriers faced by the stage-of-exercise-adoption model (as shown in Table 1) indicates that women in the precontemplation stage faced the greatest levels of barriers to exercise; that stage advancement coincided with barrier reduction.

Regarding the frequency of barrier ratings, the results for the present sample indicate that:

- 54% had just enough money to get by or ‘couldn’t make ends meet’,
- 44% had no family who exercised regularly,
- 44% had no friends who exercised regularly
- 44% had one or more children,
- 44% had some, or a great deal of, worry about their health,
- 21% did not have a motor vehicle,
- 19% were either dissatisfied or very dissatisfied with their overall standard of living,
- 11% did not have a telephone, and
- 7% had some, very little, or no control over their health.

Chi-square analysis indicates that two barriers, in particular, are linked with stage membership. First, women in the maintenance stage were more likely than women in the lower stages to have friends that exercised, chi-square (4, n=103) = 13.24, p<0.05. Second, women in the maintenance stage were more likely to be satisfied with their current income than women in lower stages of exercise adoption, chi-square (4, n=106) = 14.18, p<0.01.

Independent samples t-tests revealed that self-efficacy towards exercise was significantly reduced in women whose friends do not exercise, t (99) = 2.36, p<0.05, and in women who were not satisfied with their current income, t (102) = 2.35, p<0.05.

**Discussion**

The aim of the present study was to explore (in a sample of Pacific women in New Zealand) the relationships between stages of exercise adoption and the pros and cons of exercise, decisional balance, exercise self-efficacy, self-rated health, and barriers to exercise.

The results of the present study supported all of the hypotheses. Scores on pros items, the decisional balance measure (pros minus cons), self-efficacy measure, and self-rated health all positively differentiated respondents across the stages of exercise adoption. Furthermore, rating of the cons of exercise and perceived barriers to exercise decreased with an increase in stage adoption. Exercise adoption in Pacific women seems reliant upon identifying more benefits than costs to exercise, having greater belief in one’s ability to perform exercise, having good self-rated health, and perceiving few practical barriers to exercise.

These results support previous research showing that ratings of the pros and cons of exercise, and subsequent decisional balance levels reliably differentiate exercisers.
from non-exercisers across the stages of exercise adoption.\textsuperscript{7,10,11} Previous research\textsuperscript{16} showing a differential spread of self-rated health across stages of exercise adoption was also supported in the present study, indicating that self-rated health may be a reliable sign of stage of exercise adoption.

Furthermore, the strength of exercise self-efficacy in differentiating women across stages of exercise adoption in the present study supports previous research findings indicating that belief in ones ability to undertake and maintain exercise programs is a key factor in successful exercise adoption.\textsuperscript{9}

While the general level of barriers faced reliably differentiated women across the stages of exercise adoption, analysis revealed two barriers to exercise that were paramount for this population. Firstly, women in the lower stages-of-exercise-adoption had fewer friends that also exercised, and secondly, women in the lower stages were less satisfied with their current income.

Further analysis revealed that both a reduced number of friends exercising and dissatisfaction with income were associated with reduced self-efficacy to exercise. This indicates that reduced confidence to adopt and maintain personal exercise regimes may be linked to lack of peer modelling behaviour (or possibly peer support) and a lack of money or availability of inexpensive exercise options (e.g. gym membership).

Result of the current study and past research\textsuperscript{7,8,12} emphasise the strength of exercise self-efficacy in distinguishing individuals across stage of exercise adoption. This suggests that exercise interventions targeted at Pacific women should focus upon increasing this fundamental self-confidence. The present findings highlight two key areas for exercise interventions to target.

Firstly, peer-group influence may be a vital key in promoting exercise self-efficacy (and thus exercise adoption) in Pacific women. Exercise interventions tailored for increasing exercise self-efficacy in Pacific women need to highlight and utilise the motivational support garnered from peer groups, by operating within a community-based rather than individual-focused program.

Secondly, the income concerns of non-exercising Pacific women indicates that they may perceive regular exercise to be too expensive an option for them to consider seriously. Interventions promoting increased exercise adoption in this population should then focus upon readily available and inexpensive alternatives to gym-based exercise, such as community or church based exercise programs, or place an emphasis on simple cardiovascular exercises such as walking.

Feedback from respondents in the study suggests that collecting data via questionnaires meet with some resistance. For example, some respondents found the questionnaire too lengthy, and commented on the complexity of language and item relevance. This quantitative data collection approach thus runs the risk of introducing bias due to respondent confusion or misinterpretation.

Indeed, given the 'oral' characteristics of Pacific peoples, future research might establish community focus groups and semi-structured interviews aimed at identifying more accurately the sorts of individual and psychological variables that might impact on Pacific women's decisions to begin exercising.
For analysis purposes, this study has treated the sample as a homogeneous group. However, Pacific Peoples differ noticeably in their cultures and languages. Given that the majority of the sample in this research (70%) were of Samoan or Tongan ethnicity, it may be misleading to extrapolate these findings to the wider population of Pacific women. Therefore, future studies aimed at specific Pacific populations may provide more accurate information on exercise-related behaviour that reflects the realities of that particular cultural group.

Due to the cross-sectional design of this study, only some aspects of exercise behaviour change could be examined. Data analyses in this research reveal associations between variables (not cause and effect), and subsequently, the nature of casual relationships remains uncertain. However, this study has succeeded in initiating exploration of exercise habits in a group that has so far received little attention from researchers, and still remains one of our most health-challenged populations.

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References:


Factors affecting antenatal care attendance by mothers of Pacific infants living in New Zealand

Pamela Low, Janis Paterson, Trecia Wouldes, Sarnia Carter, Maynard Williams, Teuila Percival

Abstract

Aims To describe antenatal care attendance by mothers of Pacific infants recently delivered at Middlemore Hospital, South Auckland and to examine the demographic and psychosocial factors associated with late initiation of care and inadequate attendance.

Methods The data were gathered as part of the Pacific Islands Families: First Two Years of Life (PIF) Study in which 1365 birth mothers in the cohort (n=1376) were interviewed when their infants were six weeks old about their antenatal care attendance.

Results Almost all (99.1%) mothers attended antenatal care at least once. Over a quarter (26.6%) initiated their antenatal care late, and 10.7% attended fewer than the recommended number of times. Maternal factors significantly associated with late initiation of antenatal care were high parity, first pregnancy, not being employed prior to pregnancy and Cook Island Maori ethnicity. Factors associated with inadequate attendance were reaction to the pregnancy and being employed prior to pregnancy.

Conclusions A significant proportion of mothers of Pacific infants reported initiating antenatal care later than the first trimester and attending fewer antenatal visits than recommended. These findings indicate that the importance of antenatal care needs to be promoted among Pacific communities.

Antenatal care in New Zealand is provided within the course of maternity care. To receive maternity services in New Zealand, a woman needs to choose and register herself with a Lead Maternity Carer (LMC). This LMC can be a general practitioner (GP), a midwife, a private obstetrician, or a hospital specialist team working in a public or private setting. The LMC is responsible for providing and coordinating the woman’s maternity care.1

It is recommended that a woman register with an LMC by her fourteenth week of pregnancy to develop a care plan for pregnancy, birth, and after-delivery care. The antenatal care plan can include frequency of visits, what laboratory tests or scans are needed, and booking into an antenatal education course. The frequency and type of antenatal care a woman receives can be variable and is the result of the personalised agreement formulated between the woman and her LMC.1

Maternity care (and therefore the majority of antenatal care) is provided free to women who are New Zealand citizens, permanent residents, and to women who have a permit to stay in the country for two or more years. The Government pays the LMCs on a capped-fee basis for providing the modules of service required by the women.
Women may have to pay a fee for some services like a private obstetrician and non-routine laboratory tests.  

The provision of formal medical health care for pregnant women (in the form of visits to a general practitioner, obstetrician, or midwife) is widely accepted as an important means of decreasing the risk of maternal and perinatal mortality. While there are no official New Zealand guidelines for the recommended number of antenatal visits that women attend, primiparas are encouraged to attend a minimum of nine visits and multiparas a minimum of six visits. It is generally recommended that women initiate their antenatal care in the first trimester of pregnancy to maximise the benefits of screening for complications and monitoring foetal and maternal health. Research suggests that women who initiate their antenatal care later than the first trimester have poorer outcomes, such as low birth weight and pre-term birth. However, the relationship between the number of antenatal visits a woman attends and outcomes has been an issue of contention. It is acknowledged that increasing the number of antenatal visits does not necessarily improve the outcomes of the pregnancy. 

Previous research conducted on the characteristics of women who initiate their antenatal care late or attend an inadequate number of visits has found that many of the same demographic, situational, and psychosocial factors are involved. Demographically, women who attend antenatal care late tend to be younger (in particular, adolescents), of high parity or gravidity, without a partner, of low socioeconomic status, and low educational achievement. In addition, situational factors that influence the initiation or attendance of antenatal care include lack of transport, employment status, difficulties arranging childcare, and inconvenient clinic hours. Psychosocial factors include whether the pregnancy was planned, the woman’s reaction to the pregnancy, a delayed diagnosis of pregnancy, contemplation of abortion, and the availability of social support.

The health of Pacific infants has been an issue of concern in recent years. For example, Pacific infants have the highest rate of late foetal deaths (stillbirths) in New Zealand, with 9.6 deaths per 1000 births compared to 5.9 deaths per 1000 births in the total New Zealand population in 1998. The Pacific infant death rate has been higher than the national infant death rate from 1997, with an infant death rate of 7.9 deaths per 1000 births. Pacific infants also have very high rates of hospitalisation, particularly for respiratory illnesses.

Furthermore, Pacific women have the highest fertility and birth rates of women in New Zealand and represent a large proportion of potential users of antenatal care. However, there is little known about the usage of antenatal care by Pacific women in New Zealand. Research findings from previous small studies suggest that approximately 40–70% of Pacific women tend to initiate antenatal care late and attend fewer visits than other women.

The purpose of this paper is to describe antenatal care attendance by mothers of Pacific infants and to examine the maternal and sociodemographic factors associated with late attendance (after the first trimester, or 15 or more weeks into the pregnancy) and inadequate attendance (receiving fewer than 6 visits, the recommended minimum number of visits).
Methods

Data were collected as part of the Pacific Islands Families: First Two Years of Life (PIF) Study. The PIF Study is a longitudinal investigation of a cohort of 1398 infants born at Middlemore Hospital, South Auckland during the year 2000. Middlemore Hospital was chosen as the site of recruitment of the cohort as it has the largest number of Pacific births in New Zealand and is representative of the major Pacific ethnicities. All potential child participants were selected from live births at Middlemore Hospital where the child had at least one parent who identified as being of a Pacific Islands ethnicity and also a New Zealand permanent resident. All procedures and interview protocols had ethical approval from the National Ethics Committee.

Approximately 6 weeks after the birth of the child, mothers were visited in their homes by Pacific interviewers fluent in both English and a Pacific language. Once eligibility criteria were confirmed and informed consent gained, mothers participated in one-hour interviews concerning the health and development of the child and family functioning. Each interview was carried out in the preferred language of the mother. Detailed information about the cohort and procedures is described elsewhere.20

The main interview included questions on antenatal care attendance. Mothers were asked whether they had seen a doctor or midwife as part of their pregnancy care, how many weeks pregnant they were when they first sought care, and how many times they saw a doctor or midwife. Maternal and sociodemographic factors that may be associated with antenatal care use were assessed by univariate and multivariate procedures.

Results

Ninety-six percent (n=1590) of potentially eligible mothers of Pacific infants (who had been born between 15 March and 17 December 2000) gave consent to be visited in their homes when the infant was 6 weeks old. Of the 1477 mothers contacted and who met the eligibility criteria, 1376 (93.2%) agreed to participate in the study.

A more conservative recruitment rate of 87.1% would include mothers who consented to contact and were (a) confirmed eligible, or (b) of indeterminable eligibility due to inability to trace.

Of the 1376 mothers in the cohort (1.7% gave birth to twins), 9 adoptive mothers and 2 foster mothers were eliminated from these analyses. Of the 1365 remaining birth mothers, 47.2% self-identified their major ethnic group as Samoan, 21% as Tongan, 16.9% as Cook Islands Maori, 4.3% as Niuean, 3.4% as Other Pacific, and 7.2% as Non-Pacific.

The Other Pacific group includes mothers identifying equally with Pacific and Non-Pacific groups, or with Pacific groups other than Samoan, Tongan, Cook Island Maori, or Niuean. The Non-Pacific group refers to mothers of infants fathered by Pacific men. The mean (SD) age of mothers was 27 (6.2) years; 80.5% were married or in defacto partnerships, 33.0% of mothers were New Zealand-born, and 27.4% had post-school qualifications. For the majority of mothers, the study child was not their first pregnancy (gravida > 1) (78.1%) and most had given birth previously (parity > 1) (72.8%).

The majority of the mothers (99.1%) made at least one visit to a doctor and/or midwife during their pregnancy. Of these mothers, 26.6% initiated their antenatal care late (their first antenatal visit was 15 weeks or later into their pregnancy). Most mothers (89.3%) attended at least the minimum recommended number of visits—30.7% attended between 6 and 10 visits, 50.5% attended between 11 and 20 visits, and 8% attended more than 20 visits. However 10.7% of mothers attended fewer than 6 visits.
Maternal variables were examined for potential association with late initiation of antenatal care. Variables that did not reach significance were maternal age, social marital status, car ownership, annual income, and being employed prior to pregnancy. Table 1 lists the variables that were significantly associated with late initiation of antenatal care.

For the categories within each variable, the numbers and percentages of mothers who initiated antenatal care late are given, along with the associated odds ratios. Lack of formal school qualifications, not being employed prior to pregnancy, Pacific birth place, limited English fluency, and weak alignment with New Zealand way of life and customs were significantly associated (p<0.001) with late initiation of antenatal care. In addition, high parity or gravidity, unplanned pregnancy, an unhappy reaction to the pregnancy (p<0.01), Cook Island Maori and Tongan ethnicity, and lack of telephone in household (p<0.05) were also significantly associated with late initiation of antenatal care.

When controlling for the effects of all Table 1 variables in a multiple regression model, factors that remained significantly associated (p<0.05) with late initiation of antenatal care were high parity, first pregnancy (gravida), Cook Island Maori ethnicity and not being employed prior to pregnancy.

Several maternal variables were examined for potential association with inadequate attendance. Variables that did not reach significance were maternal age, education, annual income, car ownership, telephone in the household, birthplace, cultural orientation, and fluency in English.

Table 2 lists the variables that were significantly associated with inadequate use of antenatal care. For the categories within each variable, the numbers and percentages of mothers who attended fewer than six visits are given, along with the associated odds ratios. Cook Island Maori ethnicity, being non-partnered, not being employed prior to pregnancy, unplanned pregnancy, and a less than very happy reaction to the pregnancy were significantly associated (p<0.05) with inadequate use of antenatal care.

When controlling for the effects of all Table 2 variables in a multiple regression model, factors that remained significantly associated (p<0.05) with inadequate attendance were not being employed prior to pregnancy and a happy reaction to the pregnancy.
Table 1. Numbers (row percentages) and univariate odds ratios for late initiation of antenatal care by mothers by selected variables

<table>
<thead>
<tr>
<th>Maternal variable</th>
<th>Category</th>
<th>Late initiation of antenatal care</th>
<th>Univariate odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td></td>
<td>159 (24.7)</td>
<td>1.00</td>
</tr>
<tr>
<td>Cook Island Maori</td>
<td></td>
<td>75 (33.6)</td>
<td>1.54,(1.11−2.15)*</td>
</tr>
<tr>
<td>Niuean</td>
<td></td>
<td>12 (20.3)</td>
<td>0.78 (0.40−1.50)</td>
</tr>
<tr>
<td>Tongan</td>
<td></td>
<td>91 (32.2)</td>
<td>1.44 (1.06−1.96)*</td>
</tr>
<tr>
<td>Other Pacific§§</td>
<td></td>
<td>10 (21.3)</td>
<td>0.82 (0.40−1.69)</td>
</tr>
<tr>
<td>Non Pacific</td>
<td></td>
<td>13 (13.4)</td>
<td>0.47 (0.26−0.87)*</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post school qualification</td>
<td></td>
<td>80 (21.5)</td>
<td>1.00</td>
</tr>
<tr>
<td>Secondary school qualification</td>
<td></td>
<td>105 (23.1)</td>
<td>1.10 (0.79−1.53)</td>
</tr>
<tr>
<td>No formal qualifications</td>
<td></td>
<td>175 (33.3)</td>
<td>1.82 (1.34−2.47)‡</td>
</tr>
<tr>
<td>English fluency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>189 (22.7)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>171 (33.0)</td>
<td>1.68 (1.32−2.15)‡</td>
</tr>
<tr>
<td>Born in New Zealand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>90 (20.1)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>270 (29.8)</td>
<td>1.69 (1.29−2.21)†</td>
</tr>
<tr>
<td>Cultural alignment</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Low New Zealand, Low Pacific Is</td>
<td></td>
<td>80 (32.9)</td>
<td>1.00</td>
</tr>
<tr>
<td>High New Zealand, High Pacific Is</td>
<td></td>
<td>49 (21.5)</td>
<td>0.51 (0.37−0.84)†</td>
</tr>
<tr>
<td>Low New Zealand, High Pacific Is</td>
<td></td>
<td>144 (32.8)</td>
<td>0.99 (0.71−1.34)</td>
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<tr>
<td>High New Zealand, Low Pacific Is</td>
<td></td>
<td>86 (20.0)</td>
<td>0.56 (0.36−0.73)‡</td>
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<tr>
<td>Employed prior to pregnancy</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Yes</td>
<td></td>
<td>161 (21.7)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>199 (32.6)</td>
<td>1.74 (1.36−2.22)‡</td>
</tr>
<tr>
<td>Telephone in household</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>268 (25.3)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>92 (45.1)</td>
<td>1.34 (1.01−1.78)*</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primipara</td>
<td></td>
<td>68 (18.6)</td>
<td>1.00</td>
</tr>
<tr>
<td>Multipara</td>
<td></td>
<td>287 (29.8)</td>
<td>1.86 (1.38−2.50)†</td>
</tr>
<tr>
<td>Gravida</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primigravida</td>
<td></td>
<td>64 (21.6)</td>
<td>1.00</td>
</tr>
<tr>
<td>Multigravida</td>
<td></td>
<td>292 (28.2)</td>
<td>1.42 (1.04−1.93)*</td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>112 (22.3)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>247 (30.6)</td>
<td>1.44 (1.11−1.86)†</td>
</tr>
<tr>
<td>Reaction to pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very happy</td>
<td></td>
<td>105 (21.6)</td>
<td>1.00</td>
</tr>
<tr>
<td>Happy</td>
<td></td>
<td>126 (28.4)</td>
<td>1.43 (1.06−1.93)*</td>
</tr>
<tr>
<td>Neither happy nor unhappy</td>
<td></td>
<td>82 (28.5)</td>
<td>1.44 (1.03−2.01)*</td>
</tr>
<tr>
<td>Unhappy</td>
<td></td>
<td>32 (31.7)</td>
<td>1.68 (1.05−2.69)*</td>
</tr>
<tr>
<td>Very unhappy</td>
<td></td>
<td>14 (42.4)</td>
<td>2.67 (1.29−5.50)†</td>
</tr>
</tbody>
</table>

*P<0.05; †P<0.01; ‡P<0.001; § Includes mothers identifying equally with two or more Pacific Island groups, equally with Pacific Island and non-Pacific Island groups, or with Pacific Island groups other than Tongan, Samoan, Cook Island Maori, or Niuean.
Table 2. Numbers (row percentages) and univariate odds ratios for inadequate attendance at antenatal care by mothers by selected variables

<table>
<thead>
<tr>
<th>Maternal variable</th>
<th>Category</th>
<th>Inadequate attendance at antenatal care</th>
<th>Univariate odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td></td>
<td>58 (9.0)</td>
<td>1.00</td>
</tr>
<tr>
<td>Cook Island Maori</td>
<td></td>
<td>35 (15.7)</td>
<td>1.88 (1.20–2.95)†</td>
</tr>
<tr>
<td>Niuean</td>
<td></td>
<td>2 (3.4)</td>
<td>0.36 (0.09–1.49)</td>
</tr>
<tr>
<td>Tongan</td>
<td></td>
<td>37 (13.1)</td>
<td>1.52 (0.98–2.35)</td>
</tr>
<tr>
<td>Other Pacific§</td>
<td></td>
<td>6 (12.8)</td>
<td>1.48 (0.60–3.02)</td>
</tr>
<tr>
<td>Non Pacific</td>
<td></td>
<td>8 (8.2)</td>
<td>0.91 (0.42–1.96)</td>
</tr>
<tr>
<td><strong>Social marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partnered</td>
<td></td>
<td>107 (9.8)</td>
<td>1.00</td>
</tr>
<tr>
<td>Non-partnered</td>
<td></td>
<td>39 (14.9)</td>
<td>1.61 (1.08–2.38)*</td>
</tr>
<tr>
<td><strong>Employed prior to pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>55 (7.4)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>91 (14.9)</td>
<td>2.18 (1.53–3.11)‡</td>
</tr>
<tr>
<td><strong>Planned pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>37 (7.4)</td>
<td>1.00</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>109 (12.9)</td>
<td>1.86 (1.26–1.75)‡</td>
</tr>
<tr>
<td><strong>Reaction to pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very happy</td>
<td></td>
<td>33 (6.8)</td>
<td>1.00</td>
</tr>
<tr>
<td>Happy</td>
<td></td>
<td>58 (13.1)</td>
<td>2.06 (1.31–3.22)†</td>
</tr>
<tr>
<td>Neither happy nor unhappy</td>
<td></td>
<td>29 (10.1)</td>
<td>1.53 (.91–2.58)</td>
</tr>
<tr>
<td>Unhappy</td>
<td></td>
<td>19 (18.8)</td>
<td>3.17 (1.72–5.85)‡</td>
</tr>
<tr>
<td>Very unhappy</td>
<td></td>
<td>7 (21.2)</td>
<td>3.69 (1.49–9.13)†</td>
</tr>
</tbody>
</table>

*P<0.05; †P<0.01; ‡P<0.001; § Includes mothers identifying equally with two or more Pacific Island groups, equally with Pacific Island and non-Pacific Island groups, or with Pacific Island groups other than Tongan, Samoan, Cook Island Maori, or Niuean.
Discussion

Overall, antenatal care attendance by mothers of Pacific infants living in South Auckland is relatively high, with most mothers in the cohort attending at least one antenatal care visit during their pregnancy. However, over a quarter of the mothers initiated their antenatal care late or after the first trimester (in the 15th week of pregnancy or later).

While not ideal, this finding is positive in comparison to previous research findings. For example, a study of a cohort of New Zealand children born in 1991 found that 42.9% of the 238 Pacific mothers involved in the study initiated their antenatal care late, and more recent investigations into late attendance have found that up to 70% of Pacific women in South Auckland are attending late. Previous studies have defined late attendance as attending in the 13th week or later. However, it is not likely that the 2-week discrepancy in time frames used would account for such a large difference in late attendance. Further comparative studies are needed as it is difficult to determine whether the current findings represent an actual decrease in late attendance.

It is possible that funding constraints within the maternity care system may impact upon the initiation of antenatal care. LMCs are not funded to provide a module of care for pregnant women until the second trimester, and do not sign a care plan until this time (fourteenth week of pregnancy). While this does not stop a woman from attending visits to her GP or receiving advice from her midwife, this current system may act as a disincentive to receiving early care for some women. Furthermore, some women may experience a delay in registering with an LMC or receiving treatment if their LMC of choice is fully booked.

The majority of mothers in the current study attended at least the minimum recommended number of antenatal visits. Almost 11% of the mothers attended fewer than 6 visits. This is comparable to research done by the National Health Committee (NHC) in 1999, which found that 12% of Pacific women attended fewer than 6 visits, compared to 6% of European women.

The present study found that mothers of Pacific infants have similar demographic, situational and psychosocial factors influencing the initiation and uptake of antenatal care as found in previous research. However, different factors were involved in late initiation of antenatal care and inadequate attendance.

Maternal gravida and parity were associated with late initiation of antenatal care, but not attending fewer visits. High parity, indicating that the mother had experience giving birth before, was associated with late initiation of antenatal care. This is in line with previous research and suggests that these women feel that they do not need to attend as early because they already know what to expect during pregnancy and childbirth. Mothers who reported this to be their first pregnancy were more likely to initiate their care late, suggesting that lack of knowledge or experience with pregnancy and childbirth is also a contributing factor to late initiation of antenatal care. These mothers simply may not have recognised that they were pregnant until later in the pregnancy.
Mothers whose pregnancies were unplanned and had a less than a very happy reaction to the pregnancy were more likely to initiate antenatal care late and attend inadequately. Previous studies have suggested that ambivalence over the pregnancy and its outcome can delay a woman’s decision making about whether to attend antenatal care.\textsuperscript{13,14} Considering that 60\% of the cohort had an unplanned pregnancy, and 70.8\% were not using contraception at the time of conception,\textsuperscript{21} these findings suggest that family planning education targeted at Pacific women needs to be increased, in order to reduce delay in attending antenatal care.

Not being employed prior to pregnancy was associated with both late initiation of antenatal care and inadequate attendance. Despite the fact that New Zealand provides fully subsidised antenatal care,\textsuperscript{3} many mothers of Pacific infants have a number of socioeconomic barriers to attending antenatal care.

It was of particular concern that compared to Samoan mothers, mothers of Cook Island Maori ethnicity were significantly more likely to initiate antenatal care late. There is a need for a focused strategy to educate and inform Cook Island Maori women about the benefits of early and adequate attendance of antenatal care.

Although only significant at the univariate level, Pacific-born mothers, mothers not fluent in English, and mothers with low cultural alignment to New Zealand way of life and customs were more likely to initiate care late. These findings suggest that women who described themselves as culturally isolated from mainstream New Zealand society are less likely to feel comfortable utilising antenatal services. These findings support what has been found by other authors,\textsuperscript{15,19,22} who suggest that cost and ethnicity play a large role in the poor uptake of primary health care services by Pacific peoples.

Discomfort seeing a medical professional of a different ethnic background, lack of understanding of the New Zealand medical system, and reliance on traditional medicine are possible reasons put forward by these authors.\textsuperscript{15,19,22} There is a need for more culturally appropriate medical services to be available to Pacific people, or at least information available to educate Pacific people about what to expect of the New Zealand medical system.

Traditional antenatal care in the Pacific Islands involves a communal approach, with extended family members and other members of the community playing a role in looking after the pregnant woman and keeping her healthy. In addition, traditional birth attendants or traditional healers may give assistance.\textsuperscript{23,24} The extent to which traditional healers are used by Pacific peoples in New Zealand remains largely unknown.\textsuperscript{19} While no association between use of traditional healers during the pregnancy (11.2\% of the mothers) and antenatal care attendance was found in this cohort, provision of antenatal services for Pacific women needs to take into account traditional methods of caring for pregnant women.

In conclusion, while almost all mothers attended antenatal care at least once, a significant proportion of mothers reported initiating antenatal care later than the first trimester and attending fewer antenatal visits than recommended. It is acknowledged, however, that possible changes in antenatal care delivery or consumer behaviour may have occurred since 2000 when PIF data regarding antenatal care was collected. Findings from the present study of Pacific families in New Zealand can be used to target mothers for improved uptake of antenatal care.
The benefits of antenatal care attendance need to be promoted not just to Pacific women, but also to Pacific communities on the whole, through health professionals, community leaders, churches and Pacific agencies. In order to increase early and adequate antenatal care attendance, antenatal care needs to be presented as a vital way of safeguarding the health of Pacific infants, for all Pacific women, irrespective of prior experience with pregnancy.

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**Correspondence:** Dr Janis Paterson, Faculty of Health Studies, Auckland University of Technology, Private Bag 92006, Auckland. Fax: (09) 917 9877; email: janis.paterson@aut.ac.nz

**References:**


Soil-transmitted helminth infection, skin infection, anaemia, and growth retardation in schoolchildren of Taveuni Island, Fiji

Mark Thomas, Graeme Woodfield, Christine Moses, Geoffrey Amos

Abstract

Aim To estimate the prevalence of hookworm, ascaris, and trichuris infection; as well as anaemia, growth retardation, scabies, and impetigo; in schoolchildren of Taveuni Island, Fiji.

Methods Schoolchildren from five villages on Taveuni Island were examined and had their haemoglobin concentration measured on a finger-prick blood sample. In addition, they had a faecal sample examined for the presence of helminth ova.

Results 258 children aged 5–15 years were surveyed. The overall prevalence of infection was: hookworm 14%, ascaris 33%, trichuris 17%, scabies 32%, and impetigo 2%. Eight percent of children were anaemic, while 8% and 6% of children were on or below the third centile for weight and height respectively.

Conclusions The relatively low overall prevalence of hookworm infection and of anaemia suggests that regular anthelminthic treatment of schoolchildren would only provide modest health benefits. Further study is needed to identify the reasons why Taveuni Island schoolchildren weigh less than expected for their age.

Anaemia due to hookworm infection and impetigo secondary to scabies are reported to be common problems in Fijian children.1–3 Both hookworm infection and scabies are amenable to community-based control programs which can provide significant long-term benefits for childhood health.4–7

The World Health Organization (WHO) has drawn attention to the morbidity and mortality caused by soil-transmitted helminths (i.e. the hookworms Necator americanus and Ancylostoma duodenale, and the nematodes Ascaris lumbricoides and Trichuris trichiura). It has been estimated that the burden of disease caused by soil-transmitted helminth (STH) infection in school-age children in developing countries is greater than that caused by any other communicable or non-communicable disease.

In response to this problem, the WHO has recommended that school-based programs to control STH infections should be instituted if the cumulative prevalence of STH infection in schoolchildren is greater than 50%.8

Prompted by local concern about the impact of hookworm and scabies on the health of the children of Taveuni Island, we sought to estimate the prevalence of STH infection, anaemia, scabies, impetigo, and growth retardation in a representative sample of schoolchildren aged 5 to 15 years on Taveuni Island, Fiji.
Methods

We based our survey on WHO guidelines for school-based surveys. Children were recruited at five geographically separated schools during the second week of June 2004. After obtaining informed written consent from their parents, the children had their height and weight measured, their hands, arms, legs, and feet examined for scabies and impetigo, and the haemoglobin concentration estimated on a finger-prick sample of their blood, using a portable haemoglobinometer (HemoCue, Sheffield, England).

All children were provided with a specimen jar containing 7 ml of 40% formalinised saline, and were asked to return this jar to school, the following day, with a small sample of their faeces. These faeces samples were refrigerated until examined at Diagnostic Medlab, Auckland, for the presence of helminth ova using the formal ethyl acetate concentration method.

All children were treated with a single 400 mg oral dose of albendazole (Eskazole, SKB) and those with anaemia (haemoglobin [Hb] level <110g/L) were treated with ferrous sulphate (Ferogradumet, Abbott) 325 mg daily for 3 months.

Children with scabies or impetigo were treated with permethrin cream (Lyderm, PSM Healthcare Ltd) or mupirocin ointment (Bactroban, GSK) respectively. Nurses with responsibility for the communities served by each of the schools assisted with the evaluation of each child, gave advice to the child and their parents on the medical treatments provided, and arranged follow-up care as necessary.

Children whose height or weight was less than or equal to the third centile for children of their age and sex (2000 CDC growth charts, National Center for Health Statistics) were defined as suffering from growth retardation.

Differences in categorical variables across groups were compared using Fisher’s Exact test, and an unpaired t-test was used to compare continuous variables. All analyses were performed using SAS statistical software.

Results

A total of 258 children, aged between 5 and 15 years and from five schools, participated in the survey (Table 1).

206 children (80% of the total sample) provided a faecal sample for subsequent examination for helminth ova. The overall prevalence of STH infection was 45% (95% CI: 38–52%). Hookworm (14%), ascaris (33%), and trichuris (17%) were commonly detected (Table 1).

The prevalence of hookworm infection did not differ greatly between villages. In contrast, however, the prevalence of ascaris and trichuris did differ between villages (Figure 1). Overall, 39/50 (78%) of children from Waimakilu village had a STH infection, compared with 8/41 (20%) of children from Niusawa village; p <0.001. Three children, one each from Bouma, Wainikeli, and Niusawa villages, had Strongyloides stercoralis ova in their faecal samples.

250 children (97% of the total sample) provided a finger prick sample of blood. The haemoglobin concentration in these samples ranged from 71–149 g/L (mean=125, SD=11) (Figure 2).
Table 1. Demographic features and prevalence of soil-transmitted helminth (STH) infections, skin infections, anaemia, and growth retardation in children from five schools on Taveuni Island, Fiji

<table>
<thead>
<tr>
<th>Village</th>
<th>Waimakilu (n=50)</th>
<th>Bouma (n=52)</th>
<th>Wainekeli (n=50)</th>
<th>Niusawa (n=49)</th>
<th>Vuna (n=57)</th>
<th>Total (n=258)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/Female</td>
<td>24/26</td>
<td>26/26</td>
<td>28/22</td>
<td>30/19</td>
<td>27/30</td>
<td>135/123</td>
</tr>
<tr>
<td>Age: median; range (yrs)</td>
<td>11; 6-13</td>
<td>10; 6-12</td>
<td>10; 8-15</td>
<td>10; 7-11</td>
<td>8; 5-11</td>
<td>10; 5-15</td>
</tr>
<tr>
<td>Weight ≤ 3rd centile for age</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Height ≤ 3rd centile for age</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>Height and weight ≤ 3rd centile for age</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Scabies</td>
<td>35 (70%)</td>
<td>23 (44%)</td>
<td>2 (4%)</td>
<td>12 (24%)</td>
<td>12 (21%)</td>
<td>84 (32%)</td>
</tr>
<tr>
<td>Anaemia &lt;110g/L</td>
<td>3 (7%)</td>
<td>8 (16%)</td>
<td>2 (4%)</td>
<td>1 (1%)</td>
<td>5 (9%)</td>
<td>19 (8%)</td>
</tr>
<tr>
<td>Faecal sample received</td>
<td>50</td>
<td>27</td>
<td>36</td>
<td>41</td>
<td>52</td>
<td>206</td>
</tr>
<tr>
<td>Hookworm infection</td>
<td>8 (16%)</td>
<td>5 (19%)</td>
<td>6 (17%)</td>
<td>5 (12%)</td>
<td>5 (10%)</td>
<td>29 (14%)</td>
</tr>
<tr>
<td>Ascaris infection</td>
<td>31 (62%)</td>
<td>11 (41%)</td>
<td>14 (39%)</td>
<td>3 (7%)</td>
<td>10 (19%)</td>
<td>69 (33%)</td>
</tr>
<tr>
<td>Trichuris infection</td>
<td>23 (46%)</td>
<td>4 (15%)</td>
<td>1 (2%)</td>
<td>3 (7%)</td>
<td>4 (8%)</td>
<td>35 (17%)</td>
</tr>
<tr>
<td>Any STH infection</td>
<td>39 (78%)</td>
<td>15 (56%)</td>
<td>18 (50%)</td>
<td>8 (20%)</td>
<td>13 (25%)</td>
<td>93 (45%)</td>
</tr>
</tbody>
</table>
Table 2. Association between hookworm infection and anaemia (Hb <110g/L) in children from five schools on Taveuni, Fiji

<table>
<thead>
<tr>
<th></th>
<th>Anaemia (n=19)</th>
<th>No anaemia (n=243)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hookworm</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4 (21%)</td>
<td>25 (10%)</td>
</tr>
<tr>
<td>No</td>
<td>8 (42%)</td>
<td>169 (70%)</td>
</tr>
<tr>
<td><strong>Number of hookworm ova seen</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>8 (42%)</td>
<td>169 (70%)</td>
</tr>
<tr>
<td>Few</td>
<td>3 (16%)</td>
<td>21 (9%)</td>
</tr>
<tr>
<td>Many</td>
<td>1 (5%)</td>
<td>4 (2%)</td>
</tr>
</tbody>
</table>

Figure 1. Prevalence of hookworm, trichuris, ascaris, and any soil-transmitted helminth infection in children from five schools on Taveuni Island, Fiji
Figure 2. Fingerprick haemoglobin concentrations in children from five schools on Taveuni Island, Fiji
Figure 3A. Height and weight of boys from five schools on Taveuni Island, Fiji
Figure 3B. Height and weight of girls from five schools on Taveuni Island, Fiji
Figure 4. Prevalence of scabies in children from five schools on Taveuni Island, Fiji
Nineteen children (8%) had a haemoglobin concentration less than 110 g/L. Four out of 29 (14%) children with hookworm infection were anaemic, compared with 8/177 children who did not have hookworm infection (RR: 3.4, 95% CI: 0.95–11.4, p=0.07) (Table 2).

234 children (91% of the total sample) had their height and weight measured. The distribution of heights and weights of these children are shown in Figure 3. Overall, the distribution of the children’s heights corresponded with the range found in children in the United States, although the distribution of heights for the older boys was less than expected. The distribution of weights of both the boys and the girls was lower than predicted at all age ranges. A total of 19 children (13 boys and 6 girls) were on or below the third centile of their expected weight for age, and a total of 14 children (9 boys and 5 girls) were on or below the third centile of their expected height for age.

There were no significant differences in the prevalence of growth retardation either between children with or without hookworm infection, or between children with or without any STH infection.

All 258 children were examined for the presence of scabies and impetigo; 84 (32%) children had scabies (which was graded as 1+ in 48 children, 2+ in 26 children, and 3+ in 10 children) but no child had crusted scabies.

The prevalence of scabies in children from each of the five schools is shown in Figure 4. Six children (2%) had impetigo, which was graded as 1+ in all six children. Two children in Waimakilu village school, and one child in each of the other schools, had impetigo.

**Discussion**

This study is the largest survey to date of the relationships between STH infection and anaemia and growth retardation in Fijian children. We are not aware of any recent comparable data from other regions of Fiji and therefore cannot exclude the possibility that our results are not broadly representative of all Fijian schoolchildren.

We did, however, make a concerted effort to recruit students across a broad age range, from widely separated schools, and within communities with differing levels of infrastructure development. As a result, we are confident that our results are representative of the approximately 3,500 children who attend the 21 schools on Taveuni, the third-largest island of the Fiji Islands group in terms of land area.

We found a striking disparity in the prevalence of STH infection between schoolchildren from different villages on Taveuni. In one village, Waimakilu, the cumulative prevalence of STH infection in schoolchildren was almost 80%, while in two other villages, Niusawa and Vuna, the prevalence was only 20% and 25% respectively.

These differences in the cumulative prevalence of STH infection between villages have important implications for the design of helminth control programs. In communities where the cumulative prevalence of STH infection in school-age children exceeds 70%, the WHO recommends that all school-age children should be treated for STH infection 2–3 times per year.
In contrast, in communities where the cumulative prevalence of STH infection in school-age children is 50–70%, the WHO recommends that all school-age children should be treated for STH infection at least once a year. The WHO does not recommend regular treatment of STH infection if the cumulative prevalence of STH infection in school-age children is <50%. Health education and improvements in sanitation and water supply are recommended for all communities, but especially those communities with a very high prevalence of STH infection.8

We found that the prevalence of hookworm infection was less than that reported by others. Hawley surveyed two communities on Viti Levu Island in 1968 and 1969, and found that the prevalence of hookworm infection was 11% in children aged less than 1 year, 38% in children aged 1–5 years, 87% in children aged 6–10 years and 90% in children aged 11–15 years.2 Mathai et al surveyed two communities on Viti Levu Island during the 1990s and found hookworm infection in 19% of schoolchildren in one community and 50% of subjects of all ages in another community.1

Similar high rates of infection were found in an isolated Aboriginal community in northern Australia where 93% of children aged 5–14 years were infected;4 in children in the Muheza, Tanga, and Korogwe districts of Tanzania where 61% of children were infected;2 and in primary schoolchildren in KwaZulu-Natal, South Africa, where 59% of children were infected.6 The prevalence of hookworm infection in the schoolchildren of Taveuni is much less than the prevalence in other countries where school-based anthelminthic programs have been instituted.3–5

We found that 8% of children were anaemic (Hb <110 g/L). Buchanan et al surveyed a large number of children for anaemia in four regions of Viti Levu Island in 1975.10 Buchanan et al found that 33/890 (3.7%) of children aged 5–9 years were anaemic (packed cell volume [PCV] <0.33), and that 162/690(23.5%) of children aged 10–14 years were anaemic (PCV <0.37).

Our results cannot be directly compared with those of Buchanan et al, however, because we used different criteria for the diagnosis of anaemia. Our results are broadly similar, however, and suggest that anaemia is not a common health problem for schoolchildren on Taveuni.

The association of anaemia with hookworm infection in our survey suggests that either testing for hookworm infection and treatment of those found to be infected, or empiric treatment of hookworm, should be routine for children with anaemia. However the relatively low prevalence of hookworm infection in our study suggests that community-wide treatment of hookworm would provide only modest benefits in terms of prevention of anaemia.

There are few data available on the height and weight of schoolchildren in Fiji.11,12 Our results provide a useful overview of the height and weight of schoolchildren on Taveuni. We found that significant growth retardation was not common in schoolchildren on Taveuni. The overall distribution of heights for boys and girls corresponded well with the distribution predicted by the 2000 CDC growth charts, which are based on surveys of US children.9 However the overall distribution of weights for both boys and girls was lower than the distribution predicted by the 2000 CDC growth charts; 19/234(8%) children weighed less than the third centile for their age and 14/234(6%) children were shorter than the third centile for their age.
There was no association between village of residence, the presence of hookworm infection or the presence of any STH infection and growth retardation. This suggests that school-based anthelminthic programs would not have a significant effect on either the height or weight of Taveuni schoolchildren.

We found that scabies was common but was not associated with a high prevalence of impetigo. The two villages with the highest prevalence of scabies, Waimakilu and Bouma, were the villages which also had the highest cumulative prevalence of STH infection. This suggests that the same environmental factors may contribute to the persistence of these infections. We noted that the water supply was less well-developed in Waimakilu and Bouma than in the other three villages and expect that improvements in water supply to these and similar villages would confer diverse health benefits.

In conclusion we found a relatively low prevalence of hookworm infection, anaemia, and growth retardation in Taveuni Island schoolchildren. These results suggest that repeated, school-based, anthelminthic programs directed primarily against hookworm would confer marginal health benefits. We did, however, find moderately high cumulative prevalence of other STH infections which might benefit from repeated, school-based, anthelminthic programs directed primarily against ascaris and trichuris.

Alternatively, efforts to improve water supply and sanitation might achieve similar reductions in hookworm and other STH prevalence, with the additional benefit of reductions in the prevalence of other infectious diseases such as skin and gastrointestinal infections. We found a moderately high prevalence of scabies and a surprisingly low prevalence of impetigo. Improvements in water supply and improved case finding and treatment may be expected to reduce the prevalence of scabies.

Our measurements of height and weight and haemoglobin concentration provide data which should be compared with those from other Fiji or Pacific communities. They should stimulate research to determine the reasons for the children of Taveuni Island to generally weigh less than expected for their age.

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**Acknowledgements:** This study was generously supported by the Rotary Clubs in Taveuni (Fiji), Kumeu (New Zealand), and Newmarket (New Zealand). Diagnostic Medlab (Auckland, New Zealand) kindly examined the faecal samples for helminth ova and provided some of the equipment used in the project. The nurses and teachers who serve the community of Taveuni; as well as Mimi Irwin, Kelvin Moses, and Annabell Woodfield; assisted greatly with the examination of the children. Teena West kindly provided statistical assistance.

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References:

Talking about TB: multicultural diversity and tuberculosis services in Waikato, New Zealand

Clif van der Oest, Richard Chenhall, Dell Hood, Paul Kelly

Abstract

**Aim** To explore the diversity of opinion amongst different refugee and minority group representatives about tuberculosis, and to examine the provision of services and their effectiveness in the Waikato Health District, New Zealand.

**Methods** Open-ended qualitative interviews with the representatives of seven minority populations were undertaken. The interviews focused on the cultural differences in the approach of minority populations to health issues and on the accessibility of health services to these population groups. Participants expressed their opinions about how health services, and more specifically about how tuberculosis (TB) health services could be improved.

**Results** Important cultural differences between the minority populations were elucidated by community representatives that may determine the interpretation of symptoms and timing of presentation at medical services, the appropriate cultural processes to be followed in the consultation, and adherence to prescribed treatment.

**Conclusions** The absence of health services oriented towards specific minority and refugee groups, and communication difficulties with healthcare providers, are important cultural barriers to TB control in Waikato. Recognition of the diversity of these populations, and the cultural and structural barriers that they face in accessing health services in Waikato and other similar health districts in New Zealand, is needed. The development of strategies is required to reduce barriers to TB treatment so that patients from diverse cultural backgrounds can be diagnosed early and effectively treated.

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New Zealand has one of the lowest rates of tuberculosis (TB) in the world, but has high rates in the indigenous Maori and non-European immigrant populations.\(^1\)\(^-\)\(^6\) TB is an infectious disease that is prevalent in developing countries.\(^7\) It is transmitted through airborne droplets or through the ingestion of infected food, and results in disease of the lung and (less frequently) other body organs.\(^7\)

In New Zealand and other developed countries, increasing immigration from high TB incidence countries and the deterioration of control programs as a consequence of reduced Public Health funding have resulted in an increased incidence of TB.\(^2\)\(^,\)\(^8\)-\(^11\)

A recent study examined the effects of the changing socioeconomic, cultural, and geographic characteristics of TB cases in the Waikato Health District (WHD) of New Zealand from 1992 to 2001.\(^12\) That study documented the persisting high incidence of TB amongst Maori, as well as the significant rise in the incidence of TB amongst migrants from countries with a high prevalence of TB. Therefore, it is important to examine the accessibility and delivery of health services to the Maori and immigrant populations.
In August 2002, the Waikato Refugee and New Migrant Strategic Plan – 2002 to 2007 was released. This document is designed to address the broad areas of social integration, health, education, literacy, and employment of new immigrants in the WHD. The authors describe the plan as a response ‘to the challenges of resettlement and meeting the often complex needs of these new (immigrants) and their families’.

The plan is also described as ‘the first significant attempt to plan and fund inter-sectoral service development for refugees and new migrants within the Waikato region’. Within the area of health, the plan recognises significant problems amongst refugees and new migrants (such as issues of access to healthcare services, non-compliance with treatment, inability to meet the cost of medicines, and failure to keep appointments) and subsequently makes several recommendations.

Our study is designed to achieve a better understanding of both the cultural differences between different minority populations in their understanding and approach to TB health issues, as well as to better understand the various barriers that these different populations experience in accessing health services.

With the development of this knowledge, health services (including those for the management of TB) can more effectively meet the needs of these populations and fulfil the aims of the Strategic Plan.

Methods

The research was undertaken over a 3-month period from January 2002 to March 2002. It was decided that community representatives (acting as proxy respondents for their community group) would be approached to participate in this study. Reasons and the potential biases for this decision are presented in the discussion section of this paper.

Participants were selected by using the contact list in the New Settlers Handbook, which lists all immigrant communities and the contact details of community representatives. From the largest community groups, seven individuals were contacted and given information about this project, and asked whether they were available to participate. Arrangements for the interviews’ location and time were also arranged. Representatives from the seven minority populations agreed to participate and were subsequently sent a letter outlining the purpose of the research project (see Table 1).

Each interview was undertaken in English at a venue of the community representative’s choice. Open-ended questions were used to elicit each representative’s opinions about the significance of TB for their community; these included the community’s perceptions of the current level of TB services, and the community representative’s thoughts about how these services could be improved.

At each interview, the responses to each of the questions were recorded in note form by the interviewer, and then transcribed following the completion of the interview. Whilst many researchers tape-record (and later transcribe) interviews for later analysis, we did not have the funds or resources to carry this out. However we were able to make detailed notes during and after each interview which resulted in very little loss of detailed data.

We were unable to show each participant these notes and allow them to change any incorrect emphases, after the completion of the interviews, due to the lack of funding for return visits to give the appropriate level of time and personal contact necessary to allow for feedback. This may have affected the results received, however the researcher was able to clarify statements and provide feedback to participants during the in-depth interview and later by phone.

The Waikato Ethics Committee and the Northern Territory University Human Research Ethics Committee approved this study.
Table 1. Minority populations included in the research project at Waikato Health District, 2002

<table>
<thead>
<tr>
<th>Minority population from</th>
<th>Population size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kampuchea (Cambodia)</td>
<td>762</td>
</tr>
<tr>
<td>China</td>
<td>4752</td>
</tr>
<tr>
<td>Cook Islands</td>
<td>4353</td>
</tr>
<tr>
<td>Maori</td>
<td>64185</td>
</tr>
<tr>
<td>Philippines</td>
<td>543</td>
</tr>
<tr>
<td>Samoa</td>
<td>3141</td>
</tr>
<tr>
<td>Somalia</td>
<td>492</td>
</tr>
</tbody>
</table>

Source: Statistics New Zealand.

Results

TB beliefs—Whilst all respondents reported that TB was well understood by their communities, several community representatives stated that the symptoms of TB (a persistent cough) were often not recognised or misattributed to other conditions. For example, the Maori representative articulated that lung cancer was often attributed to the symptoms of TB.

There were a variety of other reasons noted by community representatives to explain why TB may not be recognised. Asian representatives reported a widely held belief that TB is not prevalent in New Zealand, thus individuals were less likely to recognise symptoms. Other respondents, such as the Kampuchean community representative, described particular sociocultural beliefs, such as the transmission of TB only occurs within particular family groups and leaves other families immune.

Other groups were aware that overcrowded housing was a problem associated with TB. For example, the Phillipino representative suggested that Doctors could help improve the treatment of people by helping to reduce the overcrowding that often occurs with these families, when two families may decide to occupy one house.

Several community representatives discussed the stigma associated with TB, which affected their understanding of the disease. For example, migrants who had recently arrived from countries with high levels of TB and the older generation of the Pacific Island and Maori population (who could remember when the incidence of TB was high in New Zealand) were reported to hold high levels of stigma. However, the concept of stigma was not uniform across the different community representatives.

Stigma was often interpreted as a fear of getting a disease that was believed to be incurable and highly contagious. In other cases, stigma was described as resulting in isolation of the affected individuals until treatment has been completed. The Kampuchean representative reports that the family will react to an individual who has been diagnosed with TB by isolating him in different degrees because of the significant fear that TB engenders for most Kampucheans.

Somali, Asian, and Maori community representatives reported that stigma had been reduced with very simple health education stressing that TB is curable.

Barriers to access to healthcare services—Several barriers to accessing healthcare services were identified by the community representatives. These varied from issues...
around the high cost of accessing primary healthcare services to a preference for alternative forms of treatment. Community representatives also discussed reduced access to health services and relatively high levels of unemployment among their minority populations.

Difficulty in accessing primary health services, such as local general practitioners, was reported by the representatives from all groups as one of the main reasons that healthcare is deferred.

All the representatives reported high levels of unemployment in their populations, and consequently the consultation fee charged for each visit to the primary healthcare service is not affordable for them. For example the:

- Somali representative said that (as 95% of the Somali community are beneficiaries) many are simply too poor to attend the GP, and thus will tend to present in the later stages of any illness (including TB).
- Cook Island representative said that there are several reasons for not going to a doctor, with perhaps the most important reason being their inability to afford the cost of going to see a doctor, and there being no ‘free’ health services in Hamilton.
- Kampuchean representative said that unaffordable or irregular transport services further restrict access to primary healthcare services.
- Maori representative said that nurses need to recognise that patients do not have the transport to be able to pick up their medication.

Various community representatives (such as the Chinese, Maori, and Pacific Islanders) reported that individuals may not access healthcare from a medical service because they choose instead to use traditional healers. However, this was not the case for all communities with the Somali representative describing that many recently immigrated Somalis who had experienced high TB-related morbidity and mortality rates in their native country preferred to seek medical attention from a health service at an early stage of onset, rather than from traditional healers.

**Service provision in the healthcare setting**—In the provision of health services, community representatives were asked further about the difficulties their community members experienced within the healthcare setting. Responses ranged from articulating who should speak, who should be included in the consultation, and the importance of following cultural protocols.

All community representatives noted that important cultural differences exist between the different populations in the preferred styles of health consultations. In the Somali and Asian populations, community representatives described that communication with the patient is normally undertaken through the head of the family. Whilst this is normally a senior male, the family matriarch undertakes this role in the Cook Island community.

Each community representative emphasised that consultative care involves the entire family, though assuming different formats. Nevertheless, there was a concern that involving the whole family may affect the degree to which a patient may disclose health information in the health setting.
All community representatives reported that individuals often feel unable to identify with a health professional who is not from their own cultural background, and are uncomfortable in the health centre setting generally.

Concerns about confidentiality result in individuals not fully divulging their health problem and limiting the consultation’s usefulness. Specific cultural protocols are often not understood or followed by the health centre.

The Samoan representative described that individuals need to be consulted and seen in a familiar environment by nurses, healthcare workers and social workers who are of their ethnic background and speak their language, in conjunction with the public health nurse or physician who is treating them.

The Maori representative also stressed the importance for continuity of care with the need for Maori nurses. Such nurses, the representative stated, are better able to establish a relationship of trust and communication by knowing different members of the family of the particular individual, and also in being able to use the symbols of the Maori culture to help increase someone’s knowledge about this disease.

Amongst the Pacific Islander groups, there was a perceived need for an ethno-specific health services, with the Cook Islander representative stating a Cook Island primary healthcare service is a very high priority but this aspiration is currently being stifled by very inadequate available funding.

Communication barriers in the health consultation were reported by the representatives of all the communities. The Samoan representative describes that immigrants who are fluent in conversational English also experience communication difficulties because they do not understand the medical terminology used by medical staff.

The Pacific Island representatives identified that communication difficulties may result in misunderstandings and confusion and are a primary contributing factor to non-adherence. A lack of language-appropriate written information on common health issues (including TB) and prescription instructions were also identified by the Chinese, Somali, Kampuchean, Phillipino, and Cook Island representatives. Each immigrant community representative advocated the need for interpreters, with the proviso (for issues of disclosure) that interpreters need to be acceptable to the family.

When discussing service provision, the issue of adherence to treatment was also raised. Communities who were reported as having a high level of knowledge concerning TB (either through direct experience either in the past or from their home country) reported high levels of adherence to treatment.

Other community representatives (especially the Phillipino, Chinese, and Kampuchean) said that their community members generally believed in the efficacy of prescribed medication. The Kampuchean representative describes that people in (her) community are very happy to (take medications), and are generally very diligent about taking and completing courses of medication prescribed to them. This appears to be a reflection of the fear and anxiety that they hold about TB, coupled with the vivid recollection of the people who died from TB in refugee camps, and in Kampuchea’.
In this case, historical memory of TB from an immigrant’s home country can result in individuals seeking and complying to mainstream TB treatment. However, adherence to TB treatment and prescribed medication more generally, was reported by the Pacific Island and Maori representatives to be poor in their communities. They reported that reduced adherence to medication can often be the result of ambivalence about the merits of prescribed medication over traditional medications, by the adverse side effects of TB medication, or as a result of insufficient or misinterpreted medical advice.

The Maori community representative described that medication can also be easily lost or misplaced in large mobile family households. In addition the lack of transport creates difficulties in accessing medication from pharmacies. Both the Pacific Island and Maori community representatives reported that treatment is often discontinued prior to completion once the symptoms are resolved.

**Discussion**

This project explored the commonalities and differences between the issues faced by different minority community groups around TB and the provision of services in the Waikato. Demographic changes (with the increased number of refugees with TB) make this research timely for TB services in Waikato and for other predominantly rural districts of New Zealand.

The study results reveal key themes around the signification of TB beliefs, access problems, the need for cultural sensitivity via culturally appropriate communication, and cultural practices and issues related to adherence.

In approaching the health needs of these populations, it is important to recognise both the social and cultural diversity, and the various barriers they face in accessing health services. Without this recognition and further research, the development of health services will be ineffective—leading to poor treatment outcomes, the failure to improve the health of the patient, and failure to eradicate TB as a public health problem in the Waikato district.

In talking about TB with community representatives who spoke as proxy respondents for their communities, this study does not claim to be representative of the attitude of entire community groups, however it does suggest some key themes and issues that require further and more systematic investigation.

The use of data from proxy respondents has been well canvassed in the literature and is often used in research that requires health information to be collected by direct interview methods. Where there are limited resources for collecting large numbers of interviews, or where the index respondents are unable to be interviewed due to sickness or cognitive impairment, the use of proxy respondent has been particularly useful.

More recently, proxy respondents have been used as a means to identify key issues for further investigation. However, the use of proxy respondents is not without its pitfalls. For example, Nelson et al argued that the item response rate is affected by the topic of the question, the degree of details required, and the relationship of the index and proxy respondent to each other.
Further problems include over-reporting, under-reporting, and misclassification of responses due to the specific characteristics of study questions. Despite these issues, this study opted for the proxy respondent approach for several reasons.

Specifically, the research represents an investigative scoping approach, where preliminary attitudes and beliefs around TB were sought to inform future research. The Waikato Ethics Board did not permit interviews to be carried out with individuals who were affected by TB unless trained translators were present. The funds of this project could not cover these costs so it was decided to select community representatives who had a high level of English skills.

We recognise that these individuals are not representative of all members of their community and that they may well have had their own intentions and motivations in agreeing to be part of this study. However the researchers felt that given the circumstances, it was important to continue with the interviews and that community representatives would be able to provide important and culturally relevant information.

An important finding from the interviews conducted in this study was that TB has a particular cultural context for different ethnic community groups, related (in part) to their recent past experience of the disease. Rubel et al, describe these cultural contexts succinctly as the ‘health culture’ of the patient, which they define as ‘the understanding and information people have from family, friends, and neighbours as to the nature of a health problem, its cause, and its implications’. 16

Other recent research indicate that understanding the particular cultural background of a patient gives useful insight into health decision-making behaviour and subsequently the degree of adherence to prescribed treatment. 17–18,19–20

Cultural differences are also reflected in the different cultural practices for health consultations, including the different roles that the family plays in these. This is an important issue for health services in both identifying appropriate cultural practices and accommodating family consultations. Family involvement in consultations also raises important issues (including the confidentiality of disclosure between the patient and health professional, and the appropriate care of the individual who may be experiencing TB related stigma).

Interviews with community representatives suggest that stigma related to TB is an important factor associated with non-completion of treatment. Stigma related to fear of contracting an incurable disease, and of being isolated from family, was described as affecting an individual’s response to developing symptoms and the timing of their presentation at health services.16–17,19,21–24

With appropriate education, community representatives also noted that stigma was reduced through improved education about health issues, an observation with clear and important implications for health service planning.

In developing effective health services for immigrant and indigenous populations in a multicultural society such as New Zealand, it is important to recognise that poor health outcomes (associated with populations) have often been erroneously attributed to cultural factors alone.22–26 However structural barriers such as class, gender, and age have been shown to impact on the delivery of health services to marginalised populations, such as those documented here, in previous research.21,25–26
There is a well-documented relationship between migrants, low socioeconomic status, and poor health outcomes.\textsuperscript{26–29} TB is an interesting and appropriate case study for this due to the link between poverty, TB, ethnicity, and the associated issues such as stigma in this life-threatening disease.

In this study, interviews with the community representatives may indicate that (in comparison with the general New Zealand population) minority groups in the Waikato experience reduced access to health services and inadequate housing. Education levels were not mentioned by any of the community representatives in this study and it is difficult to ascertain whether this is relevant without further research. However, lack of the financial means to pay for services, combined with associated transportation costs, were found to be significant in explaining low attendance to health services.

In addition to barriers in accessing health services, interviews with the community representatives also suggested communication barriers by minority populations when utilising existing healthcare services. Subsequently, the net result of health consultations were described as being confusing, involving misunderstandings, and resulting in low treatment adherence. Communication difficulties are also reflected in an earlier New Zealand study, including a study of refugees in Porirua (Wellington region) which concluded that the major unsatisfied health need for this group of refugees was interpreting services.\textsuperscript{31}

Health services in the WHD incorporate both ethno-specific and mainstreamed health services. Ethno specific health services have been developed outside of the confines of the established health system for minority populations. Mainstreaming services, on the other hand, are health services to minority populations that are delivered within the established health system.

Julian, in outlining the arguments for both forms, describes that ‘basing service delivery on ethnicity tends to segregate and marginalise migrants, but ignoring ethnicity and catering for migrants only within general services can mean neglecting special needs and perpetuating structural discrimination’.\textsuperscript{32}

The last decade has seen the development of some ethno-specific primary healthcare services for Maori. However the majority of minority populations do not have easy access to ethno-specific primary healthcare services. Interviews with community representatives, particularly amongst the Pacific Island communities, declared the need for their own ethno-specific primary healthcare services and community health based organisations. In explaining why Pacific Island community representatives were more forceful in their attitudes (concerning a need for such services) may be related to the overall longer length of time that such communities have been established within the broader society.

The development of such services for minority populations is costly and there are various difficulties associated with determining eligibility of the different communities for the development of their own service. Previous research indicates that treating patients in the community itself is a large step towards addressing the issues which lead to delays and non-completion.\textsuperscript{33}

Alongside patient and community education, utilising trained community volunteers, makes treatment more accessible and decreases the problems associated with stigma
through the public nature of treatment. As low adherence to prescribed medication was an important finding of this study (related to low or misinformation about TB treatment), health promotion activities aimed at providing culturally relevant and accessible information, combined with accessible service provision, would be the most appropriate intervention.

Table 2. Key recommendations for healthcare delivery to minority populations in the Waikato Health District

- To assess the feasibility and costing of developing ethno-specific primary healthcare services to accommodate the cultural needs of minority populations.
- To develop community based organisations and the training of community health workers for minority populations.
- To improve the quality and effectiveness of communication of health professionals working with minority populations by developing:
  - A comprehensive professional interpreter service for primary healthcare services,
  - A national resource of reference material outlining appropriate cultural practices for each minority population,
  - A national electronic resource of health education,
  - Material for each minority population, and
  - Pharmacy systems which will produce drug prescriptions in English as well as in the patient’s native language.
- To facilitate specific professional training for health professionals working with minority populations.
- To develop appropriate health promotion materials for each minority population after close consultation with these populations.

Conclusion

Based on the findings of this study, and on a review of relevant international literature, the Refugee and New Migrant Strategic Plan – 2002 to 2007 may need to be modified further. Recommendations from this study are presented in Table 2.

Social and cultural diversity is an important issue for health services in a multicultural society. This paper indicates that there is a perception amongst community representatives that their minority population groups experience disadvantage in accessing health services.

Whilst the development of ethno-specific health services within a mainstreaming health service environment would require a substantial amount of funds for relatively small population groups, simple measures such as community and patient education (undertaken by trained volunteers from the community) needs to be explored. Health services also need to recognise that there are both similarities and important
differences among the various African, Asian, and Pacific minority populations regarding their understanding of TB and of their approach to health services.

The implications of this challenge (improving access of indigenous and immigrant populations to health services) for the current TB control program in the WHD is equally relevant to TB control in other parts of New Zealand and in other countries with a low national prevalence of TB. Similarly the recommendations developed through this research may have equal applicability as a means of achieving improved access to health services by minority populations.

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References:


Smoking cessation using mobile phone text messaging is as effective in Maori as non-Maori

Dale Bramley, Tania Riddell, Robyn Whittaker, Tim Corbett, Ruey-Bin Lin, Mary Wills, Mark Jones, Anthony Rodgers

Abstract

Aims To determine whether a smoking cessation service using mobile phone text messaging is as effective for Maori as non-Maori.

Methods A single-blind randomised controlled trial was undertaken with recruitment targeted to maximise the participation of young Maori. The intervention included regular, personalised text messages providing smoking cessation advice, support, and distraction. Maori text messages related to Maori language, support messages (in Maori and English) and information on Maori traditions. Text messaging was free for 1 month. After 6 weeks, the number of messages reduced from 5 per day to 3 per week until the 26-week follow-up.

Results Participants included 355 Maori and 1350 non-Maori. Maori in the intervention group were more likely to report quitting (no smoking in the past week) at 6 weeks (26.1%) than those in the control group (11.2%) RR 2.34, 95% CI: 1.44–3.79. There was no significant difference between the RR for Maori and that for non-Maori (RR: 2.16, 95%CI: 1.72–2.71).

Conclusions A mobile phone-based cessation programme was successful in recruiting young Maori, and was shown to be as effective for Maori as non-Maori at increasing short-term self-reported quit rates. This shows clear potential as a new public health initiative.
utilised by this group. There is also limited direct evidence of smoking cessation interventions demonstrating efficacy in young people or for Maori.

New smoking cessation interventions for young Maori adults are clearly needed, and mobile phones could provide an important new delivery medium. More than 85% of young New Zealand adults now have a mobile phone (statistics by ethnicity are not available), and text messaging among this age group has rapidly developed into a new communications medium.

Over a million text messages (where up to 160 characters of text are sent directly from one mobile phone to another) are sent every day in New Zealand. This could represent a new channel for the delivery of smoking cessation services inexpensively to a large section of the population wherever they are located.

Methods

A large, simple randomised trial of a new smoking cessation service using mobile phone text messaging was performed (STOp smoking by Mobile Phone – STOMP); the overall methodology and results of which are reported in another paper.

This trial was specifically designed to maximise participation by Maori, and to allow for analyses to be performed that had adequate power to report results for Maori and non-Maori.

People were eligible for inclusion provided they met the following criteria: aged 16 years or more, currently smoking cigarettes daily, interested in quitting, able to send and receive text messages, current owner of a Vodafone mobile phone (at the time the trial started Vodafone was the only telephone network where all users could send and receive text messages), English speaking, and able to provide informed consent.

Recruitment was targeted to Maori participants in a variety of ways, with recruitment information being disseminated via: Maori radio station advertising, mailing lists of Maori students attending tertiary institutions, advertisements in a Maori student magazine, hospital staff email lists, faxes to Maori health providers, and via Maori smokefree networks and providers. Non-targeted advertising for the trial (newspapers, websites, magazines, Quitline [http://www.quit.org.nz/] also mentioned that the researchers were particularly interested in recruiting Maori.

After enrolment participants were randomised to either a control group or to a group that received a support programme. The intervention group received regular, personalised text messages providing smoking cessation advice, support, and distraction. An algorithm was developed to match participant characteristics with a database of over one thousand text messages so that an individualised programme was provided.

Participants self-identifying as Maori also received Maori–specific text messages. A list of approximately 140 texts were developed by the Maori researchers (DB, TR) and students. These related to Maori language (Lets learn te reo, words such as change, courage, challenge, action, goal, strength), general support messages (in Maori and English), and information on Maori customs and traditions.

A Quit day was negotiated with each participant, and five messages were sent per day for the week leading up to the Quit day, and during the following 4 weeks. On the Quit day, free outgoing text messaging also began, with participants encouraged to tell all their friends and family they were quitting on that day, as a means of distraction and communicating the need for support. Six weeks after randomisation and coinciding approximately with the end of the free text month, the intervention became less intensive, with the number of sent text messages reducing from five a day to three per week until the end of the 26-week follow-up.

Participants allocated to the control group received no smoking-related information. They received one text message a fortnight reminding them that completed follow-up would be rewarded with a free month of text messaging, and giving the study centre contact details. There were no restrictions on the use of other smoking cessation strategies by trial participants— i.e. this trial tested the addition of mobile phone-based services to existing practice.
The main outcome of the trial was the prevalence of current non-smoking (i.e. not smoking in the past week) 6 weeks after randomisation. Secondary outcomes included self-reported non-smoking at 12 and 26 weeks. All baseline and follow-up data were collected by mobile phone or text messaging, and confirmation of informed consent was by text messaging. Participants were informed at the outset of the study that baseline levels of smoking and reports of quitting may be verified, in an attempt to improve the veracity of self-reported data. A random sample of 100 participants who reported quitting at 6 weeks were selected for personal visits to verify quitting with salivary cotinine levels.

Central telephone randomisation was used—with age, sex, number of cigarettes, and stage of change as stratification factors in the minimisation algorithm. Participants were aware of which group they were allocated to, but follow-up methods were identical for all participants, with any follow-up phone calls made by staff who were unaware of the treatment allocation (i.e. single blind).

Data were analysed following a pre-specified analysis plan. Simple chi-squared analyses compared the proportion quit by treatment group, with estimation of relative risks (RRs), 95% confidence intervals (CIs), and two-sided p values. The number of cigarettes smoked and Fagerstrom score (a measure of nicotine dependence) during follow-up were compared with analysis of covariance.

The role of possible baseline effect modifiers and confounders was assessed with standard logistic regression analyses and was to be reported if the estimate of treatment effect on the primary outcome changed by greater than 10%. Participants without follow-up data were assumed to be still smoking in the primary analysis. Secondary analyses were performed assuming that participants with no follow-up data either: had the same smoking status as at last follow-up or, were all non-smoking.

Additional sensitivity analyses assumed that the rate of non-confirmed quitters for the whole trial was the same as for the sample assessed for salivary cotinine. Pre-specified subgroup analyses were planned providing there was a treatment effect of at least three standard deviations in the primary outcome.

**Results**

The overall results of the STOMP study are presented in a separate paper. We report here for the first time the results of the Maori and non-Maori analyses. Overall, 1705 participants were eligible and were randomised to control or treatment, including 355 (21%) Maori and 1350 (79%) non-Maori participants (Figure 1).

Twenty-seven Maori participants were lost to 6-week follow-up (8%), compared to 4% of non-Maori (missing data were assumed smoking). Follow-up rates at 6 months were lower than at 6 weeks, particularly in the intervention group. Follow-up in Maori participants at 6 months was 55% in the intervention group compared to 69% in the control group (p=0.006); and in non-Maori, 73% compared to 82% in the control group (p=0.0002). Maori in the control and intervention groups were similar with respect to age, gender, income level, and smoking dependence/history (Table 1).

In comparison with non-Maori participants, there were a higher proportion of Maori women and the median age of Maori participants was older. Maori participants were also less likely to have used a nicotine replacement product of any type in the past, although were more likely to have contacted Quitline when compared to non-Maori.

Maori participants in the treatment group were more likely to report having stopped smoking at 6 weeks than those in the control group, with 26.1% quit compared to 11.2% (RR: 2.34, 95% CI: 1.44–3.79) (Table 2). There was no significant difference between the RR for Maori and that for non-Maori (RR: 2.16, 95% CI: 1.72–2.71), that is the intervention was as effective for Maori as for non-Maori.
Figure 1. Flowchart of recruitment and retention of participants by Maori/non-Maori

Excluded (n=939)
  Ineligible smoking status (n=151)
  Not NZ resident (n=3)
  Refuse saliva test (n=109)
  Aged under 16 yrs (n=50)
  Other/unknown (n=626)

Randomised (n=1705)

Allocated to Control (n=853)
  Maori (n=179)
    Lost to follow-up 6 wks (n=11)
    Lost to follow-up 26wks (n=56)
  non-Maori (n=674)
    Lost to follow-up 6 wks (n=24)
    Lost to follow-up 26wks (n=123)

Allocated to Active (n=852)
  Maori (n=176)
    Lost to follow-up 6 wks (n=16)
    Lost to follow-up 26wks (n=80)
  non-Maori (n=676)
    Lost to follow-up 6 wks (n=30)
    Lost to follow-up 26wks (n=181)
### Table 1. Baseline characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Maori Control</th>
<th>Maori Active</th>
<th>Non-Maori Control</th>
<th>Non-Maori Active</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>131 (73.2)</td>
<td>132 (75.0)</td>
<td>366 (54.3)</td>
<td>368 (54.4)</td>
<td>997 (58.5)</td>
</tr>
<tr>
<td><strong>Age: Median (IQR)</strong></td>
<td>25 (20–32)</td>
<td>24 (19–33)</td>
<td>22 (19–28)</td>
<td>21 (19–29)</td>
<td>22 (19–30)</td>
</tr>
<tr>
<td><strong>Income level ($)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;15,000</td>
<td>37 (20.7)</td>
<td>43 (24.4)</td>
<td>178 (24.0)</td>
<td>178 (26.2)</td>
<td>436 (25.6)</td>
</tr>
<tr>
<td>15–30,000</td>
<td>78 (43.6)</td>
<td>83 (47.2)</td>
<td>271 (40.2)</td>
<td>281 (41.6)</td>
<td>713 (41.8)</td>
</tr>
<tr>
<td>&gt;30,000</td>
<td>63 (35.2)</td>
<td>49 (27.8)</td>
<td>211 (31.3)</td>
<td>207 (30.6)</td>
<td>540 (31.1)</td>
</tr>
<tr>
<td>Did not answer</td>
<td>1 (0.6)</td>
<td>1 (0.6)</td>
<td>14 (2.1)</td>
<td>10 (1.5)</td>
<td>26 (1.5)</td>
</tr>
<tr>
<td><strong>Fagerstrom Score</strong></td>
<td>5 (4–7)</td>
<td>5 (4–6)</td>
<td>5 (3–6)</td>
<td>5 (3–6)</td>
<td>5 (3–6)</td>
</tr>
<tr>
<td><strong>Roll your own cigarettes</strong></td>
<td>39 (21.8)</td>
<td>42 (23.9)</td>
<td>142 (21.1)</td>
<td>146 (21.6)</td>
<td>369 (21.6)</td>
</tr>
<tr>
<td><strong>No times tried to quit: Median (IQR)</strong></td>
<td>2 (1–3)</td>
<td>2 (1–4)</td>
<td>2 (1–4)</td>
<td>2 (1–4)</td>
<td>2 (1–4)</td>
</tr>
<tr>
<td><strong>Nicotine replacement product</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
<td>37 (20.7)</td>
<td>46 (26.1)</td>
<td>185 (27.5)</td>
<td>198 (29.3)</td>
<td>466 (27.3)</td>
</tr>
<tr>
<td>Current</td>
<td>1 (0.6)</td>
<td>2 (1.1)</td>
<td>8 (1.2)</td>
<td>7 (1.0)</td>
<td>18 (1.1)</td>
</tr>
<tr>
<td><strong>Nicobrevin use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
<td>2 (1.1)</td>
<td>5 (2.8)</td>
<td>23 (3.4)</td>
<td>31 (4.6)</td>
<td>61 (3.6)</td>
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<tr>
<td>Current</td>
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<td>1 (0.6)</td>
<td>0</td>
<td>0</td>
<td>1 (0.1)</td>
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<tr>
<td><strong>Buproprion use</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Ever</td>
<td>2 (1.1)</td>
<td>3 (1.7)</td>
<td>12 (1.8)</td>
<td>15 (2.2)</td>
<td>32 (1.9)</td>
</tr>
<tr>
<td>Current</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1 (0.2)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td><strong>Quitline use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
<td>20 (11.2)</td>
<td>20 (11.4)</td>
<td>66 (9.8)</td>
<td>63 (9.3)</td>
<td>169 (9.9)</td>
</tr>
<tr>
<td>Current</td>
<td>1 (0.6)</td>
<td>0</td>
<td>7 (1.0)</td>
<td>4 (0.6)</td>
<td>12 (0.7)</td>
</tr>
<tr>
<td><strong>Other quit aids use</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever</td>
<td>2 (1.1)</td>
<td>7 (4.0)</td>
<td>31 (4.6)</td>
<td>25 (3.7)</td>
<td>65 (3.8)</td>
</tr>
<tr>
<td>Current</td>
<td>0</td>
<td>0</td>
<td>1 (0.1)</td>
<td>3 (0.4)</td>
<td>4 (0.2)</td>
</tr>
<tr>
<td><strong>Any quit aid or product in current use</strong></td>
<td>2 (1.1)</td>
<td>3 (1.7)</td>
<td>15 (2.2)</td>
<td>15 (2.2)</td>
<td>35 (2.1)</td>
</tr>
</tbody>
</table>

IQR=interquartile range.
Figure 2. Effect of text message-based smoking cessation programme on smoking cessation at 6 and 26 weeks (by Maori/non-Maori)

Table 2. Treatment effects on number of participants achieving smoking cessation at 6, 12, and 26 weeks (by Maori/non-Maori)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>Active</th>
<th>RR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Maori</td>
<td>N ( %)</td>
<td>N ( %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 (11.2)</td>
<td>46 (26.1)</td>
<td>2.34 (1.44–3.79)</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>-non-Maori</td>
<td>89 (13.2)</td>
<td>193 (28.6)</td>
<td>2.16 (1.72–2.71)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>12 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Maori</td>
<td>N ( %)</td>
<td>N ( %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 (19.6)</td>
<td>47 (26.7)</td>
<td>1.37 (0.93–2.01)</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>-non-Maori</td>
<td>125 (18.5)</td>
<td>200 (29.6)</td>
<td>1.60 (1.31, 1.94)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>26 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Maori</td>
<td>N ( %)</td>
<td>N ( %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33 (18.4)</td>
<td>38 (21.6)</td>
<td>1.17 (0.77–1.78)</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>-non-Maori</td>
<td>169 (25.1)</td>
<td>178 (26.3)</td>
<td>1.05 (0.88–1.26)</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Assumes all participants with missing smoking status were smoking
Sensitivity analyses were performed to assess the potential impact of missing data from those lost to follow-up, with the pattern of missing data for Maori similar to the overall pattern in the study. Salivary cotinine testing showed no clear evidence of different degrees of over-reporting of quit rates between the overall intervention and control groups, with 18% of those invited (47% of those who undertook the test) congruent with not smoking. The relative risk estimates for the primary outcome were not substantially altered in sensitivity analyses adjusting for missing data (Figure 2) and salivary cotinine verification tests.

Secondary outcomes at 12 and 26 weeks are shown in Table 2. Reported smoking cessation rates remained high at 26 weeks in the intervention group (21.6%) but increased in the control group (18.4%). For all assessments at all follow-up times there was no clear difference in proportional effects for Maori versus non-Maori (p homogeneity ≥0.2 for all comparisons).

**Discussion**

This is the first randomised controlled trial of smoking cessation where Maori smoking cessation rates are compared to non-Maori. This trial was specifically designed and executed to ensure high Maori participation in the trial and to ensure that the results presented would have adequate meaning for Maori.

Such a methodology is essential to ensure that matters related to indigenous inequalities are addressed in the design and implementation of clinical trials in New Zealand, and furthermore to ensure that new and innovative interventions do reach those in highest need and in particular Maori. If steps are not taken in the design and implementation of clinical trials to ensure responsiveness to Maori there is a risk that such research could in fact increase inequalities, in that interventions may be preferentially taken up by population groups with less need. Such as is seen with the lower proportion of Maori taking up free diabetes checks (35% compared to 51% overall), despite higher prevalence rates.

This manuscript has been written using a kaupapa Maori framework whereby the study analysis was undertaken from a Maori perspective. This is distinct from other methodologies that may ‘minoritise’ Maori with insufficient data quantity or quality to undertake analyses necessary to inform Maori health development. Where appropriate, kaupapa Maori methodology enables disparities to be identified and their elimination prioritised. This is consistent with the Treaty of Waitangi.

Several lessons can be learned from this study. Clinical trials can be designed in such a way as to be successful in reaching both Maori and non-Maori participants. Efforts were made to reach young Maori by targeted recruitment methods in this trial, resulting in 21% of participants at baseline (compared to 14.7% of the general population). Also according to the 2001 New Zealand Census, participants (aged 15–30 years) had a very similar personal income distribution to that for the same age group in the general population.

This trial shows how a modern communications medium, which has been rapidly adopted by young adults, can be used as a means of delivering important health services to young people where current delivery systems are not working. Mobile phones and text messaging are used by a wide range of young people, and have the benefit of being with the person most of the day.
The high Maori participation reflects the acceptability of this intervention for young Maori adults, including its use of Maori (te reo) health-related text messages. These messages may be able to be used for future interventions. Indeed, there is potential for other services to use this method of delivering health messages with the advantages of being affordable, personalised, age-appropriate, and not location-dependent. Any such services must continue to adapt as communications technology changes.

The finding that this intervention was as effective for Maori as for non-Maori is important due to higher smoking rates and the ensuing higher rates of smoking related disease in Maori compared to non-Maori. A smoking cessation service that can target and enrol young Maori in this way has the potential to deliver an equal benefit to Maori, or perhaps even to positively impact on inequalities in health status.

**Methodological considerations**—Limitations of this study include a differential loss to follow-up (overall follow-up rates of 67% in the intervention group and 78% in the control group). This reflects a differential incentive to participate, with the control group receiving their month of free text messaging after the 26-week follow-up. Due to limited resources, the intervention group were not offered this incentive. Also the reported quit rates increased over time in the control group, suggesting that some participants thought their free text month might depend on reporting quitting. Over-reporting of quitting is thought to be more likely in young people and was seen here with salivary cotinine validation in a sample of participants (described in Rodgers et al).

The greater loss to follow-up at 26 weeks in the intervention group also means that the treatment of missing data makes a considerable difference to the result. If all missing data are regarded as smoking (the primary analysis), then disproportionate numbers in the intervention group are classified as smokers and this gives a very conservative estimate of the effect of the intervention (RR close to null). The true effect of this intervention is in fact more likely to be reflected in the greater RR estimate found with assuming the continuation of previous smoking status. As such, analysis with last smoking status value carried forward, or with assuming not smoking, shows significant improvements for Maori and non-Maori remaining at 26 weeks (Figure 2).

These results need to be validated in a larger study with adequate power for Maori and non-Maori and with an adequate follow-up period.

**Conclusion**—This trial shows that it is possible to reach and recruit young Maori to participate in an innovative smoking cessation intervention. It also shows that a mobile phone-based cessation programme was as successful at increasing self-reported short-term quit rates in Maori as in non-Maori. Smoking prevalence amongst Maori has changed little in recent years, and new methods of cessation for young Maori are clearly needed. Any reductions in smoking prevalence in young Maori would have significant public health benefits, as the earlier a smoker quits smoking the greater the health gain. This intervention clearly has potential as a public health initiative and the results shown here form a good basis for further trials.

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(None of the investigators have a personal financial interest in the software developed as part of this trial. STOMP has been set up as a not-for-profit entity wholly owned by Auckland University which owns the software and intellectual property developed for the trial.)

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Cushing’s syndrome due to adrenal carcinoma

Patrick Gladding, Tim King, Andrew Grey

Abstract
Cushing’s syndrome results from chronic excessive endogenous or exogenous glucocorticosteroids. Extremely high concentrations cause an accelerated syndrome with rapid deterioration, often suggesting ectopic ACTH production. We present a case of adrenocortical carcinoma-causing corticotrophin-independent Cushing’s syndrome.

Case report
A 53-year-old man was admitted to Auckland City Hospital (Auckland, New Zealand) with cellulitis of the right inguinal crease.

During the preceding 6 months, he had been diagnosed with hypertension, type II diabetes mellitus, a transient delusional state requiring risperidone, and admitted with acute coronary syndrome. A cardiologist had seen him with suspected heart failure.

Investigations at a hypertension clinic revealed proteinuria (1.5 g/d) hyper-reninaemia (renin 325 mU/L), normal aldosterone, and normal 24-hr urinary catecholamines. Ultrasound showed a 10-cm right adrenal mass.

At admission, he had Cushingoid facies, proximal myopathy, lower limb oedema, and tender erythema below the right inguinal crease. Investigations showed: hypokalaemia; 24-hour urinary cortisol 3690 nmol/d (100–330); adrenocorticotropic hormone (ACTH) <1.1 pmol/L (2–11); and dehydroepiandrosterone (DHEAS) 8.7 umol/L (1.1–6.3). Ultrasound of the right groin showed a fluid collection and gas in the soft tissues. A magnetic resonance imaging (MRI) scan confirmed a large right adrenal mass compressing the inferior vena cava (IVC), without psoas abscess (Figure 1).

Local infection required prolonged intravenous cefuroxime and metronidazole, and three operative debridements. Recovery was complicated by pulmonary embolus, treated with anticoagulation then vena caval filter. Metapyrone therapy was commenced to reduce hypercortisolaemia. Right adrenalectomy and nephrectomy removed a low-grade adrenocortical carcinoma. Invasion into the renal capsule necessitated nephrectomy but tumour infiltration of the inferior vena cava prevented complete tumour removal.

A follow-up MRI scan at 20 months showed an asymptomatic residual tumour.
Figure 1. Abdominal MRI: T2-weighted coronal view. A 9.1-cm right adrenal mass displaces the inferior vena cava

Discussion

The concurrence of common medical conditions suggested Cushing’s syndrome. However life-threatening complications were already present at diagnosis. Adrenal carcinoma may cause 8% of cases of Cushing’s syndrome.\(^1\)

Adrenocortical carcinoma is rare (0.5–2 cases/million/year\(^2\)). Most patients are in the fifth decade with a slight female preponderance. Sixty percent present with hormonal excess, usually of cortisol, occasionally with virilisation. More than half are considered surgical candidates, but long-term survival is restricted to early-stage disease (5-year survival: 15–47\%).\(^2\)

The hypercortisolaemic state impairs cell-mediated immunity and predisposes to a variety of opportunistic infections: *Candida; Cryptococcus*; aspergillosis; nocardiosis; *Pneumocystis; Toxoplasma*; herpes virus; *Mycobacterium avium* complex; *Listeria monocytogenes*; and reactivation tuberculosis.\(^3,4\)

The incidence is greater in patients taking glucocorticoids than in endogenous Cushing’s syndrome.\(^3\) Cunningham et al also described a 41-year-old woman with vulvar necrotising fasciitis due to an ACTH-producing thymic tumour.\(^5\)
Necrotising fasciitis is a rapidly progressive and potentially fatal surgical emergency (characterised by local pain and fever, fascial necrosis, and systemic toxicity). Diagnosis is confounded in hypercortisolaemia by suppression of inflammation and fever. Leucocytosis is often discounted, and coexistent diabetes adds to the morbidity. Normalising the hypercortisolaemic state aids in treatment of infection; indeed, morbidity is high when cortisol production is uncontrolled.\(^3\)

We describe a case of Cushing’s syndrome and sepsis, caused by locally advanced adrenocortical carcinoma. Presentations of Cushing’s syndrome can be varied, and patients can present across a range of disciplines. Early consideration of the diagnosis increases the possibility of successful treatment.

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Malignant hypertension secondary to cortisol-secreting adrenal tumour

Shao-Wen Weng, Cheng-Hsu Yang, Wan-Ting Huang, Mien-Cheng Chen, Pei-Wen Wang

Abstract

Adrenal cortical tumour-induced malignant hypertension is rare, except for some documented aldosterone-producing adenomas. Hypertension is a common feature of Cushing’s syndrome, whereas malignant hypertension is rarely seen. This case in Taiwan is only the second reported case with malignant hypertension secondary to a cortisol-secreting adrenal tumour. The immunohistochemical study of the excised tumour showed strong positive staining of interleukin (IL)-6. IL-6 can trigger inflammatory vascular damage, which is typical in the malignant phase of hypertension. We hypothesise that IL-6 may have played an important role in this case.

Case report

In May 2000, a 35-year-old male patient was found to have systolic and diastolic hypertension (his blood pressure was around 170/100 mmHg); there was no personal or family history of hypertension. From 2000 to 2002 he received irregular treatment at a local hospital. In 2002, he presented to Chang Gung Memorial Hospital (Kaohsiung, Taiwan) acutely complaining of palpitations, severe headache, blurred vision, and altered level of consciousness.

On physical examination, the patient displayed discrete Cushing’s stigmata. His blood pressure was 210/135 mmHg. Serum laboratory examination showed normal renal function—and normal electrolyte, glucose and plasma renin, and aldosterone levels. No proteinuria or casts were seen on urinalysis. The 24 hours urine vanillylmandelic acid (VMA) level was within normal range, and his computed tomography (CT) head scan was normal. His level of consciousness returned to normal the following day.

Endocrinological examinations showed low serum basal adrenocorticotropic hormone (ACTH) level, elevated cortisol level, and absence of the circadian rhythm. There was resistance to both high- and low-dose dexamethasone suppression. Abdominal CT scan showed a right adrenal tumour approximately 3×3×2.5 cm in size, and an I-131-NP-59 adrenal scan showed unilateral visualisation of the right adrenal gland.

Blood pressure was controlled at around 120–140/80–90 mmHg using a multidrug regimen consisting of a calcium-channel blocker, angiotensin-converting enzyme (ACE) inhibitor, diuretic, central agonist, beta blocker, alpha blocker, and direct vasodilator. Thereafter, laparoscopic adrenalectomy was performed. Grossly, the tumour was well defined and the cutting surface revealed brownish to yellow colour. Histology was consistent with a functional adrenal adenoma. Photomicrography identified bland-looking cortical cells with pale to pinkish cytoplasm (Figure 1A).
Figure 1A. Photomicrography of the tumour cells showing abundant pale cytoplasm alternating with pinkish ones in the focal area (Hematoxylin-Eosin stain, x100 magnification); Figure 1B. Positive cytoplasmic immunostaining with IL-6 antibody in tumour cells (DAB chromogen and hematoxylin counterstain, x200 magnification)

The immunohistochemical study of the tumour showed a negative stain for ACTH and chromogranin-A, but a strong positive stain for interleukin (IL)-6 (Figure1B). Following his operation, the endocrinological examination showed a very low 8A.M serum cortisol level, so a maintenance dose of cortisone acetate was administered. The dosages of the antihypertensive drugs were tapered day by day. Six months later, his blood pressure was well controlled with beta blocker and diuretic only. Cardiac echocardiogram showed regression of left ventricular hypertrophy and improvement of the ejection fraction rate.

Discussion

Apart from some aldosterone-producing adenomas that have been reported,1–3 adrenal cortical tumour-induced malignant hypertension is infrequent. The incidence of malignant hypertension secondary to a cortisol-producing adenoma is extremely rare, and only one other case has been reported.4 However, the blood pressure after adrenalectomy of the previous reported case4 was better controlled than in our case.
This difference may be due to the early detection of the adrenal tumour in the initial stage of the hypertension.

The previous case\textsuperscript{4} did not mention an immunohistochemistry study, however. IL-6 mediated vascular inflammation and atherosclerosis has been documented by Verma et al.\textsuperscript{5} In our case, the blood pressure was not completely reversed to normal after adrenalectomy—this may be due to the poor vascular compliance caused by IL-6 induced inflammatory vascular injury and longstanding poor control of blood pressure.

Our patient had uncontrolled hypertension for 2½ years prior to successful removal of the tumour. Recently, it was reported that a significantly higher systolic blood pressure was observed in middle-aged healthy UK men with IL-6-174 G>C polymorphism.\textsuperscript{6} Whether the current case harboured the IL-6-174 G>C polymorphism and rendered the hypertension more difficult to control is worth our further investigation.

Previous case studies have described the associations between IL-6 and pheochromocytoma. Both paraneoplastic syndrome with pyrexia and marked inflammatory signs\textsuperscript{7} as well as paracrine stimulation of the ipsilateral adrenal cortex by IL-6 originating from the pheochromocytoma have been described.\textsuperscript{8} The above mechanism was described in a case with subclinical Cushing’s syndrome related to pheochromocytoma.\textsuperscript{8}

IL-6 is a potent activator of the human hypothalamic pituitary-adrenal axis.\textsuperscript{9} Following chronic administration of IL-6 in humans, there was a substantial elevation of cortisol level, whereas ACTH levels were blunted.\textsuperscript{10} Path et al have demonstrated that IL-6 could cause the release of cortisol by a direct action on adrenal cells via IL-6 receptors in primary culture.\textsuperscript{11} However, the association between IL-6 and cortisol-secreting tumour was rare mentioned previously.

Willenberg et al demonstrated that IL-6 mRNA was more pronounced expression in adrenal adenomas of patients with Cushing’s syndrome than in normal human adrenals.\textsuperscript{12} However, the sensitivity of adenomatous adrenal cells to IL-6 was significantly decreased relative to cells from normal controls.\textsuperscript{12} Indeed, it is likely that the abundant content of IL-6 in the cytoplasm of the adrenal tumour cells in the current case may stimulate the adjacent normal adrenal cells through the paracrine mechanism to cause hypercortisonism.

In relation to our case, we emphasise the reversibility of malignant hypertension in cortisol-secreting adrenal tumour after adrenalectomy, and IL-6 may have played an important role in this case.

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The New Zealand Suicide Prevention Strategy consultation round: an open submission to the Ministry of Health

Sunny Collings

An all-ages suicide prevention strategy for New Zealand

The draft document *New Zealand Suicide Prevention Strategy: A Life Worth Living* has been released for public consultation.¹ This new strategy refocusses the New Zealand approach, and addresses the need for suicide prevention activity across the whole lifespan. Its development brings New Zealand’s policy into line with what is being done in many other countries, including the USA² and the UK.³ Hopefully we will be able to distil the best from these overseas strategies and adapt them to our society and our health and social service delivery systems. Indeed, this is an opportunity for New Zealand to develop a world-class framework for all-ages suicide prevention.

**Strengths**

The *Strategy’s* strengths are: acknowledgement of the importance of different kinds of evidence, and of leadership, monitoring, and evaluation; clarity about the social values underpinning the framework; emphasis on a ‘whole of government’ and ‘whole of community’ approach; and taking a long-term view.

Given the strong evidence linking mental illness with suicide at the individual level,⁴ the *Strategy* is appropriately located within the Ministry of Health’s scope of responsibilities.

**Deficiencies**

The *Strategy’s* strengths are seriously undermined by some major deficiencies. Unless these are rectified, we will lose the opportunity to have an excellent suicide prevention strategy.

Firstly, although leadership is mentioned, there is no indication of where this is to come from, what the governance structure and process will be, or what the leadership remit will be.

Secondly, there is no reference to any of the national all-ages suicide prevention strategies already in place in other countries. While it is likely that we will wish to do some things differently, why not embrace some of the strengths of other programmes?

Thirdly, the content is (for the most part) so high-level that it does not meet its stated aim of helping to identify actions to reduce rates of suicide and attempted suicide. It appears to emphasise social objectives at the expense of the strong evidence that exists on risk and protective factors for suicidal behaviour. Unfortunately an unbalanced approach to suicide prevention will likely have sub-optimal effects.⁵–⁷
What detail is needed?

As a practising psychiatrist, I see no obvious relevance in the strategy to my day-to-day work with people who are suicidal. Is there to be comprehensive training of all mental health service staff in risk assessment and management, with a regular retraining programme? Will there be a national initiative supporting the development of skills in sound clinical management planning in relation to acute and chronic suicide risk? Will there be national standards of practice in relation to deliberate self-harm (adequately resourced, of course)? How do existing clinical guidelines fit with the strategy? Where does the mental health in primary care initiative fit in, in terms of getting services to more people with mental illness? How is the ‘strengths-based’ model intended to change my clinical risk assessments?

From a public health perspective, more focus is needed. For example, we need to have a programme aimed at men—but what? Should there be a link with alcohol- and substance-use problems? We may need to cast aside assumptions—simply encouraging men to seek help may not work. Surely a consultation document should propose some possibilities. Reducing access to the means of suicide is an evidence based approach—what about investigating the possibility of requiring all cars to have ignition switches linked to cabin air quality, or modified exhausts to make hose attachment difficult? (both with the aim of preventing suicide by carbon monoxide asphyxiation). And, from the policy perspective, how does the strategy link with the Mental Health Information Strategy and the Second National Mental Health and Addiction Plan?

Research and evaluation are a key part of any successful strategy, and this is acknowledged in the draft. What do policy makers see as the key questions? Is the focus of the strategy on ‘strengths’ to be evaluated in any way? Are we to invest in intervention studies in local services, using serious deliberate self-harm as a proxy outcome for suicide? Are the widening physical health disparities in New Zealand being mirrored by a widening gap in mental health status, and if so, what does this mean for our suicide prevention efforts? The strategy hints at this but it is undeveloped. Will new programmes be set up with a commitment to robust evaluation from the outset?

A consultation document or a draft strategy?

Perhaps I have misunderstood the primary purpose of the document: that it is simply intended to set out the broad policy framework within which the actual strategy will be developed—yet it is called a draft strategy. If it is a draft, it may miss the mark with most of the people on the ground doing the crisis intervention work; engaging people with mental illness in appropriate services and then treating them; dealing with those with substance-use problems; and conducting the research that provides the evidence. The consultation process would be more constructive if there were details available regarding the implementation, as the different stakeholder groups would be able to see where they fit in to the overall plan.

Essential features of an effective suicide prevention strategy

A robust suicide prevention strategy for New Zealand will have the following characteristics: it will be nested in the long term social goals for New Zealand as the
draft proposes; it will build on existing strategies from here and elsewhere; and it will be committed to evidence-based suicide prevention initiatives with commitment of significant resources to timely monitoring and evaluation.

The long-term view will enable support of a broadly-based research programme that may lead to new avenues for suicide prevention. Those of us in the various sectors contributing to suicide prevention will cooperate with competent and expert leadership. We will relinquish ‘risk factor envy’\(^1^3\) so that those who view suicide prevention as a social goal and those who see it as a health goal work in synergy rather than in competition.

To achieve this goal, it is critical that we have an adequately resourced, balanced, and highly-specified implementation and evaluation plan aligned with existing evidence (backed by leadership credible across sectors and flexible enough to accommodate new evidence). Such a plan will necessarily include a focus on high-risk groups, an interest in means restriction, service development and access to appropriate services, and an acknowledgement of health inequalities.

**Please contribute to the New Zealand all-ages suicide prevention strategy**

Please take the opportunity to contribute to the development of the implementation plan by making a submission via the Ministry of Health website or by attending one of the public meetings (dates and venues are on the website). This plan is important for the health of New Zealanders, and the constructive contributions of health professionals will make it a much better one. This strategy will be with us for probably 10 years, but the implementation can start now, with a click of your mouse:

- Website: [http://www.moh.govt.nz/suicideprevention](http://www.moh.govt.nz/suicideprevention)
- Email: suicideprevention@moh.govt.nz

*Submissions close on Friday 17 June 2005 at 5pm.*

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PHARMAC and tobacco control in New Zealand:
Government policy ‘up in smoke’

Shaun Holt, Matire Harwood, Sarah Aldington, Richard Beasley

Abstract
There is increasing concerning amongst the medical profession in New Zealand about the adverse effect that PHARMAC has on the health of New Zealanders through restricting the availability of medications. In this article, the circumstances surrounding the restrictions limiting the availability of the smoking cessation treatment bupropion are presented. The authors conclude that the decision by PHARMAC not to fund bupropion is directly contrary to Government policy and is inconsistent with evidence-based medicine and international recommendations. It is suggested that the PHARMAC decision seriously questions the Ministry of Health’s commitment to smoking cessation and the health of disadvantaged groups in New Zealand, particularly Maori.

Drug: Bupropion (Zyban)

Indication: Treatment of smoking cessation

Recommended dose & duration: Bupropion SR 150 mg daily for 3 days, then 150 mg bd for 7–12 weeks, together with behavioural therapy

Clinical efficacy: Bupropion is an antidepressant which is an effective treatment for smoking cessation, resulting in a two-fold greater rate of smoking cessation compared with placebo.\(^1\)\(^-\)\(^5\)

Bupropion may be more effective than nicotine replacement therapy (NRT) in achieving smoking cessation.\(^6\)

Bupropion has been shown to be effective in Maori with a risk ratio for abstinence of 2.4 over 12 months.\(^7\)

Rare serious adverse events such as seizures can occur, resulting in its contraindication in patients with a history of or significant predisposition to seizures.\(^8\),\(^9\)

Background: Tobacco smoking is a major public health problem in New Zealand, being the single greatest preventable cause of premature death.
In New Zealand, smoking kills around 4,500 persons per year.\textsuperscript{10}

The situation is of particular concern in Maori in whom it has been estimated that one in three deaths is due to smoking.\textsuperscript{11}

The rate of smoking in Maori adults is around 50%, compared with around 20% in non-Maori.\textsuperscript{12}

**Government policy:** The New Zealand Health Strategy highlights a reduction of smoking as one of the 13 population health objectives.\textsuperscript{13}

The Ministry of Health goals for tobacco control\textsuperscript{14} are:

- To significantly reduce the levels of tobacco consumption and smoking prevalence.
- To reduce inequalities in health outcomes.
- To reduce the prevalence of smoking among Maori, to at least the same level as non-Maori.
- To reduce New Zealanders’ exposure to secondhand smoke.

In its 5 year plan for tobacco control, the Ministry of Health states\textsuperscript{14} that it will:

- Give substantial weight to interventions for which there is strong scientific evidence of effectiveness.
- Give weight to interventions that benefit a large proportion of the community.
- Give weight to cost-effective interventions.
- Strive to maximise the benefits of targeted interventions (people with the greatest health needs such as Maori and low income New Zealanders) and minimise potential adverse effects.

**Current situation:** New Zealand: Bupropion has been registered and approved for use in New Zealand since May 2000, however is not yet funded by PHARMAC.\textsuperscript{15}

The National Health Committee endorsed the use of bupropion in clinical practice in 2002.\textsuperscript{15}

Following a review of adverse reactions to bupropion, the Medicines Adverse Reactions Committee (MARC) recommended in 2002 that bupropion should only be considered as a second-line intervention (after unsuccessful trials with smoking cessation treatment
International: In the United States and United Kingdom, bupropion is the only non-nicotine drug recommended as first-line pharmacotherapy, with strength (A) evidence as an efficacious smoking cessation treatment that patients should be encouraged to use.\textsuperscript{16,17} Nortriptyline is recommended as a second-line agent in the US Guidelines because it is not registered for smoking cessation in the US and there are more concerns about potential side effects than with first-line medications.

Access/supply: Bupropion can be obtained through the private pharmaceutical market, on prescription. A full 7-week course costs about NZ$330.\textsuperscript{15} Nicotine replacement therapy (NRT) is subsidised by the Government.

There is evidence of efficacy with the antidepressant nortriptyline, however it was not registered for use in New Zealand as a smoking cessation adjunct until 2003. Until then nortriptyline could only be prescribed for this purpose under Section 25 of the Medicines Act 1981 which allows off-label prescribing for non-approved indications.\textsuperscript{15}

Economic analysis: Bupropion is more cost-effective than the majority of treatments currently funded by PHARMAC in terms of cost per life year saved.

Other issues: The study demonstrating the efficacy of bupropion in Maori\textsuperscript{7} is the first randomised, double-blind, placebo-controlled trial of a pharmacotherapy in the Maori population.

Comment: The decision by PHARMAC not to fund bupropion is directly contrary to Government policy and is inconsistent with evidence-based medicine and with US and UK guidelines. The PHARMAC decision seriously questions the Ministry of Health’s commitment to smoking cessation and the health of disadvantaged groups in New Zealand, particularly Maori.
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References:


Important note on the use of adrenalin in hay fever

This extract comes from the New Zealand Medical Journal 1905, Volume 4 (15), p190

Recent reports indicate that the best results in hay fever are obtained from the exhibition of very weak solutions of adrenalin frequently repeated. In the *International Medical Magazine*, July 1903, page 404, Dr E.B. Gleason of Philadelphia says, “The patient may also spray the nose every hour or two, if necessary, with a solution of adrenalin hydrochlorate in the strength of 1 to 10,000 or 1 to 20,000. When the writer first began using this drug his results were not altogether satisfactory. Temporary relief was always obtained to a greater or less extent, but the use of the stronger solutions was always followed by a reaction similar to that of cocaine-solutions. The results have been vastly better since very dilute solutions at frequent intervals have been employed.”

Dr George L. Richards, chairman of the Eastern Section of the American Laryngological, Rhinological, and Otological Society, directs attention to the above in a private communication, and says, “It has been my own experience that very weak solutions, repeated as needed, work very much better than the stronger ones, and I have found a solution as weak as 1-16,000 to answer very well – that is, I order 1 drachm of the 1-1000 solution with sufficient of the diluting medium to make 2 ounces.” To make a 1-10,000 solution of adrenalin chloride, take one part of adrenalin chloride solution 1-1,000 to nine parts of distilled water or normal salt solution. To prepare a 1-20,000 solution, of course double the quantity of diluent is required.

Busy practitioners will find Messrs. Parke, Davis, and Co’s compressed tablets No.365 of great convenience in the preparation of normal salt solution; one of these dissolved in 4 oz of water provides normal salt solution, which is preferable to distilled water as a diluting medium.

We have pleasure in drawing attention to the new sweetmeat, or rather, food, which has been recently put on the market by Messrs Cadbury. Milk chocolate is at once a most pleasant as well as a nourishing article.
Acute Nephralgia

Mohan Rao, Sagar Nigwekar

A 53-year-old healthy man was evaluated for severe left-flank pain. There was no history of trauma.

Figure 1. Abdominal CT scan showing left-sided renal infarction

Figure 2. Renal arteriogram demonstrating ‘string of beads’ appearance (arrowhead) indicating fibromuscular dysplasia (FMD)
Discussion

Fibromuscular dysplasia (FMD) is an uncommon vascular disease that can involve any vascular bed; renal artery involvement being the most common. Complications include renal artery stenosis, aneurysm formation, dissection, and embolus. The latter two can cause renal infarction.

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Reference:

More, or less, on dementia treatment

Regular readers, if indeed there are any, will recall a recent abstract which was less than enthusiastic about the results achieved by the use of cholinesterase inhibitors, including galantamine and donepezil, in the management of dementia.

And now, NICE (National Institute of Clinical Excellence), the NHS prescribing watchdog for England and Wales, has retracted its previous guidance—issued in 2001 which said that these drugs should be prescribed for Alzheimer’s disease—after reviewing the latest evidence on efficacy and cost effectiveness.

On the other hand, a spokesperson for the Royal College of Psychiatrists says “on average, drugs for Alzheimer’s disease delay the decline associated with the illness by six to nine months. This is a degree of benefit which patients value.”

Chronic obstructive pulmonary disease (COPD) and theophylline?

Theophylline is commonly used with benefit in the management of asthma in both children and adults, but its role in the management of COPD has not been defined.

An international team has recently reported on their review of 20 randomized-controlled trials comparing oral theophylline with placebo for a minimum of 7 days in people with stable COPD. FEV₁, FVC, VO₂ max, PaO₂, and PaCO₂ all showed significant improvement in the theophylline treatment arms, and the patients preferred theophylline over placebo. Theophylline increased the risk of nausea compared with placebo and unfortunately the more serious adverse effects of theophylline (e.g. supraventricular arrhythmias) were not found in this review.

Stroke patients and nutrition

The three FOOD (feed or ordinary diet) trials, which have involved more than 4000 stroke patients in hospital, have recently been reported. One trial evaluated oral nutritional supplements, the second the merits of early nasogastric tube feeding, and the third the outcome of percutaneous gastrostomy feeding.

In the first trial, supplementation did not have a significant effect on death or poor outcome. In the second trial, early tube feeding was associated with a non-significant reduction in risk of death, but at the expense of severe disability in those who would otherwise have died. In the third trial, the rate of death and poor outcome was higher with percutaneous endoscopic gastrostomy than with nasogastric feeding.

An accompanying commentary advised that oral food supplements should be reserved for undernourished patients, and that enteral feeding for dysphagic patients should be via the nasogastric route if possible.
World Trade Organization (WTO), AIDS, and India

India has a significant problem with AIDS. India also has a large generic drug industry. No doubt the latter has helped in the management of the former.

The WTO has been pressurising India for years to change its anomalous patent laws, which have allowed generic companies to grab a market of any new drug simply by changing a step in its patented synthetic pathway.

In March, the Indian parliament approved a bill to bring national patent rules in line with international norms. By requiring a product, rather than a process, to be patentable, the bill effectively wipes out the country’s generic drug industry.

And presumably many Indians as well?

Nature 2005;434:552–3

Morning after pill in Canada

In April, Health Canada reclassified the morning-after pill (levonorgestrel 0.75mg) as a nonprescription drug, thus permitting pharmacists to dispense this postcoital oral contraceptive directly to women.

This move has generally been well regarded, presumably with the exception of a minority religious group. However, some are less pleased with the need for a required consultation with a pharmacist. They point out that few pharmacies offer the privacy necessary for such a conversation. This fact, together with the professional fees attached to the consultation, represents a needless barrier to access.

Yes, two pertinent points.

CMAJ 2005;172:845 & 849
Doctor-bashing

Recently the New Zealand Herald published an obituary\(^1\) that does a monstrous injustice to the memory of Professor Dennis Bonham. He had his critics, but did more good for the health of New Zealanders than any of them. I hope that one day the good will be properly recognised.

Hospital-bashing and doctor-bashing have become increasingly popular pastimes during the past 20 years. I have no wish to excuse error or incompetence, but there are now better means in place for dealing with them. More important than any disciplinary function is to ensure as far as possible that they do not happen again, and this is not necessarily helped by a public reaction that is too often excessive and may in the end do more harm than good.

Why there is so much negativity is unclear to me, but part of the explanation may be found in comments on a quite unrelated matter reported by the Herald the day before the obituary appeared.\(^2\) It quoted Justice Wild on the Berryman bridge saga:

“[It] is a neat demonstration of several characteristics of New Zealand and New Zealanders, some of which are good, some unfortunate. First, it demonstrates the admirable tendency of New Zealanders to rally behind people they perceive to be the underdogs….This is a good characteristic of New Zealanders, provided those they are supporting are worthy underdogs. Second, it demonstrates the tendency and ability of ‘underdogs’, and those advocating on their behalf, to manipulate public opinion by carefully selecting facts favourable to their cause, and ignoring or obscuring unfavourable facts….A third, and regrettable, New Zealand characteristic demonstrated by ‘the Berryman bridge saga’ is the tendency of many New Zealanders to bash institutions which are important in our country....’

In this instance, the bashing was of the Army and courts, but the comments apply even more strongly to hospitals and doctors. In mail the same week came the annual report of the Medical Protection Society, which is of course a group based in the UK but which looks after professional interests of some 200,000 health professionals in over 40 countries, including New Zealand. From its wide international perspective it had this to say about our country:

“New Zealand continues to be one of the most hostile medicolegal environments in any of the places in which MPS operates….Our three medicolegal advisers….receive proportionately more requests for assistance than we see elsewhere....”

This would be entirely understandable if our doctors are proportionately worse than those elsewhere, but does anyone seriously suggest that this is so? Even in this case, the problem is likely to get worse rather than better as more of our best students choose to study fields other than medicine, and our best doctors migrate overseas for better pay and conditions as well as less hostility. Is this what the country wants?

Over the years our community has become influenced increasingly more by show than by substance. The perception of Professor Bonham reflected in the Herald obituary is a classic illustration. If this continues, the substance itself will fade—for example by the loss of the best doctors and potential doctors—and finally with it even the show, as people come to realise there is nothing behind it.
Having retired and being now a ‘consumer’ (horrible word) rather than a provider of health services, I feel especially strongly. I am alive today only because of an aortic valve replacement carried out 6 years ago by the recently reviled Green Lane Cardiothoracic Service, by one of the world pioneers in this surgery. I can walk only because of the good offices of an orthopaedic colleague in replacing a hip. And there are other colleagues and health workers to whom I and my family are similarly indebted.

The benefits of health services are felt in every home in the land, even if unrecognised. They are especially evident in services for reproductive health, due in no small measure to the work of Dennis Bonham. In the absence of modern care, at least two mothers in my own family would have lost their lives in childbirth, and a 31-week preterm grandson, now developing well, would either not have survived or have survived disabled.

Surely it is time for the community, while not being uncritical, to count its blessings. Time too, for those who have directly benefited, to make their voices more loudly heard.

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References:
No-fault medical misadventure law ends finger-pointing

Removing the onus to find fault from medical misadventure legislation has cleared a long-standing obstacle to improving patient safety and reducing treatment injuries, says ACC.

Under an amendment to the Injury Prevention, Rehabilitation and Compensation Act which takes effect on 1 July 2005, people who suffer an injury as a result of medical treatment will no longer have to prove that their health professional was at fault or that the injury was “rare and severe” in order to get ACC help.

The change will put health professionals and ACC on the same cooperative footing and make patients’ well-being and the delivery of the safest possible treatment their joint priority. One immediate outcome will be prompter processing of claims, which ACC hopes will be lodged at the time by the health professional who provided the treatment.

ACC’s General Manager Specialist Rehabilitation, Jackie Pivac, said the move away from the punitive system of finding and reporting medical error would strengthen the relationship between ACC and the health sector, and help to build productive partnerships in the interests of patients rather than adversarial relationships.

“The old legislation offered little incentive for health professionals to acknowledge when things did not go according to plan and learn from them,” Ms Pivac said. “It was inherently adversarial. Often someone had to be found at fault before we could accept a claim and proceed with rehabilitation.

“There is no doubt it discouraged cooperation with ACC in resolving a claim because health professionals had to provide evidence against themselves. This reticence led to lengthy delays in processing claims because ACC couldn’t obtain all the necessary information. Another inevitable outcome was that it hindered efforts to gather information about trends and patterns of preventable injuries - information that is vital to improving patient safety and overall care.”

The Act replaces “medical misadventure” with a category called “treatment injury” which includes both serious and minor injuries caused during treatment by a health professional. Things that are a necessary part of treatment - for example, an incision during surgery - or ordinary consequences of treatment - such as hair loss after chemotherapy - are still not covered. It is anticipated that more claims will be accepted, especially some of those that previously did not meet the arbitrary rarity and severity criteria.

The law change affects all registered health practitioners, including chiropractors, clinical dental technicians, dental technicians, dentists, medical laboratory technologists, medical practitioners (doctors, surgeons, anaesthetists etc), medical radiation technologists, midwives, nurses, occupational therapists, optometrists, pharmacists, physiotherapists and podiatrists.

Ms Pivac said the law laid the groundwork for greater collaboration and openness. “When hospital staff, for example, are asked to submit a report on their involvement...”
in the care of a patient who has made an ACC claim, they can do so secure in the knowledge our focus is on the injury, not on whether they were at fault in any way.

“We are also hoping the claims process will be instigated at its source - by the health professional involved in the treatment - rather than down the track by the disgruntled patient, or the patient’s GP, as often used to happen. I think it’s quite reasonable to expect that health professionals will be willing to take the initiative in this new no-fault environment.”

As well as receiving patients’ claims much sooner after an injury, ACC also expects to process claims faster. In the past, medical misadventure claims took on average six months to deal with. Given some of those lodging claims had significant rehabilitation and compensation needs, delays of that length were quite unsatisfactory. ACC is now hopeful of settling straightforward cases within a fortnight and more complicated cases within about two to three months.

Ms Pivac said the previous system wasn’t easy for patients either. “It was a traumatic and time-consuming business and took them into a complex medico-legal field. Extending the ACC scheme’s no-fault principle to the health sector will enable patients to receive rehabilitation and compensation without the stress and delays.”

Two years of consultation with the health sector preceded the legislation’s introduction to Parliament. About 80 per cent of submissions endorsed the thrust of the Bill, with objections focused chiefly on ACC’s reporting requirements which, in the interests of public safety, have not been eliminated entirely.

ACC will no longer routinely report individual cases or competency concerns to the Health and Disability Commissioner or to the registration authority or employer in question. But it will keep a “safety net” in place by reporting any risk of harm to the public. If information collected in the course of processing a claim suggests there is a risk to the public - say, from an organisation, a type of treatment, a practitioner, unsuitable medical facilities and equipment or a particular drug - then it will make a report to the relevant authority.

In addition, information gathered from claims will be used in research efforts to help cut the number of treatment injuries. This information, which will not identify individuals, will be shared with the health sector.

“Once again, the focus is improving patient safety and care,” Ms Pivac said. “ACC has shed its role of playing policeman to medical professionals, a role that was at odds with the no-fault nature of the rest of the ACC scheme.”

One thing that won’t change is patients’ right to make a complaint to the Health and Disability Commissioner if they are unhappy with the standard of care they received from their medical professional. ACC will advise patients of the Commissioner’s role and its advocacy service.

ACC levies in the health sector will not change either. ACC has never levied the sector for the cost of medical misadventure claims and that will not alter, even though the number of claims is expected to rise by between 1,000 and 2,000 a year, mainly because of the inclusion of minor injuries. In the past ACC has received about 3,000 medical misadventure claims a year.
Ms Pivac predicted a lot of minor injuries would be resolved during the treatment process. However, many were likely to be prevented in time as medical professionals modified their practices as a result of receiving more comprehensive injury data from ACC. That data would also be shared with district health boards and teaching institutions to promote safer work practices.

For more information, go to http://www.acc.co.nz/for-providers

Richard Braddell
Media Advisor
Accident Compensation Corporation (ACC)
The New Zealand Government’s 2005 Budget: missed opportunities for significant public health progress

The Government’s 2005 Budget of May 2005 has increased the level of funding for health services, for primary care, and for health research. However, it is a weak budget in overall public health terms, omitting basic steps necessary to improve the overall health status of New Zealanders.

Key issues on which progress could have been made from a public health perspective include the following:

- **Improved progressivity**—Deprivation and income inequalities have a major impact on health in New Zealand. Identifying the potential health benefits of wealth redistribution policies is complex, but preliminary modelling work based on New Zealand census mortality data is suggestive of overall reductions in the inequalities in mortality and in overall mortality rates if income is more equally distributed (Personal Communication, T Blakely, University of Otago). These potential equity benefits are particularly necessary, due to the marked increase in inequalities in this country as a result of various government policies since the early 1980s.

While the 2004 Working for Families budget package was a valuable initiative to address inequalities, the 2005 Budget did not substantively advance government policy on deprivation and income inequalities by making the overall tax and benefit system more progressive. It also lacked specific reforms that could potentially benefit low-income New Zealanders, such as making childcare a tax-deductible expense.

- **Focus on prevention**—The Budget included commendable funding for primary prevention in some components of the cancer control package and for immunisation. Nevertheless, this will have a relatively minor impact on prevention in comparison to what is achievable. Recent work by the Ministry of Health, identifying the major upstream causes of preventable death by risk factor in New Zealand, shows the major scope for primary prevention (e.g. diet for 29% of deaths, tobacco [18%], and deprivation [17%]). Furthermore, the scientific evidence-base for cost-effective interventions in some of these areas of primary prevention is strong, particularly with regard to tobacco control.

- **Support for Maori**—Substantive progress with improving Maori health is critical to reducing health inequalities, enhancing social justice, meeting the Government’s Treaty of Waitangi obligations, and meeting key Government goals. Some of the Budget items relating to healthcare and housing for lower income population groups may provide minor health benefits to Maori. Nevertheless, there was no specific funding for Maori health programmes and indeed the word “Maori” was not mentioned once in the Budget speech; despite the evidence favouring culturally appropriate prevention programmes and healthcare services designed to address Maori health needs.
• **Action on health protecting taxes**—This Budget further elaborated aspects of a proposed carbon charge (a desirable intervention from a global public health perspective), but it failed to introduce other health protecting taxes. It failed to raise tobacco tax despite the lack of a non-indexation rise since 2000, and strong New Zealand and international evidence for public health benefits from increasing this tax. There is also an ethical justification of tobacco taxes when the revenue is used appropriately for tobacco control. Similarly, there is also strong international evidence for the health benefits from alcohol taxes.

An increase in alcohol taxes is particularly relevant in New Zealand, given the high prevalence of self-reported hazardous drinking patterns (eg, 27% of males) and the high net annual years of life lost from alcohol use. Other potential targets for health protecting taxes were also ignored (e.g. on foods high in saturated fat, salt in processed foods, and the advertising of high sugar and/or fat foods).

Central government fiscal policies can only address some of the multiple social and economic determinants of health status. Nevertheless, it creates an important fiscal framework and the Government missed obvious opportunities in this Budget to significantly improve public health and reduce health inequalities in New Zealand. We will now have to wait for the next budget for an opportunity for further progress in these areas.

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References:


The New Zealand Government’s energy policies need to consider public health benefits

The New Zealand Government has recently released a discussion document on “Creating a Sustainable Energy System.” This document is helpful in that it recognises both the approaching end of cheap oil and the threat posed by climate change (around which the scientific consensus is now very strong). However as energy policies have links with public health, it is of concern that it fails to adequately consider the health benefits and costs of various energy policies.

In only two places does the document specifically mention energy-associated health issues: first that poorly insulated and inadequately heated homes are risk factors for poor health; and second that motor vehicle emissions contribute to the air pollution burden on health (although it does not bring a comprehensive approach to the air pollution burden as it ignores other emission sources such as thermal power stations). Although these two issues are important, there are many other ways in which a nation’s energy policies may affect its citizens’ health.

The health benefits that might arise from such energy policies as introducing carbon charges (scheduled for New Zealand in April 2007) include the following:

- **Reduced harm from multiple sources of air pollution**—Carbon charges (if not blunted by negotiated agreements that allow avoidance of charges) are likely to impact on the extent of coal burning for industrial and domestic use, to encourage use of more fuel efficient vehicles, and even to slow the growth in usage rates of private vehicle transportation. For example, fuel price rises have led to greater usage rates of public transport in the past (as documented in Auckland after petrol price increases in 2000).

Such changes may help to limit air pollution and to protect health, given that particulate air pollution (from vehicles and other sources) is estimated to cause around 970 premature deaths each year in New Zealand. In particular, air pollution has been associated with increased risk of hospitalisation or death in a number of New Zealand cities. These impacts are consistent with growing international evidence for adverse health impacts from air pollution.

The harm from motor vehicle emissions would be further reduced if vehicle tuning and emission measurement as part of warrant of fitness checks were required.

- **Reduced harm from injury**—If carbon charges encouraged greater use of buses and trains, this would reduce overall road traffic injury rates as these forms of transport are much safer per kilometre travelled than car travel. In New Zealand, substantial reductions in fatal vehicle crashes were significantly associated with the fuel price increases of the 1979 oil crisis. Similarly, United States data indicates that higher fuel taxes have reduced vehicle crash fatalities. The Intergovernmental Panel on Climate Change has also reported that controlling road traffic would benefit health through reductions in road traffic crashes.
Any reduction in traffic volumes may also make cycling and walking relatively safer and more acceptable for commuters, and thus increase physical activity levels.

- **Potential health benefits of tax reform**—The additional revenue from carbon charges provides the Government with more opportunity to lower GST or make other tax reforms (e.g. making childcare a tax-deductible expense). If such reforms helped reduced poverty levels, then it could benefit public health as well as reducing health inequalities.

Finally, if New Zealand and other countries work together to reduce fossil fuel use globally, this will contribute to minimising the likely adverse health effects associated with greenhouse gas induced climate change. These include the expanded ranges of disease vectors such as mosquitoes;¹⁵,¹⁶ the adverse effects on food production (and hence nutrition); and extreme weather events such as floods, storms, and heat waves.

These potential health effects need to be considered in designing future energy policies. Given the health issues involved, health professionals should actively critique proposed government energy policies, and advocate for those policies that are both environmentally sustainable and pro-health.

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**References:**


Regarding Pippa MacKay’s editorial: the NZMA Chairman’s response

In his letter published in the previous issue of the NZMJ (http://www.nzma.org.nz/journal/118-1215/1481), Dr Ben Gray writes to the Editor: “By accepting the Chair of the RMI as an editorial contributor you are aligning the NZMA’s position with the RMI.”

I am moved to respond that while the NZMA is the proud publisher of the NZMJ, the Journal has editorial independence, as any good journal must have.

The Journal and its Editor do not determine, nor necessarily reflect, the position and policies of the NZMA.

Ross Boswell
Chairman, NZMA
Acute mountain sickness and driving at high altitude: caution is required due to the sudden onset of dysfunction

Recent experience in August 2004 with a tour group of 30 travelling in cars from Beijing via the northern Silk Road to Urumqi, across the Taklimakan desert to Golmud and then to Lhasa, highlights the difficulties to be faced with acute mountain sickness (AMS).

As susceptibility to mountain sickness cannot be forecast,\(^1,2\) those on self-drive tours such as ours have to be wary of its possible effects. AMS is a common experience for people using this northern approach road to Lhasa.\(^3\) Though we were at 2500+ metres for the preceding several days (as planned protection from AMS), our group’s experience was alarming, with unheralded rapid onset of serious cerebral dysfunction.

On the day we left Golmud to cross the Tibetan Plateau, at the evening meal at Tuotuo Heyan (4500 metres), four people were found to have developed marked cerebral dysfunction with inertia, confusion, and incoherence. They had exhibited no symptoms until then.

Descent to a lower altitude was not possible; shelter was found, and with initial oxygen for an hour; followed by strict bed rest, oral fluids, dexamethasone, and acetazolamide, along with overnight supervision; all were stable and coherent with only minor AMS symptoms by the morning. Next day there were two more mild cases with all six recovering after a night at 4100 metres.

With the progressive reduction of barriers to travel in China, unrestricted self-drive touring may well be possible by the 2008 Olympics. Other New Zealanders have recently toured in this fashion.\(^4\) Preventive measures help protect driver competence but these cannot be relied on.

Based on our experience, printed guidelines should include a suggested precautionary rule\(^1\) of once over 2500 metres only gaining 600 metres between places where sleeping, and, if minor symptoms of AMS appear, staying at that sleeping height for another 24 hours. Having an altitude meter (a hand-held GPS also performs that function) would also assist in preventing this potentially dangerous, and difficult to predict, disorder in those planning self-drive touring at altitudes over 2500 metres.

(My thanks to Marty Lemberg and the staff of the Otumoetai Health Centre, Tauranga for their advice and support, and for arranging the necessary supplies.)

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References:

Rex Earl Wright-St Clair

Rex Wright-St Clair, who did so much to promote the study of medical history in New Zealand, died in his sleep at Auckland on 17 February 2005 after attending the opening session of the 9th Biennial Conference of the Australian Society of the History of Medicine.

This was the first occasion on which the Society had visited New Zealand and it is a source of deep regret that Rex died just hours before the AGM, when the members voted to change the name of the Society to the Australian and New Zealand Society of the History of Medicine.

Rex was born in Hamilton on 3 September 1922. The grandson of a Maori Land Court interpreter, he never lost his Waikato roots. Dux of Hamilton High School in 1940, he then entered the Otago Medical School, graduating MB ChB in 1947.

Other than a brief interlude as a locum in Auckland, Rex spent the whole of his professional career in his native Hamilton, working for two decades as a sole practitioner GP until a stroke encouraged him to embark on a new career as a medical administrator, initially as assistant medical superintendent of Waikato Hospital and then as medical superintendent of the Waikato Hospital Board Community Health Service from 1977–1988.

When Rex committed to any venture it was for the long term. Nowhere was this better exemplified than in his contribution to The Order of St John. Starting in the Cadet Division, he became a divisional surgeon in 1949 and was admitted to the Order as an officer in 1962. In 1977, he was promoted to be a Knight of Grace and in 1982 was reclassified as a Knight of Justice. In addition to his medical work for St John, Rex published a history of the Order’s work in New Zealand (1977) and an extensively revised second edition in 1985.

Over the last 50 years of his life, Rex also had a second career—for it was far more than a hobby—as a medical historian. During this time, he produced in excess of 50 publications, ranging from short vignettes to his award-winning book, Thoroughly a Man of the World: A Biography of Sir David Monro MD (1971). The first of these publications, an article entitled The beginnings of medical registration in New Zealand, appeared in the NZMJ in 1955. The last, an essay on Dr AS Thomson for a forthcoming international dictionary of medical biography arrived on my desk in December 2004. As ever, it was carefully crafted and eloquently phrased, requiring a minimum of editorial interference.

Rex’s contribution to medical history extended far beyond the written word. He organised New Zealand’s first international medical conference in 1987, a bold move which inspired two sequels, in 1994 and 2005. Even a cursory glance through Rex’s meticulously ordered correspondence files reveals how much assistance he offered...
freely to other medical historians, in New Zealand and overseas. He will be sadly missed, though his legacy of published work will ensure he will not be forgotten.

Rex is survived by Elizabeth, his wife for 55 years, their three children (Janice, Valerie, and Craig), five grandchildren, and a great granddaughter.

We are grateful to Dr Derek A Dow (Honorary Senior Lecturer, University of Auckland) for this obituary.
James Verney Cable

Verney Cable was born in Wellington in 1908, the elder son of electrical engineer, Matthew, and his wife Elsie. He received his schooling at Kilbirnie School, Wellington College, and at Waitaki Boys’ High School before entering the Otago Medical School.

He had an outstanding undergraduate record, topping his class in anatomy, passing with distinction and he was awarded the Scott Memorial Medal. He also won the Christie Medal in applied anatomy. Later in the course he was awarded the Graduates’ Association Medal in clinical medicine, the Batchelor Memorial Medal in obstetrics and gynaecology, and the Marjorie McCallum Medal. He did his final year at Wellington Hospital graduating MB ChB in 1932. He was awarded a travelling scholarship in medicine. After a brief locum at Masterton Hospital, he went back to Dunedin to be Anatomy Demonstrator.

He returned to Wellington Hospital for two house surgeon years and was appointed Medical Registrar in 1935. In May 1935, he passed the MD examinations and decided to leave Wellington Hospital to seek further training in England.

Soon after arriving in London he was appointed to the house staff of the City of London Hospital for Diseases of the Heart and Lungs at Victoria Park. Whilst there, he passed the London MRCP. In 1938, he was appointed sole RMO at the National Heart Hospital. He might have stayed in England but for the war, and in late 1940 he returned to New Zealand with wife Pat and their first child to the position of Assistant Professor, Department of Medicine, Otago Medical School, under the newly arrived Professor Horace Smirk.

Verney remained in this post for two years and then enlisted with the army. He served in Egypt and in Italy, and by 1945 was Lieutenant-Colonel, OC Medical Division 2NZ General Hospital.

In March 1946, he took up the appointment of Resident Physician, Wellington Hospital, a position in which he remained until his retirement in 1974. In this role, Verney had control over a majority of the medical beds and he quickly established a reputation as an excellent clinician. He passed the MRACP examinations in 1952 and was awarded the FRACP in 1958.

He was responsible for a number of innovations including the undertaking of the first cardiac catheterisations in Wellington (1951–1953) and he performed the first haemodialysis procedure in Australasia in 1958. He spent 6 months at the Massachusetts General Hospital in 1954 as Fulbright Lecturer in Medicine, Harvard University.
Verney was heavily involved in the education of student nurses throughout his career at Wellington Hospital. In 1960, he published the outstanding *book Principles of Medicine – an integrated textbook for nurses*. This was to be used by nurses throughout New Zealand and beyond for a number of years. Verney kept the book up-to-date and published four subsequent editions, the last in 1972.

Verney was a pioneer, an innovator, and a teacher who inspired generations of students, colleagues and friends to always question conventional wisdom and look beyond the near horizon. He had a somewhat acerbic manner and was intolerant of incompetence, but he commanded respect from his hospital colleagues.

After retiring from Wellington Hospital, Verney joined the staff of Silverstream Hospital as visiting physician. He was Medical Superintendent there in 1979 and finally retired in 1982.

He developed an interest in Japan and the Japanese language from the late 1950s and was President of the NZ Japan Society 1965–1968. Indeed, he remained mentally active throughout his life. In the 1970s, he enrolled as an extramural student at Massey University and graduated BA in 1981, majoring in history.

Pat, his dear wife of 69 years, died in 2004. Verney died at Dannevirke on March 15, and is survived by a son and two daughters.

We are grateful to Dr Ron Easthope (retired Wellington cardiologist, now working part-time as Clinical Advisor, Information Services, Capital and Coast DHB) for this obituary.
John Wilfred Logan

John Logan died peacefully at home on 30 December 2004. He was born in 1921, the second of four boys, to a farming couple, in Whangarei.

He was educated at Kamo Primary School and Whangarei Boys High School, where he was successful academically. John was also in the school’s First XV, and represented the school at shot put.

John completed his medical Intermediate year at Auckland University in 1938, and then spent the war years at the University of Otago Medical School; 1946 and 1947 were spent as a house surgeon at Napier Hospital, and in 1948, he worked for a year in the Radiotherapy Department in Wellington Hospital under Dr “Nudge” Lynch.

The next 2 years were spent in specialist radiotherapy training at the Christy Hospital and Holt Radium Institute in Manchester, England. It is here where he met, and subsequently married, his wife Mary.

In 1950, he returned to Wellington Hospital where he remained in full time hospital practice until his retirement in 1986.

Work at Wellington Hospital was often difficult due to inadequate staffing and resources. Despite this, John, in addition to a demanding clinical practice, developed a keen interest in basic science and clinical research—an interest he maintained even after his retirement. He published papers on viruses and cancer in the 1950s, followed by numerous papers and letters on topics such as seasonal variations in cancer incidence, dietary effects on cancer and its treatment, immunology, and cot deaths.

Outside medicine, he was a devoted family man, raising four boys in Island Bay, Wellington. He was passionately interested in art and music, and was a skilled painter himself. In the 1960s, he was a merit award winner in the Kelliher award competition, at that time New Zealand’s premier art award.

John enjoyed a long and happy retirement and is survived by his wife Mary and his four sons: an engineer, a lawyer, a doctor, and an artist/musician.

We are grateful to one of John’s sons, Dr Andrew J Logan, for this obituary.
The Postgraduate Medical Committee in the University of Auckland invites applications for this study award established in 1986.

The Award has been set up to enable professional workers in the field of geriatrics (particularly those who are not usually eligible for study grants) to travel abroad to study geriatric care. In some instances, appropriate study within New Zealand may be funded.

Under the terms of the Award, the Postgraduate Medical Committee will provide a grant-in-aid, of $10,000, towards the cost of airfares and living expenses for the period of the study leave.

The Award is to be taken up between 1 October 2005 and 30 September 2006, although the exact timing is subject to negotiation.

Closing date for applications: Monday, 22 August 2005

Further details are available from:
Secretary of the Postgraduate Medical Committee, University of Auckland
Tel: (09) 373 7599 x 84468 (please leave a message),
or email: cthomas@ihug.co.nz
University of Otago Faculty of Medicine / Freemasons
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The above Fellowships or Scholarships are open to University graduates who intend to pursue long-term work in Paediatrics or Child Health within New Zealand. The Fellowships include full-time salary for 1 year, with provision for a further year.

Applications close on 24 June 2005 with the Manager of the Faculty of Medicine, University of Otago Medical School, P O Box 913, Dunedin, from whom further details may be obtained.
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NZMA Members, and families of deceased Members, may apply for aid when in situations of financial hardship or distress.

Applications should be directed through the NZMA:

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P O Box 156
Wellington
Tel: 0800 656161
The New Zealand Dementia Guide


As soon as I received this book, I knew the perfect person to help me write the review—my mother who is now the main caregiver (outside the rest home) for my grandfather who has dementia and is in a secure unit. My mother was so pleased with the book she is now asking for it back: “I can now recognise some of the signs mentioned in the book such as the small shuffling steps,” and “one of the rest-home workers thought I was a nurse after I armed myself with knowledge gained from this book.” She also said that she could now empathise more with her mother who struggled to take care of, and love, her husband because of the dementia.

The book truly lives up to its name of being a guide, as it is very informative and provides useful information (importantly in a New Zealand context) about almost everything most readers need to know about dementia: the types of dementia and degrees of severity; therapies and treatments (including medication); being a caregiver; choosing and understanding residential care; behavioural and psychological difficulties; end-of-life issues; special needs; and spiritual, cultural, legal, and ethical issues. The book finishes with a glossary, contact details (of support people and organisations including websites and phone numbers) section, reading list, and index.

The chapters are positioned logically, and contain easy-to-understand, double-spaced text, which aids readability along with good use of bullet points and blank space. There are, however, few illustrations or diagrams. Other good features of the book are a summary at the end of each chapter to consolidate one’s learning, and true stories written in the first or third person. The book could either be read cover-to-cover and/or used as a trusty reference. I imagine the book would be most suitable for people caring (either at home or professionally) for people with dementia, especially in its early stages so they know what lies ahead; it can certainly inform and empower them. Every New Zealand rest home should have a copy for its staff, and probably most already have it.

Although the book is well-bound and has an attractive cover, the pages themselves are of a budget, newsprint type (no colour), probably to make the book more affordable so it reaches a larger readership. Perhaps if there are further editions then the paper could be upgraded.

Chris(tine) Perkins, who trained at Otago Medical School and then worked as a GP before specialising in old-age psychiatry in both the public and private sectors, modestly states at the end: “I hope this book has gone a little way to addressing some of the fears and prejudices we have about dementia, so that we can be more understanding and compassionate towards these people and those who care for them”—a classic understatement. Recommended.

Brennan Edwardes
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